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Contents

I *Acts whose publication is obligatory*

★ **Annex to Council Directive 96/49/EC of 23 July 1996, as announced in Commission Directive 96/87/EC of 13 December 1996, adapting to technical progress Council Directive 96/49/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by rail** (1) . . 1

(1) Text with EEA relevance

Price: 109 ECU

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Acts whose titles are printed in light type are those relating to day-to-day management of agricultural matters, and are generally valid for a limited period.

The titles of all other Acts are printed in bold type and preceded by an asterisk.

I

(Acts whose publication is obligatory)

Annex to Council Directive 96/49/EC of 23 July 1996, [1] as announced in Commission Directive 96/87/EC of 13 December 1996, [2] adapting to technical progress Council Directive 96/49/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by rail

(Text with EEA relevance)

[1] OJ L 235, 17.9.1996, p. 25.
[2] OJ L 335, 24.12.1996, p. 45.

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PART I

GENERAL REQUIREMENTS

1 (1) This Annex constitutes the regulations concerning the carriage of dangerous goods by rail, in accordance with Council Directive 96/49/EC. It has been taken from the 'Regulations concerning the international carriage of dangerous goods by rail'.

(2) The substances and articles of this Directive are arranged in the following classes:

Class 1 Explosive substances and articles.

Class 2 Gases.

Class 3 Flammable liquids.

Class 4.1 Flammable solids.

Class 4.2 Substances liable to spontaneous combustion.

Class 4.3 Substances which, in contact with water, emit flammable gases.

Class 5.1 Oxidizing substances.

Class 5.2 Organic peroxides.

Class 6.1 Toxic substances.

Class 6.2 Infectious substances.

Class 7 Radioactive material.

Class 8 Corrosive substances.

Class 9 Miscellaneous dangerous substances and articles.

(3) Substances and articles covered by the titles of Classes 1 and 7 (restrictive classes) are not to be accepted for carriage, subject to the following exceptions. Substances and articles listed under marginal numbers (marg.) 101 and 701 are to be accepted for carriage provided that they comply with the conditions laid down in the various classes.

(4) Substances and articles of Classes 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 8 and 9 (non-restrictive classes), which are mentioned in marginals 201, 301, 401, 431, 471, 501, 551, 601, 651, 801 and 901 or are covered by one of the collective headings in these marginals, are only to be accepted for carriage under the conditions laid down in the various classes. Other substances and articles covered by the titles of these classes are to be accepted for carriage without special conditions.

(5) Substances and articles which are expressly excluded from carriage under the terms of the notes set out in the various classes cannot be accepted for carriage.

(6) Normal conditions of carriage are applicable to the substances and articles of this Directive, unless otherwise provided by this Directive.

2 (1) The conditions of carriage applicable to each class, with the exception of Class 7, are subdivided into the following sections:

A. Packages:

1. General conditions of packing;
2. Special conditions of packing;
3. Mixed packing;
4. Marking and danger labels on packages.

B. Method of despatch and restrictions on forwarding.

C. Particulars in the consignment note.

2 *(cont'd)*

D. Transport equipment:

1. Conditions relating to wagons and loading;
2. Marking and danger labels on wagons, tank wagons, tank-containers and small containers.

E. Prohibitions on mixed loading.

F. Empty packagings.

G. Other requirements.

The conditions of carriage applicable to Class 7 are contained in schedules comprising the following headings.

1. Materials.
2. Packaging/Package.
3. Maximum radiation level.
4. Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks.
5. Decontamination and use of wagons, equipment or parts thereof.
6. Mixed packing.
7. Mixed loading.
8. Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks.
9. Marking and danger labels on wagons other than tank wagons.
10. Transport documents.
11. Storage and despatch.
12. Carriage of packages, containers, tank wagons, tank-containers and overpacks.
13. Other provisions.

The appendices contain:

Appendix I: Stability and safety conditions relating to explosive substances and articles, and for nitrocellulose mixtures, together with the glossary of names in marg. 101;

Appendix II: Requirements relating to the nature of aluminium alloy receptacles for certain gases of Class 2; requirements concerning the materials and construction of receptacles in accordance with marg. 206 intended for the carriage of deeply refrigerated liquefied gases of Class 2; requirements concerning the materials and construction of shells of tank wagons and shells of tank-containers for which a test pressure of at least 1 MPa (10 bar) is prescribed, as well as shells of tank wagons and shells of tank-containers intended for the carriage of deeply refrigerated liquefied gases of Class 2; requirements relating to tests on aerosol dispensers and receptacles, small, containing gas (gas cartridges) of item 5 of Class 2;

Appendix III: Tests relating to flammable liquids of Classes 3, 6.1 and 8; test for determining fluidity; tests for determining the ecotoxicity, persistence and bioaccumulation of substances in the aquatic environment for classification in Class 9;

Appendix IV: (reserved);

Appendix V: General packing conditions, types of packaging, requirements applicable to packagings, test requirements for packagings;

2 *(cont'd)*

Appendix VI: General requirements for the use of intermediate bulk containers (IBCs), types of IBC, requirements relating to the construction of IBCs and requirements relating to IBC testing;

Appendix VII: Requirements relating to radioactive material of Class 7;

Appendix VIII: Requirements relating to requirements and the list of Dangerous Goods;

Appendix IX: Requirements relating to danger labels, explanation of illustrations and markings for elevated temperature substances;

Appendix X: Requirements relating to the use of tank-containers, their construction and the tests which they must undergo;

Appendix XI: Requirements relating to the use of tank wagons, their construction and the tests which they must undergo.

(2) The regulations for the completion of formalities required by the Customs or other administrative authorities should also be observed (see Art. 25, para. 1 of the CIM Uniform Rules).

In addition to the particulars and attestations required by this Directive, it is particularly necessary that the attestations called for by the administrative authorities should also be entered in the consignment note, to which any accompanying documents required by these authorities should be attached.

(3) In conformity with para. 2 of the RIEx (Annex IV to the CIM Uniform Rules), substances and articles of this Directive, with the exception of those of Class 7, are only to be accepted for carriage as express parcels (colis express) in so far as this means of carriage is specifically laid down under Section B of the various classes. For the carriage of substances of Class 7 as express parcels, see marg. 701 (4).

(4) In conformity with Article 18 (e) of the Uniform Rules concerning the Contract for International Carriage of Passengers and Luggage by Rail (CIV), substances and articles of this Directive are excluded from carriage as luggage unless tariffs provide for exceptions.

(5) For traffic in terms of Article 3, para. 3 of the Convention concerning International Carriage by Rail (COTIF), besides the provisions of this Directive any special national or international rules for the carriage of dangerous goods by road or waterway are equally applicable in so far as they do not conflict with the requirements of this Directive.

3 (1) A non-radioactive substance [see the definition of radioactive material in marg. 700 (1)] falling under a collective heading of any class is not to be accepted for carriage if in addition it is covered by the title of a restrictive class where it is not listed.

(2) A non-radioactive subtance [see the definition of radioactive material in marg. 700 (1)] not specifically listed in a class, but falling under two or more collective headings of various classes, is subject to the conditions of carriage laid down:

(a) in the restrictive class, if one of the relevant classes is restrictive;

(b) in the class corresponding to the principal danger which the substance is likely to manifest during carriage, if none of the relevant classes is restrictive.

(3) The following provisions shall apply to substances, solutions and mixtures (such as preparations and wastes) not mentioned by name in the lists of substances of the various classes.

Note: 1. Solutions and mixtures comprise two or more components. These components may be either substances of this Directive or substances which are not subject to the requirements of this Directive.

2. Solutions and mixtures containing one or more components of a restrictive Class are not to be accepted for carriage unless those components are listed by name in the list of substances of the restrictive Class.

3. Solutions and mixtures having a specific activity exceeding 70kBq/kg (2 nCi/g) are substances of Class 7 [see marg. 700 (1)].

(a) A solution or mixture containing a dangerous substance listed by name in together with one or more non-dangerous substances, shall be regarded as the dangerous substance listed by name, unless:

1. The solution or mixture is specifically listed by name elsewhere in this Directive; or

2. It is quite clear from the item for a dangerous substance that it is applicable only to the pure or technically pure substance; or

3. The Class, physical state or packing group of the solution or mixture is different from that of the dangerous substance.

3 *(cont'd)*

For such solutions and mixtures, the word *solution* or *mixture* shall then be added as part of the name in the consignment note for the purposes of clarity in the description, e.g. *acetone solution*.

If the Class, physical state or packing group are different from that for the pure substance, the solution or mixture shall be classified under an appropriate n.o.s. entry, depending on the degree of danger.

(b) Substances having more than one danger characteristic, as well as solutions and mixtures containing two or more components subject to this Directive shall be placed under an item and letter of the appropriate Class in accordance with their danger characteristics. Such classification according to the danger characteristics shall be carried out as follows:

1.1 Determination of the physical and chemical characteristics and physiological properties by measurement or calculation and classification shall be made according to the criteria of the various classes.

1.2 If this determination is not possible without disproportionate cost or effort (as for some kinds of wastes), the solutions or mixtures shall be placed in the Class of the component presenting the predominant danger.

2. If a substance presents more than one danger characteristic, or if the mixture or solution contains more than one component of the classes or groups of substances listed below, it shall be classified in the class or the group of substances presenting the predominant danger.

2.1 If there is no predominant danger, classification shall be based on the following order of precedence:

— substances and articles of Class 1

— substances and articles of Class 2

— self-reactive and related substances and explosive substances in non-explosive state (wetted or phlegmatized explisive substances) of Class 4.1

— pyrophoric substances of Class 4.2

— substances of Class 5.2

— substances of Class 6.1 which are highly toxic on inhalation according to the criteria of marginal 600 (3), excluding substances, solutions and mixtures (such as preparations and wastes) meeting the classification criteria of Class 8 and having an inhalation toxicity of dusts and mists (LC_{50}) in the range of group (a), but toxicity through oral ingestion or dermal contact only in the range of group (c) or which present a lower degree of toxicity. These substances, solutions and mixtures (such as preparations and wastes) shall be assigned to Class 8.

— infectious substances of Class 6.2

2.2 If the danger characteristics fall within more than one Class or group of substances not listed in 2.1, the substances, mixtures or solutions shall be classified in the Class or group of substances presenting the predominant danger.

2.3 If there is no predominant danger, the substance, solution or mixture shall be classified as follows:

2.3.1 Assignment to a Class shall be on the basis of the various danger characteristics or components in accordance with the table. For Classes 3, 4.1, 4.2, 4.3, 5.1, 6.1, 6.2, 8 and 9, account shall be taken of the degree of danger indicated by letters (a), (b) or (c) of the various items (see marg. 300 (3), 400 (3), 430 (3), 470 (3), 500 (3), 600 (3), 650 (3), 800 (3) and 900 (2)].

Note: Example to explain the use of the table:

Mixture consisting of a flammable liquid classified under Class 3, letter (c), a toxic substance classified under Class 6.1, letter (b), and a corrosive substance classified under Class 8, letter (a).

Procedure:

The intersection of line 3(c) with column 6.1(b) gives 6.1(b); The intersection of line 6.1(b) with column 8(a) gives 8(a). This mixture is therefore to be classified under Class 8, letter (a).

3 (cont'd)

Table marg. 3 (3)

Class and where applicable, letter	4.1 b)		4.1 c)		4.2 b)		4.2 c)		4.3 a)	4.3 b)	4.3 c)	5.1 a) (1)		5.1 b) (1)		5.1 c) (1)		6.1 a) (3) DER-MAL	6.1 a) (3) ORAL	6.1 b) (3)		6.1 c) (3)		8 a) (4)		8 b) (4)		8 c) (4)		9
3 a) (2)	SOL 4.1 (5)	LIQ 3 a)	SOL 4.1 (5)	LIQ 3 a)	SOL 4.2 (5)	LIQ 3 a)	SOL 4.2 (5)	LIQ 3 a)	4.3 a)	4,3 a)	4,3 a)	SOL 5.1 a)	LIQ 3 a)	SOL 5.1 a)	LIQ 3 a)	SOL 5.1 a)	LIQ 3 a)	3 a)	3 a)	3 a)		3 a)		3 a)		3 a)		3 a)		3 a)
3 b) (2)	SOL 4.1 (5)	LIQ 3 b)	SOL 4.1 (5)	LIQ 3 b)	SOL 4.2 (5)	LIQ 3 b)	SOL 4.2 (5)	LIQ 3 b)	4.3 a)	4.3 b)	4.3 b)	SOL 5.1 a)	LIQ 3 a)	SOL 5.1 b)	LIQ 3 b)	SOL 5.1 b)	LIQ 3 b)	3 a)	3 a)	3 b)		3 b)		8 a)		3 b)		3 b)		3 b)
3 c) (2)	SOL 4.1 (5)	LIQ 3 b)	SOL 4.1 (5)	LIQ 3 c)	SOL 4.2 (5)	LIQ 3 b)	SOL 4.2 (5)	LIQ 3 c)	4.3 a)	4.3 b)	4.3 c)	SOL 5.1 a)	LIQ 3 a)	SOL 5.1 b)	LIQ 3 b)	SOL 5.1 c)	LIQ 3 c)	6.1 a)	6.1 a)	6.1 b)		3 c) (8)		8 a)		8 b)		3 c)		3 c) (6)
4.1 b)					4.2 b)		4.2 b)		4.3 a)	4.3 b)	4.3 b)	5.1 a)		4.1 b)		4.1 b)		6.1 a)	6.1 a)	SOL 4.1 b)	LIQ 6.1 b)	SOL 4.1 b)	LIQ 6.1 b)	8 a)		SOL 4.1 b)	LIQ 8 b)	SOL 4.1 b)	LIQ 8 b)	4.1 b)
4.1 c)					4.2 b)		4.2 c)		4.3 a)	4.3 b)	4.3 c)	5.1 a)		4.1 b)		4.1 c)		6.1 a)	6.1 a)	6.1 b)		SOL 4.1 c)	LIQ 6.1 c)	8 a)		8 b)		SOL 4.1 c)	LIQ 8 c)	4.1 c) (6)
4.2 b)									4.3 a)	4.3 b)	4.3 b)	5.1 a)		4.2 b)		4.2 b)		6.1 a)	6.1 a)	4.2 b)		4.2 b)		8 a)		4.2 b)		4.2 b)		4.2 b)
4.2 c)									4.3 a)	4.3 b)	4.3 c)	5.1 a)		5.1 b)		4.2 c)		6.1 a)	6.1 a)	6.1 b)		4.2 c)		8 a)		8 b)		4.2 c)		4.2 c) (6)
4.3 a)												5.1 a)		4.3 a)		4.3 a)		6.1 a)	4.3 a)	4.3 a)		4.3 a)		4.3 a)		4.3 a)		4.3 a)		4.3 a)
4.3 b)												5.1 a)		4.3 b)		4.3 b)		6.1 a)	4.3 a)	4.3 b)		4.3 b)		8 a)		4.3 b)		4.3 b)		4.3 b)
4.3 c)												5.1 a)		5.1 b)		4.3 c)		6.1 a)	6.1 a)	6.1 b)		4.3 c)		8 a)		8 b)		4.3 c)		4.3 c) (6)
5.1 a) (1) (7)																		5.1 a)	5.1 a)	5.1 a)		5.1 a)		5.1 a)		5.1 a)		5.1 a)		5.1 a)
5.1 b) (1) (7)																		6.1 a)	5.1 a)	5.1 b)		5.1 b)		8 a)		5.1 b)		5.1 b)		5.1 b)
5.1 c) (1) (7)																		6.1 a)	6.1 a)	6.1 b)		5.1 c)		8 a)		8 b)		5.1 c)		5.1 c) (6)
6.1 a) (3) DERMAL																								SOL 6.1 a)	LIQ 8 a)	6.1 a)		6.1 a)		6.1 a)
6.1 a) (3) ORAL																								SOL 6.1 a)	LIQ 8 a)	6.1 a)		6.1 a)		6.1 a)
6.1 b) (3) INHAL																								SOL 6.1 a)	LIQ 8 a)	6.1 b)		6.1 b)		6.1 b)
6.1 b) (3) DERMAL																								SOL 6.1 a)	LIQ 8 a)	SOL 6.1 b)	LIQ 8 b)	6.1 b)		6.1 b)
6.1 b) (3) ORAL					SOL = Solid substances and mixtures. LIQ = Liquid substances, mixtures and solutions. DERMAL = Dermal toxicity. ORAL = Oral toxicity. INHAL = Inhalation toxicity.																			8 a)		SOL 6.1 b)	LIQ 8 b)	6.1 b)		6.1 b)
6.1 c) (3)																								8 a)		8 b)		8 c)		6.1 c) (6)
8 a) (4)																														8 a)
8 b) (4)																														8 b)
8 c) (4)																														8 c) (6)

(1) These mixtures and solutions may have explosive properties, in which case they are not to be accepted for carriage unless they meet the requirements of Class 1.
(2) Solutions or mixtures containing substances of Class 3, marginal 301, items 6, 12 or 13 shall be placed in that Class under those items.
(3) Solutions or mixtures containing substances of Class 6.1, marginal 601, items 1 to 5 shall be placed in that Class under those items.
(4) Solutions or mixtures containing substances of Class 8, marginal 801, items 6, and 15 shall be placed in that Class under those items.
(5) Assignment to a class and letter of an item may be based on the test procedure (see marg. 400 and 430).
(6) Solutions or mixtures containing substances of Class 9, marginal 901, item 2(b), shall be placed in that Class under that item, provided they do not also contain substances mentioned in footnotes (1) to (4) above. If they do contain such substances, they shall be classified accordingly.
(7) There is at present no test criterion for determining the degree of danger (packing group) for liquids of Class 5.1. The degree of danger (packing group) for such substances can be determined only by comparison with substances listed by name under an item and a group designated by the letters (a), (b) or (c).
(8) Class 6.1 for pesticides.

3 *(cont'd)*

2.3.2. Classification under an n.o.s. entry or an item of a Class determined in accordance with 2.3.1 on the basis of the danger characteristics of the various components of the solution or mixture. Classification under a general n.o.s. entry is permissible only where classification under a specific n.o.s. entry is not possible.

Note: Examples for the classification of the mixtures and solutions in classes and items:

A solution of phenol of Class 6.1, item 14(b), in benzene of Class 3, item 3(b), is to be classified in Class 3, item 3(b); this solution is to be classified under the entry *1992 flammable liquid, toxic, n.o.s.,* Class 3, item 19(b) by virtue of the toxicity of the phenol.

A solid mixture of sodium arsenate of Class 6.1, item 51(b), and sodium hydroxide of Class 8, item 41(b), is to be classified under the entry *3290 toxic solid, corrosive, inorganic, n.o.s.* in Class 6.1, item 67(b).

A solution of naphthalene (crude or refined) of Class 4.1, item 6(c), in petrol of Class 3, item 3(b), is to be classified under the entry *3295 hydrocarbons, liquid, n.o.s.* in Class 3, item 3(b).

A mixture of hydrocarbons of Class 3, item 31(c) and polychlorinated biphenyls (PCB) of Class 9, item 2(b) is to be classified under the entry *2315 polychlorinated biphenyls* in Class 9, item 2(b).

A mixture of propyleneimine of Class 3, item 12 and polychlorinated biphenyls (PCB) of Class 9, item 2(b) is to be classified under the entry *1921 propyleneimine, inhibited* in Class 3, item 12.

(4) Wastes are substances, solutions, mixtures or articles for which no direct use is envisaged but which are carried for reprocessing, dumping, elimination by incineration or other methods of disposal.

(5) Radioactive material whose specific activity exceeds 70 kBq/kg (2 nCi/g) and which

(a) meets the criteria for carriage under Schedule 1 of Class 7 and

(b) has dangerous properties covered by the title of any other class or classes

shall be excluded from carriage if it is covered by the title of a restrictive class in which it is not listed.

(6) Radioactive material whose specific activity exceeds 70 kBq/kg (2 nCi/g) and which

(a) meets the criteria for carriage under Schedule 1 of Class 7; and

(b) has dangerous properties covered by the title of any other class or classes

shall, in addition to meeting the requirements of Schedule 1 of Class 7, be subject to the conditions of carriage laid down:

— in the restrictive class, if one of the classes concerned is a restrictive class and the substance is listed in it, or

— in the class corresponding to the predominant danger exhibited by the substance during carriage, if none of the classes concerned is a restrictive class.

(7) For the purposes of this Directive, substances, solutions and mixtures (such as preparations and wastes) which cannot be assigned to Classes 1 to 8 or 9, items 1 to 8, 13 and 14 and items 20, 21, 31 to 36, but which may be assigned to Class 9, item 11 or 12 on the basis of the test methods and criteria according to Appendix III, Section C, marg. 1320 to 1326, shall be considered to be pollutant to the aquatic environment. Solutons and mixtures (such as preparations and wastes) for which classification values conforming to the classification criteria are not available shall be considered to be pollutant to the aquatic environment if the LC_{50} [1] evaluated according to the following formula:

$$LC_{50} = \frac{LC_{50} \text{ of the pollutant} \times 100}{\text{percentage by mass of the pollutant}}$$

is equal to or lower than:

(a) 1 mg/l,

[1] According to the definition contained in marg. 1396.

3 *(cont'd)*

(b) 10 mg/l if the pollutant is not readily degradable or, being degradable, has a log $P_{ow} \geq 3.0$.

Note: For substances of Classes 1 to 8 and Class 9, items 1 to 8, 13 and 14 and items 20, 21, 31 to 36 which are pollutant to the aquatic environment according to the criteria of Appendix III, Section C, marg. 1320 to 1326, no additional condition of carriage is applicable.

4 (1) The following units of measurement [1] are applicable in this Directive:

Measurement of:	SI-Unit [2]	Acceptable alternative unit	Relationship between units
Length	m (metre)	—	—
Area	m^2 (square metre)	—	—
Volume	m^3 (cubic metre)	l [3] (litre)	$1\ l = 10^{-3}\ m^3$
Time	s (second)	min (minute)	1 min = 60 s
		h (hour)	1 h = 3 600 s
		d (day)	1 d = 86 400 s
Mass	kg (kilogramme)	g (gramme)	$1\ g = 10^{-3}$ kg
		t (tonne)	$1\ t = 10^3$ kg
Specific gravity	kg/m^3	kg/l	$1\ kg/l = 10^3\ kg/m^3$
Temperature	K (kelvin)	°C (degree Celsius)	0 °C = 273,15 K
Difference of temperature	K (kelvin)	°C (degree Celsius)	1 °C = 1 K
Force	N (newton)	—	$1\ N = 1\ kg \cdot m/s^2$
Pressure	Pa (pascal)	bar (bar)	$1\ bar = 10^5$ Pa
			$1\ Pa = 1\ N/m^2$
Stress	N/m^2	N/mm^2	$1\ N/mm^2 = 1$ MPa
Work	J (joule)	kWh (kilowatt hour)	1 kWh = 3,6 MJ
Energy		—	$1\ J = 1\ N \cdot m = 1\ W \cdot s$
Quantity of Heat		eV (electron-volt)	$1\ eV = 0{,}1602 \cdot 10^{-18}$ J
Power	W (watt)	—	$1\ W = 1\ J/s = 1\ N \cdot m/s$
Kinematic viscosity	m^2/s	mm^2/s	$1\ mm^2/s = 10^{-6}\ m^2/s$
Dynamic viscosity	$Pa \cdot s$	$mPa \cdot s$	$1\ mPa \cdot s = 10^{-3}\ Pa \cdot s$
Activity [4]	Bq (becquerel)		
Dose equivalent [5]	Sv (sievert)		

(1) The following round figures are applicable for the conversion of the units hitherto used into SI units:

Force				
1 kg	= 9,807 N			
1 N	= 0,102 kg			
Stress				
$1\ kg/mm^2$	$= 9{,}807\ N/mm^2$			
$1\ N/mm^2$	$= 0{,}102\ kg/mm^2$			
Pressure				
1 Pa	$= 1\ N/mm^2 = 10^{-5}$ bar	$= 1{,}02 \cdot 10^{-5}\ kg/cm^2$	$= 0{,}75 \cdot 10^{-2}$ torr	
1 bar	$= 10^5$ Pa	$= 1{,}02\ kg/cm^2$	= 750 torr	
$1\ kg/cm^2$	$= 9{,}807 \cdot 10^4$ Pa	= 0,9807 bar	= 736 torr	
1 torr	$= 1{,}33 \cdot 10^2$ Pa	$= 1{,}33 \cdot 10^{-3}$ bar	$= 1{,}36 \cdot 10^{-3}\ kg/cm^2$	
Energy, work, quantity of heat				
1 J	= 1 Nm	$= 0{,}278 \cdot 10^{-6}$ kWh	$= 0{,}102$ kgm	$= 0{,}239 \cdot 10^{-3}$ kcal
1 kWh	$= 3{,}6 \cdot 10^6$ J	$= 367 \cdot 10^3$ kgm	= 860 kcal	
1 kgm	= 9,807 J	$= 2{,}72 \cdot 10^{-6}$ kWh	$= 2{,}34 \cdot 10^{-3}$ kcal	
1 kcal	$= 4{,}19 \cdot 10^3$ J	$= 1{,}16 \cdot 10^{-3}$ kWh	= 427 kgm	
Power				
1 W	= 0,102 kgm/s	= 0,86 kcal/h		
1 kgm/s	= 9,807 W	= 8,43 kcal/h		
1 kcal/h	= 1,16 W	= 0,119 kgm/s		
Kinematic viscosity				
$1\ m^2/s$	$= 10^4$ St (Stokes)			
1 St	$= 10^{-4}\ m^2/s$			
Dynamic viscosity				
$1\ Pa \cdot s$	$= 1\ Ns/m^2$	= 10 P (poise)	$= 0{,}102\ kgs/m^2$	
1 P	$= 0{,}1\ Pa \cdot s$	$= 0{,}1\ Ns/m^2$	$= 1{,}02 \cdot 10^{-2}\ kgs/m^2$	
$1\ kgs/m^2$	$= 9{,}807\ Pa \cdot s$	$= 9{,}807\ Ns/m^2$	= 98,07 P	

(2) The International System of Units (SI) is the result of decisions taken at the General Conference on Weights and Measures (Adress: Pavillon de Breteuil, Parc de St-Cloud, F-92 310 Sèvres).

(3) The abbreviation 'L' for litre is also authorised, in place of the abbreviation 'l', when a typewriter is used.

(4) For the sake of clarity, activity may also be indicated, in parentheses, in Ci (curie) (relationship between the units: $1\ Ci = 3{,}7 \cdot 10^{10}$ Bq). By derogation from the conversion formula, rounded values may be given.

(5) For the sake of clarity, the dose equivalent may also be indicated, in parentheses, in rem (relationship between the units: 1 rem = 0,01 Sv).

4 *(cont'd)* The decimal multiples and sub-multiples of a unit may be formed by prefixes, having the following meanings, placed before the name of the units.

Factor		Prefix	Symbol
1 000 000 000 000 000 000 = 10^{18}	quintillion (1)	exa	E
1 000 000 000 000 000 = 10^{15}	quadrillion (1)	peta	P
1 000 000 000 000 = 10^{12}	trillion (1)	tera	T
1 000 000 000 = 10^{9}	billion (1)	giga	G
1 000 000 = 10^{6}	million (1)	mega	M
1 000 = 10^{3}	thousand	kilo	k
100 = 10^{2}	hundred	hecto	h
10 = 10^{1}	ten	deca	da
0,1 = 10^{-1}	tenth	deci	d
0,01 = 10^{-2}	hundredth	centi	c
0,001 = 10^{-3}	thousandth	milli	m
0,000 001 = 10^{-6}	millionth	micro	μ
0,000 000 001 = 10^{-9}	billionth (1)	nano	n
0,000 000 000 001 = 10^{-12}	trillionth (1)	pico	p
0,000 000 000 000 001 = 10^{-15}	quadrillionth (1)	femto	f
0,000 000 000 000 000 001 = 10^{-18}	quintillionth (1)	atto	a

(1) Editorial note: In this translation, the value of billion, trillion etc follows United Nations usage.

(2) When the mass of packages is mentioned in this Directive, the gross mass is meant unless otherwise stated.

(3) Unless expressly stated otherwise, the sign '%' in this Directive represents:

(a) in the case of mixtures of solids or of liquids, and also in the case of solutions and of solids wetted by a liquid: a percentage mass based on the total mass of the mixture, solution or wetted solid;

(b) in the case of mixtures of compressed gases filled by volume, the proportion of the volume indicated as a percentage of the total volume of the gaseous mixture or, if they are filled under pressure, the proportion of the mass indicated as a percentage of the total mass of the mixture. In the case of mixtures of liquefied gases and gases dissolved under pressure, the proportion of the mass indicated as a percentage of the total mass of the mixture.

(4) For the pruposes of the Directive, an 'n.o.s.' (not otherwise specified) entry means a collective entry to which substances, mixtures, solutions or articles may be assigned if they

(a) are not specifically named in the items of the list of substances, and

(b) exhibit chemical, physical and/or dangerous properties corresponding to the class, item and group and the name of the n.o.s. entry.

(5) Pressures of all kinds relating to receptacles (such as test pressure, internal pressure, safety-valve opening pressure) are always indicated as gauge pressure (pressure in excess of atmospheric pressure); on the other hand, vapour pressure is always expressed as absolute pressure.

(6) Where this Directive specifies a degree of filling for receptacles, this is always related to a reference temperature of the substances of 15 °C, unless some other temperature is indicated.

(7) For the classification of substances, dangerous goods with a melting point or initial melting point of 20 °C or lower at a pressure of 101,3 kPa shall be considered to be liquids. A viscous substance for which a specific melting point cannot be determined shall be subjected to the ASTM D 4359-90 test or to the test for determining fluidity (penetrometer test) prescribed in Appendix III, marg. 1310.

4 *(cont'd)*

(8) — 'Recommendations on the Transport of Dangerous Goods' means the ninth revised edition of the Recommendations on Transport of Dangerous Goods published by the United Nations (ST/SG/AC.I0/I/Rev.9).

— 'Manual of Tests and Criteria' means the second revised edition of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, published by the United Nations (ST/SG/AC.10/11/ Rev.2).

5 If receptacles made of plastics material are accepted as packaging, the railway of the country of despatch can demand proof that the plastics material is suitable for its intended use.

6 A substance or article of this Directive may only be carried in bulk, in tank wagons, in tank-containers or in small containers if these means of carriage are expressly authorized for that substance or article in the appropriate class.

7 (1) Containers which satisfy the requirements of these Regulations, as well as the requirements of RICo (Annex III to the CIM Uniform Rules) if they have a capacity of 1 m^3 or more, are to be regarded as containers for the purpose of this Directive.

Note: 1. Intermediate bulk containers (IBCs) (see Appendix VI) are not to be regarded as containers for the purpose of this Directive.

2. For the purposes of this Directive swap bodies are considered to be large containers.

(2) Large containers and tank-containers which meet the definition of 'container' given in the Convention for Safe Containers (CSC) [1] as amended oor in UIC leaflets 590 [2] (1.1.1989) and 592-1 to 592-4 [2] (1.7.1994) may not be used to carry dangerous goods unless the large container or the frame of the tank-container satisfies the provisions of the Convention or of UIC leaflets 590 and 592-1 to 592-4.

A large container may be presented for carriage only if it is structurally serviceable.

(a) The term 'structurally serviceable' means that the container is free from major defects in its structural components, e.g. top and bottom side rails, top and bottom end rails, door sill and header, floor cross members, corner posts and corner fittings. 'Major defects' are dents or bends in structural members greater than 19 mm in depth, regardless of length; cracks or breaks in structural members; more than one splice or an improper splice (e.g. a lapped splice) in top or bottom end rails or door headers or more than two splices in any top or bottom side rail or any splice in a door sill or corner post; door hinges and hardware that are seized, twisted, broken, missing or otherwise inoperative; non-closing gaskets and seals; any distortion of the overall configuration sufficient to prevent proper alignment of handling equipment, mounting and securing on a chassis or wagon.

(b) In addition, deterioration in any component of the container, such as rusted metal in sidewails or disintegrated fibreglass is unacceptable, regardless of the material of construction. Normal wear, including oxidization (rust), slight dents and scratches and other damage that does not affect serviceability or weather-tightness are, however, acceptable.

(c) Before being loaded, the container shall be checked to ensure that it is free from any residue of a previous load and that the interior floor and walls are free from protrusions.

(3) All requirements of this Directive relating to carriage in wagons apply similarly to carriage in large containers, apart from tank-containers.

(4) The requirements of Appendix X shall apply to the carriage of liquid, powdery and granular substances in tank-containers with a capacity of more than 0,45 m^3. Tank-containers for substances of Class 2 shall have a capacity exceeding 1 000 litres.

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[1] This Convention is published by the International Maritime organization (IMO), London.

[2] The UIC leaflets are available from the International Union of Railways — Publications — 16, Rue Jean Rey, F-75015 Paris.

7 *(cont'd)* (5) The requirements relating to receptacles sent as packages shall apply to small containers — excluding the tank-containers referred to in (4) — intended for the carriage of goods in bulk, unless the special requirements of the various classes state otherwise. Tank-containers for substances of Class 2 shall have a capacity exceeding 1 000 litres.

8 (1) If mixed packing of several substances with each other or with other goods is authorized by virtue of the provisions of Section A.3 of the various classes, or those of Class 7, inner packagings containing different substances and articles shall be carefully and effectively separated from each other within the outer packagings if dangerous reactions, such as production of dangerous heat, combustion, formation of mixtures sensitive to friction or shock, emission of flammable or toxic gases, are likely to occur as a result of damage to or destruction of the inner packagings. Unless otherwise provided in this paragraph or in the special conditions for the packing of certain substances, liquids of classes 3, 4.1, 4.2, 4.3, 5.1, 6.1, 8 or 9 classified under (a) or (b) of the various items, in glass or earthenware packagings shall be packed using material capable of absorbing the liquid. Absorbent material shall not react dangerously with the liquid. Absorbent material is not required if the inner packagings are so protected that breakage of them and leakage of their contents from the outer packaging will not occur during normal conditions of carriage. Where absorbent material is required and an outer packaging is not leakproof, a means of containing the liquid in the event of a leakage shall be provided in the form of leakproof liner, plastics bag or other equally effective means of containment [see also marg. 1500 (5)]. For mixed packing of substances of Class 7, see marg. 1711 (1) of Appendix VII.

(2) In the case of mixed packing, the requirements of this Directive relating to the particulars in the consignment note apply for each of the dangerous goods of different denominations contained in the outer package and this outer package shall bear all the markings and all the danger labels required by this Directive for the dangerous goods which it contains.

9 (1) For the carriage of packages containing dangerous goods, overpacks may be used if they meet the following conditions:

'Overpack' shall mean an enclosure used by a single consignor to contain one or more packages, consolidated into a single unit easier to handle and stow during carriage. Examples of overpacks:

(a) a loading tray such as a pallet, on which several packages are placed or stacked and secured by a plastics strip, shrink or stretch-wrapping or other appropriate means; or

(b) an outer protective packaging such as a box or a crate.

Note: This definition does not apply to the overpacks defined in class 7 (see marg. 700, definition 13).

An overpack shall bear the identification number of the goods, preceded by the letter 'UN', and the labels of all the packages contained in the overpack, unless the identification numbers and the labels representing all the dangerous goods contained in the overpack are visible.

Each package of dangerous goods contained in an overpack shall comply with all the provisions in force. The function of each packaging shall not be affected by the overpack. The prohibitions on mixed loading in Section E of the various classes also apply to these overpacks.

(2) Damaged, defective or leaking dangerous goods packages, or dangerous goods that have spilled or leaked may be carried in special salvage packagings described in marg. 1559. This does not prevent the use of a larger size packaging of appropriate type and performance level under the conditions of marg. 1500 (14).

When damaged packages are carried in salvage packagings, the salvage packagings shall bear the identification number preceded by the letters 'UN' and all the danger labels of the damaged package it contains, as well as the word 'SALVAGE'.

In addition to the particulars required in the various classes for the goods carried, the consignor shall enter the words 'Salvage packaging' in the consignment note.

10 Observance of the mixed loading prohibitions prescribed under Section E of each class, with the exception of Class 7 where they are prescribed in marg. 703, heading 7, is based on the danger labels of Appendix IX. These labels shall be affixed to the packages in conformity with the requirements under Section A.4 of the various classes with the exception of Class 7. For the labelling of packages containing material of Class 7, see marg. 706.

11 (1) Unless requirements to the contrary appear in the various classes, packages may be loaded:

(a) in covered wagons, or

(b) in sheeted open wagons, or

(c) in open wagons (unsheeted).

(2) Packages whose packagings are made of materials sensitive to moisture shall be loaded in covered or sheeted open wagons.

(3) Packages, including intermediate bulk containers (IBCs), as well as uncleaned empty packagings, including uncleaned empty intermediate bulk containers (IBCs), bearing labels conforming to models Nos. 6.1 — except those containing substances of Class 2 —, 6.2 or 9, the latter containing substances of items 1, 2, 3 or 13 of Class 9, shall not be stacked on or loaded in immediate proximity to packages known to contain foodstuffs, other articles of consumption and animal feedstuffs in wagons and at places of loading, unloading or transhipment.

Where they are loaded in immediate proximity of packages known to contain foodstuffs, other articles of consumption or animal feedstuffs, they shall be kept from the latter,

(a) by complete partitions which shall be as high as the packages bearing labels conforming to models Nos 6.1, 6.2 or 9 containing substances of items 1, 2, 3 or 13 of Class 9, or

(b) by packages not bearing labels conforming to models Nos 6.1, 6.2 or 9, or bearing labels conforming to model No 9 but not containing substances of items 1, 2, 3 or 13 of Class 9, or

(c) by a space of at least 0,8 m,

unless the packages bearing labels conforming to models Nos 6.1, 6.2 or containing substances of items 1, 2, 3 or 13 oof Class 9 are provided with an additional packaging or are completely covered (e.g. by a sheeting, a fibreboard cover or other measures).

(4) The requirements in force at the dispatching station shall be complied with for the loading of goods, unless any special requirements are prescribed in the individual classes.

12 Substances and articles of this Directive, except those which are handed over for carriage as *colis express,* may only be forwarded in goods trains.

13 The following shall bear a marking in accordance with the requirements of Appendix VIII when carrying substances listed in Appendix VIII, marg. 1802:

— tank wagons,

— battery wagons,

— wagons with demountable tanks,

— tank-containers,

— bulk wagons,

— large and small bulk containers.

Full wagon loads made up of packages containing one and the same dangerous substance mentioned in marg. 1802 of Appendix VIII may bear the marking in accordance with the requirements of that Appendix.

14 Packages, including intermediate bulk containers (IBCs), large and small containers and tank-containers, and full wagon loads made up of packages containing one and the same substance which do not meet the requirements of this Directive with regard to packaging, labelling, marking on packages, mixed packing or marking, but are in conformity with the requirements for maritime or air transport of dangerous goods [1] shall be accepted for carriage prior to or following maritime or air carriage subject to the following conditions:

(a) packages or intermediate bulk containers (IBCs) shall bear the markings and danger labels in accordance with the requirements for maritime or air transport [1] if the markings and labels are not in accordance with the requirements of this Directive:

(b) the requirements for maritime or air transport [1] shall apply to mixed packing in a package;

(c) for carriage prior to or following carriage by sea, large and small containers, tank-containers and full wagon loads made up of packages containing one and the same substance, if they are not marked and labelled in accordance with this Directive, shall be marked and labelled ('placarded') in accordance with the requirements for maritime transport [1];

(d) in addition to the information prescribed in this Directive, the consignment note shall include the following: '*Carriage in accordance with RID marg. 14*'.

This derogation shall not apply in the case of goods classified as dangerous in classes 1 to 8 of this Directive and considered as non-dangerous in accordance with the requirements for maritime or air transport [1].

15 (1) Dangerous goods may also be carried by piggyback transport in accordance with the following provisions.

Note: 1. For the purposes of this Directive, 'piggyback transport' means the carriage on rail wagons of road vehicles.

2. For the purposes of this Directive:

— swap bodies are considered to be large containers [see marg. 7 (2)], and

— tank swap bodies are considered to be tank-containers (see Appendix X)

(2) Road vehicles handed over for carriage by piggyback transport, as well as their contents, shall comply with the provisions of Council Directive 94/55/EC.

However the following are not to be accepted:

— explosive substances of compatibility group A (ADR Class 1 marg. 2101, item 01 classification code 1.1A);

— self-reactive substances requiring temperature control (ADR Class 4.1, marg. 2401, items 41 to 50, identification numbers 3231 to 3240);

— organic peroxides requiring temperature control (ADR Class 5.2, marg. 2551, items 11 to 20, identification numbers 3111 to 3120);

— 1829 sulphur trioxide, at least 99,95 % pure, without inhibitor, carried in tanks [ADR Class 8, marg. 801, item 1(a)].

(3) The carrying wagons used in piggyback transport shall bear on both sides the danger labels prescribed by this Directive for the goods carried.

The danger labelling of wagons is not necessary

(a) where use is made of the 'rolling road' system (loading of lorries with or without trailer and of semi-trailers with tractor on wagons used for this system of transport), unless the railways concerned on a particular route decide to the contrary, and

(b) for other carriage of road tank verhicles.

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[1] These requirements are published for sea transport in the IMDG Code and for air transport in the ICAO Technical Instructions.

15 *(cont'd)*

(4) The written instructions prescribed in marginal 10 385 of ADR shall be attached to the consignment note.

(5) Besides the particulars prescribed in the various classes of this Directive for the goods carried, the consignor shall include in the box on the consignment note reserved foor the description of the goods the entry: '*Carriage in accordance with marg. 15 RID*'. For the carriage of tanks, which, in accordance with marginal 10 500, paragraphs (2) to (5) of ADR must bear a plate, the hazard and substance identification numbers shall also be included in front of the description in the goods in the consignment note.

16 If the carriage of dangerous goods in a large container precedes a voyage by sea, a container packing certificate conforming to paragraph 12.3.7 of the general introduction to the IMDG Code [1] shall be provided with the consignment note.

The functions of the consignment note and the container packing certificate prescribed above may be incorporated into a single document; if not, these documents shall be attached one to the other. If these functions are incorporated into a single document, the inclusion in the consignment note of a statement that the loading of the container has been carried out in accordance with the applicable modal regulations together with the identification of the person responsible for the person responsible for the container packing certificate shall be sufficient. The use of electronic data processing (EDP) or electronic data interchange (EDI) techniques as an aid to or instead of paper documentation is not precluded.

Note: A container packing certificate shall not be required for tank-containers.

17 The requirements laid down in this Directive do not apply:

(a) to the carriage of dangerous goods by private individuals where the goods in question are packaged for retail sale and are intended for their personel or domestic use or for leisure or sporting activities;

(b) to the carriage of machinery or equipment not specified in this Directive and which happen to contain dangerous goods in their internal or operational equipment;

(c) to carriage undertaken by, or under the supervision of, the emergency services;

(d) to emergency transport intended to save human lives or protect the environment provided that all measures are taken to ensure that such transport is carried out in complete safety.

18 Unless otherwise prescribed in the various classes, the substances and articles of this Directive may be carried until 30 June 1997 in accordance with the requirements of RID applicable until 31 December 1996. The consignment note shall in such cases, bear the inscription '*Carriage in accordance with RID in force before 1 January 1997*'.

19-99

[1] Guidelines for use in practice and in training for loading goods in large containers have been drawn up by the International Maritime Organization (IMO) and the International Labour Organization (ILO) and have been published by IMO ('IMO/ILO Guidelines for packing Cargo in Freight Containers or Vehicles').

PART II

SPECIAL REQUIREMENTS RELATING TO THE VARIOUS CLASSES

CLASS 1

EXPLOSIVE SUBSTANCES AND ARTICLES

1. List of substances and articles

100 (1) Among the substances and articles covered by the title of Class 1, only those listed in marg. 101 or assigned to an n.o.s. entry or to the entry '0190 Samples, explosive' in marg. 101 are to be accepted for carriage. These substances and articles are only to be accepted for carriage subject to the conditions set out in margs. 100(2) to 143 and Appendix I and are then considered as substances and articles of this Directive.

(2) Class 1 comprises:

a) Explosive substances: solid or liquid substances (or mixtures of substances) capable by chemical reaction of producing gases at such a temperature and pressure and at such a speed as to cause damage to the surroundings.

Pyrotechnic substances: substances or mixtures of substances designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonating, self-sustaining, exothermic, chemical reactions.

Note: 1. Explosive substances which are unduly sensitive or are liable to spontaneous reaction are not to be accepted for carriage.

2. Substances which are not themselves explosive but which may form an explosive mixture of gas, vapour or dust are not substances of Class 1.

3. Also excluded from Class 1 are: water- or alcohol-wetted explosives of which the water or alcohol content exceeds the limits indicated in marg. 101 and those containing plasticizers — these explosives are assigned to Class 4.1 (marg. 401, items 21, 22 and 34) — and those explosives which, on the basis of their predominant danger, are assigned to Class 5.2.

b) Explosive articles: articles containing one or more explosive substances and/or pyrotechnic substances.

Note: Devices containing explosive and/or pyrotechnic substances in such small quantity or of such a character that their unadvertent or accidental ignition or initiation during carriage would not cause any manifestation external to the device by projection, fire, smoke, heat or loud noise are not subject to the requirements of Class 1.

c) Substances and articles not mentioned under (a) or (b) above which are manufactured with a view to producing a practical effect by explosion or a pyrotechnic effect.

(3) Explosive substances and articles shall be assigned to a name in marg. 101 in accordance with the test methods for the determination of explosive properties and the classification procedures set out in Appendix I and they shall meet the conditions appropriate to that name or shall be assigned to an n.o.s. entry in marg. 101 in accordance with these test methods and classification procedures.

Samples of new or existing explosive substances or articles carried for purposes including: testing, classification, research and development, quality control, or as a commercial sample, other than initiating explosives, may be assigned to the entry '0190 Samples, explosive', item 51 of marg. 101.

Assignment of substances and articles not mentioned by name to an n.o.s. entry or to the entry '0190 Samples, explosive' shall be made by the competent authority of the country of origin.

Substances and articles which are assigned to an n.o.s. entry or to the entry '0190 Samples, explosive' as well as certain substances the carriage of which is subject to a specific authorization by the competent authority according to the notes inserted in the list of substances and articles of marg. 101 may be carried only with the approval of the competent authority of the country of origin and under the conditions laid down by that authority.

100 *(cont'd)*

If the country of origin is not a Member State, the conditions laid down shall be recognized by the competent authority of the first COTIF Contracting State reached by the consignment.

The approval shall be issued in writing.

(4) Substances and articles of Class 1, other than empty packagings, uncleaned, of item 91, shall have been assigned to a division in accordance with paragraph (6) and to a compatibility group in accordance with paragraph (7). The division shall be based on the results of the tests described in Appendix I, applying the definitions in paragraph (6). The compatibility group shall be determined in accordance with the definitions in paragraphe (7). The classification code shall consist of the division number and the compatibility group letter.

(5) Substances and articles of Class 1 are assigned to packing groupe II (see Appendix V).

(6) Definition of divisions:

1.1 Substances and articles which have a mass explosion hazard. (A mass explosion is an explosion which affects almost the entire load virtually instantaneously).

1.2 Substances and articles which have a projection hazard but not a mass explosion hazard.

1.3 Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

(a) combustion of which gives rise to considerable radiant heat; or

(b) which burn one after another, producing minor blast or projection effects or both.

1.4 Substances and articles which present only a slight risk in the event of ignition or initiation during carriage. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package.

1.5 Very insensitive substances having a mass explosion hazard which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of carriage. As minimum requirement they shall not explode in the external fire test.

1.6 Extremely insensitive articles which do not have a mass explosion hazard. The articles contain only extremely insensitive detonating substances and demonstrate a negligible probability of accidental initiation or propagation.

Note: The risk from articles of Division 1.6 limited to the explosion of a single article.

(7) Definition of compatibility groups of substances and articles:

A Primary explosive substance.

B Article containing a primary explosive substance and not having two or more effective protective features. Some articles, such as detonators for blasting, detonator assemblies for blasting and primers, cap-type, are included, even though they do not contain primary explosives.

C Propellant explosive substance or toher deflagrating explosive substance or article containing such explosive substance.

D Secondary detonating explosive substance or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and having two or more effective protective features.

100 *(cont'd)*

E Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing a flammable liquid or gel or hypergolic liquids).

F Article containing a secondary detonating explosive substance with its own means of initiation, with a propelling charge (other than one containing a flammable liquid or gel or hypergolic liquids) or without a propelling charge.

G Pyrotechnic substance, or article containing a pyrotechnic substance, or article containing both an explosive substance and an illuminating, incendiary, tear- or smoke-producing substance (other than a water-activated article or one which contains white phosphorus, phosphides, a pyrophoric substance, a flammable liquid or gel or hypergolic liquids).

H Article containing both an explosive substance and white phosphorus.

J Article containing both an explosive substance and a flammable liquid or gel.

K Article containing both an explosive substance and a toxic chemical agent.

L Explosive substance or article containing an explosive substance and presenting a special risk (e.g. due to water activation or the presence of hypergolic liquids, phosphides or a pyrophoric substance) necessitating isolation of each type.

N Articles containing only extremely insensitive detonating substances.

S Substance or article so packed or designed that any hazardous effects arising from accidental functioning are confined within the package unless the package has been degraded by fire, in which case all blast or projection effects are limited to the extent that they do not significantly hinder or prevent fire-fighting or other emergency response efforts in the immediate vicinity of the package.

Note: 1. Each substance or article, packed in a specified packaging, may be assigned to one compatibility group only. Since the criterion of compatibility group S is empirical, assignment to this group is necessarily linked to the tests for assignment of a classification code.

2. Articles of compatibility groups D or E may be fitted or packed together with their own means of initiation provided that such means have at least two effective protective features designed to prevent an explosion in the event of accidental functioning of the means of initiation. Such packages shall be assigned to compatibility groups D or E.

3. Articles of compatibility groups D or E may be packed together with their own means of initiation, which do not have two effective protective features (i.e. means of initiation assigned to compatibility group B), provided that they comply with the requirements of marg. 104 (6). Such packages shall be assigned to compatibility groups D or E.

4. Articles may be fitted or packed together with their own means of ignition provided that the means of ignition cannot function during normal conditions of carriage.

5. Articles of compatibility groups C, D and E may be packed together. Such packages shall be assigned to compatibility group E.

(8) Substances of compatibility group A and articles of compatibility group K, in accordance with paragraph (7), shall not be accepted for carriage.

(9) For the purposes of the requirements of this Class and by derogation from marg. 1510 (3), the term 'package' shall also include an unpackaged article in so far as that article is accepted for carriage unpackaged.

101 (1) The substances and articles of Class 1 to be accepted for carriage are listed in Table 1 below. Explosive substances and articles listed in marg. 1170 can be assigned to the various names in marg. 101 only if their properties, composition, construction and anticipated use correspond to one of the descriptions contained in Appendix I.

TABLE 1

List of substances and articles

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
1.	ARTICLES CLASSIFIED AS 1.1 B			
	0029 Detonators, non-electric, for blasting	1.1 B	EP 31	—
	0030 Detonators, electric, for blasting	1.1 B	EP 31	—
	0073 Detonators for ammunition	1.1 B	EP 33	—
	0106 Fuzes-detonating	1.1 B	EP 41	—
	0225 Boosters with detonators	1.1 B	EP 33	—
	0360 Detonator assemblies, non-electric, for blasting	1.1 B	EP 31	—
	0377 Primers, cap-type	1.1 B	EP 33	—
	0461 Components, explosive train, n.o.s. (2)	1.1 B	EP 01	—
2.	SUBSTANCES CLASSIFIED AS 1.1 C			
	0160 Poweder, smokeless	1.1 C	EP 14 (b)	256
	0433 Powder cake (powder paste), wetted, with not less than 17 % alcohol by mass	1.1 C	EP 11	—
	Note: This substance, when containing less alcohol than specified, shall not be carried unless specifically authorized by the competent authority [see marg. 100 (3)].			
	0474 Substances, explosive, n.o.s. (2)	1.1 C	EP 01	—
	0497 Propellant, liquid	1.1 C	EP 15	254, 255
	Note: Unless it can be demonstrated by testing that its sensitivity when frozen is no greater than when liquid, the propellant shall remain liquid during normal conditions of transport and not freeze at temperatures above − 15 °C.			
	0498 Propellant, solid	1.1 C	EP 14 (b)	—
3.	ARTICLES CLASSIFIED AS 1.1 C			
	0271 Charges, propelling	1.1 C	EP 43	256
	0279 Charges, propelling, for cannon	1.1 C	EP 30	—
	0280 Rocket motors	1.1 C	EP 30	—
	0326 Cartridges for weapons, blank	1.1 C	EP 30	—
	0462 Articles, explosive, n.o.s. (2)	1.1 C	EP 01	—
4.	SUBSTANCES CLASSIFIED AS 1.1 D			
	0004 Ammonium picrate, dry or wetted with less than 10 % water by mass	1.1 D	EP 12	253
	0027 Black powder (gunpowder) granular or as meal	1.1 D	EP 13	—
	0028 Black powder (gunpowder), compressed, or *black powder, (gunpowder),* in pellets	1.1 D	EP 13	—

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous Goods.
(2) Carriage only with the approval of the competent authority [see marg. 100 (3)].

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Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
4. *(cont'd)*	*0072 Cyclotrimethylenetrinitramine (cyclonite: hexogen: RDX), wetted* with not less than 15 % water by mass *Note:* This substance, when containing less water than specified, shall not be carried unless specifically authorized by the competent authority [see marg. 100 (3)].	1.1 D	EP 12 (a)	—
	0075 Diethyleneglycol dinitrate, desensitized with not less than 25 % non-volatile water-insoluble phlegmatizer by mass	1.1 D	EP 15	254, 255
	0076 Dinitrophenol, dry or wetted with less than 15 % water by mass	1.1 D	EP 12	253
	0078 Dinitroresorcinol, dry or wetted with less than 15 % water by mass	1.1 D	EP 12	253
	0079 Hexanitrodiphenylamine, (dipicrylamine, hexyl)	1.1 D	EP 12 (b) or EP 12 (c)	—
	0081 Explosive, blasting, type A *Note:* Substances containing more than 40 % liquid nitric esters shall satisfy the exudation test specified in Appendix I, marg. 1101 (4).	1.1 D	EP 16	—
	0082 Explosive, blasting, type B	1.1 D	EP 16 or EP 17	260
	0083 Explosive, blasting, type C	1.1 D	EP 16	267
	0084 Explosive, blasting, type D	1.1 D	EP 16	—
	0118 Hexolite (hexotol), dry or wetted with less than 15 % water by mass	1.1 D	EP 12	—
	0133 Mannitol hexanitrate (nitromannite), wetted with not less than 40 % water by mass, or a mixture of alcohol and water *Note:* This substance, when containing less alcohol or water than specified, shall not be carried unless specifically authorized by the competent auhtority [see marg. 100 (3)].	1.1 D	EP 12 (a)	—
	0143 Nitroglycerin, desensitized with not less than 40 % non-volatile water-soluble phlegmatizer by mass *Note:* 1. This substance, when containing less phlegmatizer than specified shall not be carried unless specifically authorized by the competent authority [see marg. 100 (3)]. 2. Lactose or glucose or similar materials, may be used as a phlegmatizer provided that the substance contains not less than 90 %, by mass, of phlegmatizer.	1.1 D	EP 15	254, 255

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous Goods.

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
4. *(cont'd)*	3. The competent authority may authorize these mixtures to be classified in Class 4.1 on the basis of a Series 6 (c) test on at least three packages as prepared for carriage. 4. Mixtures containing at least 98 % by mass, of phlegmatizer are not subject to the requirements of this Directive. 5. Packages containing mixtures with not less than 90 %, by mass, of phlegmatizer need not bear a label conforming to model No 6.1.			
	0144 *Nitroglycerin solution in alcohol,* with more than 1 % but not more than 10 % nitroglycerin	1.1 D	EP 15	264
	Note: 3064 nitroglycerin, solution in alcohol with more than 1 % but not more than 5 % nitroglycerine, carried under special conditions of packing, is a substance of Class 3 (see marg. 301, item 6).			
	0146 *Nitrostarch,* dry or wetted with less than 20 % water by mass	1.1 D	EP 12	—
	0147 *Nitro-urea*	1.1 D	EP 12 (b)	—
	0150 *Pentaerythrite tetranitrate, (pentaerythritol tetranitrate, PETN), wetted* with not less than 25 % water by mass, or *desensitized* with not less than 15 % phlegmatizer by mass	1.1 D	EP 12 (a) or EP 12 (b)	—
	Note: This substance, when containing less water or phlegmatizer than specified, shall not be carried unless specifically authorized by the competent authority [see marg. 100 (3)].			
	0151 *Pentolite,* dry or wetted with less than 15 % water by mass	1.1 D	EP 12	—
	0153 *Trinitroaniline (picramide)*	1.1 D	EP 12 (b) or EP 12 (c)	—
	0154 *Trinitrophenol (picric acid),* dry or wetted with less than 30 % water by mass	1.1 D	EP 12	253
	Note: For small quantities of not more than 500g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provision with respect to packaging (see marg. 401, item 21).			

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous goods.

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
4. *(cont'd)*	*0155 Trinitrochlorobenzene (picryl chloride)*	1.1 D	EP 12 (b) or EP 12 (c)	
	Note: For small quantites of not more than 500g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marg. 401, item 21).			
	0207 Tetranitroaniline	1.1 D	EP 12 (b) or EP 12 (c)	—
	0208 Trinitrophenylmethylnitramine (tetryl)	1.1 D	EP 12 (b) or EP 12 (c)	—
	0209 Trinitrotoluene (tolite, TNT), dry or wetted with less than 30 % water by mass	1.1 D	EP 12	262
	Note: For small quantities of not more than 500g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marg. 401, item 21).			
	0213 Trinitranisole	1.1 D	EP 12 (b) or EP 12 (c)	—
	0214 Trinitrobenzene, dry or wetted with less than 30 % water by mass	1.1 D	EP 12	—
	Note: For small quantities of not more than 500g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marg. 401, item 21).			
	0215 Trinitrobenzoic acid, dry or wetted with less than 30 % water, by mass	1.1 D	EP 12	—
	Note: For small quantites of not more than 500g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marg. 401, item 21).			
	0216 Trinitro-m-cresol	1.1 D	EP 12 (b) or EP 12 (c)	253
	0217 Trinitronaphthalene	1.1 D	EP 12 (b) or EP 12 (c)	—

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous goods.

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
4. *(cont'd)*	*0218 Trinitrophenetole*	1.1 D	EP 12 (b) or EP 12 (c)	—
	0219 Trinitroresorcinol (styphnic acid), dry or wetted with less than 20 % water by mass (or mixture of alcohol and water)	1.1 D	EP 12	253
	0220 Urea nitrate, dry or wetted with less than 20 % water by mass	1.1 D	EP 12	—
	Note: For quantities of not more than 11,5 kg per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marg. 401, item 21).			
	0222 Ammonium nitrate containing more than 0,2 % combustible substances, (including any organic substance calculated as carbon), to the exclusion or any other substance	1.1 D	EP 12 (b) or EP 12 (c)	—
	0223 Ammonium nitrate fertilizer, which is more liable to explode than ammonium nitrate with 0,2 % combustible substances, (including any organic substance calculated as carbon), to the exclusion of any other substance	1.1 D	EP 12 (b) or EP 12 (c)	—
	0226 Cyclotetramethylenetetranitramine, (HMX, octogen), wetted with not less than 15 % water by mass	1.1 D	EP 12 (a)	—
	Note: This substance, when containing less water than specified, shall not be carried unless specifically authorized by the competent authority [see marg. 100 (3)].			
	0241 Explosive, blasting, type E	1.1 D	EP 16 or EP 17	261 for EP 17
	0266 Octolite (Octol), dry or wetted with less than 15 % water by mass	1.1 D	EP 12	—
	0282 Nitroguanidine (picrite), dry or wetted with less than 20 % water by mass	1.1 D	EP 12	—
	0340 Nitrocellulose, dry or wetted with less than 25 % water (or alcohol) by mass	1.1 D	EP 12 (a) or EP 12 (b)	—
	0341 Nitrocellulose, unmodified or plasticized with less than 18 % plasticizing substance by mass	1.1 D	EP 12 (b)	—
	0385 5-Nitrobenzotriazol	1.1 D	EP 12 (b) or EP 12 (c)	—

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous Goods.

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
4. *(cont'd)*	*0386 Trinitrobenzenesulphonic acid*	1.1 D	EP 12 (b) or EP 12 (c)	253
	0387 Trinitrofluorenone	1.1 D	EP 12 (b) or EP 12 (c)	—
	0388 Trinitrotoluene (TNT) and trinitrobenzene mixtures or *trinitrotoluene (TNT) and hexanitrostilbene mixtures*	1.1 D	EP 12 (b) or EP 12 (c)	—
	0389 Trinitrotoluene (TNT) mixtures containing trinitrobenzene and hexanitrostilbene	1.1 D	EP 12 (b) or EP 12 (c)	—
	0390 Tritonal	1.1 D	EP 12 (b) or EP 12 (c)	—
	0391 Cyclotrimethylenetrinitramine (cyclonite, hexogen, RDX) and cyclotetramethylenetetranitramine (HMX, octogen) mixtures wetted with not less than 15 % water by mass, or *cyclotrimethylenetrinitramine (cyclonite, hexogeen, RDX) and cyclotetramethylenetetra-nitramine (HMX, octogen) mixtures desensitized* with not less than 10 % phlegmatizer by mass *Note:* This substance, when containing less water or phlegmatizer than specified, shall not be carried unless specifically authorized by the competent authority [see marg. 100 (3)].	1.1 D	EP 12 (a) or EP 12 (b)	—
	0392 Hexanitrostilbene	1.1 D	EP 12 (b) or EP 12 (c)	—
	0393 Hexotonal	1.1 D	EP 12 (b)	—
	0394 Trinitroresorcinol (styphnic acid), wetted with not less than 20 % water by mass (or mixture of water and alcohol)	1.1 D	EP 12 (a)	253
	0401 Dipicryl sulphide dry or wetted with less than 10 % water by mass *Note:* For small quantities of not more than 500 g per package, this substance, with not less than 10 % water, by mass, may alsol be classified in Class 4.1. subject to special provision with respect to packaging (see marg. 401, item 21).	1.1 D	EP 12	—
	0402 Ammonium perchlorate	1.1 D	EP 12 (b) or EP 12 (c)	—

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101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
4. *(cont'd)*	*Note:* Classification of this substance shall be in accordance with the results of the tests under Appendix I. Depending on the particle size and the packaging of the substance, see also Class 5.1 [marg. 501, item 12(b)].			
	0411 Pentaerythrite tetranitrate (Pentaerythritol tetranitrate; PETN) with not less than 7 % wax, by mass	1.1 D	EP 12 (b) or EP 12 (c)	—
	Note: The phlegmatized substance shall be significantly less sensitive than dry PETN.			
	0475 Substances, explosive, n.o.s. (2)	1.1 D	EP 01	
	0483 Cyclotrimethylenetrinitramine (cyclonite, hexogen, RDX) desensitized	1.1 D	EP 12 (b) or EP 12 (c)	—
	0484 Cyclotetramethylenetetranitramine (octogen, HMX) desensitized	1.1 D	EP 12 (b) or EP 12 (c)	—
	0489 Dinitroglycoluril (DINGU)	1.1 D	EP 12 (b) or EP 12 (c)	—
	0490 Nitroriazolone (NTO)	1.1 D	EP 12 (b) or EP 12 (c)	—
	0496 Octonal	1.1 D	EP 12 (b) or EP 12 (c)	—
5.	ARTICLES CLASSIFIED AS 1.1 D			
	0034 Bombs, with bursting charge	1.1 D	EP 30	—
	0038 Bombs, photoflash	1.1 D	EP 30	—
	0042 Boosters, without detonator	1.1 D	EP 32	—
	0043 Bursters, explosive	1.1 D	EP 33	—
	0048 Charges, demolition	1.1 D	EP 30	—
	0056 Charges, depth	1.1 D	EP 30	—
	0059 Charges, shaped, commercial, without detonator	1.1 D	EP 37	257
	0060 Charges, supplementary, explosive	1.1 D	EP 32	—
	0065 Cord, detonating, flexible	1.1 D	EP 39	258
	0099 Fracturing devices, explosive, without detonator, for oil wells	1.1 D	EP 34	—
	0124 Jet perforating guns, charged, oil well, without detonator	1.1 D	EP 01	—
	0137 Mines with bursting charge	1.1 D	EP 30	—
	0168 Projectiles with bursting charge	1.1 D	EP 30	—
	0221 Warheads, torpedo, with bursting charge	1.1 D	EP 30	—
	0284 Grenades, hand or rifle, with bursting charge	1.1 D	EP 41	—

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(2) Carriage only with the approval of the competent authority [see marg. 100 (3)].

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
5. *(cont'd)*	*0286 Warheads, rocket,* with bursting charge	1.1 D	EP 30	—
	0288 Charges, shaped, flexible, linear	1.1 D	EP 38	—
	0290 Cord (fuse), detonating, metal clad	1.1 D	EP 39	258
	0374 Sounding devices, explosive	1.1 D	EP 34	—
	0408 Fuzes, detonating, with protective features	1.1 D	EP 41	—
	0442 Charges, explosive, commercial without detonator	1.1 D	EP 37	—
	0451 Torpedoes with bursting charge	1.1 D	EP 30	—
	0457 Charges, bursting, plastics bonded	1.1 D	EP 30	—
	0463 Articles, explosive, n.o.s. (2)	1.1 D	EP 01	—
6.	ARTICLES CLASSIFIED AS 1.1 E			
	0006 Cartridges for weapons, with bursting charge	1.1 E	EP 30	—
	0181 Rockets with bursting charge	1.1 E	EP 30	—
	0329 Torpedoes with bursting charge	1.1 E	EP 30	—
	0464 Articles, explosive, n.o.s. (2)	1.1 E	EP 01	—
7.	ARTICLES CLASSIFIED AS 1.1 F			
	0005 Cartridges for weapons with bursting charge	1.1 F	EP 30	—
	0033 Bombs, with bursting charge	1.1 F	EP 30	—
	0037 Bombs, photoflash	1.1 F	EP 30	—
	0136 Mines with bursting charge	1.1 F	EP 30	—
	0167 Projectiles with bursting charge	1.1 F	EP 30	—
	0180 Rockets with bursting charge	1.1 F	EP 30	—
	0292 Grenades, hand or rifle, with bursting charge	1.1 F	EP 41	—
	0296 Sounding devices, explosive	1.1 F	EP 34	—
	0330 Torpedoes with bursting charge	1.1 F	EP 30	—
	0369 Warheads, rocket, with bursting charge	1.1 F	EP 30	—
	0465 Articles, explosive, n.o.s. (2)	1.1 F	EP 01	—
8.	SUBSTANCES CLASSIFIED AS 1.1 G			
	0094 Flash powder	1.1 G	EP 13	263
	0476 Substances, explosive, n.o.s. (2)	1.1 G	EP 01	—
9.	ARTICLES CLASSIFIED AS 1.1 G			
	0049 Cartridges, flash	1.1 G	EP 35	—
	0121 Igniters	1.1 G	EP 42	—
	0192 Signals, railway track, explosive	1.1 G	EP 35	—
	0194 Signals, distress, ship	1.1 G	EP 35	—
	0196 Signals, smoke	1.1 G	EP 35	—
	0333 Fireworks	1.1 G	EP 35	—
	0418 Flares, surface	1.1 G	EP 35	—
	0420 Flares, aerial	1.1 G	EP 35	—
	0428 Articles, pyrotechnic for technical purposes	1.1 G	EP 35	—

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(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
10.	ARTICLES CLASSIFIED AS 1.1 J			
	0397 Rockets, liquid fuelled, with bursting charge	1.1 J	EP 01	—
	0399 Bombs with flammable liquid, with bursting charge	1.1 J	EP 01	
	0449 Torpedoes, liquid fuelled, with or without bursting charge	1.1 J	EP 01	—
11.	SUBSTANCES CLASSIFIED AS 1.1 L			
	0357 Substances, explosive, n.o.s. (2)	1.1 L	EP 01	—
12.	ARTICLES CLASSIFIED AS 1.1 L			
	0354 Articles, explosive, n.o.s. (2)	1.1 L	EP 01	—
13.	ARTICLES CLASSIFIED AS 1.2 B			
	0107 Fuzes, detonating	1.2 B	EP 41	—
	0268 Boosters, with detonator	1.2 B	EP 33	—
	0364 Detonators, for ammunition	1.2 B	EP 33	—
	0382 Components, explosive train, n.o.s. (2)	1.2 B	EP 01	—
14.	SUBSTANCES CLASSIFIED AS 1.2 C			
	(reserved)	1.2 C		
15.	ARTICLES CLASSIFIED AS 1.2 C			
	0281 Rocket motors	1.2 C	EP 30	—
	0328 Cartridges for weapons, inert projectile	1.2 C	EP 30	—
	0381 Cartridges, power device	1.2 C	EP 34	—
	0413 Cartridges for weapons, blank	1.2 C	EP 30	—
	0414 Charges, propelling, for cannon	1.2 C	EP 30	—
	0415 Charges, propelling	1.2 C	EP 43	256
	0436 Rockets with expelling charge	1.2 C	EP 30	—
	0466 Articles, explosive, n.o.s. (2)	1.2 C	EP 01	—
16.	SUBSTANCES CLASSIFIED AS 1.2 D			
	(reserved)	1.2 D		
17.	ARTICLES CLASSIFIED AS 1.2 D			
	0035 Bombs with bursting charge	1.2 D	EP 30	—
	0102 Cord, (fuse), detonating, metal clad	1.2 D	EP 39	258
	0138 Mines with bursting charge	1.2 D	EP 30	—
	0169 Projectiles with bursting charge	1.2 D	EP 30	—
	0283 Boosters without detonator	1.2 D	EP 32	—
	0285 Grenades, hand or rifle, with bursting charge	1.2 D	EP 41	—
	0287 Warheads, rocket, with bursting charge	1.2 D	EP 30	—
	0346 Projectiles with buyrster or expelling charge	1.2 D	EP 30	—
	0375 Sounding devices, explosive	1.2 D	EP 34	—
	0409 Fuzes, detonating, with protective features	1.2 D	EP 41	—

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(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].

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Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
17. *(cont'd)*	*0439 Charges, shaped, commercial* without detonator	1.2 D	EP 37	257
	0443 Charges, explosive, commercial without detonator	1.2 D	EP 37	—
	0458 Charges, bursting, plastics bonded	1.2 D	EP 30	—
	0467 Articles, explosive, n.o.s. (2)	1.2 D	EP 01	—
18.	ARTICLES CLASSIFIED AS 1.2 E			
	0182 Rockets with bursting charge	1.2 E	EP 30	—
	0321 Cartridges for weapons with bursting charge	1.2 E	EP 30	—
	0468 Articles, explosive, n.o.s. (2)	1.2 E	EP 01	—
19.	ARTICLES CLASSIFIED AS 1.2 F			
	0007 Cartridges for weapons, with bursting charge	1.2 F	EP 30	—
	0204 Sounding devices, explosive	1.2 F	EP 34	—
	0291 Bombs with bursting charge	1.2 F	EP 30	—
	0293 Grenades, hand or rifle, with bursting charge	1.2 F	EP 41	—
	0294 Mines with bursting charge	1.2 F	EP 30	—
	0295 Rockets with bursting charge	1.2 F	EP 30	—
	0324 Projectiles with bursting charge	1.2 F	EP 30	—
	0426 Projectiles with burster or expelling charge	1.2 F	EP 30	—
	0469 Articles, explosive, n.o.s. (2)	1.2 F	EP 01	—
20.	SUBSTANCES CLASSIFIED AS 1.2 G			
	(reserved)	1.2 G		
21.	ARTICLES CLASSIFIED AS 1.2 G			
	0009 Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.2 G	EP 30	—
	0015 Ammunition, smoke with or without burster, expelling charge or propelling charge	1.2 G	EP 30	—
	0018 Ammunition, tear-producing with burster, expelling charge or propelling charge	1.2 G	EP 30	—
	0039 Bombs, photoflash	1.2 G	EP 30	—
	0171 Ammunition, illuminating with or without burster, expelling charge or propelling charge	1.2 G	EP 30	—
	0238 Rockets, line-throwing	1.2 G	EP 30	—
	0313 Signals, smoke	1.2 G	EP 35	—
	0314 Igniters	1.2 G	EP 42	—
	0334 Fireworks	1.2 G	EP 35	—
	0372 Grenades, practice, hand or rifle	1.2 G	EP 41	—
	0419 Flares, surface	1.2 G	EP 35	—
	0421 Flares, aerial	1.2 G	EP 35	—
	0429 Articles, pyrotechnic for technical purposes	1.2 G	EP 35	—
	0434 Projectiles with burster or expelling charge	1.2 G	EP 30	—

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(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
22.	ARTICLES CLASSIFIED 1.2 H			
	0243 Ammunition, incendiary, white phosphorus, with burster, expelling charge or propelling charge	1.2 H	EP 30	—
	0245 Ammunition, smoke, white phosphorus, with burster, expelling charge or propelling charge	1.2 H	EP 30	—
23.	ARTICLES CLASSIFIED AS 1.2 J			
	0395 Rocket motors, liquid fuelled	1.2 J	EP 01	—
	0398 Rockets, liquid fuelled with bursting charge	1.2 J	EP 01	—
	0400 Bombs with flammable liquid, with bursting charge	1.2 J	EP 01	—
24.	SUBSTANCES CLASSIFIED AS 1.2 L			
	0358 Substances, explosive, n.o.s. (2)	1.2 L	EP 01	—
25.	ARTICLES CLASSIFIED AS 1.2 L			
	0248 Contrivances, water-activated with burster, expelling charge or propelling charge	1.2 L	EP 44	259
	0322 Rocket motors with hypergolic liquids with or without expelling charge	1.2 L	EP 01	—
	0355 Articles, explosive, n.o.s. (2)	1.2 L	EP 01	—
	0380 Articles, pyrophoric	1.2 L	EP 01	—
26.	SUBSTANCES CLASSIFIED AS 1.3 C			
	0077 Dinitrophenolates of alkali metals, dry or wetted with less than 15 % water by mass	1.3 C	EP 14	253
	0132 Deflagrating metal salts of aromatic nitro-derivatives, n.o.s. (2)	1.3 C	EP 14 (b)	253
	0159 Powder-cake (powder paste), wetted with not less than 25 % water by mass	1.3 C	EP 11	—
	Note: This substance, when containing less water than specified, shall not be carried unless specifically authorized by the competent authority [see marg. 100 (3)].			
	0161 Powder, smokeless	1.3 C	EP 14 (b)	256
	0234 Sodium dinitro-o-cresolate, dry or wetted with less than 15 % water by mass	1.3 C	EP 14	253
	Note: For small quantities of not more than 500 g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marg. 401, item 22).			
	0235 Sodium picramate, dry or wetted with less than 20 % water by mass	1.3 C	EP 14	253

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous Goods.
(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
26. *(cont'd)*	*0236 Zirconium picramate*, dry or wetted with less than 20 % water by mass	1.3 C	EP 14	253
	0342 Nitrocellulose, wetted with not less than 25 % alcohol by mass	1.3 C	EP 14 (a)	—
	Note: For nitrocellulose with not less than 25 % alcohol by mass and with a nitrogen content of not more than 12,6 % by mass of the nitrocellulose, under special packing conditions, see Class 4.1 [marg. 401, item 24 (b)]			
	0343 Nitrocellulose, plasticized with not less than 18 % plasticizer by mass	1.3 C	EP 11	—
	Note: For nitrocellulose with not more than 12,6 % nitrogen by dry mass with plasticizer, under special conditions of packing, see Class 4.1 [marg. 2401, item 24(b)]			
	0406 Dinitrosobenzene	1.3 C	EP 14 (b)	—
	0477 Substances, explosive, n.o.s. (2)	1.3 C	EP 01	—
	0495 Propellant, liquid	1.3 C	EP 15	254, 255
	Note: Unless it can be demonstrated by testing that its sensitivity when frozen is not greater than when liquid, the propellant shall remain liquid during normal conditions of transport and not freeze at temperatures above – 15 °C.			
	0499 Propellant, solid	1.3 C	EP 14 (b)	—
27.	ARTICLES CLASSIFIED AS 1.3 C			
	0183 Rockets, with inert head	1.3 C	EP 30	—
	0186 Rockets motors	1.3 C	EP 30	—
	0242 Charges, propelling, for cannon	1.3 C	EP 30	—
	0272 Charges, propelling	1.3 C	EP 43	256
	0275 Cartridges, power device	1.3 C	EP 34	—
	0277 Cartridges, oil well	1.3 C	EP 34	—
	0327 Cartridges for weapons, blank or *cartridges, small arms, blank*	1.3 C	EP 30	—
	0417 Cartridges for weapons, inert projectile or *cartridges, small arms*	1.3 C	EP 30	—
	0437 Rockets with expelling charge	1.3 C	EP 30	—
	0447 Cases, combustible, empty, without primer	1.3 C	EP 36	—
	0470 Articles, explosive, n.o.s. (2)	1.3 C	EP 01	—

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous Goods.
(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
28.	ARTICLES CLASSIFIED AS 1.3 F			
	(reserved)	1.3 F		
29.	SUBSTANCES CLASSIFIED AS 1.3 G			
	0305 Flash powder	1.3 G	EP 13	263
	0478 Substances, explosive, n.o.s. (2)	1.3 G	EP 01	—
30.	ARTICLES CLASSIFIED AS 1.3 G			
	0010 Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.3 G	EP 30	—
	0016 Ammunition, smoke with or without burster, expelling charge or propelling charge	1.3 G	EP 30	—
	0019 Ammunition, tear-producing with burster, expelling charge or propelling charge	1.3 G	EP 30	—
	0050 Cartridges, flash	1.3 G	EP 35	—
	0054 Cartridges, signal	1.3 G	EP 35	—
	0092 Flares, surface	1.3 G	EP 35	—
	0093 Flares, aerial	1.3 G	EP 35	—
	0101 Fuse, non-detonating	1.3 G	EP 40	—
	0195 Signals, distress, ship	1.3 G	EP 35	—
	0212 Tracers for ammunition	1.3 G	EP 33	—
	0240 Rockets, line-throwing	1.3 G	EP 30	—
	0254 Ammunition, illuminating, with or without burster, expelling charge or propelling charge	1.3 G	EP 30	—
	0299 Bombs, photoflash	1.3 G	EP 30	—
	0315 Igniters	1.3 G	EP 42	—
	0316 Fuzes, igniting	1.3 G	EP 41	—
	0318 Grenades, practice, hand or rifle	1.3 G	EP 41	—
	0319 Primers, tubular	1.3 G	EP 33	—
	0335 Fireworks	1.3 G	EP 35	—
	0424 Projectiles, inert with tracer	1.3 G	EP 30	—
	0430 Articles, pyrotechnic for technical purposes	1.3 G	EP 35	—
	0487 Signals, smoke	1.3 G	EP 35	—
	0488 Ammunition, practice	1.3 G	EP 30	—
	0492 Signals, railway track, explosive	1.3 G	EP 35	—
31.	ARTICLES CLASSIFIED AS 1.3 H			
	0244 Ammunition, incendiary, white phosphorus with burster, expelling charge or propelling charge	1.3 H	EP 30	—
	0246 Ammunition, smoke, white phosphorus with burster, expelling charge or propelling charge	1.3 H	EP 30	—

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous Goods.
(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
32.	ARTICLES CLASSIFED AS 1.3 J			
	0247 Ammunition, incendiary, liquid or gel, with burster, expelling charge or propelling charge	1.3 J	EP 01	—
	0396 Rocket motors, liquid fuelled	1.3 J	EP 01	—
	0450 Torpedoes, liquid fuelled, with inert head	1.3 J	EP 01	—
33.	SUBSTANCES CLASSIFIED 1.3 L			
	0359 Substances, explosive, n.o.s. (2)	1.3 L	EP 01	—
34.	ARTICLES CLASSIFIED AS 1.3 L			
	0249 Contrivances, water-activated with burster, expelling charge or propelling charge	1.3 L	EP 44	259
	0250 Rocket motors with hypergolic liquids, with or without expelling charge	1.3 L	EP 01	—
	0356 Articles, explosive, n.o.s. (2)	1.3 L	EP 01	—
35.	ARTICLES CLASSIFIED AS 1.4 B			
	0255 Detonators, electric, for blasting	1.4 B	EP 31	—
	0257 Fuzes, detonating	1.4 B	EP 41	—
	0267 Detonators, non-electric, for blasting	1.4 B	EP 31	—
	0350 Articles, explosive, n.o.s. (2)	1.4 B	EP 01	—
	0361 Detonator assemblies, non-electric, for blasting	1.4 B	EP 31	—
	0365 Detonators for ammunition	1.4 B	EP 33	—
	0378 Primers, cap type	1.4 B	EP 33	—
	0383 Components, explosive train, n.o.s. (2)	1.4 B	EP 01	—
36.	SUBSTANCES CLASSIFIED AS 1.4 C			
	0407 Tetrazol-1-acetic acid	1.4 C	EP 14 (b)	—
	0448 5-Mercapotetrazol-1-acetic acid	1.4 C	EP 14 (b)	—
	0479 Substances, explosive, n.o.s. (2)	1.4 C	EP 01	—
37.	ARTICLES CLASSIFIED AS 1.4 C			
	0276 Cartridges, power device	1.4 C	EP 34	—
	0278 Cartridges, oil well	1.4 C	EP 34	—
	0338 Cartridges for weapons, blank or *cartridges, small arms, blank*	1.4 C	EP 30	—
	0339 Cartridges for weapons, inert projectile or *cartridges, small arms*	1.4 C	EP 30	—
	0351 Articles, explosive, n.o.s. (2)	1.4 C	EP 01	—
	0379 Cases, cartridge, empty, with primer	1.4 C	EP 36	—
	0438 Rockets with expelling charge	1.4 C	EP 30	—
	0446 Cases, combustible, empty, without primer	1.4 C	EP 36	—
	0491 Charges propelling	1.4 C	EP 43	256

(1) The identification numbers are taken from United Nations Recommendations on the Transport of Dangerous Goods.
(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
38.	SUBSTANCES CLASSIFIED AS 1.4 D			
	0480 Substances, explosive, n.o.s. (2)	1.4 D	EP 01	—
39.	ARTICLES CLASSIFIED AS 1.4 D			
	0104 Cord (fuse), detonating, mild effect, metal clad	1.4 D	EP 39	258
	0237 Charges, shaped, flexible, linear	1.4 D	EP 38	—
	0289 Cord, detonating, flexible	1.4 D	EP 39	258
	0344 Projectiles with bursting charge	1.4 D	EP 30	—
	0347 Projectiles with burster or expelling charge	1.4 D	EP 30	—
	0352 Articles, explosive, n.o.s. (2)	1.4 D	EP 01	—
	0370 Warheads, rocket, with burster or expelling charge	1.4 D	EP 30	—
	0410 Fuzes, detonating, with protective features	1.4 D	EP 41	—
	0440 Charges, shaped, commercial, without detonator	1.4 D	EP 37	257
	0444 Charges, explosive, commercial without detonator	1.4 D	EP 37	—
	0459 Charges, bursting, plastics bonded	1.4 D	EP 30	—
	0494 Jet perforating guns, charged oil well, without detonator	1.4 D	EP 01	—
40.	ARTICLES CLASSIFIED AS 1.4 E			
	0412 Cartridges for weapons, with bursting charge	1.4 E	EP 30	—
	0471 Articles, explosive, n.o.s. (2)	1.4 E	EP 01	—
41.	ARTICLES CLASSIFIED AS 1.4 F			
	0348 Cartridges for weapons, with bursting charge	1.4 F	EP 30	—
	0371 Warheads, rocket, with burster or expelling charge	1.4 F	EP 30	—
	0427 Projectiles, with burster or expelling charge	1.4 F	EP 30	—
	0472 Articles, explosive, n.o.s. (2)	1.4 F	EP 01	—
42.	SUBSTANCES CLASSIFIED AS 1.4 G			
	0485 Substances, explosive, n.o.s. (2)	1.4 G	EP 01	—
43.	ARTICLES CLASSIFIED AS 1.4 G			
	0066 Cord, igniter	1.4 G	EP 40	—
	0103 Fuse, igniter, tubular, metal clad	1.4 G	EP 40	—
	0191 Signal devices, hand	1.4 G	EP 35	—
	0197 Signals, smoke	1.4 G	EP 35	—
	0297 Ammunition, illuminating, with or without burster, expelling charge or propelling charge	1.4 G	EP 30	—
	0300 Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.4 G	EP 30	—
	0301 Ammunition, tear-producing, with burster, expelling charge or propelling charge	1.4 G	EP 30	—

(1) The identification numbers are taken from United Nations Recommendations on the Transport of Dangerous Goods.
(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
43. *(cont'd)*	*0303 Ammunition*, smoke with or without burster, expelling charge or propelling charge	1.4 G	EP 30	—
	0306 Tracers for ammunition	1.4 G	EP 33	—
	0312 Cartridges, signal	1.4 G	EP 35	—
	0317 Fuzes, igniting	1.4 G	EP 41	—
	0320 Primers, tubular	1.4 G	EP 33	—
	0325 Igniters	1.4 G	EP 42	—
	0336 Fireworks	1.4 G	EP 35	—
	0353 Articles, explosive, n.o.s. (2)	1.4 G	EP 01	—
	0362 Ammunition, practice	1.4 G	EP 30	—
	0363 Ammunition, proof	1.4 G	EP 30	—
	0403 Flares, aerial	1.4 G	EP 35	—
	0425 Projectiles, inert with tracer	1.4 G	EP 30	—
	0431 Articles, pyrotechnic for technical purposes	1.4 G	EP 35	—
	0435 Projectiles with burster or expelling charge	1.4 G	EP 30	—
	0452 Grenades, practice, hand or rifle	1.4 G	EP 41	—
	0453 Rockets, line throwing	1.4 G	EP 30	—
	0493 Signals, railway track, explosive	1.4 G	EP 35	—
44.	SUBSTANCES CLASSIFIED AS 1.4 L			
	(reserved)	1.4 L		
45.	ARTICLES CLASSIFIED AS 1.4 L			
	(reserved)	1.4 L		
46.	SUBSTANCES CLASSIFIED AS 1.4 S			
	0481 Substances, explosive, n.o.s. (2)	1.4 S	EP 01	—
47.	ARTICLES CLASSIFIED AS 1.4 S			
	0012 Cartridges for weapons, inert projectile or *cartridges, small arms*	1.4 S	EP 30	—
	0014 Cartridges for weapons, blank or *cartridges, small arms, blank*	1.4 S	EP 30	—
	0044 Primers, cap type	1.4 S	EP 33	—
	0055 Cases, cartridge, empty, with primer	1.4 S	EP 36	—
	0070 Cutters, cable, explosive	1.4 S	EP 34	—
	0105 Fuse, safety	1.4 S	EP 40	—
	0110 Grenades, practice, hand or rifle	1.4 S	EP 41	—
	0131 Lighters, fuse	1.4 S	EP 42	—
	0173 Release devices, explosive	1.4 S	EP 34	—
	0174 Rivets, explosive	1.4 S	EP 34	—
	0193 Signals, railway track, explosive	1.4 S	EP 35	—
	0323 Cartridges, power device	1.4 S	EP 34	—
	0337 Fireworks	1.4 S	EP 35	—
	0345 Projectiles, inert, with tracer	1.4 S	EP 30	—
	0349 Articles, explosive, n.o.s. (2)	1.4 S	EP 01	—

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous Goods.
(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].

101 *(cont'd)*

Item	Identification number and name of the substance or article (1)	Classification code in accordance with marg. 100 (6) and (7)	Packing	
			Packing methode [see marg. 103 (3)]	Special packing requirements [see marg. 103 (4)]
1	2	3	4	5
47. *(cont'd)*	*0366 Detonators for ammunition*	1.4 S	EP 33	—
	0367 Fuzes, detonating	1.4 S	EP 41	—
	0368 Fuzes, igniting	1.4 S	EP 41	—
	0373 Signal devices, hand	1.4 S	EP 35	—
	0376 Primers, tubular	1.4 S	EP 33	—
	0384 Components, explosive train, n.o.s. (2)	1.4 S	EP 01	—
	0404 Flares, aerial	1.4 S	EP 35	—
	0405 Cartridges, signal	1.4 S	EP 35	—
	0432 Articles, pyrotechnic, for technical purposes	1.4 S	EP 35	—
	0441 Charges, shaped, commercial, without detonator	1.4 S	EP 37	257
	0445 Charges, explosive, commercial, without detonator	1.4 S	EP 37	—
	0454 Igniters	1.4 S	EP 42	—
	0455 Detonators, non-electric, for blasting	1.4 S	EP 31	—
	0456 Detonators, electric, for blasting	1.4 S	EP 31	—
	0460 Charges, bursting, plastics bonded	1.4 S	EP 30	—
	0500 Detonator assemblies, non-electric for blasting	1.4 S	EP 31	—
48.	SUBSTANCES CLASSIFIED AS 1.5 D			
	0331 Explosive, blasting, type B	1.5 D	EP 16 or EP 17	—
	Note: The word 'AGENT' may be used instead of 'EXPLOSIVE' when approved by the competent authority.			
	0332 Explosive, blasting, type E	1.5 D	EP 16 or EP 17	
	Note: The word 'AGENT' may be used instead of 'EXPLOSIVE' when approved by the competent authority.			
	0482 Substances, explosive, very insensitive, n.o.s., [Substances, EVI (3)*, n.o.s.]* (2)	1.5 D	EP 01	—
49.	(reserved)			
50.	ARTICLES CLASSIFIED AS 1.6 N			
	0486 Articles, explosive, extremely insensitive [articles EEI (4)*]*	1.6 N	EP 01	—
51.	SAMPLES EXPLOSIVE			
	0190 Samples, explosive (2), other than initiating explosive	(5)	EP 01	16
91.	EMPTY PACKAGINGS			
	Empty packagings, uncleaned	—	—	—

(1) The identification numbers are taken from the United Nations Recommendations on the Transport of Dangerous Goods.
(2) Carriage only with the approval of the competent authority [see marginal 2100 (3)].
(3) EVI = explosive, very insensitive.
(4) EEI = explosive, extremely insensitive.
(5) Division and Compatibility Group shall be defined as directed by the competent authority and according to the principles in marg. 100 (4).

2. Conditions of Carriage

A. Packages

1. General conditions of packing

102 (1) All explosive substances and articles, as prepared for carriage, shall have been classified in accordance with the procedures detailed in marg. 100.

(2) All packagings for Class 1 goods shall be so designed and constructed that:

(a) they will protect the explosive substances and articles, prevent them escaping and cause no increase in the risk of unintended ignition or initiation when subjected to normal conditions of carriage including foreseeable changes in temperature, humidity and pressure;

(b) the complete package can be handled safely in normal conditions of carriage; and

(c) the packages will withstand any loading imposed on them by foreseeable stacking to which they will be subject during carriage so that they do not add to the risk presented by the explosive substances and articles, the containment function of the packagings is not harmed, and they are not distorted in a way or to an extent which will reduce their strength or cause instability of a stack.

(3) The packages shall conform to the requirements of Appendices V and VI, in particular to the requirements for the testing of packagings in Section IV of these appendices, subject to marg. 1500 (12) and 1512 (5).

(4) In accordance with the requirements of marg. 100 (5), 1511 (2) and 1611 (2), packagings or intermediate bulk containers (IBCs) of packing group II marked with the letter 'Y' shall be used for substances and articles of Class 1.

(5) The closure device of packagings containing liquid explosives shall ensure a double protection against leakage.

(6) The closure device of metal drums shall include a suitable gasket; if a closure device includes a screw-thread, the ingress of explosive substances into the screw-thread shall be prevented.

(7) Packagings for water soluble explosives shall be water resistant. Packagings for desensitized or phlegmatized substances shall be closed to prevent changes in concentration during carriage.

(8) Nails, staples and other closure devices made of metal without protective covering shall not penetrate to the inside of the outer packaging unless the inner packaging adequately protects the explosive substances and articles against contact with the metal.

(9) Inner packagings, fittings and cushioning materials and the placing of explosive substances or articles in packages shall be accomplished in a manner which prevents the explosive substance from becoming loose in the outer packaging under normal conditions of carriage. Metallic components of articles shall be prevented from making contact with metal packagings. Articles containing explosive substances not enclosed in an outer casing shall be separated from each other in order to prevent friction and impact. Padding, trays, partitioning in the inner or outer packaging, mouldings or receptacles may be used for this purpose.

(10) Packagings shall be made of materials compatible with, and impermeable to, the explosives contained in the package, so that neither interaction between the explosives and the packaging materials, nor leakage, causes the explosive substances and articles to become unsafe to carry, or the hazard division or compatibility group to change.

102 *(cont'd)*

(11) The ingress of explosive substances into the recesses of seamed metal packagings assembled by stapling shall be prevented.

(12) Plastics packagings shall not be liable to generate or accumulate sufficient static electricity so that a discharge could cause the packaged explosive substances or articles to initiate, ignite or function.

(13) Large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features, may be carried unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of carriage. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for carriage unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling devices.

(14) Explosive substances shall not be packed in inner or outer packagings where the differences in internal and external pressures, due to thermal or other effects, could cause an explosion or rupture of the package.

(15) Whenever loose explosive substances or the explosive substance of an uncased or partly cased article may come into contact with the inner surface of metal packagings (1A2, 1B2, 4A, 4B and metal receptacles), the metal packaging shall be provided with an inner liner or coating [see marg. 1500 (2)].

2. Individual conditions of packing

103 (1) Substances and articles shall be packed as indicated in marg. 101, Table 1, columns 4 and 5, and as set out in detail in paragraphs (3), Table 2 and (4), Table 3.

(2) Nortwithstanding the packing methods for explosive substances and articles prescribed in marg. 101, Table 1, columns (4) and (5) and in paragraphe (3), Table 2 below, method EP 01 may be adopted for any explosive substance or article provided the product as packaged has been tested and approved by the competent authority of the country of origin or if the country of origin is not a Member State, by the competent authority of the first COTIF Contracting State reached by the consignment and proved to present no greater hazard than that presented when the product is packed in accordance with the method specified in Table 1, column 4.

(3) TABLE 2:

Packing methods

Note: 1. In Table 2, the following convention is used:

Packing method EP 01 — reserved for methods requiring competent authority approval;

Packing methods EP 11 to EP 29 — reserved for explosive substances; and

Packing methods EP 30 onwards — reserved for explosive articles.

2. Whenever 'Boxes, natural wood, ordinary (4C1)' are listed in this Table, a 'Box, natural wood, siftproof walls (4C2)' may be used instead.

3. Leakproof packagings shall correspond to a design type that has passed the leakproofness test for Packing Group II.

4. The term 'receptacle' used in the inner and intermediate packaging columns of this table includes boxes, bottles, cans, drums, jars and tubes, including any means of closure.

5. Reels are devices made of plastics, wood, fibreboard, metal or other suitable material comprising a central spindle with side walls at each end of the spindle. Articles and substances can be wound onto the spindle and may be retained by side walls.

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(Cont'd)

6. Trays are sheets of metal, plastics, fibreboard or other suitable material which are placed in the inner, intermediate or outer packaging and achieve a close-fit in such packaging. The surface of the tray may be shaped so that packagings or articles can be inserted, held secure and separated from each other.

7. Som UN identification numbers cover substances which may be carried dry or wetted. Where appropriate, the heading of the packing method indicates whether it is suitable for the dry, powder or wetted substance.

Method EP 01

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements

As approved by the competent authority of the country of origin, or if the country of origin is not a Member States by the competent authority of the first COTIF Contracting State reached by the consignment. The State's distinguishing sign for motor vehicles in internationl traffic of the country for which the authority acts shall be marked on the consignment note as follows:

'Packaging approved by the competent authority of ...'

This packing method applies to Nos:

0461 of item 1	0467 of item 17	0479 of item 36
0474 of item 2	0468 of item 18	0351 of item 37
0462 of item 3	0469 of item 19	0480 of item 38
0475 of item 4	0395, 0398, 0400 of item 23	0352, 0494 of item 39
0124, 0463 of item 5	0358 of item 24	0471 of item 40
0464 of item 6	0322, 0355, 0380 of item 25	0472 of item 41
0465 of item 7	0477 of item 26	0485 of item 42
0476 of item 8	0470 of item 27	0353 of item 43
0397, 0399, 0449 of item 10	0478 of item 29	0481 of item 46
0357 of item 11	0247, 0396, 0450 of item 32	0349, 0384 of item 47
0354 of item 12	0359 of item 33	0482 of item 48
0382 of item 13	0250, 0356 of item 34	0484 of item 50
0466 of item 15	0350, 0383 of item 35	0190 of item 51

Method EP 11

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, waterproofed plastics textile, rubberized Sheets plastics textile, rubberized	Not necessary	Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibreboard (1G) plastics, removable head (1H2) Drums steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2)

103 *(cont'd)*

This packing method applies to Nos:
0433 of item 2
0159, 0343 of item 26

Special provision: see marg. 102(7)

Note: Inner packagings are not required for 0159 when metal (1A2 or 1B2) or plastics (1H2) drums are used as outer packagings.

Method EP 12 (a)

(solid wetted 1.1D)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, multiwall, water resistant plastics textile textile, rubberized woven plastics	Bags plastics textile, plastics coated or lined	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastic, solid (4H2)
Receptacles metal plastics	Receptacls metal plastics	Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

This packing method applies to Nos:
0004, 0072, 0076, 0078, 0118, 0133, 0146, 0150, 0151, 0154, 0209, 0214, 0215, 0219, 0220, 0226, 0266, 0282, 0340, 0391, 0394, 0401 of item 4.

Note: 1. Intermediate packagings are not required if leakproof drums are used as the outer packaging.
2. Intermediate packagings are not required for 0072 and 0226.

Method EP 12 (b)

(solid dry, other than powder 1.1D)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, kraft paper, multiwall, water resistant plastics textile textile, rubberized woven plastics	Bags (for 0150 only) plastics textile, plastics coated or lined	Bags woven plastics, sift-proof (5H2) water resistant (5H3) plastics, film (5H4) textile, sift-proof (5L2) textile, water resistant (5L3) paper, multiwall, water resistant (5M2)

103 *(cont'd)*

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
		Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

This packing method applies to Nos:

0004, 0076, 0078, 0079, 0118, 0146, 0147, 0150, 0151, 0153, 0154, 0155, 0207, 0208, 0209, 0213, 0214, 0215, 0216, 0217, 0218, 0219, 0220, 0222, 0223, 0266, 0282, 0340, 0341, 0385, 0386, 0387, 0388, 0389, 0390, 0391, 0392, 0393, 0401, 0402, 0411, 0483, 0484, 0489, 0490, 0496 of item 4.

Note: Inner packagings are not required for 0222 and 0223 when the outer packaging is a bag.

Method EP 12 (c)

(for solid dry powder 1.1D)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, multiwall, water resistant plastics woven plastics	Bags paper, multiwall, water resistant with inner lining plastics	Boxes steel (4A) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Receptacles fibreboard metal plastics wood	Receptacles metal plastics	Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G)

This packing method applies to Nos:

0004, 0076, 0078, 0079, 0118, 0146, 0151, 0153, 0154, 0155, 0207, 0208, 0209, 0213, 0214, 0215, 0216, 0217, 0218, 0219, 0220, 0222, 0223, 0266, 0282, 0385, 0386, 0387, 0388, 0389, 0390, 0392, 0401, 0402, 0411, 0483, 0484, 0489, 0490, 0496 of item 4.

Note: 1. Intermediate packagings are not required if drums are used as the outer packaging.

2. These packages shall be sift-proof.

103
(cont'd)

Method EP 13

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics textile, rubberized	Not necessary	Boxes steel (4A) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Receptacles fibreboard metal plastics wood		Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G)
Sheets paper, kraft paper, waxed		

This packing method applies to Nos:

0027, 0028 of item 4; 0094 of item 8; 0305 of item 29

Special provision: the special provision in marg. 102(15) applies to 0027 when inner packagings are not used:

Note: 1. Inner packagings are not necessary for 0027 when drums are used as the outer packaging.
2. Packages shall be sift-proof.
3. Sheets may only be used for 0028.

Method EP 14 (a)

(solid wetted)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics textile woven plastics	Bags plastics textile, plastics coated or lined	Boxes steel (4A) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Receptacles metal plastics	Receptacles metal plastics	Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

This packing method applies to Nos:

0077, 0234, 0235, 0236, 0342 of item 26

Note: 1. Inner packagings are not required for 0342 when metal (1A2 or 1B2) or plastics (1H2) drums are used as outer packagings.
2. Intermediate packagings are not required if leakproof removable head drums are used as the outer packaging.

103
(cont'd)

Method EP 14 (b)

(solid dry)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, kraft plastics textile, sift-proof woven plastics, sift-proof Receptacles fibreboard metal paper plastics woven plastics, sift-proof	Not necessary	Boxes natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

This packing method applies to Nos:

0160, 0498 of item 2; 0077, 0132, 0161, 0234, 0235, 0236, 0406, 0499 of item 26; 0407, 0448 of item 36.

Special provisions: the special provisions in marg. 102(15) applies to 0160 and 0161, when metal drums (1A2 or 1B2) are used as the outer packaging:

Note: Inner packagings are not required for 0160 and 0161 if drums are used as the outer packaging.

Method EP 15

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles metal plastics	Bags plastics in metal receptacles Drums metal	Boxes natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G)

This packing method applies to Nos:

0497 of item 2; 0075, 0143, 0144 of item 4; 0495 of item 26

Note: 1. Metal receptacles as inner packagings may only be used for 0144.
2. Bags are to be used as intermediate packagings for 0075, 0143, 0495 and 0497 when boxes are used as outer packagings.
3. Drums are to be used as intermediate packagings for 0075, 0143, 0495 and 0497 when drums are used as outer packagings.
4. Intermediate packagings are not necessary for 0144.
5. Fibreboard boxes (4G) may only be used for 0144.
6. Aluminium drums, removable head (1B2) are not allowed for 0144.

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(cont'd)

Method EP 16

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, water and oil resistant plastics textile, plastics coated or lined woven plastics, sift-proof	Not necessary	Bags woven plastics (5H1/2/3) paper, multiwall, water resistant (5M2) plastics, film (5H4) textile, sift-proof (5L2) textile, water resistant (5L3)
Receptacles fibreboard, water resistant metal plastics wood, sift-proof		Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Sheets paper, water resistant papier, waxed plastics		Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2) Jerricans steel, removable head (3A2) plastics, removable head (3H2)

This packing method applies to Nos:

0081, 0082, 0083, 0084, 0241 of item 4; 0331, 0332 of item 48.

Note: 1. Inner packagings are not necessary for 0082, 0241, 0331 and 0332 if leakproof removable head drums are used as the outer packaging.

2. Inner packagings are not required for 0082, 0084, 0241, 0331 and 0332 when the explosive is contained in a material impervious to liquid.

3. Inner packagings are not required for 0081 when contained in rigid plastics which is impervious to nitric esters.

4. Inner packagings are not required for 0331 when bags (5H2, 5H3 or 5H4) are used as outer packagings.

5. Bags (5H2) and (5H3) shall be used only for 0082, 0241, 0331 and 0332.

6. Bags shall not be used as outer packagings for 0081.

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(cont'd)

Method EP 17

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Not necessary	Not necessary	IBCs metal (11A), (11B), (11N), (21A), (21B), (21N), (31A), (31B), (31N) flexible (13H2), (13H3), (13H4), (13L2), (13L3), (13L4), (13M2) rigid plastics (11H1), (11H2), (21H1), (21H2), (31H1), (31H2) composite (11HZ1), (11HZ2), (21HZ1), (21HZ2), (31HZ1), (31HZ2)

This packing method applies to Nos:

0082, 0241 of item 4; 0331, 0332 of item 48

Note: 1. IBCs shall only be used for free-flowing substances.
2. Metal IBCs shall not be used for 0082 and 0241.
3. Flexible IBCs shall be used for solids only.

Method EP 30

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Not necessary	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

This packing method applies to Nos:

0279, 0280, 0326 of item 3; 0034, 0038, 0048, 0056, 0137, 0168, 0221, 0268, 0451, 0457 of item 5; 0006, 0181, 0329 of item 6; 0005, 0033, 0037, 0136, 0167, 0180, 0330, 0369 of item 7; 0281, 0328, 0413, 0414, 0436 of item 15; 0035, 0138, 0169, 0287, 0346, 0458 of item 17; 0182, 0321 of item 18; 0007, 0291, 0294, 0295, 0324, 0426 of item 19; 0009, 0015, 0018, 0039, 0171, 0238, 0434 of item 21; 0243, 0245 of item 22; 0183, 0186, 0242, 0327, 0417, 0437 of item 27; 0010, 0016, 0019, 0240, 0254, 0299, 0424, 0488 of item 30; 0244, 0246 of item 31; 0338, 0339, 0438 of item 37; 0344, 0347, 0370, 0459 of item 39; 0412 of item 40; 0348, 0371, 0427 of item 41; 0297, 0300, 0301, 0303, 0362, 0363, 0425, 0435, 0453 of item 43; 0012, 0014, 0345, 0460 of item 47.

The special provision in marg. 102(13) does not apply to: 0005, 0007, 0012, 0014, 0033, 0037, 0136, 0167, 0180, 0238, 0240, 0242, 0279, 0291, 0294, 0295, 0324, 0326, 0327, 0330, 0338, 0339, 0348, 0369, 0371, 0413, 0414, 0417, 0426, 0427, 0453, 0457, 0458, 0459 and 0460.

The special provision in marg. 102(15) applies to 0457, 0458, 0459, 0460.

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Method EP 31

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics Receptacles fibreboard metal plastics wood Reels	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted (4F) fibreboard (4G) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

This packing method applies to Nos:

0029, 0030, 0360 of item 1; 0255, 0267, 0361 of item 35; 0455, 0456, 0500 of item 47

Note: 1. Bags shall not be used as inner packagings for 0029, 0267 and 0455.
2. Reels shall only be used as inner packagings for 0030, 0255, 0360, 0361, 0456 and 0500.

Method EP 32 (a)

Articles consisting of closed metal, plastics or fibreboard casings that contain a detonating explosive, or consisting of plastics-bonded detonating explosives

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Not necessary	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

This packing method applies to Nos:

0042, 0060 of itemr 5; 0283 of item 17

Method EP 32 (b)

Articles without closed casings

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles fibreboard metal plastics	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

103 *(cont'd)*

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Sheets paper plastics		

This packing method applies to Nos:

0042, 0060 of item 5; 0283 of item 17

Special provision: the special provision in marg. 102(15) applies for 0042, 0060 and 0283.

Method EP 33

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles fibreboard metal plastics wood	Receptacles fibreboard metal plastics wood	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Trays, fitted with dividing partitions fibreboard plastics wood		

This packing method applies to Nos:

0073, 0225, 0377 of item 1; 0043 of item 5; 0268, 0364 of item 13; 0212, 0319 of item 30; 0365, 0378 of item 35; 0306, 0320 of item 43; 0044, 0366, 0376 of item 47

Note: 1. Trays shall only be used as inner packagings for 0044, 0073, 0319, 0320, 0364, 0365, 0366, 0376, 0377 and 0378.

2. Receptacles are only required as intermediate packagings when the inner packagings are trays.

Method EP 34

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags water resistant	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Receptacles fibreboard metal plastics wood		Drums steel, removable head (1A2) aluminium, removable head (1B2)

103 *(cont'd)*

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Sheets fibreboard, corrugated Tubes fibreboard		

This packing method applies to Nos:

0099, 0374 of item 5; 0296 of item 7; 0381 of item 15; 0375 of item 17; 0204 of item 19; 0275, 0277 of item 27; 0276, 0278 of item 37; 0070, 0173, 0174, 0323 of item 47

Method EP 35

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics Receptacles fibreboard metal plastics wood Sheets paper plastics	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

This packing method applies to Nos:

0049, 0192, 0194, 0196, 0333, 0418, 0420, 0428 of item 9; 0313, 0334, 0419, 0421, 0429 of item 21; 0050, 0054, 0092, 0093, 0195, 0335, 0430, 0487, 0492 of item 30; 0191, 0197, 0312, 0336, 0403, 0431, 0493 of item 43; 0193, 0337, 0373, 0404, 0405, 0432 of item 47

Method EP 36

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics textile	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

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(cont'd)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Boxes fibreboard plastics wood Dividing partitions in the outer packaging		Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

This packing method applies to Nos:
0447 of item 27; 0379, 0446 of item 37; 0055 of item 47

Method EP 37

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics Boxes fibreboard Tubes fibreboard metal plastics Dividing partitions in the outer packaging	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G)

This packing method applies to Nos:
0059, 0442 of item 5; 0439, 0443 of item 17; 0440, 0444 of item 39; 0441, 0445 of item 47

Method EP 38

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2)

This packing method applies to Nos:
0288 of item 5; 0237 of item 39

Special provision: the special provision in marg. 102(15) applies to 0237 and 0288.

Note: If the ends of the articles are sealed, inner packagings are not necessary.

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(Cont'd)

Method EP 39

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics	Not necessary	Boxes steel (4A) aluminium (4B) natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Receptacles fibreboard metal plastics wood		Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)
Reels		
Sheets paper, kraft plastics		

This packing method applies to Nos:

0065, 0290 of item 5; 0102 of item 17; 0104, 0289 of item 39

Note: Inner packagings are not required for 0065 and 0289 when the articles are in coils.

Method EP 40

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Reels		Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G)
Sheets paper, kraft plastics		

This packing method applies to Nos:

0101 of item 30; 0066, 0103 of item 43; 0105 of item 47

Special provision: the special provision in marg. 102(15) applies to 0105.

Note: 1. If the ends of 0105 are sealed, no inner packagings are required.
2. For 0101, the packaging shall be sift-proof except when the fuse is covered by a paper tube and both ends of the tube are covered with removable caps.
3. Steel and aluminium (boxes and drums) may not be used for 0101.

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(cont'd)

Method EP 41

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles fibreboard metal plastics wood	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Trays, fitted with dividing partitions plastics wood		Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)
Dividing partitions in the outer packaging		

This packing method applies to Nos:

0106 of item 1; 0284, 0408 of item 5; 0292 of item 7; 0107 of item 13; 0285, 0409 of item 17; 0293 of item 19; 0372 of item 21; 0316, 0318 of item 30; 0257 of item 35; 0410 of item 39; 0317, 0452 of item 43; 0110, 0367, 0368 of item 47

Method EP 42

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics	Not necessary	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Receptacles fibreboard metal plastics wood		Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)
Sheets paper		
Trays, fitted with dividing partitions plastics		

This packing method applies to Nos:

0121 of item 9; 0314 of item 21; 0315 of item 30; 0325 of item 43; 0131, 0454 of item 47

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(cont'd)

Method EP 43

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags	Not necessary	Boxes
paper, kraft		steel (4A)
plastics		aluminium (4B)
textile		natural wood, ordinary (4C1)
textile, rubberized		plywood (4D)
		reconstituted wood (4F)
		fibreboard (4G)
		plastics, solid (4H2)
Receptacles		Drums
fibreboard		steel, removable head (1A2)
metal		aluminium, removable head (1B2)
plastics		plywood (1D)
		fibre (1G)
		plastics, removable head (1H2)
Trays, fitted with dividing partitions		
plastics		
wood		

This packing method applies to Nos:

0271 of item 3; 0415 of item 15; 0272 of item 27; 0491 of item 37

Note: Instead of the above inner and outer packagings, composite packagings (6HH2) (plastics receptacle with outer solid plastics box) may be used.

Method EP 44

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles	Not necessary	Boxes
fibreboard		steel (4A)
metal		aluminium (4B)
plastics		natural wood, ordinary (4C1) with metal liner
		plywood (4D) with metal liner
		reconstituted wood (4F) with metal liner
		plastics, expanded (4H1)
Dividing partitions in the outer packaging		

This packing method applies to Nos:

0248 of item 25; 0249 of item 34

(4) TABLE 3

Special packing requirements

Note: 1. For the special packing requirements applicable to the various substances and articles, see marg. 101, Table 1, column 5.

103 *(cont'd)*

2. Numbers assigned to special requirements are the same as those assigned to special provisions in Chapter 3 of the United Nations Recommendations on the Transport of Dangerous Goods.

No	Special packing requirement
16.	Explosive samples which are non-wetted or non-desensitized shall be limited to 10 kg in small packages as specified by the competent authority. Explosive samples which are wetted or desensitized shall be limited to 25 kg.
253.	Packagings shall be lead free.
254.	Inner packagings shall have taped screw cap closures and be not more than 5 litres capacity each. Inner packagings shall be surrounded with non-combustible absorbent cushioning materials. The amount of absorbent cushioning material shall be sufficient to absorb the liquid contents. Metal receptacles shall be cushioned from each other. Net mass of propellant is limited to 30 kg for each package when outer packagings are boxes.
255.	When intermediate packagings are drums, they shall be surrounded with non-combustible cushioning material in a quantity sufficient to absorb the liquid contents. A composite packaging consisting of a plastics receptacle in a metal drum may be used instead of the inner and intermediate packagings. The net volume of propellant in each package shall not exceed 120 litres.
256.	Metal packagings shall be so constructed that the risk of explosion, by reason of increase in internal pressure form internal or external causes is prevented.
257.	When the shaped charges are packed singly, the conical cavity shall face downwards and the package marked 'THIS SIDE UP'. When the shaped charges are packed in pairs, the conical cavities shall face inwards to minimize the jetting effect in the event of accidental initiation.
258.	The ends of the detonating cord shall be sealed, for example, by a plug firmly fixed so that the explosive cannot escape. The ends of CORD DETONATING flexible shall be tied fast.
259.	Packagings shall be protected against the ingress of water. When CONTRIVANCES, WATER ACTIVITED are carried unpackaged, they shall be provided with at least two independent protective features which prevent the ingress of water.
260.	Packing method EP 17 may only be used for explosives of 0082 which are mixtures of ammonium nitrate or other organic nitrates with other combustible substances which are not explosive ingredients. Such explosives shall not contain nitroglycerin, similar liquid organic nitrates, or chlorates.
261.	Packing method EP 17 may only be used for explosives of 0241 which consist of water as an essential ingredient and high proportions of ammonium nitrate or other oxidizers, some or all of which are in solution. The other constituents may include hydrocarbons or aluminium powder, but shall not include nitro-derivatives such as trinitrotoluene.
262.	Bags, sift-proof (5H2) may be used for flake or prilled TNT in the dry state and a maximum net mass of 30 kg.
263.	No more than 50 g of substance shall be packed in an inner packaging.
264.	Absorbent cushioning material shall be inserted.
267.	Any explosives, blasting, type C containing chlorates shall be segregated from explosives containing ammonium nitrate or other ammonium salts.

3. Mixed packing

104 (1) Substances and articles covered by the same identification number [1] with the exception of substances and articles of compatibility group L and substances and articles assigned to an n.o.s. entry or the entry 0190 Samples, explosive of item 51, may be packed together. In this case, the most secure outer packaging shall be used.

(2) Except where otherwise specially provided below, substances and articles having different identification numbers may not be packed together.

(3) Substances and articles of Class 1 may not be packed together with substances of other classes or with goods which are not subject to the requirements of this Directive.

(4) Articles of compatibility groups C, D and E may be packed together.

(5) Articles of compatibility groups D or E may be packed together with their own means of initiation provided that such means have at least two effective protective features which prevent explosion of an article in the event of accidental functioning of the means of initiation.

(6) Articles of compatibility groups D or E may be packed together with their own means of initiation which do not have two effective protective features (i.e. means of initiation assigned to compatibility group B), provided that, in the opinion of the competent authority of the country of origin [2], the accidental functioning of the means of initiation does not cause the explosion of an article under normal conditions of carriage.

(7) Substances and articles of compatibility group L may not be packed together with a different type of substance or article of that compatibility group.

(8) Articles may be packed together with their own means of ignition provided that the means of ignition will not function under normal conditions of carriage.

(9) Goods with the identification numbers shown in table 4 may be included in the same package under the conditions indicated.

(10) For mixed packing, account shall be taken of a possible amendment of the classification of packages in accordance with marg. 100.

(11) For the description of goods in the consignment note in the case of the mixed packing of substances and articles of Class 1, see marg. 115(4).

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[1] Identification number of the substance or article according to the United Nations Recommendations on the Transport of Dangerous Goods [see marg. 101, footnote [1]].

[2] If the country of origin is not a Member State, the approval shall require validation by the competent authority of the first COTIF Contracting State reached by the consignment.

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(cont'd)

TABLE 4

Special conditions of mixed packing

Item	Item	2	4		9			21			26	27	30					43					47						
	Identification number	0160	0027	0028	0194	0333	0428	0238	0334	0429	0161	0186	0054	0195	0240	0335	0430	0191	0197	0312	0336	0431	0012	0014	0044	0337	0373	0405	0432
2	0160		B	B							B														B				
4	0027	B		B							B														B				
	0028	B	B								B														B				
9	0194						B	B		B		B	B	B	B		B	B	B	B		B					B	B	B
	0333								A							A					A					A			
	0428				B			B		B		B	B	B	B		B	B	B	B		B					B	B	B
21	0238				B		B			B		B	B	B	B		B	B	B	B		B					B	B	B
	0334					A										A					A					A			
	0429				B		B	B				B	B	B	B		B	B	B	B		B					B	B	B
26	0161	B	B	B																				B					
27	0186				B		B	B		B			B	B	B		B	B	B	B		B					B	B	B
30	0054				B		B	B		B		B		B	B		B	B	B	B		B					B	B	B
	0195				B		B	B		B		B	B		B		B	B	B	B		B					B	B	B
	0240				B		B	B		B		B	B	B			B	B	B	B		B					B	B	B
	0335					A			A												A					A			
	0430				B		B	B		B		B	B	B	B			B	B	B		B					B	B	B
43	0191				B		B	B		B		B	B	B	B		B		B	B		B					B	B	B
	0197				B		B	B		B		B	B	B	B		B	B		B		B					B	B	B
	0312				B		B	B		B		B	B	B	B		B	B	B			B					B	B	B
	0336					A			A							A										A			
	0431				B		B	B		B		B	B	B	B		B	B	B	B							B	B	B
47	0012																							A					
	0014																						A						
	0044	B	B	B							B																		
	0337					A			A							A					A								
	0373				B		B	B		B		B	B	B	B		B	B	B	B		B						B	B
	0405				B		B	B		B		B	B	B	B		B	B	B	B		B					B		B
	0432				B		B	B		B		B	B	B	B		B	B	B	B		B					B	B	

Explanations:
A: Substances and articles with these identification numbers may be included in the same package without any special limitation of mass.
B: Substances and articles with these identification numbers may be included in the same package up to a total mass of 50 kg of explosive substance.

4. Marking and danger labels on packages (see Appendix IX)

Marking

105 (1) Packages shall bear the identification number and one of the names of the substance or article printed in italics in marg. 101, Table 1, column 2. For substances and articles assigned to an n.o.s. entry or the entry 0190 Samples, explosive of item 51, as well as for other articles of item 25 and item 34, the technical name of the goods shall be given in addition to the name of the n.o.s. entry or the entry 0190 Samples, explosive of item 51. For substances of item 4, Nos 0081, 0082, 0083, 0084 and 0241, and substances of item 48, Nos 0331 and 332, the commercial name of the particular explosive shall be specified in addition to the type. For other substances and articles, the commercial of technical name may be added. The marking, which shall be clearly legible and indelible, shall be in an official language of the country of origin and also, if that language is not French, German, Italian or English, German, Italian or English, unless the international tariffs or agreements concluded between the railway administrations provide otherwise. In the case of military consignments within the meaning of marg. 143, carried as a full wagon load, the packages may bear the descriptions prescribed by the competent military authority in place of the descriptions conforming to marg. 101, Table 1, column 2.

105 (cont'd)

Danger labels

(2) Packages containing substances or articles of items 1 to 34 shall bear a label conforming to model No 1. The classification code according to marg. 101, Table 1, column 3, shall be shown on the lower part of the label. Packages containing substances or articles of items 35 to 47 shall bear a label conforming to model No 1.4 and packages containing substances of item 48 shall bear a label conforming to model No 1.5 and those containing article of item 50 shall bear a label conforming to model No 1.6. The compatibility group according to marg. 101, Table 1, column 3, shall be shown on the lower part of the label.

(3) Packages containing substances and articles of

item 4, Nos 0076 and 0143 (only mixtures with less than 90 % (mass) phlegmatizer);

item 21, No 0018;

item 26, No 0077;

item 30, No 0019; and

item 43, No 0301

shall in addition bear a label conforming to model No 6.1.

Packages containing articles containing one or several corrosive substances according to criteria for Class 8, of

item 21, Nos 0015 [1] and 0018;

item 30, Nos 0016 [1] and 0019; and

item 43, Nos 0301 and 303 [1]

shall in addition bear a label conforming to model No 8.

(4) For the carriage of military consignments within the meaning of marg. 143, as a full wagon load, it shall not be necessary for packages to bear the danger labels prescribed in marg. 105(2) and (3), provided that the mixed loading requirements prescribed in marg. 130(1) and (2) are observed on the basis of the information in the consignment note, in accordance with marg. 115(1).

106-109

B. Method of despatch and restrictions on forwarding

110 (1) Substances and articles of compatibility group L may only be carried as a full wagon load.

(2) Substances and articles of item 43, Nos 0066, 0336 and 0431, and item 47 may also be forwarded as express parcels. A package shall not weigh more than 40 kg. [see also marg. 121(2)].

111-114

[1] For numbers 0015, 0016 and 0303, only articles containing one or several corrosive substances according to the criteria of Class 8.

C. Particulars in the consignment note

115 (1) The description of the goods in the consignment note shall conform to one of the identification numbers and one of the names *in italics* in marg. 101, table 1, column 2. For substances and articles assigned to an n.o.s. entry, or to then entry 0190 Samples, explosive, of item 51, as well as for other articles of items 25 and 34, the technical name of the goods shall be given in addition to the name of the n.o.s. entry or the entry 0190 Samples, explosive, of item 51. The description of the goods shall be followed by the *classification code and item number of the substances* (marg. 101, Table 1, columns 3 and 1), completed by *the net mass in kg of the explosive substance and the initials 'RID'* e.g.: *'0160 Powder, smokeless, 1.1. C, item 2, 4 600 kg, RID'*.

A cross shall be inserted in the appropriate box on the consignment note.

(2) For substances of item 4, Nos 0081, 0082, 0083, 0084 and 0241 and for substances of item 48, Nos 0331 and 0332, the commercial name of the explosive shall be specified as well as the type of explosive. For other substances and articles, the commercial name or technical name may be added.

(3) For full wagon loads, the consignment note shall indicate the number of packages, the mass of each package in kg and the total net mass of explosive substance in kg.

(4) For mixed packing of two different goods, the description of the goods in the consignment note shall include the identification numbers and names printed in italics in marg. 101, Table 1, column 2 of both substances of articles. If more than two different goods are contained in the same package in conformity with marg. 104, the consignment note shall indicate under the description of the goods the identification numbers of all substances and articles contained in the package, in the form, '*Goods of Nos ...*'.

(5) For the carriage of substances and articles assigned to an n.o.s. entry or to the entry 0190 Samples, explosive, of item 51, or packed in accordance with method EP 01, a copy of the competent authority approval with the conditions of carriage shall be attached to the consignment note. It shall be in an official language of the country of origin and also, if that language is not French, German, Italian or English, in French, German, Italian or English, unless international tariffs or agreements concluded between the railway administrations provide otherwise.

(6) If packages containing substances and articles of compatiblity groups B and D are loaded together in the same wagon in accordance with the requirements of marg. 130(1), the approval certificate for the protective container or separate compartment in accordance with marg. 130(1), footnote 1, shall be attached to be consignment note.

(7) When explosive substances or articles are carried in packagings conforming to method EP 01, the consignment note shall specify '*Packaging approved by the competent authority of...*' (see marg. 103, method EP 01).

(8) In the case of military consignments within the meaning of marg. 143, the descriptions prescribed by the competent military authority may be used in place of the descriptions in accordance with marg. 101, Table 1, column 2.

For the carriage of military consignments to which the derogations in accordance with marg. 105(1) and (4), 120(1) and 125(7) apply, the following shall be entered in the consignment note: '*Military consignment*'.

116-119

D. Transport equipment

1. Conditions relating to wagons and their loading

a. For packages

120 (1) Substances and articles of Class 1 shall be loaded in covered wagons. No metal objects in the interior of the wagon other than those forming part of the construction of the wagon shall be allowed to protrude. Before loading, the floor of the wagon shall be carefully cleaned by the consignor. The doors and ventilator shutters of the wagons shall be closed. Only wagons fitted with regulation sheet steel spark-guards shall be used for the carriage of substances and articles of divisions 1.1, 1.2, 1.3, 1.5, and 1.6, even when these substances and articles are loaded in large containers. For wagons fitted with a combustible floor, the sheet steel spark-guards shall not be fixed directly to the floor of the wagon.

Articles which, because of their dimensions or their mass, cannot be loaded in covered wagons may equally be carried on open wagons. They shall be covered by sheets.

For the carriage of substances of items 2, 4, 8, 26 and 29, and 9, 21 and 30, the floor of the wagon shall have a non-metallic surface or covering.

Whithin the meaning of marg. 143, military consignments of substances and articles of Class 1 which form part of military equipment and of the structure of military material, may also be loaded onto open wagons under the following conditions:

— consignments shall be accompanied by the competent military authority or, by order of this authority;

— means of initiation not having at least two effective protective devices shall be removed, unless the substances and articles are place in locked military vehicles.

(2) For the separation of packages bearing labels conforming to model No 6.1 from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11(3).

121 (1) Packages containing substances and articles of Class 1 shall be so loaded and stowed in the wagons that they cannot move or shift. They shall be protected against any chafing or bumping.

(2) Express parcels consignments may be loaded in railway vehicules which can simultaneously serve for the carriage of persons, but only up to a limit of 100 kg per vehicle.

b. For small containers

122 (1) Packages containing substances or articles of Class 1 may be carried in small containers.

(2) The loading requirements set out in marg. 121(1) shall apply by analogy to small containers.

(3) The mixed loading prohibitions laid down in marg. 130 shall be observed inside a small container, as well as in the wagon carrying one or more small containers.

(4) For carriage in small containers of substances of items 2, 4, 8, 26 and 29, and for fireworks of items 9, 21 and 30, the floor of the container shall have a non-metallic surface or covering.

123-124

2. Marking and danger labels on wagons and on small containers (see Appendix IX)

125 (1) Wagons in which packages bearing labels conformings to models Nos 1, 1.4, 1.5 or 1.6 are loaded shall bear this same label on both their sides. Compatibility groups shall not be indicated on the labels if the wagon contains substances or articles belonging to two or more compatibility groups.

(2) Where packages of different divisions are loaded in a wagon, the wagon shall bear only labels conforming to the model of the most dangerous division, in the order 1.1 (the most dangerous), 1.5, 1.2, 1.3, 1.6, 1.4 (the least dangerous).

Where substances of item 48 are loaded in a wagon with substances or articles of division 1.2, the wagon shall be labelled as division 1.1.

(3) Wagons loaded with substances and articles of the following items and identification numbers shall in addition bear on both sides labels conforming to model No 6.1:

item 4, Nos 0076 and 0143;

item 21, No 0018;

item 26, No 0077;

item 30, No 0019; and

item 43, No 0301.

(4) Wagons loaded with articles of the following items and identification numbers shall in addition bear on both sides labels conforming to model No 8:

item 21, Nos 0015 [1] and 0018;

item 30, Nos 0016 [1] and 0019; and

item 43, Nos 0301 and 0303 [1].

(5) Wagons carrying full loads containing substances and articles of items 1 to 13, 19, 22 to 26, 28, 31 to 34 shall in addition bear, in or alongside the label-holder, labels conforming to model No 13. Wagons carrying full loads containing substances of the following items and identification numbers shall, however, bear in or alongside the label-holder, labels conforming to model No 15 instead of No 13:

item 2 No 0160; and

item 4 Nos 0072, 0075, 0083, 0133, 0143, 0146, 0150, 0208, 0219, 0226, 0340, 0341, 0391, 0394 and 0411.

(6) Small containers shall be labelled in accordance with marg. 105(2) and (3).

(7) Wagons in which packages are loaded to be carried as military consignments, within the meaning of marg. 143, and which in conformity with marg. 105(4) do not bear danger labels, shall bear on both sides the following danger labels:

— labels conforming to mdoel No 1 for wagons contaning substances and articles of items 1 to 34

— labels conforming to model No 1.4 for wagons containing substances and articles of items 35 to 47

— labels conforming to model No 1.5 for wagons containing substances of item 48

— labels conforming to model No 1.6 for wagons containing articles of item 50.

126-129

[1] For numbers 0015, 0016 and 0303, only articles containing one or several corrosive substances according to the criteria of Class 8.

E. Prohibitions on mixed loading

130 (1) Packages bearing a label conforming to models Nos 1, 1.4, 1.5 or 1.6 but which are assigned to different compatibility groups shall not be loaded together in the same wagon, unless mixed loading for the corresponding compatibility groups is authorized in the following table 5:

TABLE 5

Compatibility groups	B	C	D	E	F	G	H	J	L	N	S
B	X		(1)								X
C		X	X	X		X				(2), (3)	X
D	(1)	X	X	X		X				(2), (3)	X
E		X	X	X		X				(2), (3)	X
F					X						X
G		X	X	X		X					X
H							X				X
J								X			X
L									(4)		
N		(2), (3)	(2), (3)	(2), (3)						(2)	X
S	X	X	X	X	X	X	X	X		X	X

X = mixed loading authorized.

(1) Packages containing articles assigned to compatibility group B and packages containing substances and articles assigned to compatibility group D may be loaded together on one wagon provided they are carried in separate containers or compartments, of a model approved by the competent authority or a body recognized by that authority, in such a way that there is no danger of transmission of detonation from the articles of compatibility group B to the substances or articles of compatibility group D between the containers or compartments.

(2) Different type of 1.6N articles may be loaded together as 1.6N only when it is proved by testing or analogy that there is no additional risk or sympathetic detonation between the articles. Otherwise they shall be treated as division 1.1.

(3) When articles of compatibility group N are carried with substances or articles of compatibility groups C, D or E, the articles of compatibility group N shall be considered as having the characteristics of compatibility group D.

(4) Packages containing substances and articles of compatibility group L may be loaded together in the same wagon with packages containing substances and articles of the same type belonging to the same compatibility group.

(2) Packages bearing a label conforming to models Nos 1, 1.4, 1.5 or 1.6 shall not be loaded together in the same wagon with packages bearing a label conforming to models Nos 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 7A, 7B, 7C, 8 or 9.

These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

131 Separate consignment notes shall be made out for consignments which may not be loaded in the same wagon.

132-134

F. Empty packagings

135 (1) Empty packagings, uncleaned, of item 91 shall be securely closed and be leakproof to the same degree as if they were full.

(2) Empty packagings, uncleaned, of item 91 shall bear the same danger labels as if they were full.

(3) For the separation of empty packagings, uncleaned, of item 91, bearing labels conforming to model No 6.1, from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11(3).

(4) The description in the consignment note shall be: '*Empty packagings, 1, item 91, RID*'. A cross shall be entered in the appropriate box on the consignment note.

136-139

G. Other requirements

140 For the separation of packages bearing labels conforming to model No 6.1 from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11(3).

H. Special provisions

141 Every wagon bearing a label conforming to models Nos 1, 1.5 or 1.6, as well as wagons loaded with large containers bearing these labels, shall be separated, by two 2-axle barrier wagons, or one barrier wagon with 4 or more axles, from wagons bearing labels conforming to models Nos 3, 4.1, 4.2, 4.3, 5.1 o 5.2. Empty or loaded wagons not bearing a label conforming to models Nos 3, 4.1, 4.2, 4.3, 5.1 or 5.2 are regarded as barrier wagons.

Large containers bearing labels conforming to models Nos 1, 1.5 or 1.6 shall not be loaded on a wagon with large containers or tank-containers bearing labels conforming to models Nos 3, 4.1, 4.2, 4.3, 5.1 or 5.2.

142 (1) Substances and articles of Classe 1 belonging to the armed forces of a Member State, that were packaged prior to 1 January 1990 in accordance with the requirements of RID in effect at that time may be carried after 31 December 1989 provided the packagings maintain their integrity and are declared in the consignment note as military goods packaged prior to 1 January 1990. The other requirements applicable as from 1 January 1990 for this Class shall be complied with.

(2) Substances and articles of Class 1 that were packaged between 1 January 1990 and 31 December 1996 in accordance with the requirements of RID in effect at that time may be carried after 31 December 1996 provided the packagings maintain their integrity and are declared in the consignment note as goods of Class 1 packaged between 1 January 1990 and 31 December 1996.

143 For military consignments of substances and articles of Class 1 belonging to the armed forces or under the orders of the armed forces, derogations are applicable (see marg. 105(1) und (4), 115(8), 120(1) and 125(7)].

144-199

CLASS 2

GASES

1. List of substances and articles

200 (1) Among the substances and articles covered by the title of Class 2, those which are listed in marg. 201 or are covered by a collective entry of that marginal are subject to the requirements set out in marg. 200 to 250. These substances and articles to be accepted for carriage under certain requirements are to be considered as substances and articles of this Directive.

Note: For the quantities of substances and articles listed in marg. 201, which are not subject to the section 'Conditions of Carriage', see marg. 201a.

(2) A gas is a substance which:

(a) at 50 °C has a vapour pressure greater than 300 kPa (3 bar); or

(b) is completely gaseous at 20 °C at the standard pressure of 101,3 kPa.

Note: 1052 Hydrogen fluoride shall nevertheless be classified in Class 8, (see marg. 801, item 6).

(3) The title of Class 2 covers pure gases, mixtures of gases, mixtures of one or more gases with one or more other substances and articles containing such substances.

Note: 1. A pure gas may contain other components deriving from its production process or added to preserve the stability of the product, provided that the concentration of these components does not change its classification or its conditions of carriage, such as filling ratio, filling pressure or test pressure.

2. n.o.s. entries in marg. 201 cover pure gases as well as mixtures.

3. For the classification of solutions and mixtures (such as preparations and wastes) see also marg. 3 (3) and paragraphs (6) and (7) of this marginal.

(4) Substances and articles of Class 2 are subdivided as follows:

Item 1 Compressed gases: gases having a critical temperature below 20 °C;

Item 2 Liquefied gases: gases having a critical temperature of 20 °C or above;

Item 3 Refrigerated liquefied gases: gases which when carried are partially liquid because of their low temperature;

Item 4 Gases dissolved under pressure: gases which when carried are dissolved in a solvent;

Item 5 Aerosol dispensers and receptacles, small, containing gas (gas cartridges);

Item 6 Other articles containing gas under pressure;

Item 7 Non-pressurized gases subject to special requirements (gas samples);

Item 8 Empty receptacles and empty tanks.

200 *(cont'd)*

(5) Substances and articles classified under the various items of marg. 201 are assigned to one of the following groups according to their hazardous properties, as follows [1]:

A	asphyxiant
O	oxidizing
F	flammable
T	toxic
TF	toxic, flammable
TC	toxic, corrosive
TO	toxic, oxidizing
TFC	toxic, flammable, corrosive
TOC	toxic, oxidizing, corrosive

Note: Corrosive gases are considered to be toxic, and are therefore assigned to group TC, TFC, or TOC [see paragraphe (7)].

For gases and gas mixtures presenting according to the criteria hazardous properties associated with more than one group, the groups designated by letter T take precedence over all other groups. The groups designated by letter F take precedence over the groups designated by letters A or O.

(6) If a mixture of Class 2, specifically named under an item number and group comes into a different item number and group on the basis of criteria mentioned in paragraphs (4) and (7) of this marginal, this mixture shall be classified according to the criteria and assigned to an appropriate n.o.s. entry.

(7) Substances and articles not specifically named in marg. 201 shall be classified in accordance with paragraphs (4) and (5).

According to their hazardous properties, the following criteria shall apply:

Asphyxiant gases

Gases which are non-oxidizing, non-flammable and non-toxic and which dilute or replace oxygen normally present in the atmosphere.

Flammable gases

Gases which at 20 °C and the standard pressure of 101,3 kPa:

(a) are flammable when in a mixture of 13 % or less (by volume) with air; or

(b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit.

Flammability shall be determined by tests or by calculation in accordance with methods approved by ISO (see ISO standard 10156:1990).

Where insufficient data are available to use these methods, tests by a comparable method recognized by the competent authority of the country of origin may be used.

If the country of origin is not a Member State these methods shall be recognized by the competent authority of the first COTIF Contracting State reached by the consignment.

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[1] In the United Nations Recommendations on the Transport of Dangerous Goods, the International Maritime Dangerous Goods (IMDG) Code and the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air, gases are assigned to one of the following three divisions, based on the primary hazard:
Division 2.1: flammable gases (corresponding to the groups designated by the capital letter F);
Division 2.2: non-flammable, non-toxic gases (corresponding to the groups designated by the capital letters A or O);
Division 2.3: toxic gases [corresponding to the groups designated by the capital letter T (i.e. T, TF, TC, TO, TFC and TOC)].

200 *(cont'd)*

Oxidizing gases

Gases, which may, generally by providing oxygen, cause or contribute to the combustion of other substances more than air does. Oxidizing ability shall be determined either by tests or by calculation methods approved by ISO (see ISO standard 10156:1990).

Toxic gases

Note: Gases meeting the criteria for toxicity in part or completely owing to their corrosivity shall be classified as toxic. See also the criteria under the heading 'Corrosive gases' for a possible subsidiary corrosivity risk.

Gases which:

(a) are known to be so toxic or corrosive to humans as to pose a danger to health; or

(b) are presumed to be toxic or corrosive to humans because their LC_{50} value for acute toxicity is less than or equal to 5 000 ml/m^3 (ppm) when tested in accordance with marg. 600 (3).

In the case of gas mixtures (including vapours of substances from other classes) the following formula may be used:

$$LC_{50}\ \text{Toxic (mixture)} = \frac{1}{\sum_{i=1}^{n} \frac{f_i}{T_i}}$$

where f_i = mole fraction of the ith component substance of the mixture;

T_i = toxicity index of the ith component substance of the mixture. The T_i equals the LC_{50} value as found in ISO standard DIS 10298 1995. When no LC_{50} value is listed in ISO standard DIS 10298 1995, a LC_{50} value available in scientific literature shall be used. When the LC_{50} value is unknown, the toxicity index shall be determined by using the lowest LC_{50} value of substances of similar physiological and chemical effects, or through testing if this is the only practical possibility.

Corrosive gases

Gases or gas mixtures meeting the criteria for toxicity completely owing to their corrosivity shall be classified as toxic with a subsidiary corrosive risk.

A gas mixture that is considered to be toxic due to the combined effects of corrosivity and toxicity has a subsidiary risk of corrosivity when the mixture is known by human experience to be destructive to the skin, eyes or mucous membranes or when the LC_{50} value of the corrosive components of the mixture is less than or equal to 5 000ml/m^3 (ppm) when the LC_{50} is calculated by the formula:

$$LC_{50}\ \text{Corrosive (mixture)} = \frac{1}{\sum_{i=1}^{n} \frac{f_{ci}}{T_{ci}}}$$

where f_{ci} = mole fraction of the ith corrosive component substance of the mixture;

T_{ci} = toxicity index of the ith corrosive component substance of the mixture. The T_{ci} equals the LC_{50} value as found in ISO standard DIS 10298 1995. When no LC_{50} value is listed in ISO standard DIS 10298 1995, a LC_{50} value available in scientific literature shall be used. When the LC_{50} value is unknown the toxicity index is determined by using the lowest LC_{50} value of substances of similar physiological and chemical effects, or through testing if this is the only practical possibility.

200 *(cont'd)*

(8) Chemically unstable substances of Class 2 are not to be handed over for carriage, unless the necessary steps have been taken to prevent all possibility of a dangerous reaction e.g. decomposition, dismutation or polymerisation under normal conditions of carriage. To this end particular care shall be taken to ensure that receptacles do not contain any substances liable to promote these reactions.

201 **1. Compressed gases. Gases having a critical temperature below 20 °C**

Item and group	Identification number	Name and description
1 A		**Asphyxiant gases or gases presenting no subsidiary risk**
	1002	*air, compressed*
	1006	*argon, compressed*
	1046	*helium, compressed*
	1056	*krypton, compressed*
	1065	*neon, compressed*
	1066	*nitrogen, compressed*
	1979	*rare gases mixture, compressed*
	1980	*rare gases and oxygen mixture, compressed*
	1981	*rare gases and nitrogen mixture, compressed*
	1982	*tetrafluoromethane, compressed (refrigerant gas R 14, compressed)*
	2036	*xenon, compressed*
	2193	*hexafluoroethane, compressed (refrigerant gas R 116, compressed)*
	1956	*compressed gas, n.o.s.*
		Note: 1. Mixtures containing more than 21 % oxygen by volume shall be classified as oxidizing. 2. Air and other breathing mixtures are not considered to be asphyxiant. 3. Mixtures of identification numbers 1979, 1980 or 1981 shall not contain more than 10 % xenon.
1 O		**Oxidizing gases**
	1014	*oxygen and carbon dioxide mixture, compressed*
		Note: Mixtures of identification number 1014 shall not contain more than 30 % carbon dioxide.
	1072	*oxygen, compressed*
	3156	*compressed gas, oxidizing, n.o.s.*
1 F		**Flammable gases**
	1049	*hydrogen, compressed*
	1957	*deuterium, compressed*
	1962	*ethylene, compressed*
	1971	*methane, compressed* or
	1971	*natural gas, compressed* with high methane content
	2034	*hydrogen and methane mixture, compressed*
	2203	*silane, compressed*
		Note: 2203 *silane, compressed* is considered to be spontaneously flammable (pyrophoric).
	1964	*hydrocarbon gas mixture, compressed, n.o.s.*
	1954	*compressed gas, flammable, n.o.s.*
1 T		**Toxic gases**
	1612	*hexaethyl tetraphosphate and compressed gas mixture*
	1955	*compressed gas, toxic, n.o.s.*

201 *(cont'd)*

Item and group	Identification number	Name and description
1 TF		**Toxic, flammable gases**
	1016	*carbon, monoxide, compressed*
	1023	*coal gas, compressed*
	1071	*oil gas, compressed*
	1911	*diborane, compressed*
	2600	*carbon monoxide and hydrogen mixture, compressed* (synthesis gas, water gas, Fischer Tropsch gas)
	1953	*compressed gas, toxic, flammable, n.o.s.*
1 TC		**Toxic, corrosive gases**
	1008	*boron trifluoride, compressed*
	1859	*silicon tetrafluoride, compressed*
	2198	*phosphorus pentafluoride, compressed*
	2417	*carbonyl fluoride, compressed*
	3304	*compressed gas, toxic, corrosive, n.o.s.*
1 TO		**Toxic, oxidizing gases**
	2451	*nitrogen trifluoride, compressed*
	3303	*compressed gas, toxic, oxidizing, n.o.s.*
1 TFC		**Toxic, flammable, corrosive gases**
	3305	*compressed gas, toxic, flammable, corrosive, n.o.s.*
1 TOC		**Toxic, oxidizing, corrosive gases**
	1045	*fluorine, compressed*
	1660	*nitric oxide, compressed*
	2190	*oxygen difluoride, compressed*
	3306	*compressed gas, toxic, oxidizing, corrosive, n.o.s.*

2. Liquefied gases: Gases having a critical temperature of 20 °C or above

Item and group	Identification number	Name and description
2 A		**Asphyxiant gases**
	1009	*bromotrifluoromethane (refrigerant gas R 13B1)*
	1013	*carbon dioxide*
	1015	*carbon dioxide and nitrous oxide mixture*
	1018	*chlorodifluoromethane (refrigerant gas R 22)*
	1020	*chloropentafluoroethane (refrigerant gas R 115)*
	1021	*1-chloro-1,2,2,2-tetrafluoroethane (refrigerant gas R 124)*
	1022	*chlorotrifluoromethane (refrigerant gas R 13)*
	1028	*dichlorodifluoromethane (refrigerant gas R 12)*
	1029	*dichlorofluoromethane (refrigerant gas R 21)*
	1058	*liquefied gases* non-flammable, charged with nitrogen, carbon dioxide or air
	1080	*sulphur hexafluoride*
	1858	*hexafluoropropylene (refrigerant gas R 1216)*
	1952	*ethylene oxide and carbon dioxide mixture*, with not more than 9 % ethylene oxide
	1958	*1,2-dichloro-1,1,2,2-tetrafluoroethane (refrigerant gas R 114)*
	1973	*chlorodifluoromethane and chloropentafluoroethane mixture with fixed boiling point*, with approximately 49 % chlorodifluoromethane *(refrigerant gas R 502)*

201 *(cont'd)*

Item and group	Identification number	Name and description
2 A *(cont'd)*	1974	chlorodifluorobromomethane (refrigerant gas R 12B1)
	1976	*octafluorocyclobutane (refrigerant gas R C318)*
	1983	*1-chloro-2,2,2-trifluoroethane (refrigerant gas R 133a)*
	1984	*trifluoromethane (refrigerant gas R 23)*
	2422	*octafluorobut-2-ene (refrigerant gas R 1318)*
	2424	*octafluoropropane (refrigerant gas R 218)*
	2599	*chlorotrifluoromethane and trifluoromethane, azeotropic mixture,* with approximately 60 % chlorotrifluoromethane *(refrigerant gas R 503)*
	2602	*dichlorodifluoromethane and 1,1-difluoroethane, azeotropic mixture* with approximately 74 % dichlorodifluoromethane *(refrigerant gas R 500)*
	3070	*ethylene oxide mixture and dichlorodifluoromethane* with not more than 12,5 % ethylene oxide
	3159	*1,1,1,2-tetrafluoroethane (refrigerant gas R 134a)*
	3220	*pentafluoroethane (refrigerant gas R 125)*
	3296	*heptafluoropropane (refrigerant gas R 227)*
	3297	*ethylene oxide and chlorotetrafluoroethane mixture* with not more than 8,8 % ethylene oxide
	3298	*ethylene oxide and pentafluoroethane mixture* with not more than 7,9 % ethylene oxide
	3299	*ethylene oxide and tetrafluoroethane mixture,* with not more than 5,6 % ethylene oxide
	1078	*refrigerant gas, n.o.s.* such as mixtures of gases, indicated by the letter R..., which as; *mixture F 1*, have a vapour pressure at 70 °C not exceeding 1,3 MPa (13 bar) and a density at 50 °C not lower than that of dichlorofluoromethane (1,30 kg/l); *mixture F 2*, have a vapour pressure at 70 °C not exceeding 1,9 MPa (19 bar) and a density at 50 °C not lower than that of dichlorodifluoromethane (1,21 kg/l); *mixture F 3*, have a vapour pressure at 70 °C not exceeding 3 MPa (30 bar) and a density at 50 °C not lower than that of chlorodifluoromethane (1,09 kg/l). *Note:* Trichlorofluoromethane (refrigerant R 11), 1,1,2-trichloro-1,2,2-trifluoroethane (refrigerant R 113), 1,1,1-trichloro-2,2,2-trifluoroethane (refrigerant R 113a), 1-chloro-1,2,2-trifluoroethane (refrigerant R 133) and 1-chloro-1,1,2-trifluoroethane (refrigerant R 133b) are not substances of Class 2. They may, however, enter into the composition of mixtures F 1 to F 3.
	1968	*insecticide gas, n.o.s.*
	3163	*liquefied gas, n.o.s.*
		Note: 2455 methyl nitrite is not to be accepted for carriage.
2 O		**Oxidizing gases**
	1070	*nitrous oxice*
	3157	*liquefied gas, oxidizing, n.o.s.*
2 F		**Flammable gases**
	1010	*1,2-butadiene, inhibited* or
	1010	*1,3-butadiene, inhibited* or
	1010	*mixtures of 1,3-butadiene and hydrocarbons, inhibited,* having a vapour pressure at 70 °C not exceeding 1,1 MPa (11 bar) and a density at 50 °C not lower than 0,525 kg/l. *Note:* In receptacles containing 1,2-butadiene, the oxygen concentration in the gaseous phase shall not exceed 50 ml/m³.
	1011	*butane*
	1012	*butylenes mixture* or
	1012	*1-butylene* or
	1012	*trans-2-butylene* or
	1012	*cis-1-butylene*
	1027	*cyclopropane*
	1030	*1,1-difluoroethane (refrigerant gas R 152a)*
	1032	*dimethylamine, anhydrous*
	1033	*dimethyl ether*
	1035	*ethane*
	1036	*ethylamine*

201 *(cont'd)*

Item and group	Identification number	Name and description
2 F *(cont'd)*	1037	ethyl chloride
	1039	ethyl methyl ether
	1041	*ethylene oxide and carbon dioxide mixture* with more than 9 % but not more than 87 % ethylene oxide
	1055	*isobutylene*
	1060	*methylacetylene and propadiene mixture, stabilized* such as mixtures of methylacetylene and propadiene with hydrocarbons, which as: *mixture P 1*, contain not more than 63 % methylacetylene and propadiene by volume and not more than 24 % propane and propylene by volume, the percentage of C_4-saturated hydrocarbons being not less than 14 % by volume; and as *mixture P 2*, contain not more than 48 % methylacetylene and propadiene by volume and not more than 50 % propane and propylene by volume, the percentage of C_4-saturated hydrocarbons being not less than 5 % by volume; and mixtures of propadiene containing 1 % to 4 % methylacetylene
	1061	*methylamine, anhydrous*
	1063	*methyl chloride (refrigerant gas R 40)*
	1077	*propylene*
	1081	*tetrafluoroethylene, inhibited*
	1083	*trimethylamine, anhydrous*
	1085	*vinyl bromide, inhibited*
	1086	*vinyl chloride, inhibited or vinyl chloride, stabilized*
	1087	*vinyl methyl ether, inhibited*
	1860	*vinyl fluoride, inhibited*
	1912	*methyl chloride and methylene chloride mixture* *Note:* When this mixture is non-flammable, it shall be classified under item 2 A, identification number 3163.
	1959	*1,1-difluoroethylene (refrigerant gas R 1132a)*
	1969	*isobutane*
	1978	*propane*
	2035	*1,1,1-trifluoroethane (refrigerant gas R 143a)*
	2044	*2,2-dimethylpropane*
	2200	*propadiene, inhibited*
	2419	*bromotrifluoroethylene*
	2452	*ethylacetylene, inhibited*
	2453	*ethyl fluoride (refrigerant gas R 161)*
	2454	*methyl fluoride (refrigerant gas R 41)*
	2517	*1-chloro-1,1-difluoroethane (refrigerant gas R 142b)*
	2601	*cyclobutane*
	3153	*perfluoro(methyl vinyl ether)*
	3154	*perfluoro(ethyl vinyl ether)*
	3252	*difluoromethane (refrigerant gas R 32)*
	1965	*hydrocarbon gas mixture, liquefied, n.o.s.* such as mixtures, which as: *mixture A*, have a vapour pressure at 70 °C not exceeding 1,1 MPa (11 bar) and a density at 50 °C not lower than 0,525 kg/l; *mixture A 0*, have a vapour pressure at 70 °C not exceeding 1,6 MPa (16 bar) and a density at 50 °C not lower than 0,495 kg/l; *mixture A 1*, have a vapour pressure at 70 °C not exceeding 2,1 MPa (21 bar) and a density at 50 °C not lower than 0,485 kg/l; *mixture B*, have a vapour pressure at 70 °C not exceeding 2,6 MPa (26 bar) and a density at 50 °C not lower than 0,450 kg/l; *mixture C*, have a vapour pressure at 70 °C not exceeding 3,1 MPa (31 bar) and a relative density at 50 °C not lower than 0,440 kg/l. *Note:* 1. In the case of the above-mentioned mixtures, the use of the following names customary in the trade is permitted for describing these substances: for mixture A and A 0 *butane*, for mixture C *propane*. 2. 1075 *petroleum gases, liquefied may* be used as an alternative entry for 1965 *hydrocarbon gas mixture, liquefied, n.o.s.* for carriage prior to or following maritime or air carriage.
	3161	*liquefied gas, flammable, n.o.s.*

201 *(cont'd)*

Item and group	Identification number	Name and description
2 T		**Toxic gases**
	1062	*methyl bromide*
	1581	*chloropicrin and methyl bromide mixture*
	1582	*chloropicrin and methyl chloride mixture*
	2191	*sulphuryl fluoride*
	1967	*insecticide gas, toxic, n.o.s.*
	3162	*liquefied gas, toxic, n.o.s.*
2 TF		**Toxic, flammable gases**
	1026	*cyanogen*
	1040	*ethylene oxide, or ethylene oxide with nitrogen* up to a total pressure of 1 MPa (10 bar) at 50 °C
	1053	*hydrogen sulphide*
	1064	*methyl mercaptan*
	1082	*trifluorochloroethylene, inhibited*
	2188	*arsine*
	2192	*germane*
	2199	*phosphine*
	2202	*hydrogen selenide, anhydrous*
	2204	*carbonyl sulphide*
	2676	*stibine*
	3300	*ethylene oxide and carbon dioxide mixture* with more than 87 % ethylene oxide
	3160	*liquefied gas, toxic, flammable, n.o.s.*
	Note: 2192 *germane* and 2199 *phosphine* are considered to be spontaneously flammable (pyrophoric).	
2 TC		**Toxic, corrosive gases**
	1005	*ammonia, anhydrous*
	1017	*chlorine*
	1048	*hydrogen bromide, anhydrous*
	1050	*hydrogen chloride, anhydrous*
	1069	*nitrosyl chloride*
	1076	*phosgene*
	1079	*sulphur dioxide*
	1589	*cyanogen chloride, inhibited*
	1741	*boron trichloride*
	2194	*selenium hexafluoride*
	2195	*tellurium hexafluoride*
	2196	*tungsten hexafluoride*
	2197	*hydrogen iodide, anhydrous*
	2418	*sulphur tetrafluoride*
	2420	*hexafluoroacetone*
	3057	*trifluoroacetyl chloride*
	3308	*liquefied gas, toxic, corrosive, n.o.s.*
2 TO		**Toxic, oxidizing gases**
	3083	*perchloryl fluoride*
	3307	*liquefied gas, toxic, oxidizing, n.o.s.*
2 TFC		**Toxic, flammable, corrosive gases**
	2189	*dichlorosilane*
	2534	*methylchlorosilane*
	3309	*liquefied gas, toxic, flammable, corrosive, n.o.s.*

201 *(cont'd)*

Item and group	Identification number	Name and description
2 TOC		**Toxic, oxidizing, corrosive gases**
	1067	*dinistrogen tetroxide (nitrogen dioxide)*
	1749	*chlorine trifluoride*
	1975	*nitric oxide and dinitrogen tetroxide mixture (nitric oxide and nitrogen dioxide mixture)*
	2548	*chlorine pentafluoride*
	2901	*bromine chloride*
	3310	*liquefied gas, toxic, oxidizing, corrosive, n.o.s.*
		Note: 2421 *nitrogen trioxide* is not to be accepted for carriage.

3. Refrigerated liquefied gases: Gases which when carried are partially liquid because of their low temperature

Note: Refrigerated gases, which cannot be classified under an identification number of this item are not to be accepted for carriage.

Item and group	Identification-number	Name and description
3 A		**Asphyxiant gases**
	1913	*neon, refrigerated liquid*
	1951	*argon, refrigerated liquid*
	1963	*helium, refrigerated liquid*
	1970	*krypton, refrigerated liquid*
	1977	*nitrogen, refrigerated liquid*
	2187	*carbon dioxide, refrigerated liquid*
	2591	*xenon, refrigerated liquid*
	3136	*trifluoromethane, refrigerated liquid*
	3158	*gas, refrigerated liquid, n.o.s.*
3 O		**Oxidizing gases**
	1003	*air, refrigerated liquid*
	1073	*oxygen, refrigerated liquid*
	2201	*nitrous oxide, refrigerated liquid*
	3311	*gas, refrigerated liquid, oxidizing, n.o.s.*
3 F		**Flammable gases**
	1038	*ethylene, refrigerated liquid*
	1961	*ethane, refrigerated liquid*
	1966	*hydrogen, refrigerated liquid*
	1972	*methane, refrigerated liquid* or
	1972	*natural gas, refrigerated liquid* with high methane content
	3138	*ethylene, acetylene and propylene mixture, refrigerated liquid*, containing at least 71,5 % ethylene with not more than 22,5 % acetylene and not more than 6 % propylene
	3312	*gas, refrigerated liquid, flammable, n.o.s.*
3 TC		**Toxic, corrosive gases**
		Note: 2186 *hydrogen chloride, refrigerated liquid* is not to be accepted for carriage.

201 (cont'd)

4. Gases dissolved under pressure: Gases which when carried are dissolved in a solvent

Note: Gases dissolved under pressure, which cannot be classified under an identification number of this item are not to be accepted for carriage.

Item and group	Identification number	Name and description
4 A		**Asphyxiant gases**
	2073	*ammonia solution*, density less than 0,880 kg/l at 15 °C in water, with more than 35 % but not more than 50 % ammonia
	Note:	2672 ammonia solution containing not less than 10 % but not more than 35 % ammonia is a substance of Class 8 [see marg. 801, item 43(c)].
4 F		**Flammable gases**
	1001	*acetylene, dissolved*
4 TC		**Toxic, corrosive gases**
	3318	*ammonia solution*, density less than 0,880 kg/l at 15 °C in water, with more than 50 % ammonia

5. Aerosols and receptacles, small, containing gas (gas cartridges)

(see also marg. 201a)

Note: 1. Aerosols, i.e. aerosol dispensers, are any non-refillable receptacles containing, under pressure, a gas or a mixture of gases listed in marg. 207 (3), with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state.

2. Receptacles, samll, containing gas (gas cartridges) are any non-refillable receptacles containing, under pressure, a gas or a mixture of gases listed in marg. 207 (3) and (4). They may or may not be fitted with a valve.

3. Aerosols and receptacles, small, containing gas shall be assigned, according to the danger of the contents to groups A to TOC. The contents are considered to be flammable if the contents include more than 45 % by mass, or more than 250 g, of flammable components. Flammable components are gases which are flammable in air at normal pressure or substances or preparations in liquid form which have a flash-point less than or equal to 100 °C.

Item and group	Identification number	Name and description
5 A		**Asphyxiant gases**
	1950	*aerosols*
	2037	*receptacles, small, containing gas (gas cartridges)*, without a release device, non-refillable
5 O		**Oxidizing gases**
	1950	*aerosols*
	2037	*receptacles, small, containing gas (gas cartridges)*, without a release device, non-refillable

201 *(cont'd)*

Item and group	Identification number	Name and description
5 F		**Flammable gases**
	1950	*aerosols*
	2037	*receptacles, small, containing gas (gas cartridges)*, without a release device, non-refillable
5 T		**Toxic gases**
	1950	*aerosols*
	2037	*receptacles, small, containing gas (gas cartridges)*, without a release device, non-refillable
5 TF		**Toxic, flammable gases**
	1950	*aerosols*
	2037	*receptacles, small, containing gas (gas cartridges)*, without a release device, non-refillable
5 TC		**Toxic, corrosive gases**
	1950	*aerosols*
	2037	*receptacles, small, containing gas (gas cartridges)*, without a release device, non-refillable
5 TO		**Toxic, oxidizing gases**
	1950	*aerosols*
	2037	*receptacles, small, containing gas (gas cartridges)*, without a release device, non-refillable
5 TFC		**Toxic, flammable, corrosive gases**
	1950	*aerosols*
	2037	*receptacles, small, containing gas (gas cartridges)*, without a release device, non-refillable
5 TOC		**Toxic, oxidizing, corrosive gases**
	1950	*aerosols*
	2037	*receptacles, small, containing gas (gas cartridges)*, without a release device, non-refillable

6. Other articles containing gas under pressure

Item and group	Identification number	Name and description
6 A		**Asphyxiant gases**
	1044	*fire extinguishers* with compressed or liquefied gas
	2857	*refrigerating machines*, containing non-flammable, non-toxic, liquefied gas or ammonia solutions (identification number 2672)
	3164	*articles, pressurized, pneumatic* (containing non-flammable gas)
	3164	*articles, pressurized, hydraulic* (containing non-flammable gas)
6 F		**Flammable gases**
	1057	*lighters* (cigarettes) containing flammable gas
	1057	*lighters refills* (cigarettes), containing flammable gas
	3150	*devices, small, hydrocarbon gas powered*, with release device
	3150	*hydrocarbon gas refills for small devices*, with release device

201 *(cont'd)*

7. Non-pressurized gases subject to special requirements (gas samples)

Item and group	Identification number	Name and description
7 F		**Flammable gases**
	3167	*gas sample, non-pressurized, flammable, n.o.s.*, not refrigerated liquid
7 T		**Toxic gases**
	3169	*gas sample, non-pressurized toxic, n.o.s.*, not refrigerated liquid
7 TF		**Toxic, flammable gases**
	3168	*gas sample, non-pressurized, toxic, flammable, n.o.s.* not refrigerated liquid

8. Empty receptacles

Item and group	Identification number	Name and description
8		*empty receptacles* accoording to marg. 211 including *empty tank wagons, empty battery wagons with empty demountable tanks, empty tank-containers*, uncleaned having contained substances of Class 2. *Note:* 1. Receptacles, tank wagons, battery wagons, wagons with demountable tanks and tank-containers which after having been emptied of substances of this Class still contain small residual amounts are regarded as empty receptacles or empty tanks, uncleaned. 2. Empty receptacles, uncleaned, which have contained substances of this Class are not subject to the requirements of this Directive if adequate measures have been taken to nullify any hazards. Hazards are nullified if adequate measures have been taken to nullify all hazards of classes 1-9.

201a The following are not subject to the requirements of Section 2 'Conditions of Carriage', except for the cases provided for in paragraph (3):

(1) Gases and articles handed over for carriage in conformity with the following requirements:

Note: Gases contained in the tanks of vehicles which are used for their propulsion or for the operation of their specialized equipment (e.g. refrigerating equipment) are not subject to the requirements of Section 2 'Conditions of Carriage'.

(a) Gases of items 1 A, 1 O, 2 A and 2 O the pressure of which in the receptacle or tank, referred to a temperature of 15 °C, does not exceed 200 kPa (52 bar) and which are completely in the gaseous state during carriage; this includes every kind of receptacle or tank, e.g. also parts of machinery and apparatus;

(b) 1013 carbon dioxide of items 2 A or 1070 nitrous oxide of item 2 O, in the gaseous state containing not more than 0,5 % air, in metal capsules (sodors, sparklets) of marg. 205, with not more than 25 g carbon dioxide or 25 g nitrous oxide and, per cm^3 of capacity, not more than 0,75 g carbon dioxide or nitrous oxide;

201a
(cont'd)

(c) Gases contained in the fuel tanks of transported vehicles; the fuel cock between the fuel tank and the engine shall be closed and the electric contact open;

(d) Gases contained in the equipment used for the operation of the vehicles (e.g. fire extinguishers or inflated pneumatic tyres, even as spare parts or as a load);

(e) Gases contained in the special equipment of wagons and necessary for the operation of this special equipment during carriage (cooling systems, fish-tanks, heaters, etc.) as well as spare receptacles for such equipment or uncleaned empty exchange receptacles, carried in the same wagon;

(f) Uncleaned empty static pressure tanks which are carried on condition that they are hermetically closed;

(g) Articles of items 5 A, 5 O and 5 F of a capacity not exceeding 50 cm^3;

(h) 2857 Refrigerating machines of item 6 A, containing less than 12 kg gas of item 2 A or 2073 ammonia solutions of item 4 A, and similar appliances containing less than 12 kg gas of item 2 F; these machines shall be so protected and stowed as to prevent damage to the refrigerating system;

(i) Gases of item 3 A, intended for the cooling of e.g. medical or biological specimens, if contained in special double walled receptacles, which fully comply with the requirements of marg. 206 (2)(a);

(j) The following articles of item 6 A, manufactured and filled according to the regulations of the manufacturing State, packaged in strong outer packaging:

1044 fire extinguishers provided with protection against inadvertent discharge;

3164 Articles, pressurized pneumatic or hydraulic, designed to withstand stresses greater than the internal gas pressure by virtue of transmission of force, intrinsic strength or construction;

(k) Gases contained in foodstuffs or beverages.

(2) Gases and articles, carried in accordance with the following requirements:

(a) Receptacles conforming to marg. 202 containing gases of items 1 A, 2 A, 3 A and 4 A, with a maximum capacity of 120 ml;

(b) Articles of items 5 T, 5 TF, 5 TC, 5 TO, 5 TFC and 5 TOC with a maximum capacity of 120 ml, conforming to marg. 202;

(c) Articles of items 5 A, 5 O and 5 F with a maximum capacity of 1 000 ml which meet the conditions of marg. 202, 207 and 208.

These shall be packed:

(i) in outer packagings which at least meet the conditions of marg. 1538. The total gross mass of the package shall not exceed 30 kg; or

(ii) in shrink wrapped or stretch wrapped trays. The total gross mass of the package shall not exceed 20 kg.

The 'General packing conditions' of marg. 1500 (1), (2) and (5) to (7) shall be observed.

(3) For carriage in accordance with paragraph (2), the description of the goods in the consignment note shall conform to the requirements of marg. 266 and include the words '*limited quantity*'.

Each package shall be clearly and durably marked with the identification number of the goods shown on the consignment note, preceded by the letters 'UN'.

2. Conditions of carriage

(The conditions of carriage for empty receptacles are set out under F.)

A. Packages

1. General conditions of packing

202 (1) The materials of which the receptacles and their closures are made and all materials that might come into contact with the contents shall not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(2) Receptacles, including their closures shall be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. When outer packagings are prescribed, the receptacles shall be firmly secured therein. Unless otherwise specified in section A.2 entitled 'Special conditions of packing', inner packagings may be enclosed in outer packagings either singly or in groups.

(3) Receptacles shall contain only the gas or gases for which the receptaclle has been approved.

(4) Receptacles shall be constructed to withstand the potential pressure developed by the substance due to temperature changes to which it may be subject during normal conditions of carriage.

(5) Articles of items 5 and 6 and receptacles intended for the carriage of gases of items 1, 2, 4 and 7, shall be hermetically closed so as to prevent escape of the gases.

Note: 1. Specific conditions of packing for each gas are listed in marg. 250.

2. For the carriage of substances of Class 2 in tank wagons, battery wagons or wagons with demountable tanks, see Appendix XI, in tank-containers, see Appendix X.

2. Special conditions of packing

a. Nature of receptacles

203 (1) The following materials may be used:

(a) carbon steel for the gases of items 1, 2, 3, 4 and articles of 5;

(b) alloy steel (special steels), nickel, nickel alloy (such as monel) for the gases of items 1, 2, 3, 4 and articles of 5;

(c) copper for the:

(i) gases of items 1 A, 1 O, 1 F and 1 TF, whose filling pressure referred to a temperature of 15 °C does not exceed 2 MPa (20 bar);

(ii) gases of item 2 A; and also 1079 sulphur dioxide of item 2 TC, 1033 dimethyl ether of item 2 F; 1037 ethyl chloride of item 2 F; 1063 methyl chloride of item 2 F; 1086 vinyl chloride of item 2 F; 1085 vinyl bromide of item 2 F; and 3300 ethylene oxide and carbon dioxide mixture with more than 87 % ethylene oxide of item 2 TF;

(iii) gases of items 3 A, 3 O and 3 F;

(d) aluminium alloy: see table in marg. 250;

(e) composite material for gases of items 1, 2, 3, 4 and articles of 5;

(f) synthetic material for gases of item 3 and articles of item 5;

(g) glass for the gases of items 3 A other than 2187 carbon dioxide or mixtures thereof, and gases of item 3 O.

203 *(cont'd)* (2) The requirements of this marg. are deemed to be met if the following standards are complied with: (reserved).

204 (1) Receptacles for 1001 dissolved acetylene of item 4 F shall be completely filled with a porous mass, uniformly distributed, of a type approved by the competent authority and which:

(a) does not attack the receptacles or form harmful or dangerous compounds either with acetylene or with the solvent;

(b) is capable of preventing the spread of decomposition of the acetylene in the mass.

(2) The solvent shall not attack the receptacles.

(3) The requirements of this marg. are deemed to be met if the following standards are complied with: (reserved).

205 (1) Metal capsules may be used to contain the following gases, on condition that the mass of the liquid per litre of capacity does not exceed either the maximum mass of contents indicated in marg. 250 or 150 g per capsule:

(a) gases of item 2 A;

(b) gases of item 2 F other than methylsilane or mixtures thereof assigned to identification number 3161;

(c) gases of item 2 TF other than 2188 arsine, 2202 hydrogen selenide or mixtures thereof;

(d) gases of item 2 TC other than 1589 cyanogen chloride or mixtures thereof;

(e) gases of item 2 TFC other than 2189 dichlorosilane as well as dimethylsilane, trimethylsilane or mixtures thereof assigned to identification number 3309.

(2) The capsules shall be free from faults liable to impair their strength.

(3) The leakproofness of the closure shall be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any leakage of the closure system during carriage.

(4) The capsules shall be placed in an outer packaging of sufficient strength. A package shall not weigh more than 75 kg.

206 (1) Gases of item 3 shall be enclosed in closed receptacles of metal or synthetic or composite material which are equipped with insulation so that they cannot become coated with dew or hoar-frost. The receptacles shall be fitted with safety valves.

(2) Gases of item 3 A, other than 2187 carbon dioxide and mixtures thereof, and gases of item 3 O may also be enclosed in receptacles which are not closed but equipped with devices which prevent the liquid from splashing out and which are:

(a) double-walled vacuum-jacketed glass receptacles surounded by an absorbent insulating material; these receptacles shall be protected by iron-wire baskets and placed in metal cases; or

(b) receptacles of metal, synthetic or composite material protected against heat transmission in such a way that they cannot become coated with dew or hoar-frost.

(3) The metal cases referred to in subparagraph (2)(a) and the receptacles referred to in subparagraph (2)(b) shall be fitted with means of handling. The openings of the receptacles referred to in paragraph (2) shall be fitted with devices allowing gases to escape, preventing any splashing out of the liquid, and so fixed that they cannot fall out. In the case of 1073 oxygen, refrigerated liquid of item 3 O and mixtures thereof, the devices referred to above and the absorbent insulating material surrounding the receptacles referred to in subparagraph (2)(a) shall be made of non-combustible materials.

206 *(cont'd)*

(4) In the case of receptacles intended for the carriage of gases of item 3 O, the materials used to ensure the leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents.

207

(1) Aerosol dispenser (1950 aerosols) and 2037 receptacles, small, containing gas (gas cartridges) of item 5 shall satisfy the following requirements:

(a) aerosol dispensers (1590 aerosols) containing only a gas or a mixture of gases, and 2037 gas cartridges, shall be made of metal. This requirement shall not apply to receptacles of item 5 with a maximum capacity of 100 ml for 1011 butane of item 2 F. Other aerosol dispensers (1950 aerosols) shall be made of metal, synthetic material or glass. Receptacles made of metal and having an outside diameter of not less than 40 mm shall have a concave bottom;

(b) receptacles made of materials liable to shatter, such as glass or certain synthetic materials, shall be enclosed in a device (close-mesh metal wire netting, flexible cover made of synthetic material, etc.) affording protection against fragments and their dispersal. Receptacles whose capacity does not exceed 150 ml and whose internal pressure at 20 °C is below 150 kPa (1,5 bar) are exempted from this requirement;

(c) the capacity of receptacles made of metal shall not exceed 1 000 ml; that of receptacles made of synthetic material or of glass shall not exceed 500 ml;

(d) each model of receptacle shall, before being put into service, satisfy a hydraulic pressure test carried out in conformity with Appendix II, marg. 1291. The internal pressure to be applied (test pressure) shall be 1,5 times the internal pressure at 50 °C, with a minimum pressure of 1 MPa (10 bar);

(e) the release device and dispersal devices of aerosol dispensers (1950 aerosols) and the valves of 2037 gas cartridges shall ensure that the receptacles are so closed as to be leakproof and shall be protected against accidental opening. Valves and dispersal devices which close only by the action of the internal pressure are not to be accepted.

(2) The requirements of paragraph (1) are deemed to be met if the following standards are complied with:

— for aerosol dispensers (1950 aerosols) of item 5;

Annex to the Council Directive 75/324/EWG [1] as amended by Commission Directive 94/1/EC [2];

— for 2037 gas cartridges of item 5 F containing 1965 hydrocarbon gas mixtures, liquefied: standard EN 417: 1992.

(3) The following gases shall be accepted as propellants, as constituents of propellants, or as filling gases, for aerosol dispensers (1950 aerosols): gases of items 1 A and 1 F other than 2203 silane; gases of items 2 A and 2 F, other than methylsilane assigned to identification number 3161; and 1070 nitrous oxide of item 2 O.

(4) All the gases listed under (3) and, in addition, the following gases shall be accepted as filling gases for 2037 gas cartridges;

— 1062 methyl bromide of item 2 T;

— 1040 ethylene oxide, 1064 methyl mercaptan, 3300 ethylene oxide and carbon dioxide mixture with more than 87 % ethylene oxide of item 2 TF.

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[1] Council Directive 75/324/EEC of 20 May 1975 on the approximation of the laws of the Member States relating to aerosol dispensers, published in the European Communities L 147, 9.6.1975.

[2] Commission Directive 94/1/EC of 6 January 1994, concerning technical adaptation of Council Directive 75/324/EEC on the approximation of the laws of the Member States relating to aerosol dispensers, published in the Official Journal of the European Communities L 23, 28.1.1994.

208 (1) The internal pressure at 50 °C of articles of item 5 shall exceed neither two-thirds of the test pressure of the article nor 1,32 MPa (13,2 bar).

(2) Articles of item 5 shall be so filled that at 50 °C the liquid phase does not exceed 95 % of their capacity. The capacity of aerosol dispensers (1950 aerosols) is the available volume in a closed dispenser fitted with the valve support, the valve and the dip tube.

(3) Articles of item 5 shall satisfy a leakproofness test in conformity with Appendix II marg. 1292.

209 (1) Articles of item 5, shall be placed in wooden cases or strong fibreboard or metal boxes; aerosol dispensers (1950 aerosols) made of glass of synthetic material and liable to shatter shall be separated from one another by interposed sheets of fibreboard or of another suitable material.

(2) A package shall not weigh more than 50 kg if fibreboard boxes are used or more than 75 kg if other packagings are used.

(3) In the case of carriage by full wagon load, metal articles of item 5 may also be packed as follows: the articles shall be grouped together in units on trays and held in position with a suitable plastics cover; these units shall be stacked and suitably secured on pallets.

210 (1) The following requirements apply to articles of item 6 F:

(a) 1057 lighters and 1057 lighter refills shall comply with the requirements of the country in which they were filled. They shall bo provided with protection against inadvertent discharge. The liquid portion of the gas shall not exceed 85 % of the capacity of the receptacle at 15 °C. The receptacles, including the closures, shall be capable of withstanding the internal pressure of the liquefied petroleum gas at 55 °C. The valve mechanisms and ignition devices shall be securely sealed, taped or otherwise fastened or designed to prevent operation or leakage of the contents during carriage. The lighters or lighter refills shall be carefully packed to prevent inadvertent operation of the release devices. Lighters shall contain not more than 10 g of liquefied petroleum gas. Lighters refills shall contain not more than 65 g of liquefied petroleum gas.

The lighters and lighter refills shall be packed in the following outer packagings: natural wood boxes conforming to marg. 1527, plywood boxes conforming to marg. 1528 or reconstituted wood boxes conforming to marg. 1530 with a maximum gross mass of 40 kg. The packagings shall be tested and approved in accordance with Appendix V for Packing Group II.

(b) 3150 devices, small, hydrocarbon gas powered and 3150 hydrocarbon gas refills for small devices shall comply with the requirements of the country in which they were filled. The devices and refills shall be packed in outer packagings conforming to marg. 1538(b) tested and approved in accordance with Appendix V for Packing Group II.

(2) Gases of item 7 shall be at a pressure corresponding to ambient atmospheric pressure at the time the containment system is closed but not exceeding 105 kPa (absolute).

The gases shall be contained in hermetically sealed glass or metal inner packagings with a maximum quantity per package of 5 litres for gases of item 7 F and 1 litre for gases of item 7 T and item 7 TF.

The outer packagings shall meet the requirements for combination packagings in accordance with marg. 1538(b) and shall be tested and approved in accordance with Appendix V for Packing Group III.

b. Conditions governing receptacles

Note: These conditions are not applicable to the metal capsules referred to in marg. 205, to the receptacles referred to in marg. 206(2), the aerosol dispensers (1950 aerosols) or 2037 gas cartridges referred to in marg. 207 or to articles of item 6 F and receptacles for gases of item 7 referred to in marg. 210.

1. Construction and fittings

211 A distinction is made between the following five types of receptacles:

(1) Cylinders; there are transportable pressure receptacles of a capacity not exceeding 150 litres.

(2) Tubes; these are large seamless transportable pressure cylinders of a capacity exceeding 150 litres and of not more than 5 000 litres;

(3) Pressure drums; these are welded transportable pressure receptacles of a capacity exceeding 150 litres and of not more than 1 000 litres, (e.g. cylindrical receptacles equipped with rolling hoops, receptacles on skids and receptacles in frames);

(4) Cryogenic receptacles; these are transportable thermally insulated receptacles for deeply refrigerated liquefied gases of a capacity of not more than 1 000 litres;

(5) Bundles of cylinders (also known as frames); these are transportable assemblies of cylinders which are interconnected by a manifold and held firmly together.

Note: For limitations in capacity and use of the different types of receptacles, see the table in marg. 250.

212 (1) Receptacles and their closures shall be designed, calculated, manufactured, tested and equipped in such a way as to withstand all conditions to which they will be subjected during normal conditions of use and carriage.

In the design of pressure receptacles, all relevant factors are to be taken into account such as:

— internal pressure,

— ambient and operational temperatures including during carriage,

— dynamic loads.

Normally the wall thickness shall be determined by calculation, accompanied, if needed, by experimental stress analysis. The wall thickness may be determined by experimental means.

Appropriate design calculations for the shell and supporting components shall be used to ensure the safety of the receptacles concerned.

The minimum wall thickness to withstand pressure shall be calculated with regard in particular to:

— the calculation pressure which shall not be less than the test pressure,

— the calculation temperatures allowing for sufficient safety margins,

— the maximum stresses and peak stress concentrations where necessary,

— factors inherent in the properties of the material.

Material characteristics to be considered are, when applicable:

— yield strength,

— tensile strength,

— time-dependent strength,

— fatigue data,

— Young's modulus (modulus of elasticity),

— appropriate amount of plastic strain,

— impact strength,

— fracture resistance.

212 *(cont'd)* The requirements of this paragraph are considered to have been complied with if the following Directives, as relevant, are applied:

— for seamless steel cylinders: Annex I, Parts 1 to 3 of Council Directive 84/525/EEC [1];

— for welded steel cylinders: Annex I, Parts 1 to 3 of Council Directive 84/527/EEC [2];

— for seamless aluminium cylinders: Annex I, Parts 1 to 3 of Council Directive 84/526/EEC [3].

(2) Receptacles not designed and constructed according to the Directives listed in paragraph (1) shall be designed and constructed in accordance with the provisions of a technical code recognized by the competent authority. The following minimum requirements however shall be met:

(a) For metal receptacles referred to in marg. 211 (1), (2), (3) and (5), at the test pressure the stress in the metal at the most severely stressed point of the receptacle shall not exceed 77 % of the guaranteed minimum yield stress (Re).

By 'yield stress' is meant the stress at which a permanent elongation of 2 per thousand (i.e. 0,2 %) or, for austenitic steels, 1 % of the gauge length on the test-piece, has been produced.

Note: In the case of sheet-metal, the axis of the tensile test-piece shall be at right angles to the direction of rolling. The permanent elongation at fracture, (l = 5d) shall be measured on a test-piece of circular cross-section in which the gauge lenght 1 is equal to five times the diameter d; if test pieces of rectangular cross-section are used, the gauge length 1 shall be calculated by the formula:

$$1 = 5{,}65\sqrt{F_0}$$

where F_0 indicates the initial cross-sectional area of the test-piece.

Receptacles and their closures shall be made of suitable materials which shall be resistant to brittle fracture and to stress corrosion cracking between – 20 °C and + 50 °C.

For welded receptacles only materials of faultless weldability whose adequate impact strength at an ambient temperature of – 20 °C can be guaranteed, particularly in the weld seams and the zones adjacent thereto, shall be used.

Welds shall be skilfully made and shall afford the fullest safety.

Any additional thickness to allow for corrosion shall not be taken into consideration in calculating the thickness of the walls.

(b) For composite receptacles referred to in marg. 211 (1), (2), (3) and (5) which make use of composite materials i.e. comprising a liner hoop wrapped or fully wrapped with reinforcement material, the construction shall be such that a minimum burst ratio (burst pressure divided by test pressure) is

— 1,67 for hoop wrapped receptacles

— 2,00 for fully wrapped receptacles.

(c) The following requirements apply to the construction of receptacles of marg. 206 (1), intended for gases of item 3:

1. The materials and the construction of metal receptacles shall conform to the requirements of Appendix II, marg. 1250 to 1254. All the mechanical and technological characteristics of the material used shall be established for each receptacle at the initial inspection; with regard to the impact strengt and the bending coefficient, see Appendix II, marg. 1255 to 1261.

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[1] Council Directive 84/525/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to seamless, steel gas cylinders, published in the Official Journal of the European Communities L 300, 19.11.1984.

[2] Council Directive 84/527/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to welded unalloyed steel gas cylinders, published in the Official Journal of the European Communities L 300, 19.11.1984.

[3] Council Directive 84/526/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to seamless, unalloyed aluminium and aluminium alloy gas cylinders, published in the Official Journal of the European Communities L 300, 19.11.1984.

212 *(cont'd)*

2. If other materials are used, they shall resist brittle fracture at the lowest working temperature of the receptacle and its fittings;

3. Receptacles shall be fitted with a safety valve which shall be capable of opening at the working pressure shown on the receptacle. The valves shall be so constructed as to work perfectly even at their lowest working temperature. Their reliability of functioning at that temperature shall be established and checked by testing each valve or a sample of valves of the same type of construction;

4. The openings and safety valves of receptacles shall be so designed as to prevent the liquid from splashing out;

5. Receptacles whose filling is measured by volume shall be provided with a level indicator;

6. The receptacles shall be thermally insulated. The thermal insulation shall be protected against impact by means of continuous sheathing. If the space between the receptacle and the sheathing has been evacuated (vacuum-insulated), the protective sheathing shall be designed to withstand without deformation an external pressure of at least 100 kPa (1 bar). If the sheathing is so closed as to be gas-tight (e.g. in the case of vacuum-insulation), a device shall be provided to prevent any dangerous pressure from developing in the insulating layer in the event of inadequate gas-tightness of the receptacle or its fittings. The device shall prevent moisture from penetrating into the insulation.

213 (1) Apart from a manhole which, if provided, shall be closed by an effective closure and from the necessary orifice for the removal of deposits, receptacles conforming with marg. 211 (3) shall not be equipped with more than two openings for filling and discharge respectively.

Receptacles referred to in marg. 211 (1) and (3), intended for the carriage of gases of item 2 F may be provided with other openings intended in particular for verifying the level of the liquid and the gauge pressure.

(2) Valves (cocks) shall be effectively protected from damage which could cause gas release if the receptacle falls, and during carriage and stacking. This requirement is deemed to be complied with if one or more of the following conditions are fulfilled:

(a) Valves are placed inside the neck of the receptacle and protected by a screw-threaded plug;

(b) Valves are protected by caps. Caps shall possess vent-holes of sufficient cross-sectional area to evacuate gases if leakage occurs at the valves;

(c) Valves are protected by shrouds or other safety devices;

(d) Valves are designed and constructed in such a way that they do not leak, even if they have been damaged;

(e) Valves are placed inside a protective frame;

(f) Receptacles are carried in protective boxes or frames.

The requirements of this paragraph are deemed to be met if the following standards are complied with: (reserved).

(3) For receptacles, the following requirements apply:

(a) If the cylinders referred to in marg. 211 (1) are fitted with a device to prevent rolling, this device shall not be integral with the valve cap;

(b) Receptacles in conformity with marg. 211 (3), which are capable of being rolled shall be equipped with rolling hoops or be otherwise protected against damage due to rolling (e.g. by corrosion-resistant metal sprayed on to the receptacle surface);

Receptacles referred to in marg. 211 (3) and (4) which are not capable of being rolled, shall be fitted with devices (skids, rings, straps) ensuring that they can be safely handled by mechanical means and so arranged as not to impair the strength of, nor cause undue stresses in the wall of the receptacle;

213
(cont'd)

(c) Bundles of cylinders referred to in marg. 211 (5) shall be fitted with appropriate devices ensuring that they can be handled and carried safely. Cylinders within the bundle and the manifold shall be suitable for the type of gas and the manifold shall have at least the same test pressure as the cylinders. The manifold and the master cock shall be situated so as to be protected against any damage.

Bundles of cylinders for the carriage of certain gases subject to special requirements '1' in the table in marg. 2250 shall have on each cylinder a valve which can be independently closed, which shall be closed during carriage.

(4) (a) Receptacles, containing pyrophoric gases and very toxic gases (gases with an LC_{50} lower than 200 ppm) shall have their valve opening(s) fitted with gas-tight plugs or cap nuts which shall be made of a material not liable to attack by the contents of the receptacle.

(b) Pyrophoric gases and very toxic gases are subject to special provision 'e' in the table of marg. 250.

(c) When these receptacles are manifolded in a bundle, each receptacle shall be fitted with a valve that shall be closed during carriage.

The requirement under (a) shall apply only to the master cock.

214

2. Testing and approval of receptacles

215 (1) The conformity of receptacles, having a test pressure product of more than 300 MPa/litre (3 000 bar.litre) with the requirements of this Class, shall be demonstrated to a testing and certifying body approved by the competent authority of the country of origin [1], by means of one of the following methods:

(a) Single receptables shall be examined, tested and approved by a testing and certifying body approved by the competent authority, on the basis of the technical documentation and declaration of the manufacturer on compliance of the receptacle with the relevant requirements of this Class. The technical documentation shall include full specifications on design and construction, and full documentation on the manufacturing and testing; or

(b) The construction of the receptacles shall be tested and approved by a testing and certifying body approved by the competent authority on the basis of the technical documentation with regard to their compliance with the relevant requirements of this Class. Receptacles shall furthermore be designed, manufactured and tested according to a comprehensive quality assurance programme for design, manufacture, final inspection and testing. The quality assurance programme shall guarantee the conformity of the receptacles with the relevant requirements of this Class and shall be approved and supervised by a testing and certifying body approved by the competent authority; or

(c) The design type of the receptacles shall be approved by a testing and certifying body approved by the competent authority. Any receptacle of this design shall be manufactured and tested according to a quality assurance programme for production, final inspection and testing, which shall be approved and supervised by a testing and certifying body approved by the competent authority; or

(d) The design type of the receptacles shall be approved by the competent authority or by a testing and certifying body approved by the competent authority. Any receptacle of this design shall be tested under the supervision of a testing and certifying body approved by the competent authority on the basis of a declaration of the manufacturer on compliance with the approved design and the relevant requirements of this Class.

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[1] If the country of origin is not a Member State, the competent authority of the first COTIF Contracting State reached by the consignment.

215 *(cont'd)*

(2) The conformity of receptacles having a test pressure capacity product of more than 100 MPa/litre (1 000 bar.litre) and not more than 300 MPa/litre (3 000 bar.litre) with the requirements of this Class shall be demonstrated to a testing and certifying body approved by the competent authority of the country of origin [1]by means of a method described in paragraph (1) or by one of the following methods:

(a) The receptacles shall be designed, manufactured and tested according to a comprehensive quality assurance programme for their design, manufacture, final inspection and testing, approved and supervised by a testing and certifying body approved by the competent authority; or

(b) The design type of the receptacle shall be approved by a testing and certifying body approved by the competent authority. The compliance of any receptacle with the approved design shall be declared in writing by the manufacturer on the basis of his quality assurance programme for testing of receptacles, approved and supervised by a testing and certifying body approved by the competent authority; or

(c) The design type of the receptacle shall be approved by a testing and certifying body approved by the competent authority. The compliance of any receptacle with the approved design shall be declared in writing by the manufacturer and all receptacles of this type shall be tested under the supervision of a testing and certifying body approved by the competent authority.

(3) The conformity of receptacles, having a test pressure capacity product equal to or less than 100 MPa/litre (1 000 bar.litre) with the requirements of this Class shall be demonstrated to a testing and certifying body approved by the competent authority of the country of origin [1]by means of one of the methods described in paragraphs (1) or (2) or by one of the following methods:

(a) The compliance of any receptacle with a design type, fully specified in technical documentation, shall be declared in writing by the manufacturer and all receptacles of this design shall be tested under the supervision of a testing and certifying body approved by the competent authority; or

(b) The design type of the receptacle shall be approved by a testing and certifying body approved by the competent authority. The compliance of all receptacles with the approved design type, shall be declared in writing by the manufacturer and all receptacles of this design type shall be tested individually.

(4) The requirements of paragraphs (1) to (3) shall be deemed to be complied with:

(a) as regards the quality assurance systems mentioned in paragraphs (1) and (2), if they conform to the relevant European Standard of the EN ISO 9000 series;

(b) in their entirety, if the relevant conformity assessment procedures of Council Decision 93/465/EEC [2]

— for the receptacles listed under paragraph (1) the modules G, H with design test, B in combination with D and B in combination with F;

— for the receptacles listed under paragraph (2), the modules H, B in combination with E and B in combination with extended module C (C1);

— for the receptacles listed under paragraph (3), the modules Aa and B in combination with C.

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[1] If the country of origin is not a Member State, the competent authority of the first COTIF Contracting State reached by the consignment.

[2] Council Decision of 22 July 1993 concerning the modules to be used in the technical Directive harmonizing the various phases of the conformity assessment procedures, published in the Official Journal of the European Communties No L 220 of 30 August 1993.

215 *(cont'd)*

(5) Requirements for manufacturers

The manufacturer shall be technically competent and shall possess all suitable means required for the satisfactory manufacture of receptacles; this relates in particular to qualified personnel

(a) to supervise the entire manufacturing process,

(b) to carry out joining of material,

(c) to carry out the relevant tests.

The proficiency test of a manufacturer shall in all instances be carried out by a testing and certifying body approved by the competent authority. The particular certification process the manufacturer intends to apply shall be taken into consideration.

(6) Requirements for testing and certifying bodies

Testing and certifying bodies shall be independent from manufacturing enterprises and technologically competent to the degree required. These requirements shall be deemed to be met if the bodies have been approved on the basis of an accreditation procedure in accordance with the European standard series EN 45 000.

216

(1) Receptacles shall be subjected to initial inspection in accordance with the following specification:

On an adequate sample of receptacles:

(a) Testing of the material of construction in respect at least of yield stress, tensile strength, and permanent elongation at fracture;

(b) Measurement of wall thickness at the thinnest point, and calculation of the stress;

(c) Checking the homogeneity of the material for each manufacturing batch, and inspection of the external and internal condition of the receptacles;

For all receptacles:

(d) A dydraulic pressure test in accordance with the requirements of marg. 219;

Note: With the agreement of the expert approved by the competent authority, the hydraulic pressure test may be replaced by a test using a gas, where such an operation does not entail any danger.

(e) An inspection of the markings on the receptacles [see marg. 223(1) to (4)];

(f) In addition, receptacles intended for the carriage of 1001 acetylene, dissolved of item 4F shall have an inspection of the nature of the porous mass and the quantity of solvent.

The requirements of this paragraph are deemed to be met if the following standards are complied with: (reserved)

(2) Specific requirements apply for aluminium alloy receptacles for certain gases (see Appendix II).

The requirements of this paragraph are deemed to be met if the following Directive is complied with:

— Annex I, Part 3, and Annex II to Council Directive 84/526/EEC [1]

(3) Receptacles shall withstand the test pressure without undergoing permanent deformation or exhibiting cracks.

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[1] Council Directive 84/526/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to seamless, unalloyed aluminium and aluminium alloy gas cylinders, published in the Offical Journal of the European Communities L 300, 19.11.1984.

217 (1) Refillable receptacles shall be subject to periodic inspections under the supervision of an expert approved by the competent authority, in accordance with the following specifications:

(a) Check of the external condition of the receptacle and verification of the equipment and the markings;

(b) Check of the internal condition of the receptacle (e.g. by weighing, internal inspection, checks of wall thickness etc.);

(c) The hydraulic pressure test and, if necessary, verification of the characteristics of the material by suitable tests.

Note: 1. With the agreement of the expert approved by the competent authority, the hydraulic pressure test may be replaced by a test using a gas, where such an operation does not entail any danger, or by an equivalent method based on ultrasound.

2. With the agreement of the expert approved by the competent authority, the hydraulic pressure test of receptacles according to marg. 211(1) and (2) may be replaced by an equivalent method based on acoustic emission.

3. With the agreement of the expert approved by the competent authority, the hydraulic pressure test of each welded steel receptacle of marg. 211(1) intended for the carriage of gases of item 2 F, identification number 1965, with a capacity below 6.5 l may be replaced by another test ensuring an equivalent level of safety.

The requirements of this paragraph are deemed to be met if the following standards are complied with: (reserved)

(2) If special requirements for certain substances do not appear in the table of marg. 250, periodic inspections shall be carried out:

(a) Every 3 years in the case of receptacles intended for the carriage of gases of items 1 and 2 of groups TC, TFC and TOC;

(b) Every 5 years in the case of receptacles intended for the carriage of gases of items 1 and 2 of groups T, TF and TO and gases of item 4;

(c) Every 10 years in the case of receptacles intended for the carriage of gases of items 1, 2 and 3 of groups A, O and F.

By derogation from these time limits, the periodic inspection of receptacles which are made of composite materials shall be carried out at intervals determined by the competent authority of the COTIF Contracting State which has approved the technical code for the design and construction.

(3) For receptacles intended for the carriage of 1001 acetylene, dissolved, of item 4 F, only the external condition (corrosion, deformation), and the condition of the porous mass (loosening, settlement) shall be examined.

If a monolithic material is used as a porous mass, the interval between periodic inspections may be extended to 10 years.

The requirements of this paragraph are deemed to be met if the following standards are complied with: (reserved)

(4) By derogation from marg. 217(1)(c), closed receptacles conforming to marg. 206(1) shall be subjected to external inspection and to a leakproofness test. The leakproofness test shall be carried out with the gas contained in the receptacle or with an inert gas. Checking shall be performed by means of a pressure gauge or by vacuum measurement. The thermal insulation need not be removed.

The requirements of this paragraph are deemed to be met if the following standards are complied with: (reserved)

(5) The receptacles referred to in marg. 211 may be carried after the expiry of the time-limit set for the periodic test prescribed for the purpose of undergoing the test.

218

c. Test pressure, degree of filling, and limitation of capacity of receptacles

219 The following requirements apply to receptacles referred to in marg. 211:

(a) The minimum test pressure required for receptacles referred to in marg. 211 (1), (2), (3) and (5) is 1 MPa (10 bar);

(b) For gases of iterm 1 having a critical temperature below – 50 °C the internal pressure (test pressure) to be applied in the hydraulic pressure test shall be at least one and one-half times the filling pressure at 15 °C;

(c) For gases of item 1 having a critical temperature of – 50 °C or above and for liquefied gases of item 2 having a critical temperature below 70 °C, the degree of filling shall be such that the internal pressure at 65 °C does not exceed the test pressure of the receptacles.

For gases and gas mixtures with insufficient data, the maximum permissible filling degree (FD) shall be determined as follows:

$$FD \leq 8{,}5 \times 10^{-4} \times d_g \times P_e$$

where FD = maximum permissible filling degree (in kg/l)

d_g = gas density (at 15 °C, 1 bar) (in kg/m^3)

P_e = minimum test pressure (in bar)

If the density of the gas is unknown, the maximum permissible filling degree shall be determined as follows:

$$FD \leq \frac{P_e \times MM \times 10^{-3}}{R \times 338}$$

where FD = maximum permissible filling degree (in kg/l)

P_e = minimum test pressure (in bar)

MM = molecular mass (in g/mol)

R = $8{,}31451 \times 10^{-2}$ bar·l·mol^{-1}·K^{-1} (gas constant)

(For gas mixtures the average molecular mass is to be taken, taking in account the concentrations of the various components);

(d) For gases of item 2 having a critical temperature of 70 °C or above, the maximum permissible mass of contents per litre of capacity (degree of filling) equals 0,95 times the density of the liquid phase at 50 °C (in kg/l); in addition, the vapour phase shall not disappear below 60 °C. The test pressure shall be at least equal to the vapour pressure of the liquid at 70 °C, minus 100 kPa (1 bar).

For pure gases with insufficient data the maximum permissible degree of filling shall be determined as follows:

$$FD \leq (0{,}0032 \times BP - 0{,}24) \times d_l$$

where FD = maximum permissible filling degree (in kg/l)

BP = boiling point (in Kelvin)

d_l = density of the liquid at boiling point (in kg/l)

(e) For gases of items 3 A and 3 O, the degree if filling, at the filling temperature and at a pressure of 0,1 MPa (1 bar) shall not exceed 98 % of the capacity.

For gases of item 3 F the degree of filling shall remain below the level at which, if the contents were raised to the temperature at which the vapour pressure equalled the opening pressure of the safety valves, the volume would reach 95 % of the capacity at that temperature in the liquid phase.

For receptacles according to marg. 206(1), the test pressure equals 1,3 times the maximum allowable working pressure, increased by 1 bar for vacuum insulated receptacles;

219 *(cont'd)* (f) For 1001 acetylene, dissolved of item 4 F, once equilibrium has been achieved at 15 °C, the filling pressure shall not exceed the value prescribed by the competent authority for the porous mass [see marg. 223(1)(h)]. The quantity of solvent and the quantity of acetylene shall likewise correspond to the figures specified in the approval.

The requirements of this paragraph are deemed to be met if the following standards are complied with: (reserved)

Note: The test pressure, degree of filling and limitation of capacity of receptacles of marg. 211 for the different gases, as well as restrictions concerning toxic gases with a LC_{50} less than 200 ppm are given in the table contained in marg. 250.

220-221

3. Mixed Packing

222 (1) Substances and articles of this Class may be packed together in an outer packaging if they do not react dangerously with each other.

(2) Substances and articles of this Class may be packed together in the same outer packaging with substances and/or goods which are not subject to the requirements of this Directive if they do not react dangerously with each other.

(3) Substances and articles of this Class may be packed together in the same combination packaging conforming to marg. 1538 with substances and articles of other classes — provided that mixed packing is also permitted for substances and articles of those classes — if they do not react dangerously with each other.

(4) The following are considered dangerous reactions:

(a) combustion and/or giving off considerable heat;

(b) emission of flammable and/or toxic gases;

(c) formation of corrosive liquids;

(d) formation of unstable substances.

(5) The requirements of marg. 8 and 202 shall be met.

(6) A package shall not weigh more than 100 kg when wood or fibreboard boxes are used.

4. Marking and labels on packages (see Appendix IX)

Marking

223 (1) Refillable receptacles conforming to the requirements of marg. 211 shall bear the following particulars in clearly legible and durable characters:

(a) The name or the mark of the manufacturer;

(b) The approval number (if the design type of the receptacle is approved according to marg. 215);

(c) The serial number of the receptacle provided by the manufacturer;

(d) The tare of the receptacle without fittings and accessories, when the check of wall thickness required in marg. 217(1)(b) is performed by weighing;

(e) The test pressure (see marg. 219);

223
(cont'd)

(f) The date (month and year) of the initial test and the most recent periodic inspection;

Note: The month need not be indicated for gases for which the interval between periodic inspections is 10 years or more (see marg. 217(2) and marg. 250).

(g) The stamp of the expert who carried out the tests and inspections;

(h) In the case of 1001 acetylene, dissolved of item 4 F; the permitted filling pressure [see marg. 219 (f)] and the total of the mass of: the empty receptacle, the fittings and accessoiries, the porous mass and the solvent;

(i) The water capacity in litres;

(j) For gases of item 1 filled by pressure, the maximum filling pressure at 15 °C allowed for the receptacle;

These marks shall be immovably affixed, e.g. engraved, either on a reinforced part of the receptacle, on a ring, or on immovably affixed attachments.

They may also be engraved on the receptacle directly, provided it can be demonstrated that the strength of the receptacle is not impaired by the marking.

(2) Refillable receptacles according to marg. 211 shall in addition bear the following particulars in clearly legible and durable characters:

(a) The identification number and the name of the gas or mixture of gases in full, as given in marg. 201;

In the case of gases classified under an n.o.s. entry, only the identification number and the technical name [1] of the gas shall be indicated;

In the case of mixtures, not more than the two constituents which most predominantly contribute to the hazards need be indicated;

(b) For gases of item 1 filled by mass and for liquefied gases, either the maximum permissible filling mass and the tare of the receptacle with fittings and accessories as fitted at the time of filling, or the gross mass;

(c) The date (year) of the next periodic inspection.

These marks may either be engraved or indicated on a durably attached information disk or label on the receptacle, or indicated by an adherent and clearly visible marking such as by painting or by an equivalent process.

(3) The requirements of paragraphs (1) and (2) are deemed to be met if the following standards are complied with: (reserved).

(4) Non-refillable cylinders according to marg. 211(1) shall bear the following particulars in clearly legible and durable characters:

(a) The name or the mark of the manufacturer;

(b) The approval number (if the design type of the receptacle is approved according to marg. 215);

(c) The serial or batch number of the receptacle provided by the manufacturer;

(d) The test pressure (see marg. 219);

(e) The date (month and year) of manufacture;

(f) The stamp of the expert who carried out the initial test;

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[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Instead of the technical name the use of one of the following names is permitted:
— For 1078 refrigerant gas, n.o.s., of item 2 A: mixture F 1, mixture F 2, mixture F 3;
— For 1060 methyl acetylene and propadiene mixtures, stabilized of item 2 F: mixture P 1, mixture P 2;
— For 1965 hydrocarbon gas mixture, liquefied, n.o.s., of item 2 F: mixture A or butane, mixture A 0 or butane, mixture A 1, mixture B, mixture C or propane.

223 *(cont'd)*

(g) The identification number and the name of the gas or mixture of gases in full, as given in marg. 201;

In case of gases classified under n.o.s. entry, only the identification number and the technical name [1] of the gas shall be indicated;

In the case of mixtures, not more than the two constituents which most predominantly contribute to the hazards need be indicated;

(h) The marking '*Do not refill*'; this marking shall be a minimum of 6 mm in height.

The marks mentioned in this paragraph, other than (g), shall be immovably affixed, e.g. engraved, either on a reinforced part of the receptacle, on a ring, or on immovably affixed attachments.

They may also be engraved on the receptacle directly, provided it can be demonstrated that the strength of the receptacle, on a ring, or on immovably affixed attachments.

The requirements of this paragraph are deemed to be met if the following standards are complied with: (reserved).

(5) Every package containing receptacles filled with gases of items 1 to 4, 6 F, 7 or receptacles, small, containing gas (gas cartridges) of item 5 shall be clearly marked with the identification number of the goods to be entered in the consignment note, preceded by the letters 'UN', with the addition: 'Class 2'.

This requirement need not be complied with if the receptacles and their markings are clearly visible.

(6) Packages containing aerosol dispensers of item 5 shall be clearly marked as follows:'*UN 1950 Aerosols*'

Danger labels

224

Note: For the purpose of labelling, a package is any packaging containing receptacles, aerosol dispensers or receptacles small, containing gas (gas cartridges), or any receptacle referred to in marg. 211 without outer packaging.

(1) Packages containing substances and articles of this Class shall bear the labels indicated below:

Substances and articles assigned under the various item numbers to the following groups	Label model Nos.
A	2
O	2 + 05
F	3
T	6.1
TF	6.1 + 3
TC	6.1 + 8
TO	6.1 + 05
TFC	6.1 + 3 + 8
TOC	6.1 + 05 + 8

(2) Every package containing gases of item 3 shall in addition bear, on two opposite sides, labels conforming to model No 11.

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[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Instead of the technical name the use of one of the following names is permitted:
— For 1078 refrigerant gas, n.o.s., of item 2 A: mixture F 1, mixture F 2, mixture F 3;
— For 1060 methyl acetylene and propadiene mixtures, stabilized of item 2 F: mixture P 1, mixture P 2;
— For 1965 hydrocarbon gas mixture, liquefied, n.o.s., of item 2 F: mixture A or butane, mixture A 0 or butane, mixture A 1, mixture B, mixture C or propane.

224 *(cont'd)* (3) Labels on cylinders of marg. 211(1) may be attached to the shoulder of the cylinders and may have smaller dimensions accordingly, provided that they remain clearly visible.

B. Method of despatch and restrictions on forwarding

225 (1) Substances and articles of Class 2, except gases of groups T, TF, TC, TO, TFC and TOC, 2203 silane, compressed, of item 1 F, may also be sent as express parcels. A package shall not weigh more than 50 kg.

(2) The consignor and the railway shall come to an agreement on the conditions of carriage before consignments are handed over for the carriage of gases of item 3 in tank wagons or tank-containers fitted with safety valves.

(3) Consignments of 1749 chlorine trifluoride of item 2 TOC of a total mass exceeding 500 kg shall only be accepted in full wagon loads and subject to a maximum of 5 000 kg per wagon.

C. Particulars in the consignment note

226 (1) The description of the goods in the consignment note shall conform to one of the identification numbers and one of the names printed in italics in marg. 201.

If the substance is not mentioned by name but is assigned to an n.o.s. entry, the description of the goods shall consist of the substance identification number and the n.o.s. designation, followed by the chemical or technical name.[1]

The description of the goods shall be followed by *particulars of the Class, the item number, the group, and the initials 'RID'*, e. g. *'2 item 2 F, RID'*.

A cross shall be inserted in the appropriate box on the consignment note.

For the carriage of mixtures [see marg. 200(3)], containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the mixtures.

For the carriage of mixtures [see marg. 200(3)] in tank wagons, battery wagons, wagons with demountable tanks or tank-containers, the composition of the mixture as a percentage of the volume or as a percentage of the mass shall be given. Components below 1 % need not be indicated.

If a marking accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall also be given before the description of the substance.

The hazard identification number shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

Instead of the technical name, the use of one of the following names is permitted [1]:

— For 1078 refrigerant gas, n.o.s., of item 2 A: *mixture F 1, mixture F 2, mixture F 3*;

— For 1010 of item 2 F: *mixture of 1,3- butadiene and hydrocarbons, inhibited*;

— For 1060 methylacetylene and propadiene mixture, stabilized, of item 2 F: *mixture P 1, mixtures P 2*;

— For 1965 hydrocarbon gas mixture, liquefied, n.o.s. of item 2 F: *mixture A* or *butane, mixture A 0* or *butane, mixture A 1, mixture B, mixture C* or *propane*;

[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose.

226 *(cont'd)*

For carriage in tanks, the trade names 'butane' and 'propane' may be used only as a complement.

For these mixtures, the composition need not be indicated.

(2) For the carriage of receptacles referred to in marg. 211 under the conditions of marg. 217(5), the following entry shall be included in the consignment note:

'*Carriage in conformity with marg. 217(5)*'.

(3) Where tank wagons have been refilled without having been previously cleaned out, the consignment note shall show, as total weight of goods carried, the sum of the weight of the new load and of the residual load, which will be the same as the gross weight of the tank wagon less its registered unladen weight. In addition, the words '*Mass when filled ... kg*' may also be added.

(4) In the case of tank wagons and tank-containing gases of item 3, the consignor shall enter in the consignment note:

— '*The tank is guaranteed as insulated in order that the valves cannot open before ...* (date accepted by the railway)'.

D. Transport equipment

1. Conditions relating to wagons and their loading

a. For packages

227 (1) Packages shall not be thrown or subjected to impact.

(2) Receptacles shall be stowed in wagons so that they cannot overturn or fall, and comply with the following requirements:

(a) The cylinders referred to in marg. 211(1) shall be laid parallel to or at right angles to the longitudinal axis of the wagon; however, those situated near the end walls shall be laid at right angles to the said axis.

Short cylinders of large diameter (about 30 cm or over) may be stowed longitudinally with their valve protective devices directed towards the middle of the wagon.

Cylinders which are sufficiently stable or which are carried in suitable devices preventing them from overturning may be placed upright.

Cylinders which are laid flat shall be so wedged, made fast or otherwise suitably and securely fixed that they cannot shift;

(b) receptacles containing gases of item 3 shall always be placed in the position for which they were designed and be protected against any possibility of being damaged by other packages;

(c) receptacles designed to be rolled shall be laid with their longitudinal axis parallel to that of the wagon and shall be secured against any lateral movement.

(3) When pallets loaded with articles of item 5 in the manner prescribed in marg. 209(3) are stacked, each tier of pallets shall be evenly distributed over the lower tier, if necessary by the interposition of a material of adequate strength.

b. For small containers

228 (1) With the exception of packages containing gases of item 3, packages containing substances set out in this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 230 shall be applied to the contents of a small container.

2. Marking and danger labels on wagons, tank wagons, battery wagons, wagons with demountable tanks, tank-containers and small containers (See Appendix IX)

229 (1) Wagons, tank wagons, battery wagons, wagons with demountable tanks and tank-containers containing substances and articles of this Class shall bear on both sides labels as follows:

Note: For wagons carrying large containers or tank-containers, see marg. 1900(1) (b).

Substances and articles assigned to the various items to the following groups	Label model Nos.
A	2
O	2 + 05
F	3
T	6.1
TF	6.1 + 3
TC	6.1 + 8
TO	6.1 + 05
TFC	6.1 + 3 + 8
TOC	6.1 + 05 + 8

(2) Tank wagons, battery wagons, wagons with demountable tanks and wagons carrying tank-containers shall bear a label conforming to model No 13 on both their sides.

(3) Small containers shall be labelled in conformity with the requirements of paragraph (1).

E. Prohibitions on mixed loading

230 Packages bearing a label conforming to models Nos 2, 3 or 6.1 shall not be loaded together in the same wagon with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01.

These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

Separate consignment notes be made out for consignments which may not be loaded together in the same wagon.

231

F. Empty packagings

232 (1) Receptacles, tank wagons, battery wagons, wagons with demountable tanks and tank-containers, empty and uncleaned, of item 8 shall be closed in the same manner as though they were full.

(2) Receptacles, tank wagons, battery wagons, wagons with demountable tanks and tank-containers, empty and uncleaned, of item 8 shall bear the same danger labels as though they were full.

(3) The description in the consignment note shall conform to one of the names printed in italics in item 8 completed by *'2, item 8, RID'*, e. g. *'Empty receptacle, 2 item 8, RID'*.

A cross shall be inserted in the appropriate box on the consignment note.

For receptacles of a capacity exceeding 1 000 litres, and for empty tank wagons, battery wagons, wagons with demountable tanks or empty tank-containers, uncleaned, this description shall be completed by adding the words 'Last load', together with the hazard and substance identification numbers, the name, the item and the group if necessary, of the substances, e.g. *'Last load: 268 1017 chlorine, item 2TC'*.

232 *(cont'd)* (4) The receptacles of item 8 referred to in marg. 211 may be carried after the expiry of the time-limit set for the periodic test prescribed in marg. 217, for the purpose of undergoing the test.

233-237

G. Other regulations

(reserved).

H. Transitional measures

239 (1) Receptacles built before 1 January 1997 and not conforming to the requirements of this Directive applicable as from 1 January 1997 but the carriage of which was permitted under the requirements of RID applicable until 31 December 1996 may continue to be carried after that date if the periodic inspection requirements in marg. 217 are complied with.

(2) Cylinders referred to in marg. 211(1) which have been subjected to an initial inspection or periodic inspection before 1 January 1997 may be carried empty uncleaned without a label until the date of the next refilling or the next periodic inspection.

240-249

I. Table of gases and special provisions

250 List of gases with reference to the main requirements of marg. 211 to 219 and to special requirements applicable to certain substances.

List of gases: see tables

Key for 'special requirements':

a: Aluminium alloys not allowed in contact with gas.

b: Valves made of copper are not accepted.

c: Metal parts in contact with the contents shall not contain more than 70 % copper.

d: No receptacle may contain more than 5 kg of the substance.

e: The valve outlets shall be fitted with plugs or cap-nuts ensuring gas-tightness [see marg. 213(4)].

f: The necessary steps to prevent dangerous reactions (e.g. polymerisation, decomposition etc.) during carriage shall be taken. If necessary, stabilization or addition of an inhibitor is required.

g: The use of test pressures other than those indicated is allowed provided the requirements of marg. 219(c) are followed.

h: If a monolithic material is used as a porous mass, the interval between inspections may be extended to 10 years.

i: Maximum filling according to the figures specified in the approval.

j: The test pressure and degree of filling shall be calculated in accordance with the requirements of marg. 219.

k: The interval between tests may be extended to 10 years when receptacles are made of aluminium alloys.

l: Each cylinder in the same frame (bundle) shall be fitted with an individual valve that shall be closed during carriage.

250 *(cont'd)*

m: The interval between inspections for steel cylinders of marg. 211(1) may be extended to 15 years:

(a) with the agreement of the competent authority (authorities) of the country (countries) where the periodic inspection and the carriage take place, and

(b) in accordance with the requirements of a technical code or a standard recognized by the competent authority or in accordance with standard EN 1440: 1996 'Transportable refillable welded steel cylinders for liquefied petroleum gas (LPG) — Periodic requalification'.

n: In the case of receptacles for the carriage of gases under a n.o.s. entry, the following requirements shall be taken into account as applicable:

(1) The materials of which the receptacles and their closures are made shall not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(2) The test pressure and degree of filling is to be calculated in accordance with the requirements of marg. 219.

(3) Toxic gases and gas mixtures with a LC_{50} less than 200 ppm are not allowed for carriage in receptacles referred to in marg. 211(2) and (3).

(4) The valves of receptacles for toxic gases and gas mixtures with a LC_{50} less than 200 ppm, pyrophoric gases or flammable mixtures of gases containing more than 1 % of pyrophoric compounds shall be fitted with gas tight plugs or capnuts. When these receptacles are manifolded in a bundle, each receptacle shall be fitted with an individual valve that shall be closed during carriage.

(5) The neccessary steps to prevent dangerous reactions (e.g. polymerisation, decomposition) during carriage shall be taken. If necessary, stabilization or addition of an inhibitor is required.

Item and group	UN No	Name of the substance	Packing	Pressure			Filling	Special requirements
			Type of receptacle (marg. 211)	Pressure		Period (years) (1)	Max. fill. kg/l or MPa or Vol- %	
				X fill. press	MPa			
1 A	1002	*air, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1006	*argon, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1046	*helium, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1056	*krypton, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1065	*neon, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1066	*nitrogen, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1979	*rare gases mixture, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1980	*rare gases and oxygen mixture, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1981	*rare gases and nitrogen mixture, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1982	*tetrafluoromethane, compressed (refrigerant gas R 14, compressed)*	(1),(2),(3),(5)		20,0 30,0	10	0,62 0,94	g g
	2036	*xenon, compressed*	(1),(2),(3),(5)		13,0	10	1,24	g
	2193	*hexafluoroethane, compressed (refrigerant gas R 116, compressed)*	(1),(2),(3),(5)		20,0	10	1,10	g
	1956	*gas, n.o.s.*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	n
1 O	1014	*carbon dioxide and oxygen mixture, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1072	*oxygen, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	3156	*compressed gas, oxidizing, n.o.s.*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	n

(1) Not applicable to receptacles in composite materials [see marg. 217(2)].

250
(cont'd)

Item and group	UN No	Name of the substance	Packing	Pressure			Filling	Special Requirements
			Type of receptacle (marg. 211)	Pressure		Period (years) (1)	Max. fill. kg/l or MPa or Vol- %	
				X fill. press	MPa			
1 F	1049	*hydrogen, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1957	*deuterium, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1962	*ethylene compressed*	(1),(2),(3),(5)		22,5	10	0,34	g
			(1),(2),(3),(5)		30,0		0,37	g
	1971	*methane, compressed or*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1971	*natural gas, compressed with* high methane content						
	2034	*hydrogen and methane mixture, compressed*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	2203	*silane, compressed***	*(1),(2),(3),(5)*		22,5	10	0,32	e,g,l
			(1),(2),(3),(5)		25,0	10	0,41	e,g,l
	1964	*hydrocarbon gas mixture, compressed, n.o.s.*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	n
	1954	*compressed gas, flammable, n.o.s.*	(1),(2),(3),(5)	1,5		10	2/3 T.P.	n
1 T	1612	*hexaethyl tetraphosphate and compressed gas mixture*	(1),(2),(3),(5)	1,5		5	2/3 T.P.	
	1955	*compressed gas, toxic, n.o.s.*	(1),(2),(3),(5)	1,5		5	2/3 T.P.	n
1 TF	1016	*carbon monoxide, compressed*	(1),(2),(3),(5)	1,5		5	2/3 T.P.	k
	1023	*coal gas, compressed*	(1),(2),(3),(5)	1,5		5	2/3 T.P.	
	1071	*oil gas, compressed*	(1),(2),(3),(5)	1,5		5	2/3 T.P.	
	1911	*diborane, compressed*	(1),(5)		25,0	5	0,072	e,f,l
	2600	*carbon monoxide and hydrogenmixture, compressed*	(1),(2),(3),(5)	1,5		5	2/3 T.P.	k
	1953	*compressed gas, toxic, flammable, n.o.s.*	(1),(2),(3),(5)	1,5		5	2/3 T.P.	n
1 TC	1008	*baron trifluoride, compressed*	(1),(2),(3),(5)		22,5	3	0,715	g
			(1),(2),(3),(5)		30,0		0,86	g
	1859	*silicon tetrafluoride, compressed*	(1),(2),(3),(5)		20,0	3	0,74	g
			(1),(2),(3),(5)		30,0		1,10	g
	2198	*phosphorus pentafluoride, compressed*	(1),(5)		20,0	3	0,90	e,g,l
			(1),(5)		30,0		1,34	e,g,l
	2417	*carbonyl fluoride, compressed*	(1),(2),(3),(5)		20,0	3	0,47	g
			(1),(2),(3),(5)		30,0		0,70	g
	3304	*compressed gas, toxic, corrosive, n.o.s.*	(1),(2),(3),(5)	1,5		3	2/3 T.P.	n
1 TO	2451	*nitrogen trifluoride*	(1),(2),(3),(5)		20,0	5	0,5	g
			(1),(2),(3),(5)		30,0		0,75	g
	3303	*compressed gas, toxic, oxidizing, n.o.s.*	(1),(2),(3),(5)	1,5		5	2/3 T.P.	n
1 TFC	3305	*compressed gas, toxic, flammable, corrosive, n.o.s.*	(1),(2),(3),(5)	1,5		3	2/3 T.P.	n

(1) Not applicable to receptacles in composite materials [see marg. 217(2)].

250 *(cont'd)*

Item and group	UN No	Name of the substance	Packing	Pressure			Filling	Special Requirements
			Type of receptacle (marg. 211)	Pressure		Period (years) (1)	Max. fill. kg/l or MPa or Vol- %	
				X fill. press	MPa			
1 TOC	1045	*fluorine, compressed*	(1),(5)		20,0	5	2,8 MPa	a,d,e,l
	1660	*nitric oxide, compressed*	(1),(5)	1,5		3	2/3 T.P.	e,l
	2190	*oxygen difluoride*	(1),(5)		20,0	3	2,8 MPa	a,d,e,l
	3306	*compressed gas, toxic, oxidizing, corrosive, n.o.s.*	(1),(2),(3),(5)	1,5		3	2/3 T.P.	n
2 A	1009	*bromotrifluoromethane (refrigerant gas R 13B1)*	(1),(2),(3),(5)		4,2	10	1,13	g
			(1),(2),(3),(5)		12,0	10	1,44	g
			(1),(2),(3),(5)		25,0	10	1,60	g
	1013	*carbon dioxide*	(1),(2),(3),(5)		19,0	10	0,66	g
			(1),(2),(3),(5)		25,0	10	0,75	g
	1015	*carbon dioxide and nitrous oxide mixture*	(1),3),(5)		25,0	10	0,75	g
	1018	*chlorodifluoromethane (refrigerant gas R 22)*	(1),(2),(3),(5)		2,9	10	1,03	
	1020	*chloropentafluoroethane (refrigerant gas R 115)*	(1),(2),(3),(5)		2,5	10	1,08	
	1021	*1-chloro-1,2,2,2-tetrafluoroethane (refrigerant gas R 124)*	(1),(2),(3),(5)		1,2	10	1,20	
	1022	*chlorotrifluoromethane (refrigerant gas R 13)*	(1),(2),(3),(5)		10,0	10	0,83	g
			(1),(2),(3),(5)		12,0	10	0,90	g
			(1),(2),(3),(5)		19,0	10	1,04	g
			(1),(2),(3),(5)		25,0	10	1,10	g
	1028	*dichlorodifluoromethane (refrigerant gas R 12)*	(1),(2),(3),(5)		1,8	10	1,15	
	1029	*dichlorofluoromethane (refrigerant gas R 21)*	(1),(2),(3),(5)		1,0	10	1,23	
	1058	*liquefied gases*, non-flammable, charged with nitrogen, carbon dioxide or air	(1),(2),(3),(5)	1,5		10		j
	1080	*sulphur hexafluoride*	(1),(2),(3),(5)		7,0	10	1,04	g
			(1),(2),(3),(5)		14,0	10	1,33	g
			(1),(2),(3),(5)		16,0	10	1,37	g
	1858	*hexafluoropropylene (refrigerant gas R 1216)*	(1),(2),(3),(5)		2,2	10	1,11	
	1952	*carbon dioxide and ethylene oxide mixture with not more than* 9 % ethylene oxide	(1),(2),(3),(5)		19,0	10	0,66	
			(1),(2),(3),(5)		25,0	10	0,75	
	1958	*dichlorotetrafluoroethane (refrigerant gas R 114)*	(1),(2),(3),(5)		1,0	10	1,30	
	1973	*chlorodifluoromethane and chloropentafluoroethane mixture with fixed boiling point, with approximately* 49 % chlorodifluoromethane (refrigerant gas R 502)	(1),(2),(3),(5)		3,1	10	1,05	
	1974	*chlorodifluorobromomethane (refrigerant gas R 12B1)*	(1),(2),(3),(5)		1,0	10	1,61	

(1) Not applicable to receptacles in composite materials [see marg. 217(2)].

250 *(cont'd)*

Item and group	UN No	Name of the substance	Packing	Pressure			Filling	Special Requirements
			Type of receptacle (marg. 211)	Pressure		Period (years) (1)	Max. fill. kg/l or MPa or Vol- %	
				X fill. press	MPa			
2 A *(cont's)*	1976	*octafluorocyclobutane (refrigerant gas RC 318)*	(1),(2),(3),(5)		1,1	10	1,34	
	1983	*1-chloro-2,2,2-trifluoroethane (refrigerant gas R 133a)*	(1),(2),(3),(5)		1,0	10	1,18	
	1984	*trifluoromethane (refrigerant gas R 23)*	(1),(2),(3),(5) (1),(2),(3),(5)		19,0 25,0	10 10	0,87 0,95	g g
	2422	*octafluorobut-2-ene (refrigerant gas R 1318)*	(1),(2),(3),(5)		1,2	10	1,34	
	2424	*octafluoropropane (refrigerant gas R 218)*	(1),(2),(3),(5)		2,5	10	1,09	
	2599	*Chlorotrifluoromethane and trifluoromethane, azeotropic mixture*, with approximately 60 % chlorotrifluormethane *(refrigerant gas R 503)*	(1),(2),(3),(5) (1),(2),(3),(5) (1),(2),(3),(5)		3,1 4,2 10,0	10 10 10	0,11 0,20 0,66	
	2602	*dichlorodifluoromethane and 1,1-difluoroethane, azeotropic mixture* with approximately 74 % dichlorodifluoromethane *(refrigerant gas R 500)*	(1),(2),(3),(5)		2,2	10	1,01	
	3070	*ethylene and dichlorodifluoromethane, mixture* with not more than 12,5 % ethylene oxide	(1),(2),(3),(5)		1,8	10	1,09	
	3159	*1,1,1,2-tetrafluoroethane (refrigerant gas R 134a)*	(1),(2),(3),(5)		2,2	10	1,04	
	3220	*pentafluoroethane (refrigerant gas R 125)*	(1),(2),(3),(5)		4,9	10	0,95	g
	3296	*heptafluoropropane (refrigerant gas R 227)*	(1),(2),(3),(5)		1,5	10	1,20	
	3297	*ethylene oxide and chlorotetrafluoroethane mixture*, with not more than 8,8 % ethylene oxide	(1),(2),(3),(5)		1,0	10	1,16	
	3298	*ethylene oxide and pentafluoroethane mixture* not more than 7,9 % ethylene oxide	(1),(2),(3),(5)		2,6	10	1,02	
	3299	*ethylene oxide and tetrafluoroethane, mixture*, with not more than 5,6 % ethylene oxide	(1),(2),(3),(5)		1,7	10	1,03	
	1078	*refrigerant gases, n.o.s.,* *mixture F 1* *mixture F 2* *mixture F 3* other mixtures	 (1),(2),(3),(5) (1),(2),(3),(5) (1),(2),(3),(5) (1),(2),(3),(5)		 1,2 1,8 2,9	 10 10 10 10	 1,23 1,15 1,03	 n
	1968	*insecticide gas, n.o.s.*	(1),(2),(3),(5)			10		n
	3163	*liquefied gas, n.o.s.*	(1),(2),(3),(5)			10		n
2 O	1070	*nitrous oxide*	(1),(2),(3),(5) (1),(2),(3),(5) (1),(2),(3),(5)		18,0 22,5 25,0	10 10 10	0,68 0,74 0,75	g g g
	3157	*liquefied gas, oxidizing, n.o.s.*	(1),(2),(3),(5)			10		n

(1) Not applicable to receptacles in composite materials [see marg. 217(2)].

250 *(cont'd)*

Item and group	UN No	Name of the substance	Packing	Pressure			Filling	Special Requirements
			Type of receptacle (marg. 211)	Pressure		Period (years) (1)	Max. fill. kg/l or MPa or Vol- %	
				X fill. press	MPa			
2 F	1010	*1,2-butadiene, inhibited* or	(1),(2),(3),(5)		1,0	10	0,59	f
	1010	*1,3-butadiene, inhibited* or	(1),(2),(3),(5)		1,0	10	0,55	f
	1010	*mixtures of 1,3-butadiene and hydrocarbons, inhibited*	(1),(2),(3),(5)		1,0	10	0,50	f,j
	1011	*butane*	(1),(2),(3),(5)		1,0	10	0,51	
	1012	*butylenes, mixture* or	(1),(2),(3),(5)		1,0	10	0,50	j
	1012	*1-butylene* or	(1),(2),(3),(5)		1,0	10	0,53	
	1012	*cis-1-butylene* or	(1),(2),(3),(5)		1,0	10	0,55	
	1012	*trans-2-butylene*	(1),(2),(3),(5)		1,0	10	0,54	
	1027	*cyclopropane*	(1),(2),(3),(5)		2,0	10	0,53	
	1030	*1,1-difluoroethane (refrigerant gas R 152a)*	(1),(2),(3),(5)		1,8	10	0,79	
	1032	*dimethylamine, anhydrous*	(1),(2),(3),(5)		1,0	10	0,59	b
	1033	*dimethyl ether*	(1),(2),(3),(5)		1,8	10	0,58	
	1035	*ethane*	(1),(2),(3),(5)		9,5	10	0,25	g
			(1),(2),(3),(5)		12,0	10	0,29	g
			(1),(2),(3),(5)		30,0	10	0,39	g
	1036	*ethylamine*	(1),(2),(3),(5)		1,0	10	0,61	b
	1037	*ethyl chloride*	(1),(2),(3),(5)		1,0	10	0,80	a
	1039	*ethyl methyl ether*	(1),(2),(3),(5)		1,0	10	0,64	
	1041	*ethylene oxide and carbon dioxide mixture*, with more than 9 % but not more than 87 % ethylene oxide	(1),(2),(3),(5)		19,0	10	0,66	g
			(1),(2),(3),(5)		25,0	10	0,75	g
	1055	*isobutylene*	(1),(2),(3),(5)		1,0	10	0,52	
	1060	*methyl acetylene and propadiene mixture, stabilized*	(1),(2),(3),(5)			10		c,f,j
		propadiene with 1 % to 4 % methyl acetylene	(1),(2),(3),(5)		2,2	10	0,50	c,f
		mixture P 1	(1),(2),(3),(5)		3,0	10	0,49	c,f
		mixture P 2	(1),(2),(3),(5)		2,4	10	0,47	c,f
	1061	*methylamine, anhydrous*	(1),(2),(3),(5)		1,3	10	0,58	b
	1063	*methyl chloride (refrigerant gas R 40)*	(1),(2),(3),(5)		1,7	10	0,81	a
	1077	*propylene*	(1),(2),(3),(5)		3,0	10	0,43	
	1081	*tetrafluoroethylene, inhibited*	(1),(2),(3),(5)		20,0	10	0,5 MPa	f
	1083	*trimethylamine, anhydrous*	(1),(2),(3),(5)		1,0	10	0,56	b
	1085	*vinyl bromide, inhibited*	(1),(2),(3),(5)		1,0	10	1,37	a,f
	1086	*vinyl chloride, inhibited*	(1),(2),(3),(5)		1,2	10	0,81	a,f
	1087	*vinyl methyl ether, inhibited*	(1),(2),(3),(5)		1,0	10	0,67	f
	1860	*vinyl fluoride, inhibited*	(1),(2),(3),(5)		25,0	10	0,64	a,f,g
	1912	*methylchloride and methylene chloride mixture*	(1),(2),(3),(5)		1,7	10	0,81	a
	1959	*1,1-difluoroethylene (refrigerant gas R 1132a)*	(1),(2),(3),(5)		25,0	10	0,77	g
	1969	*isobutane*	(1),(2),(3),(5)		1,0	10	0,49	
	1978	*propane*	(1),(2),(3),(5)		2,5	10	0,42	
	2035	*1,1,1-trifluoroethane (refrigerant gas R 143a)*	(1),(2),(3),(5)		3,5	10	0,75	

(1) Not applicable to receptacles in composite materials [see marg. 217(2)].

250 *(cont'd)*

Item and group	UN No	Name of the substance	Packing	Pressure			Filling	Special Requirements
			Type of receptacle (marg. 211)	Pressure		Period (years) (1)	Max. fill. kg/l or MPa or Vol- %	
				X fill. press	MPa			
2 F *(cont'd)*	2044	*2,2-dimethylpropane*	(1),(2),(3),(5)		1,0	10	0,53	
	2200	*propadiene, inhibited*	(1),(2),(3),(5)		2,2	10	0,50	f
	2419	*bromotrifluorethylene*	(1),(2),(3),(5)		1,0	10	1,19	
	2452	*ethylacetylene, inhibited*	(1),(2),(3),(5)		1,0	10	0,57	c,f
	2453	*ethyl fluoride (refrigerant gas R 161)*	(1),(2),(3),(5)		3,0	10	0,57	
	2454	*methyl fluoride (refrigerant gas R 41)*	(1),(2),(3),(5)		30,0	10	0,36	
	2517	*1-chloro-1,1-difluoroethane (refrigerant gas R 142b)*	(1),(2),(3),(5)		1,0	10	0,99	
	2601	*cyclobutane*	(1),(2),(3),(5)		1,0	10	0,63	
	3153	*perfluoro(methyl vinyl ether)*	(1),(2),(3),(5)		2,0	10	0,75	
	3154	*perfluoro(ethyl vinyl ether)*	(1),(2),(3),(5)		1,0	10	0,98	
	3252	*difluoromethane (refrigerant gas R 32)*	(1),(2),(3),(5)		4,8	10	0,78	
	1965	*hydrocarbon gas, mixture, liquefied, n.o.s.,*						
		mixture A	(1),(2),(3),(5)		1,0	10	0,50	m,n
		mixture A 0	(1),(2),(3),(5)		1,5	10	0,47	m,n
		mixture A 1	(1),(2),(3),(5)		2,0	10	0,46	m,n
		mixture B	(1),(2),(3),(5)		2,5	10	0,43	m,n
		mixture C	(1),(2),(3),(5)		3,0	10	0,42	m,n
		other mixtures	(1),(2),(3),(5)			10		m,n
	3161	*liquefied gas, flammable, n.o.s.*	(1),(2),(3),(5)			10		n
2 T	1062	*methyl bromide*	(1),(2),(3),(5)		1,0	5	1,51	a
	1581	*chloropicrin and methyl bromide, mixture*	(1),(2),(3),(5)		1,0	5	1,51	a
	1582	*chloropicrin and methyl chloride, mixture*	(1),(2),(3),(5)		1,7	5	0,81	a
	2191	*sulphuryl fluoride*	(1),(2),(3),(5)		5,0	5	1,10	k
	1967	*insecticide gas, toxic n.o.s.*	(1),(2),(3),(5)			5		n
	3162	*liquefied gas, toxic, n.o.s.*	(1),(2),(3),(5)			5		n
2 TF	1026	*cyanogen*	(1),(2),(3),(5)		10,0	5	0,70	k
	1040	*ethylene oxide, or*	(1),(2),(3),(5)		1,5	5	0,78	f
	1040	*ethylene oxide with nitrogen* up to a total pressure of 1 MPa (10 bar) at 50 °C						
	1053	*hydrogen sulphide*	(1),(2),(3),(5)		5,5	5	0,67	k
	1064	*methyl mercaptan*	(1),(2),(3),(5)		1,0	5	0,78	k
	1082	*trifluoroethylene, inhibited*	(1),(2),(3),(5)		1,9	5	1,13	f,k
	2188	*arsine*	(1),(5)		4,2	5	1,10	e,l
	2192	*germane* (2)	(1),(5)		25,0	5	1,02	e,g,l
	2199	*phosphine* (2)	(1),(5)		22,5	5	0,30	e,g,l
			(1),(5)		25,0	5	0,51	e,g,l
	2202	*hydrogen selenide, anhydrous*	(1),(5)		3,1	5	1,60	e,l
	2204	*carbonyl sulphide*	(1),(2),(3),(5)		2,6	5	0,84	k
	2676	*stibine*	(1),(5)		2,0	5	1,2	e,l

(1) Not applicable to receptacles in composite materials [see marg. 217(2)].
(2) Considered as pyrophoric.

250 *(cont'd)*

Item and group	UN No	Name of the substance	Packing	Pressure			Filling	Special Requirements
			Type of receptacle (marg. 211)	Pressure		Period (years) (1)	Max. fill. kg/l or MPa or Vol- %	
				X fill. press	MPa			
2 TF *(cont'd)*	3300	*ethylene oxide and carbon dioxide mixture* with more than 87 % ethylene oxide	(1),(2),(3),(5)		2,8	5	0,73	f
	3160	*liquefied gas, toxic, flammable, n.o.s.*	(1),(2),(3),(5)			5		n
2 TC	1005	*ammonia, anhydrous*	(1),(2),(3),(5)		3,3	5	0,53	b
	1017	*chlorine*	(1),(2),(3),(5)		2,2	5	1,25	a
	1048	*hydrogen bromide, anhydrous*	(1),(2),(3),(5)		6,0	3	1,54	a
	1050	*hydrogen chloride, anhydrous*	(1),(2),(3),(5)		10,0	3	0,30	a,g
			(1),(2),(3),(5)		12,0	3	0,56	a,g
			(1),(2),(3),(5)		15,0	3	0,67	a,g
			(1),(2),(3),(5)		20,0	3	0,74	a,g
	1069	*nitrosyl chloride*	(1),(5)		1,3	3	1,10	e,l
	1076	*phosgene*	(1),(3),(5)		2,0	3	1,23	e,l
	1079	*sulphur dioxide*	(1),(2),(3),(5)		1,4	3	1,23	
	1589	*cyanogen chloride, inhibited*	(1),(5)		2,0	3	1,03	e,f,l
	1741	*boron trichloride*	(1),(2),(3),(5)		1,0	3	1,19	
	2194	*selenium hexafluoride*	(1),(5)		2,0	3	1,3	e,g,l
	2195	*tellurium hexafluoride*	(1),(5)		2,0	3	1,0	e,l
	2196	*tungsten hexafluoride*	(1),(5)		1,0	3	2,70	a,e,l
	2197	*hydrogen iodide, anhydrous*	(1),(2),(3),(5)		2,3	3	2,25	a
	2418	*sulphur tetrafluoride*	(1),(5)		3,0	3	0,91	e,l
	2420	*hexafluoroacetone*	(1),(2),(3),(5)		2,2	3	1,08	
	3057	*trifluoroacetyl chloride*	(1),(2),(3),(5)		1,7	3	1,17	
	3308	*liquefied gas, toxic, corrosive, n.o.s.*	(1),(2),(3),(5)			3		n
2 TO	3083	*perchloryl fluoride*	(1),(2),(3),(5)		3,3	5	1,21	k
	3307	*liquefied gas, toxic, oxidizing, n.o.s.*	(1),(2),(3),(5)			5		n
2 TFC	2189	*dichlorosilane*	(1),(2),(3),(5)		1,0	3	0,90	
	2534	*methylchlorosilane*	(1),(2),(3),(5)			3		j
	3309	*liquefied gas, toxic, flammable, corrosive, n.o.s.*	(1),(2),(3),(5)			3		n
2 TOC	1067	*dinitrogen tetroxide (nitrogen dioxide)*	(1),(3),(5)		1,0	3	1,30	e,l
	1749	*chlorine trifluoride*	(1),(2),(3),(5)		3,0	3	1,40	a
	1975	*nitric oxide and dinitrogentetroxide mixture (nitric oxide and nitrogen dioxide mixture)*	(1),(3),(5)			3		e,j,l
	2548	*chlorine pentafluoride*	(1),(5)		1,3	3	1,49	a,e,l
	2901	*bromine chloride*	(1),(2),(3),(5)		1,0	3	1,5	a
	3310	*liquefied gas, toxic, oxidizing, corrosive, n.o.s.*	(1),(2),(3),(5)			3		n
3 A	1913	*neon, refrigerated liquid*	(4)	1,3		10	98 %	
	1951	*argon, refrigerated liquid*	(4)	1,3		10	98 %	
	1963	*helium, refrigerated liquid*	(4)	1,3		10	98 %	
	1970	*krypton, refrigerated liquid*	(4)	1,3		10	98 %	
	1977	*nitrogen, refrigerated liquid*	(4)	1,3		10	98 %	
	2187	*carbon dioxide, refrigerated liquid*	(4)	1,3		10	98 %	
	2591	*xenon, refrigerated liquid*	(4)	1,3		10	98 %	
	3136	*trifluoromethane, refrigerated liquid*	(4)	1,3		10	98 %	
	3158	*gas, refrigerated liquid, n.o.s.*	(4)	1,3		10	98 %	n

(1) Not applicable to receptacles in composite materials [see marg. 217(2)].

250 *(cont'd)*

Item and group	UN No	Name of the substance	Packing	Pressure			Filling	Special Requirements
			Type of receptacle (marg. 211)	Pressure		Period (years) (1)	Max. fill. kg/l or MPa or Vol- %	
				X fill. press	MPa			
3 O	*1003*	*air, refrigerated liquid*	(4)	1,3		10	98 %	
	1073	*oxygen, refrigerated liquid*	(4)	1,3		10	98 %	
	2201	*nitrous oxide, refrigerated liquid*	(4)	1,3		10	98 %	
	3311	*gas, refrigerated, liquid, oxidizing, n.o.s.*	(4)	1,3		10	98 %	n
3 F	*1038*	*ethylene, refrigerated liquid*	(4)	1,3		10	95 %	
	1961	*ethane, refrigerated liquid*	(4)	1,3		10	95 %	
	1966	*hydrogen, refrigerated liquid*	(4)	1,3		10	95 %	
	1972	*methane, refrigerated liquid or*	(4)	1,3		10	95 %	
	1972	*natural gas, refrigerated liquid* with high methane content						
	3138	*ethylene, acetylene and propylene, mixture, refrigerated liquid* containing at least 71,5 % ethylene with not more than 22,5 % acetylene and not more than 6 % propylene	(4)	1,3		10	95 %	c
	3312	*gas, refrigerated, liquid, flammable, n.o.s.*	(4)	1,3		10	95 %	n
4 A	*2073*	*ammonia solution* relative, density less than 0,880 kg/l at 15 °C,						
		with more than 35 %, and not more than 40 % ammonia	(1),(2),(3),(5)		1,0	5	0,80	
		with more than 40 %, and not more than 50 % ammonia	(1),(2),(3),(5)		1,2	5	0,77	
4 F	*1001*	*acetylene, dissolved*	(1),(5)		6,0	5		c,h,i
4 TC	*3318*	*ammonia solution*, relative density less than 0,880 kg/l at 15 °C in water, with more than 50 % ammonia	(1),(2),(3),(5)			5		j

(1) Not applicable to receptacles in composite materials [see marg. 217(2)].

251-299

CLASS 3

FLAMMABLE LIQUIDS

1. List of substances

300 (1) Among the substances and mixtures covered by the heading of Class 3, those listed in marg. 301 or which fall under a collective heading of that marg. and articles containing such substances, are subject to the conditions prescribed in marg. 300(2) to 234 and are consequently substances of this Directive.

Note: For the quantities of substances listed in marg. 301 which are not subject to the requirements of the section headed 'Conditions of Carriage' see marg. 301a.

(2) The heading of Class 3 covers substances and articles containing substances of this Class which:

— are liquid in accordance with marg. 4(7);

— have at 50°C a vapour pressure of not more than 300 kPa (3 bar) and are not completely gaseous at 20°C and at the standard pressure of 101.3 kPa;

— have a flash-point of not more than 61°C.

The heading of Class 3 also covers flammable liquid substances and molten solid substances with a flax-point of more than 61°C and which are carried or handed over for carriage whilst heated at temperatures equal to or higher than their flash-point.

Substances having a flash-point above 35°C, non-toxic and non-corrosive, which, under the test conditions given, do not sustain combustion (see Appendix III, marg. 1304) are excluded; if however these substances are handed over for carriage and carried whilst heated at temperatures equal to or higher than their flash-point, they are substances of this Class.

Flammable liquids which, because of additional dangerous properties, are listed in, or assigned to, other classes are also excluded. The flas-point shall be determined as indicated in Appendix III, marg. 1300 to 1302.

Note: 1. For gas oil, diesel fuel, heating oil (light) (identification number 1202) having a flash-point above 61°C see, however, note in marg. 301, item 31(c).

2. For substances having a flash-point above 61°C which are carried or handed over for carriage at or above their flash-point, see however marg. 301, item 61(c).

(3) The substances and articles of Class 3 are subdivided as follows:

A. Substances having a flash-point below 23°C, not toxic, not corrosive;

B. Substances having a flash-point below 23°C and toxic;

C. Substances having a flash-point below 23°C and corrosive;

D. Substances having a flash-point below 23°C, toxic and corrosive and articles containing those substances;

E. Substances having a flash-point between 23°C and 61°C inclusive which might be slightly toxic and/or slightly corrosive;

F. Substances and preparations used as pesticides having a flash-point below 23°C;

G. Substances having a flash-point above 61°C which are carried or handed over for carriage at or above their flash-point;

H. Empty packagings.

300 *(cont'd)*

Substances and articles of Class 3, other than those of items 6, 12, 13 and 28 classified under the various item number of marg. 301 shall be assigned to one of the following groups according to their degree of danger:

(a) very *dangerous substances*: flammable liquids having a boiling point or initial boiling point not exceeding 35°C, and flammable liquids having a flash-point below 23°C, which are either highly toxic according to the criteria of marg. 600 or highly corrosive according to the criteria of marg. 800;

(b) *dangerous substances*: flammable liquids having a flash-point below 23°C which are not classified under group (a), with the exception of substances of marg. 301, item 5(c);

(c) *substances presenting a minor danger*: flammable liquids having a flash-point of 23°C to 61°C and substances of marg. 301, item 5(c).

(4) If substances of Class 3, are result of admixtures, come into different categories of risk from those to which the substances specifically named in marg. 301 belong, these mixtures or solutions shall be assigned to the items and groups to which they belong on the basis of their actual degree of danger.

Note: For the classification of solutions and mixtures (such as preparations and wastes), see also marg. 3(3).

(5) On the basis of the test procedure in accordance with Appendix III, marg. 1300 to 1302, 1310 and 1311, and the criteria set out in (2), it may also be determined whether the nature of a solution or a mixture specifically named or containing a specifically named substance is such that the solution or mixture is not subject to the requirements for this Class.

(6) Liquids which are highly toxic on inhalation, flammable, having a flash-point below 23°C are substances of Class 6.1 (see marg. 601, items 1 to 10).

(7) Substances of Class 3 which are liable to form peroxides easily (as happens with ethers or with certain heterocyclic oxygenated substances) are to be accepted for carriage only if their peroxide content, calculated as hydrogen peroxide (H_2O_2), does not exceed 0,3%. The peroxide content shall be determined as indicated in Appendix III, marg. 1303.

(8) The chemically unstable substances of Class 3 are to be accepted for carriage only if the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end, it shall in particular be ensured that receptacles do not contain any substance liable to promote these reactions.

A. Substances having a flash-point below 23°C, not toxic, not corrosive

301 1. Substances, solutions and mixtures (such as preparations and wastes) having a vapour pressure at 50°C of more than 175 KPa (1,75 bar):

(a) *1089 acetaldehyde* (ethanal),
1108 1-pentene (n-amylene),
1144 crotonylene (2-butyne),
1243 methylformate,
1265 pentanes, liquid (isopentane),
1267 petroleum crude oil,
1303 vinylidene chloride inhibited,
1308 zirconium suspended in a flammable liquid,
1863 fuel, aviation, turbine engine,
2371 isopentenes,
2389 furan,
2456 2-chloropropene,
2459 2-methyl-1-butene,
2561 3-methyl-1- butene (1-isoamylene) (isopropylethylene),
2749 tetramethylsilane,

1268 petroleum distillates, n.o.s. or
1268 petroleum products, n.o.s.,
3295 hydrocarbons, liquid n.o.s.,
1993 flammable liquid, n.o.s.

301 *(cont'd)*

2. Substances, solutions and mixtures (such as preparations and wastes) having a vapour pressure at 50°C of more than 110 kPa(1,10 bar) but not more than 175 kPa(1,75 bar):

(a) *1155 diethyl ether (ethyl ether)*
1167 divinyl ether inhibited,
1218 isoprene, inhibited,
1267 petroleum crude oil,
1280 propylene oxide,
1302 vinyl ethyl ether, inhibited
1308 zirconium suspended in a flammable liquid,
1863 fuel, aviation, turbine engine,
2356 2-chloropropane,
2363 ethyl mercaptan,
1268 petroleum distillates, n.o.s. or
1268 petroleum products, n.o.s.,
3295 hydrocarbons, liquid, n.o.s.,
1993 flammable liquid, n.o.s.;

(b) *1164 dimethyl sulphide,*
1234 methylal (dimethoxymethane),
1265 pentanes, liquid (n-pentane),
1267 petroleum crude oil,
1278 1-chloropropane (propyl chloride),
1308 zirconium suspended in a flammable liquid,
1863 fuel, aviation, turbine engine,
2246 cyclopentene,
2460 2-metyl-2-butene,
2612 methyl propyl éther,
1224 ketones, n.o.s.,
1987 Alcohols, n.o.s.,
1989 Aldehydes, n.o.s.,
1268 petroleum distillates, n.o.s. or
1268 petroleum products, n.o.s.,
3295 hydrocarbons, liquid, n.o.s.,
1993 flammable liquid n.o.s.

3. Substances, solutions and mixtures (such as preparations and wastes) having a vapour pressure at 50°C of not more than 110 kPa(1,10 bar):

(b) *1203 motor spirit,*
1267 petroleum crude oil,
1863 fuel, aviation, turbine engine,
1268 petroleum distillates, n.o.s. or
1268 petroleum products, n.o.s.

Note: While in some climatic conditions petrol (gasoline) may have a vapour pressure at 50°C of more than 110 kPa(1,10 bar) but not more than 150 kPa(1,50 bar), it is to continue to be classified under this item number.

Hydrocarbons:

1114 benzene,
1136 coal tar distillates,
1145 cyclohexane,
1146 cyclopentane,
1175 ethylbenzene,
1206 heptanes,
1208 hexanes,
1216 isooctenes,
1262 octanes,
1288 shale oil,
1294 toluene,
1300 turpentine substitute (white spirit),
1307 xylenes (o-xylene; dimethylbenzene),
2050 diisobutylemes, isomeric compounds,
2057 tripropylene,
2241 cycloheptane,
2242 cycloheptene,

301 *(cont'd)*

2251 bicyclo-(2,2,1)-hepta-2,5-diene inhibited or
2251 2,5-norbornadiene inhibited,
2256 cyclohexene,
2263 dimethyl-cyclohexanes,
2278 n-heptene,
2287 isoheptenes,
2288 isohexenes,
2296 methylcyclohexane,
2298 methylcyclopentane,
2309 octadienes,
2358 cyclooctatetraene,
2370 1-hexene,
2457 2,3-dimethylbutane,
2458 hexadienes,
2461 methylpentadienes,

3295 hydrocarbons, liquid, n.o.s.;

Halogenated substances:

1107 amyl chloride,
1226 1-bromobutane,
1127 chlorobutanes (butyl chlorides),
1150 1,2-dichloroethylene,
1279 propylene dichloride,
2047 dichloropropenes,
2338 benzotrifluoride,
2339 2-bromobutane,
2340 2-bromoethyl ethyl ether,
2342 bromomethylpropanes,
2343 2-bromopentane,
2344 bromopropanes,
2345 3-bromopropyne,
2362 1,1-dichloroethane (ethylidene chloride),
2387 fluorobenzene,
2388 fluorotoluenes,
2390 2-iodobutane,
2391 iodomethylpropanes,
2554 methylallyl chloride;

Alcohols:

1105 amyl alcohols,
1120 butanols,
1148 diacetone alcohol technical,
1170 ethanol (ethyl alcohol) or
1170 ethanol solution (ethyl alcohol solution) containing more than 70% alcohol by volume,
1219 isopropanol (isopropyl alcohol),
1274 n-propanol (propyl alcohol normal),

3065 alcoholic beverages containing more than 70% alcohol by volume,
1987 Alcohols, n.o.s.;

Note: Alcoholic beverages containing more than 24% but not more than 70% alcohol by volume are substances of item 31(c).

Ethers:

1088 acetal (1,1-diethoxyethane),
1159 diisopropyl ether,
1165 dioxane,
1166 dioxolane,
1179 ethyl butyl ether,
1304 vinyl isobutyl ether inhibited,
2056 tetrahydrofuran,
2252 1,2-dimethoxyethane,

301 *(cont'd)*

2301 2-methylfuran,
2350 butyl methyl ether,
2352 butyl vinyl ether, inhibited,
2373 diethoxymethane,
2374 3,3-diethoxypropene,
2376 2,3-dihydropyran,
2377 1,1-dimethoxyethane,
2384 di-n-propyl ether,
2398 methyl tert-butyl ether,
2536 methyltetrahydrofuran,
2615 ethyl propyl ethers,
2707 dimethyldioxanes,
3022 1,2-butylene oxide, stabilized,

3271 ethers, n.o.s.;

Aldehydes:

1129 butyraldehyde,
1178 2-ethylbutyraldehyde,
1275 propionaldehyde,
2045 isobutyraldehyde (isobutyl aldehyde),
2058 valeraldehydes,
2367 alphamethylvaleraldehyde,

1989 Aldehydes, n.o.s.;

Ketones:

1090 acetone,
1156 diethyl ketone,
1193 methyl ethyl ketone (ethyl methyl ketone),
1245 methyl isobutyl ketone,
1246 methyl isopropenyl ketone, inhibited,
1249 methyl propyl ketone,
2346 butanedione (diacetyl),
2397 3-methylbutan-2-one,

1224 ketones, n.o.s.;

Esters:

1123 butyl acetates,
1128 n-butyl formate,
1161 dimethyl carbonate,
1173 ethyl acetate,
1176 ethyl borate,
1190 ethyl formate,
1195 ethyl propionate,
1213 isobutyl acetate,
1220 isopropyl acetate,
1231 methyl acetate,
1237 methyl butyrate,
1247 methyl methacrylate monomer, inhibited,
1248 methyl propionate,
1276 n-propyl acetate,
1281 propyl formates,
1301 vinyl acetate, inhibited,
1862 ethyl crotonate,
1917 ethyl acrylate, inhibited,
1919 methyl acrylate, inhibited,
2277 ethyl methacrylate,
2385 ethyl isobutyrate,
2393 isobutyl formate,
2394 isobutyl propionate,
2400 methyl isovalerate,
2403 isopropenyl acetate,
2406 isopropyl isobutyrate,
2409 isopropyl propionate,

301 *(cont'd)*

2416 trimethyl borate,
2616 triisopropyl borate,
2838 vinyl butyrate, inhibited,

3272 esters, n.o.s.;

Substances containing sulphur:

1111 amyl mercaptans,
2347 butyl mercaptans,
2375 diethyl sulphide,
2381 dimethyl disulphide,
2402 propanethiols (propyl mercaptans),
2412 tetrahydrotiophene (thiolanne),
2414 thiophene,
2436 thioacetic acid;

Substances containing nitrogen:

1113 amyl nitrites,
1222 isopropyl nitrate,
1261 nitromethane,
1282 pyridine,
1648 acetonitrile (methyl cyanide),
1865 n-propyl nitrate,
2351 butyl nitrites,
2372 1,2-di-(dimethylamino) ethane (tetramethylethylenediamine),
2410 1,2,3,6-tetrahydropyridine;

Other flammable substances and mixtures and preparations containing flammable liquids:
1091 acetone oils,
1201 fusel oil,
1293 tinctures, medicinal
1308 zirconium suspended in a flammable liquid,
2380 dimethyldiethoxysilane,

1993 flammable liquid, n.o.s.

Note: For viscous substances, mixtures and preparations, see item 5.

4. Solutions of nitrocellulose in mixtures of substances of items 1 to 3 containing more than 20% but not more than 55% nitrocellulose with a nitrogen content not exceeding 12,6% (by dry mass):

(a) *2059 nitrocellulose solution, flammable;*

(b) *2059 nitrocellulose solution, flammable.*

Note: 1. Mixtures having a flash-point below 23°C and containing more than 55% nitrocellulose, with a nitrogen content above 12,6% (by dry mass), are substances of Class 1, (see marg. 101, item 4, identification number 0340, or item 26, identification number 0342), or of Class 4.1 (see marg. 401, item 24).

2. Mixtures containing 20% or less nitrocellulose with a nitrogen content not exceeding 12,6% (by dry mass) are substances of item 5.

5. Liquid or viscous mixtures or preparations, including those containing 20% or less nitrocellulose with a nitrogen content not exceeding 12,6% (by dry mass):

(a) having a boiling point or initial boiling point not exceeding 35°C provided that they do not come under (c):

1133 adhesives,
1139 coating solution, (includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining),
1169 extracts, aromatic, liquid,

301 *(cont'd)*

1197 extracts, flavouring, liquid,
1210 printing ink,
1263 paint (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base),
1263 paint related material (including paint thinning or reducing compound),
1266 perfumery prodcuts,
1286 rosin oil,
1287 rubber solution,
1866 resin solution;

(b) having a boiling point or initial boiling point exceeding 35°C provided that they do not come under (c):

1133 adhesives,
1139 coating solution (includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining),
1169 extracts, aromatic, liquid,
1197 extracts, flavouring, liquid,
1210 printing ink,
1263 paint (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filter and liquid lacquer base),
1263 paint related material (including paint thinning or reducing compound),
1266 perfumery products,
1286 rosin oil,
1287 rubber solution,
1306 wood preservatives,
1866 resin solution,
1999 tars liquid including road asphalt and oils, bitumen and cut backs,
3269 polyester resin kit;

(c) *1133 adhesives,*
1139 coating solution (includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining),
1169 extracts, aromatic, liquid,
1197 extracts, flavouring, liquid,
1210 printing ink,
1263 paint (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base),
1263 paint related material (including paint thinning or reducing compound),
1266 perfumery products,
1286 rosin oil,
1287 rubber solution,
1306 wood preservatives,
1866 resin solutin,
1999 tars liquid including road asphalt and oils, bitumen and cut backs,
3269 polyester resin kit,
1993 flammable liquid, n.o.s.

Classification under (c) is only possible if the following requirements are met:

1. that the height of the separated layer of solvent is less than 3% of the total height in the solvent-separation test; [1] and

[1] *Solvent-separation test:* This test is carried out at 23°C using a 100 ml graduated measuring cylinder of the stoppered type of approximately 25 cm total height and of a uniform internal diameter of approximately 3 cm over the calibrated section. The substance should be stirred to obtain a uniform consistency and poured into the measuring cylinder up the 100 ml mark. The stopper should be inserted and the cylinder left standing undisturbed for 24 hours. After 24 hours the height of the upper separated layer should be measured and the layer's height as a percentage of the total height of the sample should be calculated.

301 *(cont'd)*

2. that the viscosity [1] and flash-point are in accordance with the following table:

Kinematic viscosity (extrapolated) (at near-zero shear rate) mm^2/s at 23 °C	Flow time t in accordance with ISO 2431:1984		Flash-point in °C
	in s	Jet diameter in mm	
$20 < \nu \leq 80$	$20 < t \leq 60$	4	above 17
$80 < \nu \leq 135$	$60 < t \leq 100$	4	above 10
$135 < \nu \leq 220$	$20 < t \leq 32$	6	above 5
$220 < \nu \leq 300$	$32 < t \leq 44$	6	above – 1
$300 < \nu \leq 700$	$44 < t \leq 100$	6	above – 5
$700 < \nu$	$100 < t$	6	– 5 and below

Note: 1. Mixtures containing more than 20% but not more than 55% nitrocellulose with a nitrogen content not exceeding 12,6% by dry mass are substances of item 4.

Mixtures having a flash-point below 23 °C and containing:

— more than 55% nitrocellulose, whatever their nitrogen content; or

— not more than 55% nitrocellulose with a nitrogen content above 12,6% by dry mass, are substances of Class 1 (see marg. 101 item 4, identification number 0340, or item 22, identification number 0342) or of Class 4.1 (see marg. 401, item 24).

2. No substance of this Directive listed by name under other entries may be carried under the entry 1263 Paint or 1263 Paint related material. Substances carried under identification number 1263 may contain not more than 20% nitrocellulose provided that the nitrogen content does not exceed 12,6% by dry mass.

3. 3269 polyester resin kits have two components: a basic product (Class 3, group (b) or (c)) and an activator (organic peroxide), each packed separately in an inner packaging. The organic peroxide shall be of types D, E or F, not requiring temperature control and restricted to 125 ml liquid and 500 g solid per inner packaging. The components may be placed in the same outer packaging, provided that they do not react dangerously with each other in the event of leakage.

4. 1139 coating solution also includes surface treatments or coatings used for industrial or other purposes, such as vehicle under-coating, drum or barrel lining.

6. *3064 nitroglycerin solution in alcohol* with more than 1% but not more than 5% nitroglycerin.

Note: Special packing conditions are applicable for this substance (see marg. 303); see also Class 1, marg. 101, item 4, identification number 0144.

7. (b) *1204 nitroglycerin solution in alcohol with not more than 1% nitroglycerin.*

B. Substances having a flash-point below 23°C and toxic

Note: 1. Liquids which are highly toxic on inhalation, having a flash-point below 23°C (see marg. 601, items 1 to 10) and toxic substances having a flash-point equal to or greater than 23°C are substances of Class 6.1.

2. For toxicity criteria, see marg. 600(3).

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[1] *Viscosity determination:* Where the substance concerned is non-Newtonian, or where a flow cup method of viscosity determination is otherwise unsuitable, a variable shear-rate viscometer should be used to determine the coefficient of dynamic viscosity of the substance, at 23°C, at a number of shear rates, the values obtained are plotted against shear rate and then extrapolated to zero shear rate. The dynamic viscosity thus obtained, divided by the density, gives the apparent kinematic viscosity at near-zero shear rate.

301 *(cont'd)*

11. Nitriles or isonitriles (isocyanides):

(a) *1093 acrylonitrile, inhibited,*
3079 methacrylonitrile, inhibited,
3273 nitriles, flammable, toxic, n.o.s.;

(b) *2284 isobutyronitrile,*
2378 2-dimethyl-aminoacetonitrile,
2404 propionitrile,
2411 butyronitrile,
3273 nitriles, flammable, toxic, n.o.s.

12. *1921 propyleneimine, inhibited.*

Note: Special packing conditions are applicable for this substance (see marg. 304).

13. *2481 ethyl isocyanate.*

Note: Special packing conditions are applicable for this substance (see marg. 304).

14. Other isocyanates:

(a) *2483 isopropyl isocyanate,*
2605 methoxymethyl isocyanate;

(b) *2486 isobutyl isocyanate,*
2478 isocyanates, flammable, toxic, n.o.s. or
2478 isocyanate solution, flammable, toxic, n.o.s.

Note: Solutions of isocyanates having a flash-point 23°C or above are substances of Class 6.1. items 18 or 19.

15. Other substances containing nitrogen:

(a) *1194 ethyl nitrite, solution*

16. Halogenated organic substances:

(a) *1099 allyl bromide,*
1100 allyl chloride,
1991 chloroprene, inhibited;

(b) *1184 ethylene dichloride* (1,2-dichloroethane),
2354 chloromethyl ethyl ether.

17. Oxygenated organic substances:

(a) *2336 allyl formate,*
2983 ethylene oxide and propylene oxide mixture, not more than 30% ethylene oxide,
1986 alcohols, flammable, toxic, n.o.s.,
1988 aldehydes, flammable, toxic, n.o.s.;

(b) *1230 methanol,*
2333 allyl acetate,
2335 allyl ethyl ether,
2360 diallyl ether,
2396 methacrylaldehyde, inhibited,
2622 glycidaldehyde,
1986 alcohols, flammable, toxic, n.o.s.,
1988 aldehydes, flammable, toxic, n.o.s.

18. Organic substances containing sulphur:

(a) *1131 carbon disulphide;*

(b) *1228 mercaptans, liquid, flammable, toxic, n.o.s.,*
1228 mercaptan mixture, liquid, flammable, toxic, n.o.s.

301 *(cont'd)*

19. Substances, solutions and mixtures (such as preparations and wastes), having a flash-point below 23°C and toxic which cannot be classified under other collective headings:

(a) *1992 flammable liquid, toxic, n.o.s.;*

(b) *2603 cycloheptatriene,*

3248 medicine, liquid, flammable, toxic, n.o.s.,
1992 flammable liquid, toxic, n.o.s.

Note: Pharmaceutical products ready for use, e.g. cosmetics, drugs and medicines, which are substances manufactured and packed in packagings of a type intended for retail sale or distribution for personal or household consumption, which would otherwise be substances of item 19(b), are not subject to the requirements of this Directive.

C. Substances having a flash-point below 23°C and corrosive

Note: 1. Corrosive liquids having a flash-point of 23°C or above are substances of Class 8 (see marg. 801).

2. Certain flammable corrosive liquids having a flash-point below 23°C and a boiling point above 35°C are substances of Class I [see marg. 800(7)(a)].

3. For corrosivity criteria, see marg. 800(3).

21. Chlorosilanes:

(a) *1250 methyltrichlorosilane,*
1305 vinyltrichlorosilane, inhibited;

(b) *1162 dimethyldichlorosilane,*
1196 ethyltrichlorosilane,
1298 trimethylchlorosilane,

2985 chlorosilanes, flammable, corrosive, n.o.s.

Note: Chlorosilanes which emit flammable gases on contact with water are substances of Class 4.3 [see marg. 471, item 1 (a)].

22. Amines and their solutions:

(a) *1221 isopropylamine,*
1297 trimethylamine, aqueous solution containing 30% to 50% trimethylamine (by mass),

2733 amines, flammable, corrosive, n.o.s. or
2733 polyamines, flammable, corrosive, n.o.s.;

(b) 1106 amylamines,
1125 n-butylamine,
1154 diethylamine,
1158 diisopropylamine,
1160 dimethylamine, aqueous solution,
1214 isobutylamine,
1235 methylamine, aqueous solution,
1277 propylamine,
1296 triethylamine,
1297 trimethylamine, aqueous solution with not more than 30% trimethylamine by mass,
2266 diethyl-N-propylamine,
2270 ethylamine, aqueous with not less than 50% but not more than 70% ethylamine (by mass),
2379 1, 3 dimethyl-butylamine,
2383 dipropylamine,
2945 N-methylbutylamine,

2733 amines, flammable, corrosiv, n.o.s. or
2733 polyamines, flammable, corrosive, n.o.s.

Note: 1032 Dimethylamine anhydrous, 1036 ethylamine, 1061 methylamine, anhydrous and 1083 trimethylamine, anhydrous are substances of Class 2 (see marg. 201, item 2F).

301 *(cont'd)*

23. Other substances containing nitrogen:

(b) *1922 pyrrolidine,*
2386 1-ethylpiperidine,
2399 1-methylpiperidine,
2401 piperidine,
2493 hexamethyleneimine,
2535 4-methylmorpholine (n-methylmorpholine).

24. Solutions of alcoholates:

(b) *1289 sodium methylate solution* in alcohol,
3274 alcoholates solution, n.o.s. in alcohol.

25. Other halogenated corrosive substances:

(b) *1717 acetyl chloride,*
1723 allyl iodide,
1815 propionyl chloride,
2353 butyryl chloride,
2395 isobutyryl chloride.

26. Substances, solutions and mixtures (such as preparations and wastes) having a flash-point below 23°C and highly corrosive, corrosive or slightly corrosive which cannot be classified under other collective headings:

(a) *2924 flammable liquid, corrosive, n.o.s.;*

(b) *2924 flammable liquid, corrosive, n.o.s.*

D. Substances having a flash-point below 23°C, toxic and corrosive and articles containing those substances

27. (a) *3286 flammable liquid, toxic, corrosive, n.o.s.;*

(b) *2359 diallylamine,*
3286 flammable liquid, toxic, corrosive, n.o.s.

28. *3165 Aircraft hydraulic power unit fuel tank* containing a mixture of anhydrous hydrazine and methylhydrazine.

Note: Special packing conditions are applicable for these tanks (see marg. 309).

E. Substances having a flash-point between 23°C and 61°C inclusive which might be slightly toxic or corrosive

Note: Non-toxic and non-corrosive solutions and homogeneous mixtures having a flash-point of 23°C or above (viscous substances, such as paints or varnishes, excluding substances containing more than 20% nitrocellulose) packed in receptacles of less than 450 litres capacity, shall not be subject to the requirements of this Directive if, in the solvent-separation test, as described in footnote [1] to item 3, the height of the separated layer of solvent is less than 3% of the total height, and if the substances, at 23°C have, in the flow cup conforming to ISO 2431:1894 having a jet 6 mm in diameter, a flow time of:

(a) not less than 60 seconds, or

(b) not less than 40 seconds and contain not more than 60% of substances of Class 3.

31. Substances, solutions and mixtures (such as preparations and wastes) having a flash point between 23 °C and 61 °C inclusive, not slightly toxic and not slightly corrosives:

c) *1202 diesel fuel* or
1202 gas oil or
1202 heating oil, (light)

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[1] *Solvent-separation test:* This test is carried out at 23°C using a 100 ml graduated measuring cylinder of the stoppered type of approximately 25 cm total height and of a uniform internal diameter of approximately 3 cm over the calibrated section. The substance should be stirred to obtain a uniform consistency and poured into the measuring cylinder up the 100 ml mark. The stopper should be inserted and the cylinder left standing undisturbed for 24 hours. After 24 hours the height of the upper separated layer should be measured and the layer's height as a percentage of the total height of the sample should be calculated.

301 *(cont'd)*

1223 kerosene
1267 petroleum crude oil
1863 fuel, aviation, turbine engine

1268 petroleum distillates, n.o.s. or
1268 petroleum products, n.o.s.

Note: By derogation from marg. 300(2), diesel fuel, gas oil and heating oil, light, having a flash-point above 61 °C shall be deemed substances of item 31 (c), substance identification number 1202.

Hydrocarbons:

1136 coal tar distillates
1147 decahydronaphthalene (decalin)
1288 shale oil
1299 turpentine
*1300 turpentine substitute (*white spirit)
1307 xylenes (m-xylene), (p-xylene), (dimethylbenzene)
*1918 isopropylbenzene (*cumene)
1920 nonanes
1999 tars, liquid, including road asphalt and oils, bitumen and cut backs
2046 cymenes (o-, m-, p-) (methyl isopropyl benzene)
2048 dicyclopentadiene
2049 diethyl benzenes (o-, m-, p-)
2052 dipentene (limonene)
2055 styrene monomer, inhibited (vinylbenzene monomer inhibited)
2057 tripropylene (propylene trimer)
2247 n-decane
2286 pentamethylheptane (isododecane)
2303 isopropenylbenzene
2324 triisobutylene
2325 1, 3, 5-trimethylbenzene (mesitylene)
2330 undecane
2364 n-propyl benzene
2368 alpha-pinene
2520 cyclooctadienes
2541 terpinolene
2618 vinyltoluenes, inhibited (o-, m-, p-)
2709 butylbenzenes
2850 propylene tetramer (tetrapropylene)

2319 terpene hydrocarbons, n.o.s.
3295 hydrocarbons, liquid, n.o.s.

Halogenated substances:

1134 chlorobenzene (phenyl chloride)
1152 dichloropentanes
2047 dichloropropenes
2234 chlorobenzotrifluorides (o-, m-, p-)
2238 chlorotoluenes (o-, m-, p-)
2341 1-bromo-3-methylbutane
2392 iodopropanes
2514 bromo-benzene.

Alcohols:

1105 amyl alcohols
1120 butanols
1148 diacetone alcohol, chemically pure
1170 ethanol solution (ethyl alcohol, solution) containing more than 24 % but not more than 70 % alcohol by volume,
1171 ethylene glycol monoethyl ether (2-ethoxyethanol)
1188 ethylene glycol monomethyl ether (2-methoxyethanol)
1212 isobutanol (isobutyl alcohol)
1274 n-pRopanol (propyl alcohol, normal)

301 *(cont'd)*

2053 methyl isobutyl carbinol (methyl amyl alcohol)
2244 cyclopentanol
2275 2-ethylbutanol
2282 hexanols
2560 2-methylpentan-2-ol
2614 methylallyl alcohol
2617 methylcyclohexanol, flammable
3065 alcoholic beverages containing between 24 % and 70 % alcohol by volume
3092 1-methoxy-2-propanol

1987 alcohols, n.o.s.

Note: 1. Aqueous solutions of ethyl alcohol and alcoholic beverages containing not more than 24 % alcohol by volume are not subject to the requirements of this Directive.

2. Alcoholic beverages containing more than 24 % but not more than 70 % alcohol by volume are subject to the requirements of this Directive only if carried in receptacles with a capacity of more than 250 litres or in tank wagons or in tank-containers.

Ethers:

1149 dibutyl ethers
1153 ethylene glycol diethyl ether (1, 2-diethoxyethane)
2219 allyl glycidyl ether
2222 anisole (phenyl methyl ether)
2707 dimethyldioxanes
2752 1,2-epoxy-3-ethoxypropane

3271 ethers, n.o.s.

Aldehydes:

1191 octylaldehydes, flammable (ethyl hexaldehydes), (2-ethylhexaldehyde), (3-ethylhexaldehyde), (octyl aldehyde)
1207 hexaldehyde
1264 paraldehyde
2498 1, 2, 3, 6-tetrahydrobenzaldehyde
2607 acrolein, dimer, stabilizied
3056 n-heptaldehyde

1989 aldehydes, n.o.s.

Ketones:

1110 n-amyl methyl ketone
1157 diisobutyl ketone
1229 mesityl oxide
1915 cyclohexanone
2245 cyclopentanone
2271 ethyl amyl ketones
2293 4-methoxy-4-methylpentan-2-one
2297 methylcyclohexanone
2302 5-methylhexan-2-one
2621 acetyl methyl carbinol
2710 dipropyl ketone

1224 ketones, n.o.s.

Esters:

1104 amyl acetates
1109 amyl formates
1123 butyl acetates
1172 ethylene glycol monoethyl ether acetate (2-ethoxyethyl acetate)
1177 ethylbutyl acetate
1180 ethyl butyrate
1189 ethylene glycol monomethyl ether acetate
1192 ethyl lactate
1233 methylamyl acetate
1292 tetraethyl silicate
1914 butyl propionates
2227 n-butyl methacrylate, inhibited
2243 cyclohexyl acetate

301 *(cont'd)*

2283 isobutyl methacrylate, inhibited
2323 triethyl phosphite
2329 trimethyl phosphite
2348 butyl acrylates, inhibited
2366 diethyl carbonate (ethyl carbonate)
2405 isopropyl butyrate
2413 tetrapropyl orthotitanate
2524 ethyl orthoformate
2527 isobutyl acrylate, inhibited
2528 isobutyl isobutyrate
2616 triisopropyl borate
2620 amyl butyrates
2933 methyl-2-chloropropionate
2934 isopropyl-2-chloropropionate
2935 ethyl-2-chloropropionate
2947 isopropyl chloroacetate

3272 esters, n.o.s.

Substances containing nitrogen:

1112 amyl nitrates
2054 morpholine
2265 N,N-dimethylformamide
2313 picolines (methylpyridines)
2332 acetaldehyde oxime
2351 butyl nitrites
2608 nitropropanes
2840 butyraldoxime
2842 nitroethane
2943 tetrahydrofurfurylamine.

Substances containing sulphur:

3054 cyclohexyl mercaptan.

Other flammable substances, mixtures and preparations containing flammable liquids:

1130 camphor oil
1133 adhesives
1139 coating solution (includes surface treatments or coating used for industrial or other purposes such as vehicle undercoating, drum or barrel lining)
1169 extracts, aromatic, liquid
1197 extracts, flavouring, liquid
1201 fusel oil
1210 printing ink
1263 paint (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or
1263 paint related material (including paint thinning or reducing compound)
1266 perfumery products
1272 pine oil
1286 rosin oil
1287 rubber solution
1293 tinctures, medicinal
1306 wood preservatives, flammable, liquid
1308 zirconium suspended in a flammable liquid
1866 resin solution
3269 polyester resin kits

1993 flammable liquid, n.o.s.

Note: 1. Mixtures containing more than 20 % but not more than 55 % nitrocellulose with a nitrogen content not exceeding 12,6 % (by dry mass) are substances of item 34 (c).

2. For 3269 polyester resin kits, see item 5, Note 3

3. 1139 coating solution also include surface treatments or coating used for industrial or other purposes, such as vehicle under coating, drum or barrel lining.

301 *(cont'd)*

32. Substances, solutions and mixtures (such as preparations and wastes) having a flash-point between 23 °C and 61 °C inclusive, slightly toxic:

c) *2841 di-n-amylamine*
2310 pentane-2, 4-dione

1228 mercaptans, liquid, flammable, toxic, n.o.s. or
1228 mercaptan mixtures, liquid, flammable, toxic, n.o.s.
1986 alcohols, flammable, toxic, n.o.s.
1988 aldehydes, flammable, toxic, n.o.s.
2478 isocyanates, flammable toxic, n.o.s. or
2478 isocyanate solution, flammable, toxic, n.o.s.
3248 medecine, liquid, flammable, toxic, n.o.s
1992 flammable liquid toxic, n.o.s.

Note: Pharmaceutical products ready for use, e.g. cosmetics, drugs and medicines, which are substances manufactured and packed in packagings of a type intended for retail sale or distribution for personal or household consumption, which would otherwise be substances of item 32 (c) are not subject to the requirements of this Directive.

33. Substances, solutions and mixtures (such as preparations and wastes) having a flash-point between 23 °C and 61 °C inclusive, slightly corrosive:

c) *1106 amylamine*
1198 formaldehyde solution, flammable
1289 sodium methylate, solution in alcohol
1297 trimethylamine, aqueous solution (not more than 30 % trimethylamine, by mass)
2260 tripropylamine
2276 2-ethylhexylamine
2361 diisobutylamine
2526 furfurylamine
2529 isobutyric acid
2530 isobutyric anhydride
2610 triallylamine
2684 diethylaminopropylamine

2733 amines, flammable, corrosive, n.o.s. or
2733 polyamines, flammable, corrosive, n.o.s.
2924 flammable liquid, corrosive, n.o.s.

34. Solution of nitrocellulose in mixtures of substances of item 31 (c) containing more than 20 % but not more than 55 % nitrocellulose with a nitrogen content not exceeding 12,6 % (by dry mass):

c) *2059 Nitrocellulose solution, flammable*

Note: Mixtures

— containing more than 55 % nitrocellulose, wathever its nitrogen content, or

— containing not more than 55 % nitrocellulose with a nitrogen content above 12,6 % (by dry mass),

are substances of Class 1 (see marg. 101 item 4, identification number 0340 or item 26, identification number 0342) or of Class 4.1 (see marg. 401, item 24).

F. Substances and preparations used as pesticides having a flash-point below 23 °C

Note: 1. Flammable liquids and preparations used as pesticides, which are highly toxic, toxic or slightly toxic and have a flash-point of 23 °C or above are substances of Class 6.1 (see marg. 601, items 71 to 73).

2. The table in marg. 601, items 71 tot 73, contains a list of common pesticides and a reference to the identification numbers assigned to names that are relevant to the generic chemical group (e.g. organophosphorus pesticides) to which the particular pesticide belongs. The description used in the carriage of the pesticide shall include the name selected from those referenced on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks it may exhibit, supplemented by the indication of the active ingredient.

301 *(cont'd)*

3. Substances and preparations used as pesticides listed under item 41 shall be classified under letter (a) or (b) according to their boiling point and their degree of toxicity. The classification into 'highly toxic', 'toxic' and 'slightly toxic' of all active substances and their preparations used as pesticides shall be effected in accordance with marg. 600(3).

41. Pesticides, liquid, flammable, toxic, flash-point less than 23 °C. Under this item, substances and preparations used as pesticides listed below shall be classified under letters (a) and (b) below:

(a) having a boiling point or initial boiling point not exceeding 35 °C and/or highly toxic;

(b) having a boiling point or initial boiling point exceeding 35 °C and toxic or slightly toxic.

2758 carbamate pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2760 arsenical pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2762 organochlorine pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2764 triazine pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2766 phenoxy pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2768 phenyl urea pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2770 benzoic derivative pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2772 dithiocarbamate pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2774 phthalimid derivative pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2776 copper based pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2778 mercury based pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2780 substituted nitrophenol pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2782 bipyridilium pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2784 organophosphorus pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
2787 organotin pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
3024 coumarin pesticide, liquid, flammable, toxic, flash-point less than 23 °C;
3021 pesticide, liquid, flammable, toxic, flash-point less than 23 °C.

G. Substances having a flash-point above 61 °C which are carried or handed over for carriage at or above their flash-point

61. (c) *3256 Elevated temperature liquid, flammable, n.o.s.* with a flash-point above 61 °C, at or above its flash-point.

Note: 3257 elevated temperature liquid, n.o.s., at or above 100 °C and, for a substance with a flash-point, below its flash-point (including molten metals and molten salts etc.) is a substance of Class 9 [see marg. 901, item 20 (c)].

H. Empty packagings

71. *Empty packagings* including *empty intermediate bulk containers (IBCs), empty tank wagons, empty tank-containers,* uncleaned, having contained substances of Class 3.

Note: Uncleaned, empty packagings, including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the requirements of this Directive if adequate measures have been taken to nullify any hazard. Hazards are nullified if adequate measures have been taken to nullify all hazards of classes 1 to 9.

301a Substances of items 1 to 5, 21 to 26 and 31 to 34 and slightly toxic substances of items 41 carried in conformity with the following requirements are not subject to the requirements of section 2 'Conditions of Carriage', except in the cases described in paragraph (3).

(1) (a) Substances classified under (a) of each item: not more than 500 ml per inner packaging and not more than 1 litre per package;

(b) Substances classified under (b) of each item except item 5 (b) and alcoholic beverages of item 3 (b): not more than 3 litres per inner packaging and not more than 12 litres per package;

301a *(cont'd)*

(c) alcoholic beverages of item 3 (b): not more than 5 litres per inner packaging;

(d) Substances classified under items 5 (b): not more than 5 litres per inner packaging and not more than 20 litres per package;

(e) Substances classified under (c) of each item: not more than 5 litres per inner packaging and not more than 45 litres per package.

These quantities of substances shall be carried in combination packagings conforming at least to the conditions of marg. 1538.

The 'General conditions of packing' of marg. 1500 (1), (2) and (5) to (7) shall be observed.

Note: In the case of homogeneous mixtures containing water, the quantities specified relate only to the substance of this Class contained in those mixtures.

(2) Substances classified under (b) or (c) items 2 to 5, 21 to 26, 31 to 34 and 41, contained in metal or plastics inner packagings and carried in shrink-wrapped or stretch-wrapped trays as outer packagings in conformity with the following requirements:

(a) Substances classified under (b) of each item, except item 5(b) and alcoholic beverages of item 3(b): not more than 1 litre per metal inner packaging or 500 ml per plastics inner packaging, and not more than 12 litres per package;

(b) Alcoholic beverages of item 3(b): not more than 1 litre per metal inner packaging or 500 ml per plastic inner packaging;

(c) Substances classified under item 5(b): not more than 1 litre per metal inner packaging or 500 ml per plastics inner packaging and not more than 5 litres per package;

(d) Substances classified under (c) of eacht item: not more than 5 litres per inner packaging.

The total gross mass of the package shall not exceed 20 kg in any case.

The 'General conditions of packaging' of marg. 1500 (1), (2) and (5) to (7) shall be observed.

Note: In the case of homogeneous mixtures containing water, the quantities specified relate only to the substances of this Class contained in those mixtures.

(3) For carriage in accordance with paragraphs (1) and (2) above, the description of the goods in the consignment note shall conform to the requirements of marg. 314 and include the words '*limited quantity*'. Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

(4) Alcoholic beverages of item 31 (c) in packagings containing not more than 250 litres.

(5) The motor-fuel contained in the tanks of transport vehicles for their propulsion or the operation of their specialized equipment (refrigerators, for example). The fuel cocks between the engine and the fuel tank of motor cycles and motor-assisted pedal cycles whose tanks contain fuel, must be closed during carriage; in addition, these motor cycles and motor-assisted pedal cycles shall be loaded upright and secured against falling.

2. Conditions of carriage

(The conditions of carriage for empty packagings are set out under F.)

A. Packages

1. General conditions of packing

302 (1) Packagings shall satisfy the conditions of Appendix V, unless special conditions are prescribed in Section A.2 for the packing of certain substances.

(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix VI.

302 *(cont'd)*

(3) In accordance with the requirements of marg. 300 (3) and 1511 (2) or 1611 (2) the following shall be used:

— Packagings of packing group I, marked with the letter 'X', for the very dangerous substances classified under (a) of each item;

— Packagings of packing group II or I, marked with the letter 'Y', or 'X', or IBCs of packing group II, marked with the letter 'Y', for the dangerous substances classified under (b) of each item;

— Packagings of packing group III, II or I, marked with the letter 'Z', 'Y' or 'X', or IBCs of packing group III or II, marked with the letter 'Z' or 'Y', for the less dangerous substances classified under (c) of each item.

Note: For the carriage of substances of Class 3 in tank wagons, see Appendix XI, in tank-containers see Appendix X.

2. Special conditions of packing

303 Nitroglycerin, solution in alcohol, of item 6 shall be packed in metal cans of not more than 1 litre capacity each, overpacked in a wooden box capable of containing not more than 5 litres of solution. Metal cans shall be completely surrounded with absorbent cushioning material. Wooden boxes shall be completely lined with suitable material imprevious to water and nitroglycerin.

Packages of this kind shall satisfy the test requirements for combination packagings in accordance with Appendix V for packing group II.

304 (1) Propyleneimine of item 12 shall be packed in:

(a) steel receptacles of sufficient thickness, which shall be closed by a screw-threaded bung or plug rendered leakproof both to liquid and to vapour by means of a suitable gasket. The receptacles shall initially and periodically, at least every five years, be tested at a pressure of not less than 0,3 MPa (3 bar) gauge pressure in accordance with marg. 215 to 217. Each receptacle shall be secured by absorbent cushioning materials in a strong leakproof protective metal packaging. The protective packaging shall be hermetically closed and its closure shall be secured against any inadvertent opening. The mass of the contents shall not exceed 0,67 kg per litre of capacity. A package shall not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or

(b) steel receptacles of sufficient thickness, which shall be closed by a screw-threaded bung and a screw-threaded protective cap or equivalent device leakproof both to liquid and to vapour. The receptacles shall initially and periodically, at least every five years, be tested at a pressure of at least 1 MPa (10 bar) gauge pressure in accordance with marg. 215 to 217. The mass of the contents shall not exceed 0,67 kg per litre of capacity. A package shall not weigh more than 75 kg.

(c) receptacles in conformity with (a) and (b) shall bear, in clearly legible and durable characters:

— the name or mark of the manufacturer and the number of the receptacle. The word 'propyleneimine';

— the tare of the receptacle and its maximum permitted mass when filled;

— the date (month and year) of the initial test and of the most recent test undergone;

— the stamp of the expert who carried out the tests and examinations.

(2) Ethyl isocyanate of item 13 shall be packed in:

(a) hermetically closed receptacles made of pure aluminium and having a capacity not exceeding 1 litre, which shall not be filled beyond 90 % of their capacity. The receptacles shall be secured, not more than 10 in a box, with appropriate cushioning material in a wooden box. Packages of this kind shall satisfy the test requirements for combination packagings conforming to marg. 1538 for packing group I, and shall not weigh more than 30 kg; or

304 *(cont'd)*

(b) receptacles made of pure aluminium having a wall thickness of not less than 5 mm or in receptacles of stainless steel. The receptacles shall be fully welded and shall initially and periodically, at least every five years, be tested at a pressure of at least 0,5 MPa (5 bar) gauge pressure in accordance with marg. 215 to 217. They shall be so closed as to be leakproof by means of two closures one above the other, one of which shall be screw-threaded or secured in an equally effective manner. The degree of filling shall be not more than 90 %.

Drums weighing more than 100 kg shall be fitted with rolling hoops or stiffening ribs;

(c) receptacles in conformity with (b) shall bear, in clearly legible and durable characters;

— the name or mark of the manufacturer and the number of the receptacle.

— the words 'ethyl isocyanate';

— the tare of the receptacle and its maximum permitted mass when filled;

— the date (month and year) of the initial test and the most recent test undergone;

— the stamp of the expert who carried out the test and examinations.

305 Substances classified under (a) of the various items of marg. 301 shall be packed in:

(a) non-removable head steel drums conforming to marg. 1520; or

(b) non-removable head aluminium drums conforming to marg. 1521; or

(c) non-removable head steel or aluminium jerricans conforming to marg. 1522; or

(d) non-removable head plastics drums of a capacity not exceeding 60 litres or non-removable head plastics jerricans conforming to marg. 1526; or

(e) composite packagings (plastics material) conforming to marg. 1537; or

(f) combination packagings with inner packagings of glass, plastics material or metal conforming to marg. 1538.

306 (1) Substances classified under (b) of the various items of marg. 301 shall be packed in:

(a) steel drums conforming to marg. 1520; or

(b) aluminiums drums conforming to marg. 1521; or

(c) steel or aluminium jerricans conforming to marg. 1522; or

(d) plastics drums or jerricans conforming to marg. 1526; or

(e) composite packagings (plastics material) conforming to marg. 1537; or

(f) combination packagings conforming to marg. 1538.

Note: 1. to (a), (b), (c) and (d): Nitromethane of item 3 (b) shall not be carried in removable head packagings.

2. to (a), (b), (c) and (d): Simplified conditions are applicable to removable-head drums or jerricans for viscous substances having a viscosity above 200 mm^2/s at 23 °C (see marg. 1512, 1553, 1554 and 1561).

(2) Substances classified under (b) of items 3, 15, 17, 22, 24 and 25 as well as the slightly toxic substances classified under (b) of item 41 may also be packed in composite packagings (glass, porcelain or stoneware) conforming to marg. 1539.

(3) Substances classified under (b) of the various items of marg. 301 with the exception of nitromethane of item 3 (b) which have a vapour pressure at 50 °C of not more than 110 kPa (1,10 bar) may also be packed in metal IBCs conforming to marg. 1622, in rigid plastics IBCs conforming to marg. 1624 or in composite IBCs with rigid plastics inner receptacle conforming to marg. 1625.

307 (1) Substances classified under (c) of the various items of marg. 301 shall be packed in:

(a) steel drums conforming to marg. 1520; or

(b) aluminium drums conforming to marg. 1521; or

(c) steel or aluminium jerricans conforming to marg. 1522; or

(d) plastic drums or jerricans conforming to marg. 1526; or

(e) composite packagings (plastics material) conforming to marg. 1538; or

(f) combination packagings conforming to marg. 1538; or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539.

Note: to (a), (b), (c) and (d): Simplified conditions are applicable to removable-head drums and jerricans for viscous substances having a viscosity of more than 200 mm^2/s at 23 °C (see marg. 1512, 1553, 1554 and 1561).

(2) Substances classified under (c) of the various items of marg. 301 may also be packed in metal IBCs conforming to marg. 1622, in rigid plastics IBCs conforming to marg. 1624 or in composite IBCs with plastics inner receptacles conforming to marg. 1625. IBCs of Type 31 HZ2 shall be filled to at least 80 % of the volume of the outer casing.

308 (1) Ethyl alcohol and its aqueous solutions and alcoholic beverages of items 3 (b) and 31 (c) may also be packed in bung-type wooden barrels conforming to marg. 1524.

(2) Alcoholic beverages containing more than 24 % alcohol but not more than 70 % by volume, when carried as part of the manufacturing process, may be carried in wooden casks with a capacity of not more than 500 litres, deviating from the provisions of Appendix V on the following conditions:

(a) the casks shall be checked and tightened before filling;

(b) sufficient ullage (not less than 3 %) shall be left to allow for the expansion of the liquid;

(c) the casks shall be carried with the bungholes pointing upwards and,

(d) the casks shall be carried in containers meeting the requirements of the International Convention for Safe Containers (CSC) [1], as amended. Each cask shall be secured in custom-made cradles and be wedged by appropriate means to prevent them from being displaced in any way during carriage.

(3) Substances of items 3 (b), 4 (b), 5 (b) and (c), 31 (c), 32 (c), 33 (c), 34 (c) and the slightly toxic substances classified under (b) of item 41 may also be packed in light gauge metal packagings conforming to marg. 1540. Simplified conditions are applicable to removable-head light gauge metal packagings for viscous substances having a viscosity of more than 200 mm^2/s at 23 °C and for substances of item 5 (c) (see marg. 1512 and 1552 to 1554).

Note: Nitromethane of item 3 (b) shall not be carried in removable-head packagings.

(4) The following substances: *1133 adhesives, 1210 printing ink, 1263 paint, 1263 paint-related material, 1866 resin solution* and *3269 polyester resin kit* of items 5 (b), 5 (c) and 31 (c) may be carried in quantities not exceeding 5 litres in metal or plastics packagings meeting only the requirements of marg. 1500 (1), (2) and (5) to (7), provided the packagings are secured on pallets by straps, by shrink or stretch-wrapping or by other suitable means, or provided the packagings with a maximum total gross mass of 40 kg. The information in the consignment note shall conform to marg. 314 (1) and (3).

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[1] International Convention for Safe Containers (Geneva, 1972), as amended, published by the International Maritime Organization, 4, Albert Embankment, London SEI 7SR.

309 Aircraft hydraulic power unit fuel tanks of item 28 are permitted subject to either of the following conditions:

(a) the unit shall consist of an aluminium pressure vessel made from tubing and having welded heads. Primary containment of the fuel within this vessel shall consist of a welded aluminium bladder having a maximum internal volume of 46 litres. The outer vessel shall have a minimum design gauge pressure of 1 275 kPa and a minimum burst gauge pressure of 2 755 kPa. Each vessel shall be leak-checked during manufacture and before shipment and shall be found leakproof. The complete inner unit shall be securely packed in non-combustible cushioning material, such as vermiculite, in a strong outer tightly closed metal packaging which will adequately protect all fittings. Maximum quantity of fuel per unit and package is 42 litres; or

(b) the shall consist of an aluminium pressure vessel. Primary containment of the fuel within this vessel shall consist of a welded hermetically sealed fuel compartment with an elastomeric bladder having a maximum internal volume of 46 litres. The pressure vessel shall have a minimum design gauge pressure of 2 860 kPa and a minimum burst gauge pressure of 5 170 kPa. Each vessel shall be leak-checked during manufacture and before shipment and shall be found leakproof. The complete inner unit shall be securely packed in non-combustible cushioning material, such as vermiculite, in a strong outer tightly closed metal packaging which will adequately protect all fittings. Maximum quantity of fuel per unit and package is 42 litres.

310 Receptacles or IBCs, containing preparations of items 31 (c), 32 (c), and 33 (c), which give of small quantities of carbon dioxide and/or nitrogen, shall be vented, in accordance with marg. 1500 (8) or 160 (6).

3. Mixed packing

311 (1) Substances covered by the same item number may be packed together in a combination packaging conforming to marg. 1538.

(2) Substances or articles of different items of this Class in quantities not exceeding 5 litres per receptacle, may be packed together and/or with goods not subject to the requirements of this Directive in a combination packaging conforming to marg. 1538 provided the do not react dangerously with one another.

(3) Substances of items 6, 7, 12 and 13 shall not be packed with other goods.

(4) Substances classified under (a) of the various items of marg. 301 shall not be packed together with substances and articles of classes 1 and 5.2 (other than hardeners and compound systems) and material of Class 7.

(5) Except as otherwise specially provided, substances classified under (a) of the various items of marg. 301, in quantities not exceeding 0,5 litres per inner packaging and 1 litre per package, and substances classified under (b) or (c) of the various items of marg. 301, in quantities not exceeding 5 litres per inner packaging may be packed together in a combination packaging conforming to marg. 1538 with substances or articles of other classes, provided that mixed packing is also permitted for substances or articles of these classes, and/or with goods which are not subject to the requirements of this Directive, provided they do not react dangerously with one another.

(6) The following are considered dangerous reactions:

(a) combustion and/or giving off considerable heat;

(b) emission of flammable and/or toxic gases;

(c) formation of corrosive liquids;

(d) formation of unstable substances.

311 (cont'd)

(7) The requirements of marg. 8 and 302 shall be complied with.

(8) If wooden or fibreboards boxes are used, a package shall not weigh more than 100 kg.

4. Marking and danger labels on packages (see Appendix IX)

Marking

312 (1) Each package shall be clearly and durably marked with the identification number of the goods to be entered in the consignment note, prededed by the letters 'UN'.

Danger labels

(2) Packages containing substances or articles of this Class shall bear a label conforming to model No 3.

(3) Packages containing substances of items 11 to 19, 32 and 41 shall also bear a label conforming to model No 6.1.

(4) Packages containing substances or articles of items 21 to 26 and 33 shall also bear a label conforming to model No 8.

(5) Packages containing substances or articles of items 27 and 28 shall also bear a label conforming to model No 6.1 and a label conforming to model No 8.

(6) Packages containing receptacles, the closures of which are not visible from the outside and packages containing vented receptacles without outer packaging shall bear on two opposite sides a label conforming to model No 11.

B. Method of dispatch and restrictions on forwarding

313 With the exception of substances of items 6, 12, 13 and 28 and substances classified under (a) of each item, packages containing other substances of this Class may be sent as express parcels if they contain:

— not more than 6 litres per package of substances classified under (b) of each item;

— not more than 45 litres per package of substances classified under (c) of each item.

A package shall not weigh more than 50 kg.

C. Particulars in the consignment note

314 (1) The description of the goods in the consignment note shall conform to one of the identification numbers and names printed in italics in marg. 301.

If the substance is not mentioned by name, but assigned to an n.o.s. entry or a generic entry the description of the goods shall consist of the identification number and the n.o.s designation or generic entry designation, followed by the chemical or technical name of the substance [1].

The description of the goods shall be followed by *particulars of the Class, the item number, and if applicable the group (a), (b) or (c), and the initials 'RID', (e.g. '3, item 1 (a), RID').*

[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose.

314 *(cont'd)* For the carriage of substances and preparations used as pesticides of item 41, the description of the goods shall include the name of the active ingredient(s) in conformity with the nomenclature approved by ISO [1] or the table in marg. 601, items 71 to 73 or the chemical name of the active ingredient(s), e.g. '*2784 organophosphorus pesticide, liquid, flammable, toxic (Dimephos), 3, item 41(b), RID*'.

For the carriage of wastes [see marg. 3 (4)], the description of the goods shall be: '*Waste containing...*', the component(s) used for the classification of the waste under marg. 3 (3) to be entered under its/their chemical name(s) e.g. '*Waste, containing 1230 methanol, 3, item 17 (b) RID*'.

For the carriage of solutions and mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which most predominantly contribute to the danger or dangers of the solutions and mixtures.

For the carriage of solutions and mixtures containing only one component subjet to the requirements of this Directive, the words '*solution*' or '*mixture*' shall be added as part of the name in the consignment note [see marg. 3 (3)].

If a marking in accordance with Appendix VIII is prescribed, the description of the goods shall also be preceded by the *hazard identification number* in accordance with Appendix VIII.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

If a solution or mixture containing a named substance in accordance with marg. 300 (3) is not subject to the conditions of this Class, the consignor may enter in the consignment note: '*Not goods of Class 3*'.

(2) For consignments in accordance with the Note under E of marg. 301, the consignor may enter in the consignment note '*Not goods of Class 3*'.

(3) For consignments in accordance with marg. 308 (4), the consignor shall enter in the consignment note '*Carriage in accordance with marg. 308 (4)*'.

D. Transport equipment

1. Conditions relating to wagons and loading

a. For packages

315 (1) With regard to keeping apart packages bearing labels conforming to model No 6.1 from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

(2) Packages shall be so loaded in wagons that they cannot shift dangerously, overturn or fall.

In addition INCs of Type 31H22 shall only be carried in closed wagons.

316

b. Carriage in small containers

317 (1) Packages containing substances of this Class may be carried in small containers.

(2) The prohibition on mixed loading laid down in marg. 320 shall also be observed inside small containers.

(3) The requirements of marg. 324 are also applicable, by analogy, to carriage in small containers.

[1] This nomenclature is contained in standard ISO R. 1750:1981, as amended and supplemented.

2. Marking and danger labels on wagons, tank wagons, tank-containers and small containers (see Appendix IX)

318 (1) Wagons, tank wagons and tank-containers carrying substances of Class 3 shall bear on both sides a label conforming to model No 3.

(2) Wagons, tank wagons and tank-containers containing substances listed in marg. 312 (3) to (5) shall in addition bear on both sides a label in accordance with that marg.

(3) Small containers shall be labelled in accordance with marg. 312 (2) to (5).

319

E. Prohibition on mixed loading

320. Packages bearing a label conforming to model No 3 shall not be loaded in the same wagon together with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. This requirement shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

321 Separate consignment notes shall be made out of consignments which may not be loaded together in the same wagon.

F. Empty packagings

322. (1) Empty packagings, including empty IBCs, empty tank wagons and empty tank-containers, uncleaned, of item 71 shall be closed in the same way and with the same degree of leakproofness as if they were full.

(2) Empty packagings, including empty IBCs, empty tank wagons and empty tank-containers, uncleaned, of item 71 shall bear the same danger labels as if they were full.

(3) The description in the consignment note shall conform to one of the names printed in italics in item 71, followed by '*3, item 71, RID*', e.g. '*Empty packaging 3, item 71, RID*'.

A cross shall be inserted in the appropriate box on the consignment note.

For empty tank wagons or empty tank-containers, uncleaned, this description shall be completed by adding the words 'Last load', together with the hazard identification number, substance identification number, the name, item and, if applicable, group (a), (b) or (c) of the liste of substances of the goods last loaded, e.g. '*Last loaded, 33 1203 Petrol, item 3 (b)*'.

(4) With regard to keeping uncleaned, empty packages of item 71, bearing labels conforming to model No 6.1, apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

G. Other requirements

323 With regard to keeping packages bearing labels conforming to model No 6.1, apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

324 If substances contained in packages bearing labels conforming to model No 6.1 have leaked and been spilled in a wagon, the wagon not be used again until it has been thoroughly cleaned and, if necessary, decontaminated. Any other goods and articles carried in the same wagon shall be inspected for possible contamination.

325-399

CLASS 4.1

FLAMMABLE SOLIDS

1. List of substances

400 (1) Among the substances and articles covered by the heading of Class 4.1, those which are listed in marg. 401 or are covered by a collective entry in that marg. are subject to the requirements set out in marg. 400 (2) to 424 and are consequently substances and articles of this Directive.

Note: For the quantities substances listed in marg. 401, which are not subject to the requirements of the section headed 'Conditions of Carriage', see marg. 401a.

(2) The heading of Class 4.1 covers substances and articles which are not liquid according to marg. 4 (7) or which are self-reactive liquids. The following are assigned to Class 4.1:

— readily flammable solid substances and articles, and those which can be ignited by flying sparks or can cause fire through friction;

— self-reactive substances which (at normal or elevated temperatures) are liable to undergo strongly exothermal decomposition caused by excessively high carriage temperatures or by contact with impurities;

— substances related to self-reactive substances, which are distinguished from the latter by having a self-accelerating decomposition temperature (SADT) greater than 75 °C , and are liable to undergo a strongly exothermic decomposition and may, in certain packagings, meet the criteria for explosive substances of Class 1;

— explosives, which are wetted with such a quantity of water or alcohol or which contain such a quantity of plasticizing or inerting agent, that their explosive properties are neutralised.

Note: 1. Self-reactive substances and formulations of self-reactive substances are not considered to be self-reactive substances of Class 4.1 if:

— they are explosives according to the criteria of Class 1;

— they are oxidizing substances according to the assignment procedure of Class 5.1;

— they are organic peroxides according to the criteria of Class 5.2;

— their heat of decomposition is less than 300 J/g;

— their self-accelerating decomposition temperature is greater than 75 °C for a 50 kg package; or

— tests have proved that they are exempted as type G [see Manual of Tests and Criteria, Part II, paragraph 20.4.2 (g)].

2. The heat of decomposition can be determined using any internationally recognised method e.g. Differential Scanning Calorimetry and adiabatic calorimetry.

3. The self-accelerating decomposition temperature (SADT) is the lowest temperature at which self-accelerating decomposition may accur with a substance in the packaging as used during carriage. Requirements for the determination of the SADT are given in the Manual of Tests and Criteria, Part II Chapter 20 and Section 28.4.

(3) The substances and articles of Class 4.1 are subdivided as follows:

A. Solid organic flammable substances and articles

B. Solid inorganic flammable substances and articles

C. Explosive substances in non-explosive state

400 *(cont'd)*

D. Substances related to self-reactive substances

E. Self-reactive substances not requiring temperature control

F. Empty packagings

Substances and articles of Class 4.1, with the exception substances of items 5 and 15, classified under the various items of marg. 401 shall be assigned to one of the following groups designated by the letter (a), (b) or (c) according to their degree of danger:

(a) very dangerous

(b) dangerous

(c) less dangerous

All solid substances, normally wetted, which, if in the dry state, would be classified as explosives, are assigned to group (a) of the various items.

Self-reactive substances are assigned to group (b) of the various items. Related substances have been assigned to group (b) or (c).

(4) The assignment of substances and articles not specifically named to items 3 to 8 of marg. 401, as well as within these items to the groups, can be based on experience or on the results of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.2.1. Assignment to items 11 to 14, 16 and 17, as well as within these items to the groups, shall be based on the results of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.2.1; experience shall also be taken into account when it leads to a more strictly-based assignment.

(5) When substances or articles not specifically named are assigned to the items of marg. 401 on the basis of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.2.1, the following criteria apply:

(a) Readily flammable powdery, granular or pasty substances of items 1, 4, 6 to 8, 11, 12, 14, 16 and 17, shall be assigned to Class 4.1 if they can be easily ignited by brief contact with an ignition source (e.g. a burning match), or if, in the event of ignition, the flame spreads rapidly, the combustion time is less than 45 seconds for a measured distance of 100 mm or the speed of combustion is greater than 2,2 mm/s.

(b) Metal powders or powders of metal alloys of item 13 shall be assigned to Class 4.1 if they can be ignited by a flame and reaction spreads over the whole sample in 10 minutes or less.

(6) When substances and articles not specifically named are assigned to the groups of the items of marg. 401 on the basis of test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.2.1., the following criteria apply:

(a) Flammable solids of items 4, 6 to 8, 11, 12, 14, 16 and 17 which, when tested, have a combustion time of less than 45 seconds over a measured distance of 100 mm and:

(i) the flame passes the wetted zone, shall be assigned to group (b);

(ii) the wetted zone stops the flame during at least four minutes, shall be assigned to group (c);

(b) Metal powders or powders of metal alloys of item 13, in which, when tested, the reaction:

(i) spreads over the whole sample in five minutes or less, shall be assigned to group (b);

(ii) spreads over the whole sample in more than five minutes shall be assigned to group (c).

400 *(cont'd)*

(7) If substances of Class 4.1, as a result of admixtures, come into different categories of risk from those to which the substances of marg. 401 belong, these mixtures shall be assigned to the items and groups to which they belong on the basis of their actual degree of danger.

Note: For the classification of solutions and mixtures (such as preparations and wastes) see also marg. 3 (3).

(8) When substances and articles are specifically named under more than one group of the same item of marg. 401, the relevant group may be determined on the basis of the results of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.2.1. and the criteria set out in (6).

(9) On the basis of the test procedures in accordance with Manual of Tests and Criteria, Part III, section 33.2.1. and the criteria set out in (6), it may also be determined whether the nature of a specifically named substance is such that the substance is not subject to the requirements for this Class (see marg. 414).

(10) The chemically unstable substances of Class 4.1 are to be accepted for carriage only if the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end, it shall in particular be ensured that receptacles do not contain any substance liable to promote these reactions.

(11) Flammable solids, oxidizing, assigned to identification number 3097 of the UN Recommandations are not to be accepted for carriage [see, however, marg. 3 (3), footnote (1) to the table in paragraph 2.3.1].

Self-reactive substances

(12) The decomposition of self-reactive substances can be initiated by heat, contact with catalytic impurities (e.g. acids, heavy-metal compounds, bases), friction or impact. The rate of decomposition increases with temperature and varies with the substance. Decomposition, particularly if no ignition occurs, may result in the evolution of toxic gases or vapours. For certain self-reactive substances, the temperature shall be controlled. Some self-reactive substances may decompose explosively, particularly if confined. This characteristic may be modified by the addition of diluents or by the use of appropriate packagings. Some self-reactive substances burn vigorously. Self-reactive substances are, for example, some compounds of the types listed below:

aliphatic azo compounds (-C-N=N-C-);

organic azides (-C-N_3);

diazonium salts (-$CN_2^+Z^-$);

N-nitroso compounds (-N-N=O);

aromatic sulphohydrazides (-SO_2-NH-NH_2).

This list is not exhaustive and substances with other reactive groups and some mixtures of substances may have similar properties.

(13) Self-reactive substances are classified into seven types according to the degree of danger. The principles to be applied to the classification of substances not listed in marg. 401 are set out in Part II of the Manual of Tests and Criteria. The types of self-reactive substance range from type A, which is not accepted for carriage in the packaging in which it is tested, to type G, which is not subject to the provisions for self-reactive substances of Class 4.1 [see marg. 414 (5)]. The classification of types B to F is direcly related to the maximum quantity allowed in one packaging.

(14) The following self-reactive substances are not permitted for carriage:

— self-reactive substances type A [see Manual of Tests and Criteria, Part II, paragraph 20.4.2. (a)];

— self-reactive substances with a self-accelerating decomposition temperature (SADT) $\leq$ 55 °C.

400 *(cont'd)*

(15) Self-reactive substances and formulations of self-reactive substances listed in marg. 401 are assigned to collective headings:

— items 31 to 40, identification numbers 3221 to 3230.

The classifications for substances of items 31 to 40 are based on the technically pure substance (except where a concentration of less than 100 % is specified). For other concerntrations, the substance may be classified differently following the procedures in Part II of the Manual of Tests and Criteria.

The collective headings specify:

— self-reactive substances types B to F, see paragraph (13);

— physical state (liquid/solid).

(16) Classification of self-reactive substances or formulations of self-reactive substances not listed in marg. 401 and assignment to a collective heading shall be made by the competent authority of the country of origin. If the country of origin is not a Member State, the classification and the conditions of carriage shall be recognized by the competent authority of the first COTIF contracting state reached by the consignment.

(17) Activators, such as zinc compounds, may be added to some self-reactive substances to change their reactivity. Depending on both the type and the concentration of the activator, this may result in a decrease in thermal stability and a change in explosive properties. If either of these properties is altered, the new formulation shall be assessed in accordance with the classification procedure.

(18) Samples of self-reactive substances or formulations of self-reactive substances not listed in marg. 401, for which a complete set of test results is not available and which are to be carried for further testing or evaluation, shall be assigned to one of the appropriate entries for self-reactive substances type C provided the following conditions are met:

— the available data indicates that the sample would be no more dangerous than self-reactive substances type B;

— the sample is packaged in accordance with packing method OP2 and the quantity per wagon is limited to 10 kg.

Samples which require temperature control are not permitted for carriage.

(19) In order to ensure safety during carriage, self-reactive substances are in many cases desensitized by use of a diluent. Where a percentage of a substance is stipulated, this refers to the percentage by mass, rounded to the nearest whole number. If a diluent is used, the self-reactive substance shall be tested with the diluent present in the concentration and form used in carriage. Diluents which may allow a self-reactive substance to concentrate to a dangerous extent in the event of leakage from a packaging shall not be used. Any diluent shall be compatible with the self-reactive substance. In this regard, compatible diluents are those solids or liquids which have no detrimental influence on the thermal stability and hazard type of the self-reactive substance.

A. Solid organic flammable substances and articles

401

1. Substances obtained from the processing of rubber in flammable form:

   (b) *1345 rubber scrap* or *1345 rubber shoddy*, powdered or granulated.

2. Flammable articles in commercial form:

   (c) *1331 matches, 'strike anywhere'*
   1944 matches, safety (book, card or box)
   1945 matches, wax, 'vesta'
   2254 matches, fuses
   2623 firelighters, (solid), with flammable liquid.

Note: Special packing requirements are applicable for 1331 matches, 'strike anywhere' [see marg. 407 (4)].

401 *(cont'd)*

3. Articles made from weakly nitrated nitrocellulose:

(b) *3270 nitrocellulose membrane filters;*

Note: 1. The nitrogen content of the nitrocellulose shall not exceed 11,5 %. Each single filter sheet shall be packed between sheets of glazed paper. The proportion of glazed paper between the filter sheets shall be not less than 65 %, by mass. The membrane filters/paper arrangement shall not be liable to propagate a detonation as tested by one of the tests described in the Manual of Tests and Criteria, Part I, Test series 1 (a).

2. 3270 nitrocellulose membrane filters shall be packed in receptacles so constructed that explosion is not possible by reason of increased internal pressure.

(c) *1324 films, nitrocellulose base*, gelatin coated
2000 celluloid (in block, rods, rolls, sheets, tubes, etc. except scrap)
1353 fibres impregnated with weakly nitrated nitrocellulose, n.o.s. or
1353 fabrics impregnated with weakly nitrated nitrocellulose, n.o.s.

Note: 2006 plastics, nitrocellulose-based, self-heating, n.o.s., and 2002 celluloid scrap are substances of Class 4.2 (see marg. 431, item 4).

4. (c) *3175 solids* or mixtures of solids (such as preparations and wastes) *containing flammable liquid, n.o.s.,* having a flash-point up to 61 °C.

5. Organic flammable substances in the molten state:

2304 naphthalene, molten
3176 flammable solid, organic, molten, n.o.s.

Note: 1334 naphthalene, crude or refined, is a substance of item 6.

6. Organic flammable solids, non-toxic and non-corrosive, and mixtures of organic flammable solids, non-toxic and non-corrosive (such as preparations and wastes) which cannot be classified under other collective headings:

(b) *1325 flammable solid, organic, n.o.s.;*

(c) *1312 borneol*
1328 hexamethylenetetramine
1332 metaldehyde
1334 naphthalene, crude or
1334 naphthalene, refined
2213 paraformaldehyde
2538 nitronaphthalene
2717 camphor, synthetic

1325 flammable solid, organic, n.o.s.

Note: 2304 naphthalene, molten is a substance of item 5.

7. Organic flammable solids, toxic, and mixtures of organic flammable solids, toxic (such as preparations and wastes), which cannot be classified under other collective headings:

(b) *2926 flammable solid, organic, toxic, n.o.s.;*

(c) *2926 flammable solid, organic, toxic, n.o.s.*

Note: For toxicity criteria, see marg. 600 (3).

8. Organic flammable solids, corrosive, and mixtures of organic flammable solids, corrosive (such as preparations and wastes), which cannot be classified under other collective headings:

(b) *2925 flammable solid, organic, corrosive, n.o.s.;*

(c) *2925 flammable solid, organic, corrosive, n.o.s.*

Note: For corrosivity criteria, see marg. 800 (3).

B. Solid inorganic flammable substances and articles

401 *(cont'd)*

11. Inorganic non-metallic substances in flammable form:

(b) *1339 phosphorus heptasulphide* (P_4S_7) free from yellow and white phosphorus,
1341 phosphorus sesquisulphide (P_4S_3) free from yellow and white phosphorus
1343 phosphorus trisulphide (P_4S_6) free from yellow and white phosphorus
2989 lead phosphite, dibasic

3178 flammable solid, inorganic, n.o.s.;

Note: Phosphorus sulphides which are not free from yellow and white phosphorus shall not be accepted for carriage.

(c) *1338 phosphorus, amorphous*
1350 sulphur (also flowers of sulphur)
2687 dicyclohexylammonium nitrite
2989 lead phosphite, dibasic
3178 flammable solid, inorganic, n.o.s.

Note: 1. 1350 sulpur is not subject to the requirements of this Directive if the substance:

(a) is carried in quantities not exceeding 400 kg per package, or

(b) is in a special form (e.g. beads, granules, pellets or flakes).

2. 2448 sulphur, molten is a substance of item 15.

12. Flammable metal salts of organic compounds:

(b) *3181 metal salts of organic compounds, flammable, n.o.s.;*

(c) *1313 calcium resinate*
1314 calcium resinate, fused
1318 cobalt resinate, precipitated
1330 manganese resinate
2001 cobalt naphthenates, powder
2714 zinc resinate
2715 aluminium resinate

3181 metal salts of organic compounds, flammable, n.o.s.

13. Metals and metal alloys in powdered or other flammable form:

Note: 1. Ferrocerium (lighter flints), stabilized against corrosion, with a minimum iron content of 10 % is not subject to the requirements of this Directive.

2. Metals a metal alloys in powdered or other flammable form, liable to spontaneous combustion, are substances of Class 4.2 (see marg. 431, item 12).

3. Metals and metal alloys in powdered or other flammable form which, in contact with water, emit flammable gases are substances of Class 4.3 (see marg. 471, items 11 to 15).

(b) *1309 aluminium powder, coated*
1323 ferrocerium
1326 hafnium powder, wetted with not less than 25 % (mass) water
1333 cerium, slabs, ingots or rods
1352 titanium powder, wetted with not less than 25 % (mass) water
1358 zirconium powder, wetted with not less than 25 % (mass) water

3089 metal powder, flammable, n.o.s.;

Note: 1. Hafnium, titanium and zirconium powders shall contain a visible excess of water.

2. Hafnium, titanium and zirconium powders, wetted, mechanically produced, of a particle size of 53 μm and over, or chemically produced, of a particle size of 840 μm and over, are not subject to the requirements of this Directive.

401 *(cont'd)*

(c) *1309 aluminium powder, coated*
1346 silicon, powder, amorphous
1869 magnesium or
1869 magnesium alloys, pellets, turnings or ribbons
2858 zirconium, dry coiled wire, finished metal sheets, strip (thinner than 254 μm, but not thinner than 18μm)
2878 titanium sponge granules or
2878 titanium sponge powder

3089 metal powder, flammable, n.o.s.

Note: 1. Magnesium alloys with not more than 50 % magnesium are not subject to the requirements of this Directive.

2. Silicon powder in any other form is not subject to the requirements of this Directive.

3. 2009 zirconium, dry, finished sheets, strip or coiled wire, in thicknesses of less than 18 μm, is a substance of Class 4.2 [see marg. 431, item 12(c)]. Zirconium, dry, finished sheets, strip or coiled wire, in thicknesses of 254 μm or more, is not subject to the requirements of this Directive.

14. Flammable metal hydrides:

(b) *1437 zirconium hydride*
1871 titanium hydride

3182 metal hydrides, flammable, n.o.s.;

(c) *3182 metal hydrides, flammables, n.o.s.*

Note: 1. Metal hydrides which, in contact with water, emit flammable gases, are substances of Class 4.3 (see marg. 471, item 16).

2. 2870 aluminium borohydride or 2870 aluminium borohydride in devices is a substance of Class 4.2 [see marg. 431, item 17(a)].

15. The following inorganic flammable substance in molten state:

2448 sulphur, molten.

Note: 1. 1350 sulphur (solid) is a substance of item 11 (c).

2. Other inorganic flammable substances in molten form are not to be accepted for carriage.

16. Inorganic flammable solids, toxic, and mixtures of inorganic flammable solids, toxic (such as preparations and wastes), which cannot be classified under other collective headings:

(b) *1868 decaborane*

3179 flammable solid, inorganic, toxic, n.o.s.;

(c) *3179 flammable solid, inorganic, toxic, n.o.s.*

Note: For toxicity criteria, see marg. 600 (3).

17. Inorganic flammable solids, corrosive, and mixtures of inorganic flammable solids, corrosive (such as preparations and wastes), which cannot be classified under other collective headings:

(b) *3180 flammable solid, inorganic, corrosive, n.o.s.;*

(c) *3180 flammable solid, inorganic, corrosive, n.o.s.*

Note: For corrosivity criteria, see marg. 800 (3).

C. Explosive substances in the non-explosive state

401 *(cont'd)*

Note: 1. Explosive substances in the non-explosive state, other than those listed in items 21 to 25 shall not be accepted for carriage as substances of Class 4.1.

2. Nitroglycerin mixture with more than 2 % but not more than 10 % nitroglycerin, by mass desensitized, which has been assigned to identification No 3319 of the United Nations Recommendations on the Transport of Dangerous Goods, shall not be accepted for carriage as a substance of Class 4.1 unless it meets the requirements of the competent authority (see also marg. 101, item 4, identification No 0143).

3. Special packing requirements are applicable for substances of 21 to 25 (see marg. 404).

21. (a) 1. The following water-wetted explosive substances:

1310 ammonium picrate, wetted with not less thans 10 % (mass) water
1322 dinitroresorcinol, wetted with not less than 15 % (mass) water
1336 nitroguanidine (picrite), wetted with not less than 20 % (mass) water
1337 nitrostarch, wetted with not less than 20 % (mass) water
1344 trinitrophenol, wetted with not less than 30 % (mass) water
1347 silver picrate, wetted with not less than 30 % (mass) water
1349 sodium picramate, wetted with not less than 20 % (mass) water
1354 trinitrobenzene, wetted with not less than 30 % (mass) water
1355 trinitrobenzoic acid, wetted with not less than 30 % (mass) water
1356 trinitrotoluene, wetted with not less than 30 % (mass) water
1357 urea nitrate, wetted with not less than 20 % (mass) water
1517 zirconium picramate, wetted with not less than 20 % (mass) water
3317 2-amino-4,6-dinitrophenol, wetted with not less than 20 % (mass) water.

2. The following water-wetted explosive substances, provided they are carried in quantities of not more than 500 g per package:

0154 trinitrophenol (picric acid), wetted with not less than 10 % (mass) water.

Note: For trinitrophenol wetted with not less than 30 % water by mass, see under 1. above.

0155 trinitochlorobenzene (picryl choride), wetted with not less than 10 % (mass) water,

0209 trinitrotoluene (TNT), wetted with not less than 10 % (mass) water,

Note: For trinitrotoluene wetted with not less than 30 % water by mass see under 1. above.

0214 trinitrobenzene, wetted with not less than 10 % (mass) water.

Note: For trinitrobenzene wetted with not less than 30 % water by mass, see under 1. above.

0215 trinitrobenzoic acid, wetted with not less than 30 % (mass) water,

Note: For trinitrobenzoic acid, wetted with not less than 30 % water by mass, see under 1. above.

2852 dipicryl suphide, wetted with not less than 10 % (mass) water.

3. The following water-wetted explosive substance, provided that it is carried in quantities of not more than 11,5 kg per package:

0220 urea nitrate, wetted with not less than 10 % (mass) water.

Note: For urea nitrate wetted with not less than 20 % water by mass, see under 1. above.

Note: 1. Explosive substances listed under (a)1. with a water content lower than the stated limits are substances of Class 1 (see marg. 101, item 4); however, some of these substances may be carried under the conditions of Class 4.1 if they meet the conditions of (a) 2. or (a) 3.

2. Dipicryl suphide, wetted with less than 10 % (mass) water is a substance of Class 1, identification number 0401 (see marg. 101, item 4).

401 *(cont'd)*

3. Explosive substances with identification numbers 0154, 0155, 0209, 0214 or 0215 in quantities of more than 500 g per package and 0220 in quantities of more than 11,5 kg per package may be carried only under the conditions of Class 1.

4. The water shall be homogeneously distributed over the entire explosive substance. During carriage there shall not be any separation of the mixture which reduces the inerting effect.

5. Water-wetted explosives shall not be capable of being brought to detonation by the action of the standard detonator [1], and they shall not be capable of being brought to mass explosion by the effect of a powerful booster.

22. (a) 1. The following toxic, water-wetted explosives:

1320 dinitrophenol, wetted with not less than 15 % (mass) water
1321 dinitrophenolates, wetted with not less than 15 % (mass) water
1348 sodium dinitro-o-cresolate, wetted with not less than 15 % (mass) water.

2. The following toxic, water wetted explosive substance, provided that it is carried in quantities of not more than 500 g per package:

0234 *sodium dinitro-o-cresolate,* wetted with not less than 10 % (mass) water.

Note: 1. Explosive substances listed under (a) 1. with a water content lower than the stated limits are substances of Class 1 (see marg. 101, items 4 and 26). However, for sodium dinitro-o-cresolate, wetted, see Note 2.

2. (i) For sodium dinitro-o-cresolate, wetted with not less than 15 % (mass) water (No 1348), see 1. above.

(ii) Sodium dinitro-o-cresolate, wetted with less than 15 % (mass) water (No 0234) may be carried under the conditions of Class 4.1 if the conditions of (a) 2. are met.

(iii) 0234 sodium dinitro-o-cresolate, wetted with less than 15 % (mass) water, in quantities of more than 500 g per package may be carried only under the conditions of Class 1.

3. The water shall be homogeneously distributed over the entire explosive substance. During carriage, there shall not be any separation of the mixture which reduces the inerting effect.

4. Water-wetted explosives shall not be capable of being brought to detonation by the action of the standard detonator [1], and they shall not be capable of being brought to mass explosion by the effect of a powerful booster.

23. The following explosive substance rendered inert:

b) *2907 isosorbide dinitrate mixture* with not less than 60 % lactose, mannose, starch or calcium hydrogen phosphate or with other phlegmatizers, provided that such phlegmatizer has inerting properties which are at least as effective.

24. The following nitrated cellulose mixtures:

b) *2555 nitrocellulose* with not less than 25 % (mass) watter
2556 nitrocellulose with not less than 25 % alcohol, by mass, and not more than 12,6 % nitrogen, by dry mass
2557 nitrocellulose, with not more than 12,6 % nitrogen, in the dry mass, *mixture with* or *without plasticizer, with* or *without pigment*.

Note: 1. 2555 nitrocellulose with not less than 25 % (mass) water, 2556 nitrocellulose with not less than 25 % (mass) alcohol or 2557 nitrocellulose mixture with not more than 12,6 % nitrogen in the dry mass, with or without plasticizer, with or without pigment, shall be packed in receptacles so constructed that explosion by reason of increased internal pressure is not possible.

[1] See 'Manual of Tests and Criteria', Appendix I.

401 *(cont'd)*

2. In the case of 2557 nitrocellulose with not more than 12,6 % nitrogen, by dry mass, mixture with or without plasticizer, with or without pigment, the formulation shall be prepared so that it remains homogeneous and does not separate during carriage. Formulations not showing dangerous properties when tested for their liability to detonate, deflagrate or explode when heated under defined confinement by tests of Test series 1 (a), 2 (b) and 2 (c) respectively in the Manual of Tests and Criteria, Part I and not being a flammable substance when tested in accordance with test N.1 in the Manual of Tests and Criteria, Part III, subsection 33.2.1.4 (chips, if necessary, crushed and sieved to a particle size of less than 1,25 mm) are not subject to the requirements of this Directive.

3. Nitrocellulose mixtures with a water content, alcohol content or plasticizer content lower than the stated limits are substances of Class 1 (see marg. 101, items 4 and 26).

25. The following toxic azide:

(a) *1571 barium azide, wetted* with not less than 50 % (mass) water.

Note: Barium azide with a water content lower than the stated limit is not to be accepted for carriage.

D. Substances related to self-reactive substances

26. The following substances related to self-reactive substances:

(b) *3242 azodicarbonamide*

(c) *2956 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)*
3241 2-bromo-2-nitropropane-1,3-diol
3251 isosorbide-5-mononitrate

Note: 1. Special packing requirements are applicable for substances of item 26 [see marg. 404 (3)].

2. Isosorbide-5-mononitrate or formulations of this substance which have been shown by the performance of test series 2 of the Class 1 assignment procedure (see Manual of Tests and Criteria, Part I, Section 12) to be too insensitive for inclusion in Class 1 are not subject to the requirements of this Directive.

E. Self-reactive substances not requiring temperature control

31. (b) *3221 self-reactive liquid type B.* [1]

32. (b) *3222 self-reactive solid type B*, such as:

Substance	Concentration (%)	Packing method (see marg. 405)
2-diazo-1-naphthol-4-sulphonylchloride	100	OP5
2-diazo-1-naphthol-5-sulphonylchloride	100	OP5

33. (b) *3223 self-reactive liquid type C*, such as:

Substance	Packing method (see marg. 405)
self-reactive liquid, *sample* [1]	OP2

[1] See marg. 400 (18)

[1] No self-reactive substances are currently included under this item.

401 *(cont'd)*

34. (b) *3224 self-reactive solid type C*, such as:

Substance	Concentration (%)	Packing method (see marg. 405)
N,N'-dinitroso-N,N'-dimethylterephthalamide, as a paste	72	OP6
N,N'-dinitrosopentamethylenetetramine (1)	82	OP6
self-reactive solid, *sample* (2)		OP2
azodicarbonamide preparation type C (3)	< 100	OP6

(1) With a compatible diluent having a boiling of not less than 150 °C.
(2) See marg. 400(18).
(3) Azodicarbonamide formulations which fulfil the criteria of the Manual of Tests and Criteria, Part II, paragraph 20.4.2(c).

35. (b) *3225 self-reactive liquid type D.* (1)

36. (b) *3226 self-reactive solid type D*, such as:

Substance	Concentration (%)	Packing method (see marg. 405)
1,1'-azodi(hexahydrobenzonitrile)	100	OP7
benzene-1,3-disulphonyldrazide, as a paste	52	OP7
benzene sulphonylhydrazide	100	OP7
4-(benzyl(ethyl)amino)-3-ethoxybenzenediazonium zinc chloride	100	OP7
3-chlor-4-diethylaminobenzenediazonium zinc chloride	100	OP7
diphenyloxide-4,4'-disulphonylhydrazide	100	OP7
4-dipropylaminobenzenediazonium zinc chloride	100	OP7
4-methylbenzenesulphonylhydrazide	100	OP7
sodium 2-diazo-1-naphthol-4-sulphonate	100	OP7
sodium 2-diazo-1-naphthol-5-sulphonate	100	OP7
azodicarbonamide preparation type D (1)	< 100	OP7

(1) Azodicarbonamide formulations which fulfil the criteria of the Manuel of Tests and Criteria, Part II, paragraphe 20.4.2(d).

37. (b) *3227 self-reactive liquid type E.* (1)

38. (b) *3228 self-reactive solid type E.* (1)

39. (b) *3229 self-reactive liquid type F.* (1)

40. (b) *3230 self-reactive solid type F.* (1)

F. Empty packagings

51. *Uncleaned empty packagings*, including *empty intermediate bulk containers* (IBCs), *empty tank wagons*, *empty tank-containers*, as well as *empty wagons* and *empty small containers* for carriage of goods in bulk which have contained substances of Class 4.1.

Note: Uncleaned, empty packagings, including empty intermediate bulk containers (IBC), which have contained substances of this Class are not subject to the requirements of this Directive if adequate measures have been taken to nullify any hazards. Hazards are nullified if adequate measures have been taken to nullify all hazards of classes 1-9.

(1) No self-reactive substances are currently included under this item.

401a The following shall not be subject to the requirements of Section 2 'Conditions of Carriage', except in the cases provided for in (3):

(1) Substances of items 1 to 4, 6 and 11 to 14 carried in accordance with the following requirements:

(a) Substances classified ander (b) of each item: up to 3 kg per inner packaging and 12 kg per package;

(b) Substances classified ander (c) of each item: up to 6 kg per inner packaging and 24 kg per package.

These quantities of substances shall be carried in combination packagings which at least meet the conditions of marg. 1538.

The 'General packing conditions' of marg. 1500(1) and (2) as well as (5) to (7) shall be observed.

(2) Substances of items 1 to 4, 6 and 11 to 14 contained in metal or plastics inner packagings and carried in shrink-wrapped or stretch-wrapped trays as outer packagings in accordance with the following requirements:

(a) Substances classified under (b) of each item: up to 500 g per inner packaging and 12 kg per package;

(b) Substances classified under (c) of each item: up to 3 kg per inner packaging.

The total gross mass of the package shall not exceed 20 kg in any case.

The 'General packing conditions' of marg. 1500(1), (2) and (5) to (7) shall be observed.

(3) For carriage in accordance with paragraphs (1) and (2) above, the description of the goods in the consignment note shall conform to the requirements of marg. 414 and include the words '*limited quantity*'. Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

2. Conditions of carriage

(**The conditions of carriage for empty packagings are included under F**)

A. Packages

1. General conditions of packing

402 (1) Packagings shall conform to the conditions of Appendix V, unless special conditions are prescribed in Section A.2. for the packing of certain substances.

(2) Intermediate bulk containers (IBCs) shall conform to the conditions of Appendix VI.

(3) In accordance with the requirements of marg. 400(3) and 1511(2) or 1611(2) respectively, the following shall be used:

— packagings of packing group I, marked with the letter 'X', for very dangerous substances classified under (a) of each item;

— packagings of packing groups II or I, marked with the letter 'Y' or 'X', or IBCs of packing group II, marked with the letter 'Y', for dangerous substances classified under (b) of each item;

— packagings of packing groups III, II or I, marked with the letter 'Z', 'Y' or 'X', or IBCs of packing groups III or II, marked with the letter 'Z' or 'Y', for less dangerous substances classified under (c) of each item.

Note: For the carriage of substances of Class 4.1 in tank wagons see Appendix XI, in tank-containers see Appendix X. For carriage in bulk see marg. 416.

2. Special packing conditions

403 Substances of item 5 and molten sulphur of item 15 may be carried only in tank wagons (see Appendix XI) or in Tank-containers (see Appendix X).

404 (1) Substances of items 21, 22, 23 and 25 shall be packed in:

(a) drums conforming to marg. 1523 for plywood, marg. 1525 for fibreboard or marg. 1526 for plastics material, in each case with one or more moisture-proof inner bags, or

(b) combination packagings conforming to marg. 1538 with moisture-proof inner packagings. However, no inner or outer packagings of metal shall be permitted.

The packagings shall be so designed that the water content or the content of phlegmatizer, which is added to the substance to render it inert, cannot diminish during carriage.

(2) Substances of item 24 shall be packed in:

(a) removable-head steel drums conforming to marg. 1520, or

(b) removable-head aluminium drums conforming to marg. 1521, or

(c) removable-head steel or aluminium jerricans conforming to marg. 1522, or

(d) plywood drums conforming to marg. 1523, or

(e) fibre drums conforming to marg. 1525, or

(f) fibreboard boxes conforming to marg. 1530, or

(g) steel or aluminium boxes conforming to marg. 1532, or

(h) combination packagings conforming to marg. 1538; however, no inner or outer packagings of metal shall be permitted.

Metal receptacles shall be so constructed and closed that they yield to an internal pressure of not more than 300 kPa (3 bar).

2555 nitrocellulose with not less than 25 % water by mass may also be packed in plastics drums and jerricans conforming to marg. 1526.

If 2557 nitrocellulose with not more than 18 % plasticizing substance by mass and not more than 12,6 % nitrogen in the dry mass is packed in metal receptacles, an inner bag of multiwall paper shall be used.

2557 nitrocellulose, with not more than 12,6 % nitrogen, by dry mass, mixture, with or without plasticizer, with or without pigment may also be packed in paper bags conforming to marg. 1536, provided that they make up a full wagon load or are loaded on pallets.

If 2555 nitrocellulose with not less than 25 % water by mass or 2556 nitrocellulose with not less than 25 % alcohol by mass is packed in plywood drums, fibre drums or fibreboard boxes, a moisture-proof inner bag, a plastics film lining or an inner coating of plastics material shall be used.

All packagings shall be so designed that the water, alcohol or phlegmatizer content cannot diminish during carriage.

(3) (a) Substances of item 26, other than 3241 2-bromo-2-nitropropane-1,3-diol, shall be packed in fibre drums conforming to marg. 1525 with plastics lining or an equally effective inner coating.

A package shall not weigh more than 50 kg.

(b) 3242 azodicarbonamide of item 26(b) may also be packed in:

— an inner packaging of a single plastics bag in fibreboard box, of maximum contents 50 kg, or

404 *(cont'd)*

— inner packagings of plastics bottles, jars, bags or boxes, of maximum contents 5 kg each, within an outer packaging of a fibreboard box or a fibre drum of maximum contents 25 kg.

(c) 3241 2-bromo-2-nitropropane-1,3-diol shall be packed in accordance with packing method OP6 as set out in marg. 405(1) and the table.

405 (1) Substances of items 31 to 40 shall be packed using packing methods OP1 to OP8 in the table below, as indicated in marg. 401. A packing method corresponding to a smaller package size (i.e. with a lower OP number) may be used but a packing method corresponding to a larger package size (i.e. with a higher OP number) shall not be used. Metal packagings meeting the test criteria of packing group I shall not be used. For combination packagings, cushioning materials shall not be readily combustible and shall not cause decomposition of the self-reactive substance if leakage occurs. The quantities specified for each packing method represent the maximum that is currently considered good practice. The following types of packaging may be used:

— drums conforming to marg. 1520, 1521, 1523, 1525 or 1526; or

— jerricans conforming to marg. 1522 or 1526; or

— boxes conforming to marg. 1527, 1528, 1529, 1530, 1531 or 1532; or

— composite packagings with a plastics inner receptacle conforming to marg. 1537, provided that:

(a) the packagings meet the requirements of Appendix V;

(b) metal packagings (including inner packagings of combination packagings and outer packagings of combination packagings or composite packagings) are used solely for packing methods OP7 and OP8; and

(c) in combination packagings, glass receptacles are used only as inner packagings containing a maximum of 0,5 litre or 0,5 kg of a substance.

TABLE

Maximum quantity per packaging/package [1] for packing methods OP1 to OP8

Maximum quantity	Packing method							
	OP1	OP2 [1]	OP3	OP4 [1]	OP5	OP6	OP7	OP8
Maximum mass (kg) for solids and for combination packagings (liquids and solids)	0,5	0,5/10	5	5/25	25	50	50	200 [2]
Maximum contents in litres for liquids [3]	0,5	—	5	—	30	60	60	225 [4]

[1] If two values are given, the first applies to the maximum net mass per inner packaging and the second to the maximum net mass of the complete package.
[2] 60 kg for jerricans; 100 kg for boxes.
[3] Viscous liquids shall be treated as solids if the criteria of marg. 1310 for classification in Class 4.1 are met, or if they are not liquids according to the ASTM D 4359-90 test method.
[4] 60 litres for jerricans.

(2) Packages bearing a lable conforming to model No 01 in accordance with marg. 412(4) shall comply with the provisions of marg. 102(8) and (9).

405 *(cont'd)*

(3) For self-reactive substances of formulations of self-reactive substances not listed in marg. 401, the following procedure shall be used to assign the appropriate packing method:

(a) self-reactive type B:

Substances and articles shall be assigned packing method OP5 provided that they satisfy the criteria of the Manual of Tests and Criteria, Part II, paragraphe 20.4.5(b) in one of the packagings indicated. If the self-reactive substance can only satisfy these criteria in a smaller packaging than those listed for packing method OP5 (i.e. one of the packagings listed for OP1 to OP4), then the corresponding packing method with the lower OP number shall be assigned.

(b) self-reactive substances typ C:

Substances and articles shall be assigned packing method OP6 provided that they satisfy the criteria of the Manual of Tests and Criteria, Part II, paragraphe 20.4.2(c) in one of the packagings indicated. If the self-reactive substance can only satisfy these criteria in a smaller packaging than those listed for packing method OP6 then the corresponding packing method with the lower OP number shall be assigned.

(c) self-reactive substances type D:

Packing method OP7 shall be assigned.

(d) self-reactive substances type E:

Packing method OP8 shall be assigned.

(e) self-reactive substances type F:

Packing method OP8 shall be assigned.

(4) Substances of marg. 401, items 39(b) or 40(b) may be carried in IBCs under the conditions laid down by the competent authority of the country of origin, on the basis of testing, the competent authority is satisfied that such carriage may be safely conducted. The tests shall include those necessary:

— to prove that the self-reactive substance complies with the principles for classification given in the Manual of Tests and Criteria, Part II, paragraphe 20.4.2(f);

— to prove the compatibility with all materials normally in contact with the substance during carriage;

— to design, when applicable, emergency-relief devices; and

— to determine if any special requirements are necessary.

If the country of origin in not a Member State, these conditions shall be recognized by the competent authority of the first COTIF Contracting State reached by the consignment.

(5) To prevent explosive rupture of metal IBCs or composite IBCs with full wall metal casing, the emergency-relief devices shall be designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of fire engulfment (heat load 110 kW/m^2) or self-accelerating decomposition.

(6) Packages, including IBCs, containing substances of items 31(b), 33(b), 35(b), 37(b) or 39(b) which give off small quantities of gases, shall be vented, in accordance with marg. 1500(8) or marg. 1601(6).

406 (1) Substances classified under(b) of items 1 to 17 shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

(d) plastics drums and jerricans conforming to marg. 1526, or

406 *(cont'd)*

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marg. 1539, or

(h) metal IBCs conforming to marg. 1622.

(2) Substances classified under(b) of items 1 to 17 with a melting-point above 45 °C may also be packed in:

(a) plywood drums conforming to marg. 1523 or fibre drums conforming to marg. 1525, if necessary with one or more sift-proof inner bags, or

(b) boxes conforming to marg. 1532 for steel or aluminium, marg. 1527 for natural wood, marg. 1528 for plywood, marg. 1529 for reconstituted wood, marg. 1530 for fibreboard or marg. 1531 for plastics, if necessary with one or more sift-proof inner bags, or

(c) sift-proof bags conforming to marg. 1533 for textiles, marg. 1534 for woven plastics, marg. 1535 for plastics film or marg. 1536 for paper, provided that the goods are carried as a full wagon load, or the bags are loaded on pallets.

(3) Substances classified under(b) of items 1, 6, 7, 8, 12, 13, 16 and 17 may also be packed in:

(a) rigid plastics IBCs conforming to marg. 1624, or

(b) composite IBCs with plastics inner receptacle conforming to marg. 1625, excluding types 11HZ2 and 31HZ2.

(4) Substances classified under(b) of items 1, 6, 12 and 13 with a melting-point above 45 °C may also be packed in:

(a) fibreboard IBCs conforming to marg. 1626, or

(b) wooden IBCs conforming to marg. 1627.

(5) Substances classified under(b) of items 1, 6 and 12 with a melting-point above 45 °C may also be packed in flexible IBCs conforming to marg. 1623, excluding types 13H1, 13L1 and 13M1, provided that the goods are carried as a full wagon load or the flexible IBCs are loaded on pallets.

407 (1) Substances classified under(c) of items 1 to 17, excluding 1331 matches, 'strike anywhere' of item 2(c), shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

(d) plastics drums and jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marg. 1539, or

(h) light-gauge metal packagings conforming to marg. 1540, or

(i) metal IBCs conforming to marg. 1622, or

(j) rigid plastics IBCs conforming to marg. 1624, or

(k) composite IBCs with plastics inner receptacle conforming to marg. 1625, excluding types 11HZ2 and 31HZ2.

407 *(cont'd)*

(2) Substances classified under(c) of items 1 to 17, excluding 1331 matches, 'strike anywhere' of item (c), with a melting-point above 45 °C, may also be packed in:

(a) plywood drums conforming to marg. 1523 or fibre drums conforming to marg. 1525, if necessary with one or more sift-proof inner bags, or

(b) boxes conforming to marg. 1532 for steel and aluminium, marg. 1527 for natural wood, marg. 1528 for plywood, marg. 1529 for reconstituted wood, marg. 1530 for fibreboard, or marg. 1531 for plastics, if necessary with one or more sift-proof inner bags, or

(c) sift-proof bags conforming to marg. 1533 for textiles, marg. 1534 for woven plastics, marg. 1535 for plastics film or marg. 1536 for paper.

(3) Substances classified under(c) of items 6, 11 to 14, 16 and 17 with a melting-point above 45 °C may also be packed in:

(a) flexible IBCs conforming to marg. 1623, excluding types 13H1, 13L1 and 13M1, or

(b) fibreboard IBCs conforming to marg. 1626, or

(c) woooden IBCs conforming to marg. 1627, or

(d) composite IBCs with plastics inner receptacle of type 11HZ2 conforming to marg. 1625.

(4) 1331 matches 'strike anywhere' of item 2(c) shall be tightly packed, in sufficiently small quantities, in fibreboard, wood, plywood, reconstituted wood, or metal inner packagings so as to prevent accidental ignition under normal conditions of carriage. Each inner packaging shall not contain more than 700 matches. Inner packagings shall be packed in outer packagings conforming to marg. 1520 for steel drums, marg. 1521 for aluminium drums, marg. 1522 for steel jerricans, marg. 1523 for plywood drums, marg. 1527 for boxes of natural wood, marg. 1528 for plywood boxes, marg. 1529 for reconstituted wood boxes, marg. 1530 for fibreboard boxes, marg. 1531 for plastics boxes, or marg. 1532 for steel or aluminium boxes. Packagings shall not weigh more than 45 kg except for fibreboard boxes which shall not exceed 27 kg.

408 Celluloid in sheets of item 3(c) may also be carried unpackaged on pallets, wrapped in plastics film and secured by appropriate means, such as steel bands, as a full wagon load in covered wagons. A pallet shall not weigh more than 1 000 kg.

409-410

3. Mixed packing

411 (1) Substances grouped under the same item may be included in the same combination packaging conforming to marg. 1538.

(2) Substances of items 21 to 26 and 31 to 40 shall not be packed in the same package with other goods.

(3) Except for the substances mentioned in paragraph (2) and unless special conditions to the contrary are prescribed under paragraphe (7), substances under the different items of Class 4.1 in quantities not exceeding 5 kg per inner packaging may be packed together in a combination packaging conforming to marg. 1538 with substances and articles of other classes — provided that mixed packing is also permitted for substances and articles of these classes — and/or with goods not subject to the requirements of this Directive, provided they do not react dangerously with one another.

(4) The following shall be considered dangerous reactions:

(a) combustion and/or giving off of considerable heat,

(b) emission of flammable and/or toxic gases,

411 *(cont'd)*

(c) formation of corrosive liquids,

(d) formation of unstable substances.

(5) The provisions of marg. 8 and 402 shall be observed.

(6) Where a wooden or fibreboard box is used, a package shall not weigh more than 100 kg [see however marg. 407(4)].

(7) Substances classified under(b) or (c) of items 1 to 5 and 11 to 14 shall not be packed together with substances of Class 5.1 classified under (a) or (b) of the various items of marg. 501.

4. Marking and danger labels on packages (see Appendix IX)

Marking

412 (1) Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

Danger labels

(2) Packages containing substances of Class 4.1 shall bear a label conforming to model No 4.1.

(3) Packages containing substances of items 7, 16, 22 or 25 shall, in addition, bear a label conforming to model No 6.1 and packages containing substances of items 8 and 17 a label conforming to model No 8.

(4) Packages containing self-reactive substances of items 31 and 32 shall in addition bear a label conforming to model No 01 unless the competent authority has permitted this label to be dispensed with for the type of packaging tested because the results have proved that the self-reactive substance in such a packaging does not exhibit explosive behaviour [see marg. 414(4)].

(5) Packages containing liquids in packagings the closures of which are not visible from the outside, packages containing vented packages or vented packagings without outer packagings shall bear on two opposite sides a label conforming to model No 11.

B. Method of despatch and restrictions on forwarding

413 (1) Substances of items 5 and 15 may only be carried in tank wagons (see Appendix XI) or in tank-containers (see Appendix X).

(2) With the exception of substances of paragraph (1) and items 31 and 32, and substances classified under (a) for the various items, packages containing substances of this Class may be sent as express parcels if they contain:

— substances classified under (b) of the various items: up to 4 litres per package for liquids and 12 kg per package for solids, or

— substances classified under (c) of the various items: up to 24 kg per package.

C. Particulars in the consignment note

414 (1) The description of the goods in the consignment note shall conform to one of the identification numbers and names printed in *italics* in marg. 401.

414 *(cont'd)* If the substance is not mentioned by name, but is assigned to an n.o.s. entry or collective heading, the description of the goods shall consist of the identification number and the n.o.s. designation or collective heading, followed by the chemical or technical name [1].

The description of the goods shall be followed by *particulars of the Class, the item number, the group (a), (b) or (c) where appropriate, and the initials 'RID'* e.g. *'4.1, item 6(b), RID'*. A cross shall be inserted in the appropriate box on the consignment note.

For the carriage of wastes [see marg. 3(4)], the description of the goods shall be: 'Waste, containing...', the component(s) used for the classification of the waste under marg. 3(3) to be entered under its/their chemical name(s), e.g. *'Waste, earth containing toluene, 4.1 item 4(c), RID'*.

For the carriage of solutions or mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

For the carriage of solutions and mixtures containing only one component subject to the requirements of this Directive, the words *solution* or *mixture* shall be added as part of the name in the consignment note [see marg. 3(3)].

When a solid is handed over for carriage in the molten state, the description of the goods shall further specify *molten*, unless the term already appears in the name.

When a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall in addition be quoted before the description of the substance.

The *hazard identification number* shall also be shown when full loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

If a named substance, in accordance with marg. 400(9), is not subject to the conditions of this Class, the consignor may enter in the consignment note: *'Not goods of Class 4.1'*.

(2) When substances are carried under conditions fixed by the competent authority [see marg. 400(16) and 405(4)], the following statement shall be included in the consignment note: *'Carriage in accordance with marg. 414(2)'*.

(3) When a sample of a self-reactive substance is carried in accordance with marg. 400(18), the following statement shall be included in the consignment note: *'Carriage in accordance with marg. 414(3)'*.

(4) When, by permission of the competent authority in accordance with marg. 412(4), a label conforming to model No 01 is not required, the following statement shall be included in the consignment note: *'The danger label conforming to model No 01 is not required'*.

(5) When self-reactive substances type G [see Manual of Tests and Criteria, Part II, para. 20.4.2(g)] are carried, the following statement may be given in the consignment note: *'Not a self-reactive substance of Class 4.1'*.

D. Transport equipment

1. Conditions relating to wagons and loading

a. For packages

415 (1) Packages shall be so loaded in wagons that they cannot shift dangerously, tip over or fall off.

(2) Packages containing substances of Class 4.1 other than substances of items 31 to 40 shall be loaded in covered wagons or in sheeted open wagons. Substances of items 31 to 40 shall be loaded in covered wagons with adequate ventilation. Wagons shall be thoroughly cleaned before loading.

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[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose.

415 *(cont'd)* For the carriage of packages bearing the additional label conforming to model No 01 [see marg. 412(4)], only wagons with regulation sheet steel spark guards shall be used, even when these substances are loaded in large containers. For wagons fitted with a floor, the steel sheet spark guards shall not be fixed directly to the floor of the wagon. Packages shall be loaded so that a free circulation of air within the loading space provides a uniform temperture of the load. If the contents of one wagon or large container exceeds 5 000 kg, the load shall be divided into stacks of not more than 5 000 kg separated by air spaces of at least 0,05 m. Packages shall be protected against damage which might be caused by other packages.

(3) With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11(3).

b. For carriage in bulk

416 (1) Solids and mixtures (such as preparations and wastes) of items 6(c), with the exception of 1334 naphthalene, 11(c), 12(c), 13(c) and 14(c) may be carried in bulk in covered wagons, movable-roof wagons or sheeted open wagons.

Naphthalene of item 6(c) may be carried in bulk in steel wagons with a movable roof or in open steel wagons covered with non-flammable sheets.

(2) Waste of item 4(c) may be carried in bulk, in open wagons but only with sheeting and adequate ventilation, or in movable-roof wagons. Suitable measures shall be taken to ensure that none of the contents, particularly any liquid components, can escape.

c. For carriage in small containers

417 (1) With the exception of packages containing substances of items 31 and 32, packages containing substances of this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 420 shall apply also to the contents of small containers.

(3) Solids and mixtures (such as preparations and wastes) of item 6(c), except 1334 naphthalene, 11(c), 12(c), 13(c) and 14(c) may also be carried without inner packaging in small containers of the closed type with complete walls.

2. Marking and danger labels on wagons, tank wagons, tank-containers and small containers (see Appendix IX)

418 (1) For the carriage of substances of this Class, labels conforming to model No 4.1 shall be affixed to both sides of wagons, tank wagons and tank-containers.

(2) Wagons, tank wagons and tank-containers containing substances listed in marg. 412(3) and (4) shall in addition bear on both sides a label conforming to that marg. Wagons containing substances of items 7, 16, 22 and 25 shall in addition bear on both sides a label conforming to model No 6.1, those containing substances of items 8 and 17 a label conforming to model No 8.

(3) Small containers shall be labelled in accordance with marg. 412(2) to (4).

419

E. Prohibitions on mixed loading

420 (1) Packages bearing a label conforming to model No 4.1 shall not be loaded in the same wagon together with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

420 *(cont'd)* (2) Packages bearing labels conforming to models Nos 4.1 and 01 shall not be loaded together in the same wagon with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6, 2, 3, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 7A, 7B, 7C, 8 or 9.

421 Separate consignment notes shall be made out for consignments which may not be loaded together in the same wagon.

F. Empty packagings

422 (1) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), except those referred to in paragraph (2), empty tank wagons and empty tank-containers and empty wagons and empty small containers, for carriage in bulk, of item 51 shall be closed in the same way and present the same degree of leakproofness as if they were full.

(2) Uncleaned empty packagings, including empty flexible intermediate bulk containers (IBCs), of item 51, to the outside of which residues of their previous contents have adhered, shall be carried in leakproof packagings.

(3) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), which have contained water-wetted substances of item 13(b) or substances of items 21 to 25 shall not be accepted for carriage unless the residues are so packed that the content of water or other phlegmatizers added to the substances to render them inert cannot diminish.

(4) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty tank wagons and empty tank-containers, as well as empty wagons and empty small containers for the carriage of goods in bulk, of item 51, and packagings conforming to paragraph (2), shall bear the same danger labels as if they were full.

(5) The description of the goods in the consignment note shall conform to one of the names printed in italics in item 51, completed by '*4.1, item 51, RID*', e. g. '*Empty packaging, 4.1, item 51, RID*'.

A cross shall be inserted in the appropriate box on the consignment note.

In the case of uncleaned empty tank wagons, empty tank-containers, empty wagons for carriage in bulk and empty small containers for carriage in bulk, this description shall be completed by adding the words'Last load' together with the hazard and substance identification number,name and item number and, where appropriate, groupe (a), (b) or (c) of the goods last loaded (e.g. '*Last load: 44 2304 naphthalene, molten, item 5*').

(6) With regard to keeping empty, uncleaned packagings of item 51 bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption or animal feedstuffs, see marg. 11(3).

G. Other requirements

423 With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11(3).

424 If substances have leaked from packages bearing a label conforming to model No 6.1 and have been spilled in a wagon, the wagon shall not be re-used until after it has been thoroughly cleaned and, if necessary, decontaminated. All other goods and articles carried in such wagons shall be examined for possible contamination.

425-429

CLASS 4.2

SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION

1. List of substances

430 (1) Among the substances and articles covered by the heading of Class 4.2, those which are listed in marg. 431 or are covered by a collective heading in that marg. are subject to the requirements set out in marg. 430 (2) to 454 and are consequently substances and articles of this Directive.

(2) The heading of Class 4.2 covers:

— substances, including mixtures and solutions (liquids or solids), which even in small quantities ignite on contact with air within five minutes. They are described as substances liable to spontaneous combustion (pyrophoric substances);

— substances and articles, including mixtures and solutions, which, on contact with air, are liable to heat up without any energy input. These substances can ignite only in large quantities (kilograms) and after a long period of time (hours or days). They are described as self-heating substances.

(3) The substances and articles of Class 4.2 are subdivided as follows:

A. Organic substances liable to spontaneous combustion;

B. Inorganic substances liable to spontaneous combustion;

C. Organometallic compounds liable to spontaneous combustion;

D. Empty packagings.

Substances and arrticles of Class 4.2 classified under the various items of marg. 431, shall be assigned to one of the following groups designated by the letter (a), (b) or (c) according to their degree of danger:

(a) liable to spontaneous combustion (pyrophoric);

(b) self-heating;

(c) slightly self-heating.

(4) The assignment of substances and articles not specifically named to items 3 to 5, 12, 15, 16, 31 and 32 of marg. 431, as well as within these items to the groups, may be based on experience or shall be based on the results of the test procedure in accordance with the Manual of Tests and Criteria, Part II, section 33.3. Assignment to items 6 to 10, 14, 17 to 21 and 33, as well as within these to the groups, shall be based on the results of the test procedure in accordance with the Manual of Tests and Criteria, Part III, Section 33.3: experience shall also be taken into account when it leads to a more strictly-based assignment.

(5) When substances or articles not specifically named are assigned to the items of marg. 431 on the basis of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.3, the following criteria apply:

(a) Solids liable to spontaneous combustion (pyrophoric) shall be assigned to Class 4.2 when they ignite on falling from a height of 1 m or within five minutes:

(b) Liquids liable to spontaneous combustion (pyrophoric) shall be assigned to Class 4.2 when:

(i) on being poured on an inert carrier, they ignite within five minutes, or

(ii) in the event of a negative result of the test according to (i), when poured on a dry, fluted filter paper (Whatman No 3 filter), they ignite or carbonize it within five minutes;

430 *(cont'd)*

(c) Substances in which, in a 10 cm sample cube, at 140 °C test temperature, spontaneous combustion or a rise in temperature to over 200 °C is observed within 24 hours, shall be assigned to Class 4.2. This criterion is based on the temperature of the spontaneous combustion of charcoal, which is at 50 °C for a sample cube of 27 m^3. Substances with a temperature of spontaneous combustion higher than 50 °C for a volume of 27 m^3 are not to be assigned to Class 4.2.

Note: 1. Substances carried in packages with a volume of not more than 3 m^3 are exempted from Class 4.2 if, when tested with a 10 cm sample cube at 120 °C, no spontaneous combustion nor a rise in temperature to over 180 °C is observed within 24 hours.

2. Substances carried in packages with a volume oof not more than 450 litres are exempted from Class 4.2 if, when tested with a 10 cm sample cube at 100 °C, no spontaneous combustion nor a rise in temperature to over 160 °C is observed within 24 hours.

(6) When substances and articles not specifically named are assigned to the groups of the items of marg. 431 on the basis of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.3, the following criteria apply:

(a) Substances liable to spontaneous combustion (pyrophoric) shall be assigned to group (a);

(b) Self-heating substances and articles in which, in a 2,5 cm sample cube at 140 °C test temperature, spontaneous combustion or a rise in temperature to over 200 °C is observed within 24 hours, shall be assigned to group (b). Substances with a temperature of spontaneous combustion higher than 50 °C for a volume of 450 litres are not to be assigned to group (b);

(c) Slightly self-heating substances in which, in a 2,5 cm sample cube, the phenomena referred to under (b) are not observed, in the given conditions, but in which in a 10 cm sample cube at 140 °C test temperature, spontaneous combustion or a rise in temperature to over 200 °C is observed within 24 hours, shall be assigned to group (c).

(7) If substances of Class 4.2, as a result of admixtures, come into different categories of risk from those to which substances of marg. 431 belong, these mixtures shall be assigned to the items and groups to which they belong on the basis of their actual degree of danger.

Note: For the classification of solutions and mixtures (such as preparations and wastes) see also marg. 3 (3).

(8) When substances are specifically named under more than one group of the same item in marg. 431, the relevant group may be determined on the basis of the results of the test procedure in accordance with the Manual of Tests and Criteria, Part III, section 33.3 and the criteria set out in (6).

(9) On the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, section 33.3 and the criteria set out in (5), it may also be determined whether the nature of a specifically named substance is such that the substance is not subject to the requirements for this Class (see marg. 444).

(10) Substances and mixtures of substances having a melting point higher than 45 °C shall be considered to be solids as defined in the packaging requirements of marg. 435 (2), 436 (2) and 437 (3) and (4).

(11) Self-heating oxidizing solids, assigned to identification number 3127 of the United Nations Recommendations are not to be accepted for carriage [see however marg. 3 (3), footnote (1) to the table in para. 2.3.1].

A. Organic substances liable to spontaneous combustion

431 1. Carbon, powdered, in grains or in pieces:

(b) *1361 carbon*, or
1361 carbon black, animal or vegetable origin;

431 *(cont'd.)*

(c) *1361 carbon*, or
1361 carbon black, animal or vegetable origin
1362 carbon, activated.

Note: 1. Carbon made by a steam activation process and non-activated carbon black of mineral origin are not subject to the requirements of this Directive.

2. Non-activated carbon of mineral origin and carbon dust in a state not liable to self-heating are not subject to the requirements of this Directive.

2. Animal and vegetable substances:

(b) *1374 fish meal (fish scrap) unstabilized;*

(c) *1363 copra*
1386 seedcake with more than 1,5 % (mass) oil and not more than 11 % (mass) moisture
2217 seedcake with not more than 1,5 % (mass) oil and not more than 11 % (mass) moisture.

3. Industrially-produced fibres, fabrics and similar products:

(c) *1364 cotton waste, oily*,
1365 cotton, wet
1379 paper, unsaturated oil treated, incompletely dried (including carbon paper)

1373 fibres, animal or *vegetable* or *synthetic, n.o.s.* impregnated with oil or
1373 fabrics, animal or *vegetable* or *synthetic, n.o.s.* impregnated with oil.

4. Substances made from weakly nitrated cellulose:

(c) *2002 celluloid, scrap*,

2006 plastics, nitrocellulose-based, self-heating, n.o.s.

Note: 1353 fibres or fabrics impregnated with weakly nitrated cellulose, non-self-heating, and 2000 celluloid are articles of Class 4.1 [see marg. 401, item 3 (c)].

5. Solid organic spontaneously combustible non-toxic and non-corrosive substances and mixtures of solid organic spontaneously combustible non-toxic and non-corrosive substances (such as preparations and wastes) which cannot be classified under other collective entries:

(a) *2846 pyrophoric solid, organic, n.o.s.;*

(b) *1369 p-nitrosodimethylaniline*,
2940 9-phosphabicyclononanes (cyclooctadiene phosphines),

3313 organic pigments, self-heating,
3088 self-heating solid, organic, n.o.s.;

(c) *3313 organic pigments, self-heating*,
3088 self-heating solid, organic, n.o.s.

6. Liquid organic spontaneously combustible non-toxic and non-corrosive substances and solutions of organic spontaneously combustible non-toxic and non-corrosive substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) *2845 pyrophoric liquid, organic, n.o.s.;*

Note: Special packing conditions are applicable to this substance (see marg. 433).

(b) *3183 self-heating liquid, organic, n.o.s.*;

(c) *3183 self-heating liquid, organic, n.o.s.*

431 *(cont'd)*

7. Solid organic spontaneously combustible toxic substances, and mixtures of solid organic spontaneously combustible toxic substances (such as preparations and wastes) which cannot be classified under other collective headings:

   (b) *3128 self-heating solid, organic, toxic, n.o.s.;*

   (c) *3128 self-heating solid, organic, toxic, n.o.s.*

   Note: For toxicity criteria, see marg. 600 (3).

8. Liquid organic spontaneously combustible toxic substances, and solutions of organic spontaneously combustible toxic substances (such as preparations and wastes) which cannot be classified under other collective headings:

   (b) *3184 self-heating liquid, organic, toxic, n.o.s.;*

   (c) *3184 self-heating liquid, organic, toxic, n.o.s.*

   Note: For toxicity criteria, see marg. 600 (3).

9. Organic spontaneously combustible corrosive solids and mixtures oof organic spontaneously combustible corrosive solids (such as preparations and wastes) which cannot be classified under other collective headings:

   (b) *3126 self-heating solid, organic, corrosive, n.o.s.;*

   (c) *3126 self-heating solid, organic, corrosive, n.o.s.*

   Note: For corrosivity criteria, see marg. 800 (3).

10. Organic spontaneously combustible corrosive liquids and solutions of organic spontaneously combustible corrosive substances (such as preparations and wastes) which cannot be classified under other collective headings:

    (b) *3185 self-heating liquid, organic, corrosive, n.o.s.;*

    (c) *3185 self-heating liquid, organic, corrosive, n.o.s.*

    Note: For corrosivity criteria, see marg. 800 (3).

B. Inorganic substances liable to spontaneous combustion

11. Phosphorus

    (a) *1381 phosphorus, white* or *yellow, dry* or
    1381 phosphorus, white or *yellow, under water* or
    1381 phosphorus, white or *yellow, in solution.*

    Note: 2447 phosphorus, white or yellow, molten, is a substance of item 22.

12. Metals and metal alloys in powder, dust or granular from or in another spontaneously combustible form:

    (a) *1854 barium alloys, pyrophoric*
    1855 calcium, pyrophoric or
    1855 calcium alloys, pyrophoric
    2008 zirconium powder, dry
    2545 hafnium powder, dry
    2546 titanium powder, dry
    2881 metal catalyst, dry

    1383 pyrophoric metal, n.o.s. or
    1383 pyrophoric alloy, n.o.s.;

431 *(cont'd)*

(b) *1378 metal catalyst, wetted* with a visible excess of liquid
2008 zirconium powder, dry
2545 hafnium powder, dry
2546 titanium powder, dry
2881 metal catalyst, dry

3189 self-heating metal powder, n.o.s.;

(c) *1932 zirconium scrap*
2008 zirconium powder, dry
2009 zirconium, dry, finished sheets, strip or coiled wire, (less than 18 microns thick)
2545 hafnium powder, dry
2546 titanium powder, dry
2793 ferrous metal borings, shavings, turnings or *cuttings* in a self-heating form
2881 metal catalyst, dry

3189 self-heating metal powder, n.o.s.

Note: 1. 2858 finished zirconium products of a thickness of 18 microns or more are substances of Class 4.1 [see marg. 401, item 13 (c)].

2. 1326 hafnium powders, 1352 titanium powders or 1358 zirconium powders, wetted, with not less than 25 % water, are substances of Class 4.1 (see marg. 401, item 13).

3. Dust and powder of metals in non-spontaneously combustible form, which nevertheless, in contact with water, emit flammable gases, are substances of Class 4.3 (see marg. 471, item 13).

13. Sulphides, hydrogensulphides and dithionites in spontaneously combustible form:

(b) *1382 potassium sulphide, anhydrous* or
1382 potassium sulphide with less than 30 % water of crystallization
1384 sodium dithionite (sodium hydrosulphite)
1385 sodium sulphide, anhydrous or
1385 sodium sulphide with less than 30 % water of crystallization
1923 calcium dithionite (calcium hydrosulphite)
1929 potassium dithionite (potassium hydrosulphite)
2318 sodium hydrosulphide with less than 25 % water of crystallization;

Note: 1. 1847 Potassium sulphide, with not less than 30 % water of crystallization, 1849 sodium sulphide, hydrated, with not less than 30 % water of crystallization and 2949 sodium hydrogen sulphide with not less than 25 % water of crystallization are substances of Class 8 [see marg. 801, item 45 (b) 1].

2. 1931 Zinc dithionite is a substance of Class 9 [see marg. 901, item 32 (c)].

(c) *3174 titanium disulphide*

14. Metallic salts and alcoholates, non-toxic and non-corrosive, in spontaneously combustible form:

(b) *3205 alkaline earth metal alcoholates, n.o.s.;*

(c) *3205 alkaline earth metal alcoholates, n.o.s.*

Note: 'Alkaline earth metal' includes the elements magnesium, calcium, strontium and barium.

15. Metallic salts and alcoholates, corrosive, in spontaneously combustible form:

(a) *2441 titanium trichloride, pyrophoric* or
2441 titanium trichloride mixture, pyrophoric;

(b) 1431 sodium methylate,
3206 alkali metal alcoholates, self-heating, corrosive, n.o.s.;

431 *(cont'd)*

(c) *3206 alkali metal alcoholates, self-heating, corrosive, n.o.s.*

Note: 1. 2869 Titanium trichloride mixture, not spontaneously combustible, is a substance of Class 8 [see marg. 801, item 11 (b) or (c)].

'Alkali metal' includes the elements lithium, sodium, potassium, ribidium and caesium.

16. Spontaneously combustiblle non-toxic and non-corrosive inorganic solids and mixtures of spontaneously combustible non-toxic and non-corrosive inorganic solids (such as preparations and wastes) which cannot be classified under other collective headings:

(a) *3200 pyrophoric solid, inorganic, n.o.s.;*

(b) *2004 magnesium diamide*,

3190 self-heating solid, inorganic, n.o.s.;

(c) *1376 iron oxide, spent* or
1376 iron sponge, spent obtained from coal gas purification
2210 maneb [manganese ethylene 1,2-bis (dithiocarbamate)] or
2210 maneb preparations with not less than 60 % maneb,

3190 self-heating solid, inorganic, n.o.s.

Note: 1. Maneb and maneb preparations stabilized against self-heating need not be classified in Class 4.2 when it can be demonstrated by testing that a cubic volume of 1 m^3 of substance does not self-ignite and that the temperature at the centre of the sample does not exceed 200 °C, when the sample is maintained at a temperature of at least 75 °C ± 2 °C for a period of 24 hours.

2. 2968 maneb or 2968 maneb preparations which are stabilized against self-heating and which, in contact with water, emit flammable gases, are substances of Class 4.3 [see marg. 471, item 20 (c)].

17. Inorganic spontaneously combustible non-toxic and non-corrosive liquids, and solutions of inorganic spontaneously combustible inorganic non-toxic and non-corrosive substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) *2870 aluminium borohydride* or
2870 aluminium borohydride contained in devices,

3194 pyrophoric liquid, inorganic, n.o.s.;

Note: 1. Special packing conditions are applicable to these substances (see marg. 433).

2. Other metal hydrides in flammable form are substances of Class 4.1 (see marg. 401, item 14).

3. Metal hydrides which, in contact with water, emit flammable gases, are substances of Class 4.3 (see marg. 471, item 16).

(b) *3186 self-heating liquid, inorganic, n.o.s.;*

(c) *3186 self-heating liquid, inorganic, n.o.s.*

18. Inorganic spontaneously combustible toxic solids and mixtures of inorganic spontaneously combustible toxic solids (such as preparations and wastes) which cannot be classified under other collective headings:

(b) *3191 self-heating solid, inorganic, toxic, n.o.s.;*

(c) *3191 self-heating solid, inorganic, toxic, n.o.s.*

Note: For toxicity criteria, see marg. 600 (3).

19. Inorganic spontaneously combustible toxic liquids and solutions of inorganic spontaneously combustible toxic substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) *1380 pentaborane;*

Note: Special packing conditions are applicable to this substance (see marg. 433).

431 *(cont'd)*

(b) *3187 self-heating liquid, inorganic, toxic, n.o.s.;*

(c) *3187 self-heating liquid, inorganic, toxic, n.o.s.*

Note: For toxicity criteria, see marg. 600 (3).

20. Inorganic spontaneously combustible corrosive solids and mixtures of inorganic spontaneously combustible solids (such as preparations and wastes) which cannot be classified under other collective headings:

(b) *3192 self-heating solid, inorganic, corrosive, n.o.s.;*

(c) *3192 self-heating solid, inorganic, corrosive, n.o.s.*

Note: For corrosivity criteria, see marg. 800 (3).

21. Inorganic spontaneously combustible corrosive liquids and solutions of inorganic spontaneously combustible corrosive substances (such as preparations and wastes) which cannot be classified under other collective headings:

(b) *3188 self-heating liquid, inorganic, corrosive, n.o.s.;*

(c) *3188 self-heating liquid, inorganic, corrosive, n.o.s.*

Note: For corrosivity criteria, see marg. 800 (3).

22. *2447 phosphorus, white molten.*

C. Organometallic compounds liable to spontaneous combustion

Note: 1. Organometallic compounds and their solutions which are not liable to spontaneous combustion but which, in contact with water, emit flammable gases, are substances of Class 4.3 (see marg. 471, item 3).

2. Flammable solutions with organometallic compounds which are not liable to spontaneous combustion and which, in contact with water, do not emit flammable gases, are substances of Class 3.

3. Special packing conditions are applicable to the substances of items 31 to 33 (see marg. 433).

31. Spontaneously combustible metal alkyls and metal aryls

(a) *1366 diethylzinc*
1370 dimethylzinc
2005 magnesium diphenyl
2445 lithium alkyls
3051 aluminium alkyls
3053 magnesium alkyls

2003 metal alkyls, n.o.s. or
2003 metal aryls, n.o.s.

32. Other spontaneously combustible organometallic compounds

(a) *3052 aluminium alkyl halides,*
3076 aluminium alkyl hydrides,

3049 metal alkyl halides, n.o.s. or
3049 metal aryl halides, n.o.s.,
3050 metal alkyl hydrides, n.o.s. or
3050 metal aryl hydrides, n.o.s.

33. Spontaneously combustible organometallic compounds

(a) *3203 pyrophoric organometallic compound, n.o.s.*

D. Empty packagings

431 *(cont'd)* 41. Uncleaned *empty packagings*, including *empty intermediate bulk containers* (IBCs), *empty tank wagons*, *empty tank-containers* as well as *empty wagons* and *empty small containers* for the carriage of goods in bulk which have contained substances of Class 4.2.

Note: Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty tank wagons, empty tank-containers and empty small containers, which have contained substances of item 4 (c), identification No 2002, of item 12 (c), identification Nos 1932, 2009 and 2793, and of item 16 (c), identification No 1376, are not subject to the requirements of this Directive.

2. Conditions of carriage

(The conditions of carriage for empty packagings are included under F.)

A. Packages

1. General conditions of packing

432 (1) Packagings shall satisfy the conditions of Appendix V, unless special conditions for the packing of certain substances are prescribed in section A.2.

(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix VI.

(3) With the exception of the packagings referred to in marg. 436 (2) (a) and (b) and (3) and in marg. 437 (3) (a) and (b), (4) and (5), (inner) packagings shall be hermetically closed.

(4) In accordance with the provisions of marginals 430 (3) and 1511 (2) or 1611 (2) respectively, the following shall be used:

— packagings of packing group I, marked with the letter 'X', for substances liable to spontaneous combustion (pyrophoric) classified under (a) of each item;

— packagings of packing group II or I, marked with the letter 'Y' or 'X', or intermediate bulk containers (IBCs) of packing group II, marked with the letter 'Y', for the self-heating substances classified under (b) of each item;

— packagings of packing groups III, II or I, marked with the letter 'Z', 'Y' or 'X', or intermediate bulk containers (IBCs) of packing groups III or II, marked with the letter 'Z' or 'Y', for slightly self-heating substances classified under (c) of each item.

Note: For the carriage of substances of Class 4.2 in tank wagons, see Appendix XI, in tank-containers, see Appendix X. For carriage in bulk see marg. 446.

2. Special packing conditions

433 (1) Pyrophoric liquids of items 6 (a), 17 (a) with the exception of aluminium borohydride in devices, 19 (a) and 31 to 33, shall be packed in hermetically closing metal receptacles which are not affected by the contents, and have a capacity of not more than 450 litres. The receptacles shall be subjected to the initial test and periodic tests every five years at a pressure oof not less than 1 MPa (10 bar) (gauge pressure). The receptacles shall not be filled to more than 90 % of their capacity; however, a space of at least 5 % shall remain empty when the liquid is at an average temperature of 50 °C. During carriage, the liquid shall be under a layer of inert gas the gauge pressure of which shall be not less than 50 kPa (0,5 bar). The receptacles shall also carry a data plate with the following particulars entered in a durable form:

— substance or substances [1] accepted for carriage;

— tare weight [2] of the receptacle, including accessories;

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[1] The name may be replaced by a generic description, covering substances of a similar nature and also compatible with the characteristics of the receptacle.

[2] The units of measurement to be added each time after the numerical values.

433 *(cont'd)*

— test pressure [1] (gauge pressure);

— date (month, year) of the last test undergone;

— stamp of the expert who carried out the test;

— capacity [1] of the receptacle;

— maximum mass of filling allowed [1].

(2) These substances may also be packed in combination packagings conforming to marg. 1538 with a glass inner packaging and a steel or aluminium outher packaging conforming to marg. 1532. Receptacles shall not be filled to more than 90 % of their capacity. A package shall contain only a single inner packaging. Such packagings shall conform to a design type tested and approved in accordance with Appendix V for packing group I.

(3) Substances of item 31 (a), excluding 2005 magnesium diphenyl, and of item 32, may also be packed in combination packagings conforming to marg. 1538, with hermetically closed glass inner receptacles, with a capacity of not more than 1 litre, which shall be firmly secured individually in metal receptacles by means of cushioning materials as intermediate packagings. The glass receptacles shall not be filled to more than 90 % of their capacity. The following outer packagings may be used: removable head steel drums conforming to marg. 1520, removable head aluminium drums conforming to marg. 1521, plywood drums conforming to marg. 1523, fibre drums conforming to marg. 1525, steel or aluminium boxes conforming to marg. 1532, boxes of natural wood conforming to marg. 1527, plywood boxes conforming to marg. 1528, reconstituted wood boxes conforming to marg. 1529, or fibreboard boxes conforming to marg. 1530. By derogation from marg. 1538, natural wood barrels conforming to marg. 1524 shall also be permitted as outer packagings.

Combination packagings shall conform to a design type tested and approved according to Appendix V for Packing Group I. A package shall not contain more than 30 litres of substance.

434 Phosphorus of item 22 shall be carried only in tank wagons (see Appendix XI) or in tank-containers (see Appendix X).

435 (1) Substances classified under (a) of items 5, 12, 15 and 16 shall be packed in:

(a) non-removable head steel drums conforming to marg. 1520, or

(b) non-removable head aluminium drums conforming to marg. 1521, or

(c) non-removable head steel or aluminium jerricans conforming to marg. 1522, or

(d) non-removable head plastics drums with a maximum capacity of 60 litres and in non-removable head plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings with glass, plastics material or metal inner packagings conforming to marg. 1538.

(2) Solids as defined in marg. 430 (10) may also be packed: in removable head drums conforming to marg. 1520 for steel, marg. 1521 for aluminium, or marg. 1526 for plastics material, or in removable head jerricans conforming to marg. 1522 for steel or aluminium or marg. 1526 for plastics material.

(3) White or yellow phosphorus of item 11 (a) shall be packed in:

(a) non-removable head steel drums conforming to marg. 1520, or

(b) removable head steel drums conforming to marg. 1520, provided that the drums have been subjected to a leakproofness test conforming to marg. 1553, or

[1] The units of measurement to be added each time after the numerical values.

435 *(cont'd)*

(c) non-removable head steel or aluminium jerricans conforming to marg. 1522, or

(d) combination packagings conforming to marg. 1538 with metal inner packagings.

(4) Aluminium borohydride in devices of item 17 (a) may also be packed in:

(a) removable head steel drums conforming to marg. 1520, or

(b) removable head aluminium drums conforming to marg. 1521, or

(c) removable head plastics drums conforming to marg. 1526, or

(d) steel or aluminium boxes conforming to marg. 1532.

436 (1) Substances classified under (b) of the various items shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

(d) plastics drums and jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marg. 1539, or

(h) metal IBCs conforming to marg. 1622, or

(i) rigid plastics IBCs conforming to marg. 1624, or

(j) composite IBCs with plastics inner receptacle conforming to marg. 1625, except those of types 11HZ2 and 31HZ2.

(2) Solids as defined in marg. 430 (10) may also be packed in:

(a) plywood drums conforming to marg. 1523 or in fibre drums conforming to marg. 1525, if necessary with one or more sift-proof inner bags, or

(b) plastics films bags conforming to marg. 1535, provided that they make up a full wagon load or are loaded on pallets.

(3) Fishmeal of item 2 (b) may also be packed in flexible IBCs conforming to marg. 1623, with the exception of types 13H1, 13L1 and 13M1, provided that they make up a full wagon load or are loaded on pallets.

(4) 3313 organic pigments, self-heating of item 5 (b) may also be packed in:

(a) multiwall, water-resistant paper bags (5M2) conforming to marg. 1536, or

(b) woven plastics bags, sift-proof (5H2) conforming to marg. 1534, or

(c) flexible intermediate bulk containers (IBCs) conforming to marg. 1623, with the exception of types 13H1, 13L1 and 13M1.

The packagings and intermediate bulk containers (IBCs) referred to under (a), (b) and (c) may be carried only as full wagon loads or loaded on pallets.

437 (1) Substances classified under (c) of the various items shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

437 *(cont'd)*

(d) plastic drums and jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1528, or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539, or

(h) light-gauge metal packagings conforming to marg. 1540.

Note: Metal packagings for substances oof item 4 shall be so constructed and closed as to yield when the internal pressure reaches a value not greater than 300 kPa (3 bar).

(2) With the exception of substances of item 4, substances may also be packed in:

(a) metal IBCs conforming to marg. 1622, or

(b) rigid plastics IBCs conforming to marg. 1624, or

(c) composite IBCs with plastics inner receptacle conforming to marg. 1625 with the exception of types 11HZ2 and 31HZ2.

(3) Solids as defined in marg. 430 (10) may also be packed in:

(a) plywood drums conforming to marg. 1523, or in fibre drums conforming to marg. 1525, if necessary with one or more sift-proof inner bags, or

(b) textile bags, sift-proof (5L2) conforming to marg. 1533,

woven plastics bags, sift-proof (5H2) conforming to marg. 1534,

plastics film bags (5H4) conforming to marg. 1535, or multiwall,

water-resistant paper bags (5M2) conforming to marg. 1536.

(4) With the exception of substances of item 4, solid substances as defined in marg. 430 (10) may also be packed in flexible IBCs conforming to marg. 1623, with the exception oof types 13H1, 13L1 and 13M1.

(5) Substances of items 2 (c) and 3 (c) may also be packed in untested packagings subject only to the provisions of marg. 1500 (1), (2) and (5) to (7). Cotton waste with an oil content of less than 5 % by mass and cotton of item 3 (c) may also be carried in firmly secured bales.

438 (1) The openings of receptacles for the carriage of liquids having a viscosity, at 23 °C, of less than 200 mm^2/s, with the exception of glass ampoules and pressure cylinders, shall be hermetically sealed by means of two devices in series, one of which shall be screwed shut or secured in an equivalent manner.

Note: For IBCs, however, see marg. 1621 (8).

(2) Steel drums conforming to marg. 1520 containing wetted metal catalyst of item 12 (b) shall be fitted with a vent in accordance with marg. 1500 (8).

439-440

3. Mixed packing

441 (1) Substances classified under the same item may be packed together in a combination packaging conforming to marg. 1538.

(2) Substances of items 6 (a), 11, 17 (a), 19 (a) and 31 to 33 shall not be packed together with substances or articles of other items of Class 4.2, with substances or articles of other classes or with goods which are not subject to the requirements of this Directive.

441 *(cont'd)*

(3) With the exception of the substances referred to in (2) above, substances of Class 4.2, in quantities not exceeding 3 litres for liquids and/or 6 kg for solids, per inner packaging, may be packed together in a combination packaging conforming to marg. 1538, with substances or articles of other classes — provided that mixed packing is also permitted for substances and articles of those classes — and/or with goods which are not subject to the requirements of this Directive provided they do not react dangerously with one another.

For substances classified in group (a), the net quantity per package shall not exceed 3 kg for solids and 3 litres for liquids.

(4) The following shall be considered dangerous reactions:

(a) combustion and/or giving off considerable heat;

(b) emission of flammable and/or toxic gases;

(c) formation of corrosive liquids;

(d) formation of unstable substances.

(5) The requirements of marg. 8 and 432 shall be observed.

(6) A package shall not weigh more than 100 kg when wooden or fibreboard boxes are used.

4. Marking and danger labels on packages (see Appendix IX)

Markings

442 (1) Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

Danger labels

(2) Packages containing substances of Class 4.2 shall bear a label conforming to model No 4.2.

(3) Packages containing substances of item 17 (a), maneb or maneb preparations of item 16 (c), and substances of items 31 to 33, shall in addition bear a label conforming to model No 4.3.

(4) Packages containing substances of items 7, 8, 11, 18 and 19 shall in addition bear a label conforming to model No 6.1.

(5) Packages containing substances of items 9, 10, 15, 20 and 21 shall in addition bear a label conforming to model No 8.

(6) Packages containing liquids in receptacles of which the closures are not visible from the outside, and packages containing receptacles fitted with vents or receptacles fitted with vents without outer packaging and packages containing phosphorus of item 11 (a) shall bear on two opposite sides a label conforming to model No 11.

B. Method of despatch and restrictions on forwarding

443 With the exception of substances classified under (a) of each item, packages containing other substances of this Class may be sent as express parcels if they contain:

— substances classified under (b) of the various items, up to 6 litres per package for liquids and 12 kg per package for solids;

— substances classified under (c) of the various items, up to 12 litres per package for liquids and 24 kg per package for solids.

C. Particulars in the consignment note

444 The description of the goods in the consignment note shall conform to one of the identification numbers and names printed in italics in marg. 431. If the substance is not mentioned by name, but is assigned to an n.o.s. entry, the description of the goods shall consist of the identification number and the n.o.s. designation followed by the chemical or technical name [1].

The description of the goods shall be followed by *particulars of the Class, the item number, the group where appropriate, and the initial 'RID' [e.g. '4.2, item 13 (b), RID']*.

A cross shall be inserted in the appropriate box on the consignment note.

For the carriage of wastes [see marg. 3 (4)], the description of the goods shall be: 'Waste, containing ...', the component(s) used for the classification of the waste under marg. 3 (3) to be entered under its/their chemical name(s) e.g. '*Waste, containing 1381 white phosphorus, under water, 4.2, item 11 (a), RID*'.

For the carriage of solutions or mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

For the carriage of solutions and mixtures containing only one component subject to the requirements of this Directive, the words *solution or mixture* shall be added as part of the name in the consignment note [see marg. 3 (3)].

When a solid is handed over for carriage in the molten state, the description of the goods shall further specify '*molten*' unless the term already appears in the name.

When a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall in addition be quoted before the description of the substance.

The hazard identification number shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

If a substance mentioned by name is not subject to the conditions of this Class in accordance with marg. 430 (9), the consignor may enter in the consignment note: '*Not goods of Class 4.2*'.

D. Transport equipment

1. Conditions relating to wagons and loading

a. For packages

445 (1) Packages shall be so loaded in wagons that they cannot shift dangerously, tip over or fall off.

(2) Packages containing substances of Class 4.2 shall be loaded in covered wagons or in sheeted open wagons.

(3) With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

b. For carriage in bulk

446 (1) Substances of items 1 (c), 2 (c), 3, borings, shavings, turnings, and cuttings of ferrous metals of item 12 (c), spent iron oxide or spent iron sponge of item 16 (c) and solid wastes classified under (c) of these items, may be carried in bulk in sheeted open metal wagons or in movable-roof metal wagons.

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[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose.

c. For carriage in small containers

447 (1) Packages containing substances of this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 450 shall apply also to the contents of small containers.

(3) The substances mentioned in marg. 446 may also be carried in bulk in small metal containers of the closed type with complete walls.

2. Markings and danger labels on wagons, tank wagons, tank-containers and small containers (see Appendix IX)

448 (1) For the carriage of substances of this Class, labels conforming to model No 4.2 shall be affixed to both sides of wagons, tank wagons and tank-containers.

(2) Wagons, tank wagons and tank-containers containing substances of item 17 (a), maneb and maneb preparations of item 16 (c), substances of items 31 to 33, shall in addition bear on both sides labels conforming to model No 4.3, and those containing substances of items 7, 8, 11, 18, 19 and 22 shall bear labels conforming to model No 6.1, and those containing substances of items 9, 10, 15, 20 and 21 shall bear labels conforming to model No 8.

(3) Small containers shall be labelled in accordance with marg. 442 (2) and (5).

449

E. Prohibitions on mixed loading

450 Packages bearing a label conforming to model No 4.2 shall not be loaded in the same wagon together with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

451 Separate consignment notes shall be made out for consignments which may not be loaded together in the same wagon.

F. Empty packagings

452 (1) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty tank wagons and empty tank-containers and empty wagons and empty small containers for carriage in bulk of item 41 shall be closed in the same way and present the same degree of leakproofness as if they were full.

(2) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty tank wagons and empty tank-containers, as well as empty wagons and empty smalll containers for the carriage of goods in bulk, of item 41, shall bear the same danger labels as if they were full.

(3) The description of the goods in the consignment note shall conform to one of the names printed in italics in item 41, completed by '*4.2, item 41, RID*' e.g. '*Empty packaging, 4.2, item 41, RID*'. A cross shall be inserted in the appropriate box on the consignment note.

In the case of uncleaned empty tank wagons, empty tank-containers, empty wagons for carriage in bulk and empty small containers for carriage in bulk, this description shall be completed by adding the words 'Last load' together with the hazard and substance identification number, the name and item number and, where appropriate, group (a), (b) or (c) of the goods last loaded e.g. '*Last load: 46 1381 white phosphorus, dry, item 11 (a)*'.

G. Other requirements

453 With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

454 If substances have leaked from packages bearing a label conforming to model No 6.1 and have been spilled in a wagon, the wagon shall not be re-used until after it has been thoroughly cleaned and, if necessary, decontaminated. All other goods and articles carried in such wagons shall be examined for possible contamination.

455-
469

CLASS 4.3

SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

1. List of substances

470 (1) Among the substances and articles covered by the heading of Class 4.3, those which are listed in marg. 471 or are covered by a collective heading in that marg. are subject to the requirements set out in marg. 470 (2) to 494 and are consequently substances and articles of this Directive.

Note: For the quantities of substances and articles listed in marg. 471 which are not subject to the requirements of the section 'Conditions of carriage', see marg. 471a.

(2) The heading of Class 4.3 covers substances and articles containing substances of this Class which react with water to emit flammable gases liable to form explosive mixtures with air.

Note: The term 'water-reactive' used in the n.o.s. entries of marg. 471 denotes a substance which, in contact with water, emits flammable gases.

(3) Substances and articles of Class 4.3 are subdivided as follows:

A. Organic substances, organometallic compounds and substances in organic solvents, which, in contact with water, emit flammable gases.

B. Inorganic substances which, in contact with water, emit flammable gases.

C. Articles containing substances which, in contact with water, emit flammable gases.

D. Empty packagings.

Substances and articles of Class 4.3 classified under the various items of marg. 471 shall be assigned to one of the following groups, designated by the letter (a), (b) or (c), according to their degree of danger:

(a) very dangerous;

(b) dangerous;

(c) less dangerous.

(4) Assignment of substances not mentioned by name to marg. 471, items 1, 3, 11, 13, 14, 16 and 20 to 25, and within these items to the groups, shall be based on the results of the test procedure in accordance with the Manual of Tests and Criteria, Part III, section 33.4; experience shall also be taken into account when it leads to a more strictly based assignment.

(5) When substances and articles not mentioned by name are assigned to the items of marg. 471 on the basis of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.4, the following criteria apply:

A substance or article shall be assigned to Class 4.3 if:

(a) during any stage of the test the gas emitted ignites spontaneously, or

(b) the rate of emission of flammable gas is greater than 1 litre per kilogram per hour.

470 *(cont'd)*

(6) Where substances not specifically named are assigned to the groups of the items in marg. 471 on the basis of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.4, the following criteria apply:

(a) Any substance which reacts vigorously with water at ambient temperature to produce gas which ignites spontaneously, or one which reacts readily with water at ambient temperature such that the rate of emission of flammable gas within one minute is equal to or greater than 10 litres per kilogram of substance, shall be assigned to group (a);

(b) Any substance which reacts readily with water at ambient temperature such that the maximum rate of emission of flammable gas per hour is equal to or greater than 20 litres per kilogram of substance, and which does not meet the criteria of group (a), shall be assigned to group (b);

(c) Any substance which reacts slowly with water at ambient temperature such that the maximum rate of emission of flammable gas per hour is equal to or greater than 1 litre per kilogram of substance, and which does not meet the criteria of groups (a) or (b), shall be assigned to group (c).

(7) If substances of Class 4.3, as a result of admixtures, come into different categories of risk from those to which the substances of marg. 471 belong, these mixtures shall be assigned to the items and letters to which they belong on the basis of their actual degree of danger.

Note: For the classification of solutions and mixtures (such as preparations and wastes) see also marg. 3 (3).

(8) When substances are specifically named under more than one letter of the same item in marg. 471, the relevant letter may be determined on the basis of the results of the test procedure in accordance with the Manual of Tests and Criteria, Part III, section 33.4, and the criteria set out in paragraph (6).

(9) On the basis of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.4 and the criteria set out in paragraph (6), it may also be determined whether the nature of a specifically named substance is such that the substance is not subject to the requirements for this Class (see marg. 484).

(10) Substances and mixtures of substances having a melting point higher than 45 °C shall be considered as solids for the purposes of the conditions of packing in marg. 474 (2), 475 (3) and 476 (2).

(11) Water-reactive solids, flammable, assigned to identification number 3132, water-reactive solids, oxidizing, assigned to identification number 3133 and water-reactive solids, self-heating, assigned to identification number 3135 of the United Nations Recommendations are not to be accepted for carriage (see, however, marg. 3 (3), footnote (1) in the table in paragraph 2.3.1).

A. Organic substances, organometallic compounds and substances in organic solvents which, in contact with water, emit flammable gases

471

1. Chlorosilanes:

(a) *1183 ethyldichlorosilane,*
1242 methyldichlorosilane,
1295 trichlorosilane (silicochloroform),

2988 chlorosilanes, water-reactive, flammable, corrosive, n.o.s.

Note: 1. Special packing conditions are applicable to these substances [see marg. 473 (1)].

2. Chlorosilanes having a flash-point of less than 23 °C and which, in contact with water, do not emit flammable gases, are substances of Class 3 (see marg. 301, item 21).

3. Chlorosilanes having a flash-point equal to or greater than 23 °C and which, in contact with water, do not emit flammable gases, are substances of Class 8 (see marg. 801, items 36 and 37).

2. The following boron trifluoride complex:

(a) *2965 boron trifluoride dimethyletherate.*

471 *(cont'd)*

3. Organometallic compounds and their solutions:

(a) *1928 methyl magnesium bromide in ethyl ether,*

3207 organometallic compound, water-reactive, flammable, n.o.s. or
3207 organometallic compound solution, water-reactive, flammable, n.o.s. or
3207 organometallic compound dispersion, water-reactive, flammable, n.o.s.;

Note: Special packing conditions are applicable to these substances [see marg. 473 (2)].

(b) *3207 organometallic compound, water-reactive, flammable, n.o.s.* or
3207 organometallic compound solution, water-reactive, flammable, n.o.s. or
3207 organometallic compound dispersion, water-reactive, flammable, n.o.s.;

(c) *3207 organometallic compound, water-reactive, flammable, n.o.s.* or
3207 organometallic compound solution, water-reactive, flammable, n.o.s. or
3207 organometallic compound dispersion, water-reactive, flammable, n.o.s.

Note: 1. Organometallic compounds and their solutions which ignite spontaneously are substances of Class 4.2 (see marg. 431, items 31 to 33).

2. Flammable solutions with organometallic compounds in concentrations which, in contact with water, neither emit flammable gases in dangerous quantities nor ignite spontaneously, are substances of Class 3.

B. Inorganic substances which, in contact with water, emit flammable gases

Note: 1. The group of alkali metals includes the elements lithium, sodium, potassium, rubidium and caesium.

2. The group of alkaline-earth metals includes the elements magnesium, calcium, strontium and barium.

11. Alkali metals and alkaline-earth metals and their alloys and metallic compounds:

(a) *1389 alkali metal amalgam,*
1391 alkali metal dispersion or
1391 alkaline-earth metal dispersion,
1392 alkaline-earth metal amalgam,
1407 caesium,
1415 lithium,
1420 potassium metal alloys,
1422 potassium sodium alloys,
1423 rubidium,
1428 sodium,
2257 potassium,

1421 alkali metal alloy, liquid, n.o.s.;

(b) *1400 barium,*
1401 calcium,

1393 alkaline-earth metal alloy, n.o.s.;

(c) *2950 magnesium granules, coated* with a particle size not less than 149 μm.

Note: 1. Alkaline-earth metals and alkaline-earth metal alloys in pyrophoric form are substances of Class 4.2 (see marg. 431, item 12).

2. 1869 magnesium or 1869 magnesium alloys containing more than 50 % magnesium as pellets, shavings or strips, are substances of Class 4.1 [see marg. 401, item 13 (c)].

3. 1418 magnesium powder and 1418 magnesium alloys in powder form are substances of item 14.

4. 3292 batteries, containing sodium or 3292 cells, containing sodium are articles of item 31 (b).

471 *(cont'd)*

12. Silicon alloys and metal silicides:

(b) *1405 calcium silicide,*
1417 lithium silicon,
2624 magnesium silicide,
2830 lithium ferrosilicon (lithium ferrosilicide);

(c) *1405 calcium silicide,*
2844 calcium manganese silicon.

Note: For substances of (c) see also marg. 471a.

13. Other metals, metal alloys and mixtures, non-toxic, which, in contact with water, emit flammable gases:

(a) *3208 metallic substance, water-reactive, n.o.s.;*

(b) *1396 aluminium powder, uncoated,*
3078 cerium, turnings or gritty powder,
3170 aluminium smelting by-products or
3170 aluminium remelting by-products

3208 metallic substance, water-reactive, n.o.s.;

(c) *1398 aluminium silicon powder, uncoated,*
1435 zinc ashes,
3170 aluminium smelting by-products or
3170 aluminium remelting by-products

3208 metallic substance, water-reactive, n.o.s.

Note: 1. Dust and powder of metals in pyrophoric form are substances of Class 4.2 (see marg. 431, item 12).

2. Aluminium silicon powder, coated, is not subject to the requirements of this Directive.

3. 1333 cerium in slabs, rods or ingots is a substance of Class 4.1 [see marg. 401, item 13 (b)].

14. Metals and metal alloys in the form of powder or in any other form, which, in contact with water, emit flammable gases and are capable of self-heating:

(a) *1436 zinc powder* or
1436 zinc dust,

3209 metallic substance, water-reactive, self-heating, n.o.s.;

(b) *1418 magnesium powder* or
1418 magnesium alloys, powder,
1436 zinc powder or
1436 zinc dust,

3209 metallic substance, water-reactive, self-heating, n.o.s.;

(c) *1436 zinc powder* or
1436 zinc dust,

3209 metallic substance, water-reactive, self-heating, n.o.s.

Note: 1. Metals and metal alloys in pyrophoric form are substances of Class 4.2 (see marg. 431, item 12).

2. Metals and metal alloys which, in contact with water, do not emit flammable gases and are not pyrophoric or self-heating, but which are easily ignited, are substances of Class 4.1 (see marg. 401, item 13).

471 *(cont'd)*

15. Metals and metal alloys, toxic:

(b) *1395 aluminium ferrosilicon powder;*

(c) *1408 ferrosilicon* with 30 % or more but less than 90 % silicon by mass.

Note: Ferrosilicon containing less than 30 % or not less than 90 % (mass) silicon is not subject to the requirements of this Directive.

16. Metal hydrides:

(a) *1404 calcium hydride,*
1410 lithium aluminium hydride,
1411 lithium aluminium hydride, ethereal,
1413 lithium borohydride,
1414 lithium hydride,
1426 sodium borohydride,
1427 sodium hydride,
1870 potassium borohydride,
2010 magnesium hydride,
2463 aluminium hydride,

1409 metal hydrides, water-reactive, n.o.s.;

(b) *2805 lithium hydride, solid, castings,*
2835 sodium aluminium hydride,

1409 metal hydrides, water-reactive, n.o.s.

Note: 1. 1871 titanium hydride and 1437 zirconium hydride are substances of Class 4.1 (see marg. 401, item 14).

2. 2870 aluminium borhydride is a substance of Class 4.2 [see marg. 431, item 17 (a)].

17. Metal carbides and metal nitrides:

(a) *2806 lithium nitride;*

(b) *1394 aluminium carbide,*
1402 calcium carbide.

18. metal phosphides, toxic:

(a) *1360 calcium phosphide,*
1397 aluminium phosphide,
1419 magnesium aluminium phosphide,
1432 sodium phosphide,
1433 stannic phosphides,
1714 zinc phosphide,
2011 magnesium phosphide,
2012 potassium phosphide,
2013 strontium phosphide.

Note: 1. Compounds of phosphorus with heavy metals such as iron, copper, etc., are not subject to the requirements of this Directive.

2. 3048 Aluminium phosphide pesticides containing additives inhibiting the emission of toxic, flammable gases, are substances of Class 6.1 [see marg. 601, item 43 (a)].

19. Metal amides and metal cyanamides:

(b) *1390 alkali metal amides;*

(c) *1403 calcium cyanamide* with more than 0,1 % (mass) calcium carbide.

Note: 1. Calcium cyanamide with not more than 0,1 % (mass) calcium carbide is not subject to the requirements of this Directive.

2. 2004 magnesium diamide is a substance of Class 4.2 [see marg. 431, item 16 (b)].

471 *(cont'd)*

20. Inorganic solid substances and mixtures (such as preparations and wastes) which, in contact with water, emit flammable gases, non-toxic and non-corrosive, and which cannot be classified under other collective headings:

(a) *2813 water-reactive solid, n.o.s.;*

(b) *1340 phosphorus pentasulphide* (P_2S_5) free from yellow and white phosphorus;

2813 water-reactive solid, n.o.s.;

Note: Phosphorus pentasulphide not free from yellow and white phosphorus shall not be accepted for carriage.

(c) *2968 maneb* [manganese ethylene 1,2-bis-(dithiocarbamate)], *stabilized* against self-heating or *2968 maneb preparation, stabilized* against self-heating,

2813 water-reactive solid, n.o.s.

Note: 2210 maneb or 2210 maneb preparations in self-heating form are substances of Class 4.2 [see marg. 431, 16 (c)]. See, however, marg. 471a (1) (b).

21. Inorganic liquid substances and solutions of inorganic substances (such as preparations and wastes) which, in contact with water, emit flammable gases, non-toxic and non-corrosive, and which cannot be classified under other collective headings:

(a) *3148 water-reactive liquid, n.o.s.;*

Note: Special packing conditions are applicable to this substance [see marg. 473 (2)].

(b) *3148 water-reactive liquid, n.o.s.;*

(c) *3148 water-reactive liquid, n.o.s.*

22. Inorganic solid substances and mixtures (such as preparations and wastes) which, in contact with water, emit flammable gases, toxic, and which cannot be classified under other collective headings:

(a) *3134 water-reactive solid, toxic, n.o.s.;*

(b) *3134 water-reactive solid, toxic, n.o.s.;*

(c) *3134 water-reactive solid, toxic, n.o.s.*

Note: For toxicity criteria, see marg. 600 (3).

23. Inorganic liquid substances and solutions of inorganic substances (such as preparations and wastes) which, in contact with water, emit flammable gases, toxic, and which cannot be classified under other collective headings:

(a) *3130 water-reactive liquid, toxic, n.o.s.;*

Note: Special packing conditions are applicable to this substance [see marg. 473 (2)].

(b) *3130 water-reactive liquid, toxic, n.o.s.;*

(c) *3130 water-reactive liquid, toxic, n.o.s.*

Note: For toxicity criteria, see marg. 600 (3).

24. Inorganic solid substances and mixtures (such as preparations and wastes) which, in contact with water, emit flammable gases, corrosive, and which cannot be classified under other collective headings:

(a) *3131 water-reactive solid, corrosive, n.o.s.;*

(b) *3131 water-reactive solid, corrosive, n.o.s.;*

(c) *3131 water-reactive solid, corrosive, n.o.s.*

Note: For corrosivity criteria, see marg. 800 (3).

471 *(cont'd)*

25. Inorganic liquid substances and solutions of inorganic substances (such as preparations and wastes) which, in contact with water, emit flammable gases, corrosive, and which cannot be classified under other collective headings:

(a) *3129 water-reactive liquid, corrosive, n.o.s.;*

Note: Special packing conditions are applicable to this substance [see marg. 473 (2)].

(b) *3129 water-reactive liquid, corrosive, n.o.s.;*

(c) *3129 water-reactive liquid, corrosive, n.o.s.*

Note: For corrosivity criteria, see marg. 800 (3).

C. Articles containing substances which, in contact with water, emit flammable gases

Note: Special packing conditions are applicable to these articles [see marg. 473 (5)].

31. (b) *3292 batteries, containing sodium* or
3292 cells, containing sodium

Note: 1. Batteries or cells shall not contain substances of this Directive other than sodium, sulphur or polysulphides.

2. Batteries or cells shall not be offered for carriage at a temperature such that liquid elemental sodium is present in the battery or cell unless approved and under the conditions established by the competent authority of the country of origin. If the country of origin is not a Member State, the approval and conditions of carriage shall be recognized by the competent authority of the first COTIF Contracting State reached by the consignment.

3. Cells shall consist of hermetically sealed metal casings which fully enclose the dangerous substances and which are so constructed and closed as to prevent the release of these substances under normal conditions of carriage.

4. Batteries shall consist of cells secured within and fully enclosed by a metal casing so constructed and closed as to prevent the release of the dangerous substances under normal conditions of carriage.

D. Empty packagings

41. Uncleaned *empty packagings,* including *empty intermediate bulk containers* (IBCs), *empty tank wagons, empty tank-containers,* as well as *empty wagons* and *empty small containers,* for the carriage of goods in bulk, which have contained substances and articles of Class 4.3.

471a

(1) Substances and articles of the various items carried under the following conditions, except as provided for in paragraph (2) below, are not subject to the requirements of section 2, 'Conditions of Carriage':

(a) Substances classified under (b) of each item:

— liquids: up to 500 ml per inner packaging;

— aluminium powder [item 13 (b)]: up to 1 kg per inner packaging;

— other solids: up to 500 g per inner packaging;

(b) Substances classified under (c) of each item:

— liquids: up to 1 litre per inner packaging;

— solids: up to 1 kg per inner packaging.

471a *(cont'd)* These quantities of substances shall be carried in combination packagings which at least meet the conditions of marg. 1538. A package shall not weigh more than 30 kg.

These quantities contained in metal or plastics inner packagings may also be carried in shrink-wrapped or stretch-wrapped trays used as outer packagings, provided that the total gross mass of the package does not exceed 20 kg.

The 'General packing conditions' of marg. 1500 (1), (2) and (5) to (7) shall be observed.

(2) For carriage in accordance with paragraph (1) above, the description of the goods in the consignment note shall conform to the requirements of marg. 484 and include the words '*limited quantity*'. Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

(3) Batteries of item 31 (b) installed in vehicles are not subject to the requirements of Section 2 'Conditions of carriage'.

2. Conditions of carriage

(The conditions of carriage for empty packagings are set out under F.)

A. Packages

1. General conditions of packing

472 (1) Packagings shall satisfy the conditions of Appendix V, unless special conditions for the packing of certain substances are prescribed in Section A.2.

(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix VI.

(3) Packagings shall be hermetically closed so as to prevent any infiltration of humidity or any loss of the contents. They shall not have vents in accordance with marg. 1500 (8) or 1601 (6).

(4) In accordance with the provisions of marg. 470 (3) and 1511 (2) or 1611 (2) respectively, the following shall be used:

— Packagings of packing group I, marked with the letter 'X', for very dangerous substances classified under (a) of each item,

— Packagings of packing group II of I, marked with the letter 'Y' or 'X', or intermediate bulk containers (IBCs) of packing group II, marked with the letter 'Y', for dangerous substances classified under (b) of each item,

— Packagings of packing group III, II or I, marked with the letter 'Z', 'Y' or 'X', or intermediate bulk containers (IBCs) of packing group III or II, marked with the letter 'Z' or 'Y', for less dangerous substances classified under (c) of each item.

Note: For the carriage of substances of Class 4.3 in tank wagons, see Appendix XI, in tank-containers, see Appendix X. For carriage in bulk, see marg. 486.

2. Special packing conditions

473 (1) (a) Chlorosilanes of item 1(a) shall be packed in corrosion-resistant steel receptacles with a maximum capacity of 450 litres. The receptacles shall be subjected to the initial test and periodic tests every five years at a pressure of not less than 0,4 MPa (4 bar) (gauge pressure). The closing device of the receptacle shall be protected by a cap. The maximum permissible mass per litre of capacity for trichlorosilane, ethyldichlorosilane and methyldichlorosilane shall not exceed 1,14 kg, 0,93 kg or 0,95 kg respectively, if the filling is carried out by mass; if the filling is by volume, the degree of filling shall not exceed 85 %. Receptacles shall also carry a plate showing the following particulars in a durable form:

— chlorosilanes, Class 4.3;

— description of the chlorosilane(s) accepted for carriage;

473 *(cont'd)*

— tare [1] of the receptacle, including accessories;

— test pressure [1] (gauge pressure);

— date (month, year) of the last test undergone;

— stamp of the expert who carried out the test;

— capacity [1] of the receptacle;

— maximum degree of filling allowed by mass [1] for each substance accepted for carriage.

(b) Chlorosilanes of item 1(a) may also be packed in combination packagings with metal, plastics or glass inner packagings conforming to marg. 1538. The inner packagings shall be hermetically closed and have a maximum capacity of 1 litre. A package shall not weigh more than 30 kg. These combination packagings shall be tested and approved in accordance with Appendix V for packing group I.

(2) Substances of items 3(a), 21(a), 23(a) and 25(a) shall be packed in hermetically closing metal receptacles which are not affected by the contents and have a capacity of not more than 450 litres. The receptacles shall be subjected to the initial test and periodic tests every five years at a pressure of at least 1 MPa (10 bar) (gauge pressure). The receptacles shall not be filled to more than 90 % of their capacity; however, a space of at least 5 % shall remain empty for safety when the liquid is at an average temperature of 50 °C. During carriage, the liquid shall be under a layer of inert gas the gauge pressure of which shall be not less than 50 kPa (0,5 bar). The receptacles shall carry a plate showing the following particulars in a durable form:

— substance or substances [2] accepted for carriage;

— tare [1] of the receptacle, including accessories;

— test pressure [1] (gauge pressure);

— date (month, year) of the last test undergone;

— stamp of the expert who carried out the test;

— capacity [1] of the receptacle;

— maximum mass of filling allowed [1].

(3) Substances referred to in paragraph (2) may also be packed in combination packagings conforming to marg. 1538 with a glass inner packaging and a steel or aluminium outer packaging conforming to marg. 1532. Receptacles shall not be filled to more than 90 % of their capacity. A package shall contain only a single inner packaging. Such combination packagings shall conform to a design type which has been tested and approved in accordance with Appendix V for packing group I.

(4) Substances of paragraph (2) may also be packed in combination packagings conforming to marg. 1538 with hermetically closed glass inner receptacles, with a capacity of not more than 1 litre, which shall be firmly secured individually in metal receptacles by means of cushioning material. The glass receptacles shall not be filled to more than 90 % of their capacity. The following outer packagings shall be permitted: removable head steel drums conforming to marg. 1520, boxes of natural wood conforming to marg. 1527, plywood boxes conforming to marg. 1528, reconstituted wood boxes conforming to marg. 1529 or steel or aluminium boxes conforming to marg. 1532.

These combination packagings shall be tested and approved in accordance with Appendix V for packing group I.

A package shall not contain more than 30 litres of substances.

(5) (a) Cells of item 31(b) shall be placed in suitable outer packagings with sufficient cushioning material to prevent contact between cells, and between cells and the internal surfaces of the outer packaging, and to ensure that no dangerous movement of the cells within the outer packaging occurs during carriage. Suitable outer packagings are metal drums (1A2, 1B2), plywood drums (1D), fibre drums (1G), plastics drums (1H2), metal boxes (4A, 4B), wooden boxes (4C, 4D, 4F), fibreboard boxes (4G) and plastics boxes (4H2). Such packagings shall conform to a design type that has been tested and approved in accordance with Appendix V for packing group II solids.

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[1] The units of measurement to be added each time after the numerical values.

[2] The name may be replaced by a collective description covering substances of a similar nature and equally compatible with the properties of the receptacle.

473 *(cont'd)*

(b) Batteries of item 31(b) may be carried unpacked or in protective enclosures (e.g. in fully enclosed or wooden slatted crates) that are not subject to the packaging testing requirements of Appendix V.

474

(1) Substances classified under (a) of items 2, 11, 13, 14, 16 to 18, 20, 22 and 24, shall be packed in:

(a) non-removable head steel drums conforming to marg. 1520, or

(b) non-removable head aluminium drums conforming to marg. 1521, or

(c) non-removable head steel or aluminium jerricans conforming to marg. 1522, or

(d) non-removable head plastics drums with a maximum capacity of 60 litres and non-removable head plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings with glass, plastics material or metal inner receptacles conforming to marg. 1538.

(2) Solids as defined in marg. 470 (10) may also be packed in:

(a) removable head drums conforming to marg. 1520 for steel, marg. 1521 for aluminium, marg. 1526 for plastics material, or in removable head jerricans conforming to marg. 1522 for steel or aluminium or marg. 1526 for plastics material, or

(b) combination packagings conforming to marg. 1538 with one or more sift-proof inner bags.

475

(1) Substances classified under (b) of the various items shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

(d) plastics drums and jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marg. 1539.

(2) Substances of items 12 to 17 and 20 may also be packed in:

(a) metal intermediate bulk containers (IBCs) conforming to marg. 1622, or

(b) rigid plastics intermediate bulk containers (IBCs) conforming to marg. 1624, or

(c) composite intermediate bulk containers (IBCs) with plastics inner receptacle conforming to marg. 1625, with the exception of types 11HZ2 and 31HZ2.

(3) Solids as defined in marg. 470 (10) may also be packed in:

(a) plywood drums conforming to marg. 1523 or in fibre drums conforming to marg. 1525, if necessary with one or more sift-proof inner bags, or

(b) plastics film bags conforming to marg. 1535, provided that they make up a full wagon load or are loaded on pallets.

476

(1) Substances classified under (c) of the various items shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

476 *(cont'd)*

(c) steel or aluminium jerricans conforming to marg. 1522, or

(d) plastics drums and jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marg. 1539, or

(h) light-gauge metal packagings conforming to marg. 1540, or

(i) metal intermediate bulk containers (IBCs) conforming to marg. 1622, or

(j) rigid plastics intermediate bulk containers (IBCs) conforming to marg. 1624, or

(k) composite intermediate bulk containers (IBCs) with plastics inner receptacle conforming to marg. 1625, with the exception of types 11HZ2 and 31HZ2.

(2) Solids as defined in marg. 470 (10) may also be packed in:

(a) plywood drums conforming to marg. 1523 or fibre drums conforming to marg. 1525, if necessary with one or more sift-proof inner bags, or

(b) plastics film bags conforming to marg. 1535, or

(c) flexible intermediate bulk containers (IBCs) conforming to marg. 1623, with the exception of types 13H1, 13L1 and 13M1.

Note: Substances of item 15(c) may also be packed in packagings which need only meet the requirements of marg. 1500 (1), (2) and (5) to (7), and they may also be packed in IBCs of type 13H1.

477 The openings of receptacles for substances of item 23 shall be tightly closed by means of two devices in series, one of which shall be screwed or secured in an equivalent manner.

Note: For intermediate bulk containers (IBCs), see, however, marg. 1621(8).

478-480

3. Mixed packing

481 (1) Substances classified under the same item may be packed together in a combination packaging conforming to marg. 1538.

(2) Substances classified under (a) of the various items may not be packed together with substances of the various items of Class 4.3, with substances and articles of other classes or with goods which are not subject to the requirements of this Directive.

(3) With the exception of the substances referred to in (2), substances of the various items of Class 4.3, in quantities per inner packaging not exceeding 3 litres for liquids and/or 6 kg for solids, may be packed together in a combination packaging conforming to marg. 1538, with substances of other classes — provided that mixed packing is also permitted for substances and articles of those classes — and/or with goods not subject to the requirements of this Directive, provided they do not react dangerously with one another.

(4) The following shall be considered dangerous reactions:

(a) combustion and/or giving off considerable heat;

(b) emission of flammable and/or toxic gases;

(c) formation of corrosive liquids;

(d) formation of unstable substances.

481 *(cont'd)* (5) The requirements of marg. 8 and 472 shall be observed.

(6) If wooden or fibreboard cases are used, a package shall not weigh more than 100 kg.

4. Marking and danger labels on packages (see Appendix IX)

Marking

482 (1) Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

Danger Labels

(2) Packages containing substances or articles of this Class shall bear a label conforming to model No 4.3.

(3) Packages containing substances of items 1 or 2 shall, in addition, bear labels conforming to models Nos 3 and 8.

(4) Packages containing substances of item 3 and lithium aluminium hydride, ethereal, of item 16(a) shall, in addition, bear a label conforming to model No 3.

(5) Packages containing substances of item 14 shall, in addition, bear a label conforming to model No 4.2.

(6) Packages containing substances of items 15, 18, 22 and 23 shall, in addition, bear a label conforming to model No 6.1.

(7) Packages containing substances of items 24 and 25 shall, in addition, bear a label conforming to model No 8.

(8) Packages containing liquids in receptacles, the closures of which are not visible from the outside, shall bear on two opposite sides a label conforming to model No 11.

B. Method of despatch, restrictions on forwarding

483 (1) With the exception of substances classified under (a) of the various items, packages containing other substances of this Class may be sent as express parcels if they contain:

— substances classified under (b) of the various items: up to 6 litres per package for liquids and 12 kg per package for solids;

— substances classified under (c) of each item: up to 12 litres per package for liquids and 24 kg per package for solids.

(2) Packages containing articles of item 31(b) may also be sent as express parcels. In this case, a package shall not weigh more than 40 kg.

C. Particulars in the consignment note

484 The description of the goods in the consignment note shall conform to one of the identification numbers and names printed in italics in marg. 471. If the substance is not mentioned by name, but is assigned to an n.o.s. entry, the description of the goods shall consist of the identification number and the n.o.s. designation, followed by the chemical or technical name [1].

[1] The technical name shall be one currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose.

484 *(cont'd)* The description of the goods shall be followed by *particulars of the Class, the item number, the group where appropriate, and the initials 'RID'* (e.g. *'4.3, item 1(a), RID.'*). A cross shall be inserted in the appropriate box on the consignment note.

For the carriage of wastes [see marg. 3(4)], the description of the goods shall be: 'Waste containing ...', the component(s) used for the classification of the waste under marg. 3 (3) to be entered under its/their chemical name(s), e.g. *'Waste, containing 1428 sodium, 4.3, item 11 (a), RID'*.

For the carriage of solutions or mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

For the carriage of solutions and mixtures containing only one component subject to the requirements of this Directive, the words *solution* or *mixture* shall be added as part of the name in the consignment note [see marg. 3 (3)].

When a solid is handed over for carriage in the molten state, the description of the goods shall further specify '*molten*' unless the term already appears in the name.

When a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall in addition be quoted before the description of the goods.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

If a substance mentioned by name is not subject to the conditions of this Class in accordance with marg. 470 (9), the consignor may enter in the consignment note: *'Not goods of Class 4.3'*.

D. Transport equipment

1. Conditions relating to wagons and loading

a. For packages

485 (1) Packages shall be so loaded in wagons that they cannot shift dangerously, tip over or fall off.

(2) Packages containing substances or articles of Class 4.3 shall be loaded in covered wagons or in sheeted open wagons.

(3) When handling packages, special measures shall be taken to ensure that they do not come into contact with water.

(4) With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

b. For carriage in bulk

486 (1) Solids and mixtures (such as preparations and wastes) of items 11 (c), 12 (c), 13 (c), 14 (c), 17 (b) and 20 (c) may be carried in bulk in specially-equipped wagons.

(2) The receptacles of specially-equipped wagons and their closures shall conform to the general packing conditions of marg. 472 and of marg. 1500 (1), (2) and (8). They shall be so constructed that the openings designed for loading and unloading can be closed hermetically.

(3) Aluminium smelting or remelting by-products of item 13 (b) may be carried in bulk in wagons with a roof which opens.

486 *(cont'd)* (4) Calcium silicide of item 12 (b) in pieces, substances of item 12 (c) in pieces, aluminium smelting or remelting by-products of item 13 (c), and ferrosilicon of item 15 (c) may be carried in bulk in sheeted open wagons or in wagons with a roof which opens.

c. For carriage in small containers

487 (1) Packages containing substances or articles of this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 490 shall apply also to the contents of small containers.

(3) Substances mentioned in marg. 486 (1) may also be carried in bulk in small containers which shall meet the requirement of marg. 486 (2).

2. Marking and danger labels on wagons, tank wagons, tank-containers and small containers (see Appendix IX)

488 (1) The specially-equipped wagons carrying the substances referred to in marg. 486 (1) shall have affixed beside the closure the following clearly legible and indelible marking: '*Close tightly after filling and discharging*'. The marking shall be in an official language of the country of origin and also, if that language is not French, German, Italian or English, in French, German, Italian or English, unless international tariffs or agreements concluded between the railway administrations provide otherwise.

(2) When substances or articles of this Class are carried, wagons, tank wagons and tank-containers shall bear on both sides labels conforming to model No 4.3.

(3) In addition, wagons, tank wagons and tank-containers carrying substances of items 1 and 2, shall bear on both sides labels conforming to models Nos 3 and 8; those carrying substances of item 3 and lithium aluminium hydride, ethereal, of item 16 (a) shall bear a label conforming to model No 3; those carrying substances of item 14 shall bear a label conforming to model No 4.2; those carrying substances of items 15, 18, 22 and 23 shall bear a label conforming to model No 6.1; and those containing substances of items 24 and 25 shall bear a label conforming to model No 8.

(4) Small containers shall be labelled in accordance with marg. 482(2) to (7).

489

E. Prohibitions on mixed loading

490 Packages bearing a label conforming to model No 4.3 shall not be loaded in the same wagon together with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. There requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

491 Separate consignment notes shall be made out for consignments which may not be loaded together with others in the same wagon.

F. Empty packagings

492 (1) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty specially-equipped wagons in accordance with marg. 486, empty tank wagons and empty tank-containers, as well as empty wagons and empty small containers for carriage in bulk, of item 41, shall be closed and present the same degree of leakproofness as if they were full.

(2) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty specially-equipped wagons in accordance with marg. 486, empty tank wagons and empty tank-containers, as well as empty wagons and empty small containers for carriage in bulk, of item 41, shall bear the same danger labels as if they were full.

492 (cont'd) (3) The description of the goods in the consignment note shall conform to one of the names printed in italics in item 41 completed by '*4.3, item 41, RID*', e.e. '*Empty packaging, 4.3, item 41, RID*'.

A cross shall be inserted in the appropriate box on the consignment note.

In the case of uncleaned empty tank wagons, empty tank-containers, empty wagons for carriage in bulk and empty small containers for carriage in bulk, this description shall be completed by adding the words 'Last load' together with the hazard and substance identification number, the name and item number and, where appropriate group (a), (b) or (c) of the goods last loaded, e.g. '*Last load: X338 1295 trichlorosilane, item 1(a)*'.

G. Other requirements

493 With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

494 If substances from packages bearing a label conforming to model No 6.1 have leaked and been spilled in a wagon, the wagon shall not be re-used until after it has been thoroughly cleaned and, if necessary, decontaminated. All other goods and articles carried in such wagons shall be examined for possible contamination.

495-499

CLASS 5.1.

OXIDIZING SUBSTANCES

1. List of substances

500 (1) Among the substances covered by the heading of Class 5.1, those which are listed in marg. 501 or are covered by a collective heading in that marg. are subject to the requirements set out in marg. 500 (2) to 524 and are consequentely substances of this Directive.

Note: For the quantities of substances listed in marg. 501 which are not subject to the requirements of the section headed 'Conditions of Carriage', see marg. 501 a.

(2) The heading of Class 5.1 covers substances which, while in themselves not necessarily combustible, may, generally by yielding oxygen, cause or contribute to the combustion of other substances.

(3) The substances of Class 5.1 are subdivided as follows:
A. Liquid oxidizing substances and their aqueous solutions

B. Solid oxidizing substances and their aqueous solutions

C. Empty packagings

Substances of Class 5.1 (other than the substances of items 5 and 20) which are classified under the various items of marg. 501 shall be assigned to one of the following groups designated by the letter (a), (b) or (c) according to their degree of danger:

(a) highly oxidizing;

(b) oxidizing;

(c) slightly oxidizing.

(4) Oxidizing substances not specifically named may be assigned to Class 5.1 either on the basis of experience, or in accordance with the test method, procedure and criteria set out in the Manual of Tests and Criteria, Part III, section 34.4. In the event of a divergence between test results and known experience, judgement based on known experience shall take precedence over test results.

500 *(cont'd)*

(5) When solids not specifically named are assigned to the items of marg. 501 on the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, subsection 34.4.1, the following criteria apply:

— A solid shall be assigned to Class 5.1 if, in the 4:1 or the 1:1 sample-to-cellulose ratio (by mass) tested, it ignites or burns or exhibits mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose;

— A solid shall be assigned to group (a) when, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, it exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.

— A solid shall be assigned to group (b) when, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, it exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose and the criteria for group (a) are not met.

— A solid shall be assigned to group (c) when, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, it exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose and the criteria for groups (a) and (b) are not met.

(6) When liquids not specifically named are assigned to the items of marg. 501 on the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, subsection 34.4.2, the following criteria apply:

— A liquid shall be assigned to Class 5.1 of, in the 1:1 mixture, by mass, of substance and cellulose tested, if exhibits a pressure of 2070 kPa or more and a mean pressure rise time above the mean pressure rise time of a 1:1 mixture, by mass, of 65 % aqueous nitric acid and cellulose;

— A liquid shall be assigned to group (a) when, in the 1:1 mixture, by mass, of substance and cellulose tested, it spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than or equal to that of a 1:1 mixture, by mass, of 50 % perchloric acid and cellulose;

— A liquid shall be assigned to group (b) when, in the 1:1 mixture, by mass, of substance and cellulose tested, it exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of 40 % aqueous sodium chlorate solution and cellulose; and the criteria for group (a) are not met;

— A liquid shall be assigned to group (c) when, in the 1:1 mixture, by mass, of substance and cellulose tested, it exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of 65 % aqueous nitric acid and cellulose; and the criteria for groups (a) and (b) are not met.

(7) If substances of Class 5.1, as a result of admixtures, come into different categories of risk from those to which the substances of marg. 501 belong, these mixtures or solutions shall be assigned to the items and groups to which they belong on the basis of their actual degree of danger.

Note: For the classification of solutions and mixtures (such as preparations and wastes), see also marg. 3 (3).

(8) When substances are specifically named under more than one group of the same item of marg. 501, the relevant group may be determined on the basis of the results of the test procedure in accordance with the Manual of Tests and Criteria, Part III, section 34.4 and the criteria set out in paragraphs (5) and (6).

(9) On the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, section 34.4 and the criteria set out in paragraphs (5) and (6), it may also be determined whether the nature of a specifically named substance is such that the substance is not subject to the requirements for this Class (see marg. 514).

(10) For the packaging requirements of marg. 506 (3), 507 (2) and 508 (2), substances or mixtures of substances having a melting point above 45 °C are considered to be solids.

(11) The chemically unstable substances of Class 5.1 shall be accepted for carriage only if the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end it shall in particular be ensured that receptacles do not contain any material liable to promote these reactions.

500 *(cont'd)* (12) Oxidizing solids, self-heating, assigned to identification number 3100, oxidizing solids, water-reactive, assigned to identification number 3121 and oxidizing solids, flammable, assigned to identification number 3137 are not to be accepted for cariage [see, however, marg. 3 (3), footnote (1) to the table in paragraph 2.3.1].

A. Liquid oxidizing substances and their aqueous solutions

501 1. Hydrogen peroxide and its solutions, or mixtures of hydrogen peroxide with another liquid in aqueous solution:

(a) *2015 hydrogen peroxide, stabilized* or
2015 hydrogen peroxide, aqueous solution, stabilized, with more than 60 % hydrogen peroxide;

Note: 1. Special packaging conditions are applicable to these substances (see marg. 503).

2. Hydrogen peroxide, not stabilized or hydrogen peroxide, aqueous solution, not stabilized containing more than 60 % hydrogen peroxide, are not to be accepted for carriage.

(b) *2014 hydrogen peroxide, aqueous solution* which not less than 20 % but not more than 60 % hydrogen peroxide (stabilized as necessary);

3149 hydrogen peroxide and peroxyacetic acid mixture, with acid(s), water and not more than 5 % peroxyacetic acid;

Note: This mixture of hydrogen peroxide and peroxyacetic acid (No 3149) shall, in laboratory testing [1], neither detonate in the cavitated state nor deflagrate at all and shall show no effect when heated under confinement nor any explosive power. The formulation shall be thermally stable (self-accelerating decomposition temperature 60 °C or higher for a 50 kg package), and a liquid substance compatible with peroxyacetic acid shall be used for desensitization. Formulations not meeting these criteria are to be regarded as substances of Class 5.2 [see the Manual of Tests and Criteria, Part II, paragraph 20, 4.3(g)].

(c) *2984 hydrogen peroxide, aqueous solution,* with not less than 8 % but less than 20 % hydrogen peroxide (stabilized as necessary).

Note: Hydrogen peroxide, aqueous solutions containing less than 8 % hydrogen peroxide are not subject to the requirements of this Directive.

2. Tetranitromethane:

(a) *1510 tetranitromethane*.

Note: Tetranitromethane not free from combustible is not to be accepted for carriage.

3. Perchloric acid solution:

(a) *1873 perchloric acid* in aqueous solution with more than 50 % but not more than 72 % acid, by mass.

Note: 1. Perchloric acid solutions containing more than 72 % (mass) acid, or mixtures of perchloric acid with any liquid other than water, are not to be accepted for carriage.

2. 1802 Perchloric acid solution containing not more than 50 % (mass) acid is a substance of Class 8 [see marg. 801, item 4(b)]

4. Chloric acid solution:

(b) *2626 chloric acid, aqueous solution,* with not more than 10 % chloric acid.

Note: Chloric acid solution containing more than 10 % chloric acid or mixtures of chloric acid with any liquid other than water, are not to be accepted for carriage.

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[1] See the Manual of Tests and Criteria, Part II, section 20.

501 *(cont'd)*

5. The following halogenated compounds of fluorine:

1745 bromine pentafluoride
1746 bromine trifluoride
2495 iodine pentafluoride.

Note: 1. Special packing conditions are applicable to these substances (see marg. 504).

2. Other halogenated compounds of fluorine are not to be accepted for carriage as substances of Class 5.1.

B. Solid oxidizing substances and their aqueous solutions

11. Chlorates and mixtures of chlorates with borates or hygroscopic chlorides (such as magnesium chloride or calcium chloride):

(b) *1452 calcium chlorate*
1458 chlorate and borate mixture
1459 chlorate and magnesium chloride mixture
1485 potassium chlorate
1495 sodium chlorate
1506 strontium chlorate
1513 zinc chlorate
2427 potassium chlorate, aqueous solution
2428 sodium chlorate, aqueous solution
2429 calcium chlorate, aqueous solution
2721 copper chlorate
2723 magnesium chlorate

1461 chlorates, inorganic, n.o.s.
3210 chlorates, inorganic, aqueous solution, n.o.s.;

(c) *2427 potassium chlorate, aqueous solution*
2428 sodium chlorate, aqueous solution
2429 calcium chlorate, aqueous solution

3210 chlorates, inorganic, aqueous solution, n.o.s.

Note: 1. See also item 29.

2. Ammonium chlorate and its aqueous solutions and mixtures of a chlorate with an ammonium salt are not to be accepted for carriage.

12. Ammonium perchlorate:

(b) *1442 ammonium perchlorate.*

Note: Classification of this substance shall be in accordance with the results of the tests under Appendix I. Depending on the particle size and the packaging of the substance, see also Class I (marg. 101, item 4, No 0402).

13. Perchlorates (with the exception of ammonium perchlorate, see item 12):

(b) *1455 calcium perchlorate*
1475 magnesium perchlorate
1489 potassium perchlorate
1502 sodium perchlorate
1508 strontium perchlorate

1481 perchlorates, inorganic, n.o.s.
3211 perchlorates, inorganic, aqueous solution, n.o.s.;

Note: See also item 29.

(c) *3211 perchlorates, inorganic, aqueous solution, n.o.s.*

501 *(cont'd)*

14. Chlorites:

(b) *1453 calcium chlorite*
1496 sodium chlorite

1462 chlorites, inorganic, n.o.s.

Note: 1. 1908 Chlorite solution is a substance of Class 8 [see marg. 801, item 61(b) or (c)]

2. Ammonium chlorite and its aqueous solutions and mixtures of a chlorite with an ammonium salt are not to be accepted for carriage.

15. Hypochlorites:

(b) *1471 lithium hypochlorite, dry* or
1471 lithium hypochlorite mixture
1748 calcium hypochlorite, dry or
1748 calcium hypochlorite mixture, dry with more than 39 % aviable chlorine (8,8 % available oxygen)
2880 calcium hypochlorite, hydrated or
2880 calcium hypochlorite, hydrated mixture with not less than 5,5 % but not more than 10 % water,

3212 hypochlorites, inorganic, n.o.s.;

(c) *2208 calcium hypochlorite mixtures, dry* with more than 10 % but not more than 39 % available chlorine.

Note: 1. Calcium hypochlorite, mixture, dry, containing not more than 10 % available chlorine are not subject to the requirements of this Directive.

2. 1791 hypochlorite solution is a substance of Class 8 [see marg. 801, item 61(b) or c)].

3. Mixtures of a hypochlorite with an ammonium salt are not to be accepted for carriage.

4. See also item 29.

16. Bromates:

(b) *1473 magnesium bromate*
1484 potassium bromate
1494 sodium bromate

1450 bromates, inorganic, n.o.s.

3213 bromates, inorganic, aqueous solution, n.o.s.;

(c) *2469 zinc bromate*

3213 bromates, inorganic, aqueous solution, n.o.s.

Note: 1. Ammonium bromate and its aqueous solutions and mixtures of a bromate with an ammonium salt are not to be accepted for carriage.

2. See also item 29.

17. Permanganates:

(b) *1456 calcium permanganate*
1490 potassium permanganate
1503 sodium permanganate
1515 zinc permanganate

1482 permanganates, inorganic, n.o.s.
3214 permanganates, inorganic aqueous solution, n.o.s.

Note: 1. Ammonium permanganate and its aqueous solution and mixtures of a permanganate with an ammonium salt are not to be accepted for carriage.

2. See also item 29.

501 *(cont'd)*

18. Persulphates:

(c) *1444 ammonium persulphate*
1492 potassium persulphate
1505 sodium persulphate

3215 persulphates, inorganic, n.o.s.
3216 persulphates, inorganic, aqueous solution, n.o.s.

19. (Reserved)

20. Ammonium nitrate solutions:

2426 ammonium nitrate, liquid, hot concentrated solution, in a concentration of more than 80 %, but not more than 93 %, provided that:

1. the pH is between 5 and 7 measured in an aqueous solution of 10 % of the substance carried,

2. the solution does not contain more than 0,2 % combustible material or chlorine compounds in quantities such that the chlorine level exceeds 0,02 %.

Note: Aqueous solutions of ammonium nitrate, in a concentration not exceeding 80 %, are not subject to the requirements of this Directive.

21. Ammonium nitrate and ammonium nitrate fertilizers [1]:

(c) *1942 ammonium nitrate* with not more than 0,2 % combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance,

2067 ammonium nitrate fertilizers, type A1: uniform non-segregating mixtures of ammonium nitrate with added matter which is inorganic and chemically inert towards ammonium nitrate, with not less than 90 % ammonium nitrate and not more than 0,2 % combustible material (including organic material calculated as carbon), or with more than 70 % but less than 90 % ammonium nitrate and not more than 0,4 % total combustible material,

2068 ammonium nitrate fertilizers, type A2: unifrorm non-segregating mixtures of ammonium nitrate with calcium carbonate and/or dolomite, with more than 80 % but less than 90 % ammonium nitrate and not more than 0,4 % total combustible material,

2069 ammonium nitrate fertilizers, type A3: uniform non-segregating mixtures of ammonium nitrate and ammonium sulphate, with more than 45 % but not more than 70 % ammonium nitrate and not more than 0,4 % total combustible material,

2070 ammonium nitrate fertilizers type A4: uniform non-segregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers of nitrogen/phosphate/potash type, with more than 70 % but less than 90 % ammonium nitrate and not more than 0,4 % total combustible material.

Note: 1. Ammonium nitrate containing more than 0,2 % combustible substances (including any organic substance calculated as carbon) is not to be accepted for carriage unless it is a constituent of a substance or article of Class 1.

2. In determining the ammonium nitrate content, all nitrate ions for which a molecular equivalent of ammonium ions is present in the mixture shall be calculated as ammonium nitrate.

3. Fertilizers having an ammonium nitrate content or a content in combustible substances exceeding the values shown are not to be accepted for carriage except under the conditions applicable to Class 1. See also Note 5.

4. Fertilizers having an ammonium nitrate content below the limit values indicated are not subject to the requirements of this Directive.

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[1] Fertilizers containing ammonium nitrate which are assigned to United Nations Recommendations identification number 2071 are not subject to the requirements of this Directive [see marg. 900(3)]. Fertilizers containing ammonium nitrate which are assigned to United Nations Recommendations identification number 2072 are not to be accepted for carriage.

501 *(cont'd)*

5. Ammonium nitrate fertilizers, uniform non-segregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers of nitrogen/phosphate/potash types whose molecular excess of nitrate ions over ammonium ions (calculated as potassium nitrate) is less than 10 % are not subject to the requirements of this Directive, provided that:

   (a) their ammonium nitrate content is not more than 70 % and their total content of combustible material is not more than 0.4 % or

   (b) their ammonium nitrate content is not more than 45 % irrespective of their content of combustible material.

22. Nitrates (with the exception of substances of items 20, 21 and 29):

(b) *1493 silver nitrate*
1514 zinc nitrate

1477 nitrates, inorganic, n.o.s.
3218 nitrates, inorganic, aqueous solution, n.o.s.;

(c) *1438 aluminium nitrate*
1451 caesium nitrate
1454 calcium nitrate
1465 didymium nitrate
1466 ferric nitrate
1467 guanidine nitrate
1474 magnesium nitrate
1486 potassium nitrate
1498 sodium nitrate
1499 sodium nitrate and potassium nitrate mixtures
1507 strontium nitrate
2720 chromium nitrate
2722 lithium nitrate
2724 manganese nitrate
2725 nickel nitrate
2728 zirconium nitrate

1477 nitrates, inorganic, n.o.s.
3218 nitrates, inorganic, aqueous solution, n.o.s.

Note: 1. 1625 Mercuric nitrate, 1627 mercurous nitrate and 2727 thallium nitrate are substances of Class 6.1 [see marg. 601, items 52(b) and 68(b)]. 2976 Thorium nitrate, solid, 2980 uranyl nitrate hexahydrate solution and 2981 uranyl nitrate, solid are substances of Class 7 (see marg. 704, schedules 5, 6, 9, 10, 11 and 13).

2. The commercial grade of calcium nitrate fertilizer, consisting mainly of a double salt (calcium nitrate and ammonium nitrate) and containing not more than 10 % ammonium nitrate and at least 12 % water of crystallization, is not subject to the requirements of this Directive.

3. Aqueous solutions of solid inorganic nitrates, whose concentration at the minimum temperature which can be expected during carriage does not exceed 80 % of the saturation limit, are not subject to the requirements of this Directive.

23. Nitrites:

(b) *1488 potassium nitrite*
1512 zinc ammonium nitrite

2627 nitrites, inorganic, n.o.s.
3219 nitrites, inorganic, aqueous solution, n.o.s.;

(c) *1500 sodium nitrite*
2726 nickel nitrite

3219 nitrites, inorganic, aqueous solution, n.o.s.

Note: 1. Ammonium nitrite and its aqueous solutions and mixtures of an inorganic nitrite with an ammonium salt are not to be accepted for carriage.

2. Zinc ammonium nitrite is not permitted for carriage on sea routes.

501 *(cont'd)*

24. Mixtures of nitrates and nitrites of items 22 and 23:

(b) *1487 potassium nitrate and sodium nitrite mixture.*

Note: Mixtures with an ammonium salt are not to be accepted for carriage.

25. Peroxides and superoxides:

(a) *1491 potassium peroxide*
1504 sodium peroxide
2466 potassium superoxide
2547 sodium superoxide;

(b) *1457 calcium peroxide*
1472 lithium peroxide
1476 magnesium peroxide
1509 strontium peroxide
1516 Zinc peroxide
1483 peroxides, inorganic, n.o.s.

Note: See also item 29.

26. Chloroisocyanuric acids and their salts:

(b) *2465 dichloroisocyanuric acid, dry* or
2465 dichloroisocyanuric acid salts
2468 trichloroisocyanuric acid, dry.

Note: The dihydrated sodium salt of dichloroisocyanuric acid is not subject to the requirements of this Directive.

27. Solid oxidizing substances, non-toxic, non-corrosive, and mixtures of these substances (such as preparation and wastes) which cannot be classified under other collective headings:

(a) *1479 oxidizing solid, n.o.s.;*

(b) *1439 ammonium dichromate*
3247 sodium peroxoborate, anhydrous
1479 oxidizing solid, n.o.s.;

(c) *1479 oxidizing solid, n.o.s.*

28. Aqueous solutions of solid oxidizing substances, non-toxic, non-corrosive, and of mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) *3139 oxidizing liquid, n.o.s.;*

(b) *3139 oxidizing liquid, n.o.s.;*

(c) *3139 oxidizing liquid, n.o.s.*

29. Solid oxidizing substances, toxic, and mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) *3087 oxidizing solid, toxid, n.o.s.;*

(b) *1445 barium chlorate*
1446 barium nitrate
1447 barium perchlorate
1448 barium permanganate
1449 barium peroxide
1469 lead nitrate
1470 lead perchlorate
2464 beryllium nitrate
2573 thallium chlorate
2719 barium bromate
2741 barium hypochlorite with more than 22 % available chlorine,
3087 oxidizing solid, toxic, n.o.s.;

501 *(cont'd)*

(c) *1872 lead dioxide*

3087 oxidizing solid, toxic, n.o.s.

Note: For toxicity criteria, see marg. 600(3).

30. Aqueous solutions of solid oxidizing substances, toxic, and of mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) *3099 oxidizing liquid, toxic, n.o.s.;*

(b) *3099 oxidizing liquid, toxic, n.o.s.;*

(c) *3099 oxidizing liquid, toxic, n.o.s.*

Note: For toxicity criteria, see marg. 600(3).

31. Solid oxidizing substances, corrosive, and mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) *3085 oxidizing solid, corrosive, n.o.s.;*

(b) *1463 chromium trioxide, anhydrous* (solid chromic acid)

3085 oxidizing solid, corrosive, n.o.s.;

(c) *1511 urea hydrogen peroxide*

3085 oxidizing solid, corrosive, n.o.s.

Note: 1. For corrovisvity criteria, see marg. 800(3).

2. 1755 chromic acid solution is a substance of Class 8 [see marg. 801, item 17(b) or (c)].

32. Aqueous solutions of solid oxidizing substances, corrosive, and of mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) *3098 oxidizing liquid, corrosive, n.o.s.;*

(b) *3098 oxidizing liquid, corrosive, n.o.s.;*

(c) *3098 oxidizing liquid, corrosive, n.o.s.*

Note: For corrosivity criteria, see marg. 800(3).

C. Empty packagings

Note: Empty packagings with residues from their previous contents adhering to the outside are not to be accepted for carriage.

41. *Uncleaned empty packagings,* including *empty intermediate bulk containers* (IBC's), *empty tank wagons, empty tank-containers,* as well as *empty wagons* and *empty small containers* for the carriage of goods in bulk, which have contained substances of Class 5.1.

Note: Uncleaned, empty packagings, including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the requirements of this Directive if adequate measures have been taken to nullify any hazards. Hazards are nullified if adequate measures have been taken to nullify all hazards of classes 1-9.

501a (1) Substances classified under (b) or (c) of the various items, carried in accordance with the following requirements, except as provided for in paragraph (2) below, are not subject to the requirements of Section 2,'Conditions of Carriage':

(a) Substances classified under (b) of each item:

— liquid: not more than 500 ml per inner packaging;

— solids: not more than 500 g per inner packaging.

501a *(cont'd)*

(b) Substances classified under (c) of each item:

— liquids: not more than 1 liter per inner packaging;

— solids: not more than 1 kg per inner packaging.

These quantities of substances shall be carried in combination packagings which at least meet the conditions of marg. 1538. A package shall not weigh more than 30 kg.

These quantities contained in metal or plastics inner packagings may also be carried in shrinkwrapped or stretch-wrapped trays used as outer packagings provided that the total gross mass of the package does not exceed 20 kg.

The 'General conditions of packing' of marg. 1500(1), (2) and (5) to (7) shall be observed.

(2) For carriage in accordance with paragraph (1) above, the description of the goods in the consignment note shall conform to the requirements of marg. 514 and include the words '*limited quantity*'. Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

2. Conditions of carriage

(The conditions of carriage for empty packagings are set out under F.)

A. Packages

1. General conditions of packing

502 (1) Packagings shall satisfy the conditions of Appendix V, unless special conditions for the packing of certain substances are prescribed in Section A.2.

(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix VI.

(3) In accordance with the provisions of marg. 500(3) and 1511(2) or 1611(2) respectively:

— packagings of packing group I, marked with the letter 'X', for the strongly oxidizing substances classified under (a) of each item;

— packagings of packing group II or I, marked with the letter 'Y' or 'X', or intermediate bulk containers (IBCs) of packing group II, marked with the letter 'Y', for oxidizing substances classified under (b) of each item;

— packagings of packing group III, II or I, marked with the letter 'Z', 'Y' or 'X', or intermediate bulk containers (IBCs) of packing group III or II, marked with the letter 'Z' or 'Y', for slightly oxidizing substances classified under (c) of each item.

Note: For the carriage of substances of Class 5.1 in tank wagons, see Appendix XI, in tank-containers, see Appendix X. For caariage in bulk, see marg. 516.

2. Packaging of individual substances

503 (1) Substances of item 1(a) shall be packed in:

(a) non-removable head aluminium drums of at least 99,5 % purity, conforming to marg. 1521, or in non-removable head special steel drums not liable to cause decomposition of hydrogen peroxide, conforming to marg. 1520, or

(b) combination packagings conforming to marg. 1538 with inner packagings of glass, plastics or metal not liable to cause decomposition of hydrogen peroxide. An inner packaging made of glass or plastics shall not contain more than 2 litres; one of metal not more than 5 litres.

Packagings shall be fitted with a vent conforming to marg. 1500(8). They shall conform to a design type which has been tested and approved in accordance with Appendix V for packing group I.

503 *(cont'd)*

(2) Packagings shall not be filled to more than 90 % of their capacity.

(3) A package shall not weigh more than 125 kg.

504 Substances of item 5 shall be carried in cylinders with a capacity of not more than 150 litres, or receptacles with a capacity of not more than 1000 litres (e.g. cylindrical receptacles with rolling hoops or spherical receptacles), made of carbon steel or of a suitable alloy steel.

(a) The receptacles shall comply with the relevant requirements of Class 2 (see marg. 212 and 213). The receptacles shall be designed for a calculation pressure of not less than 2,1 MPa (21 bar) (gauge pressure). The wall thickness of the receptacles shall not, however, be less than 3 mm. Before their first use, the receptacles shall be subjected to a hydraulic pressure test with a gauge pressure of not less than 1 MPa (10 bar). This test shall be repeated every 8 years, together with an internal inspection of the receptacles and a check of the fittings. The receptacles shall in addition be inspected for corrosion every 2 years by means of suitable measuring apparatus (e.g. ultrasound) and also with regard to the condition of the fittings. For the tests and inspections the relevant requirements of Class 2 shall be applicable (see marg. 215 to 217).

(b) The receptacles shall not be filled to more than 92 % of their capacity.

(c) The following particulars shall be shown on receptacles in a clearly legible and permanent manner:

— the name of the manufacturer of the manufacturing mark and the number of the receptacle;

— the description of the substance conforming to marg. 501, item 5;

— the tare mass of the receptacle and the permissible maximum mass of the filled receptacle;

— the date (month, year) of the initial test and of the latest periodical test;

— the stamp of the expert who carried out the tests and inspections.

505 Ammonium nitrate solutions of item 20 shall be carried only in tank wagens (see Appendix XI) or in tank-containers (see Appendix X).

506 (1) Substances classified under (a) of the various items [other than item 1(a)] shall be packed in:

(a) non-removable head steel drums conforming to marg. 1520, or

(b) non-removable head aluminium drums conforming to marg. 1521, or

(c) non-removable head steel or aluminum jerricans conforming to marg. 1522, or

(d) non-removable head plastics drums of a capacity not exceeding 60 litres or non-removable head plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings with inner packagings of glass, plastics or metal conforming to marg. 1538.

(2) Perchloric acid of item 3(a) may also be packed in composite packagings (glass) conforming to marg. 1539.

(3) Solid substances within the meaning of marg. 500(10) may also be packed in:

(a) removable head drums conforming to marg. 1520 for steel, 1521 for aluminium, 1523 for plywood, 1525 for fibreboard, or 1526 for plastics material, or in removable head jerricans conforming to marg. 1522 for steel or aluminium or 1526 for plastics material, if necessary with one or more sift-proof inner bags, or

(b) combination packagings conforming to marg. 1538, with one or more sift-proof inner bags.

507 (1) Substances classified under (b) of the various items shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

507 *(cont'd)*

(c) steel or aluminium jerricans conforming to marg. 1522 or

(d) plastics drums or plastics jerricans conforming to marg. 1526 or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538 or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539 or

(h) metal IBCs conforming to marg. 1622 or

(i) rigid plastics IBCs conforming to marg. 1624 or

(j) composite IBCs with plastics inner receptacle conforming to marg. 1625 with the exception of types 11HZ2 and 31HZ2.

Note: to (a), (b), (c) and (d). Simplified conditions are applicable to removable head drums and jerricans for viscous substances having a viscosity of more than 200 mm^2/s at 23 °C and for solid substances (see marg. 1512, 1553, 1554 and 1561).

(2) Solid substances within the meaning of marg. 500(10) may also be packed in:

(a) removable head drums conforming to marg. 1523 for plywood or 1525 for fibreboard, if necessary with one or more sift-proof inner bags, or

(b) sift-proof bags conforming to marg. 1533 for textile material, 1534 for woven plastics material, 1535 for plastics film or 1536 for water-resistant paper provided the goods are carried as a full wagon load or the bags are loaded on pallets, or

(c) flexible intermediate bulk containers (IBCs) conforming to marg. 1623 with the exception of types 13H1, 13L1 and 13 M1, provided the goods are carried as a full wagon load or the IBCs are loaded onto pallets.

508 (1) Substances classified under (c) of the various items shall be packed in:

(a) steel drums conforming to marg. 1520 or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522 or

(d) plastics drums or plastics jerricans conforming to marg. 1526 or

(e) composite packagings (plastics material) conforming to marg. 1537 or

(f) combination packagings conforming to marg. 1538 or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539, or

(h) light gauge metal packagings conforming to marg. 1540 or

(i) metal IBCs conforming to marg. 1622 or

(j) rigid plastics IBCs conforming to marg. 1624, or

(k) composite IBCs with plastics inner receptacle conforming to marg. 1625, with the exception of types 11HZ2 and 31HZ2.

Note: to (a), (b), (c), (d) and (h). Simplified conditions are applicable to removable head drums, jerricans and light gauge metal packagings for viscous substances having a viscosity of more than 200 mm^2/s at 23 °C and for solid substances (see marg. 1512, 1552 to 1554 and 1561).

(2) Solid substances within the meaning of marg. 500(10) may also be packed in:

(a) removable head drums conforming to marg. 1523 for plywood or 1525 for fibreboard, if necessary with one or more sift-proof inner bags, or

(b) sift-proof bags conforming to marg. 1533 for textile material, 1534 for woven plastics material or 1535 for plastics film or 1536 for water resistant paper, or

(c) flexible IBCs conforming to marg. 1623 with the exception of types 13H1, 13L1 and 13M1. Substances of items 21 and 22(c) may, however, be carried in all types of flexible IBCs conforming to marg. 1623.

509 Packagings or IBCs containing substances of items 1(b) or 1(c) shall be fitted with a vent conforming to marg. 1500(8) or 1601(6) respectively.

510

3. Mixed packaging

511 (1) Substances covered by the same item number may be packed together in a combination packaging conforming to marg. 1538.

(2) Substances of different items of this Class in quantities not exceeding, per receptacle, 3 litres for liquids and/or 5 kg for solids, may be packed together and/or with goods not subject to the requirements of this Directive, in a combination packaging conforming to marg. 1538 provided they do not react dangerously with one another.

(3) Except as otherwise specially provided under paragraph (7), substances of this Class, in quantities not exceeding, per receptacle, 3 litres for liquids and/or 5 kg for solids, may be packed together in a combination packaging conforming to marg. 1538, with substances or articles of other classes, provided that mixed packaging is also permitted for the substances and articles of those classes, and/or with goods which are not subject to the requirements of this Directive, provided they do not react dangerously with one another.

(4) The following are considered dangerous reactions:

(a) combustion and/or giving off considerable heat;

(b) emission of flammable and/or toxic gases;

(c) formation of corrosive liquids;

(d) formation of unstable substance.

(5) The requirements of marg. 8 and 502 shall be complied with.

(6) If wooden of fibreboard boxes are used, a package shall not weigh more than 100 kg.

(7) For substances of items 1(a), 2, 4, 5, 11, 12, 13, 14, 16(b), 17, 25 and 27 to 32 and substances classified under (a) in the remaining items, mixed packing is not allowed. However, for perchloric acid with more than 50 % pure acid of item 3(a), mixed packing is permitted with perchloric acid of Class 8, marg. 801, item 4(b).

4. Marking and danger labels on packages (see Appendix IX)

Marking

512 (1) Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

Danger labels

(2) Packages containing substances of Class 5.1 shall bear a label conforming to model No 5.1.

(3) Packages containing substances of items 2, 5, 29 or 30 shall in addition bear a label conforming to model No 6.1. Packages containing substances of items 1(a), 1(b), 3(a), 5, 31 or 32 shall in addition bear a label conforming to model No 8.

(4) Packages containing liquid substances in receptacles, the closures of which are not visible from the outside, as well as packages containing vented receptacles or vented receptables without outer packaging, shall bear on two opposite sides a label conforming to model No 11.

B. Method of dispath and restrictions on forwarding

513 With the exception of substances of item 5 and substances classified under (a) of each item, packages containing other substances of this Class may be sent as express parcels if they contain:

— substances classified under (b) of each item: up to 4 litres per package for liquids and 12 kg per package for solids;

— substances classified under (c) of each item up to 12 litres per package for liquids and 24 kg per package for solids.

C. Particulars in the consignment note

514 The description of the goods in the consignment note shall conform to one of the identification numbers and names printed in italics in marg. 501. If the substance is not mentioned by name but is assigned to n.o.s. entry, the description of the goods shall consist of the identification number and the n.o.s; designation, followed by the chemical or technical name [1].

The description of the goods shall be followed by particulars of the *Classe, the item number, the group, where appropriate, and the initials 'RID'*, e.g. *'5.1, item 11(b)RID'*. A cross shall be inserted in the appropriate bow on the consignment note.

For the carriage of wastes [see marg. 3(e)], the description of the goods shall be: 'Waste containing...', the component(s) used for the classification of the waste under mag. 3(3) to be entered under its/their chemical name(s), e.g. *'Waste, containing 1513 zinc chlorate, 5.1, item 11(b), RID'*.

For the carriage of solutions or mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

For the carriage of solutions and mixtures containing only one component subject to the requirements of this Directive, the words *solution or mixture* shall be added as part of the name in the consignment note [see marg. 3(3)].

When a solid is handed over for carriage in the molten state, the description of the goods shall further specify '*molten*' unless the term already appears in the name.

When a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall in addition be quoted before the description of the goods.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

If a substance mentioned by name is not subject to the conditions of this Class in accordance with marg. 500(9), the consignor may enter in the consignment note: *'Not goods of Class 5.1'*.

D. Transport Equipment

1. Conditions relating to wagons and loading

a. For packages

515 (1) Wagons intended to hold packages containing substances of Class 5.1 shall be thoroughly cleaned and in particular be free of any combustible debris (straw, hay, paper, etc.) before loading.

(2) With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11(3).

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[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose.

515 (cont'd) (3) Packages shall be so loaded in wagons that they cannot shift dangerously, tip over or fall of.

(4) The use of readily combustible substances for stowing packages in wagons is prohibited.

(5) Flexible intermediate bulk containers (IBCs) intended for the carriage of substances of items 11 to 13 and 16(b) shall be loaded in covered wagons, movable-roof wagons or in open wagons covered with an impermeable and non-combustible sheet; measures shall be taken to ensure that the substances in the wagon cannot, in the event of a leak, come into contact with wood or any other combustible material.

b. For carriage in bulk

516 Substances of items 11 to 13, 16, 18, 21, 22(c) and solid wastes classified under these items may be carried in bulk in open wagons covered with an impermeable and non-combustible sheet, or in movable-roof wagons. In metal wagons, the substance being carried shall not be able to come into contact with any part made of wood or other combustible substances. Wooden wagons shall have their flooring and sides completely covered with a waterproof and incombustible lining or with a coating of sodium silicate or a similar product.

c. For carriage in small containers

517 (1) With the exception of packages containing hydrogen peroxide or solutions of hydrogen peroxide of item 1(a) of tetranitromethane of item 2, packages containing substances of this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 520 shall apply also to the contents of small containers.

(3) Solid substances of items 11 to 13, 16, 18, 21 and 22(c) may also be carried in bulk in metal small containers of the closed type with complete walls.

2. Marking and danger labels on wagons, tank wagons, tank-containers and small containers (see Appendix IX)

518 (1) For the carriage of substances of this Class, labels conforming to model No 5.1 shall be affixed to both sides of wagons, tank wagons and tank-containers.

(2) Wagons, tank wagons and tank-containers containers substances of items 2, 5, 29 or 30 shall, in addition, bear on both sides a label conforming to model No 6.1; those containing substances of items 1(a), 1(b), 3(a), 5, 31 or 32, shall also bear a label conforming to model No 8.

(3) Small containers shall be labelled in accordance with marg. 512(2) and (3).

519

E. Prohibitions on mixed loading

520 Packages bearing a label conforming to model No 5.1 shall not be loaded in the same wagon together with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

521 Separate consignment notes shall be made out for consignments which may not be loaded together in the same wagon.

F. Empty packagings

522 (1) Uncleaned empty packagings including empty intermediate bulk containers (IBCs), empty tank wagons and empty tank-containers and empty wagons and empty small containers for the carriage of goods in bulk, of item 41 shall be closed in the same way and present the same degree of leakproofness as if they were full.

522 *(cont'd)*

(2) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty tank wagons, empty tank-containers as well as empty wagons and empty small containers for carriage of goods in bulk of item 41, shall bear the same danger labels as if they were full.

(3) The description of the goods in the consignment note shall conform to one of the names printed in italics in item 41 completed by '*5.1, item 41, 41 RID*', e.g. '*Empty packaging 5.1 item 41 RID*'.

A cross shall be inserted in the appropriate bow on the consignment note.

In the case of uncleaned empty tank wagons, empty tank-containers, empty wagons for carriage in bulk and empty small containers for carriage in bulk, this description shall be completes by adding the words 'Last load' together with the hazard and substance identification number, the name and item number and, where appropriate, group (a), (b) or (c) of the goods last loaded e.g. '*Last load: 559 2015 hydrogen peroxide, stabilized, item 1(a)*'.

(4) With regard to keeping apart uncleaned empty packagings of item 41, bearing labels conforming to model No 6.1, from foodstuffs, other articles of consumption and animal feedsuffs, see marg. 11(3).

G. Other requirements

523 With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11(3).

524 If substances from packages bearing a label confirming to model No 6.1 have leaked and have been spilled in a wagon, the wagon shall not be reused until after it has been thoroughly cleaned and, if necessary, decontaminated. All other goods and articles carried in such wagons shall be examined for possible contamination.

525-549

CLASS 5.2

ORGANIC PEROXIDES

1. List of substances

550 (1) Among the substances and articles covered by the heading of Class 5.2, those which are listed in marg. 551 or are covered by a collective heading of that marg. are subject to the requirements set out in marg. 550 (4) to 568 and are consequently substances and articles of this Directive [1].

Note: For the classification of solutions and mixtures (such as preparations and wastes), see also marg. 3 (3).

(2) Organic peroxides and formulations of organic peroxides are not considered to be substances of Class 5.2, if:

— they contain not more than 1,0 % available oxygen from the organic peroxides when containing not more than 1,0 % hydrogen peroxide;

— they contain not more than 0,5 % available oxygen from the organic peroxides when containing more than 1,0 % but not more than 7,0 % hydrogen peroxide; or

[1] For the quantities of substances listed in marg. 551 not subject to the requirements of the section 'Conditions of Carriage', see marg. 551a.

550 *(cont'd)*

— tests have proved that they are of type G [see paragraph (6)].

Note: The available oxygen content (%) of an organic peroxide formulation is given by the formula $16 \times \Sigma (n_i \times c_i m_i)$

where:

n_i = number of peroxygen groups per molecule of organic peroxide i;

C_i = concentration (mass %) of organic peroxide i; and

m_i = molecular mass of organic peroxide i.

(3) The following organic peroxides shall not be permitted for carriage under the provisions of Class 5.2:

— organic peroxide type A [see Manual of Tests and Criteria, Part II, paragraph 20.4.3(a)];

— organic peroxide type B and C with a self-accelerating decomposition temperature (SADT) $\leq$ 50 °C;

— organic peroxide type D showing a violent or medium effect when heated under confinement with an SADT $\leq$ 50 °C or showing a low or no effect when heated under confinement with an SADT $\leq$ 45 °C;

— organic peroxide type E and F with an SADT $\leq$ 45 °C.

Note: The SADT is the lowest temperature at which self-accelerating decomposition may occur with a substance in the packaging as used during carriage. Requirements for the determination of the SADT and the effects of heating under confinement are given in the Manual of Tests and Criteria, Part II.

Definition

(4) Class 5.2 covers organic substances which contain the bivalent -0-0- structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals.

Properties

(5) Organic peroxide are thermally unstable substances which are liable to exothermic self-accelerating decomposition at normal or elevated temperatures. The decomposition can be initiated by heat, contact with impurities (e.g. acids, heavy-metal compounds, amines), friction or impact. The rate of decomposition increases with temperature and varies with the organic peroxide formulation. Decomposition may result in the evolution of harmful of flammable gases or vapours. Some organic peroxides may decompose explosively, particularly if confined. This characteristic may be notified by addition of diluents or by use of appropriate packagings. Many organic peroxides burn vigorously. Contact of organic peroxides with the eyes shall be avoided. Some organic peroxides will cause serious injury to the cornea, even after brief contact, or will be corrosive to the skin.

Classification of organic peroxides

(6) Organic peroxides are classified into seven types according to the degree of danger. The principles to be applied to the classification of substances not listed in marg. 551 are set out in the Manual of Tests and Criteria, Part II. The types of organic peroxide range from type A, which is not accepted for carriage in the packaging in which it is tested, to type G, which is not subject to the provisions of Class 5.2 [see marg. 561 (5)]. The classification of types B to F is directly related to the maximum quantity allowed in one packaging.

550
(cont'd)

(7) Organic peroxides and formulations of organic peroxides listed in marg. 551 are assigned to collective headings: items 1 to 10, identification numbers 3101 to 3110.

The collective headings specify:

— the type (B to F) of organic peroxide, see paragraph (6);

— physical state (liquid/solid), see marg. 553 (1).

Mixtures of these formulations may be classified as the same type of organic peroxide as that of the most dangerous component and be carried under the conditions of carriage given for this type. However, as two stable components can form a thermally less stable mixture, the self-accelerating decomposition temperature of the mixture shall be determined.

(8) Classification of organic peroxides, formulations of organic peroxides or mixtures of organic peroxides not listed in marg. 551 and assignment to a collective heading shall be made by the competent authority of the country of origin. Where the country of origin is not a member state the classification and conditions of carriage shall be approved by the competent authority of the first COTIF contracting state through which the consignment passes.

(9) Samples of organic peroxides or formulations or organic peroxides not listed in marg. 551, for which a complete set of test results is not available and which are to be carried for further testing or evaluation, shall be assigned to one of the appropriate entries for organic peroxides type C provided the following conditions are met:

— the available data indicate that the sample would be no more dangerous than organic peroxides type B;

— the sample is packaged in accordance with packing method OP2 and the quantity per wagon or large container is limited to 10 kg.

Desensitization of organic peroxides

(10) In order to ensure safety during carriage, organic peroxides are in many cases desensitized by organic liquids or solids, inorganic solids or water. Where a percentage of a substance is stipulated, this refers to the percentage by mass, rounded to the nearest whole number. In general, desensitization shall be such that, in the case of spillage, the organic peroxide will not concentrate to a dangerous extent.

(11) Unless otherwise stated for a particular organic peroxide formulation, the following definition shall apply to diluents used for desensitization:

— diluents type A are organic liquids which are compatible with the organic peroxide and which have a boiling point of not less than 150 °C. Type A diluents may be used to desensitize all organic peroxides;

— diluents type B are organic liquids which are compatible with the organic peroxide and which have a boiling point of less than 150 °C but not less than 60 °C and a flash-point of not less than 5 °C. Type B diluents may be used for desensitization of all organic peroxides provided that the boiling point of the liquid is at least 60 °C higher than the SADT in a 50 kg package.

(12) Diluents, other than type A or B, may be added to organic peroxide preparations as listed in marg. 551 provided that they are compatible. However, replacement of all or part of a type A or type B diluent by another diluent with differing properties requires that the organic peroxide preparation be reclassified in accordance with the normal classification procedure for Class 5.2.

(13) Water may only be used for the desensitization of organic peroxides which are listed in marg. 551 or approved by the competent authority as in paragraph (8) as being 'with water' or as 'stable dispersion in water'. Samples or formulations of organic peroxides not listed in marg. 551 may also be desensitized with water provided the requirements of paragraph (9) are met.

550 *(cont'd)*

(14) Organic and inorganic solid may be used for desensitization of organic peroxides provided that they are compatible.

(15) Compatible liquids and solids are those have no detrimental influence on the thermal stability and hazard type of the organic peroxide formulation.

A. Organic peroxide not requiring temperature control

551 *Note:* Organic peroxide requiring temperature control are not to be accepted for carriage [see marg. 550 (3)].

1. (b) *3101 organic peroxide type B, liquid,* such as:

Substance	Concentration (%)	Diluent Typ A (%)	Packing method (see marg. 553)	Additional labelling (see marg. 559)
tert-Amylperoxy-3, 5, 5-trimethylhexanoate	≤ 100		OP5	01
tert-Butylperoxyacetate	> 52-77	≥23	OP5	01
1, 1-Di-(tert-butylperoxy) cyclohexane	> 80-100		OP5	01
1, 1-Di-(tert-butylperoxy)-3, 3, 5-trimethylcyclohexane	> 90-100		OP5	01
Methyl ethyl keton peroxide(s) (1)	≤ 52	≥ 48	OP5	01, 8

(1) Available oxygen > 10 %.

2. (b) *3102 Organic peroxide type B, solid*, such as:

Substance	Concentration (%)	Inert solid (%)	Water (%)	Packing method (see marg. 553)	Additional labelling (see marg. 559)
tert-Butyl monoperoxymaleate	> 52-100			OP5	01
tert-Butyl monoperoxyphthalate	≤ 100			OP5	01
3-Chloroperoxybenzoic acid	> 57-86	≥ 14		OP1	01
Dibenzoyl peroxide	> 51-100	≤ 48		OP2	01
Dibenzoyl peroxide	> 77-94		≥ 6	OP4	01
Di-4-chlorobenzoyl peroxide	≤ 77		≥ 23	OP5	01
Di-2,4-dichlorbenzoyl peroxide	≤ 77		≥ 23	OP5	01
2,2-Dihydroperoxypropane	≤ 27	≥ 73		OP5	01
2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane	> 82-100			OP5	01
Di-(2-phenoxyethyl) peroxydicarbonate	> 85-100			OP5	01
Disuccinic acid peroxide (1)	> 72-100			OP4	01
3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane	> 52-100			OP4	01

(1) Addition of water will decrease the thermal stability.

551 *(cont'd)*

3. (b) *3103 Organic peroxide type C, liquid*, such as:

Substance	Concentration (%)	Diluent Type A (%)	Water (%)	Packing method (see marg. 553)	Additional labelling (see marg. 559)
1,1-Di-(tert-amylperoxy) cyclohexane	≤ 82	≥ 18		OP6	
n-Butyl-4,4-di-(tert-butylperoxy)valerate	> 52-100			OP5	
tert-Butyl hydroperoxide	> 79-90		≥ 10	OP5	8
tert-Butyl hydroperoxide + Di-tert-butylperoxide	≤ 82+≥ 9		≥ 7	OP5	8
tert-Butyl monoperoxymaleate	52	≥ 48		OP6	
tert-Butyl peroxyacetate	> 32-52	≥ 48		OP6	
tert-Butyl peroxybenzoate	>[77-100	≤ 22		OP5	
tert-Butylperoxy isopropylcarbonat	77	≤ 23		OP5	
tert-Butylperoxy-2-methylbenzoate	100			OP5	
2,2-Di-(tert-butylperoxy)butane	≤ 52	≥ 48		OP6	
1,1-Di-(tert-butylperoxy)cyclohexane	> 52-80	≥ 20		OP5	
2,5-Dimethyl-2,5-di-(tert-butylperoxy)-hexyne (1)	> 52-86	≥ 14		OP5	
1,1-Di-(tert-butylperoxy)-3,5,5-trimethylcyclohexane	> 57-90	≥ 10		OP5	
Ethyl-3,3-di-(tert-butylperoxy)butyrate	> 77-100			OP5	
Organic peroxide, liquid, sample (2)				OP2	

(1) With < 0,5 % hydroperoxide content.
(2) See marg. 550 (9).

4. (b) *3104 Organic peroxide type C, solid*, such as:

Substance	Concentration (%)	Water (%)	Packing method (see marg. 534)	Additional labelling (see marg. 559)
Cyclohexanone peroxide(s)	≤ 91	≥ 9	OP6	8
Dibenzoyl peroxide	≤ 77	≥ 23	OP6	
2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane	≤ 82	≥ 18	OP5	
2,5-Dimethyl-2,5-dihydroperoxyhexane	≤ 82	≥ 18	OP6	
Organic peroxide, solid, Sample (1)			OP2	

(1) See marg. 550 (9).

5. (b) *3105 Organic peroxide type D, liquid*, such as:

Substance	Concentration (%)	Diluent type A (%)	Water (%)	Packing method (see marg. 553)	Additional labelling (see marg. 559)
Acetyl acetone peroxide (1)	≤ 42	≥ 48	≥ 8	OP7	
Acetyl benzoyl peroxide	≤ 45	≥ 55		OP7	
tert-Amyl peroxybenzoate	≤ 96	≥ 4		OP7	
tert-Butyl cumylperoxide	> 42-100			OP7	
tert-Butyl hydroperoxide (2)	80	≥ 20		OP7	8
tert-Butyl peroxybenzoate	> 52-77	≥ 23		OP7	

551 *(Cont'd)*

Substance	Concentration (%)	Diluent type A (%)	Water (%)	Packing method (see marg. 554)	Additional labelling (see marg. 559)
tert-Butylperoxycrotonate	≤ 77	≥ 23		OP7	
tert-Butyl peroxydiethylacetate + tert-Butylperoxybenzoate	≤ 33+≤ 33	≥ 33		OP7	
1-(2-tert-Butylperoxyisopropyl)-3-isopropenylbenzene	≤ 77	≥ 23		OP7	
tert-Butylperoxy-3,5,5-trimethylhexanoate	> 32-100			OP7	
Cyclohexanoneperoxide(s) (3)	≤ 72	≥ 28		OP7	
Di-tert-butylperoxyazelate	≤ 52	≥ 48		OP7	
1,1-Di-(tert-butylperoxy)cyclohexane	> 42-52	≥ 48		OP7	
Di-(tert-butylperoxy)phthalate	> 42-52	≥ 48		OP7	
2,2-Di-(tert-butylperoxy)propane	≤ 52	≥ 48		OP7	
tert-Butylperoxy-2-ethylhexylcarbonate	≤ 100			OP7	
tert-Butyl peroxybutylfumarate	≤ 52	≥ 48		OP7	
2,5-Dimethyl-2,5-di-(tert-butyl-peroxy)hexane	> 52-100			OP7	
2,5-Dimethyl-2,5-di-(3,5,5-trimethylhexanoyl-peroxy)hexane	≤ 77	≥ 23		OP7	
Ethyl-3,3-di-(tert-amylperoxy)-butyrate	≤ 67	≥ 33		OP7	
Ethyl-3,3-di-(tert-butylperoxy)-butyrate	≤ 77	≥ 23		OP7	
3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane	≤ 52	≥ 48		OP7	
p-Methyl hydroperoxide	> 72-100			OP7	8
Methyl ethyl ketone peroxide(s) (4)	≤ 45	≥ 55		OP7	
Methyl isobutyl ketone peroxide(s) (5)	≤ 62	≥ 19		OP7	
Peroxyacetic acid, type D, stabilized (6)	≤ 43			OP7	8
Pinanyl hydroperoxide	56-100			OP7	8
tert-Amylperoxy-2-ethylhexylcarbonate	≤ 100			OP7	
1,1,3,3-Tetramethylbutyl hydroperoxide	≤ 100			OP7	

(1) Available oxygen ≤ 4,7 %.
(2) Diluent may be replaced by di-tert-butyl peroxide.
(3) Available oxygen ≤ 9 %.
(4) Available oxygen ≤ 10 %.
(5) With ≥ 19 % methyl isobutyl ketone in addition to diluent type A.
(6) Mixtures of peroxyacetic acid with hydrogen peroxide, water and acids which meet the criteria of the Manual of Tests and Criteria, Part II, paragraph 20.4.3(d).

6. (b) *3106 Organic Peroxide type D, solid*, such as:

Substance	Concentration (%)	Diluent type A (%)	Inert solid (%)	Water (%)	Packing method (see marg. 553)
Acetyl acetone peroxide (1), as a paste	≤ 32				OP7
n-Butyl-4,4-di-(tert-butylperoxy)valerate	≤ 52		≥ 48		OP7
tert-Butyl peroxybenzoate	≤ 52		≥ 48		OP7
tert-Butylperoxy-2-ethylhexanoate + 2,2-di-(tert-butylperoxy)butane	≤ 12+≤ 14	≥ 14	≥ 60		OP7
3-tert-Butylperoxy-3-phenylphthalide	≤ 100				OP7
tert-Butyl peroxystearylcarbonate	≤ 100				OP7
tert-Butyl cumyl peroxide	≤ 42		58		OP7
3-Chloroperoxybenzoic acid	≤ 57		≥ 3	≥ 40	OP7
3-Chloroperoxybenzoic acid	≤ 77		≥ 6	≥ 17	OP7
Cyclohexanoneperoxide(s) (1), (2) as a paste	≤ 72				OP7

551 *(cont'd)*

Substance	Concentration (%)	Diluent Typ A (%)	Inert solid (%)	Water (%)	Packing method (see marg. 554)
Dibenzoyl peroxide	≤ 62		≥ 28	≥ 10	OP7
Dibenzoyl peroxide (1), as a paste	> 52-62				OP7
Dibenzoyl peroxide	> 35-52		≥ 48		OP7
Di-(4-methylbenzoyl)peroxide, as a paste	≤ 52				OP7
Di-isopropylbenzenedihydroperoxide (3)	≤ 82	≥ 5		≥ 5	OP7
1,1-Di-(tert-butylperoxy)cyclohexane	≤ 42	≥ 13	≥ 45		OP7
2,2-Di-(4,4-tert-butylperoxycyclo-hexyl)-propane	≤ 42		≥ 58		OP7
Di-(2-tert-butylperoxyisopropyl)-benzene(s)	> 42-100		≥ 57		OP7
Di-(tert-butylperoxy)phthalate (1), as a paste	≤ 52				OP7
2,2-Di-(tert-butylperoxy)propane	≤ 42	≥ 13	≥ 45		OP7
1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclo-hexane	≤ 57		≥ 43		OP7
Di-(4-chlorobenzoyl)peroxide (1), as a paste	≤ 52				OP7
Di-(2,4-dichlorbenzoyl)peroxide as a paste with Silicon oil	≤ 52				OP7
Di-(1-hydroxycyclohexyl) peroxide	100				OP7
Dilauroyl peroxide	≤ 100				OP7
2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane	≤ 82		≥ 18		OP7
2,5-Dimethyl-2,5-di-(tert-butyl-peroxy)hexane	≤ 52		≥ 48		OP7
2,5-Dimethyl-2,5-di-(tert-butyl-peroxy) hexyne-3	≤ 52		≥ 48		OP7
Di-(2-phenoxyethyl)peroxydicarbonate	≤ 85			≥ 15	OP7
Distearyl peroxydicarbonate	≤ 87		≥ 13		OP7
Ethyl-3,3-di-(tert-butylperoxy) butyrate	≤ 52		≥ 48		OP7
3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclo-nonane	≤ 52		≥ 48		OP7
Tetrahydronaphtyl hydroperoxide	100				OP7

(1) With diluent type A, with or without water.
(2) Available oxygen ≤ 9 %.
(2) With ≤ 8 % 1-Isopropylhydroperoxy-4-isopropylhydroxy benzene.

7. (b) *3107 organic peroxide Typ E, liquid*, such as:

Substance	Concentration (%)	Diluent Typ A (%)	Diluent Typ B (%)	Water (%)	Packing method (see marg. 553)	Additional Labeling (see marg. 559)
tert-Amyl hydroperoxide	≤ 88	≥ 6		≥ 6	OP8	
tert-Amyl peroxyacetate	≤ 62	≥ 38			OP8	
tert-Butyl hydroperoxide (1)	≤ 79			> 14	OP8	8
Cumyl hydroperoxide	> 90-98	≤ 10			OP8	8
Dibenzoyl peroxide	> 36-42	≥ 18		≤ 40	OP8	
Dibenzoyl peroxide	> 36-42	≥ 58			OP8	
Di-tert-amyl-peroxide	≤ 100				OP8	
Di-tert-butyl peroxide	> 32-100				OP8	
1,1-Di-(tert-butylperoxy)cyclo-hexane (2)	≤ 27	≥ 36			OP8	
Di-(tert-butylperoxy)-phthalate	≤ 42	≥ 58			OP8	

551 *(cont'd)*

Substance	Concentration (%)	Diluent type A (%)	Diluent type B (%)	Water (%)	Packing method (see marg. 553)	Additional labelling (see marg. 559)
1,1-Di-(tert-butylperoxy)-3,5,5-trimethylcyclohexane	≤ 57	≥ 43			OP8	
1,1-Di-(tert-butylperoxy)-3,5,5-trimethylcyclohexane	≤ 32	≥ 26	≥ 42		OP8	
Methyl ethyl ketone peroxide(s) (3)	≤ 40	≥ 60			OP8	
Peroxyacetic acid, Typ E, stabilized (4)	≤ 43				OP8	8

(1) With < 6 % Di-tert-butyl peroxide.
(2) With ≥ 36 % ethylbenzene in addition to diluent type A.
(3) Available oxygen ≤ 8,2 %.
(4) Mixtures of peroxyacetic acid with hydrogen peroxide, water and acids which fulfil the criteria of the Manual of Tests and Criteria, Part II, paragraph 20.4.3(e).

8. (b) *3108 organic peroxide type E, solid*, such as:

Substance	Concentration (%)	Inert solid (%)	Water (%)	Packing method (see marg. 553)
tert-Butyl monoperoxymaleate (1) as a paste	≤ 52			OP8
tert-Butyl monoperoxymaleate (1)	≤ 52	≥ 48		OP8
1-(2-tert-Butylperoxy isopropyl)-3-isopropenylbenzene	≤ 42	≥ 58		OP8
Dibenzoyl peroxide (1) as a paste	≤ 52			OP8
n-Butyl-4,4-di-(tert-butylperoxy)-valerate	≤ 42	≥ 58		OP8
Dibenzoyl peroxide as a paste	≤ 56,5		≥ 15	OP8
2,5-Dimethyl-2,5-di-(tert-butylperoxy)-hexane as a paste	≤ 47			OP8

(1) With diluent type A, with or without water.

9. (b) *3109 organic peroxide type F, liquid*, such as:

Substance	Concentration (%)	Diluent type A (%)	Diluent type B (%)	Water (%)	Packing method (see marg. 553)	Additional labelling (see marg. 559)
tert-Butyl hydroperoxide	≤ 72			≥ 28	OP8	8
tert-Butyl peroxy-3,5,5-trimethylhexanoate	≤ 32	≥ 68			OP8	
tert-Butyl peroxyacetate (1)	≤ 22		≥ 78		OP8	
tert-Butyl peroxyacetate (1)	≤ 32	≥ 68			OP8	
Cumyl hydroperoxide	80-90	≥ 10			OP8	8
Cumyl hydroperoxide	≤ 80	≥ 20			OP8	
Dibenzoyl peroxide as a stable dispersion in water	≤ 42				OP8	
Dilauroyl peroxide as a stable dispersion in water	≤ 42				OP8	
Di-tert-butyl peroxide (1)	≤ 52		≥ 48		OP8	
1,1-Di-(tert-butylperoxy) cyclohexane	≤ 42	≥ 58			OP8	
1,1-Di-(tert-butylperoxy) cyclohexane	≤ 13	≥ 13	≥ 74		OP8	

551 *(cont'd)*

Substance	Concentration (%)	Diluent type A (%)	Diluent type B (%)	Water (%)	Packing method (see marg. 553)	Additional labelling (see marg. 559)
2,5-Dimethyl-2,5-di-(tert-butylperoxy)-hexane	≤ 52	≥ 48			OP8	
Isopropylcumyl hydroperoxide	≤ 72	≥ 28			OP8	8
p-Menthyl hydroperoxide	≤ 72	≥ 28			OP8	
Peroxyacetic acid, type F, stabilized [2]	≤ 43				OP8	8
Pinanyl hydroperoxide	< 56	> 44			OP8	

[1] Diluent type B with boiling point > 110 °C.
[2] Mixtures of peroxyacetic acid with hydrogen peroxide, water and acids which fulfil the criteria of the Manual of Tests and Criteria, Part II, paragraph 20.4.3 (f).

10. (b) *3110 organic peroxide type F, solid*, such as:

Substance	Concentration (%)	Inert solid (%)	Packing method (see marg. 553)
Dicumyl peroxide	> 42-100	≤ 57	OP8

B. Empty packagings

31. *Uncleaned empty packagings*, including *empty intermediate bulk containers* (IBCs), *empty tank wagons* and *empty tank-containers*, having contained substances of Class 5.2.

551a (1) Substances or articles of items 1 to 10 carried in accordance with the following conditions are not subject to the requirements of section 2 'Conditions of Carriage' except as provided for in paragraph (2) below:

(a) liquids of items 1 and 3: not more than 25 ml per inner packaging;

(b) solids of items 2 and 4: not more than 100 g per inner packaging;

(c) liquids of items 5, 7 and 9: not more than 125 ml per inner packaging;

(d) solids of items 6, 8 and 10: not more than 500 g per inner packaging.

These quantities of substances shall be carried in combination packagings which at least meet the conditions of marg. 1538. The total gross mass of the package shall not exceed 30kg. These quantities contained in metal or plastics inner packagings may also be carried in shrink-wrapped or stretch-wrapped trays as outer packagings, provided that the total gross mass of the package does not exceed 20 kg. These quantities of substances may be packed together with other articles provided that they will not interact dangerously in the event of leakage.

The following are considered dangerous reactions:

(a) combustion and/or giving off considerable heat;

(b) emission of flammable and/or toxic gases;

(c) formation of corrosive liquids;

(d) formation of unstable substances.

551a *(cont'd)* The 'General conditions of packing' of marg. 1500 (1), (2) and (5) to (7) shall be observed.

(2) For carriage in accordance with paragraph (1) above, the description of the goods in the consignment note shall conform to the requirements of marg. 561 and include the words '*limited quantity*'. Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

2. Conditions of carriage

(The conditions of carriage relating to empty packagings are set out under F.)

A. Packages

1. General conditions of packing

552 (1) Packagings shall satisfy the conditions of Appendix V and shall be so constructed that none of the materials in contact with the contents will dangerously affect them. They shall not be filled to more than 93 % of their capacity. For combination packagings, cushioning materials shall not be readily combustible and shall not cause decomposition of the organic peroxide if leakage occurs.

(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix VI.

(3) In accordance with the requirements of marg. 1511 (2) or 1611 (2), substances and articles shall be packed in packages of Packing Groups II or I, marked with the letter 'Y' or 'X', or in IBCs of Packing Group II marked with the letter 'Y'.

Note: For carriage in tank wagons, see Appendix XI; for carriage in tank-containers, see AppendixX.

2. Packing of individual substances

553 (1) The packing methods for substances of Class 5.2 are listed in the Table in paragraph 2 and are designated OP1 to OP8. Viscous substances with an outflow time from a DIN-cup with 4 mm outlet at 20 °C exceeding 10 minutes (corresponding to an outflow time of more than 690 seconds at 20 °C from a Ford cup 4, or to more than $2{,}68 \times 10^3$ m^2/s) shall be considered as solids.

(2) Substances and articles shall be packed in accordance with packing methods OP1 to OP8 of the Table below, in accordance with the requirements of marg. 551. A packing method corresponding to a smaller package size (i.e. with a lower OP number) may be used, but a packing method corresponding to a larger package size (i.e. with a higher OP number) shall not be used.

The quantities specified for each packing method represent the maximum that is currently considered good practice.The following kinds of packaging may be used:

— drums conforming to marg. 1520, 1521, 1523, 1525 oder 1526; or

— jerricans conforming to marg. 1522 or 1526; or

— boxes conforming to marg. 1527, 1528, 1529, 1530, 1531 or 1532; or

— composite packagings with plastics inner receptacle, conforming to marg. 1537 provided that:

(a) the requirements of Appendix V are complied with;

(b) metal packagings (including inner packagings of combination packagings and outer packagings of combination or composite packagings) are used only for packing methods OP7 and OP8;

553 *(cont'd)*

(c) in combination packagings, glass receptacles are only used as inner packagings with a maximum content of 0,5 kg or 0,5 litre.

Table

Maximum quantity per packaging/packing (1) methods OP1 to OP8

Maximum quality	Packing method							
	OP1	OP2 (1)	OP3	OP4 (1)	OP5	OP6	OP7	OP8
Maximum mass (kg) for solids and for combination packagings (liquids and solids)	0,5	0,5/10	5	5/25	25	50	50	200 (2)
Maximum contents in litres for liquids (3)	0,5	—	5	—	30	60	60	225 (4)

(1) If two values are given, the first applies to the maximum net mass per inner packaging and the second to the maximum net mass of the complete package.
(2) 60 kg for jerricans; 100 kg for boxes.
(3) Viscous liquids shall be treated as solids if the criteria of marg. 553 (1) are met.
(4) 60 litres for jerricans.

(3) Packages bearing a label conforming to model No 01 shall comply with the requirements of marg. 102 (8) and (9).

(4) Packagings, including IBCs, containing substances of items 1(b), 3(b), 5(b), 7(b) or 9(b) which emit small quantities of gases, shall be vented, in accordance with marg. 1500 (8) or 1601 (6).

554 For organic peroxides or formulations of organic peroxides not listed in marg. 551, the following procedure shall be used to assign the appropriate packing method:

(a) organic peroxides type B:

Substances and articles shall be assigned to packing method OP5 provided that they satisfy the criteria of the Manual of Tests and Criteria, Part II, paragraph 20.4.3 (b) in one of the packagings indicated. If the organic peroxide can only satisfy these criteria in a smaller packaging than those listed for packing method OP5 (i.e. one of the packagings listed for OP1 to OP4), then the corresponding packing method with the lower OP number shall be used.

(b) Organic peroxides type C:

Substances and articles shall be assigned to packing method OP6 provided that they satisfy the criteria of the Manual of Tests and Criteria, Part II, paragraph 20.4.3 (c) in one of the packagings indicated. If the organic peroxide can only satisfy these criteria in a smaller packaging than those listed for packing method OP6, the corresponding packing method with the lower OP number shall be used.

(c) organic peroxides type D:

Packing method OP7 shall be used.

(d) organic peroxides type E:

Packing method OP8 shall be used.

(e) organic peroxides type F:

Packing method OP8 shall be used.

555 (1) Substances of items 9(b) and 10(b) of marg. 551 may be packed in IBCs in accordance with conditions laid down by the competent authority of the country of origin provided that the latter is satisfied, on the basis of tests, that such carriage presents no dangers. The tests shall, among other things

— demonstrate that the organic peroxide meets the classification criteria laid down in the Manual of Tests and Criteria, Part II, paragraph 20.4.3 (f);

— demonstrate that the substance is compatible with all materials in contact with which it is likely to come during the course of normal carriage;

— allow for the construction of emergency relief devices, if required; and

— establish whether any special measures are necessary.

If the country of origin is not a Member State, these conditions shall be recognized by the competent authority of the first COTIF Contracting State reached by the consignment.

(2) The following organic peroxides of type F may be carried in IBCs of the type shown without meeting the conditions of paragraph (1):

Substance	Type of IBC	Maximum capacity (litres)
3109 ORGANIC PEROXIDES, TYPE F, LIQUID		
tert-Butyl peroxyacetate, not more than 32 % in diluent type A	31A 31HA1	1 250 1 000
tert-Butyl peroxy-3,5,5-trimethylhexanoate, not more than 32 % in diluent type A	31A 31HA1	1 250 1 000
Cumyl hydroperoxide, not more than 90 % in diluent type A	31HA1	1 250
Dibenzoyl peroxide, not more than 42 % as a stable dispersion in water	31H1	1 000
Di-tert-butyl peroxide, not more than 32 % in diluent type A	31A 31HA1	1 250 1 000
1,1-Di-(tert-butylperoxy)-cyclohexane, not more than 42 % in diluent type A	31HA1	1 000
Dilauroyl peroxide, not more than 42 % stable dispersion in water	31HA1	1 000
Isopropyl cumyl hydroperoxide, not more than 72 % in diluent type A	31HA1	1 250
p-Menthyl hydroperoxide, not more 72 % in diluent typ A	31HA1	1 250
Peroxyacetic acid, stabilized, not more than 17 %	31H1	1 000

(3) To prevent explosive rupture of metal IBCs or composite IBCs with complete metal casing, the emergency relief devices shall be designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of fire engulfment (heat load 110 kW/m^2) or self-accelerating decomposition.

556-
557

3. Mixed packing

558 Substances of Class 5.2 shall not be packed together with substances or articles of other classes or with goods which are not subject to the requirements of this directive.

4. Marking and danger labels of packages (see Appendix IX)

Marking

559 (1) Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

Danger labels

(2) Packages containing substances of Class 5.2 shall bear a label conforming to model No 5.2.

(3) Packages containing substances of items 1 and 2 shall, in addition, bear a label conforming to model No 01 unless the competent authority has permitted this label to be dispensed with for the type of packaging tested because the results have proved that the organic peroxide in such a packaging does not exhibit explosive behaviour [see marg. 561 (4)].

(4) Where a substance is highly corrosive or corrosive according to the criteria of Class 8 [see marg. 800 (3)], packages shall, in addition, bear a label conforming to model No 8 where this is indicated in marg. 551 (additional labelling) or is required in the approved conditions of carriage [see marg. 550 (8)].

(5) Packages containing liquids in receptacles the closures of which are not visible from the outside, and packages containing vented receptacles or vented receptacles without outer packagings shall bear on two opposite sides a label conforming to model No 11.

B. Method of despatch and restrictions on forwarding

560 With the exception of substances of items 1 and 2, packages containing substances of this Class may be sent as express parcels if they contain up to 4 litres per package for liquids and 12 kg per package for solids.

C. Particulars in the consignment mote

561 (1) The description of the goods in the consignment note shall conform to one of the identification numbers and the corresponding collective heading printed in italics in marg. 551, followed by the chemical name of the substance in brackets.

The description of the goods shall be followed by particulars of the *Class, the item number, the group, where appropriate, and the initials 'RID'* e.g. *'3108, organic peroxide type E, solid, (dibenzoyl peroxide), 5.2 item 8(b), RID).'* A cross shall be inserted in the appropriate box on the consignment note.

For the carriage of wastes [see marg. 3 (4)], the description of the goods shall be: '*Waste, containing* ...', the component(s) which has/have been used for the classification of the waste under marg. 3 (3) to be entered under its/their chemical name(s), e.g. '*Waste, containing 3107 organic peroxide type E, liquid, (peroxyacetic acid), 5.2 item 7(b) RID.*'

For the carriage of solutions or mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

When a marking in accordance with Appendix VIII is prescribed, the hazard identification number in accordance with Appendix VIII shall in addition be quoted before the description of the goods.

561 *(cont'd)* (2) Where substances and articles are carried under conditions determined by the competent authority (see marg. 550 (8), 555 (1) and Appendix X/XI, paragraph 5.1.2), the consignment note shall be endorsed as follows:

'Carriage in accordance with marg. 561 (2).'

A copy of the statement of approval of the competent authority, together with the conditions of carriage, shall be attached to the consignment note.

(3) Where a sample of an organic peroxide is carried in accordance with marg. 550 (9), the consignment note shall be endorsed as follows:

'Carriage in accordance with marg. 561 (3).'

(4) Where, by permission of the competent authority in accordance with marg. 559 (3), a label conforming to model No 01 is not required, the consignment note shall be endorsed as follows:

'Danger label conforming to model No 01 not required.'

(5) Where organic peroxides type G [see The Manual of Tests and Criteria, Part II, paragraph 20.4.2 (g)] are carried, the consignment note may be endorsed as follows:

'Not a substance of Class 5.2.'

D. Transport equipment

1. Conditions relating to wagons and loading

a. For packages

562 (1) Packages shall be loaded in covered wagons with adequate ventilation. Ventilation shutters shall be open during carriage. For the carriage of packages bearing the additional label conforming to model No 01 [see marg. 559 (3)], only wagons with regulation sheet steel spark guards shall be used, even when the substances are loaded in large containers. For wagons fitted with a flammable floor, the sheet steel spark guards shall not be fixed directly to the floor of the wagon.

(2) Wagons shall be thoroughly cleaned before loading.

(3) Readily flammable materials shall not be used for stowing packages in wagons.

(4) Packages shall be kept upright and be so loaded in wagons that they cannot shift dangerously, tip over or fall off. They shall be protected against any damage which might be caused by other packages.

(5) Packages shall be so loaded that a free circulation of air within the loading space ensures the uniform temperature of the load. If the contents of a wagon exceeds 5 000 kg of organic peroxides, the load shall be divided into stacks of not more than 5 000 kg separated by air spaces of at least 0,05m.

b. For carriage in small containers

563 (1) With the exception of packages containing substances of items 1 or 2, packages containing substances of this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 565 shall also be applied to the contents of small containers.

2. Markings and danger labels on wagons, tank wagons, tank-containers and small containers (see Appendix IX)

564 (1) Wagons, tank wagons and tank-containers containing substances of this Class shall bear on both sides a label conforming to model No 5.2.

(2) Wagons containing packages bearing a label conforming to model No 01 shall in addition bear on both sides a label conforming to model No 01.

(3) Where a substance is highly corrosive or corrosive according to the criteria of Class 8 [see marg. 800 (3)], wagons and tank-containers shall in addition bear on both sides a label conforming to model No 8. This is indicated in marg. 551 (additional labelling) or, when required, in the approved conditions of carriage [see marg. 550 (8)].

(4) Small containers shall be labelled in accordance with marg. 559.

E. Prohibitions on mixed loading

565 (1) Packages bearing a label conforming to model No 5.2 shall not be loaded together in the same wagon with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

(2) Packages bearing labels conforming to models Nos 5.2 and 01 shall not be loaded together in the same wagon with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6, 2, 3, 4.1, 4.2, 4.3, 5.1, 6.1, 6.2, 7A, 7B, 7C, 8 or 9.

566 Separate consignment notes shall be made out four consignments which may not be loaded together in the same wagon.

F. Empty packagings

567 (1) Uncleaned empty packagings, including IBCs, empty tank wagons and empty tank-containers, of item 31 shall be closed in the same manner and to the same degree of leakproofness as if they were full.

(2) Uncleaned empty packagings, including empty IBCs, empty tank wagons and empty tank-containers, of item 31 shall bear the same danger labels as if they were full.

(3) The description in the consignment note shall conform to one of the names printed in italics in item 31, completed by '*5.2, item 31, RID*', e.g. '*Empty packagings, 5.2, item 31, RID*'. A cross shall be inserted in the appropriate box on the consignment note. In the case of empty tank wagons or empty tank-containers, uncleaned, this description shall be completed by adding the words 'Last load' together with the hazard and substance identification numbers, chemical name, item number and, group (b) of the goods last loaded, e.g. '*Last load: 539 3109 organic peroxide type F, liquid, (tert-butyl hydroperoxide), item 9(b)*'.

G. Other requirements

568 No requirements.

569-599

CLASS 6.1

TOXIC SUBSTANCES

1. List of substances

600 (1) Among the substances and articles covered by the title of Class 6.1, those which are listed in marg. 601 or are covered by a collective heading of that marg. are subject to the requirements set out in marg. 600 (2) to 624 and are then considered as substances and articles of this Directive.

Note: For the quantities of substances listed in marg. 601 which are not subject to the requirements of the section headed 'Conditions of Carriage' see marg. 601a.

(2) The title of Class 6.1 covers the toxic substances of which it is known by experience or regarding which it is presumed from experiments on animals that in relatively small quantity they are able by a single action or by action of short duration to cause damage to human health, or death, by inhalation, by cutaneous absorption or by ingestion.

Substances of Class 6.1 are subdivided as follows:

A. Substances which are highly toxic on inhalation with a flash-point below 23 °C;

B. Organic substances which have a flash-point of not less than 23 °C or non-flammable organic substances;

C. Organometallic compounds or carbonyls;

D. Inorganic substances which may release toxic gases on contact with water (or atmospheric humidity), aqueous solutions or acids and other toxic water-reactive substances [1];

E. Other inorganic substances and metallic salts of organic substances;

F. Substances and preparations used as pesticides;

G. Substances intended for laboratories and experiments and for the manufacture of pharmaceutical products, if not listed in other items of this Class;

H. Empty packagings.

(3) Substances and articles of Class 6.1, other than the substances and articles of items 1 to 5, which are classified under the various items of marg. 601, are assigned to one of the following groups designated by the letters (a), (b) or (c), according to their degree of toxicity:

(a) highly toxic substances;

(b) toxic substances;

(c) slightly toxic substances.

Substances, mixtures and solutions, including pesticides of items 71 to 73, not expressly mentioned, shall be classified under the appropriate item and group according to the following criteria:

1. To assess the degree of toxicity, account shall be taken of human experience of instances of accidental poisoning, as well as special properties possessed by any individual substances: liquid state, high volatility, any special likelihood of cutaneous absorption, and special biological effects.

[1] The term water-reactive denotes a substance which, in contact with water, emits flammable gases.

600 *(cont'd)*

2. In the absence of observations on humans, the degree of toxicity shall be assessed using the available data from animal experiments in accordance with the table below:

	Subdivision into groups within an item	Oral toxicity LD_{50} (mg/kg) (1)	Dermal toxicity LD_{50} (mg/kg) (1)	Toxicity on inhalation LC_{50} dusts and mists (mg/l)
Highly toxic	(a)	≤ 5	≤ 40	≤ 0,5
Toxic	(b)	> 5-50	> 40-200	> 0,5-2
Slightly toxic	(c) (2)	solids: > 50-200 liquids: > 50-200	> 200-1 000	> 2-10

(1) LD_{50} toxicity data for a number of common pesticides may be obtained from the most recent edition of the document 'The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification' available from the International Programme on Chemical Safety, World Health Organization (WHO), 1211 Geneva 27, Switzerland. While that document may be used as a source of LD_{50} data for pesticides, its classification system may not be used for purposes of transport classification of, or assignment of packing groups to, pesticides, which shall be in accordance with the requirements of this Directive.

(2) Tear gas substances shall be included in group (b) even if data concerning their toxicity correspond to group (c) criteria.

2.1. Where a substance exhibits different degrees of toxicity for two or more kinds of exposure, it shall be classified under the highest such degree of toxicity.

2.2. Substances meeting the criteria of Class 8 and with an inhalation toxicity of dusts and mists (LD_{50}) corresponding to group (a) shall only be accepted for an allocation to Class 6.1 if the toxicity through oral ingestion or dermal contact is at least in the range of group (a) or (b). Otherwise an assignment to Class 8 shall be made, if appropriate (see footnote 1 to marg. 800).

LD_{50} value for acute oral toxicity

2.3. That dose of the substance administered which is most likely to cause death within 14 days in one half of both male and female young adult albino rats. The number of animals tested shall be sufficient to give a statistically significant result and shall be in conformity with good pharmacological practices. The result is expressed in mg per kg body mass.

LD_{50} value for acute dermal toxicity

2.4. That dose of the substance which, administered by continuous contact for 24 hours with the bare skin of albino rabbits, is most likely to cause death within 14 days in one half of the animals tested. The number of animals tested shall be sufficient to give a statistically significant result and shall be in conformity with good pharmacological practices. The result is expressed in mg per kg body mass.

LC_{50} value for acute toxicity on inhalation

2.5. That concentration of vapour, mist or dust which, administered by continuous inhalation for one hour to both male and female young adult albino rats, is most likely to cause death within 14 days in one half of the animals tested. A solid shall be tested if at least 10 % of its total mass is likely to be dust in a respirable range, e.g. the aerodynamic diameter of that particle-fraction is 10 microns or less. A liquid shall be tested if a mist is likely to be generated in a leakage of the transport containment. For both solids and liquids, more than 90 % (mass) of a specimen prepared for inhalation toxicity shall be in the respirable range as defined above. The result is expressed in mg per litre of air for dusts and mists and in ml per m^3 of air (ppm) for vapours.

600 *(cont'd)*

2.6. These criteria for inhalation toxicity of dusts and mists are based on LC_{50} data relating to 1-hour exposure, and where such information is available it should be used. However, where only LC_{50} data relating to 4-hour exposure are available, such figures can be multiplied by four and the product substituted in the above criteria, i.e. LC_{50} value multiplied by four (4 hour) is considered the equivalent of LC_{50} (1 hour).

Inhalation toxicity of vapours

3. Liquids giving off toxic vapours shall be classified into the following groups where 'V' is the saturated vapour concentration (in ml/m³ of air) (volatility) at 20 °C and standard atmospheric pressure:

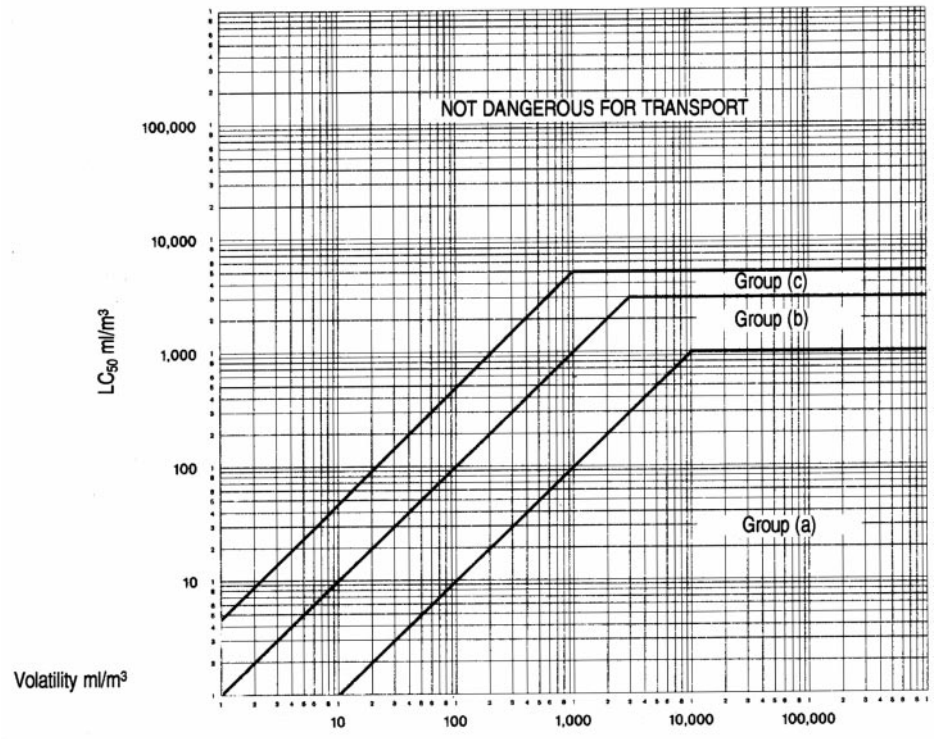
Subdivision into groups within an item		
Highly toxic	(a)	Where $V \geq 10\,LC_{50}$ and $LC_{50} \leq 1\,000$ ml/m³
Toxic	(b)	Where $V \geq LC_{50}$ and $LC_{50} \leq 3\,000$ ml/m³ and the criteria for (a) are not met
Slightly toxic	(c)	Where $V \geq {}^{1}/_{5}\,LC_{50}$ and $LC_{50} \leq 5\,000$ ml/m³ and the criteria for (a) or (b) are not met

These criteria for inhalation toxicity of vapours are based on LC_{50} data relating to 1-hour exposure, and where such information is available, it shall be used.

However, where only LC_{50} data relating to 4-hour exposure to the vapours are available, such figures can be multiplied by two and the product substituted in the above criteria, i.e. LC_{50} (4 hour) × 2 is considered the equivalent of LC_{50} (1 hour).

Inhalation Toxicity of Vapours

Packing Group Borderlines



600 *(cont'd)*

In this figure, the criteria are expressed in graphical form, as an aid to easy classification. However, due to approximations inherent in the use of graphs, substances falling on or near group borderlines shall be checked using numerical criteria.

Mixtures of liquids

4. Mixtures of liquids which are toxic on inhalation shall be assigned to danger categories according to the following criteria:

4.1. If LC_{50} is known for each of the toxic substances constituting the mixture, the group may be determined as follows:

(a) calculation of the LC_{50} of the mixture:

$$LC_{50}\ (\text{mixture}) = \frac{1}{\sum_{i=1}^{n} \frac{f_i}{LC_{50i}}}$$

where

f_i = molar fraction of constituent i of the mixture.

LC_{50i} = average lethal concentration of constituent i in ml/m^3.

(b) calculation of volatility of each mixture constituent:

$$V_i = P_i \times \frac{10^6}{101{,}3}\ ml/m^3$$

where

P_i = partial pressure of constituent i in kPa at 20 °C and at standard atmospheric pressure.

(c) calculation of the ratio of volatility to LC_{50}:

$$R = \sum_{i=1}^{n} \frac{V_i}{LC_{50i}}$$

(d) the values calculated for LC_{50} (mixture) and R are then used to determine the group of the mixture:

Group (a) $R \geq 10$ and LC_{50} (mixture) $\leq 1\,000\ ml/m^3$.

Group (b) $R \geq 1$ and LC_{50} (mixture) $\leq 3\,000\ ml/m^3$, if the mixture does not meet the criteria for (a).

Group (c) $R \geq {}^1/_5$ and LC_{50} (mixture) $\leq 5\,000\ ml/m^3$, if the mixture does not meet the criteria of group (a) or group (b).

4.2. In the absence of LC_{50} data on the toxic constituent substances, the mixture may be assigned to a group based on the following simplified threshold toxicity tests. When these threshold tests are used, the most restrictive group shall be determined and used for carrying the mixture.

4.3. A mixture is assigned to group (a) only if it meets both of the following criteria:

(i) A sample of the liquid mixture is vaporized and diluted with air to create a test atmosphere of $1\,000\ ml/m^3$ vaporized mixture in air. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have an LC_{50} equal to or less than $1\,000\ ml/m^3$.

(ii) A sample of vapour in equilibrium with the liquid mixture is diluted with 9 equal volumes of air to form a test atmosphere. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have a volatility equal to or greater than 10 times the mixture LC_{50}.

600 *(cont'd)*

4.4. A mixture is assigned to group (b) only if it meets both of the following criteria, and does not meet the criteria for group (a):

(i) A sample of the liquid mixture is vaporized and diluted with air to create a test atmosphere of 3 000 ml/m^3 vaporized mixture in air. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have an LC_{50} equal to or less than 3 000 ml/m^3.

(ii) A sample of the vapour in equilibrium with the liquid mixture is used to form a test atmosphere. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have a volatility equal or greater than the mixture LC_{50}.

4.5. A mixture is assigned to group (c) only if it meets both of the following criteria, and does not meet the criteria for groups (a) or (b):

(i) A sample of the liquid mixture is vaporized and diluted with air to create a test atmosphere of 5 000 ml/m^3 vaporized mixture in air. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have an LC_{50} equal to or less than 5 000 ml/m^3.

(ii) The vapour concentration of the liquid mixture is measured and if the vapour concentration (volatility) is equal to or greater than 1 000 ml/m^3, the mixture is presumed to have a volatility equal to or greater than 1/5 the mixture LC_{50}.

Methods for determining oral and dermal toxicity of mixtures

5. When classifying and assigning the appropriate packing group to mixtures in Class 6.1 in accordance with the oral and dermal toxicity criteria (2.3 and 2.4 above), it is necessary to determine the acute LC_{50} of the mixture.

5.1. If a mixture contains only one active substance, and the LC_{50} of that constituent is known, in the absence of reliable acute oral and dermal toxicity data on the actual mixture to be carried, the oral or dermal LC_{50} may be obtained by the following method:

$$LD_{50}\text{ value of preparation} = \frac{LD_{50}\text{ value of active substance} \times 100}{\text{percentage of active substance (by mass)}}$$

5.2. If a mixture contains more than one active constituent, there are three possible approaches that may be used to determine the oral or dermal LC_{50} of the mixture. The preferred method is to obtain reliable acute oral and dermal toxicity data on the actual mixture to be carried. If reliable, accurate data are not available, then either of the following methods may be performed:

(a) Classify the preparation according to the most hazardous constituent of the mixture as if that constituent were present in the same concentration as the total concentration of all active constituents; or

(b) Apply the formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

600 *(cont'd)*

where

C = the percentage concentration of constituent A, B, ..., Z in the mixture,

T = the oral LD_{50} value of constituent A, B, ..., Z

T_M = the oral LD_{50} values of the mixture.

Note: This formula can also be used for dermal toxicities provided that this information is available on the same species for all constituents. The use of this formula does not take into account any potentiation or protective phenomena.

(4) When, as a result of additions, substances of Class 6.1 pass into other danger categories than those to which the substances mentioned by name in marg. 601 belong, these mixtures or solutions shall be listed under the items and groups to which they belong, based on their actual degree of danger.

Note: For classification of solutions and mixtures (such as preparations and wastes), see also marg. 3 (3).

(5) On the basis of the criteria of marg. 600 (3), it may also be determined whether the nature of a solution or mixture mentioned by name or containing a substance mentioned by name is such that the solution or mixture is not subject to the requirements for this Class.

(6) Highly toxic or toxic flammable liquids having a flash-point below 23 °C, except substances which are highly toxic on inhalation of items 1 to 10, are substances of Class 3 (see marg. 301, items 11 to 19).

(7) Flammable liquids, slightly toxic, with the exception of substances and preparations used as pesticides, having a flash-point between 23 °C and 61 °C inclusive, are substances of Class 3 (see marg. 301).

(8) Self-heating substances, slightly toxic are substances of Class 4.2 (see marg. 431).

(9) Water-reactive substances, slightly toxic are substances of Class 4.3 (see marg. 471).

(10) Oxidizing substances, slightly toxic are substances of Class 5.1 (see marg. 501).

(11) Substances, slightly toxic and slightly corrosive are substances of Class 8 (see marg. 801).

(12) Chemically unstable substances of Class 6.1 shall not be accepted for carriage unless the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end, it shall in particular be ensured that packagings do not contain any substance(s) likely to cause such a reaction.

(13) Substances and mixtures having a melting point above 45 °C are considered as solids within the meaning of the packing requirements of marg. 606 (2), 607 (4) and 608 (3).

(14) The flash-point referred to below shall be determined in the manner described in Appendix III.

A. Highly toxic substances having a flash-point below 23 °C

601 1. Hydrogen cyanide, stabilized:

1051 hydrogen cyanide, stabilized, containing not more than 3 % water,
1614 hydrogen cyanide, stabilized, containing not more than 3 % water and absorbed in a porous inert material.

Note: 1. Special conditions of packing are applicable to this substance [see marg. 603 (1)].

2. Anhydrous hydrogen cyanide not satisfying these conditions is not to be accepted for carriage.

3. Hydrogen cyanide containing not more than 3 % water is stable, if the pH-value is 2,5 ± 0,5 and the liquid is clear and colourless.

601 *(cont'd)*

2. Hydrogen cyanide solutions:

1613 hydrogen cyanide, aqueous solution (hydrocyanic acid, aqueous solution), with not more than 20 % hydrogen cyanide,

3294 hydrogen cyanide, solution in alcohol, with not more than 45 % hydrogen cyanide.

Note: 1. Special conditions of packing are applicable to these substances [see marg. 603 (2)].

2. Solutions of hydrogen cyanide (hydrocyanic acid) which do not conform to these conditions are not to be accepted for carriage.

3. Melal carbonyls:

1259 nickel carbonyl,
1994 iron pentacarbonyl.

Note: 1. Special conditions of packing are applicable to these substances (see marg. 604).

2. Other metal carbonyls having a flash-point below 23 °C are not to be accepted for carriage.

4. *1185 ethyleneimine, inhibited.*

Note: Special conditions of packing are applicable to this substance [see marg. 605 (1)].

5. *2480 methyl isocyanate.*

Note: Special conditions of packing are applicable to this substance [see marg. 605 (2)].

6. Other isocyanates:

(a) *2482 n-propyl isocyanate,*
2484 tert-butyl isocyanate,
2485 n-butyl isocyanate.

7. Nitrogenous substances:

(a) 1. *1163 dimethylhydrazine, unsymmetrical,*
1244 methylhydrazine;

2. *2334 allylamine,*
2382 dimethylhydrazine, symmetrical.

8. Oxygenated substances:

(a) 1. *1251 methyl vinyl ketone, stabilized;*

2. *1092 acrolein, inhibited,*
1098 allyl alcohol,
1143 crotonaldehyde, stabilized,
2606 methyl orthosilicate.

9. Liquids as well as solutions and liquid mixtures (such as preparations and wastes) which are highly toxic on inhalation, having a flash-point below 23 °C which cannot be classified under another entry of items 1 to 8:

(a) *1239 methyl chloromethyl ether,*
3279 organophosphorus compound, toxic, flammable, n.o.s.,
2929 toxic liquid, flammable, organic, n.o.s.

10. Corrosive halogenated substances:

(a) *1182 ethyl chloroformate,*
1238 methyl chloroformate,
1695 chloroacetone, stabilized,
2407 isopropyl chloroformate,
2438 trimethylacetyl chloride.

601 (cont'd) **B. Organic substances which have a flash-point of 23 °C or over or non-flammable organic substances**

Note: Organic substances and preparations used as pesticides are substances of items 71 to 73.

11. Nitrogenous substances having a flash-point between 23 °C and 61 °C inclusive:

(a) *3275 nitriles, toxic, flammable, n.o.s.;*

(b) 1. *3073 vinylpyridines, inhibited*

2. *2668 chloroacetonitrile,*
3275 nitriles, toxic, flammable, n.o.s.

12. Nitrogenous substances having a flash-point above 61 °C:

(a) *1541 acetone cyanohydrin, stabilized,*

3276 nitriles, toxic, n.o.s.;

(b) *1547 aniline,*
1577 chlorodinitrobenzenes,
1578 chloronitrobenzenes,
1590 dichloroanilines,
1596 dinitroanilines,
1597 dinitrobenzenes,
1598 dinitro-o-cresol,
1599 dinitrophenol solution,
1650 beta-naphthylamine,
1652 naphthylurea,
1661 nitroanilines (o-, m-, p-),
1662 nitrobenzene,
1664 nitrotoluenes (o-, m-, p-),
1665 nitroxylenes (o-, m-, p-),
1708 toluidines,
1711 xylidines,
1843 ammonium dinitro-o-cresolate,
1885 benzidine,
2018 chloroanilines, solid,
2019 chloroanilines, liquid,
2038 dinitrotoluenes,
2224 benzonitrile,
2253 N,N-dimethylaniline,
2306 nitrobenzotrifluorides,
2307 3-nitro-4-chlorobenzotrifluoride,
2522 2-dimethylaminoethyl methacrylate,
2542 tributylamine,
2572 phenylhydrazine,
2647 malononitrile,
2671 aminopyridines (o-, m-, p-),
2673 2-amino-4-chlorophenol,
2690 N,n-butylimidazole,
2738 N-butylaniline,
2754 N-ethyltoluidines,
2822 2-chloropyridine,
3302 2-dimethylaminoethyl acrylate,

3276 nitriles, toxic, n.o.s.;

(c) *1548 aniline hydrochloride,*
1599 dinitrophenol solution,
1663 nitrophenols (o-, m-, p-),
1673 phenylenediamines (o-, m-, p-),
1709 2,4-toluylenediamine,
2074 acrylamide,
2077 alpha-naphthylamine,
2205 adiponitrile,

601 *(cont'd)*

2272 N-ethylaniline,
2273 2-ethylaniline,
2274 N-ethyl-N-benzylaniline,
2294 N-methylaniline,
2300 2-methyl-5-ethylpyridine,
2311 phenetidines,
2431 anisidines,
2432 N,N-diethylaniline,
2446 nitrocresols,
2470 phenylacetonitrile, liquid,
2512 aminophenols (o-, m-, p-),
2651 4,4'-diaminodiphenylmethane,
2656 quinoline,
2660 nitrotoluidines (mono),
2666 ethyl cyanoacetate,
2713 acridine,
2730 nitroanisole,
2732 nitrobromobenzene,
2753 N-ethylbenzyltoluidines,
2873 dibutylaminoethanol,
2941 fluoroanilines,
2942 2-trifluoromethylaniline,
2946 2-amino-5-diethylaminopentane,

3276 nitriles, toxic, n.o.s.

Note: Isocyanates having a flash-point above 61 °C are substances of item 19.

13. Oxygenated substances having a flash-point between 23 °C and 61 °C inclusive:

(a) *2521 diketene, inhibited;*

(b) *1199 furaldehydes.*

14. Oxygenated substances having a flash-point above 61 °C:

(b) *1594 diethyl sulphate*,
1671 phenol, solid,
2261 xylenols,
2587 benzoquinone,
2669 chlorocresols,
2821 phenol solution,
2839 aldol;

(c) *2525 ethyl oxalate*,
2609 triallyl borate,
2662 hydroquinone,
2716 1,4-butynediol,
2821 phenol solution,
2874 furfuryl alcohol,
2876 resorcinol,
2937 alpha-methylbenzyl alcohol.

15. Halogenated hydrocarbons:

(a) *1605 ethylene dibromide*,
1647 methyl bromide and ethylene dibromide mixture, liquid,
2644 methyl iodide,
2646 hexachlorocyclopentadiene;

(b) *1669 pentachloroethane*,
1701 xylyl bromide,
1702 1,1,2,2-tetrachloroethane,
1846 carbon tetrachloride,
1886 benzylidene chloride,
1891 ethyl bromide,
2322 trichlorobutene,
2653 benzyl iodide;

601 *(cont'd)*

(c) *1591 o-dichlorobenzene,*
1593 dichloromethane (methylene chloride)
1710 trichloroethylene,
1887 bromochloromethane,
1888 chloroform,
1897 tetrachloroethylene,
2279 hexachlorobutadiene,
2321 trichlorobenzenes, liquid
2504 tetrabromoethane,
2515 bromoform,
2516 carbon tetrabromide,
2664 dibromoethane,
2688 1-chloro-3-bromopropane,
2729 hexachlorobenzene,
2831 1,1,1-trichloroethane,
2872 dibromochloropropanes.

Note: 1912 methyl chloride and methylene chloride mixture is a substance of Class 2 (see marg. 201, item 2F).

16. Other halogenated substances having a flash-point between 23 °C and 61 °C inclusive:

(a) *1135 ethylene chlorohydrin,*
2295 methyl chloroacetate,
2558 epibromohydrin;

(b) *1181 ethyl chloroacetate,*
1569 bromoacetone,
1603 ethyl bromoacetate,
1916 2,2'-dichlorodiethyl ether,
2023 epichlorohydrin,
2589 vinyl chloroacetate,
2611 propylene chlorohydrin.

17. Other halogenated substances having a flash-point above 61 °C:

(a) *1580 chloropicrin,*
1670 perchloromethyl mercaptan,
1672 phenylcarbylamine chloride,
1694 bromobenzyl cyanides,
2232 2-chloroethanal,
2628 potassium fluoroacetate,
2629 sodium fluoroacetate,
2642 fluoroacetic acid,

1583 chloropicrin mixture, n.o.s.

Note: 1581 chloropicrin and methyl bromide mixture and 1582 chloropicrin and methyl chloride mixture are substances of Class 2 (see marg. 201, item 2T).

(b) *1697 chloroacetophenone,*
2075 chloral, anhydrous, inhibited,
2490 dichloroisopropyl ether,
2552 hexafluoroacetone hydrate,
2567 sodium pentachlorophenate,
2643 methyl bromoacetate,
2645 phenacyl bromide,
2648 1,2-dibromobutan-3-one,
2649 1,3-dichloroacetone,
2650 1,1-dichloro-1-nitroethane,
2750 1,3-dichloropropanol-2,
2948 3-trifluoromethylaniline,
3155 pentachlorophenol,

1583 chloropicrin mixture, n.o.s.;

(c) *1579 4-chloro-o-toluidine hydrochloride,*
2020 chlorophenols, solid,
2021 chlorophenols, liquid,

601 *(cont'd)*

2233 chloroanisidines,
2235 chlorobenzylchlorides,
2237 chloronitroanilines,
2239 chlorotoluidines,
2299 methyl dichloroacetate,
2433 chloronitrotoluenes,
2533 methyl trichloroacetate,
2659 sodium chloroacetate,
2661 hexachloroacetone,
2689 glycerol alpha-monochlorohydrin,
2747 tert-butylcyclohexyl chloroformate,
2849 3-chloropropanol-1,
2875 gexachlorophene,
1583 chloropicrin mixture, n.o.s.

18. Isocyanates having a flash-point between 23 °C and 61 °C inclusive:

(b) *2487 phenyl isocyanate,*
2488 cyclohexyl isocyanate,
2285 isocyanatobenzotrifluorides,

3080 isocyanates, toxic, flammable, n.o.s. or
3080 isocyanate solution, toxic, flammable, n.o.s.

Note: Solutions of these isocyanates having a flash-point below 23 °C are substances of Class 3 [see marg. 301, item 14 (b)].

19. Isocyanates having a flash-point above 61 °C:

(b) *2078 toluene diisocyanate* and isomeric mixtures,
2236 3-chloro-4-methylphenyl isocyanate,
2250 dichlorophenyl isocyanates,
2281 hexamethylene diisocyanate,

2206 isocyanates, toxic, n.o.s. or
2206 isocyanate solution, toxic, n.o.s.;

Note: 1. Solutions of these isocyanates having a flash-point below 23 °C are substances of Class 3 (see marg. 301, item 14).

2. Solutions of these isocyanates having a flash-point between 23 °C and 61 °C inclusive are substances of item 18 (b).

(c) *2290 isophoronediisocyanate,*
2328 trimethylhexamethylene diisocyanate and isomeric mixtures,

2206 isocyanates, toxic, n.o.s. or
2206 isocyanate solution, toxic, n.o.s.

20. Substances containing sulphur and having a flash-point between 23 °C and 61 °C inclusive:

(a) *2337 phenyl mercaptan,*
2477 methyl isothiocyanate,
3023 2-methyl-2-heptanethiol;

(b) *1545 allyl isothiocyanate, inhibited;*

3071 mercaptans, liquid, toxic, flammable, n.o.s. or
3071 mercaptan mixture, liquid, toxic, flammable, n.o.s.

21. Substances containing sulphur and having a flash-point above 61 °C:

(b) *1651 napthylthiourea,*
2474 thiophosgene,
2936 thiolactic acid,
2966 thioglycol;

(c) *2785 4-thiapentanal.*

601 *(cont'd)*

22. Substances containing phosphorus and having a flash-point between 23 °C and 61 °C inclusive:

(a) *3279 organophosphorus compound, toxic, flammable, n.o.s.;*

(b) *3279 organophosphorus compound, toxic, flammable, n.o.s.*

23. Substances containing phosphorus and having a flash-point above 61 °C:

(a) *3278 organophosphorus compound, toxic, n.o.s.;*

(b) *1611 hexaethyl tetraphosphate,*
1704 tetraethyl dithiopyrophosphate,
2501 tris-(1-aziridinyl) phosphine oxide solution,
2574 tricresyl phosphate with more than 3 % ortho isomer,

3278 organophosphorus compound, toxic, n.o.s.;

(c) *2501 tris-(1-aziridinyl) phosphine oxide solution,*

3278 organophosphorus compound, toxic, n.o.s.

24. Toxic organic substances carried in the molten state:

(b) 1. *1600 dinitrotoluenes, molten,*
2312 phenol, molten;

2. *3250 chloroacetic acid, molten.*

25. Organic substances and articles containing such substances and solutions and mixtures of organic substances (such as preparations and wastes) which cannot classified under another collective heading:

(a) *1601 disinfectant, solid, toxic, n.o.s.,*
1602 dye, liquid, toxic, n.o.s. or
1602 dye intermediate, liquid, toxic, n.o.s.,
1693 tear gas substance, liquid or *solid, n.o.s.,*
3142 disinfectant, liquid, toxic, n.o.s.,
3143 dye, solid, toxic, n.o.s. or
3143 dye intermediate, solid, toxic, n.o.s.,
2810 toxic liquid, organic, n.o.s.,
2811 toxic solid, organic, n.o.s.;

Note: 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in concentrations considered highly toxic according to the criteria in marg. 600 (3) is not to be accepted for carriage.

(b) *2016 ammunition, toxic, non-explosive* without burster or expelling charge, non-fused,
1601 disinfectant, solid, toxic, n.o.s.,
1602 dye, liquid, toxic, n.o.s. or
1602 dye intermediate, liquid, toxic, n.o.s.,
1693 tear gas substance, liquid or *solid, n.o.s.,*
3142 disinfectant, liquid, toxic, n.o.s.,
3143 dye, solid, toxic, n.o.s. or
3143 dye intermediate, solid, toxic, n.o.s.,
2810 toxic liquid, organic, n.o.s.,
2811 toxic solid, organic, n.o.s.;

(c) *2518 1,5,9-cyclododecatriene,*
2667 butyltoluenes,

1601 disinfectant, solid, toxic, n.o.s.,
1602 dye, liquid, toxic, n.o.s. or
1602 dye intermediate, liquid, toxic, n.o.s.,
3142 disinfectant, liquid, toxic, n.o.s.,
3143 dye, solid, toxic, n.o.s. or
3143 dye intermediate, solid, toxic, n.o.s.,
2810 toxic liquid, organic, n.o.s.,
2811 toxic solid, organic, n.o.s.

601 *(cont'd)*

26. Flammable toxic organic substances and articles containing such substances and solutions and mixtures of flammable toxic organic substances (such as preparations and wastes), which cannot be classified under other collective headings:

(a) 1. *2929 toxic liquid, flammable, organic, n.o.s.;*
2. *2930 toxic solid, flammable, organic, n.o.s.;*

Note: dichlorodimethyl ether, symmetrical is not to be accepted for carriage.

(b) 1. *2929 toxic liquid, flammable, organic, n.o.s.;*
2. *1700 tear gas candles,*

2930 toxic solid, flammable, organic, n.o.s.;

27. Corrosive toxic organic substances and articles containing such substances and solutions and mixtures of corrosive toxic organic substances (such as preparations and wastes):

(a) *1595 dimethyl sulphate,*
1752 chloroacetyl chloride,
1889 cyanogen bromide,
3246 methanesulphonyl chloride

2927 toxic liquid, corrosive, organic, n.o.s.,
2928 toxic solid, corrosive, organic, n.o.s.;

(b) *1737 benzyl bromide,*
1738 benzyl chloride,
1750 chloroacetic acid solution,
1751 chloroacetic acid, solid,
2017 ammunition, tear-producing, non-explosive without burster or expelling charge, non-fused,
2022 cresylic acid,
2076 cresols (o-, m-, p-)
2267 dimethyl thiophosphoryl chloride,
2745 chloromethyl chloroformate,
2746 phenyl chloroformate,
2748 2-ethylhexyl chloroformate,

3277 chloroformates, toxic, corrosive, n.o.s.,
2927 toxic liquid, corrosive, organic, n.o.s.,
2928 toxic solid, corrosive, organic, n.o.s.

Note: Chloroformates having predominantly corrosive properties are substances of Class 8 (see marg. 801, item 64).

28. Flammable corrosive toxic chloroformates:

(a) *1722 allyl chloroformate;*
2740 n-propyl chloroformate;

(b) *2743 n-butyl chloroformate,*
2744 cyclobutyl chloroformate,

2742 chloroformates, toxic, flammable, n.o.s.

Note: Chloroformates having predominantly corrosive properties are substances of Class 8 (see marg. 801, item 64).

C. Organometallic compounds and carbonyls

Note: 1. Toxic organometallic compounds used a pesticides are substances of items 71 to 73.

2. Spontaneously combustible organometallic compounds are substance of Class 4.2 (see marg. 431 item 31 to 33).

3. Water-reactive organometallic compounds, flammable, are substances of Class 4.3 (see marg. 471 item 3).

601 *(cont'd)*

31. Organic lead compounds:

(a) *1649 motor fuel anti-knock mixture* (tetraethyl lead), (tetramethyl lead).

32. Organic tin compounds:

(a) *2788 organotin compound, liquid, n.o.s.,*
3146 organotin compound, solid, n.o.s.;

(b) *2788 organotin compound, liquid, n.o.s.,*
3146 organotin compound, solid, n.o.s.;

(c) *2788 organotin compound, liquid, n.o.s.,*
3146 organotin compound, solid, n.o.s.

33. Organic mercury compounds:

(a) *2026 phenylmercuric compound, n.o.s.;*

(b) *1674 phenylmercuric acetate,*
1894 phenylmercuric hydroxide;
1895 phenylmercuric nitrate,
2026 phenylmercuric compound, n.o.s.;

(c) *2026 phenylmercuric compound, n.o.s.*

34. Organic arsenic compounds:

(a) *1698 diphenylamine chloroarsine,*
1699 diphenylchloroarsine
1892 ethyldichloroarsine,
3280 organic arsenic compound, n.o.s.;

(b) *3280 organic arsenic compound, n.o.s.;*

(c) *2473 sodium arsanilate,*
3280 organic arsenic compound, n.o.s.

35. Other organometallic compounds:

(a) *3282 organometallic compound, toxic, n.o.s.;*

(b) *3282 organometallic compound, toxic, n.o.s.;*

(c) *3282 organometallic compound, toxic, n.o.s.*

36. Carbonyls

(a) *3281 metal carbonyls, n.o.s.;*

(b) *3281 metal carbonyls, n.o.s.;*

(c) *3281 metal carbonyls, n.o.s.*

D. Inorganic substances which, on contact with water (or atmospheric humidity), aqueous solutions or acids may emit toxic gases, and other toxic water-reactive substances

41. Inorganic cyanides:

(a) *1565 barium cyanide,*
1575 calcium cyanide,
1626 mercuric potassium cyanide,
1680 potassium cyanide,
1689 sodium cyanide,

601 (cont'd)

1713 zink cyanide,
2316 sodium cuprocyanide, solid,
2317 sodium cuprocyanide solution,

1588 cyanides, inorganic, solid, n.o.s.,
1935 cyanide, solution, n.o.s.;

(b) *1587 copper cyanide,*
1620 lead cyanide,
1636 mercury cyanide,
1642 mercury oxycyanide, desensitized,
1653 nickel cyanide
1679 potassium cuprocyanide,
1684 silver cyanide

1588 cyanides, inorganic, solid, n.o.s.,
1935 cyanide solution, n.o.s.;

(c) *1588 cyanide, inorganic, solid, n.o.s.,*
1935 cyanide, solution, n.o.s.

Note: 1. Ferricyanides, ferrocyanides, alkaline thiocyanates and ammonium thiocyanate are not subject to the requirements of this Directive.

2. Solutions of inorganic cyanides with a total cyanide ion content greater than 30 % to group (a), solutions with a total cyanide ion content greater than 3 % and not more than 30 % to group (b) and solutions with a cyanide ion content greater than 0,3 % and not more than 3 % to group (c).

42. Azides:

(b) *1687 sodium azide.*

Note: 1. 1571 barium azide, wetted, is a substance of Clas 4.1 (see marg. 401 item 25).

2. Barium azide in the dry state or with less than 50 % water or alcohol is not to be accepted for carriage.

43. Preparations of phosphides containing additives inhibiting the emission of flammable gases:

(a) *3048 aluminium phosphide pesticide.*

Note: 1. These preparations are not to be accepted for carriage unless they contain additives inhibiting the emission of flammable gases.

2. 1360 calcium phosphide, 1397 aluminium phosphide, 1432 sodium phosphide, 1714 zinc phosphide, 2011 magnesium phosphide and 2013 strontium phosphide are substances of Class 4.3 (see marg. 471, item 18).

44. Other water-reactive toxic substances:

(a) *3123 toxic liquid, water-reactive, n.o.s.,*
3125 toxic solid, water-reactive, n.o.s.;

(b) *3123 toxic liquid, water-reactive, n.o.s.,*
3125 toxic solid, water-reactive, n.o.s.

Note: The terme 'water-reactive' denotes a substance which, in contact with water, emits flammable gases.

E. Other inorganic substances and metallic salts of organic substances

51. Arsenic and arsenical compounds:

(a) *1553 arsenic acid, liquid,*
1560 arsenic trichloride,

1556 arsenic compound, liquid, n.o.s., inorganic (arsenates, arsenites and arsenic sulphides),
1557 arsenic compound, solid, n.o.s., inorganic (arsenates, arsenites and arsenic sulphides);

601 *(cont'd)*

(b) *1546 ammonium arsenate,*
1554 arsenic acid, solid,
1555 arsenic bromide,
1558 arsenic,
1559 arsenic pentoxide,
1561 arsenic trioxide,
1562 arsenical dust,
1572 cacodylic acid,
1573 calcium arsenate,
1574 calcium arsenate and calcium arsenite mixture, solid,
1585 copper acetoarsenite,
1586 copper arsenite,
1606 ferric arsenate,
1607 ferric arsenite,
1608 ferrous arsenate,
1617 lead arsenates,
1618 lead arsenites,
1621 London purple,
1622 magnesium arsenate,
1623 mercuric arsenate,
1677 potassium arsenate,
1678 potasium arsenite,
1683 silver arsenite,
1685 sodium arsenate,
1686 sodium arsenite, aqueous solution,
1688 sodium cacodylate,
1691 strontium arsenite,
1712 zinc arsenate or
1712 zinc arsenite or
1712 zinc arsenate and zinc arsenite mixture,
2027 sodium arsenite, solid,

1556 arsenic compound, liquid, n.o.s., inorganic (arsenates, arsenites and arsenic sulphides),
1557 arsenic compound, solid, n.o.s., inorganic (arsenates, arsenites and arsenic sulphides);

(c) *1686 sodium arsenite, aqueous solution,*

1556 arsenic compound, liquid, n.o.s., inorganic (arsenates, arsenites and arsenic sulphides),
1557 arsenic compound, liquid, n.o.s., inorganic (arsenates, arsenites and arsenic sulphides).

Note: Substances and preparations containing arsenic and used as pesticides are substances of items 71 to 73.

52. Mercury compounds:

(a) *2024 mercury compound, liquid, n.o.s.,*
2025 mercury compound, solid, n.o.s.;

(b) *1624 mercuric chloride,*
1625 mercuric nitrate,
1627 mercurous nitrate,
1629 mercury acetate,
1630 mercury ammonium chloride,
1631 mercury benzoate,
1634 mercury bromides,
1637 mercury gluconate,
1638 mercury iodide,
1639 mercury nucleate,
1640 mercury oleate,
1641 mercury oxide,
1643 mercury potassium iodide,
1644 mercury salicylate,
1645 mercury sulphate,
1646 mercury thiocyanate,

2024 mercury compound, liquid, n.o.s.,
2025 mercury compound, solid, n.o.s.;

601 *(cont'd)*

(c) *2024 mercury comound, liquid, n.o.s.,*
2025 mercury compound, solid, n.o.s.

Note: 1. Substances and preparations containing mercury and used as pesticides are substances of items 71 to 73.

2. Mercurous chloride (calomel) is a substance of Class 9 [see marg. 901, item 12(c)]. Cinnabar is not subject to the requirements of this Directive.

3. Mercury fulminates are not to be accepted for carriage.

53. Thallium compounds:

(b) *1707 thallium compound, n.o.s.*

Note: 1. Substances and preparations containing thallium and used as pesticides are substances of items 71 to 73.

2. 2727 thallium nitrate is a substance of item 68.

54. Beryllium and beryllium compounds:

(b) 1. *1567 beryllium, powder;*

2. *1566 beryllium compound, n.o.s.;*

(c) *1566 beryllium compound, n.o.s.*

Note: 2464 beryllium nitrate is a substance of Class 5.1 [see marg. 501, item 29(b)]

55. Selenium and selenium compounds:

(a) *2630 selenates* or
2630 selenites,
3283 selenium compound, n.o.s.;

(b) *2657 selenium disulphide,*
3283 selenium compound, n.o.s.;

(c) *3283 selenium compound, n.o.s.*

Note: 1905 selenic acid is a substance of Class 8 [see marg. 801, item 16(a)].

56. Osmium compounds:

(a) *2471 osmium tetroxide.*

57. Tellurium compounds:

(b) *3284 tellurium compound, n.o.s.;*

(c) *3284 tellurium compound, n.o.s.*

58. Vanadium compounds:

(b) *2859 ammonium metavanadate,*
2861 ammonium polyvanadate,
2862 vanadium pentoxide, non-fused form,
2863 sodium ammonium vanadate,
2864 potasium metavanadate,
2931 vanadyl sulphate,
3285 vanadium compound, n.o.s.;

(c) *3285 vanadium compound, n.o.s.*

Note: 1. 2443 vanadium oxytrichloride, 2444 vanadium tetrachloride and 2475 vanadium trichloride are substances of Class 8 (see marg. 801, items 11 and 12).

2. Vanadium pentoxide, fused and solidified, is not subject to the requirements of this Directive.

601 *(cont'd)*

59. Antimony and antimony compounds:

(c) *1550 antimony lactate,*
1551 antimony potassium tartrate,
2871 antimony powder,

1549 antimony compound, solid, n.o.s.,
3141 antimony compound, inorganic, liquid, n.o.s.

Note: 1. 1730 antimony pentachloride liquid, 1731 antimony pentachloride solution, 1733 antimony trichloride and 1732 antimony pentafluoride are substances of Class 8 (see marg. 801, items 10, 11 and 12).

2. Antimony oxides and antimony sulphide with an arsenic content not exceeding 0,5 % of the total mass, are not subject to the requirements of this Directive.

60. Barium compound:

(b) *1564 barium compound, n.o.s.;*

(c) *1884 barium oxide,*

1564 barium compound, n.o.s.

Note: 1. 1445 barium chloratre, 1446 barium nitrate, 1447 barium perchlorate, 1448 barium permanganate and 1449 barium peroxide are substances of Class 5.1 (see marg. 501, item 29).

2. 1571 barium azide, wetted, is a substance of Class 4.1 (see marg. 401, item 25).

3. Barium stearate, barium sulphate and Barium titanate are not subject to the requirements of this Directive.

61. Cadmium compounds:

(a) *2570 cadmium compound;*

(b) *2570 cadmium compound;*

(c) *2570 cadmium compound.*

Note: Cadmium pigments, such as cadmium sulphides, cadmium sulphoselenides and cadmium salts of higher fatty acids (e.g. cadmium stearate), are not subject to the requirements of this Directive.

62. Lead compounds:

(c) *1616 lead acetate,*

2291 lead compound, soluble, n.o.s.

Note: 1. 1469 lead nitrate and 1470 lead perchlorate are substances of Class 5.1 (see marg. 501, item 29).

2. Lead salts and lead pigments which, when mixed in a ratio of 1:1000 with 0,07M hydrochloric acid and stirred for one hour at a temperature of 23 °C ± 2 °C, exhibit a solubility of 5 % or less are not subject to the requirements of this Directive.

63. Fluorides soluble in water:

(c) *1690 sodium fluoride,*
1812 potassium fluoride,
2505 ammonium fluoride.

Note: Corrosive fluorides are substances of Class 8 (see marg. 801, items 6 to 10).

601 *(cont'd)*

64. Fluorosilicates:

(c) *2655 potasium fluorosilicate,*
2674 sodium fluorosilicate,
2853 magnesium fluorosilicate,
2854 ammonium fluorosilicate,
2855 zinc fluorosilicate,

2856 fluorosilicates, n.o.s.

65. Inorganic substances and solutions and mixtures of inorganic substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *3287 toxic liquid, inorganic, n.o.s.,*
3288 toxic solid, inorganic, n.o.s.;

(b) *3243 solids containing toxic liquid, n.o.s.,*
3287 toxic liquid, inorganic, n.o.s.,
3288 toxic solid, inorganic, n.o.s.;

Note: Mixtures of solids which are not subject to the requirements of this Directive, and toxic liquids may be carried under number 3243 without the classification criteria of marg. 600(3) being applied to them, provided that no liquid overflow is visible during loading or when the packaging or wagon si closed. Each packaging shall correspond to a design type which has passed the leakproofness test for packing group II. This number shall not be used for solids containing a liquid classified under letter (a).

(c) *3293 hydrazine, aqueous solution,* with not more than 37 % hydrazine by mass,

3287 toxic liquid, inorganic, n.o.s.
3288 toxic solid, inorganic, n.o.s.

Note: 2030 hydrazine hydrate and 2030 hydrazine aqueous solution, with not less than 37 % and not more than 64 % hyydrazine, by mass, are substances of Class 8 [see marg. 801, item 44(b)].

66. Toxic, self-heating substances:

(a) *3124 toxic solid, self-heating, n.o.s.;*

(b) *3124 toxic solid, self-heating, n.o.s.*

67. Toxic substances, corrosive:

(a) *1809 phosphorus trichloride,*

3289 toxic liquid, corrosive, inorganic, n.o.s.,
3290 toxic solid, corrosive, inorganic, n.o.s.;

(b) *3289 toxic liquid, corrosive, inorganic, n.o.s.,*
3290 toxic solid, corrosive, inorganic, n.o.s.,

68. Toxic substances, oxidizing:

(a) *3086 toxic solid, oxidizing, n.o.s.,*
3122 toxic liquid, oxidizing, n.o.s.;

(b) *2727 thallium nitrate,*

3086 toxic solid, oxidizing, n.o.s.,
3122 toxic liquid, oxidizing, n.o.s.

F. Substances and preparations used as pesticides

Item 71 Pesticides, liquid, toxic

Item 72 Pesticides, liquid, toxic, flammable

601 *(cont'd)*

Item 73 Pesticides, solid, toxic

In these items, substances and preparations used as pesticides shall be classified under groups (a), (b) or (c) in conformity with the criteria marg. 600(3) as follows:

(a) highly toxic substances and preparations,

(b) toxic substances and preparations,

(c) slightly toxic substances and preparations.

Note: 1. Flammable liquids and preparations, used as pesticides, which are highly toxic or slightly toxic and have a flash-point below 23 °C, are substances of Class 3 (see marg. 301, item 41).

2. (a) Articles impregnated with substances and preparations used as pesticides of items 71 to 73, such as fibreboard plates, paper strips, cotton wool balls, sheets of plastics material, etc. in airtight, hermetically closed wrappings, are not subject to the requirements of this Directive.

(b) Substances such as baits and cereals impregnated with substances and preparations used as pesticides of items 71 to 73 or other substances of Class 6.1 shall be classified according to their toxicity [see marg. 600(3)].

71. Pesticides, liquid, toxic:

2992 carbamate pesticide, liquid, toxic,
2994 arsenical pesticide, liquid, toxic,
2996 organochlorine pesticide, liquid, toxic,
2998 triazine pesticide, liquid, toxic,
3000 phenoxyl pesticide, liquid, toxic,
3002 phenyl urea pesticide, liquid, toxic,
3004 benzoic derivative pesticide, liquid, toxic,
3006 dithiocarbamate pesticide, liquid, toxic,
3008 phthalimide derivative pesticide, liquid, toxic,
3010 copper based pesticide, liquid, toxic,
3012 mercury based pesticide, liquid, toxic,
3014 substituted nitrophenol pesticide, liquid, toxic,
3016 bipyridylium pesticide, liquid, toxic,
3018 organophosphorus pesticide, liquid, toxic,
3020 organotin pesticide, liquid, toxic,
3026 coumarin derivative pesticide, liquid, toxic,

2902 pesticide, liquid, toxic, n.o.s.

72. Pesticides, liquid, toxic, flammable:

2991 carbamate pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2993 arsenical pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2995 organochlorine pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2997 triazine pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2999 phenoxyl pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3001 phenyl urea pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3003 benzoic derivative pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3005 dithiocarbamate pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3007 phthalimide derivative pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3009 copper based pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3011 mercury based pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3013 substituted nitrophenol pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3015 bipyridilium pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,

601 *(cont'd)*

3017 organophosphorus pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,

3019 organotin pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3025 coumarin derivative pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2903 pesticide, liquid, toxic, flammable, n.o.s., flashpoint not less than 23 °C.

73. Pesticides, solid, toxic:

2757 carbamate pesticide, solid, toxic,
2759 arsenical pesticide, solid, toxic,
2761 organochlorine pesticide, solid, toxic,
2763 triazine pesticide, solid, toxic,
2765 phenoxy pesticide, solid, toxic,
2767 phenyl urea pesticide, solid, toxic,
2769 benzoic derivative pesticide, solid, toxic,
2771 dithiocarbamate pesticide, solid, toxic,
2773 phthalimide derivative pesticide, solid, toxic,
2775 copper based pesticide, solid, toxic,
2777 mercury based pesticide, solid, toxic,
2779 substituted nitrophenol pesticide, solid, toxic,
2781 bipyridilium pesticide, solid, toxic,
2783 organophosphorus pesticide, solid, toxic,
2786 organotin pesticide, solid, toxic,
3027 coumarin derivative pesticide, solid, toxic,

2588 pesticide, solid, toxic, n.o.s.

TABLE

List of common pesticides with corresponding identification numbers

Note: 1. The identification numbers provide a reference to the relevant names in marg. 301, item 41 or marg. 601, items 71 to 73.

2. The table contains a list of common pesticides and a reference to the identification numbers assigned to the names that are relevant to the generic chemical group (e. g. organophosphorus pesticides) to which the particular pesticide belongs. The description used in the carriage of the pesticide shall include the name selected from those referenced on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks it may exhibit, supplemented by the indication of the active ingredient.

Substance	UN No
aldicarb	2757, 2758, 2991, 2992
aldrin	2761, 2762, 2995, 2996
alkaloids or alkaloid salts	2588, 2902, 2903, 3021
allidochlor	2761, 2762, 2995, 2996
aminocarb	2757, 2758, 2991, 2992
ANTU (*)	2588, 2902, 2903, 3021
arsenic compounds (*)	2759, 2760, 2993, 2994
azinphos-ethyl	2783, 2784, 3017, 3018
azinphos-methyl	2783, 2784, 3017, 3018
bendiocarb	2757, 2758, 2991, 2992
benfuracarb	2757, 2758, 2991, 2992
benquinox	2588, 2902, 2903, 3021
binapacryl	2779, 2780, 3013, 3014
blasticidin-S-3 (*)	2588, 2902, 2903, 3021
brodifacoum (*)	3024, 3025, 3026, 3027
bromophos-ethyl	2783, 2784, 3017, 3018
bromoxynil	2588, 2902, 2903, 3021
butocarboxim	2757, 2758, 2991, 2992
camphechlor	2761, 2762, 2995, 2996

(*) Not common ISO name.

601 *(cont'd)*

Substance	UN No
carbaryl	2757, 2758, 2991, 2992
carbofuran	2757, 2758, 2991, 2992
carbophenothion	2783, 2784, 3017, 3018
cartap, hydrochloride	2757, 2758, 2991, 2992
chinomethionat	2588, 2902, 2903, 3021
chlordane	2762, 2995, 2996
chlordimeform	2762, 2995, 2996
chlordimeform hydrochloride	2762, 2995, 2996
chlorfenvinphos	2783, 2784, 3017, 3018
chlormephos	2783, 2784, 3017, 3018
chlorphacinone	2761, 2762, 2995, 2996
chlorpyriphos	2783, 2784, 3017, 3018
chlorthiophos	2783, 2784, 3017, 3018
copper compounds	2775, 2776, 3009, 3010
coumachlor	3024, 3025, 3026, 3027
coumafuryl	3024, 3025, 3026
coumaphos	3024, 3025, 3026, 3027
coumatetralyl (racumin)	3024, 3025, 3026, 3027
crimidine	2761, 2762, 2995, 2996
crotoxyphos	2783, 2784, 3017, 3018
crufomate	2784, 3017, 3018
cyanazine	2763, 2764, 2997, 2998
cyanophos	2783, 2784, 3017, 3018
cycloheximide	2588, 2902, 2903, 3021
cyhexatin	2786, 2787, 3019, 3020
cypermethrin	2588, 2902, 2903, 3021
2,4-D	2766, 2999, 3000
dazomet	2902, 2903, 3021
2,4-DB (*)	2766, 2999, 3000
DDT (*)	2761, 2762, 2995, 2996
DEF (*)	2784, 3017, 3018
demephion (*)	2783, 2784, 3017, 3018
demeton (*)	2783, 2784, 3017, 3018
demeton-O (systox) (*)	2783, 2784, 3017, 3018
demeton-O-methyl, thiono isomer	2783, 2784, 3017, 3018
demeton-S-methyl	2783, 2784, 3017, 3018
demeton-S-methyl sulphone (*)	2783, 2784, 3017, 3018
dialifos	2783, 2784, 3017, 3018
di-allate	2588, 2902, 2903, 3021
diazinon	2783, 2784, 3017, 3018
1,2-dibrom-3-chlorpropane (*)	2761, 2762, 2995, 2996
dichlofenthion	2783, 2784, 3017, 3018
dichlorvos	2783, 2784, 3017, 3018
dicoumarol (*)	3024, 3025, 3026, 3027
dicrotophos	2783, 2784, 3017, 3018
dieldrin	2761, 2762, 2995, 2996
difenacoum (*)	3024, 3025, 3026, 3027
difenzoquat	2902, 2903, 3021
dimefox	2783, 2784, 3017, 3018
dimetan (*)	2757, 2758, 2991, 2992

(*) Not common ISO name.

601
(cont'd)

Substance	UN No
dimethoate (*)	2783, 2784, 3017, 3018
dimetilan (*)	2757, 2758, 2991, 2992
dimexano	2902, 2903, 3021
dinobuton	2779, 2780, 3013, 3014
dinoseb	2779, 2780, 3013, 3014
dinoseb acetate	2779, 2780, 3013, 3014
dinoterb	2779, 2780, 3013, 3014
dinoterb acetate	2779, 2780, 3013, 3014
dioxacarb	2757, 2758, 2991, 2992
dioxathion	2783, 2784, 3017, 3018
diphacinone	2588, 2902, 2903, 3021
diquat	2782, 3015, 3016
disulfoton	2783, 2784, 3017, 3018
DNOC	2779, 2780, 3013, 3014
drazoxolon	2588, 2902, 2903, 3021
edifenphos	2783, 2784, 3017, 3018
endosulfan	2761, 2762, 2995, 2996
endothal-sodium	2588, 2902, 2903, 3021
endothion	2783, 2784, 3017, 3018
endrin	2761, 2762, 2995, 2996
EPN (*)	2783, 2784, 3017, 3018
ethion	2783, 2784, 3017, 3018
ethoate-methyl	2783, 2784, 3017, 3018
ethoprophos	2783, 2784, 3017, 3018
fenaminosulf	2588, 2902, 2903, 3021
fenaminphos	2783, 2784, 3017, 3018
fenitrothion	2784, 3017, 3018
fenpropathrin	2588, 2902, 2903, 3021
fensulfothion	2783, 2784, 3017, 3018
fenthion	2783, 2784, 3017, 3018
fentin acetate	2786, 2787, 3019, 3020
fentin hydroxide	2786, 2787, 3019, 3020
fluorine compounds (*)	2588, 2902, 2903, 3021
fluoracetamide (*)	2588, 2902, 2903, 3021
fonofos	2783, 2784, 3017, 3018
formetanate	2757, 2758, 2991, 2992
formothion	2784, 3017, 3018
heptachlor	2761, 2762, 2995, 2996
heptenophos	2783, 2784, 3017, 3018
imazalil	2902, 2903, 3021
ioxynil	2588, 2902, 2903, 3021
iprobenfos	2784, 3017, 3018
isobenzan	2761, 2762, 2995, 2996
isodrin (*)	2761, 2762, 2995, 2996
isofenphos	2783, 2784, 3017, 3018
isolan (*)	2757, 2758, 2991, 2992
isoprocarb	2757, 2758, 2991, 2992
isothioate	2783, 2784, 3017, 3018
isoxathion	2783, 2784, 3017, 3018

(*) Not common ISO name.

601 *(cont'd)*

Substance	UN No
kelevan (*)	2902, 2903, 3021
lindan (BHC)	2761, 2762, 2995, 2996
mecarbam	2783, 2784, 3017, 3018
medinoterb	2779, 2780, 3013, 3014
mephosfolan	2783, 2784, 3017, 3018
mercaptodimethur	2757, 2758, 2991, 2992
mercury (II) (mercuric) compounds	2777, 2778, 3011, 3012
mercury (I) (mercurous) compounds	2777, 2778, 3011, 3012
metam-sodium	2771, 2772, 3005, 3006
methamidophos	2783, 2784, 3017, 3018
methasulfocarb	2757, 2758, 2991, 2992
methidathion	2783, 2784, 3017, 3018
methomyl	2757, 2758, 2991, 2992
methyltrithion (*)	2783, 2784, 3017, 3018
mevinphos	2783, 2784, 3017, 3018
mexacarbate	2757, 2758, 2991, 2992
mirex (*)	2762, 2995, 2996
mobam (*)	2757, 2758, 2991, 2992
monocrotophos	2783, 2784, 3017, 3018
nabam or nabam preparations	2772, 3005, 3006
naled	2784, 3017, 3018
nicotine compounds (*)	2588, 2902, 2903, 3021
norbormide	2588, 2902, 2903, 3021
omethoate	2783, 2784, 3017, 3018
organotin pesticides	2786, 2787, 3019, 3020
oxamyl (*)	2588, 2902, 2903, 3021
oxydemethon-methyl	2783, 2784, 3017, 3018
oxydisulfoton	2783, 2784, 3017, 3018
paraoxon (*)	2783, 2784, 3017, 3018
paraquat	2781, 2782, 3015, 3016
parathion	2783, 2784, 3017, 3018
parathion-methyl	2783, 2784, 3017, 3018
pentachlorphenol (*)	2761, 2762, 2995, 2996
phenkapton	2783, 2784, 3017, 3018
phenthoate	2783, 2784, 3017, 3018
phorate	2783, 2784, 3017, 3018
phosalone	2783, 2784, 3017, 3018
phosfolan	2783, 2784, 3017, 3018
phosmet	2783, 2784, 3017, 3018
phosphamidon	2783, 2784, 3017, 3018
pindone, and salts of	2902, 2903, 3021
pirimicarb	2757, 2758, 2991, 2992
pirimiphos-ethyl	2783, 2784, 3017, 3018
promecarb	2757, 2758, 2991, 2992
promurit (muritan) (*)	2757, 2758, 2991, 2992
propaphos	2783, 2784, 3017, 3018
propoxur	2757, 2758, 2991, 2992
prothoate	2783, 2784, 3017, 3018
pyrazophos	2784, 3017, 3018

(*) Not common ISO name.

601 *(cont'd)*

Substance	UN No
pyrazoxon (*)	2783, 2784, 3017, 3018
quinalphos	2783, 2784, 3017, 3018
rotenone (*)	2588, 2902, 2903, 3021
salithion (*)	2783, 2784, 3017, 3018
schradan	2783, 2784, 3017, 3018
sodium arsenite (*)	2759, 2760, 2993, 2994
strichnine (*)	2588, 2902, 2903, 3021
sulfotep	2783, 2784, 3017, 3018
sulprofos	2783, 2784, 3017, 3018
2,4,5-T	2766, 2999, 3000
temephos	2783, 2784, 3017, 3018
TEPP	2783, 2784, 3017, 3018
terbufos	2783, 2784, 3017, 3018
terbumeton	2764, 2997, 2998
thallium compounds (*)	2588, 2902, 2903, 3021
thallium sulphate (*)	2588, 2902, 2903, 3021
thiometon	2783, 2784, 3017, 3018
thionazin (*)	2783, 2784, 3017, 3018
triadimefon	2766, 2999, 3000
triamiphos	2783, 2784, 3017, 3018
triazophos	2783, 2784, 3017, 3018
tributyltin compounds (*)	2786, 2787, 3019, 3020
tricamba	2770, 3003, 3004
trichlorfon	2783, 2784, 3017, 3018
trichloronat	2783, 2784, 3017, 3018
triphenyltin compounds other than fentin acetate and fentin hydroxide	2786, 2787, 3019, 3020
vamidothion	2783, 2784, 3017, 3018
warfarin (and salts of)	3024, 3025, 3026, 3027

(*) Not common ISO name.

G. Active substances such as those intended for laboratories and experiments and for the manufacture of pharmaceutical products, if not listed under other items of this Class

90. Active substances, including:

(a) *1570 brucine*
1692 strychnine or
1692 strychnine salts
3315 chemical sample, toxic, liquid or solid

1544 alkaloids, solid, n.o.s. or
1544 alkaloid salts, solid, n.o.s.
1655 nicotine compound, solid, n.o.s. or
1655 nicotine preparation, solid, n.o.s.
3140 alkaloids, liquid, n.o.s. or
3140 alkaloid salts, liquid, n.o.s.
3144 nicotine compound, liquid, n.o.s. or
3144 nicotine preparation, liquid, n.o.s.
3172 toxins, extracted from living sources, n.o.s.

601 *(cont'd)*

Note: 3315 Chemical sample, toxic, liquid or solid, only concerns samples of chemicals taken for analysis in connection with the implementation of the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction. The carriage of substances under this entry shall be in accordance with the chain of custody and security procedures specified by the Organization for the Prohibition of Chemical Weapons. The chemical sample may only be carried if prior approval has been granted by the competent authority or by the Director General of the Organization for the Prohibition of Chemical Weapons.

(b) *1654 nicotine*
1656 nicotine hydrochloride or
1656 nicotine hydrochloride, solution
1657 nicotine salicylate
1658 nicotine sulphate, solid or
1658 nicotine sulphate, solution
1659 nicotine tartrate

1544 alkaloids, solid, n.o.s. or
1544 alkaloid salts, solid, n.a.g
1655 nicotine compound, solid, n.o.s. or
1655 nicotine preparation, solid, n.o.s.
1851 medicine, liquid, toxic, n.o.s.
3140 alkaloids, liquid, n.o.s. or
3140 alkaloid salts, liquid, n.o.s.
3144 nicotine compound, liquid, n.o.s. or
3144 nicotine preparation, liquid, n.o.s.
3172 toxins extracted from living sources, n.o.s.
3249 medicine, solid, toxic, n.o.s.;

(c) *1544 alkaloids, solid, n.o.s.* or
1544 alkaloid salts, solid, n.o.s.
1655 nicotine compound, solid, n.o.s. or
1655 nicotine preparation, solid, n.o.s.
1851 medicine, liquid, toxic, n.o.s.
3140 alkaloids, liquid, n.o.s. or
3140 alkaloid salts, liquid, n.o.s.
3144 nicotine compound, liquid, n.o.s. or
3144 nicotine preparation, liquid, n.o.s.
3172 toxins extracted from living sources, n.o.s.
3249 medicine, solid, toxic, n.o.s.

Note: 1. The active substances and triturations or mixtures of substances of item 90 with other substances shall be classified according to their toxicity [see marg.600 (3)]

2. Pharmaceutical products ready for use, e.g. cosmetics, drugs and medicines, which are substances manufactured and packed in packagings of a type intended for retail sale or distribution for personal or household consumption, which would otherwise be substances of item 90 are not subject to the requirements of this Directive.

3. Substances and preparations containing alkaloids or nicotine used as pesticides are substances of items 71 to 73.

H. Empty packagings

Note: Empty packagings with residues from their previous contents adhering to the outside are not to be accepted for carriage.

91. *Empty packagings*, including *empty intermediate bulk containers* (IBCs), *empty tank wagons, empty tank-containers, empty small bulk containers, empty wagons for carriage in bulk*, uncleaned, which have contained substances of Class 6.1.

Note: Uncleaned, empty packagings, including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the requirements of this Directive if adequate measures have been taken to nullify any hazards. Hazards are nullified if adequate measures have been taken to nullify all hazards of classes 1-9.

601a The following are not subject to the requirements of Section 2 'Conditions of Carriage', except as provided for in paragraph (3) below:

(1) Substances classified under (b) or (c) of items 11, 12, 14 to 28, 32 to 36, 41, 42, 44, 51 to 55, 57 to 68, 71 to 73 and 90 carried in conformity with the following requirements:

(a) Substances classified under (b) of each item:

— Liquids: not more than 500 ml per inner packaging and not more than 2 litres per package;

— Solids: not more than 1 kg per inner packaging and not more than 4 kg per package.

(b) Substances classified under (c) of eacht item:

— Liquids: not more than 3 litres per inner packaging and not more than 12 litres per package;

— Solids: not more than 6 kg per inner packaging and not more than 24 kg per package.

These quantities of substances shall be carried in combination packagings conforming at least to the conditions of marg. 1538.

The 'General conditions of packing' of marg. 1500 (1), (2) and (5) to (7) shall be observed.

(2) Substances referred to in (1), contained in metal or plastics inner packagings and carried in shrink-wrapped or stretch-wrapped trays used as outer packagings in conformity with the folloxing requirements:

(a) solids classified under (b) of each item: not more than 500 g per inner packaging and not more than 4 kg per package;

(b) liquids classified under (b) of eacht item: not more than 100 ml per inner packaging and not more than 2 litres per package;

(c) solids classified under (c) of each item: not more than 3 kg per inner packaging;

(d) liquids classified under (c) of each item: not more than 1 litre per inner packaging and not more than 12 litres per package.

The total gross mass of the package shall not exceed 20 kg in any case.

The 'General conditions of packing' of marg. 1500(1), (2) and (5) to (7) shall be observed.

(3) For carriage in accordance with (1) and (2) above, the description of the goods in the consignment note shall conform to the requirements of marg. 614 and include the words '*limited quantity*'. Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

2. Conditions of carriage

(The conditions of carriage for empty packagings are included under F.)

A. Packages

1. General conditions of packing

602 (1) Packagings shall satisfy the conditions of Appendix V, unless special conditions for the packing of certain substances are prescribed in Section A.2.

(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix VI.

602 *(cont'd)*

(3) In accordance with the provisions of marg. 600 (3) and 1511 (2) or 1611 (2) the following shall be used:

— packagings of packing group I, marked with the letter 'X', for the highly toxic substances classified under (a) of each item;

— packagings of packing group II or I, marked with the letter 'Y' or 'X', or IBCs of packing group II, marked with the letter 'Y', for the toxic substances classified under (b) of each item;

— packagings of packing group III, II or I, marked with the letter 'Z', 'Y' or 'X', or IBCs of packing group III or II, marked with the letter 'Z' or 'Y', for the slightly toxic substances classified under (c) of each item.

Note: For the carriage of substances of Class 6.1 in tank wagons, see Appendix XI, in tank-containers, see Appendix X and for carriage in bulk, see marg. 616 and 617(3).

2. Special conditions of packing

603 (1) Stabilized hydrogen cyanid of item 1 shall be packed:

(a) When completely absorbed by an inert porous material: in strong metal receptacles of a capacity of not more than 7,5 litres, placed in wooden cases in such a manner that they cannot come into contact with one another. Such a combination packaging shall comply with the following conditions:

1. The receptacles shall be tested at a pressure of not less than 0,6 MPa (6 bar) (gauge pressure);
2. The receptacles shall be entirely filled with the porous material. The porous material shall not shake down or form dangerous spaces even after prolonged use or under impact, even at temperatures of up to 50 °C. The date of filling shall be durably marked on the lid of each receptacle;
3. The combination packaging shall be tested and approved, in accordance with Appendix V, for packing group I. The package shall not weigh more than 120 kg.

(b) when liquid, but not absorbed by a porous material: in carbon-steel pressure-resistant cylinders which shall satisfy the following conditions:

1. Before being used for the first time, the pressure-resistant cylinders shall undergo a hydraulic pressure test at a pressure of not less than 10 MPa (100 bar) (gauge pressure). The pressure test shall be repeated every two years and shall include a meticulous inspection of the inside of the receptacle and a check of the tare;
2. The cylinders shall comply with the relevant provisions of Class 2 [see marg. 211 (1) tot 213, 215 to 217 and 223].
3. Maximum permissible mass of the contents: 0,55 kg per litre of capacity.

(2) Solutions of hydrocyanic acid of item 2 shall be packed in flame-sealed glass ampoules, containing not more than 50 g, or in glass bottles so closed as to be leakproof and containing not more than 250 g.

The ampoules or bottles shall be carried in combination packagings which meet the following conditions:

(a) The ampoules and bottles shall be secured by absorbent cushioning materials in leakproof steel or alumunium outer packagings: a package shall not weigh more than 15 kg; or

(b) The ampoules and bottles shall be secured by absorbent cushioning materials in wooden cases with a leakproof tin-plate lining; a package shall not weigh more than 75 kg.

The combination packaging referred to in (a) and (b) shall be tested and approved, in accordande with Appendix V, for packing group I.

604 Iron pentacarbonyl and nickel tetracarbonyl of item 3 shall be packed as follows:

(1) In seamless moulded bottles made of pure aluminium of a capacity not exceeding 1 litre and a wall thickness not less than 1 mm, which shall be tested at a pressure of not less than 1 MPa (10 bar) (gauge pressure). The bottles shall be closed by means of metal screw-threaded plug with an inert gasket, the screw-threaded plug being screwed firmly into the neck of the bottle and so secured that it cannot work loose under normal conditions of carriage.

604 *(cont'd)*

A maximum of four aluminium bottles of this type may be secured in outer packagings of wood or fireboard by non-combustible absorbent cushioning material. Such a combination packaging shall conform to a design type which has been tested and approved for packing group I in accordance with Appendix V.

A package shall not weigh more than 10 kg.

(2) In metal receptacles fitted with completely leakproof closing devices which shall, if necessary, be secured against mechanical damage by protective caps. Steel receptacles of a capacity not exceeding 150 litres shall have a minimum wall thickness of 3 mm, and larger steel receptacles and receptacles made of other materials shall have walls at least thick enough to guarantee equivalent mechanical strength. The maximum capacity of receptacles permitted shall be 250 litres. The mass of the contents shall be not more than 1 kg per litre of capacity.

Before being used for the first time, the receptacles shall undergo a hydraulic pressure test at a pressure of not less than 1 MPa (10 bar) (gauge pressure). The pressure shall be repeated every five years and shall include a meticulous inspection of the inside of the receptacle and a check of the tare. Metal receptacles shall bear the following particulars in clearly legible and durable characters:

(a) the name of the substance in full (the names of both substances may also be shown side by side in the event of alternative use);

(b) the name of the owner of the receptacle;

(c) the tare of the receptacle, including such fittings and accessories as valves, protective caps, etc.;

(d) the date (month, year) of the initial test and of the most recent test, and the stamp of the expert who carried out the test;

(e) the maximum permissible mass of the contents of the receptacle in kg;

(f) the internal pressure (test pressure) to be applied in the hydraulic pressure test.

605

(1) (a) Ethyleneimine, inhibited, of item 4 shall be packed in steel receptacles of sufficient thickness, which shall be closed by a screw-threaded bung or plug rendered leakproof both to liquid and to vapour by means of a suitable gasket. The receptacles shall initially and periodically, at least everey five years, be tested at a pressure of not less tha 0,3 MPa (3 bar) (gauge pressure) in accordance with marg. 215 to 217. Each receptacle shall be secured by absorbent cushioning materials in a strong leakproof protective metal packaging. The protective packaging shall be hermetically closed and its closure shall be secured against any inadvertent opening. The mass of the contents shall not exceed 0,67 kg per litre of capacity. A package shall not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as full load, shall be fitted, with means of handing.

(b) Ethyleneimine, inhibited, of item 4 may also be packed in steel receptacles of sufficient thickness, which shall be closed by a screw-threaded bung and a screw-threaded protective cap or equivalent device leakproof both to liquid and to vapour. The receptacles shall initially and periodically, at least every five years, be tested at a pressure of at least 1 MPa (10 bar) (gauge pressure) in accordance with marg. 215 to 217. The mass of the contents shall not exceed 0,67 kg per litre of capacity. A package shall not weigh more than 75 kg.

(c) Receptacles in conformity with (a) and (b) shall bear, in clearly legible and durable characters:

— the name or mark of the maker and the number of the receptacle;

— the word 'ethyleneimine';

— the tare of the receptacle and its maximum permitted mass when filled;

— the date (month and year) of the initial test and of the most recent test undergone;

— the stamp of the expert who carried out the tests and examinations.

605 *(cont'd)*

(2) Methyl isocyanate of item 5 shall be packed:

(a) in hermetically closed receptacle made of pure aluminium and having a capacity not exceeding one litre, which shall not be filled beyond 90 % of their capacity. The receptacles shall be secured, not more than 10 to a box, with appropriate cushioning material in a wooden box. Packages of this kind shall satisfy the test requirements for combination packagings conforming to marg. 1538 for packing group I, and shall not weigh more than 30 kg; or

(b) in receptacles made of pure aluminium having a wall thickness of not less than 5 mm or in receptacles of stainless steel. The receptacles shall be fully welded and shall initially and periodically, at least every five years, be tested at a pressure of at least 0,5 MPa (5 bar) (gauge pressure) in accordance with marg. 215 to 217. They shall be so closed as to be leakproof by means of two closures one above the other, one of which shall be screw-threaded or secured in an equally effective manner.

The degree of filling shall be not more than 90 %.

Drums weighing more than 100 kg shall be fitted with rolling hoops or stiffening ribs.

(c) Receptacles in conformity with (b) shall bear, in clearly legible and durable characters:

— the name or mark of the manufacturer and the number of the receptacle;

— the words 'methyl isocyanate';

— the tare of the receptacle and its maximum permitted mass when filled;

— the date (month and year) of the initial test and of the most recent test undergone;

— the stamp of the expert who carried out the tests and examinations.

606

(1) Substances classified under (a) of the various items shall be packed in:

(a) non-removable head steel drums conforming to marg. 1520, or

(b) non-removable head aluminium drums conforming to marg. 1521, or

(c) non-removable head steel or aluminium jerricans conforming to marg. 1522, or

(d) non-removable head plastics drums of a capacity not exceeding 60 litres or non-removable head plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings with inner packaging of glass, plastics or metal conforming to marg. 1538.

(2) Solid substances within the meaning of marg. 600 (13) may also be packed in:

(a) removable head drums conforming to marg. 1520 for steel, 1521 for aluminium, 1523 for plywood, 1525 for fibreboard, or 1526 for plastics material, or in removable head jerricans conforming to marg. 1522 for steel or aluminium or 1526 for plastics material, if necessary with one or more sift-proof inner bags, or

(b) combination packagings conforming to marg. 1538, with one or more sift-proof inner bags.

(3) Sodium cyanid of item 41 (a) may also be packed in metal IBCs conforming to marg. 1622 or in wooden IBCs with a sift-proof inner liner conforming to marg. 1627, provided it is carried as a full load.

607

(1) Substances classified under (b) of the various items shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

607 *(cont'd)*

(d) plastic drums or plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastic material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538.

Note: (a), (b), (c) and (d). Simplified conditions are applicable to removable-head drums and jerricans for viscous substances having a viscosity of more than 220 mm^2/s at 23 °C and for solids (see marg. 1512, 1553, 1554 and 1561).

(2) Substances classified under (b) of the various items which have a vapour pressure at 50 °C of not more than 110 kPa (1,10 bar) may also be packed in metal IBCs conforming to marg. 1622 or in rigid plastics IBCs conforming to marg. 1624 or in composite IBCs with rigid plastics inner receptacle conforming to marg. 1625.

(3) Substances classified under item 15(b) may also be packed in composite packagings (glass, porcelain or stoneware) conforming to marg. 1539.

(4) Solid substances within the meaning of marg. 600 (13) may also be packed in:

(a) removable-head drums conforming to marg. 1523 for plywood or 1525 for fireboard, if necessary with one or more sift-proof inner bags, or

(b) water-resistant bags conforming to marg 1533 for textile material, 1534 for woven plastics material, 1535 for plastics film or 1536 for water-resistant paper, provided the goods are carried as full load or the bags secured on pallets, or

(c) composite IBCs with flexible plastics inner receptacle conforming to marg. 1625, fibreboard IBCs conforming to marg. 1626 or wooden IBCs conforming to marg. 1627, or

(d) flexible IBCs conforming to marg. 1623, with the exception of IBCs of types 13H1, 13L1, 13M1, provided that the goods are carried as a full load or the flexible IBCs are loaded on pallets.

608 (1) Substances classified under (c) of the various items shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

(d) plastics drums or plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plasticals material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539, or

(h) light gauge metal packagings conforming to marg. 1540.

Note: (a), (b), (c), (d) and (h). Simplified conditions are applicable to removable-head drums, jerricans and light gauge metal packagings for viscous substances having a viscosity of more than 200 mm^2/s at 23 °C and for solids (see marg. 1512, 1522 to 1554 and 1561).

(2) Substances classified under (c) of the various items which have a vapour pressure at 50 °C of not more than 110 kPa (1,10 bar) may also be packed in metal IBCs conforming to marg. 1622, in rigid plastics IBCs conforming to marg. 1624 or composite IBCs with plastics inner receptacle conforming to marg. 1625. IBCs of Type 31 HZ2 shall be filled to at least 80 % of the capacity of the outer casing.

608 (cont'd) (3) Solid substances within the meaning of marg. 600 (13) may also be packed in:

(a) movable-head drums conforming to marg. 1523 for plywood, or 1525 for fibreboard, if necessary with one or more sift-proof inner bags, or

(b) water-resistant bags conforming to marg. 1533 for textile-material, 1534 for woven plastics material, 1535 for plastics film or 1536 for water-resistant paper, or

(c) flexible IBCs conforming to marg. 1623 with the exception of IBCs of types 13H1, 13L1 and 13M1, in composite IBCs with flexible plastics inner receptacle conforming to marg. 1625, in fireboard IBCs conforming to marg. 1626 or wooden IBCs conforming to marg. 1627.

609 3315 chemical sample, toxic, of item 90 (a) shall be packed according to packing instruction 623 in the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air.

610

3. Mixed packing

611 (1) Substances covered by the same item number may be packed together in a combination packaging conforming to marg. 1538.

(2) Substances of different items of Class 6.1 in quantities not exceeding, per inner receptacle, 3 litres for liquids and/or 5 kg for solids, may be packed together and/or with goods not subject to the requirements of this Directive, in a combination packaging conforming to marg. 1538, provided they do not react dangerously with one another.

(3) Substances of items 1, 3, 4 and 5 shall not be packed with other goods.

(4) Substances of item 2 and substances classified under (a) of the various items shall not be packed together with substances and articles of classes 1, 5.2 and 7.

(5) Except as otherwise specially provided, substances of item 2 and substances classified under (a) of the various items, in quantities not exceeding 0,5 litre per receptacle and 1 litre per package, and substances classified under (b) and (c) of the various items, in quantities not exceeding, per inner packaging, 3 litres for liquids and/or 5 kg for solids, may be packed together in a combination packaging conforming to marg. 1538, with substances or articles of other classes, provided that mixed packing is also permitted for the substances of these classes, and/or with goods not subject to the requirements of this Directive, provided they do not react dangerously with one another.

(6) The following are considered dangerous reactions:

(a) combustion and/or giving off considerable heat,

(b) emission of flammable and/or toxic gases,

(c) formation of corrosive liquids,

(d) formation of unstable substances.

(7) The provisions of marg. 8 and 602 shall be complied with.

(8) If wooden or fibreboard boxes are used, a package shall not weigh more than 100 kg.

4. Marking and danger labels on packages (See Appendix IX)

Marking

612 (1) Each package shall be clearly and durably marked with the identification number of the goods to be entered in the consignement note, preceded by the letters 'UN'.

Danger labels

(2) Packages containing substances or articles of Class 6.1 shall bear a label conforming to model No 6.1.

(3) Packages containing substances of items 1 to 6, 7(a)2., 8(a)2, 9, 11(a) and (b)2., 13, 16, 18, 20, 22 or 26(a)1. and (b)1. and (b)1. shall, in addition, bear a label conforming to model No 3.

(4) Packages containing flammable pesticides of item 72 having a flash-point of 23 °C or above shall, in addition, bear a label conformin to model No 3.

(5) Packages containing substances of items 7(a)1., 8(a)., 10, 11(b)1. and 28 shall, in addition, bear labels conforming to models Nos 3 and 8.

(6) Packages containing substances of items 26(a)2. and (b)2. or 54(b)1. shall, in addition, bear labels conforming to model No 4.1.

(7) Packages containing substances of item 66 shall, in addition, bear a label conforming to model No 4.2.

(8) Packages containing substances of item 44 shall, in addition, bear a label conforming to model No 4.3.

(9) Packages containing substances of item 68 shall, in addition, bear a label conforming to model No 05.

(10) Packages containing substances of items 24(b)2., 27 and 67 shall, in addition, bear a label conforming to model No 8.

(11) Packages containing liquids in receptacles the closures of which are not visible from the outside, packages containing receptacles with vents, and receptacles with vents but without outer packaging, shall also bear on two opposite sides a label conforming to model No 11.

B. Method of dispatch and restrictions on forwarding

613 (1) With the exception of substances of items 1 to 5 and substances classified under (a) of each item, packages containing other substances of this Class may be sent as express parcels if they contain:

— substances classified under (b) of each item, up to 2 litres per package for liquids and 4 kg per packages for solids;

— substances classified under (c) of each item, up to 12 litres per package for liquids and 24 kg per package for solids.

(2) Substances and preparations used as pesticides of items 71 to 73, contained in receptacles which are not fragile may be sent by express parcel. A package shall not weigh more than 25 kg.

(3) Inorganic cyanides containing precious metals, and mixtures of these of item 41(a) may be sent as express parcels in combination packagings with inner packagings of glass, plastics or metal in accordance with marg. 1538. A package shall not contain more than 2 kg of substance.

Carriage in luggage vans or luggage compartments accessible to passengers shall be authorized if, by means of appropriate measures, packages are placed out of reach of non-authorized persons.

C. Particulars in the consignment note

614 The description of the goods in the consignment note shall conform to one of the substance identification numbers and one of the names printed in italics in marg. 601.

If the substance is not mentioned by name but is assigned to an n.o.s entry, or to a generic entry, the description of the goods shall consist of the identification number and the n.o.s designation or the generic entry designation, followed by the chemical or technical name [1].

The description of the goods shall be followed by *particulars of the Class, the item numbers and*, if applicable, *the group (a), (b) or (c) and the initials 'RID'*, e.g. '6.1, item 11(a), RID'. A cross shall be entered in the appropriate box on the consignment note.

For the carriage of wastes [see marg. 3(4)], the description of the goods shall be: 'Waste containing...', the components(s) used for the classification of the waste under marg. 3(3) to be entered under its/their chemical name(s), e.g. '*Waste, containing 2570 cadmium compounds, 6.1 item 61(c) RID*'.

For the carriage of solutions or mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

For the carriage of solutions and mixtures containing only one component subject to the requirements of this Directive, the words *solution* or *mixture* shall be added as part of the name in the consignment note [see marg. 3(3)].

When a solid is handed over for carriage in the molten state, the description of the goods shall be completed by the words '*molten*', unless it is already included in the name.

When a marking in accordance with Appendix VIII is prescribed, the hazard identification number, in accordance with Appendix VIII shall also be inscribed before the description of the substance.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

If a solution or mixture containing a named substance in accordance with marg 600(5) is not subject to the conditions of this Class, the consignor may enter in the consignment note '*Not goods of Class 6.1*'.

For the carriage of substances and preparations used as pesticides, the description of the goods shall include an indication of the active ingredients in conformity with the nomenclature approved by ISO [2], or in accordance with the table in marg. 601, items 71 to 73, or the chemical name of the active ingredient(s), e.g. '*2783 organophosphorus pesticide, solid, toxic, (propaphos), 6.1, item 73(c), RID*'.

For the carriage of 3315 chemical sample, toxic, item 90(a), a copy of the transport permit, indicating the quantity limits and packing requirements shall be attached to the consignment note [see also Note to item 90(a)].

D. Transport equipment

1. Conditions relating to wagons and loading

a. For packages

615 (1) With regard to keeping packages bearing labels conforming to model No 6.1 apart in wagons from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11(3).

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(1) The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose.

(2) This nomenclature is contained in standar ISO R.1750:1981, as amended and supplemented.

615 (cont'd) (2) Packages shall be so loaded in wagons that they cannot shift dangerously, overturn or fall.

In addition IBCs of Type 31 HZ2 shall only be carried in closed wagons.

(3) Wagons which have contained substances of Class 6.1 as full wagon-loads shall be checked, after unloading, for any residues of the load (see also marg. 624).

b. For carriage in bulk

616 Substances of item 60 (c), 3243 solids containing toxic liquid of item 65(b) and solids and mixtures (such as preparations and wastes) classified under (c) of the various items may be carried in bulk in sheeted open wagons or in movable-roof wagons. Wagons containing substances with identification number 3243 of item 65(b) in bulk shall be leakproof or made leakproof, e.g. by means of a sufficiently rigid inner lining.

c. For small containers

617 (1) Packages containing substances of this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 620 shall also be applied to small containers.

(3) Substances of items 60(c), 3243 solids containing toxic liquid of item 65(b) and solids and mixtures classified under (c) of the various items may also be carried in bulk in small containers of the closed type with complete walls.

Small containers containing substances with identification number 3243 of item 65(b) in bulk, shall be leakproof or made leakproof, e.g. by means of a sufficiently rigid inner lining.

(4) The requirements of marg. 615 (3) and 624 also apply, by analogy, to carriage in small containers.

2. Marking and danger labels on wagons, tank wagons, tank-containers and small containers (see Appendix IX)

618 (1) Wagons, tank wagons and tank-containers containing substances of this Class shall bear on both sides a label conforming to model No 6.1.

(2) Wagons, tank wagons and tank-containers containing substances mentioned in marg. 612(3) to (10) shall, in addition, bear on both sides a label as prescribed in that marg.

(3) Small containers shall be labelled in accordance with marg. 612(2) to (10).

619

E. Prohibitions on mixed loading

620 Packages bearing a label conforming to model No 6.1 shall not be loaded in the same wagon together with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. These requirements shall not apply to packages bearing a label conforming to model No 1.4, comptability group S.

621 Separate consignment notes shall be made out for consignments which may not be loaded together in the same wagon.

F. Empty packagings

622 (1) If the empty packagings, uncleaned, of item 91 are bags or flexible IBCs, these shall be placed in boxes or waterproof bags to prevent any leakage of substance.

(2) Other empty packagings, including uncleaned empty IBCs, empty tank wagons, empty tank-containers and empty wagons for carriage in bulk and empty small containers for carriage in bulk, of item 91 shall be closed in the same manner and with the same degree of leakproofness as if they were full.

(3) Empty packagings, including uncleaned empty IBCs, empty tank wagons, empty tank-containers, and empty wagons for carriage in bulk and empty small containers for carriage in bulk of item 91 shall bear the same danger labels as if they were full. Packagings containing bags or flexible IBCs according to paragraph (1) above shall bear danger labels as if those bags or flexible IBCs were full.

(4) The description in the consignment note shall conform to one of the names printed in *italics* in item 91 completed by '*6.1, item 91, RID*' e.g.: '*Empty packaging, 6.1, item 91, RID*'.

A cross shall be entered in the appropriate box on the consignment note.

In the case of empty tank wagons, empty tank-containers, empty wagons for carriage in bulk and empty small containers for carriage in bulk, uncleaned, this description shall be completed by adding the words 'Last load' together with the hazard and substance identification number, the name and item number and, if appropriate, group (a), (b) or (c) of the goods last loaded, e.g.: '*Last load: 60 2312 phenol, molten, item 24 (b) 1.*'.

(5) With regard to keeping empty uncleaned packagings of item 91 bearing labels in accordance with model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

G. Other requirements

623 With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

624 If substances contained in packages bearing labels conforming to model No 6.1 have leaked and been spilled in a wagon, the wagon shall not be reused until after it has been thoroughly cleaned and, if necessary, decontaminated. All other goods and articles carried in such a wagon shall be examined for possible contamination.

625-649

CLASS 6.2

INFECTIOUS SUBSTANCES

1. List of substances

650 (1) Among the substances [1] covered by the title of Class 6.2, those which are listed in marg. 651 or are covered by a collective heading of that marg. are subject to the conditions set out in marg. 650 (2) to marg. 675 and are then considered as substances of this Directive.

(2) Class 6.2 comprises substances which contain or which are believed to contain pathogens defined as micro-organisms (including bacteria, viruses, rickettsia, parasites and fungi) or recombinant micro-organisms (hybrid or mutant) that are known or reasonably believed to cause disease in animals or humans.

Note: 1. Genetically modified micro-organisms and organisms, biological products, diagnostic specimens and infected live animals shall be classified in this Class if they meet the requirements for this Class.

2. Toxins from plant, animal or bacterial sources which do not contain any infectious substances or organisms or which are not contained in them are substances of Class 6.1 (see marg. 601, item 90, identification number 3172).

(3) Substances of Class 6.2 are subdivided as follows:

A. infectious substances with a high risk potential

B. other infectious substances

C. empty packagings

The substances of marg. 651, items 3 and 4, are assigned to group (b) on the basis of their degree of danger.

(4) The assignment of substances which are not listed by name to items 1, 2 and 3 of marg. 651 shall be made on the basis of current scientific knowledge, in accordance with the following risk groups [2]:

(i) Risk group 4: a pathogen that usually causes serious human or animal disease and that can be readily transmitted from one individual to another, directly or indirectly, and for which effective treatment and preventive measures are not usually available (i.e. high individual and community risk).

(ii) Risk group 3: a pathogen that usually causes serious human or animal disease but does not ordinarily spread from one infected individual to another, and for which effective treatment and preventive measures are available (i.e. high individual risk and low community risk).

(iii) Risk group 2: a pathogen that can cause human or animal disease but is unlikely to be as serious hazard, and for which, although capable of causing serious infection on exposure, there are effective treatment and preventive measures available and the risk of spread of infection is limited (i.e. moderate individual risk and low community risk).

Note: 1. Risk group 1 includes micro-organisms that are unlikely to cause human or animal disease (i.e. no, or very low, individual or community risk). Substances containing only such micro-organisms are not considered infectious substances for the purposes of these requirements.

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[1] For the purposes of this Class, viruses, micro-organisms and organisms as well as articles contaminated with these shall be considered as substances of this Class.

[2] See 'Laboratory Biosafety Manual', Second Edition (1993) of the World Health Organization (WHO).

650 *(cont'd)*

2. Genetically modified micro-organisms and organisms [1] are micro-organisms and organisms in which the genetic material has been deliberately altered by technical methods or by means that cannot occur naturally in nature.

3. Genetically modified micro-organisms which are infectious within the meaning of this Class are substances of items 1, 2 or 3. They may not however be assigned to item 4. Genetically modified micro-organisms which are not infectious substances within the meaning of this Class may be substances of Class 9 (see marg. 901, item 13, identification number 3245).

4. Genetically modified organisms, which are known or suspected to be dangerous to humans, animals or the environment, shall be carried in accordance with conditions specified by the competent authority of the country of origin.

(5) Substances and mixtures of substances of this Class shall be considered as solids for the packaging provisions of marg. 654 and 655 as long as they do not contain free liquid at a temperature of less than 45 °C.

(6) Biological products are those products derived from living organisms, that are manufactured and distributed in accordance with the requirements of national authorities which may have special licensing requirements, and are used either for prevention, treatment, or diagnosis of disease in humans or animals, or for development, experimental or research purposes related thereto. They include, but are not limited to, finished or unfinished products such as vaccines and diagnostic products.

Diagnostic specimens are any human or animal material including, but not limited to, excreta, secreta, blood and its components, tissue and tissue fluids being carried for purposes of diagnosis or research, but excluding live infected animals.

Note: 'Biological products' and 'diagnostic specimens' are not considered as substances of this Class if they are known not to contain infectious substances.

(7) Live vertebrate or invertebrate animals shall not be used to carry an infectious agent unless the agent cannot be carried by any other means. Such animals shall be packed, labelled, marked and carried in accordance with the relevant regulations governing the carriage of animals [2].

(8) For the carriage of substances of this Class, the maintenance of a specified temperature may be necessary.

A. Infectious substances with high risk potential

651

1. *2814 infectious substance, affecting humans,*
2900 infectious substance, affecting animals only.

Note: 1. Substances which, in accordance with marg. 650 (4), are assigned to risk group 4, shall be assigned to this item.

2. Special conditions of packing are applicable to these substances (see marg. 653 and 654).

2. *2814 infectious substance, affecting humans,*
2900 infectious substance, affecting animals only.

Note: 1. Substances which, in accordance with marg. 650 (4), are assigned to risk group 3, shall be assigned to this item.

2. Special conditions of packing are applicable to these substances (see marg. 653 and 654).

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[1] See also Directive 90/219/EEC, Official Journal of the European Community L 117 of 8 May 1990, page 1.

[2] Such regulations are contained in, e.g. Directive 91/628/EEC (Official Journal of the European Community L 340 of 11 December 1991, page 17) and in the Recommendations of the Council of Europe (Ministerial Committee) on the carriage of certain animal species.

651 (cont'd)

B. Other infectious substances

3. (b) *2814 infectious substance, affecting humans,*

2900 infectious substance, affecting animals only.

Note: Substances which, in accordance with marg. 650 (4), are assigned to risk group 2, shall be assigned to this item.

4. (b) *3291 Clinical waste, unspecified, n.o.s.*

Note: 1. Unspecified wastes resulting from medical/veterinary treatment of humans/animals or from biological research, and which are unlikely to contain substances of this Class, shall be assigned to this item.

2. Specified wastes shall be assigned to items 1, 2 or 3.

3. Decontaminated clinical wastes or wastes resulting from biological research which previously contained infectious substances are not subject to the requirements of this Class.

C. Empty packagings

11. *Empty packagings,* including *empty intermediate bulk containers* (IBCs), *empty tank wagons, empty tank-containers* and *empty wagons* for carriage in bulk, uncleaned, which have contained substances of Class 6.2 (see marg. 672).

2. Conditions of carriage

(The conditions of carriage for empty packagings are included under F.)

A. Packages

1. General conditions of packing

652 (1) Packagings shall satisfy the conditions of Appendix V, unless special conditions for the packing of certain substances are prescribed in Section A.2.

(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix VI.

(3) In accordance with the requirements of marg. 650 (3) and 1511 (2) or 1611 (2), the following shall be used:

packagings of packing group II or I, marked with the letter 'Y' or 'X', or IBCs of packing group II, marked with the letter 'Y', for dangerous substances classified under the letter (b) of each item.

Note: For the carriage of substances of Class 6.2 in tank wagons see Appendix XI, or in tank-containers see Appendix X. For carriage in bulk, see marg. 666.

2. Special conditions of packing

653 (1) Packagings for substances of items 1 and 2 shall include the following essential elements:

(a) An inner packaging comprising:

— a leakproof primary receptacle;

— a leakproof secondary packaging;

— absorbent material placed between the primary receptacle and the secondary packaging. If several primary receptacles are placed in a single secondary packaging, they shall be individually wrapped so as to prevent contact between them. The absorbent material, such as cotton wool, shall be in sufficient quantity to absorb the entire contents of the primary receptacles.

653 *(cont'd)* Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging shall be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa (0,95 bar) and temperatures in the range – 40 °C to + 55 °C.

Note: Inner packagings containing infectious substances shall not be consolidated with an inner packaging with other types of goods.

(b) An outer packaging of adequate strength with regard to its capacity, mass and intended use. The minimum overall external dimension of packagings used for consignments shall be at least 100 mm.

(2) Packagings conforming to paragraph (1) shall be tested in accordance with the provisions of marg. 654; the packaging design type shall be one permitted by the competent authority. Every packaging manufactured in accordance with the approved design type shall be marked in accordance with marg. 1512.

Tests for packagings in accordance with marg. 653

654 (1) Other than for packagings for live animals and organisms, samples of each packaging shall be prepared for testing as described in paragraph (2) and then subjected to the tests in paragraphs (3) to (5). If the nature of the packaging makes it necessary, equivalent preparation and tests are permitted, provided that these may be demonstrated to be at least as effective.

(2) Samples of each packaging shall be prepared as for carriage, except that the substance to be carried shall be replaced by water, or where conditioning at – 18 °C is specified, by a mixture of water and antifreeze. Each primary receptacle [see marg. 653 (1) (a)] shall be filled to 98 % capacity.

(3) Packagings prepared as for carriage shall be subjected to the tests in the table, which, for test purposes, categorizes packagings according to their material characteristics. For outer packagings, the headings in the table relate to:

— fibreboard or similar materials whose performance may be rapidly affected by moisture;

— plastics which may embrittle at low temperature;

— other materials such as metal whose performance is not affected by moisture or temperature.

If a primary receptacle and a secondary packaging [see marg. 653 (1) (a)] are made of different materials, the material of the primary receptacle determines the appropriate test. In instances where a primary receptacle is made of two materials, the material most liable to damage shall determine the appropriate tests.

TABLE

Material of					Tests required				
Outer packaging			Inner packaging		In accordance with (3), letter				In accordance with (4)
Fibreboard	Plastics	Other	Plastics	Other	(a)	(b)	(c)	(d)	
X			X			X	X	When	X
X				X		X		dry	X
	X		X				X	ice	X
	X			X			X	is	X
		X	X				X	used	X
		X		X	X				X

(a) Samples shall be subjected to free-fall drops on to a rigid, non-resilient, flat, horizontal surface from a height of 9 m. Where the samples are in the shape of a box, five shall be dropped in sequence:

654 *(cont'd)*

— one flat onto the bottom,

— one flat onto the top,

— one flat onto the long side,

— one flat onto the short side,

— one onto a corner.

Where the samples are in the shape of a drum, three shall be dropped in sequence:

— one diagonally on to the top chime, with the centre of gravity directly above the point of impact,

— one diagonally on to the base chime,

— one flat on to the side.

Following the appropriate drop sequence, there shall be no leakage from the primary receptacle(s) which shall remain protected by absorbent material in the secondary packaging.

(b) The samples shall be subjected to a water spray that simulates exposure to rainfall of approximately 5 cm per hour for at least one hour. It shall then be subjected to the test described in (a).

(c) The samples shall be conditioned in an atmosphere of – 18 °C or less for a period of at least 24 hours and within 15 minutes of removal from that atmosphere be subjected to the test described in (a). Where the samples contain dry ice, the conditioning period may be reduced to four hours.

(d) Where the packaging is intended to contain dry ice, a test additional to that specified in (a), (b) or (c) shall be carried out. One sample shall be stored so that all the dry ice dissipates and then be subjected to the test described in (a).

(4) The competent authority may permit the selective testing of packagings that differ only in minor respects from a tested type, e.g. smaller sizes of inner packagings or inner packagings of lower net mass; and packagings such as drums, bags and boxes which are produced with small reductions in external dimension(s).

(5) Packagings with a gross mass of 7 kg or less shall be subjected to the tests described in (a) below and packagings with a gross mass exceeding 7 kg to the tests in (b) below:

(a) Samples shall be placed on a level hard surface. A cylindrical steel rod with a mass of at least 7 kg, and a diameter not exceeding 38 mm, and whose impact end edges have a radius not exceeding 6 mm, shall be dropped in a vertical free fall from a height of 1 m, measured from the impact end to the impact surface of the sample. One sample shall be placed on its base. A second sample shall be placed in an orientation perpendicular to that used for the first. In each instance, the steel rod shall be aimed to impact the primary receptacle. Following each impact, penetration of the secondary packaging is acceptable, provided that there is no leakage from the primary receptacle(s).

(b) Samples shall be dropped on to the end of a cylindrical steel rod. The rod shall be set vertically in a level hard surface. It shall have a diameter of 38 mm and the edges of the upper end a radius not exceeding 6 mm. The rod shall protrude from the surface a distance at least equal to that between the primary receptacle(s) and the outer surface of the outer packaging with a minimum of 200 mm. One sample shall be dropped in a vertical freefall from a height of 1 m, measured from the top of the steel rod. A second sample shall be dropped from the same height in an orientation perpendicular to that used for the first. In each instance, the packaging shall be so orientated that the steel rod would penetrate the primary receptacle(s). Following each impact, penetration of the secondary packaging is acceptable, provided that there is no leakage from the primary receptacle(s).

654 *(cont'd)*

(6) As long as an equivalent level of performance is maintained, the following variations in the primary receptacles placed within the secondary packaging are allowed without the need for further testing of the completed packaging:

Primary receptacles of equivalent or smaller size as compared to the tested primary receptacles may be used provided:

(a) the primary receptacles are of similar design to the primary receptacle tested (e.g. rounded, rectangular);

(b) the material of construction of the primary receptacle (e.g. glass, plastics, metal) has a resistance to impact and stacking pressure equivalent to or better than that of the primary receptacle initially tested;

(c) primary receptacles have the same or smaller openings and the closure is of equivalent design (e.g. screw-threaded plug, bung);

(d) sufficient additional cushioning material is used to fill up space and to prevent significant movement of the primary receptacles; and

(e) primary receptacles are oriented within the secondary packagings in the same manner as in the tested package.

(7) Inner receptacles of any type may be assembled within an intermediate (secondary) packaging and carried without testing in the outer packaging under the following conditions:

(a) The intermediate/outer packaging combination shall have been successfully tested in accordance with the drop test in sub-paragraph (3) (a) with fragile (e.g. glass) inner receptacles;

(b) The total combined gross mass of inner receptacles shall not exceed one half of the gross mass of inner receptacles used for the drop test in (a) above;

(c) The thickness of cushioning between inner receptacles and between inner receptacles and the outside of the intermediate packaging shall not be reduced below the corresponding thicknesses in the originally tested packaging; and if a single inner receptacle was used in the original test, the thickness of cushioning between inner receptacles shall not be less than the thickness of cushioning between the outside of the intermediate packaging and the inner receptacle in the original test. When either fewer or smaller inner receptacles are used (as compared to the inner receptacles used in the drop test), sufficient additional cushioning material shall be used to take up the void;

(d) The outer packaging shall have successfully passed the stacking test in marg. 1555 while empty. The total mass of identical packages shall be based on the combined mass of inner receptacles used in the drop test in (a) above;

(e) For inner receptacles containing liquids, an adequate quantity of absorbent material to absorb the entire liquid content of the inner receptacles shall be present;

(f) If the outer packaging is intended to contain inner receptacles for liquids and is not leakproof, or is intended to contain inner receptacles for solids and is not siftproof, a means of containing any liquid or solid contents in the event of leakage shall be provided in the form of a leakproof liner, plastics bag or other equally effective means of containment;

(g) The markings on packagings in conformity with this paragraph shall include the letter 'U' immediately following prescribed in marg. 1512 (1) (c) (iii).

655 (1) Substances classified under (b) of items 3 and 4 shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

655 *(cont'd)*

(d) plastics drums or jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539, or

(h) metal IBCs conforming to marg. 1622, or

(i) rigid plastics IBCs conforming to marg. 1624, or

(k) composite IBCs with plastics inner receptacles conforming to marg. 1625, with the exception of IBCs of types 11HZ2 and 31HZ2.

(2) Solid substances within the meaning of marg. 650 (5) may also be packed in plywood drums conforming to marg. 1523 or in fibre drums conforming to marg. 1525, if necessary with one or more leakproof inner bags.

656 Biological products and diagnostic specimens of items 1 to 3 where a relatively low probability exists that infectious substances are present e.g. for routine screening tests or initial diagnosis, shall meet all the requirements of this Class except where the following conditions are met:

(1) The primary receptacles do not contain more than 50 ml for biological products, or 100 ml for diagnostic specimens;

(2) The outer packaging does not contain, for biological products more than 50 ml when fragile primary receptacles are used and 100 ml when other than fragile primary receptacles are used, or for diagnostic specimens more than 500 ml;

(3) The primary receptacles are leakproof; and

(4) The packaging is in accordance with the requirements of this Class except that it does not need to satisfy the test requirements.

657 When substances of this Class are carried in deeply refrigerated liquid nitrogen, the inner packagings shall conform to the requirements for this Class and the containers for the nitrogen shall conform to the requirements of Class 2.

658 (1) The openings of primary receptacles for liquids of items 1 and 2 shall be closed so as to be leakproof by means of two devices placed in series, one of which shall be screw-threaded or secured in an equivalent manner.

(2) Receptacles for substances of items 3 and 4 which evolve gases and which are carried at ambient temperature of more than 15 °C shall be fitted with a specific pathogen-tight vent in the lid, which shall be protected against external mechanical stresses.

With reusable receptacles, the filter of the vent shall be replaced before refilling.

(3) Plastics or fibreboard packagings intended for the carriage of wastes of item 4 shall be resistant and impenetrable to sharp objects if the wastes contain such articles.

(4) The closure of packagings for substances of item 4 shall be so constructed that they are hermetically closed after filling and so designed that any subsequent opening is immediately evident.

659-660

3. Mixed packing

661 (1) Substances covered by the same item number may be packed together in a combination packaging conforming to marg. 1538.

(2) Substances of items 1, 2 and 3 may be packed together in a combination packaging conforming to marg. 1538, if the package is tested and approved in accordance with the requirements for substances of items 1 and 2.

(3) Substances of Class 6.2 shall not be packed together with substances of other Classes, nor with goods not subject to the requirements of this Directive. This does not apply to biological products and diagnostic specimens packed in accordance with marg. 656 or to substances being carried as coolants, eg dry ice or deeply refrigerated liquid nitrogen.

(4) The provisions of marg. 8 and 652 shall be observed.

(5) If wooden or fibreboard boxes are used, a package shall not weigh more than 100 kg.

4. Marking and danger labels on packages (See Appendix IX)

Marking

662 (1) Each package shall be clearly and durably marked with the identification number of the goods to be entered in the consignment note, preceded by the letters 'UN'.

Danger labels

(2) Packages containing substances of this Class shall bear a label conforming to model No 6.2.

(3) Packages containing substances of this Class carried in deeply refrigerated liquid nitrogen shall in addition bear a label conforming to model No 2.

(4) Packages containing liquids of item 3 in receptacles the closures of which are not visible from the outside as well as packages containing vented receptacles or vented receptacles without outer packaging shall also bear on two opposite sides a label conforming to model No 11.

B. Method of dispatch. Restrictions on forwarding

663 (1) Packages containing substances of this Class for which a specific ambient temperature has to be maintained may only be carried as a full wagon load. The conditions of carriage shall be agreed by the railway and the consignor.

(2) Packages containing substances of this Class with the exception of substances mentioned in paragraph (1) may be sent as express parcels, if they contain:

— substances other than those covered by marg. 656: up to 50 ml per package for liquids and up to 50 g per package for solids.

— substances covered by marg. 656: in quantities as specified in that marg.

— For body parts or organs, a package shall not weigh more than 50 kg.

C. Particulars in the consignment note

664 The description of the goods in the consignment note shall conform to one of the identification numbers and one of the names printed in italics in marg. 651, followed by the biological name of the substance [1] for substances of items 1 to 3.

For biological products and diagnostic specimens which are handed over for carriage under the conditions of marg. 656, the description of the goods shall be: '*Biological product/diagnostic specimen, containing ...*', the infectious substance determining the classification under items 1, 2 or 3 to be entered.

If the infectious substance is a genetically modified substance, the words '*genetically modified micro-organism*' shall be added.

The description of the goods shall be followed by the *particulars of the Class, the item number, the group (b) and the initials 'RID'*, e.g. '*6.2, item 3 (b) RID*'. A cross shall be inserted in the appropriate box on the consignment note.

For the carriage of wastes [see marg. 3 (4)] the description of the goods shall be: 'Waste, containing ...,', the component(s) used for the classification of the waste under marg. 3 (3) to be entered under its/their chemical or biological name(s), e.g.: '*Waste, containing 2814 infectious substance, affecting humans, Marburg virus, 6.2, item 2 RID*'.

For wastes of item 4, the description in italics is sufficient, e.g. '*3291 clinical waste, unspecified, n.o.s., 6.2, item 4 (b), RID*'.

For the carriage of solutions or mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

When a marking in accordance with Appendix VIII is prescribed, the *hazard identification number*, in accordance with Appendix VIII shall also be entered before the description of the substance. The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

D. Transport equipment

1. Conditions relating to wagons and loading

a. For packages

665 (1) Packages containing substances of this Class shall be stowed in such a way as to be easily accessible.

(2) Packages containing substances of this Class shall be carried in closed or sheeted wagons.

(3) With regard to keeping packages bearing labels conforming to model No 6.2 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

b. For carriage in bulk

666 (1) Substances of item 4 may be carried in bulk in specially equipped wagons.

(2) The receptacles of specially equipped wagons shall be so constructed that the filling and emptying openings can be hermetically closed.

(3) Substances of item 4 shall be loaded in receptacles in such a way that dangers to man, animals and the environment shall be avoided.

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[1] The biological name given shall normally be that used in reference books, periodicals and scientific and technical texts. Trade names shall not be used for this purpose.

c. For carriage in small containers

667 (1) Packages containing substances of this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 670 shall apply also to the contents of small containers.

(3) The requirements of marg. 674 are also applicable, by analogy, to carriage in small containers.

2. Markings and danger labels on wagons, tank wagons, tank-containers and small containers (See Appendix IX)

668 (1) For the carriage of substances and articles of this Class, labels conforming to model No 6.2 shall be affixed to both sides of wagons, tank wagons and tank-containers.

(2) Wagons containing substances listed in marg. 662 (3) shall also bear, on both sides, labels prescribed in that marg.

(3) Small containers shall be labelled in accordance with marg. 662 (2) and (3).

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E. Prohibitions on mixed loading

670 Packages bearing a label conforming to model No 6.2 shall not be loaded in the same wagon together with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

671 Separate consignment notes shall be made out for consignments which may not be loaded together in the same wagon.

F. Empty packagings

672 (1) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty tank wagons and empty tank-containers and empty wagons for carriage in bulk of item 11 shall be closed in the same way and present the same degree of leakproofness as if they were full.

(2) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty tank wagons and empty tank-containers, as well as empty wagons for the carriage of goods in bulk, of item 11, shall bear the same danger labels as if they were full.

(3) The description of the goods in the consignment note shall conform to one of the names printed in italics in item 11, completed by '*item 11, RID*', e.g. '*Empty packaging, 6.2, item 11, RID*'. A cross shall be inserted in the appropriate box on the consignment note.

In the case of uncleaned empty tank wagons, empty tank-containers and empty wagons for carriage in bulk, this description shall be completed by adding the words 'Last load' together with the hazard and substance identification numbers, the name and item number and group (b) of the goods last loaded, e.g. '*Last load: 606 2900 infectious substance, affecting animals, item 3 (b)*'.

(4) With regard to keeping empty uncleaned packagings of item 11 bearing labels conforming to model No 6.2 apart from foodstuffs, other articles of consumption and animal feedstuffs see marg. 11 (3).

G. Other requirements

673 With regard to keeping packagings bearing labels conforming to model No 6.2 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

674 If substances of this Class have leaked and been spilled in a wagon, the wagon shall not be reused until after it has been thoroughly cleaned and, if necessary, disinfected. All other goods and articles carried in such a wagon shall be examined for possible contamination. Parts of the wagon made of wood which have come into contact with substances of items 1 and 2 shall be removed and burnt.

675 Other provisions for substances of this Class which are waived for reasons other than those of safety, are not affected (e.g. those concerning import and export, marketing or disposal, protection at work, veterinary purposes).

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CLASS 7

RADIOACTIVE MATERIAL

INTRODUCTION

700 (1) *Scope*

(a) Among the materials with a specific activity of more than 70 kBq/kg(2 nCi/g) and articles containing such materials, only those listed or assigned to an n.o.s. entry in marg. 701 are to be accepted for carriage and then only under the conditions set out in the appropriate schedules of marg. 704 and in marg. 1700 to 1771 [1].

(b) The materials and articles referred to in (a) are materials and articles of this Directive.

Note: Cardiac pacemakers containing radioactive material, when they have been surgically implanted in medical patients, or radio-pharmaceuticals administered to a patient in the course of medical treatment, are not subject to the requirements of this Directive.

(2) *Definitions and Explanations*

A_1 and A_2

1. A_1 shall mean the maximum activity of special form radioactive material permitted in a Type A package. A_2 shall mean the maximum activity of radioactive material, other than special form radioactive material, permitted in a Type A package. (See marg. 1700, Table I).

Alpha emitters of low toxicity

2. Low toxicity alpha emitters shall mean natural uranium; depleted uranium; natural thorium; uranium-235 or uranium-238, thorium-232, thorium-228 and thorium-230 when contained in ores and physical or chemical concentrates; radionuclides with a half life of less than ten days.

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[1] The requirements of Class 7 are based on the following principles and provisions of the International Atomic Energy Agency (IAEA):
Regulations for the Safe Transport of Radioactive Material, Safety Series No 6, 1985 Edition, which also (as amended 1990) includes the general principles for Radiation Protection.
Explanations and further information about these regulations can be found in the following documents:
1. IAEA 'Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Materials' (1985 Edition), Safety Series No 37, Third Edition (as amended 1990).
2. IAEA 'Explanatory Material for the IAEA Regulations for the Safe Transport of Radioactive Materials' (1985 Edition), Safety Series No 7, Second Edition (as amended 1990).
3. IAEA 'Basic Safety Standards for Radiation Protection', Safety Series No 9, 1982 Edition.
4. IAEA 'Emergency Response Planning and Preparedness for Transport Accidents involving Radioactive Material', Safety Series No 87, 1988 Edition.
5. IAEA 'Schedule of Requirements for the Transport of Specified Types of Radioactive Material Consignments', Safety Series No 80 (as amended 1990).

700 *(cont'd)*

Approval

3. Multilateral approval shall mean approval by the relevant competent authority both of the country of origin of the design or shipment and of each country through or into which the consignment is to be carried.

4. Unilateral approval shall mean an approval of a design which is required to be given by the competent authority of the country of origin of the design only.

If the country of origin is not a Member State, the approval shall require validation by the competent authority of the first COTIF Contracting State reached by the consignment.

Container

5. A container for the carriage of material of this Class shall be of a permanent enclosed character, rigid and strong enough for repeated use. It may be used as a packaging if the applicable requirements are met, and it may also be used to perform the functions of an overpack.

Containment system

6. Containment system shall mean the assembly of components of the packaging specified by the designer as intended to retain the radioactive material during carriage.

Contamination

7. Contamination shall mean the presence of a radioactive substance on a surface in quantities in excess of 0,4 Bq/cm^2 (10^{-5} μCi/cm^2) for beta and gamma emitters and low toxicity alpha emitters, or 0,04 Bq/cm^2 (10^{-6} μCi/cm^2) for all other alpha emitters.

   Fixed contamination shall mean contamination other than non-fixed contamination.

   Non-fixed contamination shall mean contamination that can be removed from a surface during normal handling.

Design

8. Design shall mean the description of special form radioactive material, package, or packaging which enables such an item to be fully identified. The description may include specifications, engineering drawings, reports demonstrating compliance with regulatory provisions, and other relevant documentation.

Exclusive use

9. Exclusive use shall mean the sole use, by a single consignor, of a wagon or of a large container with a minimum length of 6 m, in respect of which all initial, intermediate, and final loading and unloading is carried out in accordance with the directions of the consignor or consignee.

Fissile material

10. Fissile material shall mean uranium-233, uranium-235, plutonium-238, plutonium-239, plutonium-241, or any combination of these radionuclides. Unirradiated natural uranium and depleted uranium, and natural uranium or depleted uranium which has been irradiated in thermal reactors only, are not included in this definition.

Low specific activity material

11. Low specific activity (LSA) material shall mean radioactive material which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply. External shielding materials surrounding the LSA material shall not be considered in determining the estimated average specific activity.

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LSA material shall be in one of three groups:

(a) LSA-I

(i) Ores containing naturally occurring radionuclides (e.g. uranium, thorium), and uranium or thorium concentrates of such ores;

(ii) Solid unirradiated natural uranium or unirradiated depleted uranium or unirradiated natural thorium or their solid or liquid compounds or mixtures; or

(iii) Radioactive material, other than fissile material, for which the A_2 value is unlimited.

(b) LSA-II

(i) Water with tritium concentration up to 0,8 TBq/l (20 Ci/l); or

(ii) Other material in which the activity is distributed throughout and the estimated average specific activity does not exceed 10^{-4} A_2/g for solids and gases, and 10^{-5} A_2/g for liquids.

(c) LSA-III

Solids (e.g. consolidated wastes, activated material) in which:

(i) The radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.);

(ii) The radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble matrix, so that, even under loss of packaging, the loss of radioactive material per package by leaching when placed in water for seven days would not exceed 0,1 A_2; and

(iii) The estimated average specific activity of the solid, excluding any shielding material, does not exceed 2×10^{-3} A_2/g.

Maximum normal operating pressure

12. Maximum normal operating pressure shall mean the maximum pressure above atmospheric pressure at mean sea-level that would develop in the containment system in a period of one year under the conditions of temperature and solar radiation corresponding to environmental conditions of carriage in the absence of venting, external cooling by an ancillary system, or operational controls during carriage.

Overpack

13. Overpack shall mean an enclosure, such as a box or bag, which need not meet the requirements for a container and which is used by a single consignor to consolidate into one handling unit a consignment of two or more packages for convenience of handling, stowage, and carriage. Overpack is not identical to outer packaging as defined in marg. 1510.

Package

14. Package shall mean the packaging with its radioactive contents as presented for carriage. Package and packaging performance standards, in terms of retention of integrity of containment and shielding, depend upon the quantity and nature of the radioactive material carried.

Performance standards applied to packages are graded to take into account conditions of carriage characterized by the following severity levels:

— conditions likely to be encountered in routine carriage (in incident-free conditions),

— conditions of carriage taking minor mishaps into account and

— accident conditions of carriage.

700 *(cont'd)*

The performance standards include design requirements and tests. Each package shall be classified as follows:

(a) *Excepted package* is a packaging containing radioactive material (see marg. 1713, Table V) that is designed to meet the general requirements for all packagings and packages (see marg. 1732).

(b) (I) *Industrial Package Type 1* (IP-1) is a packaging, tank wagon, tank-container or container containing LSA material or SCO (see definitions 11 and 22) that is designed to meet the general requirements for all packagings and packages (see marg. 1732), and, in addition, for the specific design provision (see marg. 1733).

(II) *Industrial Package Type 2* (IP-2) is a packaging, tank wagon, tank-container or container containing LSA material or SCO (see definitions 11 and 22) that is designed to meet the general requirements for all packagings and packages (see marg. 1732) and, in addition, the following specific requirements:

(i) for a package, see marg. 1734,

(ii) for a tank wagon or tank-container, see marg. 1736 and Appendices X and XI,

(iii) for a container, see marg. 1736.

(III) *Industrial Package Type 3* (IP-3) is a packaging, tank wagon, tank-container or container containing LSA material or SCO (see definitions 11 and 22) that is designed to meet the general requirements for all packagings and packages (see marg. 1732) and, in addition, the following specific requirements:

(i) for a package, see marg. 1735,

(ii) for a tank wagon or tank-container, see marg. 1736 and Appendices X and XI,

(iii) for a container, see marg. 1736.

(c) *Type A Package* is a packaging, tank wagon, tank-container or container containing an activity up to A_1 if Special Form Radioactive Material, or up to A_2 if not Special Form Radioactive Material, that is designed to meet the general requirements for all packagings and packages (see marg. 1732) and the specific requirements in marg. 1737 as appropriate.

(d) *Type B Package* is a packaging, tank wagon, tank-container or container containing an activity that may be in excess of A_1 if Special Form Radioactive Material, or in excess of A_2 if not Special Form Radioactive Material, that is designed to meet the general requirements for all packagings and packages (see marg. 1732) and the specific requirements in marg. 1737 and, as appropriate, marg. 1738-1740.

Packaging

15. Packaging shall mean the assembly of components necessary to enclose the radioactive contents completely. It may, in particular, consist of one or more receptacles, absorbent materials, spacing structures, radiation shielding, service equipment for filling, emptying, venting and pressure relief, and devices for cooling, for absorbing mechanical shocks, for providing handling and tiedown capability, for thermal insulation, and service devices integral to the package. The packaging may be a box, drum or similar receptacle, or may also be a container, tank wagon or tank-container consistent with definition 14.

Quality assurance

16. Quality assurance shall mean a systematic programme of controls and inspections applied by any organisation or body involved in the carriage of radioactive material which is aimed at providing adequate confidence that the standard of safety prescribed in Appendix VII is achieved in practice.

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Radiation level

17. Radiation level shall mean the corresponding dose equivalent rate expressed in millisievert (millirem) per hour [1].

Radioactive contents

18. Radioactive contents shall mean the radioactive material together with any contaminated solids, liquids and gases within the packaging.

Special arrangement

19. Special arrangement shall mean those provisions, approved by the competent authority, under which a consignment which does not satisfy all the applicable requirements of Schedules 5-12 of marg. 704 may be carried. Consignments of this type require multilateral approval.

Special form radioactive material

20. Special form radioactive material shall mean either an indispersible solid radioactive material or a sealed capsule containing radioactive material (see marg. 1731).

Specific activity

21. Specific activity shall mean the activity of a radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the activity per unit mass of the material.

Surface contaminated object

22. Surface contaminated object (SCO) shall mean a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces. SCO shall be in one of two groups:

    (a) SCO-I: A solid object on which:

        (i) the non-fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4 Bq/cm^2 (10^{-4} $\mu Ci/cm^2$) for beta and gamma emitters and low toxicity alpha emitters or 0,4 Bq/cm^2 (10^{-5} $\mu Ci/cm^2$) for all other alpha emitters; and

        (ii) the fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4×10^4 Bq/cm^2 (1 $\mu Ci/cm^2$) for beta and gamma emitters and low toxicity alpha emitters or 4×10^3 Bq/cm^2 (0,1 $\mu Ci/cm^2$) for all other alpha emitters; and

        (iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4×10^4 Bq/cm^2 (1 $\mu Ci/cm^2$) for beta and gamma emitters and low toxicity alpha emitters or 4×10^3 Bq/cm^2 (0,1 $\mu Ci/cm^2$) for all other alpha emitters.

    (b) SCO-II: A solid object on which either the fixed or non-fixed contamination on the surface exceeds the applicable limits specified for SCO-I in (a) above and on which:

        (i) the non-fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 400 Bq/cm^2 (10^{-2} $\mu Ci/cm^2$) for beta and gamma emitters and low toxicity alpha emitters or 40 Bq/cm^2 ($10^{-3}\mu Ci/cm^2$) for all other alpha emitters; and

        (ii) the fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 8×10^5 Bq/cm^2 (20 $\mu Ci/cm^2$) for beta and gamma emitters and low toxicity alpha emitters or 8×10^4 Bq/cm^2 (2 $\mu Ci/cm^2$) for all other alpha emitters; and

[1] For the sake of clarity, the radiation level may also be indicated, in parentheses, in millirem per hour. It is recognized that millisievert or millirem are not the correct units that should apply to radiation exposures in all cases, nevertheless, these units are used exclusively for convenience.

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(iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 8×10^5 Bq/cm^2 (20 μCi/cm^2) for beta and gamma emitters and low toxicity alpha emitters or 8×10^4 Bq/cm^2 (2 μCi/cm^2) for all other alpha emitters.

Transport index

23. Transport index (TI) shall mean a single number assigned to a package, overpack, tank wagon, tank-container or container, or to unpackaged LSA-I or SCO-I, which is used to provide control over both nuclear criticality safety and radiation exposure (see marg. 1715). It is also used to establish contents limits on certain packages, overpacks, tank wagons, tank-containers and containers; to establish categories for labelling; to determine whether carriage under exclusive use shall be required; to establish spacing requirements during storage in transit; to establish mixed loading restrictions during carriage under special arrangement and during storage in transit; and to define the number of packages allowed in a container or aboard a wagon (see Section II of Appendix VII).

Unirradiated thorium

24. Unirradiated thorium shall mean thorium containing not more than 10^{-7}g of uranium-233 per gram of thorium-232.

Unirradiated uranium

25. Unirradiated uranium shall mean uranium containing not more than 10^{-6} g of plutonium per gram of uranium-235 and not more than 9 MBq (0,20 μCi) of fission products per gram of uranium-235.

Uranium — natural, depleted, enriched

26. Natural uranium shall mean chemically separated uranium containing the naturally occurring distribution of uranium isotopes (approximately 99,28 % uranium-238, and 0,72 % uranium-235 by mass). Depleted uranium shall mean uranium containing a lesser mass percentage of uranium-235 than in natural uranium. Enriched uranium shall mean uranium containing a greater mass percentage of uranium-235 than in natural uranium. In all cases, a very small mass percentage of uranium-234 is present.

701 (1) *List of Substances*

Identification number [1] and name of the substance or article	Schedule
2910 Radioactive material, excepted package	
— *instruments* or *articles*	2
— *limited quantity of material*	1
— *articles manufactured from natural or depleted uranium or natural thorium*	3
— *empty packaging*	4
2912 Radioactive material, low specific activity (LSA), n.o.s.	
— *LSA-I*	5
— *LSA-II*	6
— *LSA-III*	7
— *under special arrangement*	13
2913 Radioactive material, surface contaminated objects (SCO)	
— *SCO-I* and *SCO-II*	8
— *under special arrangement*	13
2918 Radioactive material, fissile, n.o.s.	
— *in Type IF, Type AF, Type B(U)F* or *Type B(M)F packages*	12
— *under special arrangement*	13

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Identification number [1] and name of the substance or article	Schedule
2974 Radioactive material, special form, n.o.s.	
— *in Type A packages*	9
— *in Type B(U) packages*	10
— *in Type B(M) packages*	11
— *under special arrangement*	13
2975 Thorium metal, pyrophoric	
— *in Type A packages*	9
— *in Type B(U) packages*	10
— *in Type B(M) packages*	11
— *under special arrangement*	13
2976 Thorium nitrate, solid	
— *LSA-I*	5
— *LSA-II*	6
— *in Type A packages*	9
— *in Type B(U) packages*	10
— *in Type B(M) packages*	11
— *under special arrangement*	13
2977 Uranium hexafluoride, fissile containing more than 1 % uranium-235	
— *in approved packages*	12
— *under special arrangement*	13
2978 Uranium hexafluoride, fissile excepted or *non-fissile*	
— *LSA-I*	5
— *LSA-II*	6
— *under special arrangement*	13
2979 Uranium metal, pyrophoric	
— *in Type A packages*	9
— *in Type B(U) packages*	10
— *in Type B(M) packages*	11
— *under special arrangement*	13
2980 Uranyl nitrate hexahydrate solution	
— *LSA-I*	5
— *LSA-II*	6
— *in Type A packages*	9
— *in Type B(U) packages*	10
— *in Type B(M) packages*	11
— *under special arrangement*	13
2981 Uranyl nitrate, solid	
— *LSA-I*	5
— *LSA-II*	6
— *in Type A packages*	9
— *in Type B(U) packages*	10
— *in Type B(M) packages*	11
— *under special arrangement*	13
2982 Radioactive material, n.o.s.	
— *in Type A packages*	9
— *in Type B(U) packages*	10
— *in Type B(M) packages*	11
— *under special arrangement*	13

[1] These numbers are taken from the United Nations Recommendations.

(2) The materials and articles of this Class contain one or more of the radionuclides referred to in marg. 1700 and 1701.

701 *(cont'd)*

(3) The list hereunder sets out the schedules of marginal 704:

1. Limited Quantities of Radioactive Material in Excepted Packages.
2. Instruments or Articles in Excepted Packages.
3. Articles Manufactured from Natural Uranium, Depleted Uranium or Natural Thorium as Excepted Packages.
4. Empty Packagings as Excepted Packages.
5. Low Specific Activity Material (LSA-I).
6. Low Specific Activity Material (LSA-II).
7. Low Specific Activity Material (LSA-III).
8. Surface Contaminated Objects (SCO-I and SCO-II).
9. Radioactive Material in Type A Packages.
10. Radioactive Material in Type B(U) Packages.
11. Radioactive Material in Type B(M) Packages.
12. Fissile Material.
13. Radioactive Material Carried under Special Arrangement.

(4) Radioactive material may also be carried as express parcels. In such cases the sum of the transport indexes indicated on the labels is however limited to 10 per luggage van or compartment. For packages of Category III-YELLOW, the railway may determine the time of handing over for carriage. A package shall not weigh more than 50 kg.

(5) The provisions for the various types of consignment are contained in 13 headings in accordance with marg. 2(1):

(i) Common provisions for Schedules 1 to 4 are summarised in marg. 702;

(ii) Common provisions for Schedules 5 to 13 are summarised in marg. 703.

Common Provisions for Schedules 1 to 4 of marg. 704

702

1. *Materials*

See appropriate schedule.

2. *Packaging/Package*

See appropriate schedule.

3. *Maximum radiation level*

5 μSv/h (0,5 mrem/h) at any point on the external surface of the package.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

Non-fixed contamination on all external surfaces and in addition on the internal surfaces of wagons, containers, tank wagons, tank-containers and overpacks used for carrying excepted packages shall be kept as low as practicable and shall not exceed the following limits:

(a) Beta/gamma/low-toxicity alpha emitters: 0,4 Bq/cm^2 (10^{-5} μCi/cm^2);

(b) All other alpha emitters: 0,04 Bq/cm^2 (10^{-6} μCi/cm^2).

702 *(cont'd)*

5. *Decontamination and use of wagons, equipment or parts thereof*

Wagons, equipment or parts thereof which have become contaminated shall be decontaminated as soon as possible, and in any case before reuse, to levels not exceeding:

(a) for non-fixed contamination,

— 0,4 Bq/cm^2 (10^{-5} μCi/cm^2) for beta and gamma emitters and low toxicity alpha emitters; and

— 0,04 Bq/cm^2 (10^{-6} μCi/cm^2) for all other alpha emitters.

(b) a radiation level of 5 μSv/h (0,5 mrem/h) at the surface due to fixed contamination.

6. *Mixed packing*

No requirements.

7. *Mixed loading*

No requirements.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) See appropriate schedule.

(b) Each package, except containers, tank wagons, tank-containers and overpacks, shall be clearly and durably marked with the identification number of the goods shown in the consignment note preceded by the letters 'UN'.

9. *Danger labels on wagons other than tank-wagons*

See appropriate schedule.

10. *Transport documents*

See appropriate schedule.

11. *Storage and despatch*

No requirements.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

No requirements.

13. *Other provisions*

(a) Accident provisions: see marg. 710 and 1712.

(b) Damaged or leaking packages: see marg. 1712.

(c) Contamination surveys: see marg. 1712 (3).

(d) Quality assurance: see marg. 1766.

(e) Undeliverable consignments: see marg. 715.

Common provisions for schedules 5 to 13 of marg. 704

703 1. *Materials*

See appropriate schedule.

2. *Packaging/Package*

See appropriate schedule.

703 *(cont'd)*

3. *Maximum radiation level*

(a) The radiation levels for packages or overpacks not carried under exclusive use shall not exceed:

(i) 2 mSv/h (200 mrem/h) at any point on the external surface, and

(ii) 0,1 mSv/h (10 mrem/h) at 1 metre from that surface.

(b) The surface radiation levels for packages or overpacks carried under exclusive use may exceed 2 mSv/h (200 mrem/h) but under no circumstances shall exceed 10 mSv/h (1,000 mrem/h), provided that:

(i) the wagon is equipped with an enclosure which prevents unauthorized access to the load during carriage; and

(ii) the package or overpack is secured to retain its position within the enclosure during routine carriage; and

(iii) there are no loading or unloading operations between the beginning and end of the shipment.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

Non-fixed contamination on all external surfaces and in addition on the internal surfaces of wagons, containers, tank wagons, tank-containers and overpacks used for carrying packages shall be kept as low as practicable and shall not exceed the following limits:

(a) Beta/gamma/lowtoxicity alpha emitters:

— 0,4 Bq/cm^2 (10^{-5} μCi/cm^2) for consignments which also include excepted packages and/or non-radioactive goods;

— 4 Bq/cm^2 (10^{-4} μCi/cm^2) for all other consignments.

(b) All other alpha emitters:

— 0,04 Bq/cm^2 (10^{-6} μCi/cm^2) for consignments which also include excepted packages and/or non-radioactive goods;

— 0,4 Bq/cm^2 (10^{-5} μCi/cm^2) for all other consignments.

5. *Decontamination and use of vehicles, equipment or parts thereof*

Wagons, equipment or parts thereof which have become contaminated above the limits in paragraph 4, or which show a surface radiation level in excess of 5 μSv/h (0,5 mrem/h) shall be decontaminated as soon as possible, and in any case before reuse, to levels not exceeding:

(a) for non-fixed contamination, see provisions under 4,

(b) a radiation level of 5 μSv/h (0,5 mrem/h) at the surface due to fixed contamination.

6. *Mixed packing*

See marg. 1711 (1).

7. *Mixed loading*

(a) Packages bearing a label conforming to models Nos 7A, 7B or 7C shall not be loaded together in the same wagon with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

(b) In all other cases mixed loading is permitted. However, mixed loading in a consignment under exclusive use shall only be arranged by the consignor.

(c) Separate consignment notes shall be prepared for consignments which cannot be loaded together in the same wagon.

703 *(cont'd)*

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

The following provisions apply to packages, containers, tank wagons, tank-containers and overpacks with non-fissile material.

For packages containing fissile material and for containers and overpacks which contain packages with fissile material, see in addition Schedule 12.

(a) Packages and overpacks, other than containers, tank wagons and tank-containers.

(i) Such packages and overpacks shall, depending on the category (see marg. 1718), bear labels conforming to models Nos 7A, 7B or 7C, completed in accordance with marg. 706 (3). The labels shall be affixed to two opposite sides of the packages and overpacks.

(ii) Each label shall be marked with the maximum activity of the radioactive contents during carriage.

(iii) Each yellow label shall be marked with the transport index for the package or overpack.

(iv) In the case of substances of the following identification numbers listed in marg. 701 (1), the following additional labels shall also be affixed:

2975 Thorium metal, pyrophoric, model No 4.2;

2979 Uranium metal, pyrophoric, model No 4.2;

2976 Thorium nitrate, solid, model No 05;

2981 Uranyl nitrate, solid, model No 05;

2977 Uranium hexafluoride fissile, containing more than 1 % uranium-235, model No 8;

2978 Uranium hexafluoride, fissile excepted or non-fissile, model No 8;

2980 Uranyl nitrate hexahydrate solution, model No 8.

(v) Packages with a gross mass exceeding 50 kg shall be clearly and durably marked with their permissible gross mass on the outside.

(vi) Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note preceded by the letters 'UN'.

vii) Any labels which do not relate to the contents shall be removed or covered.

(b) Containers, also when used as overpacks, tank wagons, tank-containers and wagons and containers for carriage in bulk.

(i) Such containers, tank wagons and tank-containers shall, depending on the category (see marg. 1718), bear labels conforming to models Nos 7A, 7B or 7C, completed in accordance with marg. 706 (3).

Tank wagons and tank-containers, as well as large containers containing packages other than excepted packages, shall in addition bear labels conforming to model No 7D.

Instead of using labels conforming to models Nos 7A, 7B or 7C, and in addition labels conforming to model No 7D, enlarged labels conforming to models Nos 7A, 7B or 7C with the dimensions of model No 7D may alternatively be used.

The labels shall be affixed to all four sides of containers and tank-containers, and to both sides of tank wagons.

(ii) In the case of substances of the following identification numbers listed in marg. 701 (1), the following additional labels shall also be affixed:

2975 Thorium metal, pyrophoric, model No 4.2;

2979 Uranium metal, pyrophoric, model No 4.2;

2976 Thorium nitrate, solid, model No 05;

2981 Uranyl nitrate, solid, model No 05;

2977 Uranium hexafluoride fissile, containing more than 1 % uranium-235, model No 8

2978 Uranium hexafluoride, fissile excepted or non-fissile, model No 8;

2980 Uranyl nitrate hexahydrate solution, model No 8.

(iii) For tank wagons and tank-containers and bulk wagons and containers, the orange markings in accordance with marg. 13 and Appendix VIII shall be affixed next to the labels.

703 *(cont'd)*

(iv) Except for mixed loads, each label shall be marked with the maximum activity of the radioactive contents of the container or overpack during carriage, totalled for the entire contents. For mixed loads, see marg. 706 (3).

(v) Each yellow label shall be marked with the transport index for the container or overpack.

(vi) Containers, tank wagons and tank-containers shall be clearly and durably marked on the outside with their permissible gross mass.

(vii) Any marking or danger label which does not relate to the contents shall be removed or covered.

9. *Danger labels on wagons other than tank wagons*

(a) (i) For consignments of packaged or unpackaged radioactive material, labels conforming to model No 7D shall be affixed in a vertical orientation to the two side walls of the wagon.

(ii) In the case of substances of the following identification numbers listed in marg. 701 (1), the following additional labels shall also be affixed:

2975 Thorium metal, pyrophoric, model No 4.2;

2979 Uranium metal, pyrophoric, model No 4.2;

2976 Thorium nitrate, solid, model No 05;

2981 Uranyl nitrate, solid, model No 05;

2977 Uranium hexafluoride fissile, containing more than 1 % uranium-235, model No 8

2978 Uranium hexafluoride, fissile excepted or non-fissile, model No 8;

2980 Uranyl nitrate hexahydrate solution, model No 8.

(b) Any danger label which does not relate to the contents shall be removed or covered.

10. *Transport documents*

See appropriate schedule.

11. *Storage and despatch*

(a) Segregation during storage is required from other dangerous goods, and from persons and undeveloped photographic plates and films:

(i) for segregation from other dangerous goods — see the provisions under heading 7.

(ii) for segregation from persons, from packages marked 'FOTO' and from mailbags — see marg. 711(1) for segregation tables.

(b) Total transport index limitation for storage except LSA-I:

(i) The number of Category II — YELLOW and Category III — YELLOW packages, overpacks, tank wagons, tank-containers and containers stored in any one place shall be so limited that the total sum of the transport indexes in any individual group of such packages, overpacks, tank wagons, tank-containers or containers does not exceed 50. Such groups shall be stored so as to maintain a spacing of at least 6 m from each other.

(ii) Where the transport index of a single package, overpack, tank wagon, tank-container or container exceeds 50 or the total transport index on a wagon exceeds 50, storage shall be such as to maintain a spacing of at least 6 m from other packages, overpacks, tank wagons, tank-containers, containers or other wagons carrying radioactive material.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

(1) See appropriate schedule.

(2) (a) Segregation during transport is required from other dangerous goods and from persons and undeveloped photographic films and plates:

(i) for segregation from other dangerous goods — see the provisions under heading 7.

(ii) for segregation from persons, from packages marked 'FOTO' and from mailbags — see marg. 711(1) for segregation tables.

(b) Total transport index limitation for carriage except LSA-I:

The total number of packages, overpacks, tank-containers and containers on a single wagon shall be so limited, that the sum of the transport indexes does not exceed 50. For consignments under exclusive use this limit does not apply — see marg. 1711 (3).

703 *(cont'd)*

(c) Any package or overpack having a transport index greater than 10 shall be carried only under exclusive use.

(d) Maximum radiation levels for wagons:

(i) 2 mSv/h (200 mrem/h) at surface of wagons,

(ii) 0,1 mSv/h (10 mrem/h) at 2 metres from surface of wagons.

13. *Other provisions*

(a) Determination of transport index: see marg. 1715.

(b) Accident provisions: see marg. 710 and 1712.

(c) Damaged or leaking packages: see marg. 1712.

(d) Contamination surveys: see marg. 1712 (3).

(e) Quality Assurance: see marg. 1766.

(f) Undeliverable consignments: see marg. 715.

Schedule 1

Limited quantities of radioactive material in excepted packages

704 *Note:* 1. Radioactive material in quantities which offer a very limited radiation risk may be carried in excepted packages.

2. For other dangerous properties, see the requirements in marg. 3(5) and (6) und 1770.

1. *Materials*

2910 Radioactive material, excepted package, limited quantity of material.

(a) Non-fissile radioactive material in amounts which do not exceed the limits specified in Table 1.

(b) Fissile material with an activity which does not exceed the limits specified in Table 1, and in addition, satisfying with regard to amounts, form and packaging the provisions given in marg. 1741 allowing them to be regulated as non-fissile radioactive material packages.

TABLE 1

Activity Limits, in Terms of A_1- or A_2 Values for Excepted Packages Containing Radioactive Material (1) (2)

Nature of contents	Package limits
Solids:	
Special Form	10^{-3} A_1
Other Forms	10^{-3} A_2
Liquids	10^{-4} A_2
Gases:	
Tritium	2×10^{-2} A_2
Special Form	10^{-3} A_1
Other Forms	10^{-3} A_2

(1) For specific values of A_1 and A_2, see Table I of marg. 1700.
(2) For mixtures of radionuclides, the methods for determining A_1 and A_2 are provided in marg. 1701 (3).

704 *(cont'd)*

2. *Packaging/Package*

Radioactive material in limited quantities may be carried in packagings, tank wagons, tank-containers and containers

(a) The packaging shall be in accordance with the general provisions for all packagings and packages given in marg. 1732 and in addition, for tank wagons and tank-containers, the provisions of Appendices X and XI.

(b) Packages containing fissile material shall meet at least one of the provisions specified in marg. 1741.

(c) In particular, the package shall be designed so that during routine carriage there shall be no leakage of radioactive contents.

Radioactive material shall not be carried in bulk.

3. *Maximum radiation level*

See marg. 702.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

See marg. 702.

5. *Decontamination and use of vehicles, equipment or parts thereof*

See marg. 702.

6. *Mixed packing*

No requirements.

7. *Mixed loading*

No requirements.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) Packages

(i) Marking: See marg. 702. Danger label not required.

(ii) The packaging shall be marked 'Radioactive' on an internal surface as a warning of the presence of radioactive material on opening the package.

(b) Containers

No requirements.

(c) Tank-containers and tank wagons

See marg. 13 and Appendix VIII, as well as Appendix X/XI, paragraph 7.6.

(d) Overpacks

No requirements.

9. *Danger labels on wagons other than tank wagons*

No requirements.

10. *Transport documents*

The consignment note shall include the description '*2910 Radioactive material, excepted package, limited quantity of material, 7, Schedule 1, RID*'.

For carriage in tank wagons or tank-containers, when a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall also be entered before the description of the material.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

A cross shall be inserted in the appropriate box on the consignment note.

704 *(cont'd)*

11. *Storage and despatch*

No requirements.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

No requirements.

13. *Other provisions*

See marg. 702.

Schedule 2

Instruments or articles in excepted packages

704

Note: 1. Specified quantities of radioactive material, which are enclosed in or form a component part of an instrument or other manufactured article, and which offer a very limited radiation risk, may be carried in excepted packages.

2. For other dangerous properties, see also the provisions in marg. 1770.

1. *Materials*

2910 Radioactive material, excepted package, instruments or *articles.*

(a) Instruments and manufactured articles such as clocks, electronic tubes or apparatus having as a component part radioactive material in amounts which do not exceed the item and package limits specified in columns 2 and 3 of Table 2, provided the radiation level at 10 cm from the external surface of any unpackaged instrument or article does not exceed 0,1 mSv/h (10 mrem/h).

(b) Instruments and manufactured articles having fissile material in amounts not exceeding the limits specified in Table 2, and in addition, satisfying with regard to amounts, form and packaging the provisions given in marg. 1741 allowing them to be regulated as non-fissile radioactive material packages, provided the radiation level at 10 cm from the external surface of any unpackaged instrument or article does not exceed 0,1 mSv/h (10 mrem/h).

TABLE 2

Activity Limits, in Terms of A_1 or A_2 Values for Excepted Packages Containing Instruments and Articles (1) (2)

Nature of Contents	Item Limits	Package Limits
Solids:		
Special Form	10^{-2} A_1	A_1
Other Forms	10^{-2} A_2	A_2
Liquids	10^{-3} A_2	10^{-1} A_2
Gases:		
Tritium	2×10^{-2} A_2	2×10^{-1} A_2
Special Form	10^{-3} A_1	10^{-2} A_1
Other Forms	10^{-3} A_2	10^{-2} A_2

(1) For specific values of A_1 and A_2, see Table I of marg. 1700.
(2) For mixtures of radionuclides, the methods for determining A_1 and A_2 are provided in marg. 1701 (3).

704 *(cont'd)*

2. *Packaging/package*

(a) The packaging shall be in accordance with the general provisions for all packagings and packages given in marg. 1732.

(b) Packages containing fissile material shall meet at least one of the provisions specified in marg. 1741.

(c) The instruments and articles shall be securely packed.

(d) Carriage of unpackaged radioactive material is not allowed.

3. *Maximum radiation level*

See marg. 702.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

See marg. 702.

5. *Decontamination and use of wagons, equipment or parts thereof*

See marg. 702.

6. *Mixed packing*

No requirements.

7. *Mixed loading*

No requirements.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) Instruments or articles

Each instrument or article (except radio-luminescent time-pieces or devices) shall bear the marking 'Radioactive'.

(b) Packages

See marg. 702.

(c) Containers

No requirements.

(d) Tank-containers and tank wagons

Not applicable.

(e) Overpacks

No requirements.

9. *Danger labels on wagons other than tank wagons*

No requirements.

10. *Transport documents*

The consignment note shall include the description '*2910 Radioactive material, excepted package, instruments* or *articles, 7, Schedule 2, RID*'. If full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII, the *hazard identification number* shall also be shown before the description of the goods. A cross shall be inserted in the appropriate box on the consignment note.

704 *(cont'd)*

11. *Storage and despatch*

No requirements.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

No requirements.

13. *Other requirements*

See marg. 702.

Schedule 3

Articles manufactured from natural uranium, depleted uranium or natural thorium as excepted packages

Note: 1. Articles manufactured from unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium which offer a very limited radiation risk may be carried as excepted packages.

2. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2910 Radioactive material, excepted package, articles manufactured from natural uranium or depleted uranium or natural thorium.

Manufactured articles in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium, provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

Note: Such articles may for example be unused packagings intended for the carriage of radioactive material.

2. *Packaging/Package*

The article serving as a packaging shall be in accordance with the general provisions for all packagings and packages given in marg. 1732.

3. *Maximum radiation level*

See marg. 702.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

See marg. 702.

5. *Decontamination and use of wagons, equipment or parts thereof*

See marg. 702.

6. *Mixed packing*

No requirements.

7. *Mixed loading*

No requirements.

704 *(cont'd)*

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) Packages

See marg. 702.

(b) Containers

No requirements.

(c) Tank-containers and tank wagons

Not applicable.

(d) Overpacks

No requirements.

9. *Danger labels on wagons other than tank wagons*

No requirements.

10. *Transport documents*

The consignment note shall include the description '*2910 Radioactive material, excepted package, articles manufactured from natural uranium* or *depleted uranium or natural thorium, 7, Schedule 3, RID*'. If full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII, the *hazard identification number* shall also be shown before the description of the goods. A cross shall be inserted in the appropriate box on the consignment note.

11. *Storage and despatch*

No requirements.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

No requirements.

13. *Other provisions*

See marg. 702.

Schedule 4

Empty packagings as excepted packages

Note: 1. Empty uncleaned packagings which have been used for the carriage of radioactive material and which offer a very limited radiation risk, may be carried as excepted packages.

2. (a) Empty uncleaned packagings which, as a result of damage or other mechanical defects, can no longer be closed securely shall, if they cannot be carried in other packagings in accordance with the requirements of this Class, be carried under special arrangements (Schedule 13);

(b) Empty uncleaned packagings on which the international non-fixed contamination (activity of the residue) exceeds the maximum values given in Section 1 (c) may only be carried as packages in accordance with the various schedules (marg. 701, section 3), depending on the amount and form of their residual activity and contamination;

704 *(cont'd)*

(c) Empty packagings which have been cleaned to such an extent that no further contamination exists in excess of the value of 0,4 Bq/cm^2 (10^{-5} μCi/cm^2) for beta- or gamma-emitters and 0,04 Bq/cm^2 (10^{-6} μCi/cm^2) for alpha-emitters and which do not contain any radioactive material with a specific activity of more than 70 kBq/kg (2 m Ci/g) are no longer subject to the requirements of this Class.

3. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2910 Radioactive material, excepted package, empty packaging.

(a) Empty uncleaned packagings include empty uncleaned containers, tank wagons and tank-containers which have been used for the carriage of radioactive material.

(b) If the packaging contains any uranium or thorium in its structure, the provision specified in paragraph 2 (c) below shall apply.

(c) The internal non-fixed contamination levels (activity of the residual contents) shall not exceed:

(i) for beta/gamma/low-toxicity alpha emitters, 400 Bq/cm^2 (10^{-2} μCi/cm^2);

(ii) for all other alpha emitters, 40 Bq/cm^2 (10^{-3} μCi/cm^2).

2. *Packaging/Package*

(a) The packaging shall be in accordance with the general provisions for all packagings and packages given in marg. 1732.

(b) The packaging shall be in a well-maintained condition and securely closed.

(c) If the empty packaging includes natural uranium or depleted uranium or natural thorium in its structure, the outer surface of the uranium or thorium shall be covered with an inactive sheath made of metal or some other substantial material.

(d) Any labels displayed to meet marg. 706 shall no longer be visible.

3. *Maximum radiation level*

See marg. 702.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

See marg. 702.

5. *Decontamination and use of wagons, equipment or parts thereof*

See marg. 702.

6. *Mixed packing*

No requirements.

7. *Mixed loading*

No requirements.

704 *(cont'd)*

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) Packages

i) Marking: see marg. 702.
Danger label: not required.

ii) Packages permanently marked in accordance with marg. 705 need not have these markings removed.

(b) Containers

No requirements.

(c) Tank-containers and tank wagons

See marg. 13 and Appendix VIII as well as Appendix X/XI, paragraph 7.6

(d) Overpacks

No requirements.

9. *Danger labels on wagons other than tank wagons*

No requirements.

10. *Transport documents*

The consignment note shall include the description '*2910 Radioactive material, excepted package, empty packaging, 7, Schedule 4, RID*'. For carriage in tank wagons or tank-containers, when a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall also be entered before the description of the material. The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII. A cross shall be inserted in the appropriate box on the consignment note. For empty tank wagons or tank-containers, uncleaned, this description shall be completed by adding the words 'last load' together with the hazard and substance identification number, the name and schedule number of the goods last loaded, e.g. '*Last load 78 2980 Uranyl nitrate hexahydrate solution, Schedule 5*'.

11. *Storage and despatch*

No requirements.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

No requirements.

13. *Other provisions*

See marg. 702.

Schedule 5

Low specific activity material (LSA-I)

Note: 1. LSA-I is the first of three groups of radioactive material which by its nature has a limited specific activity or for which limits of estimated average specific activity apply.

2. Fissile material is not permitted to be carried as LSA-I material.

3. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2912 Radioactive material, low specific activity (LSA-I), n.o.s.

2976 Thorium nitrate, solid.

704 *(cont'd)*

2978 Uranium hexafluoride, fissile excepted or *non-fissile.*

2980 Uranyl nitrate hexahydrate solution.

2981 Uranyl nitrate, solid.

Low specific activity material (LSA-I): radioactive material for which the radiation level at 3 m from the unshielded contents of a single package or in a single load of unpackaged material shall not exceed 10 mSv/h (1 000 mrem/h) and meeting also one of the following descriptions:

(a) ores containing naturally occurring radionuclides (e.g. uranium, thorium), or

(b) uranium and thorium concentrates of ores containing naturally occurring radionuclides, or

(c) solid unirradiated natural uranium or depleted uranium or natural thorium, or

(d) solid or liquid compounds or mixtures of unirradiated natural uranium or depleted uranium or natural thorium, or

(e) non-fissile radioactive material for which the A_2 value is unlimited.

2. *Packaging/Package*

(a) LSA-I material may be carried in packagings, tank wagons, tank-containers and containers, provided that:

(i) the packaging, which may be a tank wagon, tank-container or container, meets the design provisions for industrial packages IP-1 or IP-2 (see marg. 1733 or 1734 and in addition, for tank wagons and tank-containers, marg. 1736 and Appendices X and XI) as appropriate for the form of the LSA-I material as specified in Table 3, and

(ii) the material is loaded into the packaging so that, in routine carriage, there will be no escape of contents and no loss of shielding.

TABLE 3

Industrial package requirements for LSA-I material

Contents	Exclusive use	Not under exclusive use
Solids	IP-1	IP-1
Liquids	IP-1	IP-2

(b) LSA-I material may be carried in bulk if:

(i) for other than natural ores, it is carried so that, in routine carriage, there will be no escape of contents from the wagon and no loss of shielding, and it is carried under exclusive use, or

(ii) for natural ores, it is carried in a wagon under exclusive use.

3. *Maximum radiation level*

See marg. 703.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) Overpacks or containers dedicated to the transport of LSA-I material under exclusive use shall be excepted from (a) above with regard to internal contamination only for as long as they remain under that exclusive use.

704 *(cont'd)*

5. *Decontamination and use of wagons, equipment or parts thereof*

(a) See marg. 703.

(b) A wagon dedicated to the carriage of LSA-I material under exclusive use shall be excepted from (a) above with regard to internal contamination only for as long as it remains in that exclusive use.

6. *Mixed packing*

See marg. 703.

7. *Mixed loading*

See marg. 703.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) For tank-containers and tank wagons, see Appendix X/XI, paragraph 7.6.

9. *Danger labels on wagons other than tank wagons*

See marg. 703.

10. *Transport documents*

(a) For a summary of the approval and notification provisions, see marg. 716.

(b) The consignment note shall include:

(i) the identification number and the name as per heading 1, together with the words 'Radioactive material, low specific activity (LSA-I), 7, Schedule 5, RID', e.g. '*2976 Thorium nitrate, solid, radioactive material, low specific activity (LSA-I), 7, Schedule 5, RID*'; or

(ii) in the case of material not otherwise specified, '*2912 Radioactive material, low specific activity (LSA-I), n.o.s., 7, Schedule 5, RID*'.

For carriage in tank wagons or tank-containers, when a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall also be entered before the description of the material. The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII. A cross shall be inserted in the appropriate box on the consignment note.

11. *Storage and despatch*

(a) See marg. 703.

(b) Total transport index limitation for storage: none.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703 12. (2), (a) to (d).

(b) Total activity in a single wagon: no limit.

13. *Other provisions*

See marg. 703.

704 (cont'd)

Schedule 6

Low specific activity material (LSA-II)

Note: 1. LSA-II is the second of three groups of radioactive material which, by its nature, has a limited specific activity or for which limits of estimated average specific activity apply.

2. If fissile material is present, the requirements of Schedule 12 shall be met in addition to the requirements of this Schedule.

3. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2912 Radioactive material, low specific activity (LSA-II), n.o.s.

2976 Thorium nitrate, solid.

2978 Uranium hexafluoride, fissile excepted or *non-fissile.*

2980 Uranyl nitrate hexahydrate solution.

2981 Uranyl nitrate, solid.

Low Specific Activity Material (LSA-II): radioactive material for which the radiation level at 3 m from the unshielded contents of a single package shall not exceed 10 mSv/h (1 000 mrem/h) and meeting one of the following descriptions:

(a) Water with tritium concentration up to 0,8 TBq/l (20 Ci/l); or

(b) Solids and gases with activity distributed throughout of not more than 10^{-4} A_2/g; or

(c) Liquids with activity distributed throughout of not more than 10^{-5} A_2/g.

2. *Packaging/Package*

(a) LSA-II material shall be carried in packagings, which may be tank wagons, tank-containers or containers.

(b) The packaging, tank wagon, tank-container or container shall meet the design requirements for industrial packages IP-2 or IP-3 (see marg. 1734 or 1735 and in addition, for tank wagons and tank-containers, marg. 1736 and Appendices X and XI) as appropriate for the form of the LSA-II material as specified in Table 4.

(c) The material shall be loaded into the packaging, tank wagon, tank-container or container so that, in routine carriage, there will be no escape of contents and no loss of shielding.

TABLE 4

Industrial package requirements for LSA-II material

Contents	Exclusive use	Not under exclusive use
Solids	IP-2	IP-2
Liquids and gases	IP-2	IP-3

3. *Maximum radiation level*

See marg. 703.

704 *(cont'd)*

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) Overpacks or containers dedicated to the carriage of LSA-II material under exclusive use may be excepted from (a) above with regard to internal contamination only for as long as they remain under that exclusive use.

5. *Decontamination and use of wagons, equipment or parts thereof*

(a) See marg. 703.

(b) A wagon dedicated to the carriage of LSA-II material under exclusive use shall be excepted from (a) above with regard to internal contamination only for as long as it remains in that exclusive use.

6. *Mixed packing*

See marg. 703.

7. *Mixed loading*

See marg. 703.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) For tank-containers and tank wagons, see also Appendix X/XI, paragraph 7.6.

9. *Danger labels on wagons other than tank wagons*

See marg. 703.

10. *Transport documents*

(a) For a summary of the approval and notification provisions see marg. 716.

(b) The consignment note shall include:

(i) the identification number and the name as per heading 1, together with the words 'Radioactive material, low specific activity (LSA-II), 7, Schedule 6, RID' e.g. '*2976 Thorium nitrate, solid, radioactive material, low specific activity (LSA-II), 7, Schedule 6, RID*'; or

(ii) in the case of material not otherwise specified, '*2912 Radioactive material, low specific activity (LSA-II), n.o.s., 7, Schedule 6, RID*'.

For carriage in tank wagons or tank-containers, when a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall also be entered before the description of the material. The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII. A cross shall be inserted in the appropriate box on the consignment note.

11. *Storage and despatch*

See marg. 703.

704 *(cont'd)*

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg 703 12. (2), (a) to (d).

(b) Total activity in a single wagon shall not exceed the values specified in Table 5.

TABLE 5

Wagon activity limits for LSA-II material

Nature of contents	Wagen limit
Non-combustible solids	No limit
Combustible solids, and all liquids and gases	$100 \times A_2$

13. *Other provisions*

See marg. 703.

Schedule 7

Low specific activity material (LSA-III)

Note: 1. LSA-III is the third of three groups of radioactive material which, by its nature, has a limited specific activity or for which limits of estimated average specific activity apply.

2. If fissile material is present, the requirements of Schedule 12 shall be met in addition to the requirements of this Schedule.

3. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2912 Radioactive material, low specific activity (LSA-III), n.o.s.

Low Specific Activity Material (LSA-III): solid radioactive material for which the radiation level at 3 m from the unshielded contents of a single package shall not exceed 10 mSv/h (1 000 mrem/h) and meeting the following conditions:

(a) the radioactive material is distributed throughout a solid or collection of solid objects or is essentially uniformly distributed in a solid compact binding agent, (e.g. concrete, bitumen, ceramic); and

(b) the radioactive material is relatively insoluble, or is intrinsically contained in a relatively insoluble matrix; and

(c) the estimated average specific activity does not exceed 2×10^{-3} A_2/g.

2. *Packaging/Package*

(a) LSA-III material shall be carried in packagings which may be containers. Carriage in tank wagons and tank-containers is not applicable.

(b) The packaging or container shall meet the design requirements for industrial packages IP-2 (see marg. 1734) if carried in exclusive use, or IP-3 (see marg. 1735) if not carried in exclusive use.

(c) The material shall be loaded into the packaging or container so that, in routine carriage, there will be no escape of contents and no loss of shielding.

3. *Maximum radiation level*

See marg. 703.

704 *(cont'd)*

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) Overpacks or containers dedicated to the carriage of LSA-III material under exclusive use may be excepted from (a) above with regard to internal contamination only for as long as they remain under that exclusive use.

5. *Decontamination and use of wagons, equipment or parts thereof*

(a) See marg. 703.

(b) A wagon dedicated to the carriage of LSA-III material under exclusive use shall be excepted from (a) above with regard to internal contamination only for as long as it remains in that exclusive use.

6. *Mixed packing*

See marg. 703.

7. *Mixed loading*

See marg. 703.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

See marg. 703.

9. *Danger labels on wagons other than tank wagons*

See marg. 703.

10. *Transport documents*

(a) For a summary of the approval and notification provisions see marg. 716.

(b) The consignment note shall include the description '*2912 Radioactive material, low specific activity (LSA-III) n.o.s., 7, Schedule 7, RID*'. If full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII, the *hazard identification number* shall also be shown before the description of the goods. A cross shall be inserted in the appropriate box on the consignment note.

11. *Storage and despatch*

See marg. 703.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703 12. (2), (a) to (d).

(b) Total acitivity in a single wagon shall not exceed the values specified in Table 6.

TABLE 6

Wagon activity limits for LSA-III Material

Nature of contents	Wagon limit
Non-combustible solids	No limit
Combustible solids	$100 \times A_2$

704 *(cont'd)*

13. *Other provisions*

See marg. 703.

Schedule 8

Surface contaminated objects (SCO-I and SCO-II)

Note: 1. A surface contaminated object (SCO) is a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces. Surface contaminated objects shall be in one of two groups, either SCO-I or SCO-II, depending on the maximum allowable contamination level (see Table 7).

2. If fissile material is present the requirements of Schedule 12 shall be met in addition to the requirements of this Schedule.

3. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2913 Radioactive material, surface contaminated objects (SCO-I) or *(SCO-II)*

(a) Solid, non-radioactive objects contaminated on the surface to a level not exceeding the contamination levels specified in Table 7 when the contamination is averaged over an area of 300 cm^2 (or the area of the surface if less than 300 cm^2).

TABLE 7

Allowable Surface Contamination for SCO

	Type of contamination	Non-fixed on accessible surface	Fixed on accessible surface	Sum of fixed and non-fixed on the inaccessible surface
SCO-I	Beta/gamma/low toxicity alpha emitters	4 Bq/cm^2 (10^{-4} μCi/cm^2)	4×10^4 Bq/cm^2 (1 μCi/cm^2)	4×10^4 Bq/cm^2 (1 μCi/cm^2)
	All other alpha emitters	0,4 Bq/cm^2 (10^{-5} μCi/cm^2)	4×10^3 Bq/cm^2 (0,1 μCi/cm^2)	4×10^3 Bq/cm^2 (0,1 μCi/cm^2)
SCO-II	Beta/gamma/low toxicity alpha emitters	400 Bq/cm^2 (10^{-2} μCi/cm^2)	8×10^5 Bq/cm^2 (20 μCi/cm^2)	8×10^5 Bq/cm^2 (20 μCi/cm^2)
	All other alpha emitters	40 Bq/cm^2 (10^{-3} μCi/cm^2)	8×10^4 Bq/cm^2 (2 μCi/cm^2)	8×10^4 Bq/cm^2 (2 μCi/cm^2)

(b) The radiation level at 3 mm from the unshielded content of a single package or from a single object or collection of objects, if unpackaged, shall not exceed 10 mSv/h (1 000 mrem/h).

2. *Packaging/Package*

(a) SCO-I and SCO-II may be carried in packagings provided that:

(i) the packaging, which may be a container, meets the design requirements for industrial packages IP-1 (see marg. 1733) for SCO-I, or IP-2 (see marg. 1734) for SCO-II; and

704 *(cont'd)*

(ii) the objects are loaded into the packaging so that, in routine carriage, there will be no escape of contents and no loss of schielding.

(b) SCO-I may be carried unpackaged, provided that:

(i) it is carried in a wagon or container so that, in routine carriage, there will be no escape of contents and no loss of shielding; and

(ii) it shall be carried under exclusive use if the contamination on the accessible and the inaccessible surfaces is greater than 4 Bq/cm^2 (10^{-4} μCi/cm^2) for beta and gamma emitters and low toxicity alpha emitters or 0,4 Bq/cm^2 (10^{-5} μCi/cm^2) for all other alpha emitters; and

(iii) measures shall be taken to ensure that radioactive material is not released into the wagon if it is expected that non-fixed contamination exists on inaccessible surfaces in excess of 4 Bq/cm^2 (10^{-4} μCi/cm^2) for beta and gamma emitters and low toxicity alpha emitters, or 0,4 Bq/cm^2 (10^{-5} μCi/cm^2) for all other alpha emitters.

(c) SCO-II shall not be carried unpackaged.

3. *Maximum radiation level*

See marg. 703.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) Overpacks or containers dedicated to the carriage of SCO under exclusive use may be excepted from (a) above with regard to internal contamination only for as long as they remain under that exclusive use.

5. *Decontamination and use of wagons, equipment of parts thereof*

(a) See marg. 703.

(b) A wagon dedicated to the carriage of SCO under exclusive use shall be excepted from (a) above with regard to internal contamination only for as long as it remains in that specific exclusive use.

6. *Mixed packing*

See marg. 703.

7. *Mixed loading*

See marg. 703.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

See marg. 703.

9. *Danger labels on wagons other than tank wagons*

See marg. 703.

704 *(cont'd)*

10. *Transport documents*

(a) For a summary of the approval and notification requirements see marg. 716.

(b) The consignment note shall include the description '*2913 Radioactive material, surface contaminated object (SCO-I)* or *(SCO-II), 7, Schedule 8, RID*'. A cross shall be inserted in the appropriate box on the consignment note. If full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VII, the *hazard identification number* shall also be shown before the description of the goods. Further details specified in marg. 709 and 710 shall also be included.

11. *Storage and despatch*

See marg. 703.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703 12. (2), (a) to (d).

(b) Total activity in a single wagon shall not exceed $100 \times A_2$.

13. *Other provisions*

See marg. 703.

Schedule 9

Radioactive material in Type A packages

Note: 1. Radioactive material in quantities which offer a limited radiological risk (see marg. 700 (2)1.) may be carried in Type A packages, which shall be designed to withstand conditions of carriage including minor mishaps.

2. If fissile material is present the requirements of Schedule 12 shall be met in addition to the requirements of this Schedule.

3. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2974 Radioactive material, special form, n.o.s.

2975 Thorium metal, pyrophoric.

2976 Thorium nitrate, solid.

2979 Uranium metal, pyrophoric.

2980 Uranyl nitrate hexahydrate solution.

2981 Uranyl nitrate, solid.

2982 Radioactive material, n.o.s.

The contents of a Type A package shall be restricted to radioactive material:

(a) with an activity not exceeding A_1 (see marg. 1700 and 1701) if in special form, or

(b) with an activity not exceeding A_2 (see marg. 1700 and 1701) if other than in special form.

2. *Packaging/Package*

(a) The packaging, which may also be a tank wagon, tank-container or container, shall meet the requirements for Type A packages specified in marg. 1737 and in addition, for tank wagons and tank-containers, Appendices X and XI.

704 *(cont'd)*

(b) In particular, the Type A package shall be designed so that, under conditions of carriage including minor mishaps, it will prevent loss or dispersal of the radioactive contents, and loss of shielding integrity which would result in more than a 20 % increase in the external radiation level at any point.

(c) If the radioactive contents are special form radioactive material, competent authority approval of the design for the special form radioactive material is required.

(d) The outside of the Type A package shall incorporate a feature such as a seal, which is not readily breakable and which, while intact, will evidence that it has not been opened.

3. *Maximum radiation level*

See marg. 703.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

See marg. 703.

5. *Decontamination and use of wagons, equipment or parts thereof*

See marg. 703.

6. *Mixed packing*

See marg. 703.

7. *Mixed loading*

See marg. 703.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) Each Type A package shall be legibly and durably marked on the outside with the words 'TYPE A'.

9. *Danger labels on wagons other than tank wagons*

See marg. 703.

10. *Transport documents*

(a) For a summary of the approval and notification requirements see marg. 716.

(b) The consignment note shall include:

(i) the identification number and the name as per heading 1, together with the words 'Radioactive material in Type A package, 7, Schedule 9, RID', e.g. '*2976 Thorium nitrate, solid, radioactive material in Type A package, 7, Schedule 9, RID*'; or

(ii) in the case of material not otherwise specified, '*2974 Radioactive material, special form, n.o.s., in Type A package, 7, Schedule 9, RID*', or '*2982 Radioactive material, n.o.s., in Type A package, 7, Schedule 9, RID*', as the case may be.

For carriage in tank wagons or tank-containers, when a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall also be entered before the description of the material. The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII. A cross shall be inserted in the appropriate box on the consignment note.

704 *(cont'd)*

11. *Storage and despatch*

See marg. 703.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

See marg. 703 12. (2).

13. *Other provisions*

See marg. 703.

Schedule 10

Radioactive material in Type B(U) packages

Note: 1. Radioactive material which exceeds in quantity the Type A package limits may be carried in a Type B(U) package which shall be designed so that it is unlikely to release its radioactive contents or lose its shielding integrity in accident conditions of carriage.

2. If fissile material is present the requirements of Schedule 12 shall be met in addition to the requirements of this Schedule.

3. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2974 Radioactive material, special form, n.o.s.

2975 Thorium metal, pyrophoric,

2976 Thorium metal, solid.

2979 Uranium metal, pyrophoric.

2980 Uranyl nitrate hexahydrate solution.

2981 Uranyl nitrate, solid.

2982 Radioactive material, n.o.s.

The limit on the total activity in a Type B(U) package shall be as is prescribed in the design approval certificate for that package.

2. *Packaging/Package*

(a) The packaging, which may also be a tank wagon, tank-container or container, shall meet the requirements for Type B packages specified in marg. 1738, as well as those for Type B(U) packages specified in marg. 1739 and in addition, for tank wagons and tank-containers, Appendices X and XI.

(b) In particular, the Type B(U) package shall be designed so that:

(i) under conditions of carriage including minor mishaps, it will restrict the loss or dispersal of the radioactive contents to no more than $A_2 \times 10^{-6}$ per hour, and prevent loss of shielding integrity which would result in more than a 20 % increase in the external radiation level at any point, and

(ii) it will be capable of withstanding the damaging effects of a transport accident as demonstrated by retaining containment integrity and shielding to the extent required by marg. 1738 and 1739.

(c) Approval of the design of Type B(U) packages in accordance with marg. 1752 by the competent authority of the country of origin of the design is required (unilateral approval).

(d) If the radioactive contents are special form radioactive material, competent authority approval of the design for the special form radioactive material is required.

704 *(cont'd)*

(e) The outside of the Type B(U) package shall incorporate a feature such as a seal, which is not readily breakable and which, while intact, will be evidence that it has not been opened.

3. *Maximum radiation level*

See marg. 703.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

See marg. 703.

5. *Decontamination and use of wagons, equipment or parts thereof*

See marg. 703.

6. *Mixed packing*

See marg. 703.

7. *Mixed loading*

See marg. 703.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) Each Type B(U) package shall be legibly and durably marked on the outside with:

(i) the identification mark allocated to that design by the competent authority.

(ii) a serial number of identify uniquely each packaging which conforms to that design,

(iii) the wording 'TYPE B(U)', and

(iv) the trefoil symbol shown in marg. 705 (5) embossed or stamped on the outermost fire and water-resistant receptacle.

9. *Danger labels on wagons other than tank wagons*

See marg. 703.

10. *Transport documents*

(a) For a summary of the approval and notification requirements see marg. 716.

(b) The consignment note shall include:

(i) the identification number and the name as per heading 1, together with the words 'Radioactive material in Type B(U) package 7, Schedule 10, RID', e.g. '*2976 Thorium nitrate, solid, radioactive material in Type B(U) package, 7, Schedule 10, RID*'; or

(ii) in the case of material not otherwise specified, '*2974 Radioactive material, special form, n.o.s., in Type B(U) package, 7, Schedule 10, RID*', or '*2982 Radioactive material, n.o.s., in Type B(U) package, 7, Schedule 10, RID*', as the case may be.

For carriage in tank wagons or tank-containers, when a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall also be entered before the description of the material.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

A cross shall be inserted in the appropriate box on the consignment note.

704 *(cont'd)*

(c) The unilateral approval certificate for the package design is required.

(d) Before each shipment of any Type B(U) package, the consignor shall be in possession of all the relevant competent authority approval certificates and shall ensure that copies of them have been submitted, before the first shipment, to the competent authority of each country through or into which the package is to be carried.

(e) Before each shipment where the activity is greater than 3×10^3 A_2 or 3×10^3 A_1, as appropriate, or 1 000 TBq (20 kCi), whichever is the lower, the consignor shall notify the competent authorities of all countries affected by the movement, preferably at least seven days in advance.

11. *Storage and despatch*

(a) See marg. 703.

(b) The consignor shall have complied with the relevant pre-use and pre-shipment provisions of marg. 1710.

(c) Any requirements in the competent authority approval certificates shall be observed.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703 12. (2), (a) bis (d).

(b) If the average heat flux from a Type B(U) package could exceed 15 W/m^2, any special stowage provisions specified in the competent authority package approval certificate must be observed.

(c) If the temperature of the accessible surface of the Type B(U) package could exceed 50 °C in the shade, carriage is permitted only under exclusive use, for which the surface temperature is limited to 85 °C. Account may be taken of barriers or screens intended to give protection to transport workers without the barriers or screens being subject to any test.

13. *Other provisions*

See marg. 703.

Schedule 11

Radioactive material in Type B(M) packages

Note: 1. Radioactive material which exceeds in quantity the Type A package limits may be carried in a Type B(M) package which shall be designed so that it is unlikely to release its radioactive contents or lose its shielding integrity in accident conditions of carriage.

2. If fissile material is present the requirements of Schedule 12 shall be met in addition to the requirements of this Schedule.

3. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2974 Radioactive material, special form, n.o.s.

2975 Thorium metal, pyrophoric,

2976 Thorium metal, solid.

2979 Uranium metal, pyrophoric.

2980 Uranyl nitrate hexahydrate solution.

2981 Uranyl nitrate, solid.

2982 Radioactive material, n.o.s.

704 *(cont'd)* The limit on the total activity in a Type B(M) package shall be as is prescribed in the design approval certificate for that package.

2. *Packaging/Package*

(a) The packaging, which may also be a tank wagon, tank-container or container, shall meet the requirements for Type B packages specified in marg. 1738, as well as those for Type B(M) packages specified in marg. 1740 and in addition, for tank wagons and tank-containers, Appendices X and XI.

(b) In particular, the Type B(M) package shall be designed so that:

(i) under conditions of carriage including minor mishaps, it will restrict the loss or dispersal of the radioactive contents to no more than $A_2 \times 10^{-6}$ per hour, and prevent loss of shielding integrity which would result in more than a 20 % increase in the external radiation level at any point, and

(ii) it will be capable of withstanding the damaging effects of a transport accident as demonstrated by retaining containment integrity and shielding to the extent required by marg. 1738 and 1739.

(c) Intermittent venting during carriage may be permitted if compensating operational controls are approved by all the competent authorities involved.

(d) Supplementary operational controls necessary to ensure safety of the Type B(M) package during transport or to compensate for the deficiencies from the Type B(U) requirements and any restrictions on mode or conditions of carriage shall be approved by all the competent authorities involved.

(e) Approval of the design of Type B(M) packages in accordance with marg. 1753 is required both by the competent authority of the country of origin of the design and of each country through or into which the packages are carried (multilateral approval).

(f) If the radioactive contents are special form radioactive material, competent authority approval of the design for the special form radioactive material is required.

(g) The outside of the Type B(M) package shall incorporate a feature such as a seal, which is not readily breakable and which, while intact, will be evidence that it has not been opened.

3. *Maximum radiation level*

See marg. 703.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

See marg. 703.

5. *Decontamination and use of wagons, equipment or parts thereof*

See marg. 703.

6. *Mixed packing*

See marg. 703.

7. *Mixed loading*

See marg. 703.

704 *(cont'd)*

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) Each Type B(M) package shall be legibly and durably marked on the outside with:

(i) the identification mark allocated to that design by the competent authority.

(ii) a serial number to identify uniquely each packaging which conforms to that design,

(iii) the wording 'TYPE B(M)', and

(iv) the trefoil symbol shown in marg. 705 (5) embossed or stamped on the outermost fire and water-resistant receptacle.

9. *Danger labels on wagons other than tank wagons*

See marg. 703.

10. *Transport documents*

(a) For a summary of the approval and notification requirements see marg. 716.

(b) The consignment note shall include:

(i) the identification number and the name as per heading 1, together with the words 'Radioactive material in Type B(M) package 7, Schedule 11, RID', e.g. '*2976 Thorium nitrate, solid, radioactive material in Type B(M) package, 7, Schedule 11, RID*'; or

(ii) in the case of material not otherwise specified, '*2974 Radioactive material, special form, n.o.s., in Type B(M) package, 7, Schedule 11, RID*', or '*2982 Radioactive material, n.o.s., in Type B(M) package, 7, Schedule 11, RID*', as the case may be.

For carriage in tank wagons or tank-containers, when a marking in accordance with Appendix VIII is prescribed, the *hazard identification number* in accordance with Appendix VIII shall also be entered before the description of the material.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

A cross shall be inserted in the appropriate box on the consignment note.

(c) The unilateral approval certificate for the package design is required.

(d) If the package is designed to allow for controlled intermittent venting or if the total contents exceed 3×10^3 A_2 or 3×10^3 A_1, as appropriate, or 1 000 TBq (20 kCi), whichever is the lower, certificates of multilateral approval of shipment are required unless the competent authorities involved authorize carriage by a specific provision in the certificates for approval of the package design.

(e) Before each shipment of any Type B(M) package, the consignor shall be in possession of all relevant approval certificates.

(f) Before each shipment, the consignor shall notify the competent authorities of all countries affected by the movement, preferably at least seven days in advance.

11. *Storage and despatch*

(a) See marg. 703.

(b) The consignor shall have complied with the relevant pre-use and pre-shipment provisions of marg. 1710.

(c) Any provisions in the certificates of approval of the design or the shipment issued by the competent authorities involved shall be observed.

704 *(cont'd)*

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703 12. (2), (a) bis (d).

(b) If the average surface heat flux from a Type B(M) package could exceed 15 W/m^2, any special stowage provisions specified in the competent authority package design approval certificate shall be observed.

(c) If the temperature of the accessible surface of the Type B(M) package could exceed 50 °C in the shade, carriage is permitted only under exclusive use, and in this case, the surface temperature is limited to 85 °C. Account may be taken of barriers or screens intended to give protection to transport workers without the barriers or screens being subject to any test.

13. *Other provisions*

See marg. 703.

Schedule 12

Fissile material

Note: 1. Radioactive material which is also fissile material shall be packaged, carried and stored so as to meet the requirements for nuclear criticality safety, as stated in this Schedule, and the requirements appropriate to its radioactivity, as stated in Schedules 6 to 11, as appropriate.

2. For other dangerous properties, see also the requirements in marg. 1770.

1. *Materials*

2918 Radioactive material, fissile, n.o.s.

2977 Uranium hexofluoride, fissile containing more then 1 % uranium-235.

Fissile material is uranium-233, uranium-235, plutonium-239, plutonium-241, or any combination of the foregoing, except for unirradiated natural or depleted uranium and natural or depleted uranium which has been irradiated in thermal reactors only.

Consignments of fissile material shall also be in full compliance with the requirements of one of the other Schedules, as appropriate to the radioactivity of the consignment.

2. *Packaging/Package*

(a) The following materials are excepted from the special packaging requirements stated in this Schedule, but shall meet the provisions of one of the other Schedules appropriate to the radioactivity of the material:

(i) Fissile material in quantity not exceeding 15 g per package under conditions fully described in marg. 1741.

(ii) Homogeneous hydrogenous solutions in concentrations and quantities limited in accordance with Table III of marg. 1703.

(iii) Enriched uranium distributed homogeneously with not more than 1 % of uranium-235, and with a total plutonium and uranium-233 content not exceeding 1 % of the mass of uranium-235, provided that if the uranium-235 is present in metallic, oxide or carbide forms, it shall not form a lattice arrangement within the package.

(iv) Material containing not more than 5 g of fissile material in any 10 litre volume.

(v) Packages containing not more than 1 kg of plutonium in which not more than 20 % by mass consists of plutonium-239, plutonium-241 or any combination of those radionuclides.

(vi) Solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2 % by mass with total plutonium and uranium-233 content not exceeding 0,1 % of the mass of uranium-235, and a minimum nitrogen to uranium atomic ratio of 2.

704 *(cont'd)*

(b) Otherwise packages for fissile material shall meet the design provisions for the type of package necessary for the radioactivity of the fissile material and, in addition, shall meet the additional requirements for packages containing fissile material stated in marg. 1741.

(c) Each design of package for fissile material shall be approved by the competent authority of the country of origin of the design and by the competent authorities of each of the countries through or into which the package is to be carried, i.e. multilateral approval is required.

(d) The outside of packages for fissile material shall incorporate a feature such as a seal, which is not readily breakable and which, while intact, will be evidence that it has not been opened.

3. *Maximum radiation level*

See appropriate Schedule.

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

See appropriate Schedule.

5. *Decontamination and use of wagons, equipment or parts thereof*

See appropriate Schedule.

6. *Mixed packing*

Only articles or documents which are necessary for the use of the radioactive material are permitted in the package, provided that there is no interaction between them and the packaging or its contents that would reduce the safety (including nuclear criticality safety) of the package.

7. *Mixed loading*

See marg. 703.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) See appropriate Schedule.

(b) Packages shall be clearly and durably marked externally with:

(i) 'TYPE A', 'TYPE B(U)', 'TYPE B(M)' as appropriate.

(ii) Competent authority identification mark.

9. *Danger labels on wagons other than tank wagons*

See marg. 703.

10. *Transport documents*

(a) For a summary of the approval and notification requirements see marg. 716.

(b) The consignment note shall include the description '*2918 Radioactive material, fissile, n.o.s., in Type IF* or *Type AF* or*Type B(U)F* or *Type B(M)F package, 7, Schedule 12, RID*'; or '*2977 Uranium hexafluoride, fissile, containing more than 1 % uranium-235, radioactive material in approved package, 7, Schedule 12, RID*', as the case may be.

A cross shall be inserted in the appropriate box on the consignment note.

704 *(cont'd)*

(c) The multilateral approval certificates for the fissile material package design are required.

(d) Before each shipment of any fissile material package, the consignor shall be in possession of all relevant approval certificates.

(e) Certificates of multilateral shipment approval are required for packages containing fissile material if the sum of the transport indexes of the packages in the consignment exceeds 50.

(f) For additional documentation requirements, see appropriate Schedule.

11. *Storage and despatch*

See marg. 703.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703 12. (2), (a) to (d).

(b) For consignments under exclusive use the total transport index limit shall be 100.

(c) Packages of fissile material for which the transport index for nuclear criticality control exceeds 0 shall not be carried in an overpack.

13. *Other provisions*

See marg. 703.

Schedule 13

Radioactive material carried under special arrangement

Note: Consignments of radioactive material which do not satisfy all of the applicable requirements of the Schedules 5-12 may be carried under special arrangement [1] subject to the implementation of special requirements approved by the competent authorities. These requirements shall ensure that the overall level of safety in carriage and in-transit storage is at least equivalent to that which would be provided if all the applicable requirements had been met.

1. *Materials*

Materials with substance identification numbers

2912, 2913, 2918, 2974, 2975, 2976, 2977, 2978, 2979, 2980, 2981 and *2982,*

see marg. 701.

Radioactive material which may be carried under special arrangement include any of those materials covered by Schedules 5-11 and, if applicable, Schedule 12.

2. *Packaging/Package*

(a) As authorised by the competent authority approval certificate for special arrangement.

(b) Multilateral approval is required.

3. *Maximum radiation level*

As authorised by the competent authority approval certificate for special arrangement.

[1] The special arrangement should not be confused with the special agreement as covered by Article 5 (2) of the CIM Uniform Rules.

704 *(cont'd)*

4. *Contamination on packages, wagons, containers, tank wagons, tank-containers and overpacks*

As authorised by the competent authority approval certificate for special arrangement.

5. *Decontamination and use of wagons, equipment or parts thereof*

See marg. 703.

6. *Mixed packing*

As authorised by the competent authority approval certificate for special arrangement.

7. *Mixed loading*

Mixed loading is only permitted if specially authorised by the competent authorities.

8. *Marking and danger labels on packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703. However consignments under special arrangement shall always bear Category III-YELLOW labels conforming to model No 7C.

(b) In addition, other labelling and marking provisions approved by the competent authorities shall be fulfilled.

9. *Danger labels on wagons other than tank wagons*

(a) See marg. 703.

(b) In addition, other requirements approved by the competent authorities shall be fulfilled.

10. *Transport documents*

(a) For a summary of the approval and notification requirements see marg. 716.

(b) The consignment note shall include:

(i) the identification number as per heading 1 and the name as per marg. 701, together with the words 'Radioactive material, under special arrangement, 7, Schedule 13, RID', e.g. '*2976 Thorium nitrate, solid, radioactive material, under special arrangement, 7, Schedule 13, RID*'; or

(ii) in the case of material not otherwise specified, the identification number as per heading 1 and the name as per marg. 701, together with the words 'under special arrangement, 7, Schedule 13, RID', e.g. '*2918 Radioactive material, fissile, n.o.s., under special arrangement, 7, Schedule 13, RID*'.

A cross shall be inserted in the appropriate box on the consignment note.

(c) Each consignment shall require multilateral approval.

(d) Before each shipment, the consignor shall be in possession of all relevant approval certificates.

(e) Before each shipment the consignor shall notify the competent authorities of all countries affected by the movement, preferably at least seven days in advance.

11. *Storage and despatch*

(a) See marg. 703.

704 *(cont'd)*

(b) Specific storage and despatch provisions approved by the competent authorities shall be fulfilled.

(c) Unless specifically excepted by the competent authority approval certificates, the consignor shall have complied with the relevant pre-use and pre-shipment provisions of marg. 1710.

12. *Carriage of packages, containers, tank wagons, tank-containers and overpacks*

(a) See marg. 703.

(b) Specific carriage provisions approved by the competent authorities shall be fulfilled.

13. *Other provisions*

See marg. 703.

Marking and labelling

Note: For radioactive material having other dangerous properties, the labelling shall also be in accordance with the requirements for the other dangerous properties [see marg. 1770 (3)].

Marking of packages, including tank wagons, tank-containers and containers

705 (1) Each package of gross mass exceeding 50 kg shall have its permissible gross mass legibly and durably marked on the outside of the packaging.

(2) Except for containers, tank wagons, tank-containers and overpacks, and except those of Schedules 1 to 4, each package shall be clearly and durably marked with the identification number of the goods to be indicated in the consignment note, preceded by the letters 'UN'.

(3) Each package which conforms to a Type A package design shall be legibly and durably marked on the outside of the packaging with 'TYPE A'.

(4) Each package which conforms to a design approved under marg. 1752-1755 shall be legibly and durably marked on the outside of the packaging with:

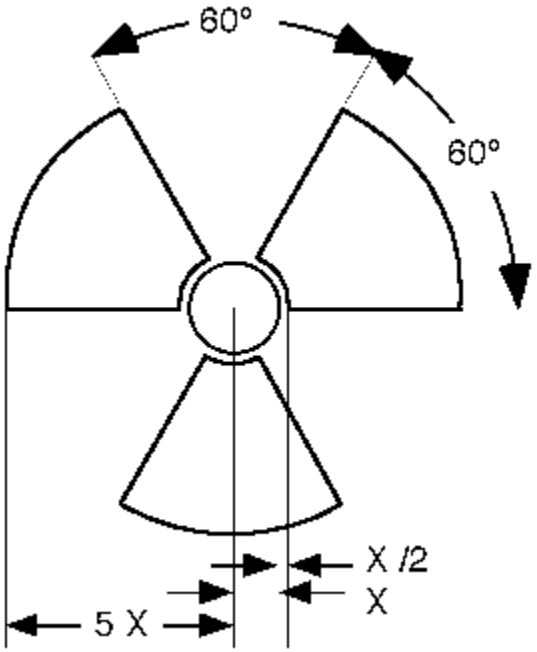
(a) The identification mark allocated to that design by the competent authority;

(b) A serial number to identify uniquely each packaging which conforms to that design; and

(c) In the case of a Type B(U) or Type B(M) package design, with 'TYPE B(U)' or 'TYPE B(M)'.

(5) Each package which conforms to a Type B(U) or Type B(M) package design shall have the outside of the outermost receptacle which is resistant to the effects of fire and water plainly marked by embossing, stamping, or other means resistant to the effects of fire and water with the trefoil symbol shown below.

705
(cont'd)



Basic trefoil symbol with proportions based on a central circle of radius X.
The minimum size of X shall be 4 mm

Labelling of packages, including tank wagons, tank-containers and containers, and of overpacks

706 (1) Each package, overpack, tank wagon, tank-container and container shall bear the labels which conform to models Nos 7A, 7B or 7C according to the appropriate category. Any labels which do not relate to the contents shall be removed or covered. For radioactive material having other dangerous properties see marg. 1770.

(2) The labels shall be affixed to two opposite sides of the outside of a package, tank wagon or overpack, or on the outside of all four sides of a container or tank-container.

(3) Each label shall be completed with the following information in a clear and indelible manner:

(a) Contents:

(i) Except for LSA-I material, the name of the radionuclide as taken from Table I of Appendix VII, using the symbols prescribed therein. For mixtures of radionuclides, the most restrictive nuclides shall be listed to the extent the space on the line permits. The group of LSA or SCO shall be shown following the name of the radionuclide. The terms 'LSA-II', 'LSA-III', 'SCO-I' and 'SCO-II' shall be used for this purpose.

(ii) For LSA-I material, the term 'LSA-I' is all that is necessary: the name of the radionuclide is not necessary.

(b) Activity:

The maximum activity of the radioactive contents during transport expressed in units of becquerel (Bq) [and, if desired, curie (Ci)] with the appropriate SI prefix ([see marg. 4 (1)]. For fissile material, the total mass in units of gram (g) or multiples thereof, may be used in place of activity.

(c) For overpacks, tank wagons, tank-containers and containers, the 'contents' and 'activity' entries on the label shall bear the information required in (a) and (b) of this paragraph respectively, totalled together for the entire contents of the overpack, tank wagon, tank-container or container except that on labels for overpacks or containers containing mixed loads of packages with different radionuclides, such entries may read 'see consignment note'.

(d) Transport index:

See marg. 1715 (3) (no transport index entry required for category I-WHITE).

Orange marking of tank wagons, tank-containers and wagons and containers for carriage in bulk

707 See marg. 13 and Appendix VIII.

Additional labelling of containers, tank wagons, tank-containers and wagons

708 (1) Tank wagons, tank-containers and large containers carrying packages other than excepted packages shall bear labels conforming to model No 7D. However, instead of using a label conforming to models Nos 7A, 7B or 7C together with a label conforming to model No 7D, it is permitted as an alternative to use enlarged labels conforming to models Nos 7A, 7B or 7C with the dimensions of model No 7D. Every label shall be affixed in a vertical orientation on all four sides of a container or of a tank-container or on both sides of a tank wagon.

(2) Wagons carrying packages, overpacks, tank-containers or containers bearing any of the labels conforming to models Nos 7A, 7B or 7C shall display the label conforming to model No 7D on both sides. In addition wagons carrying consignments under exclusive use shall display the label conforming to model No 7D on both sides.

(3) Any labels which do not relate to the contents shall no longer be visible.

Additional particulars of consignment

709 In addition to the description of the goods given in the relevant Schedule, the consignor shall include in the consignment note for each consignment of radioactive material the following information:

(a) The words 'The nature of the goods and the packaging are in conformity with the requirements of RID.';

(b) The name or symbol of each radionuclide; or for mixtures of radionuclides, a general description or a list of the most restrictive nuclides;

(c) A description of the physical and chemical form of the material, or a statement that the material is special form radioactive material. A generic description is acceptable for chemical form;

(d) The maximum activity of the radioactive contents during transport expressed in units of becquerel (Bq) [and, if desired, curie (Ci)] with the appropriate SI prefix [see marg. 4 (1)]. For fissile material, the total mass of fissile material in units of gram (g), or appropriate multiples thereof, may be used in place of activity;

(e) The category of the package, i.e. I-WHITE, II-YELLOW or III-YELLOW;

(f) The transport index (for categories II-YELLOW and III-YELLOW only);

(g) For a consignment of fissile material, where all of the packages in the consignment are excepted under marg. 1703, the words 'fissile excepted';

(h) The identification mark for each competent authority approval certificate (special form radioactive material, special arrangement, package design, or shipment) applicable to the consignment;

(i) For consignments of packages in an overpack or container, a detailed statement of the contents of each package within the overpack or container and, where appropriate, of each overpack or container in the consignment. If packages are to be removed from the overpack or container at a point of intermediate unloading, appropriate transport documentation shall be made available;

(j) When a consignment is required to be shipped under exclusive use, the statement 'exclusive use shipment'.

Information given to the railway

710 (1) The consignor shall provide with the consignment note information regarding actions, if any, that are required to be taken by the railway. The information shall include at least the following points:

(a) Supplementary operational provisions for loading, stowage, carriage, handling and unloading of the package, overpack, container, or tank wagon or tank-container including any special stowage requirements for the safe dissipation of heat [see marg. 712 (2)] or a statement that no such provisions are necessary;

(b) Any necessary routeing instructions;

(c) Written instructions appropriate to the consignment. Written instructions shall not be required for consignments made up only of radioactive material of Schedules 1 to 4.

(2) In all cases where approval of the consignment or prior notification to the competent authority is required, all the railway administrations shall be informed, if possible, at least 15 days in advance and in any case at least 5 days in advance, in order that they may take in good time any measures required for the carriage.

(3) The consignor shall be in a position to provide the certificates of the competent authorities to the railway before loading, unloading, and any trans-shipment.

Transport

Segregation during carriage

711 (1) Packages, overpacks, containers and tank wagons and tank-containers shall be segregated during carriage:

(a) for radiation control purposes, from places occupied by persons in accordance with Table 8 and from undeveloped photographic film and mailbags, in accordance with Table 9; and

Note: Mailbags shall be assumed to contain undeveloped film and plates and therefore be separated from radioactive material in the same way.

(b) from other dangerous goods in accordance with marg. 703, heading 7.

(2) Categorie II-Yellow or category III-Yellow packages or overpacks shall not be carried in compartments of passenger coaches occupied by persons, except compartments reserved for persons authorised to accompany such packages or overpacks.

TABLE 8

Minimum distances between packages of category II-Yellow or of category III-Yellow and persons

Sum of transport indexes not more than	Minimum distances in metres, no shielding material intervening, from living accommodations or regularly occupied working space in the case of exposure time not exceeding 250 hours per annum
2	1,0
4	1,5
8	2,5
12	3,0
20	4,0
30	5,0
40	5,5
50	6,5

Note: The above table is based upon a dose limit of 5 mSv (500 mrem) in any 12 month period.

711
(cont'd)

TABLE 9

Minimum distances between packages of category II-Yellow or of category III-Yellow and consignments bearing the word 'Foto', or Mailbags

Note: Mailbags shall be assumed to contain undeveloped film and plates and therefore be separated from radioactive material in the same way.

Total number of packages not more than:		Sum of transport indexes not more than:	Journey or storage duration, in hours							
Category Yellow			1	2	4	10	24	48	120	240
III	II		Minimum distances in metres							
		0,2	0,5	0,5	0,5	0,5	1	1	2	3
		0,5	0,5	0,5	0,5	1	1	2	3	5
	1	1	0,5	0,5	1	1	2	3	5	7
	2	2	0,5	1	1	1,5	3	4	7	9
	4	4	1	1	1,5	3	4	6	9	13
	8	8	1	1,5	2	4	6	8	13	18
1	10	10	1	2	3	4	7	9	14	20
2	20	20	1,5	3	4	6	9	13	20	30
3	30	30	2	3	5	7	11	16	25	35
4	40	40	3	4	5	8	13	18	30	40
5	50	50	3	4	6	9	14	20	32	45

Stowage for carriage

712 (1) Packages shall be so loaded in wagons that they cannot shift dangerously, upset or fall.

(2) Provided that its average surface heat flux does not exceed 15 W/m^2 and that immediately surrounding cargo is not in bags, a package or overpack may be carried among packaged general cargo without any special stowage provisions except as may be specifically required by the competent authority in an applicable approval certificate.

(3) Except in the case of consignment under special arrangement, mixing of packages of different kinds of radioactive material, including fissile material, and mixing of different kinds of packages with different transport indexes is permitted without specific competent authority approval. In the case of consignment under special arrangement, mixing shall not be permitted except as specifically authorised under the special arrangement.

(4) The following provisions shall apply to the loading of tank wagons and the loading of packages, overpacks, tank-containers and containers on to wagons:

(a) The transport index of a tank wagon shall not exceed the limits in Table 10. The total number of packages, overpacks, tank-containers and containers in a single wagon shall be so limited that the total sum of the transport indexes in the wagon does not exceed the values shown in Table 10.

For consignments of LSA-I material there shall be not limit on the sum of the transport indexes.

712 *(cont'd)*

(b) The radiation level under conditions likely to be encountered in routine carriage shall not exceed 2 mSv/h (200 mrem/h) at any point on, and 0,1 mSv/h (10 mrem/h) at 2 m from, the external surface of the wagon.

(5) Any package or overpack having a transport index greater than 10 shall be carried only under exclusive use.

TABLE 10

Transport index limits for containers and wagons

Type of container or wagon	Limit on total sum of transport indexes in a single container or on a wagon			
	Not under exclusive use		Under exclusive use	
	Non-fissile material	Fissile material	Non-fissile material	Fissile material
Small container	50	50	not applicable	not applicable
Large container	50	50	no limit	100
Wagon	50	50	no limit	100

Additional provisions

713 (1) For consignments under exclusive use, the radiation level shall not exceed:

(a) 10 mSv/h (1000 mrem/h) at any point on the external surface of any package or overpack, and may only exceed 2 mSv/h (200 mrem/h) provided that:

(i) the wagon is equipped with an enclosure which prevents unauthorised access to the load during carriage, and

(ii) provisions are made to secure the package or overpack so that its position within the wagon remains fixed during routine carriage, and

(iii) there are no loading or unloading operations between the beginning and end of the shipment;

(b) 2 mSv/h (200 mrem/h) at any point on the outer surfaces of the wagon including the upper and lower surfaces, or, in the case of an open wagon at any point on the vertical planes projected from the outer edges of the wagon, on the upper surface of the load, and on the lower external surface of the wagon; and

(c) 0,1 mSv/h (10 mrem/h) at any point 2 from the vertical planes represented by the outer lateral surfaces of the wagon, or, if the load is transported in an open wagon, at any point 2 m from the vertical planes projected from the outer edges of the wagon.

(2) The radiation level at any normally occupied position of the wagon shall not exceed 0,02 mSv/h (2 mrem/h) unless the persons occupying such positions are provided with personal monitoring devices.

Storage in transit

714 (1) Packages, overpacks, containers, tank wagons and tank-containers shall be segregated during storage in transit:

(a) for radiation exposure control purposes, from places occupied by persons, in accordance with Table 8 of marg. 711 (1) and from undeveloped photographic film and mailbags, in accordance with Table 9 of marg. 711 (1); and

Note: Mailbags shall be assumed to contain undeveloped film and plates and therefore be separated from radioactive material in the same way.

(b) from other dangerous goods in accordance with marg. 703, heading 7.

714 *(cont'd)*

(2) The number of category II-YELLOW and category III-YELLOW packages, overpacks, tank wagons, tank-containers and containers stored in any one place shall be so limited that the total sum of the transport indexes in any individual group of such packages, overpacks, tank wagons, tank-containers or containers does not exceed 50. Groups of such packages, overpacks, tank wagons, tank-containers and containers shall be stored so as to maintain a spacing of at least 6 m from other groups of such packages, overpacks, tank wagons, tank-containers or containers.

(3) If the transport index of a single package, overpack, tank wagon, tank-container or container exceeds 50 or the total transport index of a wagon exceeds 50, as permitted in Table 10, storage shall be such as to maintain a spacing of at least 6 m from other groups of such packages, overpacks, tank wagons, tank-containers or containers or from other wagons carrying radioactive material.

(4) Consignments in which the only radioactive contents are LSA-I materials shall be excepted from the provisions of paragraphs (2) and (3) above.

(5) Except in the case of carriage under special arrangement, mixed loading of packages of different kinds of radioactive material, including fissile material, and mixed loading of different kinds of packages with different transport indexes is permitted without specific competent authority approval. In the case of carriage under special arrangement, mixed loading shall not be permitted except as specifically authorised under the special arrangement.

Undeliverable consignments

715 If neither the consignor nor the consignee can be identified, or if the consignment cannot be delivered to the consignee and the carrier has no instructions from the consignor, the consignment shall be placed in a safe location and the competent authority shall be informed as soon as possible, and a request made for instructions on further action.

Summary of approval and prior notification privisons

716

Subject	Schedule Number	Competent Authority approval required		Consignor required to notify the competent authorities of the country of origin and of the countries en route [a] before each consignment	Marg.
		Country of origin	Countries en route [a]		
1	2	3	4	5	6
Calculation of unlisted A_1- and A_2-values	—	yes	yes	no	1750(f)
Excepted packages					1713
— package design	—	no	no	no	
— consignment	1 to 4	no	no	no	
LSA material [b] and SCO [b]/Industrial packages types 1, 2 or 3					700(2), 1714, 1733, 1734, 1735, 1736
— package design	—	no	no	no	
— consignment	5 to 8	no	no	no	
Type A packages [b]					700(2), 1737
— package design	—	no	no	no	
— consignment	9	no	no	no	

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(cont'd)

Subject	Schedule Number	Competent Authority approval required		Consignor required to notify the competent authorities of the country of origin and of the countries en route [a] before each consignment	Marg.
		Country of origin	Countries en route [a]		
1	2	3	4	5	6
Type B(U) packages [b] — package design — consignment	— 10	yes no	no no	See Note 1 See Note 2	700(2), 1719, 1739, 1752
Type B(M) packages [b] — package design — consignment	11	yes See Note 3	yes See Note 3	no yes	700(2), 1719, 1740, 1753, 1757
Packages for fissile material — package design — consignment Sum of transport indexes not more than 50 Sum of transport indexes greater than 50	— 12	yes [c] — no [d] yes	yes [c] — no [d] yes	no — See Note 2 See Note 2	1741, 1754, 1757
Special form radioactive material — design — consignment	— See Note 4	yes See Note 4	no See Note 4	no See Note 4	1731, 1751, 1761
Special Arrangement — consignment	13	yes	yes	yes	1719, 1758, 1762
Packages — Type B(U) Packages — Type B(M), and packages containing fissile material which meet the requirements of RID in force on 31 December 1989	—	yes	yes	See Note 1	1755

[a] Countries from, through or into which the consignment is carried.
[b] If the radioactive contents are fissile material which is not excepted from the provisions for packages containing fissile material, then the requirements for fissile material packages apply, see marg. 1741.
[c] Designs of packages for fissile material may also require approval in respect of one of the other items in the table.
[d] Consignments may, however, require approval in respect of one of the other items in the table.

Note: 1. Before first consignment of any package requiring competent authority approval of the design, the consignor shall ensure that a copy of the approval certificate for that design has been submitted to the competent authority of each country en route: see marg. 1719 (1).

2. Notification required if contents exceed 3×10^3 A_1 or 3×10^3 A_2 or 1000 TBq (20 kCi); see marg. 1719 (2).

3. Multilateral approval of consignment required if contents exceed 3×10^3 A_1 or 3×10^3 A_2 or 1000 TBq (20 kCi); or if controlled intermittent venting is allowed, see marg. 1757.

4. See approval and prior notification provisions for the applicable package.

CLASS 8

CORROSIVE SUBSTANCES

1. List of substances

800 (1) Among the substances and articles covered by the title of Class 8, those which are listed in marg. 801 or are covered by a collective heading of that marg. 800(2) to 824. They are then considered as substances and articles of this Directive.

Note: For the quantities of substances listed in marg. 801 which are not subject to the requirements of the section headed 'Conditions of Carriage', see marg. 801a.

(2) The title of Class 8 covers substances and articles containing substances of this Class, which by chemical action attack epithelial tissue—of skin or mucous membranes—with which they are in contact, and substances which in the event of leakage are capable of damaging or destroying other goods, or means of transport, and may also cause other hazards. The title of this Class also covers other substances which form a corrosive liquid only in the presence of water, or which produce corrosive vapour or mist in the presence of natural moisture of the air.

(3) (a) Substances and articles of Class 8 are subdivided as follows:

A. Acid substances;

B. Basic substances;

C. Other corrosive substances;

D. Articles containing corrosive substances;

E. Empty packagings

(b) Substances and articles of Class 8 which are classified under the various items of marg. 801 other than substances of items 6, 14 and 15 shall be assigned to one of the following groups according to their degree of corrosivity:

(a) highly corrosive;

(b) corrosive;

(c) slightly corrosive.

(c) Allocation of substances to groups (a), (b) or (c) in Class 8 has been on the basis of experience taking into account such additional factors as inhalation risk [1] and reactivity with water (including the formation of dangerous decomposition products). Substances not specifically named, including mixtures, can be judged by the length of time of contact necessary to produce full thickness destruction of human skin.

Substances which are judged not to cause full thickness destruction of human skin shall still be considered for their potential to cause corrosion to certain metal surfaces. In making this grouping, account shall be taken of human experience in instances of accidental exposure. In the absence of human experience, the grouping shall be based on data obtained from experiments in accordance with OECD-Guideline 404 [2].

(d) Substances that cause full thickness destruction of intact skin tissue within an observation period up to 60 minutes starting after the exposure time of three minutes or less are substances of group (a).

(e) Substances that cause full thickness destruction of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than three minutes but not more than 60 minutes are substances of group (b).

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[1] A substance or preparation meeting the criteria of Class 8 having a inhalation toxicity of dusts and mists (LC_{50}) in the range of group (a), but toxicity through oral ingestion or dermal contact only in the range of group (c) or less, shall be assigned to Class 8.

[2] OECD Guidelines for Testing of Chemicals, No 404, 'Acute Dermal Irritation/Corrosion' (1992).

800 *(cont'd)*

(f) The following are substances of group (c):

— Substances that cause full thickness destruction of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than 60 minutes but not more than 4 hours;

— Substances which are judged not to cause full thickness destruction of intact skin tissue, but which exhibit a corrosion rate on steel or aluminium surfaces exceeding 6,25 mm a year at a test temperature of 55 °C. For the purpose of testing steel, type P235 [ISO 9328 (II): 1991] or a similar type, and for testing aluminium, non-clad types 7075-T6 or AZ5GU-T6, shall be used. An acceptable test is described in standard ASTM G31-72 (extended in 1990).

(4) If substances of Class 8, as a result of admixtures, come into different categories of risk from those to which the substances specifically named in marg. 801 belong, these mixtures or solutions shall be assigned to the items/groups to which they belong on the basis of their actual degree of danger.

Note: For the classification of solutions and mixtures (such as preparations and wastes), see also marg. 3(3).

(5) On the basis of the criteria set out in (3), it may also be determined whether the nature of a solution or a mixture specifically named or containing a specifically named substance is such that the solution or mixture is not subject to the requirements for this Class.

(6) For the packaging requirements of marg. 805(2), 806(3) und 807(3), substances or mixtures of substances having a melting point above 45 °C are considered to be solids.

(7) (a) Flammable corrosive liquids having a flash-point below 23 °C, other than substances of items 54(a) and 68(a) are substances Class 3 (see marg. 301, items 21 to 26).

(b) Flammable, slightly corrosive liquids having a flash-point between 23 °C and 61 °C, are substances of Class 3 (see marg. 301, item 33).

(c) Corrosive substances which are highly toxic by inhalation, as defined in marg. 600(3), are substances of Class 6.1 (see marg. 601).

(8) The chemically unstable substances of Class 8 are to be accepted for carriage only if the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end it shall in particular be ensured that receptacles do not contain any substance liable to promote these reactions.

(9) 1910 calcium oxide and 2812 sodium aluminate, identification numbers assigned in the United Nations Recommendations on the Transport of Dangerous Goods, are not subject to the requirements of this Directive.

(10) The flash-point referred to below shall be determined in the manner described in Appendix III.

A. Acid substances

Inorganic substances

801 1. Sulphuric acid and similar substances:

(a) *1829 sulphur trioxide, inhibited* [(sulphuric anhydride, inhibited or *sulphur trioxide, stabilized* (sulphuric anhydride, stabilized)],
1831 sulphuric acid, fuming (oleum),

2240 chromosulphuric acid;

Note: 1829 sulphur trioxide shall be inhibited. Sulphur trioxide, without inhibitor (non-stabilized) shall not be accepted for carriage.

(b) *1794 lead sulphate* with more than 3 % free acid,
1830 sulphuric acid with more than 51 % acide,
1832 sulphuric acid, spent,

801 *(cont'd)*

1833 sulphurous acid,
1906 sludge acid,
2308 nitrosylsulphuric acid,
2583 alkylsulphonic acids, solid, with more than 5 % free sulphuric acid or
2583 arylsulphonic acids, solid with more than 5 % free sulphuric acid,
2584 alkylsulphonic acids, liquid with more than 5 % free sulphuric acid or
2584 arylsulphonic acids, liquid with more than 5 % free sulphuric acid,
2796 sulphuric acid with more than 51 % acid or
2796 battery fluid, acid,
2837 bisulphates, aqueous solution (hydrogensulphates, aqueous solution).

Note: 1. 2585 alkylsulphonic or arylsulphonic acids, solid and 2586 alkylsulphonic or arylsulphonic acids, liquid with more than 5 % free sulphuric acid are substances of item 34.

2. Lead sulphate with not more than 3 % free acid is not subject to the requirements of this Directive.

3. Chemically unstable mixtures of sulphuric acid, spent, are not to be accepted for carriage.

(c) *2837 bisulphates, aqueous solutions* (hydrogensulphates, aqueous solution).

2. Nitric acids:

(a) 1. *2031 nitric acid,* other than red fuming, with more than 70 % acid

2. *2032 nitric acid, red fuming;*

(b) *2031 nitric acid,* other than red fuming, with not more than 70 % acid.

3. Nitrating acid mixtures:

(a) *1796 nitrating acid mixture* with not more than 50 % nitric acid,
1826 nitrating acid mixture, spent with not more than 50 % nitric acid;

(b) *1796 nitrating acid mixture* with not more than 50 % nitric acid,
1826 nitrating acid mixture, spent with not more than 50 % nitric acid.

Note: 1. 1798 nitrohydrochloric acid is not to be accepted for carriage.

2. Chemically unstable mixtures of nitrating acid or mixtures of residual sulphuric and nitric acids, not denitrated, are not to be accepted for carriage.

4. Perchloric acid solution:

(b) *1802 perchloric acid* with not more than 50 % acid by mass in aqueous solution.

Note: 1. 1873 perchloric acid aqueous solution with more than 50 % but not more than 72 % pure acid by mass is a substance of Class 5.1 [see marg. 501, item 3(a)].

2. Perchloric acid aqueous solution with more than 72 % pure acid, by mass, or mixtures of perchloric acid with any liquid other than water, are not to be accepted for carriage.

5. Aqueous solutions of hydrogen halides, with the exception of hydrofluoric acid:

(b) *1787 hydriodic acid solution,*
1788 hydrobromic acid solution,
1789 hydrochloric acid solution,

(c) *1787 hydriodic acid solution,*

1788 hydrobromic adic solution
1789 hydrochloric acid solution,
1840 zinc chloride solution,
2580 aluminium bromide solution,
2581 aluminium chloride solution,
2582 ferric chloride solution (iron trichloride solution).

Note: 1048 hydrogen bromide, anhydrous and 1050 hydrogen chloride, anhydrous are substances of Class 2 (see marg. 201, item 2TC).

801 *(cont'd)*

6. Hydrogen fluoride and hydrofluoric acid solutions with more than 85 % hydrogen fluoride.

1052 hydrogen fluoride, anhydrous,
1790 hydrofluoric acid solution with more than 85 % hydrogen fluoride.

Note: Special packing provisions are applicable to these substances (see marg. 803).

7. Solutions of hydrogen fluoride with not more than 85 % hydrogen fluoride:

(a) *1786 hydrofluoric acid sulphuric acid mixture,*

1790 hydrofluoric acid solution with more than 60 % but not more than 85 % hydrogen fluoride;

(b) *1790 hydrofluoric acid solution* with not more than 60 % hydrogen fluoride,
2817 ammonium hydrogendifluoride solution (ammonium bifluoride solution).

(c) *2817 ammonium hydrogendifluoride solution* (ammonium bifluoride solution).

8. Fluoro-acid substances:

(a) *1777 fluorsulphonic acid;*

(b) *1757 chromic fluoride solution,*
1768 difluorophosphoric acid, anhydrous,
1775 fluoroboric acid,
1776 fluorophosphoric acid, anhydrous,
1778 fluorosilicic acid,
1782 hexafluorophosphoric acid;

(c) *1757 chromic fluoride solution.*

9. Solid fluorides and other solid fluorinated substances which, in contact with moist air or water, emit hydrogen fluoride:

(b) *1727 ammonium hydrogendifluoride* (ammonium bifluoride), *solid*
1756 chromic fluoride, solid,
1811 potassium hydrogendifluoride (potassium bifluoride),
2439 sodium hydrogendifluoride (sodium bifluoride),

1740 hydrogendifluoride, n.o.s.;

(c) *1740 hydrogendifluoride, n.o.s.*

Note: 1690 sodium fluoride, 1812 potassium fluoride, 2505 ammonium fluoride, 2674 sodium fluorosilicate and 2856 fluorosilicates, n.o.s. are substances of Class 6.1 [see marg. 601, itemn 63(c), 64(c) or 71 to 73].

10. Liquid fluorides and other liquid fluorinated substances which, in contact with moist air or water, emit hydrogen fluoride:

(b) *1732 antimony pentafluoride,*
2851 boron trifluoride dihydrate

Note: 1745 bromine pentafluoride, 1746 bromine trifluoride and 2495 iodine pentafluoride are substances of Class 5.1 (see marg. 501, item 5).

11. Solid halides and other solid halogenated substances, with the exception of fluorine compounds, which, in contact with moist air or water, emit acid fumes:

(b) *1725 aluminium bromide, anhydrous,*
1726 aluminium chloride, anhydrous,
1733 antimony trichloride,
1806 phosphorus pentachloride,
1939 phosphorus oxybromide,
2691 phosphorus pentabromide,
2869 titanium trichloride mixture;

Note: Solid hydrated forms of aluminium bromide and aluminium chloride are not subject to the requirements of this Directive.

801 *(cont'd)*

(c) *1773 ferric chloride, anhydrous* (iron (III) chloride, anhydrous),
2331 zinc chloride, anhydrous,
2440 stannic chloride pentahydrate,
2475 vanadium trichloride,
2503 zirkonium tetrachloride,
2508 molybdenum pentachloride,
2802 copper chloride,
2869 titanium trichloride mixture.

Note: Ferric chloride hexahydrate is not subject to the requirements of this Directive.

12. Liquid halides and other liquid halogenated substances, with the exception of fluorine compounds, which, in contact with moist air or water, emit acid fumes:

(a) *1754 chlorosulphonic acid* with or without sulphur trioxide,
1758 chromium oxychloride (chromyl chloride),
1828 sulphur chlorides,
1834 sulphuryl chloride,
1836 thionyl chloride,
2444 vanadium tetrachloride,
2692 boron tribromide (boron bromide),
2879 selenium oxychloride;

(b) *1730 antimony pentachloride, liquid,*
1731 antimony pentachloride, solution,
1792 iodine monochloride,
1808 phosphorus tribromide,
1810 phosphorus oxychloride (phosphoryl chloride),
1817 pyrosulphuryl chloride,
1818 silicon tetrachloride,
1827 stannic chloride, anhydrous,
1837 thiophosphoryl chloride,
1838 titanium tetrachloride,
2443 vanadium oxytrichloride;

(c) *1731 antimony pentachloride, solution.*

13. Solid hydrogen sulphates:

(b) *2506 ammonium hydrogen sulphate* (ammonium bisulphate),
2509 potassium hydrogen sulphate (potassium bisulphate).

14. Bromine or bromine solutions:

1744 bromine or,
1744 bromine, solution.

Note: Special packing provisions are applicable to these substances (see marg. 804).

15. Inorganic acid substance in molten form:

2576 phosphorus oxybromide, molten.

16. Solid inorganic acid substances and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *1905 selenic acid,*
3260 corrosive solid, acidic, inorganic, n.o.s.;

(b) *1807 phosphorus pentoxide* (phosphoric acid, anhydrous),
3260 corrosive solid, acidic, inorganic, n.o.s.;

(c) *2507 chloroplatinic acid, solid,*
2578 phosphorus trioxide,
2834 phosphorous acid,
2865 hydroxylamine sulphate,
2967 sulphamic acid,

3260 corrosive solid, acid, inorganic, n.o.s.

801 *(cont'd)*

17. Liquid inorganic acid substances and solutions and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *3264 corrosive liquid, acidic, inorganic, n.o.s.;*

(b) *1755 chromic acid, solution,*
3264 corrosive liquid, acidic, inorganic, n.o.s.;

(c) *1755 chromic acid solution,*
1805 phosphoric acid,
2693 bisulphites, aqueous solution, n.o.s.
3264 corrosive liquid, acidic, inorganic, n.o.s.

Note: 1463 chromium trioxide, anhydrous (chromic acid, solid) is a substance of Class 5.1 [see marg. 501, item 31(b)].

Organic substances

31. Solid carboxylic acids and anhydrides and solid halogenated carboxylic acids and anhdrides:

(b) *1839 trichloroacetic acid,*
1938 bromoacetic acid;

(c) *2214 phthalic anhydride* with more than 0,05 % of maleic anhydride,
2215 maleic anhydride,
2698 tetrahydrophthalic anhydrides with more than 0,05 % of maleic anhydride,
2823 crotonic acid.

Note: 1. Phthalic anhydride and tetrahydrophthalic anhydrides with not more than 0,05 % of maleic anhydride are not subject to the requirements of this Class.

2. Phthalic anhydride with not more than 0,05 % of maleic anhydride carried or handed over for carriage in the molten state at a temperature above its flash-point is a substance of Class 3 [see marg. 301, item 61 (c)].

32. Liquid carboxylic acids and anhydrides and liquid halogenated carboxylic acids and anhydrides:

(a) *2699 trifluoroacetic acid;*

(b) 1. *1764 dichloroacetic acid,*
1779 formic acid,
1940 thioglycolic acid,
2564 trichloroacetic acid solution,
2790 acetic acid solution with more than 50 % but not more than 80 % acid by mass;

2. *1715 acetic anhydride,*
2218 acrylic acid, inhibited,
2789 acetic acid, glacial or
2789 acetic acid solution, with more than 80 % acid, by mass;

(c) *1848 propionic acid,*
2496 propionic anhydride,
2511 2-chloropropionic acid,
2531 methacrylic acid, inhibited,
2564 trichloroacetic acid, solution,
2739 butyric anhydride,
2790 acetic acid solution with more than 25 % but not more than 50 % acid, by mass,
2820 butyric acid,
2829 caproic acid.

Note: Acetic acid solutions with not more than 25 % pure acid by mass are not subject to the requirements of this Directive.

801 *(cont'd)*

33. Complex compounds of boron trifluoride:

(a) *2604 boron trifluoride diethyl etherate* (boron trifluoride ether complex);

(b) *1742 boron trifluoride acetic acid complex,*
1743 boron trifluoride propionic acid complex.

Note: 2965 boron trifluoride dimethyl etherate is a substance of Class 4.3 [see marg. 471, item 2 (b)].

34. Alkylsulphonic and arylsulphonic acids and alkylsulphuric acids:

(b) *1803 phenolsulphonic acids, liquid,*
2305 nitrobenzenesulphonic acid,
2571 alkylsulphuric acids;

(c) *2585 alkylsulphonic acids, solid* with not more than 5 % free sulphuric acid or
2585 arylsulphonic acids, solid with not more than 5 % free sulphuric acid,
2586 alkylsulphonic acids, liquid with not more than 5 % free sulphuric acid,
2586 arylsulphonic acids, liquid with not more than 5 % free sulphuric acid.

Note: 2583 alkylsulphonic or arylsulphonic acids, solid and 2584 alkylsulphonic or arylsulphonic acids, liquid with more than 5 % free sulphuric acid are substances of item 1 (b).

35. Organic acid halides:

(b) 1. *1716 acetyl bromide,*
1729 anisoyl chloride,
1736 benzoyl chloride,
1765 dichloracetyl chloride
1780 fumaryl chloride,
1898 acetyl iodide,
2262 dimethylcarbamoyl chloride,
2442 trichloroacetyl chloride,
2513 bromoacetyl bromide,
2577 phenylacetyl chloride,
2751 diethylthiophosphoryl chloride,
2798 phenylphosphorus dichloride,
2799 phenylphosphorus thiodichloride,

2. *2502 valeryl chloride;*

(c) 2225 benzensulphonyl chloride.

36. Alkyl and aryl chlorosilanes having a flash-point above 61 °C:

(b) *1728 amyltrichlorosilane,*
1753 chlorophenyltrichlorosilane,
1762 cyclohexenyltrichlorosilane,
1763 cyclohexyltrichlorosilane,
1766 dichlorophenyltrichlorosilane,
1769 diphenyldichlorosilane,
1771 dodecyltrichlorosilane,
1781 hexadecyltricholorsilane,
1784 hexyltrichlorosilane,
1799 nonyltrichlorosilane,
1800 octadecyltrichlorosilane,
1801 octyltrichlorosilane,
1804 phenyltrichlorosilane,
2434 dibenzyldichlorosilane,
2435 ethylphenyldichlorosilane,
2437 methylphenyldichlorosilane,

2987 chlorosilanes, corrosive, n.o.s.

Note: Chlorosilanes which emit flammable gases in contact with water or moist air are substances of Class 4.3 (see marg. 471, item 1).

801 *(cont'd)*

37. Alkylchlorosilanes and arylchlorosilanes, having a flash-point between 23 °C and 61°C inclusive:

(b) *1724 allyltrichlorosilane, stabilised*
1747 butyltrichlorosilane,
1767 diethyldichlorosilane,
1816 propyltrichlorosilane,

2986 chlorsilanes, corrosive, flammable, n.o.s.

Note: Chlorosilanes which emit flammable gases in contact with water or moist air are substances of Class 4.3 (see marg. 471, item 1).

38. Alkylphosphoric acids:

(c) *1718 butyl acid phosphate,*
1793 isopropyl acid phosphate,
1902 diisooctyl acid phosphate,
2819 amyl acid phosphate.

39. Solid organic acid substances and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *2430 alkylphenols, solid n.o.s.* (including C_2-C_{12} homologues),
3261 corrosive solid, acidic, organic, n.o.s.;

(b) *2670 cyanuric chloride,*

2430 alkylphenols, solid, n.o.s. (including C_2-C_{12} homologues),
3261 corrosive solid, acidic, organic, n.o.s.;

(c) *2430 alkylphenol, solid, n.o.s.* (including C_2-C_{12} homologues),
3261 corrosive solid, acidic, organic, n.o.s.

40. Liquid organic acid substances and solutions and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *3145 alkylphenols, liquid, n.o.s.* (including C_2-C_{12} homologues),
3265 corrosive liquid, acidic, organic, n.o.s.;

(b) *3145 alkylphenols, liquid, n.o.s.* (including C_2-C_{12} homologues),
3265 corrosive liquid, acidic, organic n.o.s.;

(c) *3145 alkylphenols, liquid, n.o.s.* (including C_2-C_{12} homologues),
3265 corrosive liquid, acidic, organic, n.o.s.

B. Basic substances

Inorganic substances

41. Basic solid compounds of alkali metals:

(b) 1813 potassium hydroxide, solid (caustic potash),
1823 sodium hydroxide, solid (caustic soda),
1825 sodium monoxide (sodium oxide),
2033 potassium monoxide (potassium oxide)
2678 rubidium hydroxide,
2680 lithium hydroxide monohydrate,
2682 caesium hydroxide;

(c) *1907 soda lime* with more than 4 % sodium hydroxide,
3253 disodium trioxosilicate (sodium metasilicate).

Note: Soda lime with not more than 4 % sodium hydroxide is not subject to the requirements of this Directive.

801 *(cont'd)*

42. Solutions of alkaline substances:

(b) *1814 potassium hydroxide solution (*potash lye),
1819 sodium aluminate solution,
1824 sodium hydroxide solution (soda lye),
2677 rubidium hydroxide solution,
2679 lithium hydroxide solution,
2681 caesium hydroxide solution,
2797 battery fluid, alkali,
3320 sodium borohydride and sodium hydroxide solution, with not more than 12 % sodium borohydride and not more than 40 % sodium hydroxide by mass,
1719 caustic alkali, liquid, n.o.s.;

(c) *1814 potassium hydroxide solution (*potash lye),
1819 sodium aluminate solution,
1824 sodium hydroxide solution (soda lye),
2677 rubidium hydroxide solution,
2679 lithium hydroxide solution,
2681 caesium hydroxide solution,
3320 sodium borohydride and sodium hydroxide solution, with not more than 12 % sodium borohydride and not more 40 % sodium hydroxide by mass,

1719 caustic alkali liquid, n.o.s.

43. Ammonia solutions:

(c) *2672 ammonia solution* relative density between 0,880 and 0,957 at 15 °C in water, with more than 10 % but not more than 35 % ammonia.

Note: 1. 1005 ammonia, anhydrous, 3318 ammonia, aqueous solution, with more than 50 % ammonia, and 2073 ammonia, aqueous solution, with more than 35 % but not more than 50 % ammonia, are substances of Class 2 (see marg. 201, item 2TC, 4TC and 4A).

2. Ammonia solutions with not more than 10 % ammonia are not subject to the requirements of this Directive.

44. Hydrazine and its aqueous solutions:

(a) *2029 hydrazine, anhydrous;*

(b) *2030 hydrazine hydrate* or
2030 hydrazine, aqueous solution with not less than 37 % but not more than 64 % hydrazine, by mass.

Note: 3293 hydrazine, aqueous solution with not more than 37 % hydrazine, by mass, is a substance of Class 6.1 [see marg. 601, item 65 (c)].

45. Sulphides and hydrogen sulphides and their aqueous solutions:

(b) 1. *1847 potassium sulphide, hydrated* with not less than 30 % water of crystallization,
1849 sodium sulphide, hydrated with not less than 30 % water,
2818 ammonium polysulphide solution,
2949 sodium hydrosulphide with not less than 25 % water of crystallization;

2. *2683 ammonium sulphide solution.*

(c) *2818 ammonium polysulphid solution.*

Note: 1382 anhydrous potassium sulphide and 1385 anhydrous sodium sulphide and their hydrates with less than 30 % water of crystallization, and 2318 sodium hydrosulphide with less than 25 % water of crystallization are substances of Class 4.2 [see marg. 431, item 13 (b)].

46. Solid inorganic basic substances and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *3262 corrosive solid, basic, inorganic, n.o.s.;*

(b) *3262 corrosive solid, basic, inorganic, n.o.s.;*

(c) *3262 corrosive solid, basic, inorganic, n.o.s.*

801 *(cont'd)*

47. Liquid inorganic basic substances and solutions and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *3266 corrosive liquid, basic, inorganic, n.o.s.;*

(b) *3266 corrosive liquid, basic, inorganic, n.o.s.;*

(c) *3266 corrosive liquid, basic, inorganic, n.o.s.*

Organic substances

51. Tetra-alkylammonium hydroxides:

(b) *1835 tetramethylammonium hydroxide.*

52. Solid amines and polyamines:

(a) *3259 amines, solid, corrosive, n.o.s.* or
3259 polyamines, solid, corrosive, n.o.s.;

(b) *3259 amines, solid, corrosive, n.o.s.* or
3259 polyamines, solid, corrosive, n.o.s.;

(c) *2280 hexamethylenediamine, solid,*
2579 piperazine (diethylenediamine),
3259 amines, solid, corrosive, n.o.s. or
3259 polyamines, solid, corrosive, n.o.s.

53. Liquid amines and polyamines or amino-alcohols, highly corrosive or corrosive, having a flash-point above 61 °C:

(a) *2735 amines, liquid, corrosive, n.o.s.* or
2735 polyamines, liquid, corrosive, n.o.s.;

(b) *1761 cupriethylenediamine solution,*
1783 hexamethylenediamine, solution,
2079 diethylenetriamine,
2259 triethylenetetramine,
2735 amines, liquid, corrosive, n.o.s. or
2735 polyamines, liquid, corrosive, n.o.s.;

(c) *1761 cupriethylenediamine solution,*
1783 hexamethylenediamine solution,
2269 3,3'-iminodipropylamine (bisaminopropylamine, dipropylenetriamine),
2289 isophoronediamine,
2320 tetraethylenepentamine,
2326 trimethylcyclohexylamine,
2327 trimethylhexamethylenediamines,
2491 ethanolamine or
2491 ethanolamine solution,
2565 dicyclohexylamine,
2815 N-aminoethylpiperazine,
3055 2-(2-aminoethoxy)ethanol
2735 amines, liquid, corrosive, n.o.s. or
2735 polyamines, liquid, corrosive, n.o.s.

54. Liquid amines and polyamines, highly corrosive or corrosive, flamable, having a boiling point greater than 35 °C:

(a) *2734 amines, liquid, corrosive, flammable, n.o.s.* or
2734 polyamines, liquid, corrosive, flammable, n.o.s.;

(b) *1604 ethylenediamine,*
2051 2-dimethylaminoethanol,
2248 di-n-butylamine,
2258 1,2-propylenediamine,

801 *(cont'd)*

2264 dimethylcyclohexylamine,
2357 cyclohexylamine,
2619 benzyldimethylamine,
2685 N,N-diethylethylenediamine,
2686 2-diethylaminoethanol,

2734 amines, liquid, corrosive, flammable, n.o.s. or
2734 polyamines, liquid, corrosive, flammable, n.o.s.

55. Solid organic basic substances and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *3263 corrosive solid, basic, organic, n.o.s.;*

(b) *3263 corrosive solid, basic, organic, n.o.s.;*

(c) *3263 corrosive solid, basic, organic, n.o.s.*

56. Liquid orgnanic basic substances and solutions and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *3267 corrosive liquid, basic, organic, n.o.s.;*

(b) *3267 corrosive liquid, basic, organic, n.o.s.;*

(c) *3267 corrosive liquid, basic, organic, n.o.s.*

C. Other corrosive substances

61. Chlorite and hypochlorite solutions:

(b) *1791 hypochlorite solution,*
1908 chlorite solution;

(c) *1791 hypochlorite solution,*
1908 chlorite solution.

Note: Solid chlorites and hypochlorites are substances of Class 5.1 (see marg. 501, items 14, 15 and 29).

62. Chlorophenolates and phenolates:

(c) *2904 chlorophenolates, liquid,* or
2904 phenolates, liquid,
2905 chlorophenolates, solid or
2905 phenolates, solid.

63. Formaldehyde solutions:

(c) *2209 formaldehyde solution* with not less than 25 % formaldehyde.

Note: 1. 1198 formaldehyde solutions, flammable, are substances of Class 3 [see marg. 301, item 33 (c)].

2. Formaldehyde solution, non-flammable, with less than 25 % formaldehyde are not subject to the requirements of this Directive [see marg. 800(8)].

64. Chloroformates and chlorothioformates:

(a) *1739 benzyl chloroformate;*

(b) *2826 ethyl chlorothioformate.*

Note: Chlorformates having predominantly toxic properties are substances of Class 6.1 (see marg. 601, items 10, 17, 27 and 28).

801 *(cont'd)*

65. Solid corrosive substances and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *1759 corrosive solid, n.o.s.;*

(b) *1770 diphenylmethyl bromide,*
1759 corrosive solid, n.o.s.,
3147 dye, solid, corrosive, n.o.s. or
3147 dye intermediate, solid, corrosive, n.o.s.,
3244 solids with corrosive liquid, n.o.s.;

Note: Mixtures of solids not subject to the requirements of this Directive and corrosive liquids may be carried under number 3244, without being subject to the classification criteria of marg. 800(3), provided there is no free liquid visible at the time the substance is loaded or at the time the package or wagon is closed. Each packaging shall correspond to a design type which has passed the leakproofness test for packing group (b) level.

(c) *2803 gallium*

1759 corrosive solid, n.o.s.,
3147 dye, solid, corrosive, n.o.s. or
3147 dye intermediate, solid, corrosive, n.o.s.

Note: Special conditions of packing are applicable to 2803 gallium [see marg. 807(4)].

66. Liquid corrosive substances and solutions and mixtures of these substances (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *1760 corrosive liquid, n.o.s.,*
1903 disinfectant, liquid, corrosive, n.o.s.,
2801 dye, liquid, corrosive, n.o.s. or
2801 dye intermediate, liquid, corrosive, n.o.s.;

(b) *2226 benzotrichloride* (trichloromethylbenzene),
2705 1-pentol (3-methyl-2-pentene-4-yne-1-ol),
3066 paint (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or
3066 paint related material (including paint thinning or reducing compound),
1760 corrosive liquid, n.o.s.,
1903 disinfectant, liquid, corrosive, n.o.s.,
2801 dye, liquid, corrosive, n.o.s. or
2801 dye intermediate, liquid, corrosive, n.o.s.;

(c) *2809 mercury,*
3066 paint (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or
3066 paint related material (including paint thinning or reducing compound),

1760 corrosive liquid, n.o.s.,
1903 disinfectant, liquid, corrosive n.o.s.,
2801 dye, liquid, corrosive n.o.s. or
2801 dye intermediate, liquid, corrosive, n.o.s.

Note: 1. Special packing conditions are applicable to 2809 mercury [see marg. 807(4)].

2. Any substance of this Directive specifically listed by name under other items may not be carried under this entries for 3066 paint or 3066 paint related material. Substances carried under these entries may contain 20 % or less nitrocellulose provided the nitrocellulose contains not more than 12,6 % nitrogen.

801 *(cont'd)*

67. Solid corrosive substances and mixtures of these substances (such as preparations and wastes), flammable, which cannot be classified under another collective heading:

    (a) *2921 corrosive solid, flammable, n.o.s.;*

    (b) *2921 corrosive solid, flammable, n.o.s.*

68. Liquid corrosive substances and solutions and mixtures of these substances (such as preparations and wastes), flammable, having a boiling point greater than 35 °C, which cannot be classified under another collective heading:

    (a) *2920 corrosive liquid, flammable, n.o.s.;*

    (b) *2920 corrosive liquid, flammable, n.o.s.*

69. Liquid corrosive substances and mixtures of these substances, self-heating, (such as preparations and wastes) which cannot be classified under another collective heading:

    (a) *3095 corrosive solid, self-heating, n.o.s.;*

    (b) *3095 corrosive solid, self-heating, n.o.s.*

70. Liquid corrosive substances and solutions and mixtures of these substances, self-heating (such as preparations and wastes) which, in contact with water, emit flammable gases, and which cannot be classified under another collective heading:

    (a) *3301 corrosive liquid, self-heating, n.o.s.;*

    (b) *3301 corrosive liquid, self-heating, n.o.s.*

71. Solid corrosive substances and mixtures of these substances, (such as preparations and wastes) which, in contact with water, emit flammable gases, and which cannot be classified under another collective heading:

    (a) *3096 corrosive solid, water-reactive, n.o.s.;*

    (b) *3096 corrosive solid, water-reactive, n.o.s.*

    Note: The term 'water-reactive' denotes a substance which, in contact with water, emits flammable gases.

72. Liquid corrosive substances and solutions and mixtures of these substances, (such as preparations and wastes) which, in contact with water, emit flammable gases and which cannot be classified under another collective heading:

    (a) *3094 corrosive liquid, water-reactive, n.o.s.;*

    (b) *3094 corrosive liquid, water-reactive, n.o.s.*

    Note: The term 'water-reactive' denotes a substance which, in contact with water, emits flammable gases.

73. Liquid corrosive substances and mixtures of these substances, oxidizing, (such as preparations and wastes) which cannot be classified under another collective heading:

    (a) *3084 corrosive solid, oxidizing, n.o.s.;*

    (b) *3084 corrosive solid, oxidizing, n.o.s.*

74. Liquid corrosive substances and solutions and mixtures of these substances, oxidizing, (such as preparations and wastes) which cannot be classified under another collective heading:

    (a) *3093 corrosive liquid, oxidizing, n.o.s.;*

    (b) *3093 corrosive liquid, oxidizing, n.o.s.*

801 *(cont'd)*

75. Solid corrosive substances and mixtures of these substances, toxic, (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *2923 corrosive solid, toxic, n.o.s.;*

(b) *2923 corrosive solid, toxic, n.o.s.;*

(c) *2923 corrosive solid, toxic, n.o.s.*

76. Liquid corrosive substances and solutions and mixtures of these substances, toxic, (such as preparations and wastes) which cannot be classified under another collective heading:

(a) *2922 corrosive liquid, toxic, n.o.s.;*

(b) *2922 corrosive liquid, toxic, n.o.s.;*

(c) *2922 corrosive liquid, toxic, n.o.s.*

D. Articles containing corrosive substances

81. Batteries

(c) *2794 batteries, wet, filled with acid,* electric storage,
2795 batteries, wet, filled with alkali, electric storage,
2800 batteries, wet, non-spillable, electric storage,
3028 batteries, dry, containing potassium hydroxide solid, electric storage.

Note: 1. Special conditions of packing are applicable to these articles [see marg. 807 (5)].

2. Batteries (identification number 2800) can be considered as non-spillable provided that they are capable of withstanding the vibration and pressure differential tests given below, without leakage of battery fluid.

Vibration test: The battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0,8 mm (1,6 mm maximum total excursion) is applied. The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return is traversed in 95 ± 5 minutes for each mounting position (direction of vibration) of the battery. The battery is tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

Pressure differential test: Following the vibration test, the battery is stored for six hours at 24 °C ± 4 °C while subjected to a pressure differential of at least 88 kPa. The battery is tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

82. Other articles containing corrosive substances:

(b) *1774 fire extinguisher charges,* corrosive liquid,
2028 bombs, smoke, non-explosive, with corrosive liquid, without initiating device.

E. Empty packagings

91. *Empty packagings,* including *empty intermediate bulk containers* (IBCs), *empty tank wagons, empty tank-containers*, uncleaned, as well as *empty wagons* for carriage in bulk and *empty small* bulk *containers*, uncleaned, having contained substance of Class 8.

Note: Uncleaned, empty packagings including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the requirements of this Directive if adequate measures have been taken to nullify any hazards. Hazards are nullified if adequate measures have been taken to nullify all hazards of classes 1-9.

801a (1) Substances of items 1 to 5, 7 to 13, 16, 17, 31 to 47, 51 to 56 and 61 to 76, carried in conformity with the following requirements are not subject to the requirements of Section 2, 'Conditions of Carriage', except in the cases provided for in (3).

(a) Substances classified under (a) of each item:

— liquids: not more than 100 ml per inner packaging and not more than 400 ml per package;

— solids: not more than 500 g per inner packaging and not more than 2 kg per package;

(b) Substances classified under (b) of each item:

— liquids: not more than 1 litre per inner packaging and not more than 4 litres per package;

— solids: not more than 3 kg per inner packaging and not more than 12 kg per package;

(c) Substances classified under (c) of each item:

— liquids: not more than 3 litres per inner packaging and not more than 12 litres per package;

— solids: not more than 6 kg per inner packaging and not more than 24 kg per package.

These quantities of substances shall be carried in combination packagings which at least meet the conditions of marg. 1538.

The 'General conditions of packing' of marg. 1500 (1), (2) and (5) to (7) shall be observed.

(2) Substances mentioned in (1) contained in metal or plastics inner packagings carried in shrink-wrapped or stretch-wrapped trays as outer packagings in conformity with the following requirements:

(a) liquids classified under (b) of each item: not more than 500 ml per inner packaging and not more than 4 litres per package;

(b) solids classified under (b) of each item: not more than 1 kg per inner packaging and not more than 12 kg per package;

(c) liquids classified under (c) of each item: not more than 1 litre per inner packaging and not more than 12 litres per package;

(d) solids classified under (c) of each item: not more than 2 kg per inner packaging.

The total gross mass of the package shall not exceed 20 kg in any case. The 'General conditions of packing' of marg. 1500 (1), (2) and (5) to (7) shall be observed.

(3) For carriage in accordance with (1) and (2) above, the description of the goods in the consignment note shall conform to the requirements of marg. 814 and include the words '*limited quantity*'. Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

(4) (a) New storage cells, when:

— they are secured in such a way that they cannot slip, fall or be damaged;

— they are provided with carrying devices, unless they are suitably stacked, e.g. on pallets;

— there are no dangerous traces of alkalis or acids on the outside;

— they are protected against short circuits.

(b) Used storage cells, when:

— their cases are undamaged;

— they are secured in such a way that they cannot leak, slip, fall or be damaged, e.g. by stacking on pallets;

— there are no dangerous traces of alkalis or acids on the outside of the articles;

— they are protected against short circuits.

'Used storage cells' means storage cells carried for recycling, at the end of their normal service life.

801a *(cont'd)*

(5) Non-spillable batteries of item 81 (identification number 2800) are not subject to the requirements of RID if, at a temperature of 55 °C, the electrolyte will not flow from a ruptured or cracked case and there is no free liquid to flow and if when packaged for carriage, the terminals are protected from short-circuiting.

(6) Manufactured articles or instruments containing not more than 1 kg mercury of item 66 (c).

2. Conditions of carriage

(The conditions of carriage for empty packagings are included under F.)

A. Packages

1. General conditions of packing

802

(1) Packagings shall satisfy the requirements of Appendix V, unless special conditions for the packing of certain substances are prescribed in Section 2.

(2) Intermediate bulk containers (IBCs) shall satisfy the requirements of Appendix VI.

(3) In accordance with the requirements of marg. 800 (3) (b) and 1511 (2) or 1611 (2) respectively the following shall be used:

— packagings of packing group I, marked with the letter 'X', for the highly corrosive substances classified (a) of each item;

— packagings of packing group II or I, marked with the letter 'Y' or 'X', or IBCs of packing group II, marked with the letter 'Y', for the corrosive substances classified under (b) of each item;

— packagings of packing group III, II or I, marked with the letter 'Z', 'Y' or 'X', or IBCs of packing group III or II, marked with the letter 'Z' or 'Y', for the slightly corrosive substances classified under (c) of each item.

Note: For the carriage of substances of Class 8 in tank wagons, see Appendix XI, for tank-containers, see Appendix X. For carriage in bulk, see marg. 816.

2. Special conditions of packing

803

1052 hydrogen fluoride, anhydrous 1790 hydrofluoric acid solution containing more than 85 % hydrogen fluoride of item 6 shall be packed in pressure receptacles made of carbon steel or suitable alloy steel. The following pressure receptacles shall be permitted:

(a) cylinders having a capacity not exceeding 150 litres;

(b) receptacles having a capacity of not less than 100 litres and not more than 1 000 litres (for example, cylindrical receptacles fitted with rolling hoops or receptacles mounted on skids).

The pressure receptacles shall satisfy the relevant requirements of Class 2 (see marg. 212, 213, 215 to 217 and 223).

The wall thickness of the pressure receptacles shall not be less than 3 mm.

Before being used for the first time, pressure receptacles shall be subjected to a hydraulic pressure test at a pressure of not less than 1 MPa (10 bar) gauge pressure. The pressure test shall be repeated every eight years and shall be accompanied by an internal inspection of the pressure receptacles and a check of their equipment. In addition, the resistance of the pressure receptacles to corrosion shall be checked by means of suitable instruments (e.g. by ultrasound), and the condition of the equipment verified, every two years.

The tests and inspections shall be carried out under the supervision of an expert approved by the competent authority.

The maximum mass of the contents per litre of capacity for these substances shall not exceed 0,84 kg.

804 (1) Bromine and bromine solution of item 14 shall be packed in glass inner packagings, containing not more than 2,5 litres each, or in polyvinylidene fluoride (PVDF) inner packagings containing not more than 15 litres each which shall be placed in combination packagings conforming to marg. 1538. The combination packagings shall be tested and approved in accordance with Appendix V for packing group I.

(2) Bromine containing less than 0,005 % water, or 0,005 and 0,2 % water, provided that in the latter case measures are taken to prevent corrosion of the lining of the receptacles, may also be carried in receptacles satisfying the following conditions:

(a) the receptacles shall be made of steel and be equipped with a leakproof lining made of lead or of some other material affording equivalent protection and with a hermetic closure. Receptacles made of monel metal or nickel, or with a nickel lining, shall also be permitted;

(b) the capacity of the receptacles shall not exceed 450 litres;

(c) the receptacles shall not be filled to more than 92 % of their capacity or more than 2,86 kg per litre of capacity;

(d) the receptacles shall be welded and designed for a calcultion pressure of not less than 2,1 MPa (21 bar) gauge pressure. The materials and workmanship shall in other respects meet the relevant requirements of Class 2 (see marg. 212). The initial test of unlined steel receptacles shall be subject to the requirements of Class 2 (see marg. 215 to 217);

(e) the closures shall project as little as possible from the receptacle and be fitted with protective caps. The closures and caps shall be fitted with gaskets made of a material not capable of being attacked by bromine. The closures shall be in the upper part of the receptacles in such a manner that they can in no case be in permanent contact with the liquid phase;

(f) the receptacles shall be provided with fittings enabling them to stand stably upright, and with lifting attachments (rings, flanges, etc.) at the top, which shall be tested at twice the working load.

(3) Before being put into service, receptacles in conformity with (2) above shall be subjected to a leakproofness test at a pressure of at least 200 kPa (2 bar) gauge pressure. The leakproofness test shall be repeated every two years ans shall be accompanied by an internal inspection of the receptacle and a check of its tare. The test and the inspection shall be carried out under the supervision of an expert approved by the competent authority.

(4) Receptacles in conformity with (2) shall bear, in clearly legible and durable characters:

— the name of the manufacturer or the manufacturing mark and the number of the receptacle,

— the word ‘Bromine’,

— tare mass of the receptacle and the permissible maximum mass of the filled receptacle,

— date (month, year) of the initial test and of the latest periodical test,

— stamp of the expert who carried out the tests and inspections.

805 (1) Substances classified under (a) of the various items shall be packed in:

(a) non-removable head steel drums conforming to marg. 1520, or

(b) non-removable head aluminium drums conforming to marg. 1521, or

(c) non-removable head steel or aluminium jerricans conforming to marg. 1522, or

(d) non-removable head plastics drums of a capacity not exceeding 60 litres or non-removable head plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

805 *(cont'd)*

(f) combination packagings with inner packagings of glass, plastics or metal conforming to marg. 1538 or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539.

Note: 1. to (d): The permissible period of use for packagings intended for the carriage of nitric acid of item 2 (a) and hydrofluoric acid solution of item 7 (a) shall be two years from the date of their manufacture.

2. to (f) and (g): Inner packagings and receptacles of glass shall not be permitted for fluorides of items 7 (a), 8 (a) or 33 (a).

(2) Solid substances within the meaning of marg. 800 (6) may also be packed in:

(a) removable head drums conforming to marg. 1520 for steel, 1521 for aluminium, 1523 for plywood, 1525 for fibreboard, or 1526 for plastics material, or in removable head jerricans conforming to marg. 1522 for steel or aluminium or 1526 for plastics material, if necessary with one or more sift-proof inner bags; or

(b) in combination packagings conforming to marg. 1538, with one or more sift-proof inner bags.

806

(1) Substances classified under (b) of the various items shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg. 1521, or

(c) steel or aluminimum jerricans conforming to marg. 1522, or

(d) plastics drums or plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539.

Note: 1. to (a), (b), (c) and (d): Simplified conditions are applicable to removable head drums and jerricans for viscous substances having a viscosity of more than 200 mm^2/s at 23 °C and for solid substances (see marg. 1512, 1553, 1554 and 1561).

2. to (d): The permissible period of use for packagings intended for the carriage of 2031 nitric acid containing more than 55 % pure acid of item 2(b) and 1790 hydrofluoric acid solution containing at most 60 % hydrogen fluoride of item 7 (b) shall be two years from their date of manufacture.

3. to (f) and (g): Inner packagings and receptacles of glass shall not be permitted for fluorides of items 7 (b), 8 (b), 9 (b), 10 (b) or 33 (b).

(2) Substances classified under (b) of the various items which have a vapour pressure at 50 °C of not more than 110 kPa (1,10 bar) may also be packed in metal IBCs conforming to marg. 1622, rigid plastics IBCs conforming to marg. 1624 or composite IBCs with rigid plastics inner receptacle conforming to marg. 1625.

(3) Solid substances within the meaning of marg. 800 (6) may also be packed in:

(a) drums conforming to marg. 1523 for plywood or 1525 for fibreboard, if necessary with one or more sift-proof inner bags, or

(b) water-resistant bags conforming to marg. 1533 for textile material, 1534 for woven plastics material, 1535 for plastics film or 1536 for water-resistant, paper, provided the goods are carried as a full load or the bags are secured on pallets, or

(c) composite IBCs with plastics inner receptacle conforming to marg. 1625, fibreboard IBCs conforming to marg. 1626 or wooden IBCs conforming to marg. 1627, or

806 *(cont'd)*

(d) flexible IBCs conforming to marg. 1623 with the exception of IBC of types 13H1, 13L1 and 13M1, and provided that the goods are carried as a full load or the flexible IBCs are loaded on pallets.

(4) Articles of item 82 shall be packed as follows:

(a) fire extinguisher charges, corrosive liquid, in wooden boxes conforming to marg. 1527, 1528, or 1529, or fibreboard boxes conforming to marg. 1530, or expanded plastics boxes of type 4H1 conforming to marg. 1531;

(b) bombs, smoke, non-explosive with corrosive liquid, without initiating device, individually with cushioning material in boxes, tubes or partitioned compartments in either wooden boxes conforming to marg. 1527, 1528 or 1529, or steel boxes of type 4A conforming to marg. 1532.

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(1) Substances classified under (c) except gallium of item 65 (c) and mercury of item 66 (c), of the various items shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminium drums conforming to marg.1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

(d) plastics drums or plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539, or

(h) in light gauge metal packagings conforming to marg. 1540.

Note to (a), (b), (c), (d) and (h): Simplified conditions are applicable to removable head drums, jerricans and light gauge metal for viscous substances having a viscosity of more than 200 mm^2/s at 23 °C and for solid substances (see marg. 1512, 1552 to 1554 and 1561).

(2) Substances classified under (c) except gallium of item 65 (c) and mercury of item 66 (c), of the various items which have a vapour pressure at 50 °C of not more than 110 kPa (1,10 bar) may also be packed in metal IBCs conforming to marg. 1622, rigid plastics IBCs conforming to marg. 1624 or composite IBCs with plastics inner receptacle conforming to marg. 1625. IBCs of type 31HZ2 shall be filled to at least 80 % of the capacity of the outer casing.

(3) Solid substances within the meaning of marg. 800 (6) may also be packed in:

(a) drums conforming to marg. 1523 for plywood, or 1525 for fibreboard, if necessary with one or more sift-proof inner bags, or

(b) water-resistant bags conforming to marg. 1533 for textile material, 1534 for woven plastics material or 1535 for plastics film or 1536 for water-resistant paper, or

(c) flexible IBCs conforming to marg. 1623 with the exception of IBCs of types 13H1, 13L1 and 13M1, or in composite IBCs with flexible plastics inner receptacle conforming to marg. 1625, or in fibreboard IBCs conforming to marg. 1626 or wooden IBCs conforming to marg. 1627.

(4) (a) Gallium of item 65 (c) and mercury of item 66 (c) shall be packed in combination packagings conforming to marg. 1538. These combination packagings may consist of glass, porcelain, stoneware or plastics inner packagings, maximum net quantity of 10 kg.

807 *(cont'd)*

The following outer packagings may be used:

natural wood boxes conforming to marg. 1527;

plywood boxes conforming to marg. 1528;

reconstitued wood boxes conforming to marg. 1529;

fibreboard boxes conforming to marg. 1530;

plastics boxes conforming to marg. 1531;

removable head steel drums conforming to marg. 1520;

removable-head steel jerricans conforming to marg. 1522;

plywood drums conforming to marg. 1523;

fibre drums conforming to marg. 1525 or

in removable head plastics drums conforming to marg. 1526.

(b) Mercury may also be packed in welded steel bottles with inner vaulted bottoms. The closure shall be a bolt with a conical thread and the opening shall not exceed 20 mm.

(5) (a) Articles of item 81, except batteries, wet, non-spillable (identification number 2800) shall be fastened with inert cushioning material or in an equivalent manner in wooden boxes or in rigid plastics boxes or in a wooden slatted crate. Batteries shall be insulated against short-circuiting.

(b) Non-spillable batteries (identifcation number 2800) shall be protected against short-circuits and shall be securely packed in strong outer packagings.

Note: Non-spillable batteries which are an integral part of, and necessary for, the operation of mechanical or electronic equipment, shall be securely fastened in the battery holder on the equipement and protected in such a manner as to prevent damage and short-circuits.

(c) Articles of item 81 may be carried on pallets — they shall be stacked and adequately secured in tiers separeted by a lager of non-conductive material. Battery terminals shall not, in any case, support the weight of other superimposed elements. Batteries shall be isolated in such a manner as tot prevent short-circuits. Each battery need not be marked and labelled if the pallet load bears a marking and a danger label.

(6) Used storage batteries of item 81 (c) may also be carried in stainless steel or solid plastics battery boxes, of a capacity of up to 1 m^3, under the following conditions:

(a) The battery boxes shall be resistant to the corrosive substances contained in the storage batteries;

(b) Under normal conditions of carriage, no corrosive substance shall leak from the battery boxes and no other substance (e.g. water) shall enter the battery boxes. No dangerous residues of corrosive substances contained in the storage batteries shall adhere to the outside of the battery boxes;

(c) The battery boxes shall not be loaded with storage batteries ot a height greater than the height of their sides;

(d) No storage battery containing substances or other dangerous goods which may react dangerously with one another [see marg. 811 (6)] shall be placed in a battery box;

(e) The battery boxes shall be either:

i) covered; or

ii) carried in closed or sheeted open wagons.

(7) Used batteries of item 81 (c) may also be carried in steel IBCs conforming to marg. 1622, in rigid plastics IBCs conforming to marg. 1624, or in composite IBCs with a rigid plastics inner receptacle and an outer casing of steel or plastics material conforming to marg. 1625.

807 *(cont'd)* IBCs shall be subjected to testing in accordance with marg. 1652, 1653, 1655 and 1658. The requirements for substances of packing group III shall apply.

The design type shall be approved by the competent authority. IBCs shall have leakproof closures and shall meet the other requirements of paragraph (6).

808 Packagings, including IBCs, containing 1791 hypochlorite solution of item 61 shall be fitted with a vent conforming to marg. 1500 (8) or 1601 (6) respectively.

809 Molten phosphorus oxybromide of item 15 may be carried in tank wagons (see Appendix XI) or in tank-containers (see Appendix X).

810

3. Mixed packing

811 (1) Substances covered by the same item number may be packed together in a combination packaging conforming to marg. 1538.

(2) Substances of different items of this Class in quantities not exceeding, per inner packaging, 3 litres for liquids and/or 5 kg for solids, may be packed together and/or with goods not subject to the requirements of this Directive, in a combination packaging conforming to marg. 1538 provided they do not react dangerously with one another.

(3) Substances of item 4 shall not be packed together with other goods, except with substances of item 3 of Class 5.1 marg. 501. Substances of items 6 and 14 shall not be packed together with other goods.

(4) Substances classified under (a) of the various items shall not be packed together with substances and articles of classes 1, 5.2 and 7.

(5) Except where other special conditions apply, substances classified under (a) of the various items, in quantities not exceeding 0,5 litre per inner packaging and 1 litre per package, and substances classified under (b) or (c), in quantities not exceeding, per inner packaging, 5 litres for liquids and/or 5 kg for solids, may be packed together in a combination packaging conforming to marg. 1538 with substances or articles of other classes, provided that mixed packing is also permitted for the substances and articles of these classes and/or with goods which are not subject to the requirements of this Directive, provided they do not react dangerously with one another.

(6) The following are considered dangerous reactions:

(a) combustion and/or giving off considerable heat,

(b) emission of flammable and/or toxic gases,

(c) formation of corrosive liquids,

(d) formation of unstable substances.

(7) The requirements of marg. 8 and 802 shall be complied with.

(8) If wooden or fibreboard are used, a package shall not weigh more than 100 kg.

4. Marking and danger labels on packages (see Appendix IX)

Marking

812 (1) Each package shall be clearly and durably marked with the identification number of the goods to be entered in the consignment note, preceded by the letters 'UN'.

812 Danger labels
(cont'd)

(2) Packages containing substances or articles of Class 8 shall bear a label conforming to model No 8.

(3) Packages containing substances of items 32 (b)2., 33 (a), 35(b)2., 37, 54, 64 (b) and 68 shall also bear a label conforming to model No 3.

(4) Packages containing substances of items 44 (a) and 45 (b)2. shall also bear labels conforming to models Nos 3 and 6.1.

(5) Packages containing substances of items 67 shall also bear a label conforming to model No 4.1.

(6) Packages containing substances of items 69 and 70 shall also bear a label conforming to model No 4.2.

(7) Packages containing substances of items 71 and 72 shall also bear a label conforming to model No 4.3.

(8) Packages containing substances of items 3 (a), 4, 73 and 74 shall also bear a label conforming to model No 05.

(9) Packages containing substances of item 2 (a) 2. shall bear labels conforming to models Nos 05 and 6.1.

(10) Packages containing substances listed below shall also bear a label conforming to model No 6.1:

Item Number	Substance Identification Number	Substance
1 a)	1831	Sulphuric acid, fuming (oleum)
6		All substances
7		All substances
9 b)	1811	Potassium hydrogendifluoride (potassium bifluoride)
10 b	1732	Antimony pentafluoride
12 a)	2879	Selenium oxychloride
14		All substances
44 b)		All substances
45 (b)1 and 45 (c)	2818	Ammonium polysulphide solution
53 (b) and (c)	1761	Cupriethylenediamine solution
75		All substances
76		All substances

(11) Packages containing liquids in receptacles, the closures of which are not visible from the outside, as well as packages containing vented receptacles or vented receptacles without outer packaging, shall bear on two opposite sides a label conforming to model No 11.

B. Method of dispatch and restrictions on forwarding

813 With the exception of substances of items 6 and 14 and substances classified under (a) of each item, packages containing other substances of this Class may be sent as express parcels if they contain:

— substances classified under (b) of each item, up to 4 litres per package for liquids and 12 kg per package for solids;

— substances classified under (c) of each item, up to 12 litres per package for liquids and 24 kg per package for solids.

C. Particulars in the consignment note

814 The description of the goods in the consignment note shall conform to one of the substance identification numbers and one of the names printed *in italics* in marg. 801.

If the substance is not mentioned by name but is assigned to an n.o.s. entry, the description of the goods shall consist of thee substance identification number and the n.o.s. designation, followed by the chemical or technical name [1].The description of the goods shall be followed by *particulars of the Class, the item number completed if applicable, by group (a), (b) or (c) and the initials 'RID'*, e.g. *'8, item 1 (a)*, RID'. A cross shall be inserted in the appropriate box on the consignment note.

For the carriage of wastes [see marg. 3 (4)] the description of the goods shall be: 'Waste, containing ...', the component(s) which has/have been used for the classification of the waste under marg. 3 (3) to be entered under its/their chemical name(s), e.g. '*Waste, containing 1824 sodium hydroxide solution, 8, item 42 (b), RID'*.

For the carriage of solutions or mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

For the carriage of solutions and mixtures containing only one component subject to the requirements of this Directive, the words '*solution*' or '*mixture*' shall be added as part of the name in the consignement note [see marg. 3 (3)].

When a solid substance is handed over for carriage in the molten state, the description of the goods shall be completed by the word '*molten*', unless it is already included in the name.

When a marking in accordance with Appendix VIII is prescribed the description of the substance shall also be preceded by the *hazard identification number* in accordance with Appendix VIII.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

If a solution or mixture containing a named substance in accordance with marg. 800 (5) is not subject to the conditions of this Class, the consignor may enter in the consignment note '*Not goods of Class 8*'.

D. Transport equipment

1. Conditions relating to wagons and loading

(a) For packages

815 (1) Wagons intended to carry substances of items 2 (a)2, 3 (a), 4 (b), 73 and 74 shall be thoroughly cleaned before loading and in particular be free of all combustible debris (straw, hay, paper, etc.).

(2) With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

(3) Packages shall be so loaded in wagons that they cannot shift dangerously, overturn or fall. In addition, IBCs of type 31HZ2 shall only be carried in closed wagons.

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[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose.

815 *(cont'd)* (4) Thes use of readily combustible materials for stowing packages containing substances mentioned in (1) in wagons is prohibited.

(b) For carriage in bulk

816 (1) 1794 lead sulphate of item 1 (b), substances of item 13 (b) and 3244 solids containing a corrosive liquid of item 65 (b) and solids and mixtures (such as preparations and wastes) classified under (c) of the various items may be carried in bulk in sheeted open wagons or in movable-roof wagons. Wagons containing substances with identification number 3244 of item 65 (b) shall be leakproof, e.g. by means of a sufficiently stout inner lining.

(2) (a) Used batteries of item 81 (c) may be carried in bulk in specially equipped wagons.

(b) The load compartments of wagons shall be of steel resistant to the corrosive substances contained in the batteries. Less resistant steels may be used when there is a sufficiently great wall thickness or a plastics lining/layer resistant tot the corrosive substances. The design of the load compartments of wagons shall take account of any residual currents and impact from the batteries.

Note: Steel exhibiting a maximum rate of progressive reduction of 0,1 mm per year under the effects of the corrosive substances may be considered as resistant.

(c) The load compartments of wagons shall be constructed so as to ensure that no leakage of corrosive substances can occur during carriage. Open load compartments shall be covered. The cover shall be resistant to the corrosive substances.

(d) Before loading, the load compartments of wagons including their equipment shall be inspected for damage. Wagons with damaged load compartments shall not be loaded.

The load compartments of wagons shall not be loaded above the top of their walls.

(e) No batteries containing different substances and no other goods liable to react dangerously with each other shall be present in the load compartments of wagons [see marg. 811 (6)].

During carriage no dangerous residue of the corrosive substances contained in the batteries shall adhere to the surface of the load compartments of wagons.

(c) For small containers

817 (1) Packages containing substances of this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 820 shall also be applied to small containers.

(3) Lead sulphate of item 1 (b), substances of item 13 (b), solids containing a corrosive liquid with identification number 3244 of item 65 (b) and solids and mixtures (such as preparations and wastes) classified under (c) of the various items may also be carried in bulk in small containers of the closed type with complete walls and with a suitable lining. Small containers containing substances with identification number 3244 of item 65 (b) in bulk shall be leakproof or made leakproof, e.g. by means of a sufficiently stout inner lining.

(4) Used batteries of item 81 (c) may also be carried in bulk in small containers under the conditions in marg. 816 (2) (a) to (e). Small containers made of plastics material shall be able to withstand a drop test from 0,8 m fully loaded, flat on the bottom on to a hard surface at – 18 °C without breakage.

(5) The requirements of marg. 815 (1) and 824 shall also apply, by analogy, to carriage in small containers.

2. Marking and danger labels on wagons, tank wagons, tank-containers and small containers (see Appendix IX)

818 (1) Wagons, tank wagons and tank-containers containing substances of this Class shall bear on both sides a label conforming to model No 8.

(2) Wagons, tank wagons and tank-containers containing the substances listed in marg. 812 (3) to (10) shall bear on both sides labels in accordance with that marg.

(3) Small containers shall be labelled in accordance with marg. 812 (2) to (10).

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E. Prohibitions on mixed loading

820 Packages bearing a label conforming to model No 8 shall not be loaded in the same wagon together with packages bearing a label conforming to models Nos 1, 1.4, 1.5, 1.6 or 01. These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

821 Separate consignment notes shall be made out for consignments which may not be loaded together in the same wagon.

F. Empty pckagings

822 (1) Uncleaned empty packagings, including empty IBCs, empty tank wagons, empty tank-containers as well as empty wagons and empty small containers for carriage in bulk of item 91 shall be closed in the same manner and with the same degree of leakproofness as if they were full.

(2) Uncleaned empty packagings, including empty IBCs, empty tank wagons, empty tank-containers as well as empty wagons and empty small containers for carriage in bulk of item 91 shall bear the same danger labels as if they were full.

(3) The description in the consignment note shall conform to one of the names printed in italics in item 91, completed by '*8, item 91, RID*', e.g. '*Empty packaging, 8 item 91, RID*'.

A cross shall be inserted in the appropriate box on the consignment note.

In the case of uncleaned empty tank wagons, empty tank-containers, empty wagons and empty small containers for carriage in bulk, this description shall be completed by adding the words 'Last load' together with the hazard and substance identification number, the name and item and, if appropriate, group (a), (b) or (c) of the goods last loaded, e.g. '*Last load: 80 1830 sulphuric acid, item 1 (b)*'.

(4) With regard to keeping uncleaned empty packagings of item 91, bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

G. Other requirements

823 With regard to keeping packages bearing labels conforming to model No 6.1 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

824 If substances from packages bearing labels conforming to model No 6.1 have leaked and been spilled in a wagon, the wagon shall not be reused until after it has been thoroughly cleaned and, if necessary, decontaminated. All other goods and articles carried in such a wagon shall be examined for possible contamination.

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CLASS 9

MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

1. List of substances

900 (1) The heading of Class 9 covers substances and articles which, during carriage, present a danger not covered by the headings of other classes. Those substances and articles listed in marg. 901 are subject to the requirements set out in marg. 901 to 923 and are then considered as substances and articles of this Directive. [1].

(2) Substances and articles of Class 9 are subdivided as follows:

A. Substances which, on inhalation as fine dust, may endanger health;

B. Substances and apparatus which in the event of fire may form dioxins;

C. Substances evolving flammable vapours;

D. Lithium batteries;

E. Life-saving appliances;

F. Environmentally hazardous substances;

G. Elevated temperature substances;

H. Other substances presenting a hazard during carriage but not meeting the definitions of another Class;

I. Empty packagings.

Substances of Class 9 which are listed under the various items of marg. 901 shall be assigned to one of the following groups according to their degree of danger:

(b) dangerous substances;

(c) substances presenting a minor danger.

Note: For the classification of solutions and mixtures (such as preparations and wastes), see also marg. 3 (3)

(3) 1845 carbon dioxide, solid (dry ice), 2071 ammonium nitrate fertilizers, 2216 fisch meal (fish scrap), stabilized, 2807 magnetized material, 3166 engines, internal combustion, including when fitted in machinery or vehicles and 3171 battery-powered vehicle or battery-powered equipment (wet battery), identification numbers assigned in the United Nations Recommendations on the Transport of Dangerous Goods, are not subject to the requirements of this Directive.

A. Substances which, on inhalation as fine dust, may endanger health

901 1. Asbestos and mixtures containing asbestos, such as:

(b) *2212 blue asbestos* (crocidolite)
2212 brown asbestos (amosite or mysorite);

(c) *2590 white asbestos* (chrysolite, actinolite, anthophyllite or tremolite).

Note: Talc containing tremolite and/or actinolite is a substance of item 1 (c), identification No 2590.

[1] For the quantities of substances or articles listed in marg. 901 whic are not subject to the requirements of Section 2 'Conditions of Carriage', see marg. 901a.

901 (cont'd)

B. Substances and apparatus which in the event of fire may form dioxins

2. Polychlorinated Biphenyls (PCBs) and polychlorinated terphenyls (PCTs) and polyhalogenated biphenyls and terphenyls, and mixtures containing these substances:

(b) *2315 polychlorinated biphenyls*
3151 polyhalogenated biphenyls, liquid or
3151 polyhalogenated terphenyls, liquid
3152 polyhalogenated biphenyls, solid or
3152 polyhalogenated terphenyls, solid.

Note: Mixtures with a PCB or PCT content of not more than 50 mg/kg are not subject to the requirements of this Directive.

3. *Apparatus* such as transformers, condensers and hydraulic apparatus, *containing substances of item 2(b)* or *mixtures thereof*.

Note: Special packing conditions are applicable to these articles (see marg. 905).

C. Substances evolving flammable vapours

4. Polymers containing flammable liquids having a flash-point of 55 °C or less:

(c) *2211 polymeric beads, expandable*, evolving flammable vapour.
3314 plastics moulding compound, in dough, sheet or extruded rope form evolving flammable vapour.

Note: Polymeric beads and polymers for moulding may be made from polystyrene, poly (methyl methacrylate) or other polymeric material.

D. Lithium batteries

Note: Special packing conditions are applicable to these articles (see marg. 906).

5. *3090 lithium batteries*
3091 lithium batteries contained in equipment or
3091 lithium batteries packed with equipment.

Note: 1. Each cell shall not contain more than 12 g of lithium or lithium alloy. The quantity of lithium or lithium alloy contained in each battery shall not be more than 500 g. With the approval of the competent authority of the country of origin, the quantity of lithium or lithium alloy in each cell may be raised to 60 g and a package may contain up to 2 500 g of lithium or lithium alloy; the competent authority shall determine the conditions of carriage as well as the type and duration of the test. If the country of origin is not a Member State, the approval shall be recognized by the competent authority of the first COTIF Contracting State reached by the consignment.

2. Cells and batteries shall be equipped with an effective means of preventing external short circuits. Each cell and battery shall incorporate a safety venting device or be designed in such a manner that will preclude a violent rupture under normal conditions of carriage. Batteries containing cells or series of cells connected in parallel shall be equipped with diodes to prevent reverse current flow. Cells or batteries containing in equipment shall be protected against short circuits and be held securely in place.

3. Cells and batteries shall be so designed and constructed that they are capable of meeting the following tests:

(a) ten cells and one battery of each type taken from production each week shall be subjected to the tests of extreme temperature exposure and the short circuit test procedures in Part 3, Section 38.3 of the Manual of Tests and Criteria or, subject to competent authority approval, equivalent tests. There shall be no evidences of distortion, leakage or internal heating in conducting the extreme temperature exposure test. In conducting the short circuit test procedure, if venting occurs, an open flame applied to venting fames shall not produce an explosive condition; and

901 *(cont'd)*

(b) cells and batteries shall be exempted from sub-paragraph (a) above if they are hermetically closed provided that, prior to the first consignment, ten cells or four batteries of each type to be offered for carriage are subjected in sequence to the altitude simulation, extreme temperature exposure, vibration, and shock test procedures as described in Part 3, Section 38.3 of the Manual of Tests and Criteria, or equivalent tests approved by the competent authority, with no visible evidence of outgassing, leakage, loss of mass or distortion.

4. Cells contained in equipment shall not be capable of being discharged during carriage to the extent that the open circuit voltage falls below two volts or two thirds of the voltage of the undischarged cell, whichever is the lower.

5. Articles of item 5 which do not meet these conditions are not to be accepted for carriage.

E. Life-saving appliances

Note: Special packing conditions are applicable to articles of items 6 and 7 (see marg. 907).

6. *2990 life-saving appliances, self-inflating,* such as aircraft evacuation chutes, aircraft survival kits and maritime life-saving appliances.

Note: These appliances present a hazard if the self-inflating device is activated during carriage, and may also include one or more of the following substances or articles of this Directive as equipment:

signal devices of Class 1, such as smoke and illumination signal flares;

non-flammable, non-toxic gases of Class 2;

flammable substances of Classes 3 or 4.1;

organic peroxides of Class 5.2, as components of repair kits;

electric storage batteries of Class 8.

7. *3072 life-saving appliances, not self-inflating*, including one or more of the following substances of this Directive as equipment:

signal devices of Class 1, such as smoke and illumination signal flares;

non-flammable, non-toxic gases of Class 2;

flammable substances of Classes 3 or 4.1;

organic peroxides of Class 5.2, as components of repair kits;

electric storage batteries of Class 8.

8. Motor vehicle components

(c) *3268 air bag inflators,*
3268 air bag modules or
3268 seat-belt pre-tensioners.

Note: 1. This item applies to articles which may be classified in Class 1 in accordance with marg. 100(2)(b), which are used as life-saving vehicle air bags or seat-belts, when carried as component parts and when the 'air bag inflators', 'seat-belt pre-tensioners' or 'air bag modules' packaged as for carriage have been tested in accordance with test series 6(c) of Part I of the Manual of Tests and Criteria Part I, Chapter 16, with no explosion of the device, no fragmentation of device castings, and no projection hazard or thermal effect, which would significantly hinder firefighting or other emergency response efforts in the immediate vicinity.

2. Such air bags or seat-bealts installed in vehicles or in completed vehicle components such as steering columns, door panels, etc. are not subject to the requirements of this Directive.

901 *(cont'd)*

F. Environmentally hazardous substances

Note: Assignment of a substance to items 11 or 12 shall be as indicated in Appendix III, section C, marg. 1320 to 1326.

11. Liquid substances pollutant to the aquatic environment and solutions and mixtures of such substances (such as preparations and wastes), which cannot be classified in the other classes, or in items 1 to 8, 13, 14, 20, 33 and 34 of this Class.

(c) *3082 Environmentally hazardous substance, liquid, n.o.s.*, such as:

alcohol C_6-C_{17} (secondary) poly (3-6) ethoxylate
alcohol C_{12}-C_{15} poly (1-3) ethoxylate
alcohol C_{13}-C_{15} poly (1-6) ethoxylate
alpha-cypermethrin
butyl benzyl phthalate
chlorinated paraffins (C_{10}-C_{13})
1-chlorooctane
cresyl diphenyl phosphate
cyfluthrin
decyl acrylate
di-n-butyl phthalate
1,6-dichlorohexane
diisopropylbenzenes
isodecyl acrylate
isodecyl diphenyl phosphate
isooctyl nitrate
malathion
resmethrin
triaryl phosphates
tricresyl phosphates
triethylbenzene
trixylenyl phosphate.

12. Solid substances pollutant to the aquatic environment and mixtures of such substances (such as preparations and wastes) which cannot be classified in the other classes, or in items 1 to 8, 13, 14, 21, 31, 32 and 35 of this Class.

(c) *3077 Environmentally hazardous substance, solid, n.o.s.*, such as:

chlorhexidine
chlorinated paraffins (C_{10}-C_{13})
p-dichlorobenzene
diphenyl
diphenyl ether
fenbutatin oxide
mercurous chloride (calomel)
tributyltin phosphate
zinc bromide.

13. Genetically modified micro-organisms.

Note: 1. Genetically modified micro-organisms in which the genetic material has been deliberately altered by technical means or by such means that cannot occur naturally.

2. Genetically modified micro-organisms which are infectious are substances of Class 6.2 (see marg. 651, items 1 to 3, identification numbers 2814 and 2900).

3. Genetically modified micro-organisms within the meaning of these items are those which are not dangerous for humans and animals, but which could alter animals, plants, microbiological substances and ecosystems in such a way as cannot occur naturally.

901 *(cont'd)*

(b) *3245 Genetically modified micro-organisms*

Note: 1. Genetically modified micro-organisms which have received a consent for deliberate release into the environment [1] are not subject to the requirements of this Class.

2. For the purposes of the packaging requirements of marg. 903, substances and mixtures of substances are deemed to be solids if they do not contain free liquid at a temperature less than 45 °C.

3. Live vertebrate or invertebrate animals shall not be used to carry substances classified under this item unless the substance can be carried in no other way.

14. Genetically modified organisms

Note: Genetically modified organisms, which are known or suspected to be dangerous to the environment shall be carried in accordance with conditions specified by the competent authority of the country of origin.

G. Elevated temperature substances

Note: Special packing conditions are applicable to these substances (see marg. 909).

20. Substances which are carried or handed over for carriage in the liquid state at or above 100 ° and, for a substance with a flash-point, below their flash-point.

(c) *3257 elevated temperature liquid, n.o.s.* at or above 100 °C and, for a substance with a flash-point, below its flash-point (including molten metals, molten salts, etc.).

Note: 1. This item shall only be used when the substance does not meet the criteria of any other Class.

2. 3256 elevated temperature liquid, flammable, n.o.s. with a flash-point above 61 °C, at or above its flash-point is a substance of Class 3 [see marg. 301, item 61(c)].

21. Solids which are carried or handed over for carriage at or above 240 °C.

(c) *3258 elevated temperature solid, n.o.s.* at or above 240 °C

Note: This item shall only be used when the substance does not meet the criteria of any other Class.

H. Other substances presenting a hazard during carriage but not meeting the definitions of another Class

31. Solid ammonia compound having a flash-point below 61 °C:

(c) *1841 acetaldehyde ammonia*

32. Low hazard dithionite:

(c) *1931 zinc dithionite*

Note: Dithionites in spontaneously combustible form are substances of Class 4.2 [see marg. 431, item 13(b)].

33. Highly volatile liquid:

(c) *1941 dibromodifluoromethane*

34. Substances emitting noxious fumes:

(c) *1990 benzaldehyde*

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[1] See in particular Part C of Directive 90/220/EEC (Official Journal of the European Community, L 117 of 8 May 1990, pages 18 to 20), which sets out the authorization procedures for the European Community.

901 *(cont'd)*

35. Substances containing allergens:

Note: Substances which have undergone sufficient heat treatment so that they present no danger during carriage are not subject to the requirements of this Directive.

(b) *2969 castor beans* or
2969 castor meal or
2969 castor pomace or
2969 castor flake.

36. Chemical kits and first aid kits.

(b) *3316 chemical kit* or
3316 first aid kit

(c) *3316 chemical kit* or
3316 first aid kit

Note: The entry 3316 chemical kit or 3316 first aid kit includes boxes, cases, etc. containing small quantities of various dangerous goods which are used for medical, analytical or testing purposes.

Such kits may not contain dangerous goods of Class 1, Class 2 (with the exception of aerosols) assigned to groups O, F, T, TF, TC, TO, TFC, or TOC, Class 4.1, items 21 to 40, Class 4.2, Class 5.1, item 5, Class 6.1, items 1 to 5, Class 6.2, Class 7, Class 8, items 6 and 14, or any other substance classified under (a) of whatever item number or Class.

Components of kits shall not react dangerously with each other [see marg. 911(4)]. Dangerous goods in kits shall be packed in inner packagings which shall not exceed either 250 ml or 250 g and shall be protected from other materials in the kit. The total quantity of dangerous goods in any one kit shall not exceed either 1 litre or 1 kg. The maximum total quantity of dangerous goods in any outer packaging shall not exceed 10 kg. The packing group assigned to the kit as a whole shall be the most stringent packing group assigned to any individual substance in the kit.

Kit shall be packed in packagings which meet the requirements appropiate to the packing group assigned to the kit as a whole. Kits which are carried on board wagons for first-aid or operating purposes are not subject to the requirements of this Directive.

I. Empty packagings

Note: 1. Empty packagings with residues from their previous contents adhering to the outside are not to be accepted for carriage.

2. Uncleaned empty containment vessels for apparatus under item 3 are not to be accepted for carriage.

71. *Empty packagings*, including *empty intermediate bulk containers (IBCs)*, *empty tank wagons* and *empty tank-containers*, uncleaned, having contained substances of items 1, 2, 4, 11, 12, 20, 21 and 31 to 35 of Class 9.

Note: Uncleaned, empty packagings, including empty intermediate bulk (IBCs), which have contained substances of this Class are not subject to the requirements of this Directive if adequate measures have been taken to nullify any hazards. Hazards are nullified if adequate measures have been taken to nullify all hazards of Classes 1-9.

901a (1) Substances classified under (b) or (c) items 1, 2, 4, 11, 12, 31, 32, 33 and 34 carried in conformity with the following provisions, with the exception of those provided for in paragraph (2), are not subject to the requirements of Section 2, 'Conditions of Carriage':

(a) Substances classified under letter (b) of eacht item:

— Liquids: not more than 500 ml per inner packaging and not more than 2 litres per package;

— Solids: not more than 1 kg per inner packaging and not more than 4 kg per package.

(b) Substances classified under letter (c) of each item:

— Liquids: not more than 3 litres per inner packaging and not more than 12 litres per package;

— Solids: not more than 6 kg per inner packaging and not more than 24 kg per package.

These quantities of substances shall be carried in combination packagings conforming at least to the conditions of marg. 1538.

These quantities of substances contained in metal or plastics inner packagings may also be carried in shrink-wrapped or stretch-wrapped trays used as outer packagings provided that the maximum mass per package is not exceeded and the total gross mass of the package does not exceed 20 kg in any case.

The 'General conditions of packing' of marg. 1500 (1), (2) and (5) to (7) shall be observed.

(2) For carriage in accordance with paragraph (1) above, the description of the goods in the consignment note shall conform to the requirements of marg. 914 and include the words '*limited quantity*'. Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

(3) The following substances and articles of item 1 are furthermore not subject to the requirements of Section 2 'Conditions of Carriage':

(a) asbestos so immersed or fixed in natural or artificial binder material (such as cement, plastics, asphalt, resins or mineral ore) that no escape of hazardous quantities of respirable asbestos fibres can occur during carriage;

(b) finished products containing asbestos when they are so packed that no escape of hazardous quantities of respirable asbestos fibres can occur during carriage.

(4) Apparatus of item 3, containing liquids of item 2 (b), not more than 500 ml per apparatus and not more than 2 litres per package, is not subject to the requirements of Section 2, 'Conditions of Carriage'. The apparatus shall, however, be packed in conformity with marg. 905 (1) (a), and the description of the goods in the consignment note shall conform to the requirements of marg. 914 and include the words '*limited quantity*'.

Each package shall be clearly and durably marked with the identification number of the goods shown in the consignment note, preceded by the letters 'UN'.

(5) Lithium cells and batteries of item 5 packed alone or with equipment conforming to the following requirements, and equipment containing only such cells or batteries, are not subject to the requirements of Section 2, 'Conditions of Carriage':

(a) each cell with a liquid cathode contains not more than 0,5 g of lithium or lithium alloy and each cell with a solid cathode contains not more than 1 g of lithium or lithium alloy;

(b) each battery with a solid cathode contains not more than aggregate quantity of 2 g of lithium or lithium alloy and each battery with a liquid cathode contains not more than an aggregate quantity of 1 g of lithium or lithium alloy;

(c) each cell or battery containing a liquid cathode is hermetically sealed;

(d) cells are separated so as to prevent short circuits;

(e) batteries are separated so as to prevent short circuits and are packed in strong packagings, except when installed in electronic devices;

901a *(cont'd)*

(f) if a liquid cathode battery contains more than 0,5 g of lithium or lithium alloy, or a solid cathode battery contains more than 1 g of lithium or lithium alloy, it does not contain a liquid or gas which is considered dangerous unless the liquid or gas, if free, would be completely absorbed or neutralized by other materials in the battery.

Lithium cells and batteries conforming to the following requirements may also be considered as not subject to the requirements of Sections 2, 'Conditions of Carriage':

(g) each cell contains not more than 5 g of lithium or lithium alloy;

(h) each battery contains not more than 25 g of lithium or lithium alloy;

(i) each cell or battery is of a type proved to be no subject to the requirements of this Directive, in view of the result obtained in the tests described in Part 3, Section 38.3 of the Manual of Tests and Criteria. These tests shall be carried out on each type prior to its presentation for carriage for the first time under these conditions, and

(j) the cells and batteries are designed or packed in such a way as to prevent short circuits under normal conditions of carriage.

2. Conditions of carriage

(The conditions of carriage for empty packagings are included under F.)

A. Packages

1. General conditions of packing

902 (1) Packaging shall satisfy the requirements of Appendix V, unless special conditions for the packing of certain substances are prescribed in Section A.2.

(2) Intermediate bulk containers (IBCs) shall meet the conditions of Appendix VI.

(3) In accordance with the provisions of marg. 900(2) and 1511(2) or 1611(2), the following shall be used:

— packagings of packing groups II or I, marked with the letter 'Y' or 'X', or IBCs of packing group II, marked with the letter 'Y', for the dangerous substances classified under (b) of each item;

— packagings of packing groups III, II or I, marked with the letter 'Z', 'Y' or 'X' or IBCs of packing groups III or II, marked with the letter 'Z' or 'Y', for the less dangerous substances classified under (c) of each item.

Note: For the carriage of substances of Class 9 in tank wagons, see Appendix XI, in tank-containers, see Appendix X. For carriage in bulk, see marg. 916.

2. Special conditions of packing

903 (1) Substances classified under (b) of the various items of marg. 901 shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminiums drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

(d) plastics drums or plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1537, or

903 *(cont'd)*

(f) combination packagings conforming to marg. 1538.

(g) metal IBCs conforming to marg. 1622 or rigid plastics IBCs conforming to marg. 1624 or composite IBCs with a rigid plastics inner receptacle conforming to marg. 1625.

Note to (a), (b), (c) and (d): Simplified conditions are applicable to removable head drums and jerricans for viscous substances having a viscosity of more than 200 mm^2/s at 23 °C and for solids (see marg. 1512, 1553, 1554 and 1561).

(2) Solid substances with a melting-point above 45 °C may also be packed in:

(a) drums conforming to marg. 1523 for plywood or 1525 for fibreboard, if necessary with one or more sift-proof inner bags, or

(b) water-resistant bags conforming to marg. 1533 for textile material, 1534 for woven plastics material, 1535 for plastic film or 1536 for water-resistant paper, provided the goods are dispatched as a full load or the bags are secured on pallets;

(c) composite IBCs with a flexible plastic inner receptacle conforming to marg. 1625, fibreboard IBCs conforming to marg. 1626 or wooden IBCs conforming to marg. 1627, or

(d) flexible IBCs conforming to marg. 1623 with the exception of IBCs of types 13H1, 13L1 and 13M1, provided that the goods are carried as a full wagon load or the flexible IBCs are loaded on pallets.

904 (1) Substances classified under (c) of the various items of marg. 901 shall be packed in:

(a) steel drums conforming to marg. 1520, or

(b) aluminiums drums conforming to marg. 1521, or

(c) steel or aluminium jerricans conforming to marg. 1522, or

(d) plastics drums or plastics jerricans conforming to marg. 1526, or

(e) composite packagings (plastics material) conforming to marg. 1637, or

(f) combination packagings conforming to marg. 1538, or

(g) composite packagings (glass, porcelain or stoneware) conforming to marg. 1539, or

(h) light gauge metal packagings conforming to marg. 1540, or

(i) metal IBCs conforming to marg. 1622 or rigid plastics IBCs conforming to marg. 1624 or composite IBCs conforming to marg. 1625.

Note to (a), (b), (c), (d) and (h): Simplified conditions are applicable to removable head drums, jerricans and light gauge metal packagings for viscous substances having a viscosity of more than 200 mm^2/s at 23 °C and for solids (see marg. 1512, 1522 to 1554 and 1561).

(2) Solid substances with a melting-point above 45 °C may also be packed in:

(a) drums conforming to marg. 1523 for plywood or 1525 for fibreboard, if necessary with one or more sift-proof inner bags, or

(b) water-resistant bags conforming to marg. 1533 for textile material, 1534 for woven plastics material, 1535 for plastics film or 1536 for water-resistant paper;

904 *(cont'd)*

(c) flexible IBCs conforming to marg. 1623 or fireboard IBCs conforming to marg. 1626 or wooden IBCs conforming to marg. 1627.

Note: IBCs conforming to marg. 1626 containing substances of item 4 (c) and carried as a full wagon load need only meet the requirements of marg. 1621 (1) to (3), (5) and (6).

(3) Substances of item 4 (c) may also be packed in tightly-closed leakproof packagings which need only meet the requirements of marg. 100 (1), (2) and (5) to (7).

(4) Articles of item 8(c) shall be packed in combination packagings conforming to marg. 1538 and to design type tested and approved for packing group III.

Articles of item 8 (c) may also be directly packed into outer packagings listed in marg. 1538(b) and tested at the packing group III level.

Note: 3268 Airbag inflators or 3268 airbag modules or 3628 seat-belt pre-tensioners may be carried unpackaged in dedicated handling devices or in specially equipped wagons or large containers when they are carried from where they are manufactured to an assembly plant.

905

(1) Apparatus of item 3 shall be packed in:

(a) leakproof packagings, or

(b) leakproof containers.

(2) Apparatus of item 3 may also be carried in leakproof receptacles (containment vessels) which shall be able to hold, in addition to the apparatus, at least 1,25 times the substances of item 2 (b) present in the apparatus. There shall be sufficient inert material in the receptacles to absorb at least 1,1 times the substances of item 2 (b) which are contained in the apparatus. The apparatus and the receptacles shall be so designed as to avoid any leak of liquid under normal conditions of carriage.

906

(1) Articles of item 5 shall be packed in:

(a) boxes conforming to marg. 1527 for natural wood, 1528 for plywood or 1530 for fibreboard, or

(b) removable head drums conforming to marg. 1523 for plywood, 1525 for fibre or 1526 for plastics, removable head, or

(c) combination packagings with inner packagings of fibreboard and outer packaging of steel or aluminium conforming to marg. 1538. The inner packagings shall be separated from each other and from the inner surfaces of the outer packagings using non-combustible cushioning material of at least 25 mm thickness. This requirement is not, however, applicable to cells or batteries of a type conforming to the requirements of marg. 901, item 5, Note 3(b).

The combination packagings shall conform to a design type which has been tested and approved, in accordance with Appendix V, for packing group II. This requirement is not, however, applicable to cells or batteries of a type conforming to the requirements of marg. 901, item 5, Note 3(b). No single packaging or inner packaging of a combination packaging shall contain more than 500 g of lithium or lithium alloy (see, however, marg. 901, item 5, Note 1),

(2) Lithium batteries of items 5 shall be packed and be securely stowed so as to prevent movement which could lead to short circuits.

(3) Used lithium cells and batteries shall be accepted for carriage under the conditions prescribed in paragraphs (1) and (2) above. Non-approved packagings shall, however, be permitted provided that:

— they meet the 'General packing conditions' of marg. 1500(1), (2), (5) and (6);

— the cells and batteries are packed and stowed so as to prevent any risk of short circuits;

— the packages weigh not more than 30 kg.

(4) If the lithium cells or batteries are packed with equipment, they shall be placed in fibreboard inner packagings conforming to the conditions of packing group II. If the lithium cells or batteries are carried in equipment, such equipment shall be packed in strong outer packagings so as to prevent accidental operation during carriage.

907 (1) Life-saving appliances of item 6 shall be packed, individually, in strong outer packagings.

(2) Substances and articles of this Directive contained within life-saving appliances of item 6 or 7 as equipment shall be packed in inner packagings. These inner packagings shall be so stowed as to prevent any movement within the appliances.

(3) Non-flammable, non-toxic gases of Class 2 shall be contained in cylinders conforming to marg. 202 which may be connected to the life-saving the appliance.

(4) Signal devices of Class 1 shall be packed in plastics or fibreboard inner packagings.

(5) Strike-anywhere matches of Class 4.1 (marg. 401, item 2 (c), No 1331) shall be packed in inner packagings to prevent any movement.

908 (1) If substances of item 13 are carried in deeply refrigerated liquid nitrogen, the inner packagings shall conform to the requirements of this Class and teh receptacles for the nitrogen shall satisfy the requirements of Class 2.

(2) Live animals in accordance with the relevant regulations for the carriage of animals [1]

909 (1) Substances of item 20 may only be carried in tank wagons (see Appendix XI), in tank-containers (see Appendix X) or in special wagons [see marg. 916(2)]

(2) Substances of item 21 shall be carried in accordance with standards specified by the competent authority of the first COTIF Contracting State reached by the consignement. If the country of origin is not a member State, the conditions laid down shall be recognized by the competent authority of the first COTIF Contracting State reached by the consignment.

910

3. Mixed packing

911 (1) Substances covered by the same item number may be packed together in a combination packaging conforming to marg. 1538.

(2) Substances of different items of Class 9, except substances of items 13, 20 and 21, in quantities not exceeding, per inner packaging, 3 litres for liquids and/or 5 kg for solids, may be packed together and/or with goods no subject to the requirements of this Directive, in a combination packaging conforming to marg. 1538.

(3) Substances of Class 9, except substances of items 13, 20 and 21, in quantities not exceeding, per inner packaging, 3 litres for liquids and/or 5 kg for solids, may be packed together in a combination packaging conforming to marg. 1538 with substances or articles of other classes — provided that mixed packing is also permitted for the substances and articles of these classes, and/or with goods which are not subject to the requirements of this Directive, provided they do not react dangerously with one another.

(4) The following are considered dangerous reactions:

(a) combustion and/or giving off considerable heat;

(b) emission of flammable and/or toxic gases;

(c) formation of corrosive liquids;

(d) formation of unstable substances;

(5) Substances of item 13 shall not be packed together in a combination packaging conforming to marg. 1538 with other goods. This shall not apply to substances added as coolants, e.g., ice, dry ice or deeply refrigerated liquid nitrogen.

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[1] Such regulations are contained in e.g. Directive 91/628/EEC (Official Journal of the European Community, L 340 of 11 December 1991, p. 17) and in Recommandations of the Council of Europe (Ministerial Committees) on the carriage of certain animal species.

911 *(cont'd)*

(6) The requirements of marg. 8 and 902 shall be observed.

(7) If wooden or fibreboard boxes are used, a package shall not weigh more than 100 kg.

4. Marking and danger labels on packages (see Appendix IX)

Marking

912

(1) Each package, except those containing substances of item 14, shall be clearly and durably marked with the identification number of the goods to be entered in the consignment note, preceded by the letters 'UN'.

(2) Packagings containing substances of item 4 (c) shall bear the following marking: 'Keep away from any source of ignition'. This marking shall be in an official language of the country of origin, and in addition, if this language is not French, German, Italian or English, in French, German, Italian or English, unless the international tariffs or agreements concluded between the railway administrations provided otherwise.

(3) Packages containing used cells or batteries of item 5, in unmarked packagings, shall bear the inscription: 'Used lithium cells'.

Danger labels

(4) Packages containing substances or articles of this Class, with the exception of substances of item 4 (c), shall bear a label conforming to model No 9.

(5) Packages containing substances of item 2 (b) having a flash-point up to and including 61 °C shall, in addition, bear a label conforming to model No 3.

(6) Packages containing articles of item 6 or 7 need only bear a label conforming to model No 9 if the article is fully enclosed by packaging, crates or other means that prevent the ready identification of the article.

(7) Packages containing substances of item 13 carried in deeply refrigerated liquid nitrogen shall also bear a label conforming to model No 2.

(8) Packages containing liquids in receptacles the closures of which are not visible from the outside shall bear on two opposite sides a label conforming to model No 11.

B. Method of dispatch and restrictions on forwarding

913

(1) Substances of items 13 and 14 which are to be carried at a specific ambient temperature shall only be carried as a full wagon load. The conditions of carriage shall be agreed between the railway and the consignor. Substances of item 20 may be carried only in tank wagons (see Appendix XI) and in tank containers (see Appendix X) and substances of item 21 only in conformity with standards specified by the competent authority [see marg. 902(2)].

(2) Packages containing substances and articles of this Class except substances mentioned in paragraph (1) may be forwarded as express parcels, if they contain:

— substances classified under (b) of each item, up to 2 litres per package for liquids and up to 4 kg per package for solids;

— substances classified under (c) for each item, up to 12 litres per package for liquids and up to 24 kg per package for solids.

(3) Packages containing articles of items 5 to 8 may also be sent as express parcels. In such cases, a package shall not weigh more than 40 kg.

C. Particulars in the consignment note

914 (1) The description of the goods in the consignment note shall conform to one of the identification numbers except substances of item 14 and one of the names printed in italics in marg. 901.

If the substance is not mentioned by name, but is assigned to an n.o.s entry, the description of the goods shall consist of the identification number and the n.o.s designation, followed by the chemical or technical [1] name of the substance, and for substances of item 13, in the biological name of the substance [1].

A cross shall be inserted in the appropriate box on the consignment note.

The description of the goods shall be followed by *particulars of the Class, the item number (together with the group, if any) an the initials 'RID', e.g. 9, item 1 (b), RID.*

For the carriage of wastes [see marg. 3 (4)], the description of the goods shall be: '*Waste, containing...*', the component(s) which has/have been used for the classification of the waste under marg. 3 (3) to be entered under its/their chemical name(s), e.g. '*Waste containing 2212 brown asbestos, 9, item 1 (b), RID*'.

For the carriage of solutions and mixtures (such as preparations and wastes) containing several components subject to the requirements of this Directive, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

For the carriage of solutions and mixtures containing only one component subject to the requirements of this Directive, the words *solution* or *mixture* shall be added as part of the name in the consignment note [see marg. 3 (3)].

When a solid substance is handed over for carriage in the molten state, the description of the substance shall also be completed by the word '*molten*', unless it is already included in the name.

When a marking in accordance with Appendix VIII is prescribed, the description of the substance shall also be preceded by the *hazard identification number* in accordance with Appendix VIII.

The *hazard identification number* shall also be shown when full wagon loads made up of packages containing one and the same substance bear a marking in accordance with Appendix VIII.

(2) For the carriage of articles of item 5 with the approval of the competent authority, a copy of the approval with the conditions of carriage (see Note 1 to item 5, marg. 901) shall be attached to the consignment note. This approval shall be drawn up in an official language of the country of origin and also, if that language is not French, German, Italian or English, in French, German, Italian or English, unless the international tariffs or agreements concluded between the railway administrations provide otherwise.

D. Transport equipment

1. Conditions relating to wagons and their loading

a. For packages

915 (1) Packages containing substances of this Class shall be carried in covered or sheeted open wagons.

(2) With regard to keeping packages bearing labels conforming to model No 9 containing substances of items 1, 2, 3 or 13 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

(3) Packages shall be so loaded in wagons that they cannot shift dangerously, overturn or fall.

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[1] The technical or biological name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. In the case of pesticides, the name to be entered should be that given in Standard ISO 1750:1981 if listed.

915 (cont'd)

(4) Packages containing substances of item 13 shall be stowed in such a way as to be readily accessible.

(5) Wagons which have contained substances of Class 9 as full wagon loads, shall be checked, after unloading, for any residues of the load (see also marg. 923).

b. For carriage in bulk

916

(1) Substances of items 31, 32 and 35 and 2211 polymeric beads, expandable of item 4, and solids and mixtures (such as preparations and wastes) of item 12 may be carried in bulk, in sheeted open wagons or in movable roof wagons. Wagons for 2211 polymeric beads, expandable of item 4 shall have sufficient ventilation.

(2) Substances of item 20 for which carriage in tank wagons in accordance with Appendix XI or in tank-containers in accordance with Appendix X is inappropriate, because of the elevated temperature and the density of the substance, may be carried in special wagons.

Substances of item 21 (c) may be carried in bulk in specially equipped wagons.

Special wagons for substances of item 20 (c) and specially equipped wagons for substances of item 21 (c) shall be in accordance with standards specified by the competent authority of the country of origin.

If the country of origin is not a Member State, the conditions laid down shall be recognized by the competent authority of the first COTIF Contracting State reached by the consignment.

c. For carriage in small containers

917

(1) Packages containing substances or articles of this Class may be carried in small containers.

(2) The prohibition of mixed loading laid down in marg. 919 shall also be observed inside small containers.

(3) Small containers containing 2211 polymeric beads, expandable of item 4 shall bear the following marking: 'Keep away from sources of ignition'. This marking shall be in an official language of the country of origin, and in addition if that language is not French, German, Italian or English, in French, German, Italian or English, unless the international tariffs or agreements concluded between the railway administrations provide otherwise.

(4) The requirements of marg. 915 (5) and 923 are also applicable, by analogy, to carriage in small containers.

2. Marking and danger labels on wagons, tank wagons, tank-containers and small containers (see Appendix IX)

918

(1) Wagons, tank wagons and tank-containers carrying substances or articles of Class 9 except substances of item 4 (c) shall bear on both sides a label conforming to model No 9.

(2) Wagons, tank wagons and tank-containers carrying substances of item 2 (b) with a flash-point of 61 °C or below shall in addition bear on both sides a label conforming to model No 3.

(3) Small containers shall be labelled in accordance with marg. 912 (4) and (5).

(4) Special wagons carrying substances of item 20 and specially equipped wagons carrying substances of item 21 shall also bear on both sides the mark shown in Appendix IX, marg. 1910.

919

E. Prohibition of mixed loading

920 Packages bearing a label conforming to model No 9 shall not be loaded in the same wagon together with packages bearing a label conforming to model Nos. 1, 1.4, 1.5, 1.6 or 01. These requirements shall not apply to packages bearing a label conforming to model No 1.4, compatibility group S.

921 Separate consignment notes shall be made out for consignments which may not be loaded together in the same wagon.

F. Empty packagings

922 (1) If the empty packagings, uncleaned, of item 71 are bags, these shall be placed in boxes or waterproof bags to prevent any leakage of the substance.

(2) Other empty packagings, including empty intermediate bulk containers (IBCs), tank wagons and tank-containers, uncleaned, of item 71 shall be closed in the same way and present the same degree of leakproofness as if they were full.

(3) Empty packagings, including empty intermediate bulk containers (IBCs), tank wagons and tank-containers, uncleaned, of item 71 shall bear the same danger labels as if they were full.

(4) With regard to keeping empty packagings, uncleaned, of item 71, bearing labels conforming to model No 9, which have contained substances of items 1, 2, 3 or 13, apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

(5) The description in the consignment note shall conform to one of the names printed *in italics* in item 71, completed by '*9, item 71, RID*' e.g. '*Empty packaging, 9, item 71, RID*'.

A cross shall be inserted in the appropriate box on the consignment note.

For empty tank wagons or tank-containers and empty wagons for carriage in bulk, uncleaned, this description shall be completed by adding the words 'Last load' together with the hazard and substance identification number, the name and item number of the goods last loaded and, if appropriate, group (b) or (c) e.g. *Last load: 90 2315 polychlorinated biphenyls, item 2 (b)*.

G. Other requirements

923 With regard to keeping packages bearing a label conforming to model No 9 containing substances of items 1, 2, 3 or 13 apart from foodstuffs, other articles of consumption and animal feedstuffs, see marg. 11 (3).

924 (1) If any substances or articles of items 1, 2, 3, 11 or 12 have leaked and been spilled in a wagon, the latter may not be re-used until after it has been thoroughly cleaned, and, if necessary, decontaminated. Any other goods and articles which were carried in the same wagon shall be examined for possible contamination.

(2) If a substance of item 13 has leaked and been spilled in a wagon, the wagon shall not be re-used until after it has been thoroughly cleaned and, if necessary, disinfected. All other goods and articles carried in such a wagon shall be examined for possible contamination. Parts of the wagon made of wood which have come into contact with substances of item 13 shall be removed and burnt.

925-1099

PART III

APPENDICES

APPENDIX I

A. STABILITY AND SAFETY CONDITIONS RELATING TO EXPLOSIVE SUBSTANCES AND ARTICLES AND TO NITROCELLULOSE MIXTURES

General

1100 The following conditions are the minima for substances and articles accepted for carriage.

Conditions relating to explosive substances and articles

1101 (1) *Testing for assignment to Class 1*

Any substance or article having or suspected of having explosive properties shall be considered for assignment to Class 1 in accordance with the tests, procedures and criteria prescribed in Part I of the Manual of Tests and Criteria.

A substance or article assigned to Class 1 can only be accepted for carriage when it has been assigned to a name or an n.o.s entry listed in marg. 101 and meets the criteria of the Manual of Tests and Criteria.

(2) *Classification*

The substances and articles of Class 1 shall have been assigned to the appropriate division and compatibility group in accordance with the procedures and criteria prescribed in the Manual of Tests and Criteria.

(3) *Assignment to an item number, identification number and name*

The substances and articles of Class 1 shall be assigned to an item number, an identification number and a name or n.o.s. entrey listed in Table 1 of marg. 101. Interpretation of the names of substances and articles in the individual item numbers of Table 1 of marg. 101 shall be based upon the glossary in marg. 1170.

Explosive substances and articles shall only be assigned to an n.o.s. entry if they cannot be assigned to a name in Table 1 of marg. 101. Assignment to an n.o.s. entry shall be made by the competent authority of the country of origin.

(4) *Exudation test*

(a) Substances of item 4, No 0081 (Explosive, blasting, type A) shall, if they contain more than 40 % liquid nitric ester, in addition to the testing specified above satisfy the following exudation test.

(b) The apparatus for testing blasting explosive for exudation (figs. 1 to 3) consists of a hollow bronze cylinder. This cylinder, which is closed at one end by a plate of the same metal, has an internal diameter of 15,7 mm and a depth of 40 mm. It pierced by 20 holes 0,5 mm in diameter (four sets of five holes) on the circumference. A bronze piston, cylindrically fashioned over a length of 48 mm and having a total length of 52 mm, slides into the vertically placed cylinder. This piston, whose diameter is 15,6 mm, is loaded with a mass of 2,220 g so that a pressure of 120 kPa (1,20 bar) is exerted on the base of the cylinder.

(c) A small plug of blasting explosive wieghing 5 to 8 g, 30 mm long and 15 mm in diameter, is wrapped in very fine gauze and placed in the cylinder; the piston and its loading mass are then placed on it so that the blasting explosive is subjected to a pressure of 120 kPa (1,20 bar).

1101 *(cont'd)*

The time taken for the appearance of the first signs of oily droplets (nitroglycerin) at the outer orifices of the cylinder holes is noted.

(d) The blasting explosive is considered satisfactory if the time elapsing before the appearance of the liquid exudations is more than five minutes, the test having been carried out at a temperature of 15 °C to 25 °C

Test of blasting explosive for exudation

marg. 1101

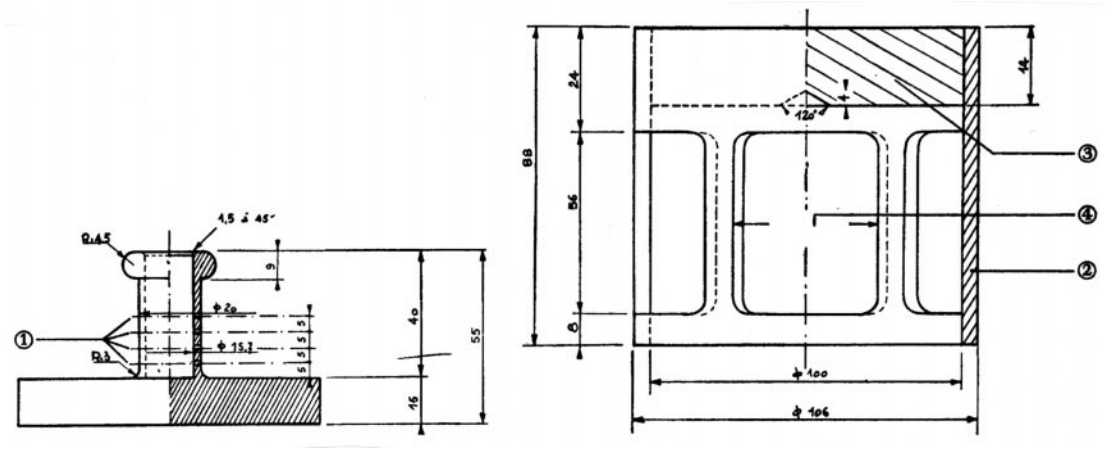


Fig. 1: Bell-shaped mass of 2,220 g capable of being suspended on the bronze piston

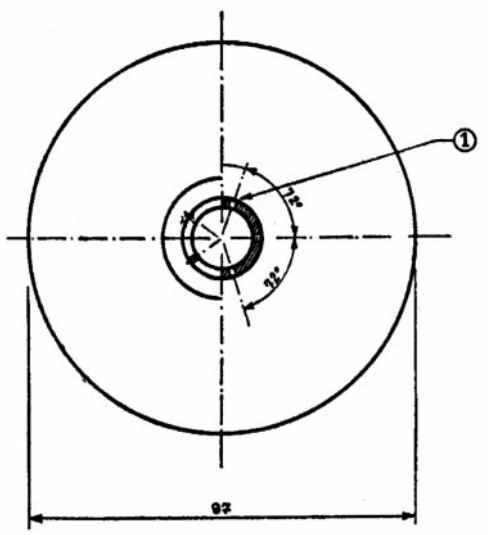


Fig. 2: Hollow bronze cylinder, closed at one end; plan and vertical section. All dimensions in mm.

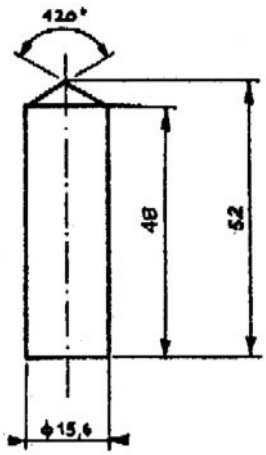


Fig. 3: Cylindrical bronze piston All dimensions in mm.

① 4 sets of 5 holes of 0,5 diameter ∅.

② copper.

③ lead plate with central tapered recess on underside.

④ 4 openings, about 46 × 56, evenly spaced round periphery.

Conditions relating to nitrocellulose mixtures of Class 4.1

1102 (1) Nitrocellulose of item 24(b), marg. 401, heated for half an hour at 132 °C shall not give off visible yellowish-brown nitrous fumes (nitrous gases). The ignition temperature shall be above 180 °C. See paragraphs (3) to (8), (9) (a) and (10) below.

(2) 3 g of plasticized nitrocellulose, heated for one hour at 132 °C, shall not give off visible yellowish-brown nutrous fumes (nitrous gases). The ignition temperature shall be above 170 °C. See paragraphs (3) to (8), (9) (b) and (10) below.

(3) The test procedures set out below are to be applied when differences of opinion arise as to the acceptability of substances for carriage by rail.

(4) If other methods or test procedures are used to verify the conditions of stability prescribed above in this appendix, those methods shall lead to the same findings as could be reached by the methods specified below.

(5) In carrying out the stability tests by heating described below, the temperature of the oven containing the sample under test shall not deviate by more than 2 °C from the prescribed temperature; the prescribed duration of a 30-minute or 60-minute test must be observed to within two minutes. The oven shall be such taht the required temperature is restored not more than five minutes after insertion of the sample.

(6) Before undergoing the tests in paragraphs (9) and (10), the samples shall be dried for not less than 15 hours at the ambient temperature in a vaccumm desiccator containing fused and granulated calcium chloride, the sample substance being spread in a thin layer; for this purpose, substances which are neither in powder form nor fibrous shall be ground, or grated, or cut unto small pieces. The pressure in the desiccator shall be brought below 6,6 kPa (0,066 bar).

(7) Before being dried as prescribed in paragraph (6) above, substances conforming to paragraph (2) shall undergo preliminary drying in a well-ventilated oven, with its temperature set at 70 °C, until the loss of mass per quarter-hour is less than 0,3 % of the original mass.

(8) Weakly nitrated nitrocellulose conforming to paragraph (1) shall first undergo preliminary drying as prescribed in paragraph (7) above; drying shall then be completed by keeping the nitrocellulose for at least 15 hours over concentrated sulphuric acid in a desiccator.

(9) *Test of chemical stability under heat*

(a) Test of the substance listed in paragraph (1) above.

1. In each of two glass test tubes having the following dimensions

length	350	mm,
internal diameter	16	mm,
thickness of wall	1,5	mm,

is placed 1 g of substance dried over calcium chloride (if necessary the drying shall be carried out after reducing the substance to pieces weighing not more than 0,05 g each). Both test tubes, completely covered with loose-fitting closures, are then so placed in an oven that at least four-fifths of their length is visible, and are kept at a constant temperature of 132 °C for 30 minutes. If is observed whether nitrous gases in the form of yellowish-brown fumes clearly visible against a white background are given off during this time.

2. In the absence of such fumes the substance is deemed to be stable.

(b) Test of plasticized nitrocellulose [paragraph (2) above]

1. 3 g of plasticized nitrocellulose are placed in glass test tubes, similar to those referred to in (a), which are then placed in an oven kept at a constant temperature of 132 °C.

1102 *(cont'd)*

2. The test tubes containing the plasticized nitrocellulose are kept in the oven for one hour. During this time no yellowish-brown nitrous fumes (nitrous gases) shall be visible. Observation and appraisal as in (a).

(10) *Ignition temperature [see paragraphs (1) and (2)]*

1. The ignition temperature is determined by heating 0,2 g of substance enclosed in a glass test tube immersed in a Wood's alloy bath. The test tube is placed in the bath when the latter has reached 100 °C. The temperature of the bath is then progressively increased 5 °C per minute.

2. The test tubes shall have the following dimensions:

length	125	mm,
internal diameter	15	mm,
thickness of wall	0,5	mm,

and shall be immersed to a depth of 20 mm.

3. The test shall be repeated three times, the temperature at which ignition of the substance occurs, i.e., slow or rapide combustion, deflagration or detonation, being noted each time.

4. The lowest temperature recorded in the three tests is the ignition temperature.

1103-1169

B. GLOSSARY OF NAMES IN MARG. 101

[**seel also marg. 1101**(3)]

1170

Note: 1. The descriptions in the glossary are not intended to replace the test procedures, nor to determine the hazard classification of a substance or article of Class 1. Assignment to the correct division and a decision on whether Compatibility Group S is appropriate shall be based on testing of the product in accordance with the Manual of Tests and Criteria Part I, or by analogy with similar products which have already been tested and assigned in accordance with the procedures of the Manual of Tests and Criteria.

2. The figures given after the names refer to the relevant item numbers (column 1) and identification numbers (column 2) of Table 1 in accordance with marg. 101, separated by an oblique (e.g. 21/0171).

For the classification code, see marg. 100(4).

Ammunition, illuminating, with or without burster, expelling charge or propelling charge 21/0171; 30/0254; 30/43/0297.

Ammunition designed to produce a single source of intense light for lighting up an area. The term includes illuminating cartridges, grenades and projectiles; and illuminating and target identification bombs.

Note: The followingarticles: *cartridges, signal; signal devices hand; signals, distress; flares, aerial; flares, surface* are not included in this definition. They are listed separately.

Ammunition, incendiary Liquid or gel, with burster, expelling charge or propelling charge 32/0247.

Ammunition containing liquid or gelatinous incendiary substance. Except when the incendiary substance is an explosive *per se*, it also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge.

1170 *(cont'd)*

Ammunition, incendiary, white phosphorus with burster, expelling charge or propelling charge 22/0243; 31/0244

Ammunition containing white phosphorus as incendiary substance. It also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge.

Ammunition, incendiary with or without burster, expelling charge or propelling charge 21/0009; 30/0010; 43/0300

Ammunition containing incendiary composition. Except when the composition is an explosive *per se*, it also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge.

Ammunition, practice 30/0488; 43/0362

Ammunition without a main bursting charge, containing a burster or expelling charge. Normally it also contains a fuze and a propelling charge.

Note: Grenades, practice are not included in this definition. They are listed separately.

Ammunition, proof 43/0363

Ammunition containing pyrotechnic substance, used to test the performance or strength of new ammunition, weapon components or assemblies.

Ammunition, smoke, white phosphorus, with burster, expelling charge or propelling charge 22/0245; 31/0246

Ammunition containing *white phosphorus* as a smoke-producing substance. It also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge. The term includes grenades, smoke.

Ammunition, smoke with or without burster, expelling charge or propelling charge 21/0015; 26/0016; 43/0303

Ammunition containing a smoke-producing substance such as chlorosulphonic acid mixture or titanium tetrachloride; or a smoke-producing pyrotechnic composition based on hexachloroethane or red phosphorus. Except when the substance is an explosive *per se*, the ammunition also contains one or more of the following: a propelling charge with primer and igniter charge: a fuze with burster or expelling charge. The term includes grenades, smoke.

Note: Signals, smoke are not included in this definition. They are listed separately.

Ammunition, tear-producing, with burster, expelling charge or propelling charge 21/0018; 30/0019; 43/0301

Ammunition containing a tear-producing substance. It also contains one or more of the following: a pyrotechnic substance; a propelling charge with primer and igniter charge; a fuze with burster or expelling charge.

Articles, explosive, extremely insensitive (Article, IIE) 50/0486

Articles containing only extremely insensitive detonating substances (EIDS) which demonstrate a negligible probability of accidental initiation or propagation under normal conditions of carriage, and which have passed Test Series 7.

Articles, pyrophoric, 25/0380

Articles which contain a pyrophoric substance (capable of spontaneous ignition when exposed to air) and an explosive substance or component. The term excludes articles containign white phosphorus.

Articles, pyrotechnic, for technical purposes 9/0428; 21/0429; 30/0430, 43/0431; 47/0432

Articles which contain pyrotechnic substances and are used for technical purposes such as heat generation, gas generation, theatrical effects, etc.

Note: The following articles: all ammunition; *cartridges, signal; cutters, cable, explosive; fireworks; flares, aerial; flares, surface; release devices, explosive; rivets, explosive; signal devices, hand; signals, distress; signals, railway track, explosives; signals, smoke* are not included in this definition. They are listed separately.

1170 *Black powder (gunpowder), compressed* or *black powder (gunpowder), in pellets* 4/0028
(cont'd) Substance consisting of a pelletised form or black powder.

Substance consisting of an intimate mixture of charcoal or other carbon and either potassium nitrate or sodium nitrate, with or wothout sulphur.

Bombs, with flammable liquid, with bursting charge 10/0399; 23/0400

Articles which are dropped from aircraft, consisting of a tank filled with flammable liquid and bursting charge.

Bombs, photo-flash 5/0038

Explosive articles which are dropped from aircraft to provide brief, intense illumination for photography. They contain a charge of detonating explosive without means of initiation or with means of initiation containing two or more effective protective features.

Bombs, photo-flash 7/0037

Explosive articles which are dropped from aircraft to provide brief, intense illumination for photography. They contain a charge of detonating explosive with means of initiation not containing two or more effective protective features.

Bombs, photo-flash 21/0039; 30/0299

Explosive articles which are dropped from aircraft to provide brief, intense illumination for photography. They contain a photo-flash composition.

Bombs, with bursting charge 5/0034; 17/0035

Explosive articles which are dropped from aircraft, without means of initiation or with means of initiation containing two or more effective protective features.

Bombs, with bursting charge 7/0033; 19/0291

Explosive articles which are dropped from aircraft, with means of initiation not containing two or more effective protective features.

Boosters, with detonator 1/0225; 13/0268

Articles consisting of a charge of detonating explosive with means of initiation. They are used to increase the initiating power of detonators or detonating cord.

Boosters, without detonator 5/0042; 17/0283

Articles consisting of a charge of detonating explosive without means of initiation. They are used to increase the initiating power of detonators or detonating cord.

1170 *(cont'd)*

Bursters, explosive 5/0043

Artricles consisting of a small charge of explosive used to open projectiles or other ammunition in order to disperse their contents.

Cartridges, flash 9/0049; 30/0050

Articles consistinf of a casing, a primer and flash powder, all assembled in one piece ready for firing.

Cartridges for weapons, blank 3/0326; 15/0413; 27/0327; 37/0338; 47/0014

Ammunition consisting of a closed cartridge case with a centre or rim fire primer and a charge of smokeless or black powder but no projectile. It produces a loud noise and is used for training, saluting, propelling charge, starter pistols, etc. The term includes ammunition, blank.

Cartridges for weapons, inert projectile 15/0328; 27/0417; 37/0339; 47/0012

Ammunition consisting of a projectile without bursting charge but with a propelling charge with or without a primer. The articles may include a tracer, provided that the predominant hazard ius that of the propelling charge.

Cartridges for weapons, with bursting charge 6/0006; 18/0321; 40/0412

Ammunition consisting of a projectile with a bursting charge without means of initiation or with means of initiation containing two or more effective protective features; and a propelling charge with or without a primer. The term includes fixed (assembled) ammunition, semi-fixed (partially assembled) ammunition and separate loading ammunition when the components are packed together.

Cartridges for weapons, with bursting charge 7/0005; 19/0007; 41/0348

Ammunition consisting of a projectile with a bursting charge with means of initiation not containing two or more effective protective features; and a propelling charge with or without a primer. The term includes fixed (assembled) ammunition, semi-fixed (partially assembled) ammunition and separate loading ammunition when the components are packed together.

Cartridges, oil well 27/0277; 37/0278

Articles consisting of a thin casing of fibreboard, metal or other material containing only propellant powder which projects a hardened projectile to perforate an oil well casing.

Note: Charges, shaped, commercial are not included in this definition. They are listed separately.

Cartridges, power device 15/0381; 27/0275; 37/0276; 47/0323

Articles designed to accomplish mechanical actions. They consist of a casing with a charge of deflagrating explosive and a means of ignition. The gaseous products of the deflagration produce inflation, linear or rotary motion or activate diaphragms, valves or switches or project fastening devices or extinguishing agents.

Cartridges, signal 30/0054; 43/0312; 47/0405

Articles designed to fire coloured flares or other signales from signal pistols, etc.

1170 *(cont'd)*

Cartridges, small arms 27/0417; 37/0339; 47/0012

Ammunition consisting of a cartridge case fitted with a centre or rim fire primer and containing both a propelling charge and solid projectile. They are designed to be fired in weapons of calibre not larger than 19.1 mm. Shot-gun cartridges of any calibre are included in this description.

Note: *Cartridges, small arms, blank*, are not included in this definition. They are listed separately. Some military small arms cartridges are not included in this definition. They are listed under *cartridges for weapons, inert projectile*.

Cartridges, for weapons, blank 27/0327; 37/0338; 47/0014

Ammunition consisting of a closed cartridge case with a centre or rim fire primer and a charge of smokeless or black powder. The cartridge cases contain no projectiles. The cartridges are designed to be fired from weapons with a calibre of at most 19.1 mm and serve to produce a loud noise and are used for training, saluting, propelling charge, starter pistols, etc.

Cases, cartridge, empty; with primer 37/0379; 47/0055

Articles consisting of a cartridge case made from metal, plastics or other non-flammable material, in which the only explosive component is the primer.

Cases, combustible, empty; without primer 27/0447; 37/0446

Articles consisting of a cartridge case made partly or entirely from nitrocellulose.

Charges, bursting, plastics bonded 5/0457; 39/0459; 47/0460

Articles consisting of a charge of detonating explosive, plastics bonded, manufactured in a specific form without a casing and without means of initiation. They are designed as components of ammunition such as warheads.

Charges, demolition 5/0048

Articles containing a charge of a detonating explosive in a casing of fibreboard, plastics, metal or other material. The articles are without means of initiation or with means of initiation containing two or more effective protective features.

Note: The following articles: *bombs; mines; projectiles* are not included in the definition. They are listed separately.

Charges, depth 5/0056

Articles consisting of a charge of detonating explosive contained in a drum or projectile without means of initiation or with means of initiation containing two or more effective protective features. They are designed to detonate under water.

Charges, explosive, commercial, without detonator 5/0442; 17/0443; 39/0444; 47/0445

Articles consisting of a charge of detonating explosive without means of initiation, used for explosive welding, jointing, forming and other metallurgical processes.

Charges, propelling, for cannon 3/0279; 15/014; 27/0242

Articles of propellant in any physical form for separate-loading ammunition for cannon.

Charges, propelling 3/0271; 15/0415; 27/0272; 37/0491

Articles consisting of a propellant charge in any physical form, with or without a casing, as a component of rocket motors or for reducing the drag of projectiles.

1170 *(cont'd)*

Charges, shaped, commercial, without detonator 5/0059; 17/0439; 39/0440; 47/0441

Articles consisting of a casing containing a charge of detonating explosive with a cavity lined with rigid material, without means of initiation. They are designed to produce a powerful, penetrating jet effect.

Charges, shaped, flexible linear 5/0288; 39/0237

Articles consisting of a V-shaped core of a detonating explosive clad by a flexible sheath.

Charges, supplementary, explosive 5/0060

Articles consisting of a small removable booster placed in the cavity of a projectile between the fuze and the bursting charge.

Components, explosive train, n.o.s. 1/0461; 13/0382; 35/0383; 47/0384

Articles containing an explosive designed to transmit detonation or deflagration within an explosive train.

Contrivances, water-activated with burster, expelling or propelling charge 25/0248; 34/0249

Articles whose functioning depends upon physico-chemical reaction of their contents with water.

Cord, detonating, flexible 5/0065; 39/0289

Article consisting of a core of detonating explosive enclosed in spun fabric and a plastics or other covering. The covering is not necessary if the spun fabric is sift-proof.

Cord (fuse), detonating, metal clad 5/0290; 17/0102

Article consisting of a core of detonating explosive clad by a soft metal tube with or without protective covering.

Cord (fuse), detonating, mild effect, metal clad 39/0104

Article consisting of a core of detonating explosive clad by a soft metal tube with or without a protective covering. The quantity of explosive substance is so small that only a mild effect is manifested outside the cord.

Cord, igniter 43/0066

Article consisting of textile yarns covered with black powder or another fast burning pyrotechnic composition and of a flexible protective covering; or it consists of a core of black powder surrounded by a flexible woven fabric. It burns progressively along its length with an external flame and is used to transmit ignition from a device to a charge or primer.

1170 *(cont'd)*

Cutters, cable, explosive 47/0070

Articles consisting of a knife-edged device which is driven by a small charge of deflagrating explosive into an anvil.

Detonator assemblies, non-electric, for blasting 1/0360; 35/0361; 47/0500

Non-electric detonators assembled with and activated by such means as safety fuse, shock tube, flash tube or detonating cord. They may be of instantaneous design or incorporate delay elements. Detonating relays incorporating detonating cord are included.

Detonators, electric, for blasting 1/0030; 35/0255; 47/0456

Articles specially designed for the initiation of blasting explosives. These detonators may be constructed to detonate instantaneously or may contain a delay element. Electric detonators are activated by an electric current.

Detonators for ammunition 1/0073; 13/0364; 35/0365; 47/0366

Articles consisting of a small metal or plastics tube containing explosives such as lead azide, PETN or combinations of explosives. They are designed to start a detonation train.

Detonators, non-electric, for blasting 1/0029; 35/0267; 47/0455

Articles specially designed for the initiation of blasting explosives. These detonators may be constructed to detonate instantaneously or may contain a delay element. Non-electric detonators are activated by such means as shock tube, flash tube, safety fuse, other igniferous device or flexible detonating cord. Detonating relays without detonating cord are included.

Explosive, lasting, type A 4/0081

Substances consisting of liquid organic nitrates such as nitroglycerin or a mixture of such ingredients with one or more of the following: nitrocellulose; ammonium nitrate or other inorganic nitrates; aromatic nitro-derivatives, or combustible materials, such as wood-meal and aluminium powder. They may contain inert components such as kieselguhr, and additives such as colouring agents and stabilizers. Such explosives shall be in powdery, gelatinous or elastic form. The term includes dynamite, gelatine, blasting and gelatine dynamites.

Explosive, blasting, type B 4/0082; 48/0331

Substance consisting of (a) a mixture of ammonium nitrate or other inorganic nitrates with an explosive such as trinitrotoluene, with or without other substances such as wood-meal and aluminium powder, or (b) a mixture of ammonium nitrate or other inorganic nitrates with other combustible substances, which are not explosive ingredients. In both cases they may contain inert components such as kieselguhr, and additives such as colouring agents and stabilizers. Such explosives shall not contain nitroglycerin, similar liquid organic nitrates or chlorates.

Explosive, blasting, type C 4/0083

Substances consisting of a mixture of either potassium or sodium chlorate or potassium, sodium or ammonium perchlorate with organic nitro-derivatives or combustible materials such as wood-meal or aluminium powder or a hydrocarbon. They may contain inert components such as kieselguhr and additives such as coulouring agents and stabilizers. Such explosives shall not contain nitroglycerin or similar liquid organic nitrates.

1170 *(cont'd)*

Explosive, blasting, 4/0084

Substances consisting of a mixture of organic nitratred compounds and combustible materials such as hydrocarbons and aluminium powder. They may contain inert components such as kieselguhr and additives such as coulouring agents and stabilizers. Such explosives shall not contain nitroglycerin, similar liquid organic nitrates, chlorates or ammonium nitrate. The term generally includes plastic explosives.

Explosives, blasting, type E 4/0241; 48/0332

Substances consisting of water as an essential ingredient and high proportions of ammonium nitrate or other oxidizers, some or all of which are in solution. The other constituents may include nitro-derivates such as trinitrotoluene, hydrocarbons or aluminium powder. They may contain inert components such as kieselguhr and additives such as colouring agents and stabilizers. The term includes explosives, emulsion; explosives, slurry and explosives, watergel.

Fireworks 9/0333; 21/0334; 30/0335; 43/0336; 47/0337

Pyrotechnic articles designed for entertainment.

Flares, aerial, 9/0420; 21/0421; 30/0093; 43/0403; 47/0404

Articles containing pyrotechnic substances which are designed to be dropped from an aircraft to illuminate, identify, signal or warn.

Flares, surface 9/0418; 21/0419; 30/0092

Articles containing pyrotechnic substances which are designed for use on the surface to illuminate, identify, signal or warn.

Flash powder 8/0094; 29/0305

Pyrotechni substance which, when ignited, produces an intense light.

Fracturing devices, explosive, without detonator, for oil wells, 5/0099

Articles consisting of a charge of detonating explosive contained in a casing without means of initation. They are used to fracture the rock around a drill shaft to assist the flow of crude oil from the rock.

Fuse, igniter, tubular, metal clad 43/0103

Article consisting of a metal tube with a core of deflagrating explose.

1170 *Fuse, non-detonating* 30/0101
(cont'd)

Article consisting of cotton yarns impregnated with fine black powder. It burns with an external flame and is used in ignition trains for fireworks, etc. It can be enclosed in a paper tube to obtain an instantaneous or quickmatch effect.

Fuse, safety 47/0105

Article consisting of a core of fine grained black powder surrounded by a flexible woven fabric with one or more protective outer coverings. When ignited, it burns at a predetermined rate without any external explosive effect.

Fuzes, detonating 1/0106; 13/0107; 35/0257; 47/0367

Articles with explosive components designed to produce a detonation in ammunition. They incorporate mechanical, electrical, chemical or hydrostatic components to initiate the detonation. They generally incorporate protective features.

Fuzes, detonating, with protective features 5/0408; 17/0409; 39/0410

Articles with explosive components designed to produce a detonation in ammunition. They incorporate mechanical, electrical, chemical or hydrostatic components to initiate the detonation. The detonating fuze must incorporate two or more effective protective features.

Fuzes, igniting 30/0316; 43/0317; 47/0368

Articles with primary explosive components designed to produce a deflagration in ammunition. They incorporate mechanical, electrical, chemical or hydrostatic components to start the deflagration. They generally incorporate protective features.

Grenades, hand or rifle, with bursting charge 5/0284; 17/0285

Articles which are designed to be thrown by hand or to be projected by a rifle. They are without means of initiation or with means of initiation containing two or more effective protective features.

Grenades hand or rifle, with bursting charge 7/0292; 19/0293

Articles which are designed to be thrown by hand or to be projected by a rifle. They are with means of initiation not containing two or more effective protective features.

Grenades, practice, hand or rifle 21/0372; 30/0318; 43/0452; 47/0110

Articles without a main bursting charge which are designed to be thrown by hand or to be projected by a rifle. They contain the priming device and may contain a spotting charge.

Hexotonal 4/0393

Substance concisting of an intimate mixture of cyclotrimethylenetrinitramine (RDX), trinitrotoluene (TNT) and aluminium.

1170 *(cont'd)*

Hexolite (hexotol), dry or wetted with less than 15 % water, by mass 4/0118

Substance consisting of an intimate mixture of cyclotrimethylenetrinitramine (RDX) and trinitrotoluene (TNT). The term includes 'Composition B'.

Igniters 9/0121; 21/0314; 30/0315; 42/0325; 47/0454

Articles containing one or more explosive substances designed to produce a deflagration in an explosive train. They may be actuated chemically, electrically or mechanically.

Note: The following articles: *cord, igniter; fuse, igniter; fuse, non-detonating; fuzes, igniting; lighters, fuse; primers, cap type; primers, tubular* are not included in this definition. They are listed separately.

*Jet perforating guns, charged,*oil well, without detonator 5/0124; 39/0494

Articles consisting of a steel tube or metallic strip, into which are inserted shaped charges connected by detonating cord, without means of initiation.

Lighters, fuse 47/0131

Article of various design actuated by friction, percussion or electricity and used to ignite safety fuse.

Mines, with bursting charge 5/0137; 17/0138

Articles consisting normally of metal or composition receptacles filled with a detonating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are designed to be operated by the passage of ships, vehicles or personnel. The term includes 'Bangalore torpedoes'.

Mines, with bursting charge 7/0136; 19/0294

Articles consisting normally of metal or composition receptacles filled with a detonating explosive, with means of initiation not containing two or more effective protective features. They are designed to be operated by the passage of ships, vehicles or personnel. The term includes 'Bangalore torpedoes'.

Octolite (Octol), dry or wetted with less than 15 % water, by mass 4/0266

Substance consisting of an intimate mixture of cyclotetramethylenetretanitramine (HMX) and trinitrotoluene (TNT)

Octonal 4/0496

Substance consisting of an intimate mixture of cyclotetramethylenetetranitramine (HMX), trinitrotoluene (TNT) and aluminium.

Pentolite, dry or wetted with less than 15 % water, by mass 4/0151

Substance consisting of an intimate mixture of pentaerthrite tetranitrate (PETN) and trinitrotoluene (TNT)

Powder cake (powder paste), wetted with not less than 17 % alcohol, by mass 2/0433

1170 *(cont'd)*

Powder cake (powder paste), wetted with not less than 25 % water, by mass 26/0159

Substance consisting of nitrocellulose impregnated with not more than 60 % of nitroglycerin or other liquid organic nitrates or a mixture of these.

Powder, smokeless 2/0160, 26/0161

Substance based on nitrocellulose used as propellant. The term includes propellants with a single base [nitrocellulose (NC) alone], those with a double base [such as NC and nitroglycerin (NG)] and those with a triple base (such as NC/NG/nitroguanidine).

Note: Cast, pressed or bag-charges of smokeless powder are listed under *charges, propelling*.

Primers, cap type 1/0377; 35/0378; 47/0044

Articles consisting of a metal or plastics cap containing a small amount of primary explosive mixture that is readily ignited by impact. They serve as igniting elements in small arms cartridges and in percussion primers for propelling charges.

Primers, tubular 30/0319; 43/0320; 47/0376

Articles consisting of a primer for ignition and an auxiliary charge of deflagrating explosive such as black powder used to ignite the propelling charge in a cartridge case for cannon, etc.

Projectiles, inert with tracer 30/0424; 43/0425; 47/0345

Articles such as a shell or bullet, which are projected from a cannon or other gun, rifle or other small arm.

Projectiles, with burster or expelling charge 17/0346; 39/0347

Articles such as a shell or bullet, which are projected from a cannon or other gun. They are without means of initiation or with means of initiation containing two or more effective protective features. They are used to scatter dyes for spotting or other inert materials.

Projectiles, with burster or expelling charge 19/0426; 41/0427

Articles such as a shell or bullet, which are projected from a cannon or other gun. They are with means of initiation not containing two or more effective protective features. They are used to scatter dyes for spotting or other inert materials.

Projectiles, with burster or expelling charge 21/0434; 43/0435

Articles such as a shell or bullet, which are projected from a cannon or other gun, rifle or other small arm. They are used to scatter dyes for spotting or other inert materials.

Projectiles, with a bursting charge 5/0168; 17/0169; 39/0344

Articles such as a shell or bullet, which are projected from a cannon or other gun. They are without means of initiation or with means of initiation containing two or more effective protective features.

Projectiles, with bursting charge 7/0167; 19/0324

Articles such as a shell or bullet, which are projected from a cannon or other gun. They are with means of initiation not containing two or more effective protective features.

1170 *(cont'd)*

Propellant, liquid 2/0497; 26/0494

Substance consisting of a deflagrating liquid explosive, used for propulsion.

Propellant, solid 2/0498, 26/0499

Substance consisting of a deflagrating solid explosive, used for propulsion.

Release devices, explosive 47/0173

Articles consisting of a small charge of explosive with means of initiation and rods or links. They sever the rods or links to release equipment quickly.

Rivets, explosive 47/0174

Articles consisting of a small charge of explosive inside a metallic rivet.

Rocket motors 3/0280, 15/0281; 27/0186

Articles consisting of a charge of explosve, generally a solid propellant, contained in a cylinder fitted with one or more nozzles. They are designed to propel a ricket or a guided missile.

Rocket motors, liquid fuelled 23/0395; 32/0396

Articles consisting of a liquid fuel within a cylinder fitted with one or more nozzles. They are designed to propel a rocket or a guided missile.

Rocket motors with hypergolic liquids, with or without expelling charge 25/0322; 34/0250

Articles consisting of a hypergolic fuel contained in a cylinder fitted with one or more nozzles. They are designed to propel a rocket or a guided missile.

Rockets, line throwing 21/0238; 30/0240; 43/0453

Articles consisting of a rocket motor which is designed to extend a line.

1170 *(cont'd)*

Rockets, liquid fuelled with bursting charge 10/0397; 23/0398

Articles consisting of a liquid fuel within a cylinder fitted with one or more nozzles and fitted with a warhead. The term includes guided missiles.

Rockets with bursting charge 6/0181; 18/0182

Articles consisting of a rocket motor and a warhead without means of initiation or with means of initiation containing two or more effective protective features. The term includes guided missiles.

Rockets, with bursting charge 7/0180; 19/0295

Articles consisting of a rocket motor and a warhead with means of initiation not containing two or more effective protective features. The term includes guided missiles.

Rockets, with expelling charge 15/0436; 27/0437; 37/0438

Articles consisting of a rocket motor and a charge to expel the payload from a rocket head. The term includes guided missiles.

Rockets, with inert head 27/0183

Articles consisting of a rocket motor and an inert head. The term includes guided missiles.

Samples, explosive other than initiating explosive 51/0190

New or existing explosive substances or articles, not yet assigned to a name of marg. 101 and carried in formity with the instructions of the competent authority and generally in small quantities, inter alia, for the purposes of testing, classification, research and development, or quality control, or as commercial samples.

Note: Explosive substances or articles already assigned to another name of marg. 101 are not included in this definition.

Signal devices, hand 43/0191; 47/0373

Portable articles containing pyrotechnic substances which produce visual signals or warnings. The term includes small surface flares such as highway or railway flares and small distress flares.

Signals, disress, ship 9/0194; 30/0195

Articles containing pyrotechnic substances designed to produce signals by leas of sound, flame or smoke or any combination thereof.

Signals, railway track, explosive 9/0192; 30/0492; 43/0493; 47/0193

Articles containing a pyrotechnic substance which explodes with a loud report when the article is crushed. They are designed to be placed on a rail.

1170 *Signals, smoke* 9/0196; 19/0313; 43/0197
(cont'd)

Articles containing pyrotechnic substances which emit smoke. In addition they may contain devices for emitting audible signals.

Souding devices, explosive 5/0374; 17/0375

Articles consisting of a charge of detonating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are dropped from ships and function when they reach a predetermined depth or the sea bed.

Sounding devices, explosive 7/0296; 19/0204

Articles consisting of a charge of detonating explosive with means of initiation not containing two or more effective protective features. They are dropped from ships and function when they reach a predetermined depth or the sead bed.

Substances, explosive, very insensitive (Substances, EVI), n.o.s. 48/0482

Substances presenting a mass explosion hazard but which are so insentitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of carriage, and which have passed Test Series 5.

Torpedoes, liquid fuelled, with inert head 32/0450

Articles consisting of a liquid explosive system to propel the torpedo through the water, with an inert head.

Torpedoes, liquid fuelled, with or without bursting charge 10/0449

Articles consisting of either a liquid explosive system to propel the torpedo through the water, with or without a warhead; or a liquid non-explosive system to propel the torpedo through the water, with a warhead.

Torpedoes, with bursting charge 5/0451

Articles consisting of a non-explosive system to propel the torpedo through the water, and a warhead without means of initiation or with means of initiation containing two or more effective protective features.

Torpedoes, with bursting charge 6/0329

Articles consisting of an explosive system to propel the torpedo through the water, and a warhead without means of initiation or with means of initiation containing two or more effective protective features.

Torpedoes, with bursting charge 7/0330

Articles consisting of an explosive or non-explosive system to propel the torpedo through the water, and a warhead with means of initiation not containing two or more effective protective features.

Tracers for ammunition 30/0212; 43/0306

Sealed articles containing pyrotechnic substances, designed to reveal the trajectory of a projectile.

Tritonal 4/0390

Substance consisting of trinitrotoluene (TNT) mixed with aluminium.

1170
(cont'd)

Warheads, rocket, with burster or expelling charge 39/0370

Articles consisting of an inert payload and a small charge of detonating or deflagrating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are designed to be fitted to a rocket motor to scatter inert material. The term includes warheads for guided missiles.

Warheads, rocket, with burster or expelling charge 41/0371

Articles consisting of an inert payload and a small charge of detonating or deflagrating explosive, with means of initiation not containing two or more effective protective features. They are designed to be fitted to a rocket motor to scatter inert material. The term includes warheads for guided missiles.

Warheads, rocket, with bursting charge 5/0286; 17/0287

Articles consisting of a detonating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are designed to be fitted to a rocket. The term includes warheads for guided missiles.

Warheads, rocket, with bursting charge 7/0369

Articles consisting of a detonating explosive, with means of initiation not containing two or more effective protective features. They are designed to be fitted to a rocket. The term includes warheads for guided missiles.

Warheads, torpedo, with bursting charge 5/0221

Articles consisting of a detonating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are designed to be fitted to a torpedo.

1171-
1199

APPENDIX II

A. REQUIREMENTS RELATING TO THE NATURE OF ALUMINIUM ALLOY RECEPTACLES FOR CERTAIN GASES OF CLASS 2

I. Quality of material

1200 (1) The materials of aluminium-alloy receptacles which are to be accepted for the gases referred to in marg. 203 (1) (d) shall satisfy the following requirements:

	A	B	C	D
Tensile strength, Rm in MPa (= N/mm²)	50 to 190	200 to 380	200 to 380	350 to 500
Yield stress, Re in MPa (= N/mm²) (permanent set $\lambda = 0{,}2\ \%$)	10 to 170	60 to 320	140 to 340	210 to 420
Permanent elongation at fracture (l = 5 d) in %	12 to 40	12 to 30	12 to 30	11 to 16
Bend test (diameter of mandrel d = nxe, where e is the thickness of the test-piece)	n = 5 (Rm ≤ 100) n = 6 (Rm > 100)	n = 6 (Rm ≤ 330) n = 7 (Rm > 330)	n = 6 (Rm ≤ 330) n = 7 Rm > 330)	n = 7 (Rm ≤ 400) n = 8 (Rm > 400)
American Association Series Number (1)	1 000	5 000	6 000	2 000

(1) See 'Aluminum Standards and Date' fifth edition, January 1976, published by the Aluminium Association, 750. Third Avenue, New York, USA.

The actual properties will depend on the composition of the alloy concerned and also on the final treatment of the receptacle, but whatever alloy is used the thickness of the receptacle shall be calculated by the following formula:

$$e = \frac{P_{MPa} \times D}{\frac{2 \times Re}{1{,}30} + P_{MPa}} \qquad \left(e = \frac{P_{bar} \times D}{\frac{20 \times Re}{1{,}30} + P_{bar}} \right)$$

where

e = minimum thickness of receptacle wall, in mm;

P_{MPa} = test pressure, in MPa, (P_{bar} = test pressure, in bar);

D = nominal external diameter of the receptacle, in mm; and

Re = guaranteed minimum yield stress with 0,2 % permanent elongation, in N/mm².

In addition, the value of the minimum guaranteed proof stress (Re) introduced into the formula is in no case to be greater than 0,85 times the guaranteed minimum tensile strength (Rm), whatever the type of alloy used.

Note: 1. The characteristics above are based on previous experience with the following materials used for receptacles:

Column A: Aluminium, unalloyed, 99,5 % pure;

Column B: Alloys of aluminium and magnesium;

Column C: Alloys Aluminium, silicon and magnesium, such as ISO/R 209-Al-Si-Mg (Aluminum Association 6351);

Column D: Alloys of aluminium, copper and magnesium.

1200 *(cont'd)*

2. The permanent elongation at fracture (l = 5d) is measured by means of test-pieces of circular section in which the gauge length l is equal to five times the diameter d; if test-pieces of rectangular section are used the gauge length must be calculated by the formula $l = 5{,}65 \sqrt{F_o}$, where F_o is the initial cross-sectional area of the test-piece.

3. (a) The bend test (see illustration) shall be carried out on specimens obtained by cutting a ring from the cylinders into two equal parts of width 3e, but in no case less than 25 mm. Each specimen may be machined only on the edges.

(b) The bend test shall be carried out between a mandrel of diameter (d) and two circular supports separated by a distance of (d + 3e). During the test the inside faces are to be at a distance apart not greater than the diameter of the mandrel.

(c) The specimen shall remain uncracked when bent inwards around the mandrel until the inside faces are at a distance apart not greater than the diameter of the mandrel.

(d) The ratio (n) between the diameter of the mandrel and the thickness of the specimen shall conform to the values given in the table.

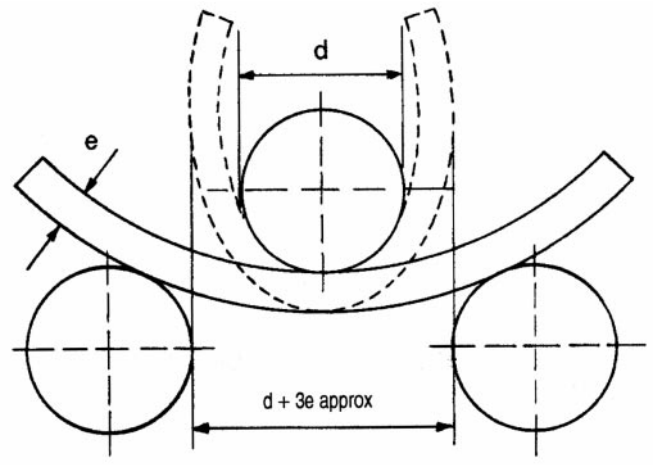


Diagram of bend test

(2) A lower minimum elongation value is acceptable, provided that an additional test approved by the competent authority of the country in which the receptacles are made proves that safety of carriage is assured in the same way as for receptacles manufactured to the values shown in the table in paragraph (1).

(3) The minimum wall thickness of the receptacles at the weakest point shall be the following:

when the diameter of the receptacle is less than 50 mm at least 1,5 mm;

when the diameter of the receptacle is from 50 to 150 mm: at least 2 mm; and

when the diameter of the receptacle is more than 150 mm: at least 3 mm.

(4) The ends of the receptacles shall have a semicircular, elliptical or 'basket-handle' section; they shall afford the same degree of safety as the body of the receptacle.

II. Additional Official Test for Aluminium Alloys

1201 (1) In addition to the tests required by marg. 215, 216 and 217, it is further necessary to test for the possibility of inter-crystalline corrosion of the inside wall of the receptacle if made of an aluminium alloy containing copper, or of an aluminium alloy containing magnesium and manganese if the magnesium content is greater than 3,5 % or the manganese content is less than 0,5 %.

1201 *(cont'd)*

(2) For an aluminium/copper alloy, the test shall be carried out by the manufacturer at the time of approval of a new alloy by the competent authority; it shall be repeated during the course of production, for each pour of the alloy.

(3) For an aluminium/magnesium alloy the test shall be carried out by the manufacturer at the time of approval of a new alloy and manufacturing process by the competent authority. If a change is made in the alloy composition or the manufacturing process the test shall be repeated.

(4) (a) Preparation of aluminium/copper alloys

Before the aluminium/copper alloy is subjected to the corrosion test, the samples shall be cleansed of grease by a suitable solvent, and dried.

(b) Preparation of aluminium/magnesium alloys

Before the aluminium/magnesium alloy is subjected to the corrosion test, the samples shall be heated for seven days at 100 °C, and then cleansed of grease by a suitable solvent and dried.

(c) Performance of test

The inner side of a sample of 1 000 m^2 (33,3 x 30 mm) of the material containing copper shall be treated with 1 000 ml of an aqueous solution containing 3 % NaCl and 0,5 % HCl at ambient temperature for 24 hours.

(d) Examination

After being washed and dried, the sample shall be examined micrographically at a magnification of 100 to 500 ×, using a section of the sample 20 mm long, preferably after electropolishing.

The depth of attack shall not go beyond the second layer of grains from the surface tested for corrosion; in principle, if the entire first layer of grains is attacked, only part of the second layer should suffer.

In the case of shapes and sections, the examination shall be performed at right angles to the surface.

If, after any electropolishing, it proves necessary to make the gain boundaries particularly visible for further examination, this shall be done by a method which is acceptable to the competent authority.

III. Protection of the Inner Surface

1202 The inner surface of aluminium-alloy receptacles shall be provided with suitable protection against corrosion if the competent testing stations consider it necessary.

1203-1249

B. REQUIREMENTS CONCERNING THE MATERIALS AND CONSTRUCTION OF RECEPTACLES IN ACCORDANCE WITH MARG. 206 INTENDED FOR THE CARRIAGE OF DEEPLY REFRIGERATED LIQUEFIED GASES OF CLASS 2

1250 (1) Receptacles shall be made of steel, aluminium, aluminium alloys, copper, or copper alloys, e.g. brass. However, receptacles made of copper or copper alloys shall be allowed only for gases containing no acetylene.

(2) Only materials appropriate to the lowest working temperature of the receptacles and of their accessories may be used.

1251 The following materials shall be allowed for the manufacture of receptacles:

(a) steels not subject to brittle fracture at minimum working temperature (see marg. 1255);

1. fine-grained unalloyed steels, down to a temperature of – 60°C;
2. nickel-alloy steels (with a nickel content of 0,5 % to 9 %), down to a temperature of – 196 °C, depending on the nickel content;
3. chrome-nickel austenitic steels, down to a temperature of – 270 °C;

(b) aluminium not less than 99,5 % pure or aluminium alloys (see marg. 1256);

(c) deoxidized copper not less than 99,9 % pure or copper alloys having a copper content of over 56 % (see marg. 1257).

1252 (1) Receptacles shall be either seamless or welded.

(2) Receptacles made of austenitic steel, copper or copper alloys may alternatively be hard-soldered.

1253 The accessories may be screwed to the receptacles or secured thereto as follows:

(a) receptacles made of steel, aluminium or aluminium alloy: by welding;

(b) receptacles made of austenitic steel, copper or copper alloys: by welding or hard-soldering.

1254 The construction of receptacles shall be such as to preclude with certainty any reduction of temperature of the load-bearing components likely to render them brittle. The fastenings of the receptacles shall themselves be so designed that even when the receptacle is at its lowest permitted working temperature they still possess the necessary mechanical properties.

1. Materials and receptacles

a. Steel receptacles

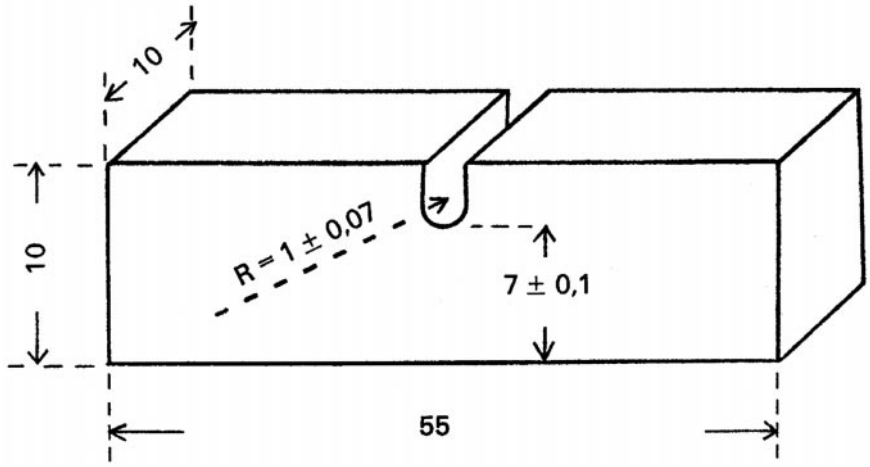
1255 The materials used for the manufacture of the receptacles, and the weld beads, shall meet at least the following conditions as to impact strength at their minimum working temperature.

The tests may be conducted with test-pieces having either a U-shaped or a V-shaped notch.

Material	Impact strength [1], [2] of the sheets and weld beads at the minimum working temperature	
	J/cm² [3]	J/cm² [4]
Unalloyed killed steel	35	28
Ferritic alloy steel Ni < 5 %	35	22
Ferritic alloy steel 5 % ≤ Ni ≤ 9 %	45	35
Cr-Ni austenitic steel	40	32

[1] The impact strengths determined with different test-pieces not comparable with each other.
[2] See also marg. 1258 to 1260.
[3] The values relate to test-pieces with a U-shaped notch as illustrated below.
[4] The values relate to test-pieces with a V-shaped notch according to ISO R 148.

1255
(cont'd)



In the case of austenitic steels, only the weld bead shall be subject to an impact-strength test.

For working temperatures below – 196 °C, the impact-strength test is not carried out at the minimum working temperature, but at – 196 °C.

b. Receptacles made of aluminium or aluminium alloys

1256 The welds of receptacles shall meet the following requirements as to bending coefficient at ambient temperature:

Thickness of sheet e in mm	Bending coefficient k (1) for the weld	
	Root in compression zone	Root in tension zone
≤ 12	≥ 15	≥ 12
> 12 to 20	≥ 12	≥ 10
> 20	≥ 9	≥ 8

(1) See marg. 1261.

c. Receptacles made of copper or copper alloys

1257 It is not necessary to carry out tests to determine whether the impact strength is adequate.

2. Tests

a. Impact-strength tests

1258 The impact strengths shown in marg. 1255 relate to test pieces measuring 10 × 10 mm having a U-shaped or a V-shaped notch.

Note: 1. For the shape of the test-piece, see footnotes (2) and (3) to marg. 1255 (table).

2. For sheets less than 10 mm but not less than 5 mm thick, test-pieces with a cross-section of 10 × e mm, where 'e' represents the thickness of the sheet, shall be used. Such impact-strength tests generally yield higher values than those on standard test-pieces.

3. No impact-strength test shall be carried out on sheets less than 5 mm thick and their welds.

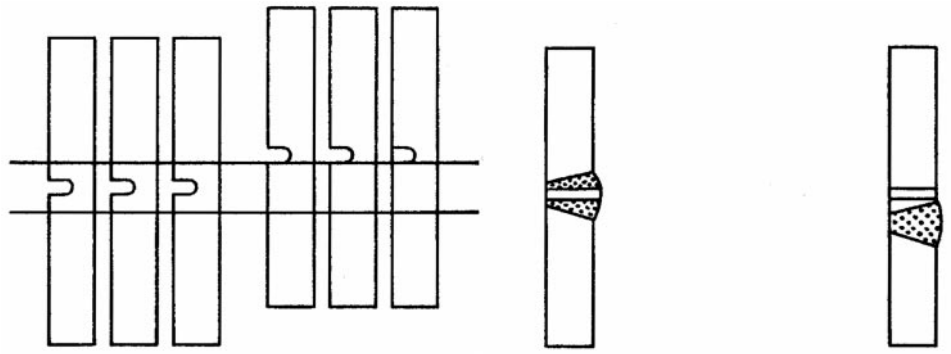
1259 (1) For testing the sheets, the impact strength shall be determined on three test-pieces. These are taken at right angles to the direction of rolling in the case of test-pieces with a U-shaped notch, or in the direction of rolling in the case of test-pieces with a V-shaped notch.

(2) For testing the welds, the test-pieces shall be taken as follows:

$e \leq 10$ mm

3 test-pieces from the centre of the weld;

3 test-pieces from the zone of deformation created by the weld (the notch shall be completely outside the molten area but as near to it as possible).



Centre of weld Zone of deformation

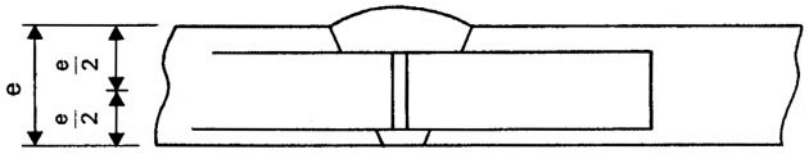
i.e. six test-pieces in all.

The test-pieces shall be so machined as to have the maximum possible thickness.

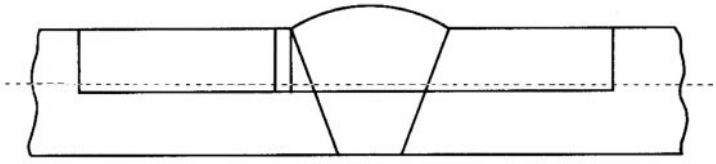
$10 \text{ mm} < e \leq 20$ mm

3 test-pieces from the centre of the weld;

3 test-pieces from the zone of deformation.



Centre of weld

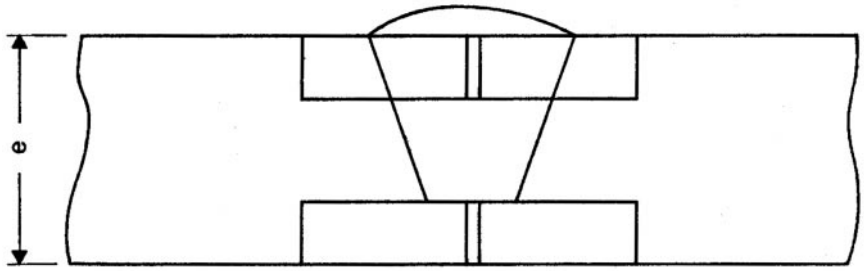


Zone of deformation

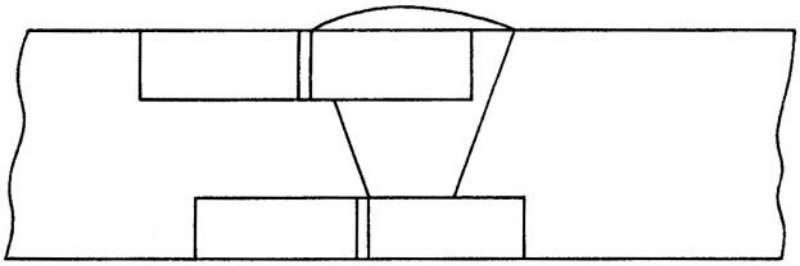
i.e. six test-pieces in all.

$e > 20$ mm

1259 *(cont'd)* 2 sets of 3 test-pieces (one set on the upper face, one set on the lower face) at each of the points indicated below:



Centre of weld



Zone of deformation

i.e. twelve test-pieces in all.

1260 (1) In the case of sheets, the average of 3 tests shall meet the minimum values given in marg. 1255; none of the values may be more than 30 % below the minimum shown.

(2) In the case of the welds, the average values obtained from the test-pieces taken at the different points, centre of weld and zone of deformation, shall correspond to the minimum values shown. None of the values may be more than 30 % below the minimum shown.

b. Determination of bending coefficient

1261 (1) The bending coefficient k referred to in marg. 1256 is defined as follows:

$$k = 50 \frac{e}{r}$$

where e = thickness of sheet in mm; and

r = mean radius of curvature in mm of the test-piece when the first crack appears in the tension zone.

(2) The bending coefficient k shall be determined for the weld. The width of the test piece shall be equal to 3 e.

(3) Four tests shall be performed on the weld, two with the root in the compression zone (fig. 1) and two with the root in the tension zone (fig. 2); all individual values obtained shall meet the minimum values shown in marg. 1256.

1261
(cont'd)

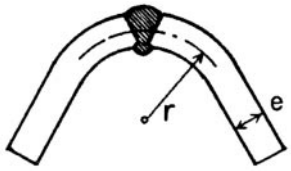


Fig. 1

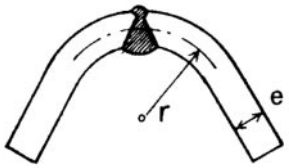


Fig. 2

1262-1269

C. REQUIREMENTS CONCERNING THE MATERIALS AND CONSTRUCTION OF SHELLS OF TANK WAGONS AND SHELLS OF TANK-CONTAINERS FOR WHICH A TEST PRESSURE OF AT LEAST 1 MPa (10 BAR) IS PRESCRIBED, AS WELL AS SHELLS OF TANK WAGONS AND SHELLS OF TANK-CONTAINERS INTENDED FOR THE CARRIAGE OF DEEPLY REFRIGERATED LIQUEFIED GASES OF CLASS 2

1. Materials and shells

1270 (1) Shells intended for the carriage of substances of Class 2, items 1, 2 and 4, Class 4.2, items 6 (a), 17 (a), 19 (a) and 31 (a) to 33 (a) and Class 8, item 6 shall be made of steel.

(2) Shells intended for the carriage of deeply refrigerated liquefied gases of Class 2 shall be made of steel, aluminium, aluminium alloy, copper or copper alloys (e.g. brass). However, shells made of copper or copper alloys shall be allowed only for gases containing no acetylene; ethylene may, however, contain not more than 0,005 % acetylene.

(3) Only materials appropriate to the minimum and maximum working temperatures of the shells and of their accessories may be used.

1271 The following shall be allowed for the manufacture of shells:

(a) steels not subject to brittle fracture at the minimum working temperature (see marg. 1275).

The following may be used:

1. mild steels (except for gases of item 3 of Class 2);
2. fine-grained steels, down to a temperature of – 60 °C;
3. nickel-alloy steels (with a nickel content from 0,5 % to 9 %), down to a temperature of – 196 °C, depending on the nickel content;
4. chrome-nickel austenitic steels, down to a temperature of – 270 °C.

(b) aluminium not less than 99,5 % pure or aluminium alloys (see marg. 1276);

(c) deoxidized copper not less than 99,9 % pure and copper alloys having a copper content of over 56 % (see marg. 1277).

1272 (1) Shells made of steel, aluminium or aluminium alloys shall be either seamless or welded.

(2) Shells made of copper or copper alloys may be hard-soldered.

1273 The accessories may be screwed to the shells or secured thereto as follows:

(a) shells made of steel, aluminium or aluminium alloys: by welding;

(b) shells made of austenitic steel, copper or copper alloys: by welding or hard-soldering.

1274 The construction of shells and their attachment to the wagon underframe or the container frame shall be such as to preclude with certainty any reduction of temperature of the load-bearing components likely to render them brittle. The fastenings of the shells shall themselves be so designed that even when the shell is at its lowest permitted working temperature they still possess the necessary mechanical properties.

2. Requirements concerning the tests

a. Steel receptacles

1275 The materials used for the manufacture of receptacles, and the weld beads, shall at their lowest working temperatures, but at least at – 20 °C, meet the following requirements as to impact strength:

The tests may be carried out with test-pieces having a V-shaped notch.

Impact strength (see marg. 1278 to 1280) of test-pieces whose longitudinal axis is perpendicular to the direction of rolling and which have a V-shaped notch (conforming to ISO Standard R148) perpendicular to the metal sheet shall have a minimum value of 34 J/cm^2 for mild steel (the tests may be carried out on the basis of existing ISO Standards with test-pieces whose longitudinal axis follows the direction of rolling), fine grained steel, ferritic alloy steel Ni < 5 %, ferritic alloy steel 5 % ≤ Ni ≤ 9 % or austenitic Cr-Ni steel.

In the case of austenitic steels, only the weld bead need be subjected to an impact-strength test.

For working temperatures below – 196 °C, the impact-strength test is not performed at the lowest working temperature, but at – 196 °C.

b. Receptacles made of aluminium or aluminium alloy

1276 The seams of receptacles shall meet the requirements laid down by the competent authority.

c. Receptacles made of copper or copper alloy

1277 It is not necessary to carry out tests to determine whether the impact strength is adequate.

3. Tests

Impact-strength tests

1278 For sheets less than 100 mm but not less than 5 mm thick, test-pieces having a cross-section of 10 × e mm, where 'e' represents the thickness of the sheet, shall be used. If necessary, a reduction to 7,5 mm or 5 mm is permitted. The minimum value of 34 J/cm^2 shall be maintained in all cases.

Note: No impact-strength tests shall be carried out on sheets less than 5 mm thick, or on their seams.

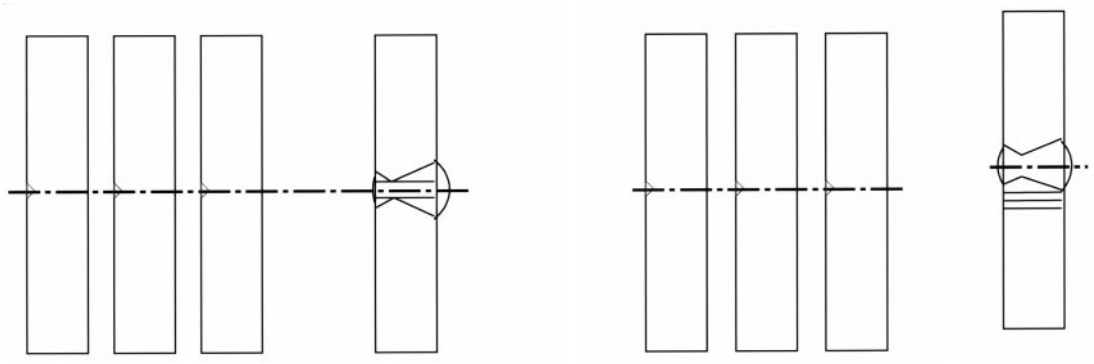
1279 (1) For testing sheet metal the impact strength shall be determined on three test-pieces. The test-pieces shall be removed at right angles to the direction of rolling; however, for mild steel, they may be removed in the direction of rolling.

(2) For testing seams, the test-pieces shall be taken as follows:

e ≤ 10 mm:

three test-pieces from the centre of the weld;

1279 *(cont'd)* three test-pieces with notches from the centre of the zone of deformation created by the weld; (the V-shaped notch shall be completely outside the melted area in the centre of the sample).

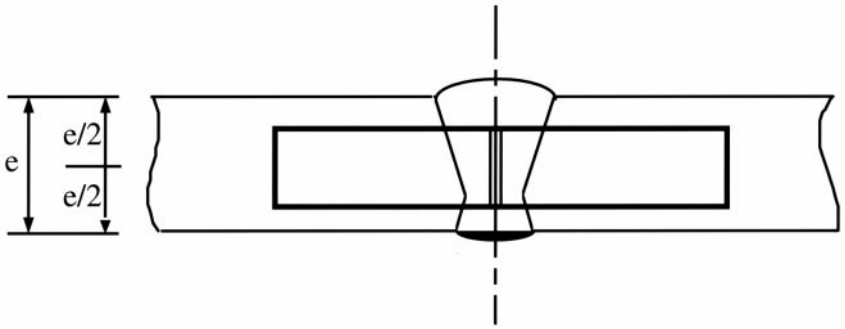


Centre of weld *Zone of deformation*

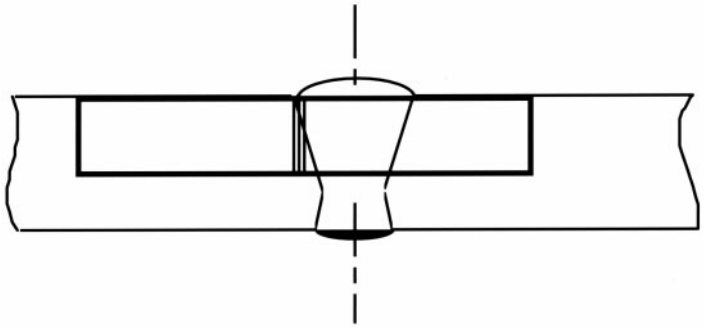
10 mm < e ≤ 20 mm:

three test-pieces from the centre of the weld;

three test-pieces from the zone of deformation created by the weld (the V-shaped notch shall be completely outside the melted area in the centre of the sample).



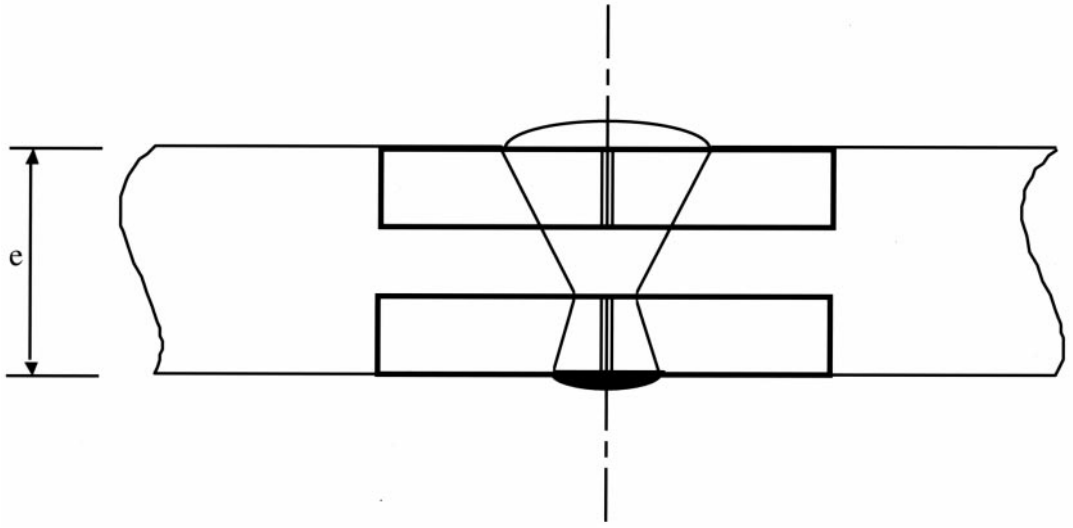
Centre of weld



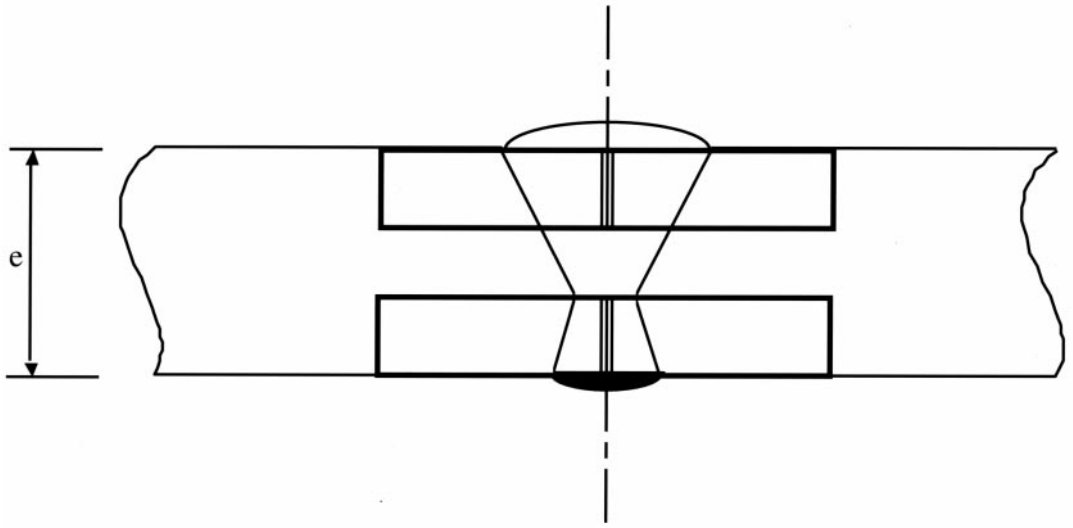
Zone of deformation

e > 20 mm:

two sets of three test-pieces (one set on the upper face, one set on the lower face) at each of the points indicated below (the V-shaped notch shall be completely outside the melted area in the centre of the sample for those taken from the zone of deformation created by the weld).



Centre of weld



Zone of deformation

1280 (1) For sheet metal the average of three tests shall meet the minimum value of 34 J/cm^2 given in marg. 1275. One of the values at most may be below the minimum value, but not less than 24 J/cm^2.

(2) For welds, the average value obtained from the three test-pieces taken from the centre of the weld shall not be lower than the minimum value of 34 J/cm^2. One of the values at most may be below the minimum value, but not less than 24 J/cm^2.

(3) For the zone of deformation created by the weld (the V-shaped notch shall be completely outside the melted area in the centre of the sample), the value obtained from not more than one of the three test-pieces may be lower than the minimum value of 34 J/cm^2 but not less than 24 J/cm^2.

1281 If the requirements of marg. 1280 are not met, one new test may be carried out:

(a) if the average value obtained from the first three tests was below the minimum value of 34 J/cm^2, or

(b) if more than one of the individual values was lower than the minimum value of 34 J/cm^2 but not less than 24 J/cm^2.

1282 When the impact-strength test is repeated on sheet metal or welds, none of the individual values may be less than 34 J/cm^2. The average value of all the results obtained in the original test and the repeated test shall be equal to or more than the minimum of 34 J/cm^2.

When the impact-strength test is repeated on the zone of deformation, none of the individual values shall be lower than 34 J/cm^2.

1283-
1290

D. REQUIREMENTS RELATING TO TESTS ON AEROSOL DISPENSERS AND RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) OF ITEM 5 OF CLASS 2

1. Pressure and bursting tests on receptacle model

1291 Hydraulic pressure tests shall be carried out on at least five empty receptacles of each model:

(a) until the prescribed test pressure is reached, by which time no leakage or visible permanent deformation shall have occurred; and

(b) until leakage or bursting occurs. The dished end, if any, should yield first and the receptacle should not leak or burst until a pressure 1,2 times the test pressure has been reached or passed.

The requirements of this marg. are considered to have been complied with if the following standard is applied:

— Standard EN 417:1992 for 2037 receptacles, small, containing gas (gas cartridges) of item 5 containing 1965 hydrocarbon gas mixture, liquefied, n.o.s.

2. Leakproofness tests on all receptacles

1292 (1) For the test on aerosol dispensers and low capacity receptacles containing gas (gas cartridges) of item 5 of Class 2 in a hot-water bath, the temperature of the bath and the duration of the test shall be such that the internal pressure of each receptacle reaches at least 90 % of the internal pressure that would be reached at 55 °C.

However, if the contents are sensitive to heat or if the receptacles are made of a plastics material which softens at this test temperature, the temperature of the bath shall be from 20 °C to 30 °C; in addition, one dispenser out of every 2000 shall be tested at the temperature prescribed in the preceding paragraph.

(2) No leakage or permanent deformation of receptacles shall occur. The provision concerning permanent deformation is not applicable to receptacles made of a plastics material which softens.

(3) The requirements of this marg. are considered to have been complied with if the following standard is applied:

— Standard EN 417:1992 for 2037 receptacles, small, containing gas (gas cartridges) of item 5 containing 1965 hydrocarbon gas mixture, liquefied, n.o.s.

1293-
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APPENDIX III

A. TESTS RELATING TO FLAMMABLE LIQUIDS OF CLASSES 3, 6.1 AND 8

Test for determining flash-point

1300 (1) The flash-point shall be determined by means of one of the following types of apparatus:

a) Abel

b) Abel-Pensky

c) Tag

d) Pensky-Martens

e) Apparatus conforming to Standards ISO 3679:1983 or ISO 3680:1983.

(2) To determine the flash-point of paints, gums and similar viscous products containing solvents, only apparatus and test methods suitable for determining the flash-point of viscous liquids shall be used, in accordance with the following standards:

a) International Standard ISO 3679: 1983

b) International Standard ISO 3680: 1983

c) International Standard ISO 1523: 1983

d) German Standard DIN 53213: 1978, Part 1.

1301 (1) The test procedure shall be either according to an equilibrium method or according to a non-equilibrium method.

(2) For the procedure according to an equilibrium method, see:

a) International Standard ISO 1516: 1981

b) International Standard ISO 3680: 1983

c) International Standard ISO 1523: 1983

d) International Standard ISO 3679: 1983.

(3) The procedure according to a non-equilibrium method shall be:

a) for the Abel apparatus, see:

(i) Britisch Standard BS 2000: 1995, Part 170

(ii) French Standard NF MO7-011: 1988

(iii) French Standard NF T66-009: 1969;

b) for the Abel-Pensky apparatus, see:

(i) German Standard DIN 51755: 1974, Part 1 (for temperatures from 5 °C to 65 °C)

(ii) German Standard DIN 51755: 1978, Part 2 (for temperatures below 5 °C)

(iii) French Standard NF MO7-036: 1984;

c) for he Tag apparatus, see American Standard ASTM D 56: 1993;

d) for the Pensky-Martens apparatus, see:

(i) International Standard ISO 2719: 1988

(ii) European Standard EN 22719: 1994 in each of its national versions (e.g. BS 2000, part 404/EN 22719)

(iii) American Standard ASTM D 93: 1994

(iv) Institute of Petroleum Standard IP 34: 1988.

1301 *(cont'd)* (4) The test methods listed in paragraphs (2) and (3) shall only be used for flash-point ranges which are specified in the individual methods. The possibility of chemical reactions between the substance and the sample holder shall be considered when selecting the method to be used. The apparatus shall, as far as is consistent with safety, be placed in a draught-free position. For safety, a method utilizing a small sample size, around 2ml, shall be used for organic peroxides and self-reactive substances (also known as 'energetic' substances) or for toxic substances.

(5) When the flash-point, determined by a non-equilibrium method in accordance with paragraph (3), is found to be 23 °C ± 2 °C or 61 °C ± 2 °C, it shall be confirmed for each temperature range by an equilibrium method in accordance with paragraph (2).

1302 In the event of a dispute as to the classification of a flammable liquid, the item number proposed by the consignor shall be accepted if a check-test of the flash-point yields a result not differing by more than 2 °C from the limits (23 °C and 61 °C respectively) stated in marg. 301. If the difference is more than 2 °C, a second respectively check-test shall be carried out, and the lowest of the flash-points obtained in the two check-tests shall be adopted.

Test for determining peroxide content

1303 To determine the peroxide content of a liquid, the procedure is as follows:

A quantity *p* (about 5 g, weighed to the nearest 0,01 g) of the liquid to be titrated is placed in a Erlenmeyer flask; 20 ml of acetic anhydride and about 1 g of powdered solid potassium iodide are added; the flask is shaken and, after 10 minutes, heated for 3 minutes to about 60 °C. When it has been left to cool for 5 minutes, 25 ml of water are added. After this, it is left standing for half an hour, then the liberated iodine is titrated with a decinormal solution of sodium thiosulphate, no indicator being added; complete discolouration indicates the end of the reaction. If n is the number of cm^3 of thiosulphate solution required, the percentage of peroxide (calculated as H_2O_2) present in the sample is obtained by the formula

$$\frac{17n}{100p}$$

Test for determining combustibility

1304 (1) The method describes a procedure for determining whether the substance, when heated under the test conditions and exposed to an external source of flame applied in a standard manner, sustains combustion.

(2) Principle of the method: A metal block with a concave depression (test portion well) is heated to a specified temperature. A specified volume of the substance under test is transferred to the well and its ability to sustain combustion is noted after application and subsequent removal of a standard flame under specified conditions.

(3) Apparatus: A combustibility tester consisting of a block of aluminium alloy or other corrosion-resistant metal of high thermal conductivity is used. The block has a concave well and a pocket drilled to take a thermometer. A small gas jet assembly on a swivel is attached to the block.

The handle and gas inlet for the gas jet may be fitted at any convenient angle to the gas jet. A suitable apparatus is shown in figure 1 and the essential dimensions are given in figures 1 and 2.

a) Gauge, for checking that the height of the centre of the gas jet above the top of the test portion well is 2.2 mm (see figure 1).

b) Thermometer, mercury in glass, for horizontal operation, with a sensitivity not less than 1 mm/°C, or other measuring device of equivalent sensitivity permitting reading at 0.5 °C intervals. When in position in the block, the thermometer bulb shall be surrounded with thermally conducting thermoplastic compound.

1304 *(cont'd)*

c) Hotplate, fitted with a temperature-control device. (Other types of apparatus with suitable temperature-control facilities may be employed to heat the metal block.)

d) Stopwatch, or other suitable timing device.

e) Syringe, capable of delivering 2 ml to an accuracy of ± 0,1 ml.

f) Fuel source, butane test fuel.

(4) Sampling: The sample shall be representative of the substance to be tested and be supplied and kept in a tightly closed container prior to test. Because of the possibility of loss of volatile constituents, the sample shall receive only the minimum treatment to ensure its homogeneity.

After removing each test portion, the sample container shall be immediately closed tightly to ensure that no volatile components escape from the container; if this closure is incomplete, an entirely new sample shall be taken.

(5) Procedure: Carry out the determination in triplicate.

WARNING: Do not carry out the test in a small confined area (for example a glove box), because of the hazard of explosions.

a) It is essential that the apparatus is set up in a completely draught-free area (see warning) and in the absence of strong light, to facilitate observation of flash, flame, etc.

b) Place the metal block on the hotplate or heat the metal block by other suitable means so that its temperature, as indicated by the thermometer placed in the metal block, is maintained at the specified temperature with a tolerance of ± 1 °C. The test temperature is 60,5 °C/75 °C [see h)]. Correct this temperature for the difference in barometric pressure from the standard atmospheric pressure (101,3 kPa) by raising the test temperature for a higher pressure or lowering the test temperature for a lower pressure by 1,0 °C for each 4kPa difference. Ensure that the top of the metal block is exactly horizontal. Use the gauge to check that the jet is 2,2 mm above the top of the well when in the test position.

c) Light the butane test fuel with the jet away from the test position (i.e. in the 'off' position, away from the well). Adjust the size of the flame so that it is 8 mm to 9 mm high and approximately 5 mm diameter.

d) Using the syringe, take from the sample container at least 2 ml of the sample and rapidly transfer a test portion of 2 ml ± 0,1 ml to the well of the combustibility tester and immediately start the timing device.

e) After a heating time of 60 s, by which time the test portion is deemed to have reached its equilibrium temperature, and if the test fluid has not ignited, swing the test flame into the test position over the edge of the pool of liquid. Maintain it in this position for 15 s and then return it to the 'off' position while observing the behaviour of the test portion. The test flame should remain alight throughout the test.

f) For each test observe and record:

i) whether there is ignition and sustained combustion or flashing, or neither, of the test portion before the test flame is moved into the test position;

ii) whether the test portion ignites while the test flame is in the test position, and, if so, how long combustion is sustained after the test flame is returned to the 'off' position.

g) If sustained combustion interpreted in accordance with paragraph (6) is not found, repeat the complete procedure with new test portions, but with a heating time of 30 s.

h) If sustained combustion interpreted in accordance with paragraph (6) is not found at a test temperature of 60,5 °C, repeat the complete procedure with new test portions, but at a test temperature of 75 °C.

1304 (6) **Interpretation of observations:**
(cont'd)

The substance should be assessed as sustaining combustion if, for either of the heating times, one of the following occurs with either of the test portions:

a) when the test flame is in the 'off' position, the test portion ignites and sustains combustion;

b) the test portion ignites while the test flame is in the test position, maintained for 15 s, and sustains combustion for more than 15 s after the test flame has been returned to the 'off' position.

Intermittent flashing shall not be interpreted as sustained combustion. Normally, at the end of 15 s, the combustion has either clearly ceased or continues. In cases of doubt, the substance shall be deemed to sustain combustion.

c) Substances are considered not to sustain combustion if their flash-point according to Standard ISO 2592: 1973 is greater than 100 °C or if they are water miscible solutions with a water content of more than 90% by mass.

Design and dimensions of the test apparatus for determining the combustibility of flammable liquids

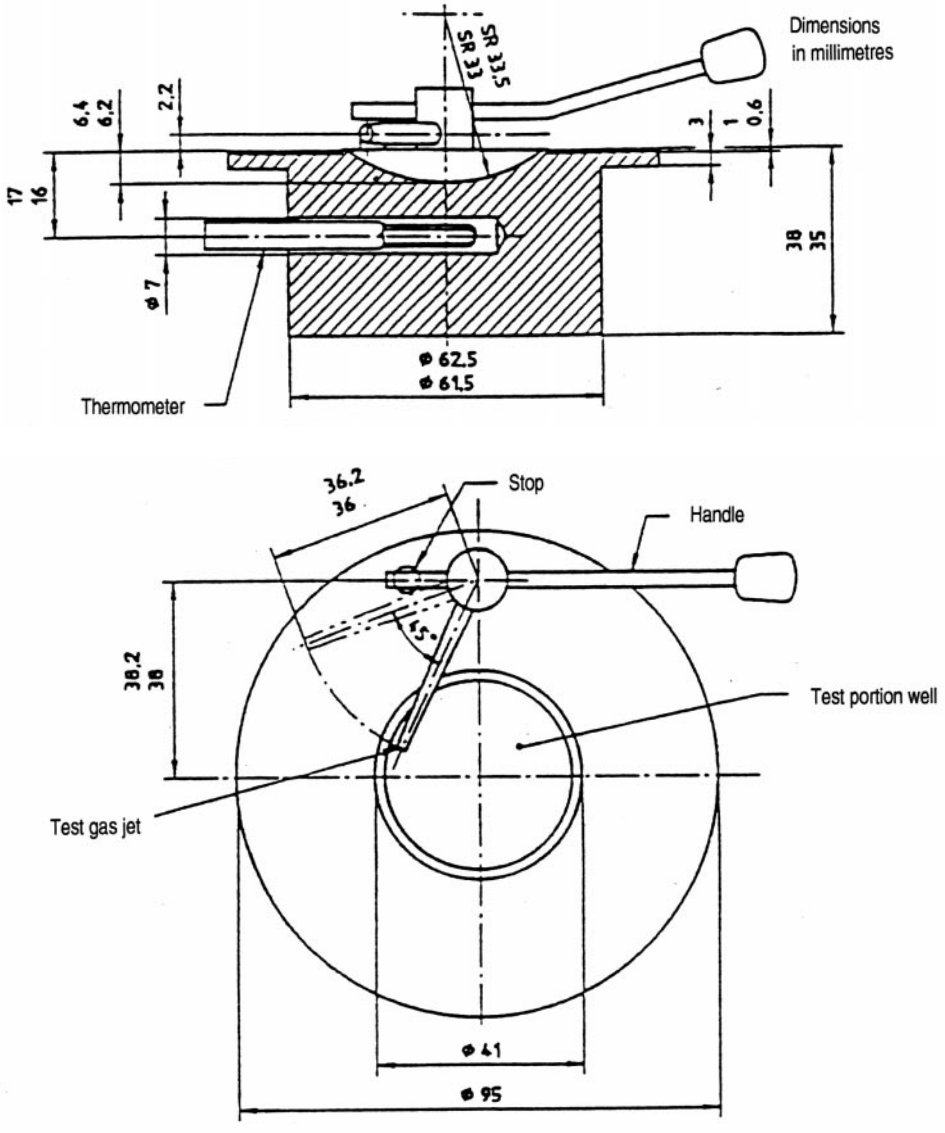


Figure 1 — Combustibility tester

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(cont'd)

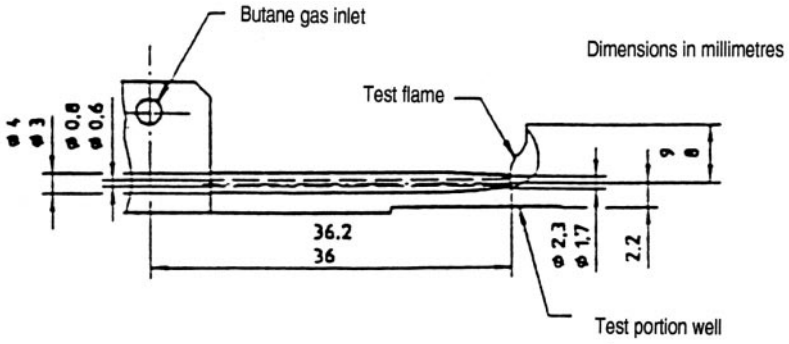


Figure 2 — Test gas jet and flame

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B. TEST FOR DETERMINING FLUIDITY

1310 To determine the fluidity of liquid or viscous substances and mixtures of Class 3 and pasty substances of Class 4.1, the following test method shall be used.

a) **Test apparatus**

Commercial penetrometer conforming to ISO Standard 2137: 1985, with a guide rod of 47,5 g ± 0,05 g; sieve disc of duralumin with conical bores and a mass of 102,5 g ± 0,05 g (see figure 1); penetration vessel with an inside diameter of 72 mm to 80 mm for reception of the sample.

b) **Test procedure**

The sample is poured into the penetration vessel not less than half an hour before the measurement. The vessel is then hermetically closed and left standing until the measurement. The sample in the hermetically closed penetration vessel is heated to 35 °C ± 0.5 °C and is placed on the penetrometer table immediately prior to measurement (not more than two minutes). The point S of the sieve disc is then brought into contact with the surface of the liquid and the rate of penetration is measured.

c) **Evaluation of test results**

A substance is not subject to the requirements of Class 3 but to those of Class 4.1 of this Directive if, after the centre S has been brought into contact with the surface of the sample, the penetration indicated by the dial gauge

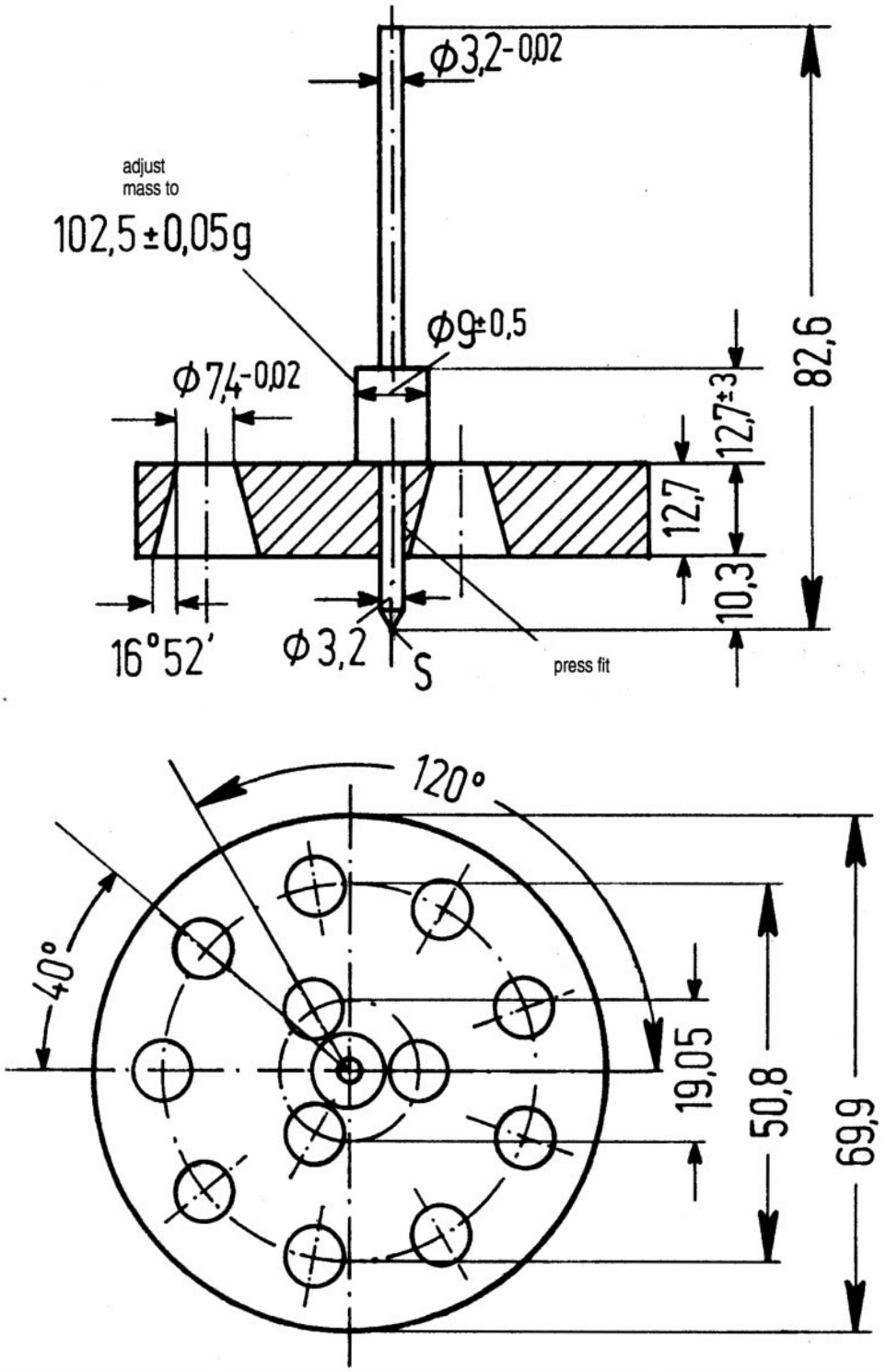
i) after a loading time of 5 s ± 0.1 s, is less than 15.0 mm ± 0.3 mm, or

ii) after a loading time of 5 s ± 0.1 s, is greater than 15.0 mm ± 0.3 mm, but the additional penetration after another 55 s ± 0,5 s is less than 5,0 mm ± 0,5 mm.

Note: In the case of samples having a flow point, it is often impossible to procedure a steady level surface in the penetration vessel and, hence, to establish satisfactory initial measuring conditions for the contact of the point S. Furthermore, with some samples, the impact of the sieve disc can cause an elastic deformation of the surface and, in the first few seconds simulate a deeper penetration. In all these cases, it may be appropriate to use the evaluation in (b) above.

1310
(cont'd)

Figure 3 — Penetrometer



Tolerances not specified are ± 0,1 mm

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C. TESTS FOR DETERMINING THE ECOTOXICITY, PERSISTENCE AND BIOACCUMULATION OF SUBSTANCES IN TE AQUATIC ENVIRONMENT FOR ASSIGNMENT TO CLASS 9

Note: The test methods used shall be those adopted by the OECD and the Commission of the European Communities. If other methods are used, they shall be internationally recognized, be equivalent to the Organization for Economic Cooperation and Development (OECD)/EC tests and be referenced in test reports.

1320 Acute toxicity for fish

The object is to determine the concentration which causes 50 % mortality in the test species; this is the (LC^{50}) value, namely, the concentration of the substance in water which will cause the death of 50 % of a test group of fish during a continuous period of testing of a least 96 hours. Appropriate types of fish include: striped brill *(Brachydanio rerio)*, fathead minnow *(Pimephales promelas)* and rainbow trout *(Oncorhynchus mykiss)*.

The fish are exposed to the test substance added to the water in varying concentrations (plus a control). Observations are recorded a least every 24 hours. At the end of the 96-hour activity and, if possible, at each observation, the concentration causing the death of 50 % of the fish is calculated. The no observed effect concentration (NOEC) at 96 hours is also determined.

1321 Acute toxicity for daphnia

The object is to determine the effective concentration of the substance in water which renders 50 % of the daphnia unable to swim (EC_{50}). The appropriate test organisms are *daphnia magna* and *daphnia pulex*. The daphnia are exposed for 48 hours to the test substance added to the water in varying concentrations. The no observed effect concentration (NOEC) at 48 hours is also determined.

1322 Algal growth inhibition

The object is to determine the effect of a chemical on the growth of algae under standard conditions. The change in biomass and the rate of growth with algae under the same conditions, but without the presence of the test chemical, are compared over 72 hours. The results are expressed as the effective concentration which reduces the rate of algal growth by 50 %, (IC_{50r}), and also the formation of the biomass, (IC_{50b}).

1323 Tests for ready biodegradability

The object is to determine the degree of biodegradation under standard aerobic conditions. The test substance is added in low cencentrations to a nutrient solution containing aerobic bacteria. The progress of degradation is followed for 28 days by determining the parameter specified in the test method used. Several equivalent test methods are available. The parameters include reduction of dissolved organic carbon (DOC), carbon dioxide (CO_2) generation or oxygen (O_2) depletion.

A substance is considered to be readily biodegradable if within not more than 28 days the following criteria are satisfied - within 10 days from when degradation first reaches 10 %:

Reduction of DOC: 70 %
Generation of CO_2: 60 % of theoretical CO_2 production.
Depletion of O_2: 60 % of theoretical O_2 requirement.

1323 *(cont'd)* The test may be continued beyond 28 days if the above criteria are not satisfied, but the result will represent the inherent biodegradability of the test substance. For assignment purposes, the 'ready' result is normally required.

Where only COD and BOD5 data are available, a substance is considered to be readily biodegradable if the ratio of BOD5 to COD is greater than or equal to 0,5.

BOD (Biochemical Oxygen Demand) is defined as the mass of dissolved oxygen required by a specific volume of solution of the substance for the process of biochemical oxidation under prescribed conditions. The result is expressed as grams of BOD per gram of test substance. The normal test period is five days using a national standard test procedure.

COD (Chemical Oxygen Demand) is a measure of the oxidizability of a substance, expressed as the equivalent amount in oxygen of an oxidizing reagent consumed by the substance under fixed laboratory conditions. The results are expressed in grams of COD per gram of substance. A national standard procedure may be used.

1324 Test for bioaccumulation potential

(1) The object is to determine the potential for bioaccumulation either by the ratio at equilibrium of the concentration (c) of a substance in a solvent to that in water or by the bioconcentration factor (BCF).

(2) The ratio at equilibrium of the concentration (c) of a substance in a solvent to that in water is normally expressed as a $\log_{10}$. The solvent and water shall have negligible miscibility and the substance shall not ionize in water. The solvent normally used is n-octanol.

In the case of n-octanol and water, the results is:

$\log P_{ow} = \log_{10} [c_o/c_w]$

where P_{ow} is the partition coefficient obtained by dividing the concentration of the substance in n-octanol (c_o) by the concentration of the substance in water (c_w).

If $\log/P_{ow} \geq 3$ then the substance has a potential to bioaccumulate.

(3) The bioconcentration factor (BCF) is defined as the ratio of the concentration of the test substance in the test fish (c_f) to the concentration in the test water (c_w) at steady state:

$BCF = (c_f)/(c_w)$.

The principle of the test involves exposing fish to a solution or dispersion at known concentrations fo the test substance in water. Continuous flow, static or semi-static procedures may be used according to the test procedure selected, based on the properties of the test substance. Fish are exposed to the test substance over a given period of time, followed by a period of no further exposure. During the second period, measurements are made of the rate of increase in the water of the test substance (i.e. the rate of excretion or depuration).

(Full details of the various test procedures and the calculation method for the BCF are given in the OECD Guidelines for Testing of Chemicals, methods 305A to 305E, 12 May 1981).

(4) A substance may have a log P_{ow} greater than 3 and a BCF less than 100 which would indicate little or no potential to bioaccumulate. In cases of doubt, the BCF value takes precedence over log P_{ow}, as indicated in the flowchart shown in marg. 1326.

1325 Criteria

A substance may be regarded as pollutant to the aquatic environment if it satisfies one of the following criteria:

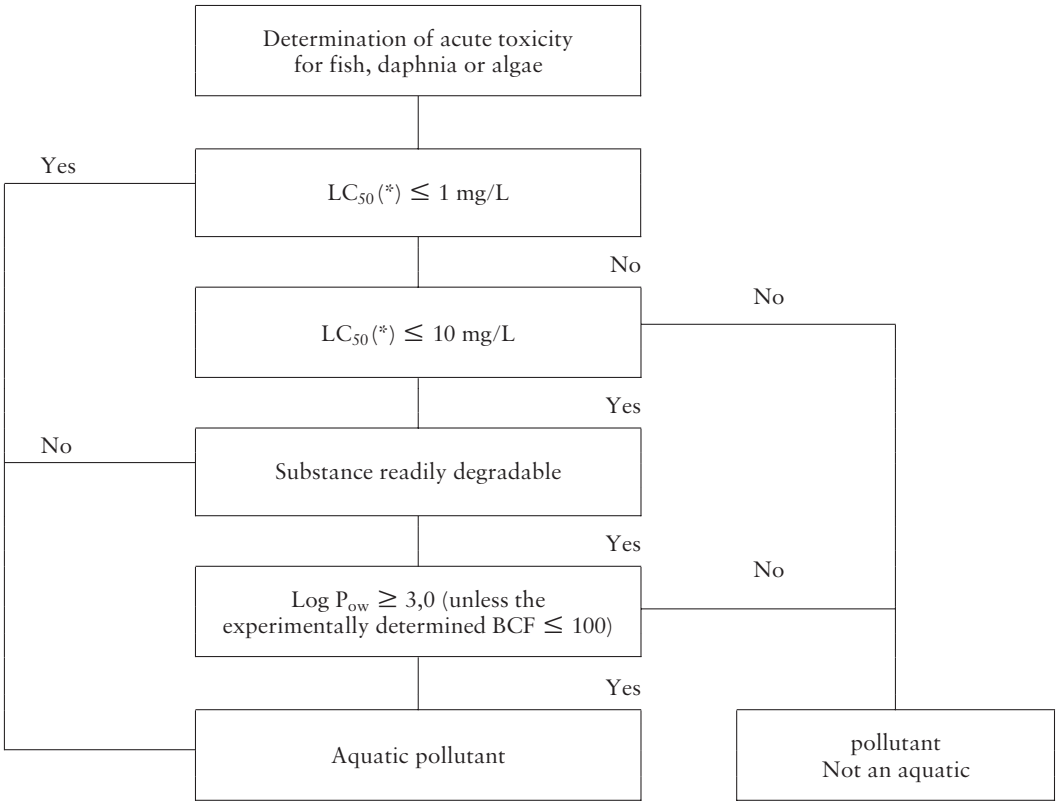
The lowest of the values of the 96 hour LC_{50} for fish, the 48 hour EC_{50} for daphnia or the 72 hour IC_{50} for algae

— is less than or equal to 1 mg/L;

— is greater than 1 mg/L but less than or equal to 10 mg/L, and the substance is not readily biodegradable;

— is greater than 1 mg/L but less than or equal to 10 mg/L, and the log P_{ow} is greater than or equal to 3.0 (unless the experimentally determined BCF is less than or equal to 100).

1326 Procedure to be followed



(*) Lowest value of 96 hour LC_{50}, 48 hour EC_{50} or 72 hour IC_{50} as appropriate.
BCF = bioconcentration factor.

1327-1399

APPENDIX IV

1400-1499 Reserved

APPENDIX V

GENERAL PACKING CONDITIONS: TYPES OF PACKAGING: REQUIREMENTS APPLICABLE TO PACKAGINGS: TEST REQUIREMENTS FOR PACKAGINGS

Note: These requirements apply to packagings containing substances and articles of classes 1, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 8 and 9.

Section I

General packing conditions

1500 (1) Packagings shall be so manufactured and closed as to prevent any leakage of contents from a package prepared for dispatch such as might be caused in normal conditions of carriage particularly by vibration or changes in temperature, humidity or pressure. No dangerous substances shall adhere to the outside of packages. These provisions apply both to new and to reused packagings.

(2) Parts of packagings which are in direct contact with dangerous substances shall not be affected by chemical or other action of those substances; where necessary, they shall be provided with a suitable inner coating or treatment. Such parts of packagings shall not incorporate constituents liable to react dangerously with the contents, to form hazardous products, or significantly to weaken them.

(3) Each packaging except inner packagings of combination packagings shall conform to a design type tested and approved in accordance with the requirements laid down in section IV. Mass-produced packagings shall conform to the approved design type.

(4) Where packagings are filled with liquid substances, sufficient ullage shall be left to ensure that no leakage of liquid substance and no permanent distortion of the packaging occurs as a result of expansion of the liquid substance due to temperatures which may be attained during carriage. For a filling temperature of 15 °C, the maximum degree of filling shall be determined as follows, unless otherwise provided under a particular Class,

either (a)

Boiling point (initial boiling point) of the substance in °C	< 60	≥ 60 < 100	≥ 100 < 200	≥ 200 < 300	≥ 300
Degree of filling as a percentage of the capacity of the packaging	90	92	94	96	98

or (b)

$$\text{Degree of filling} = \frac{98}{1 + \alpha\ (50 - t_F)} \text{ per cent of the capacity of the packaging.}$$

In this formula α represents the mean coefficient of cubic expansion of the liquid substance between 15 °C and 50 °C; that is to say, for a maximum rise in temperature of 35 °C.

α is calculated according to the formula $\alpha = \frac{d_{15} - d_{50}}{35 \times d_{50}}$

d_{15} and d_{50} the relative densities [1] of the liquid at 15 °C and 50 °C and t_F the mean temperature of the liquid at the time of filling.

[1] Relative density (d) is considered to be synonymous with specific gravity (SG) and will be used throughout this Appendix.

1500 *(cont'd)*

(5) Inner packagings shall be packed in an outer packaging in such a way that, under normal conditions of carriage, they cannot break, be punctured or leak their contents into the outer packaging. Inner packagings which are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials, etc., shall be secured in outer packagings with suitable cushioning material. Any leakage of the contents shall not substantially impair the protective properties of the cushioning material or of the outer packaging.

(6) Inner packagings containing different substances which may react dangerously with one another and cause:

(a) combustion and/or evolution of considerable heat;

(b) emission of flammable and/or toxic gases;

(c) the formation of corrosive substances; or

(d) the formation of unstable substances

shall not be placed in the same outer packaging (see also the mixed packing provisions under the various classes).

(7) The closure of packagings containing wetted or diluted substances shall be such that the percentage of liquid (water, solvent or phlegmatizer) does not fall below the prescribed limits during carriage.

(8) Where overpressure may develop in a packaging through the emission of gas from the contents (as a result of temperature increase or other causes), the packaging may be fitted with a vent provided that the gas emitted will not cause any danger on account of its toxicity, its flammability, the quantity released, etc. The vent shall be so designed that, when the packaging is in the attitude in which it is intended to be carried, leakages of liquid and the penetration of foreign matter are prevented under normal conditions of carriage. However, a substance may be carried in such a packaging only where a vent is expressly prescribed for that substance in the conditions of carriage of the relevant Class.

(9) New, remanufactured packagings shall be capable of passing the tests prescribed in section IV. Before being filled and handed over for carriage, every packaging shall be inspected and its freedom from corrosion, contamination or other damage, verified.

Any packaging which shows signs of reduced strength in comparison with the approved design type shall no longer be used or shall be so reconditioned that it is able to withstand the design-type tests.

(10) Packagings used for liquids shall undergo a leakproofness test if so required by and under the conditions prescribed in marg. 1561.

(11) Liquids shall be filled only into packagings which have an appropriate resistance to the internal pressure that may be developed under normal conditions of carriage. Packagings marked with the hydraulic test pressure as prescribed in marg. 1512 (1) (d) shall be filled only with a liquid having a vapour pressure:

(a) such that the total gauge pressure in the packaging (i.e. the vapour pressure of the filling substance plus the partial pressure of air or other inert gases, less 100 kPa) at 55 °C determined on the basis of a maximum degree of filling in accordance with (4) above and a filling temperature of 15 °C, wil not exceed two-thirds of the marked test pressure; or

(b) at 50 °C less than four-sevenths of the sum of the marked test pressure plus 100 kPa; or

(c) at 55 °C less than two-thirds of the sum of the marked test pressure plus 100 kPa.

1500
(cont'd)

Examples of required marked test pressures calculated as in (c) above.

Un No	Liquid		Packing Group	V_{p55} (kPa)	($V_{p55} \times 1,5$) (kPa)	($V_{p55} \times 1,5$) minus 100 (kPa)	Required minimum test pressure (gauge) under marg. 1554 (4) (c) (kPa)	Minimum test pressure (gauge) to be marked on the packaging (kPa)
	Name	Class						
2056	Tetrahydrofuran	3	II	70	105	5	100	100
2247	n-Decane	3	III	1,4	2,1	– 97,9	100	100
1593	Dichloromethane	6,1	III	164	246	146	146	150
1155	Diethyl ether	3	I	199	299	199	199 (4)	250

Note: 1. For pure liquids the vapour pressure at 55 °C (V_{p55}) can often be obtained from scientific tables.

2. The maximum vapour pressures in paragraphs (b) and c() refer tot the basis of the formula.

3. The minimum test pressures indicated in the table refer to the use of paragraph (c) only, which means that the marked test pressure should exceed 1,5 times the vapour pressure at 55 °C less 100 kPa. When, for example, the test pressure for n-decane is determined according to marg. 1554(4)(a) the minimum marked test pressure may be lower.

4. For diethyl ether (1155) (packaging group I) the required minimum test pressure under marg. 1554 (4) is 250 kPa.

(12) Packagings used for solids which may become liquid at temperatures likely to be encountered during carriage shall also be capable of containing the substance in the liquid state.

(13) The packagings shall be manufactured and tested under a quality assurance programme which satisfies the competent authority in order to ensure that each manufactured packaging meets the requirements of this Appendix.

(14) Appropriate measures shall be taken to prevent excessive movement of the damaged or leaking packages within a salvage packaging and when the salvage packaging contains liquids, sufficient absorbent material shall be added to eliminate the presence of free liquid.

(15) The requirements for packagings in section III are based on the packagings currently used. In order to take account of progress in science and technology, packagings having specifications different from those in section III may be used, provided that they are equally effective, are acceptable to the competent authority and are able successfully to withstand the tests prescribed in paragraph (10) and section IV.

1501-
1509

Section II

Types of packaging

Definitions

1510 (1) Subject to the special provisions for each Class, the packagings listed below may be used:

Drums:	flat-ended or convex-ended cylindrical packagings made of metal, fibre, plastics, plywood or other suitable materials. This definition also includes packagings of other shapes, e.g. round taper-necked packagings, or pail-shaped packagings. Wooden barrels and jerricans are not covered by this definition.
Wooden barrels:	packagings made of natural wood, of round croos-section, having convex walls, consisting of staves and heads and fitted with hoops.
Jerricans:	metal or plastics packagings of rectangular or polygonal cross-section with one or more orifices.
Boxes:	packagings with complete rectangular or polygonal faces, made of metal, wood, plywood, reconstituted wood, fibreboard, plastics or other suitable material. Small holes for purposes such as ease of handling or opening or to meet classification requirements are permitted as long as they do not compromise the integrity of the packaging during carriage.
Bags:	flexible packagings made of paper, plastics film, textiles, woven material or other suitable materials.
Composite packagings (plastics material):	packagings consisting of an inner plastics receptacle and an outer packaging (made of metal, fibreboard, plywood, etc.). Once assembled, such a packaging remains thereafter an inseparable unit; it is filled, stored, despatched and empties as such.
Composite packagings (glass, porcelain or stoneware):	packagings consisting of an inner glass, porcelain or stoneware receptacle and an outer packaging (made of metal, wood, fibreboard, plastics material, expanded plastics material, etc.). Once assembled, such a packaging remains thereafter an inseparable unit; it is filled, stored, despatched and emptied as such. It shall be tested in accordance with marg. 1552 (1) (a) or (b), 1553 and 1554.
Combination packagings:	a combination of packagings for transport purposes, consisting of one or more inner packagings secured in an outer packaging in accordance with marg. 1500 (5).
Reconditioned packages include the following:	metal drums that are: (i) cleaned to original materials of construction, with all former contents, internal and external corrosion, and external coatings and labels removed; ii) restored to original shape and contour, with chimes (if any) straightened and sealed, and all non-integral gaskets replaced; and iii) inspected after cleaning but before painting, with rejection of packagings with visible pitting, significant reduction in material thickness, metal fatigue, damaged threads or closures, or other significant defects.

1510 *(cont'd)*

Remanufactured packagings include metal drums that:

(i) are produced as a UN type from a non-UN type;

(ii) are converted from one UN type to another UN type; or

(iii) undergo the replacement of integral structural components (such as non-removable heads).

Remanufactured packagings are subject to the same requirements of this Appendix that apply to a new packaging of the same type.

Reused packagings: packagings which have been examined and found free of defects affecting their ability to withstand the performance test; the term includes those which are refilled with the same or similar compatible contents and are carried within distribution chains controlled by the consignor of the product.

Salvage packagings: special packagings conforming to the applicable requirements of this Appendix into which damaged, defective or leaking dangerous goods packages, or dangerous goods that have spilled or leaked are placed for purposes of carriage for recovery or disposal.

(2) Subject to the special provisions for each Class, the following packagings may also be used:

Composite packagings (glass, porcelain or stoneware): if tested in accordance with marg. 1552 (1) (e).

Light gauge metal packagings: packagings of circular, elliptical, rectangular or polygonal cross-section, (also conical) and taper-necked and pail-shaped packagings made of tinplate or light metal, having a wall thickness of less than 0,5 mm, flat or convex bottomed and with one or more orifices which are not covered in marg. 1510 (1) as drums or jerricans.

(3) The following definitions are applicable to packagings in (1) and (2) above:

Closures: devices which close an opening in a receptacle.

Inner packagings: packagings for which an outer packaging is required for carriage.

Intermediate packagings: packagings placed between inner packagings or articles and an outer packaging.

Inner receptacles: receptacles which require an outer packaging in order to perform their containment function.

Maximum capacity: (as used in Section II) the maximum inner volume of receptacles or packagings expressed in litres.

Maximum net mass: the maximum net mass of contents in a single packaging or maximum combined mass of inner packagings and the contents thereof expressed in kilograms.

Outer packaging: the outer protection of a composite or combination packaging together with any absorbent materials, cushioning and any other components necessary to contain and protect inner receptacles or inner packagings.

1510 *(cont'd)*

Packages:	the complete product of the packing operation, consisting of the packaging and its contents prepared for dispatch.
Packagings:	receptacles and any other components or materials necessary for the receptacle to perform its containment function.
Receptacles:	containment vessels for receiving and holding substances or articles, including any means of closing.
Sift-proof packagings:	packagings impermeable to dry contents including fine solid material produced during carriage.

Note: The 'inners' of 'combination packagings' are always termed 'inner packagings', not 'inner receptacles'. A glass bottle is an example of such an 'inner packaging'. The 'inners' of 'composite packagings' are normally termed 'inner receptacles'. For example, the 'inner' of a 6HA1 composite packaging (plastics material) is such an 'inner receptacle' since it is normally not designed to perform a containment function without its 'outer packaging' and is not therefore an 'inner packaging'.

Coding of design types for packagings confirming to marg. 1510 (1) and (2)

1511 (1) (a) The code number consists of

— an Arabic numeral indicating the kind of packaging, e.g. drum, jerrican etc.;

— a capital letter or letters (Latin characters) indicating the nature of the material, e.g. steel, wood, etc.;

— where necessary, an Arabic numeral indicating the category of packaging within the kind to which the packaging belongs.

(b) In the case of composite packagings, two capital letters (Latin characters) shall be used. The first shall indicate the material of the inner receptacle and the second that of the outer packaging.

(c) In the case of combination packagings, and packagings intended to contain substances of Class 6.2, items 1 and 2, only the code number for the outer packaging shall be used.

The following numerals shall be used for the kind of packaging:

1. Drum
2. Wooden barrel
3. Jerrican
4. Box
5. Bag
6. Composite packaging
0. Light gauge metal packagings

The following capital letters shall be used for the types of material:

A. Steel (all types and surface treatments)

B. Aluminium

C. Natural wood

D. Plywood

F. Reconstituted wood

G. Fibreboard

H. Plastics material, including expanded plastics material

L. Textile

M. Paper, multiwall

1511 *(cont'd)*

N. Metal (other than steel or aluminium)

P. Glass, porcelain or stoneware

(2) Three packing groups are provided for in the special requirements for each Class, according to the degree of danger presented by the substances to be carried:

— Packing Group I: for substances of group (a);

— Packing Group II: for substances of group (b);

— Packing Group III: for substances of group (c)

of the items in the list of substances.

The code number of the packaging shall be followed in the marking by a letter indication the groups of substances for which the design type is approved, as follows:

X for packagings for substances in Packing Groups I to III;

Y for packagings for substances in Packing Groups II and III; and

Z for packagings for substances in Packing Groups III.

Marking

Note: 1. The marking indicates that the packaging which bears it corresponds to a successfully tested design type and that it complies with the provisions of this Appendix which are related to the manufacture, but not to the use, of the packaging. In itself, therefore, the mark does not necessarily confirm that the packaging may be used for any substance: the type of packaging (e.g. steel drum), its maximum capacity and/or mass, and any special requirements are specified for each substance in the appropriate packaging marginals in the classes.

2. The marking is intended to be of assistance to packaging manufacturers, reconditioners, packaging users, carriers and regulatory authorities. In relation to the use of a new packaging, the original marking is a means for its manufacturers to identify the type and to indicate those performance test recommendations that have been met.

3. The marking does not always provide full details of the test levels, etc., and these may need to be taken further into account, e.g. by reference to a test certificate, to test reports or to a register of successfully tested packagings. For example, a packaging having an X or Y marking may be used for substances to which a packaging having a lesser degree of danger has been assigned with the relevant maximum permissible value of the relative density determined by taking into the account the factor 1,5 or 2,25 indicated in the packaging test requirements in Section IV as appropriate, i.e. Group I packaging tested for products of relative density 1,2 could be used as a Group II packaging for products of relative density 1,8 or a Group III packaging of relative density 2,7, provided of course that all the performance criteria can still be met with the higher relative density product.

1512 (1) Each packaging shall bear markings which are durable, legible and placed in a location and of such a size relative to the packaging as to be readily visible. For packages with a gross mass of more than 30 kg, the markings or a duplicate thereof shall appear on the top or on a side of the packaging. Letters, numerals and symbols shall be at least 12 mm high, except for packagings of 30 litres or 30 kg capacity or less, when they shall be at least 6 mm in height and for packagings of 5 litres or 5 kg or less when they shall be of an appropriate size. The marking shall show:

(a) (i) the symbol  for packagings conforming to marg. 1510 (1). For metal packagings on which the marking is stamped, the letters UN may be applied instead of the symbol ;

1512 *(cont'd)*

(ii) the symbol 'RID' [1] instead of the symbol (GB) for packagings conforming to marg. 1510 (2) and removable head drums and jerricans intended to contain liquids having a viscosity at 23 °C exceeding 200 mm²/s conforming to simplified conditions (see Note to marg. 306(1), 307(1), 507(1), 508(1), 607(1), 608(1), 806(1), 807(1), 903(1) and 904(1)];

(b) the packaging code number in accordance with marg. 1511 (1);

(c) a code in two parts:

(i) a letter (X, Y or Z) designating the packing group(s) for which the design type has been approved:

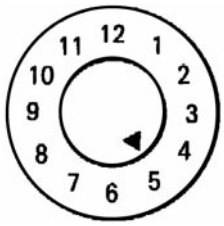
(ii) For packagings without inner packagings, intended to contain liquids, which have successfully passed the hydraulic pressure test, the relative density, rounded off to the first decimal if more than 1,2, for which the design type has been tested; this information may be omitted if the relative density is not more than 1,2; or

for packagings intended to contain solids or inner packagings, and for removable head packagings intended to contain substances having a viscosity at 23 °C of more than 200 mm²/s and for removable head light gauge metal packagings intended to contain substances of Class 3, item 5(c), the maximum gross mass in kilograms.

(iii) for packagings intended to contain substances of Class 6.2, items 1 and 2, 'Class 6.2' shall be used instead of the information required in (i) or (ii).

(d) either a letter 'S' denoting that the packaging is intended to contain liquids having a viscosity at 23 °C of more than 200 mm²/s, solids, or inner packagings and for removable-head light gauge metal packagings intended to contain substances of Class 3, item 5(c) or, where a hydraulic pressure test has been successfully passed, the test pressure in kPa rounded down to the nearest 10 kPa;

(e) the year of manufacture (last two digits). In addition, for packagings of types 1H and 3H, the month of manufacture; this part of the marking may be affixed in a different place from the other particulars. A suitable method is:



(f) the mark [2] of the State in which the approval was issued;

(g) either a registration number and the name or mark of the manufacturer or some other packaging identification mark specified by the competent authorities.

(2) Every reusable packaging liable to undergo a reconditioning process which might obliterate the packaging markings shall bear the marks indicated in (1) (a) to (e) in a permanent form. Marks are permanent if they are able to withstand the reconditioning process (e.g. embossed). For packagings other than metal drums of a capacity greater than 100 litres, these permanent marks may replace the corresponding durable markings prescribed in (1).

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[1] Or 'RID/ADR' for packagings approved for road transport as well as rail transport.
[2] Distinguishing sign for motor vehicles in international traffic prescribed in the Vienna Convention on Road Traffic (1968).

1512 *(cont'd)*

In addition to the durable markings prescribed (1), every new metal drum of a capacity greater than 100 litres shall bear the marks described in (1) (a) to (e) on the base, with an indication of the nominal thickness of at least the metal used in the body (in mm, to 0,1 mm), in permanent form (e.g. embossed).

When the nominal thickness of either head of a metal drum is thinner than that of a body, the nominal thickness of the top head, body and bottom head shall be marked on the bottom in a permanent form (e.g. embossed), for example '1,0 — 1,2 — 1,0' or '0,9 — 1,0 — 1,0'. Nominal thicknesses of metal shall be determined according to the appropriate ISO standard, e.g. ISO 3574:1986 for steel.

The marks indicated in (l) (f) and (g) shall not be applied in a permanent form (e.g. embossed) except as provided for below. For remanufactured metal drums, if there is no change to the packaging type and no replacement or removal of integral structural components, the required markings need not be permanent (e.g. embossed). Every other remanufactured metal drum shall bear the markings in (1) (a) to (e) in a permanent form (e.g. embossed) on the top head or side.

Metal drums made from materials (e.g. stainless steel) designed to be reused repeatedly may bear the markings indicated in (l) (f) and (g) in a permanent form (e.g. embossed).

(3) The registration number is valid for only one design type or series of design types. Different surface treatments may fall within the same design type.

A 'series of design types' means packagings of the same structural design, wall thickness, material and cross-section, which differ only in their lesser design heights from the design type approved.

The closures of receptacles shall be identifiable as those referred to in the test report.

(4) After reconditioning a packaging the reconditioner shall affix to it, near the durable marks required by (1) (a) to (e) the following sequence of marks:

(h) the mark of the State in whose territory the reconditioning was carried out;

(i) the name or authorised symbol of the reconditioner;

(j) the year of reconditioning, the letter 'R' and, for every packaging which has successfully undergone the leakproofness test in accordance with marg. 1500 (10), the additional letter 'L'.

When, after reconditioning, the markings required by (1) (a) to (d) no longer appear on the top head or the side of a metal drum the reconditioner shall apply them in a durable form followed by the markings required in (h), (i) and (j). These markings shall not identify a greater performance capability than that for which the original design type has been tested and marked.

(5) The letter 'T', 'V' or 'W' may follow the packaging code. The letter 'T' signifies a salvage packaging conforming to marg. 1559. The letter 'V' signifies a special packaging conforming to marg. 1558(5). The letter 'W' signifies that the packaging, although of the same type indicated by the code, is manufactured to a specification different to that in section III and is considered equivalent under the provisions of marg. 1500 (15).

(6) Packagings marked in accordance with this marg. but which were approved in a State which has not adhered to COTIF may nevertheless be used for carriage under this Directive.

1512 *(cont'd)* (7) Examples of the markings

For a new steel drum:

(UN) 1A1/Y1.4/150/83 NL/VL 123	(a)(i), (b), (c), (d) and (e) (f) and (g)

For a reconditioned steel drum:

(UN) 1A1/Y1.4/150/83 NL/RB/84 RL	(a)(i), (b), (c), (d) and (e) (h), (i) and (j)

For a remanufactured steel drum:

(UN) 1A2/Y/100/91 USA/MM5	(a), (b), (c), (d) and (e) (f) and (g)

For a steel box of equivalent specification:

(UN) 4AW/Y136/S/90 GB/MC 123	(a), (b), (c), (d) and (e) (f) and (g)

For a new fibreboard box to contain inner packagings or solids:

(UN) 4G/Y145/S/83 NL/VL 823	(a), (b), (c), (d) and (e) (f) and (g)

For fibreboard box intended to contain substances of items 1 and 2 of Class 6.2:

(UN) 4G/Class 6.2/S/92 SSP-9989-ERIKSSON	(a)(i), (b), (c) (iii), (d) and (e) (f) and (g)

For new light gauge metal packagings:

RID/ADR/0A1/Y/100/83 NL/VL 123	(a)(ii), (b), (c), (d) and (e) (f) and (g)	Non-removable head
RID/ADR/0A2/Y20/S/83 NL/VL 124	(a)(ii), (b), (c), (d) and (e) (f) and (g)	Removable head, intended for liquids with a viscosity at 23 °C exceeding 200 mm^2/s and for substances of Class 3, item 5(c).

For a salvage packaging:

(UN) IA2T/Y300/S/94 USA/abc	(a), (b), (c), (d) and (e) (f) and (g)

For removable head packagings intended to contain liquids with a viscosity at 23 °C exceeding 200 mm^2/s and meeting the simplified conditions (see Note to marg. 306 (1), 307 (1), 507 (1), 508 (1), 607 (1), 608 (1), 806 (1), 807 (1), 903 (1) and 904 (1)]:

RID/ADR/3H2/Z25/S/97.05 CH-3458/PLASPAC-AG	(a)(ii), (b), (c) (d) and (e) (f) and (g)

Note: The markings for which examples are given may be applied in a single line or in multiple lines provided the correct sequence is respected.

Certification

1513 By affixing marking in accordance with marg. 1512 (1), it is certified that mass-produced packagings correspond to the approved design type and that the requirements referred to in the approval have been met.

Index of Packagings

1514 The following table indicates the codes to be used for designating types of packagings depending on the kind of packagings, the material used for their construction and their category; it also refers to the marg. to be consulted for the appropriate requirements.

1514 *(cont'd)*

A. Conforming to marg. 1510 (1) and marked 'UN'

Kind	Material	Category	Code	Marg.
1. Drums	A. Steel	non-removable head	1A1	1520
		removable head	1A2	1520 (1)
	B. Aluminium	non-removable head	1B1	1521
		removable head	1B2	1521 (1)
	D. Plywood	—	1D	1523 (1)
	G. Fibre	—	1G	1525 (1)
	H. Plastics	non-removable head	1H1	1526
		removable head	1H2	1526 (1)
2. Barrels	C. Wood	bung type	2C1	1524
		removable head	2C2	
3. Jericans	A. Steel	non-removable head	3A1	1522
		removable head	3A2	1522 (1)
	B. Aluminium	non-removable head	3B1	1522
		removable head	3B2	1522 (1)
	H. Plastics	non-removable head	3H1	1526
		removable head	3H2	1526 (1)
4. Boxes	A. Steel	—	4A	1532 (1)
	B. Aluminium	—	4B	1532 (1)
	C. Natural wood	ordinary	4C1	1527 (1)
		with sift-proof walls	4C2	
	D. Plywood	—	4D	1528 (1)
	F. Reconstituted wood	—	4F	1529 (1)
	G. Fibreboard	—	4G	1530 (1)
	H. Plastics	expanded	4H1	1531 (1)
		solid	4H2	
5. Bags	H. Woven plastics	without inner lining or coating	5H1	1534
		sift-proof	5H2	
		water resistant	5H3	
	H. Plastics film	—	5H4	1535
	L. Textile	without inner lining or coating	5L1	1533
		sift-proof	5L2	
		water resistant	5L3	
	M. Paper	multiwall	5M1	1536
		multiwall, water resistant	5M2	

(1) In accordance with marg. 1538 these packagings may be used as outer packagings of combination packagings.

1514 *(cont'd)*

Kind	Material	Category	Code	Marg.
6. Composite packagings	H. Plastics receptacle	in steel drum	6HA1	1537
		in steel crate or box	6HA2 (1)	
		in aluminium drum	6HB1	
		in aluminium crate or box	6HB2 (1)	
		in wooden box	6HC	
		in plywood drum	6HD1	1537
		in plywood box	6HD2	
		in fibre drum	6HG1	
		in fibreboard box	6HG2	
		in plastics drum	6HH1	
		in solid plastics box	6HH2	

B. Packagings which may conform to marg. 1510 (1) or (2)

Kind	Material	Category	Code	Marg.
6. Composite packagings	P. Glass, porcelain or stoneware receptacle	in steel drum	6PA1	1539
		in steel crate or box (1)	6PA2 (1)	
		in aluminium drum	6PB1	
		in aluminium crate or box	6PB2 (1)	
		in wooden box	6PC	
		in plywood drum	6PD1	
		in wickerwork hamper	6PD2	
		in fibre drum	6PG1	
		in fibreboard box	6PG2	
		in expanded plastics packaging	6PH1	
		in solid plastics packaging	6PH2	

(1) Crates are outer packagings with incomplete surfaces.

1514 *(cont'd)*

C. Conforming only to marg 1510 (2) and marked 'RID' [1]

Kind	Material	Category	Code	Marg.
O. Light gauge metal packagings	A. Steel	non-removable head	0A1	1540
		removable head	0A2	

[1] Or 'RID/ADR' for packagings approved for road transport as well as rail transport.

1515-1519

Section III

Requirements for packagings

A. Packagings conforming to Marg. 1510 (1)

1520 *Steel drums*

1A1 non-removable head

1A2 removable head

(a) The sheet metal for the body and ends shall be of suitable steel and of a gauge appropriate to the drum's capacity and intended use.

(b) Body seams shall be welded on drums intended to contain more than 40 litres of liquid. Body seams shall be mechanically seamed or welded on drums intended to contain solids or 40 litres or less of liquids.

(c) Head and chime seams shall be mechanically seamed or welded.

(d) If there are built-on rolling hoops they shall be fitted tightly on the body and so secured that they cannot shift. Rolling hoops shall not be spot-welded.

(e) Internal coatings of lead, zinc, tin, lacquer and the like shall be tough and resilient and shall adhere to the steel at every point, including the closures.

(f) Openings for filling, emptying and venting in the bodies or heads of non-removable head (1A1) drums shall not exceed 7 cm in diameter. Drums with larger openings are considered to be of the removable head type (1A2).

(g) Closures shall incorporate a leakproof gasket except where a taper thread ensures comparable leakproofness.

(h) Closures of non-removable head drums shall either be of the screw-threaded type or be capable of being secured by a screw-threaded device or at least equally effective device.

(i) Closure devices for removable head drums shall be so designed and applied that they will remain secure and drums will remain leakproof under normal conditions of carriage. Gaskets or other sealing elements shall be used with all removable heads.

(j) Maximum capacity of drum: 450 litres.

(k) Maximum net mass: 400 kg.

1521 *Aluminium drums*

1B1 non-removable head

1B2 removable head

(a) The body and heads shall be of aluminium at least 99 % pure, or of an aluminium-base alloy having corrosion resistance and mechanical properties appropriate to the capacity of the drum and its intended use.

(b) Openings for filling, emptying and venting in the bodies or heads of non-removable head (1B1) drums shall not exceed 7 cm in diameter. Drums with larger openings are considered to be of the removable head type (1B2).

(c) Aluminium drums 1B1

End seams, if any, shall be adequately reinforced for their protection. If there are any body and end seams they shall be welded. The closure shall either be of the screw-threaded type or be capable of being secured by a screw-threaded device or a device at least equally effective. Closures shall incorporate a leakproof gasket except where a taper thread ensures comparable leakproofness.

(d) Aluminium drums 1B2

The body of the drum shall either be seamless or have a welded seam. The closures shall be so designed and fitted that they will remain secure and the drums will remain leakproof under normal conditions of carriage. Gaskets or other sealing elements shall be used with all removable heads.

(e) Maximum capacity of drum: 450 litres.

(f) Maximum net mass: 400 kg.

1522 *Steel or aluminium jerricans*

3A1 steel, non-removable head

3A2 steel, removable head

3B1 aluminium, non-removable head

3B2 aluminium, removable head

(a) Body and head shall be constructed of steel sheet, of aluminium at least 99 % pure or of an aluminium base alloy. Material shall be of a suitable type and of adequate thickness in relation to the capacity of the jerrican and to its intended use.

(b) Chimes of all steel jerricans shall be mechanically seamed or welded. Body seams for the type of steel jerricans intended to contain more than 40 litres of liquid shall be welded. Body seams of steel jerricans intended to contain 40 litres or less shall be mechanically seamed or welded. For aluminium jerricans, all seams shall be welded. Chime seams, if any, shall be reinforced by the application of a separate reinforcing ring.

(c) Openings in jerricans (3A1 and 3B1) shall not exceed 7 cm in diameter. Jerricans with larger openings are considered to be of the removable head type (3A2 and 3B2).

(d) Closures shall be so designed so that they will remain secure and leakproof under normal conditions of carriage. Gaskets or other sealing elements shall be used with closures, unless the closure is inherently leakproof.

(e) Maximum capacity of jerrican: 60 litres.

(f) Maximum net mass: 120 kg.

1523 *Plywood drums*

1D

(a) The wood used shall be well seasoned, commercially dry and free from any defect likely to lessen to effectiveness of the drum for the purpose intended. If a material other than plywood is used for the manufacture of the ends, it shall be of a quality equivalent to the plywood.

(b) At least two-ply plywood shall be used for the body and at least three-ply plywood for the ends; the plies shall be firmly glued together, with their grain crosswise, by a water-resistant adhesive.

(c) The body and ends shall be of a design appropriate to the capacity of the drum and its intended use.

(d) In order to prevent sifting of the contents, lids shall be lined with kraft paper or some other equivalent material which shall be securely fastened to the lid and extend to the outside along its full circumference.

(e) Maximum capacity of drum: 250 litres.

(f) Maximum net mass: 400 kg.

1524 *Wooden barrels*

2C1 bung type

2C2 removable head

(a) The wood used shall be of good quality, straight-grained, well-seasoned and free from knots, bark, rotten wood, sapwood or other defects likely to lessen the effectiveness of the barrel for the purpose intended.

(b) The body and ends shall be of a design appropriate to the capacity of the barrel and its intended use.

(c) Staves and ends shall be sawn or cleft with the grain so that no annual ring shall extend over more than half the thickness of a stave or head.

(d) Barrel hoops shall be of steel or iron and of good quality. The hoops of 2C2 barrels with removable heads may be of a suitable hardwood.

(e) Wooden barrels 2C1:

The diameter of the bung-hole shall not exceed half the width of the stave in which it is placed.

(f) Wooden barrels 2C2:

Heads shall fit tightly into the crozes.

(g) Maximum capacity of barrel: 250 litres.

(h) Maximum net mass: 400 kg.

1525 *Fibre drums*

1G

(a) The body of the drum shall consist of multiple plies of heavy paper or fibreboard (without corrugations) firmly glued or laminated together and may include one or more protective layers of bitumen, waxed kraft paper, metal foil, plastics material, etc.

(b) Heads shall be of natural wood, fibreboard, metal, plywood or plastics or other suitable material and may include one or more protective layers of bitumen, waxed kraft paper, metal foil, plastics material, etc.

(c) The body and heads of the drum and their joins shall be of a design appropriate to the capacity of the drum and its intended use.

1525 *(cont'd)*

(d) The assembled packaging shall be sufficiently water-resistant so as not to delaminate under normal conditions of carriage.

(e) Maximum capacity of drum: 450 litres.

(f) Maximum net mass: 400 kg.

1526 *Plastics drums and jerricans*

1H1 drums, non-removable head

1H2 drums, removable head

3H1 jerricans, non-removable head

3H2 jerricans, removable head

(a) The packagings shall be capable of withstanding the physical (in particular mechanical and thermal) and chemical stresses to be expected in carriage and of remaining leakproof. They shall be capable of withstanding dangerous substances and their vapours. They shall also have the necessary degree of resistance to ageing and ultra-violet radiation. Packagings shall be safe to handle.

(b) Unless otherwise approved by the competent authority, the period of use permitted for the carriage of dangerous substances shall not exceed five years, from the date of the manufacture of the packaging, except where a shorter period of use is prescribed because of the nature of the substance to be carried.

(c) If protection against ultra-violet radiation is required, it shall be provided by the addition of carbon black or other suitable pigments or inhibitors. These additives shall be compatible with the contents and remain effective throughout the life of the packaging.

Where use is made of carbon black, pigments or inhibitors other than those used in the manufacture of the tested design type, retesting may be waived if the carbon black content does not exceed 2 % by mass or if the pigment content does not exceed 3 % by mass; the content of inhibitors of ultra-violet radiation is not limited.

(d) Additives serving purposes other than protection against ultra-violet radiation may be included in the composition of the plastics material provided that they do not adversely affect the chemical and physical properties of the material of the packaging. In such circumstances, retesting may be waived.

(e) Appropriate steps shall be taken to ensure that the plastics material to be used in the manufacture of the packaging is chemically compatible with the goods which the packaging is intended to contain [see marg. 1551 (5)].

(f) Packagings shall be manufactured from suitable plastics material of known origin and specifications; their construction shall be fully appropriate to plastics materials and in accordance with technological developments. For new packagings, no used material other than production residues or regrind from the same manufacturing process may be used.

(g) The wall thickness at every point of the packaging shall be appropriate to its capacity and intended use, taking into account however the stresses to which each point is liable to be exposed.

(h) Openings for filling, emptying and venting in the bodies or heads of non-removable head drums (1H1) and jerricans (3H1) shall not exceed 7 cm in diameter. Drums and jerricans with larger openings are considered to be of the removable head type (1H2, 3H2).

(i) Removable head drums (1H2) and jerricans (3H2) used for solid substances shall remain leakproof at every point with respect to the filling substance.

Closures of non-removable head drums and jerricans (1H1, 3H1) shall either be of the screw-threaded type or be capable of being secured by a screw-threaded device or a device at least equally effective. Closure devices of removable head drums and jerricans (1H2, 3H2) shall be so designed and fitted that they will remain secure and the drums or jerricans will remain leakproof under normal conditions of carriage.

1526 *(cont'd)*

(j) The maximum permissible permeation for flammable liquids shall be 0,008 $\frac{g}{l \cdot h}$ at 23 °C (see marg. 1556).

(k) Maximum capacity of drums and jerricans:

1H1, 1H2: 450 litres;

3H1, 3H2: 60 litres.

(l) Maximum net mass:

1H1, 1H2: 400 kg;

3H1, 3H2: 120 kg.

1527 *Boxes of natural wood*

4C1 ordinary

4C2 with sift-proof walls

Note: For plywood boxes, see marg. 1528; for reconstituted wood boxes, see marg. 1529.

(a) The wood used shall be well seasoned, commercially dry and free from defects that would materially lessen the strength of any part of the box. The strength of the material used and the method of construction shall be appropriate to the capacity of the box and its intended use. The tops and bottoms may be made of water-resistant reconstituted wood such as hardboard, particle board or other suitable type.

Fastenings shall be resistant to vibration experienced under normal conditions of carriage. End grain nailing shall be avoided whenever practicable. Joins which are likely to be highly stressed shall be made using clenched or annular ring nails or equivalent fastenings.

(b) Boxes with sift-proof walls 4C2:

Each part of the box shall be in one piece or equivalent thereto. A part shall be deemed equivalent to a part in one piece if it is glued together by one of the following methods: Lindermann (dovetail) jointing, tongue-and-groove jointing, ship-lap or rabbet jointing, or butt-jointing with at least two corrugated metal fasteners at each joint.

(c) Maximum net mass: 400 kg.

1528 *Plywood boxes*

4D

(a) The plywood used shall have at least three plies. It shall be made of well-seasoned rotary-cut, sliced or sawn veneer commercially dry and free from defects likely to lessen the strength of the box. All plies shall be glued by means of a water-resistant adhesive. Other suitable materials may be used together with plywood in the manufacture or boxes. Boxes shall be firmly nailed or secured to corner posts or ends or be assembled by other equally suitable devices.

(b) Maximum net mass: 400 kg.

1529 *Reconstituted wood boxes*

4F

(a) The walls of boxes shall be made of water-resistant reconstituted wood such as hardboard, particle board or other suitable type. The strength of the material used and the method of construction shall be appropriate to the capacity of the box and its intended use.

1529 *(cont'd)*

(b) Other parts of the boxes may be made of other suitable material.

(c) Boxes shall be securely assembled by means of suitable devices.

(d) Maximum net mass: 400 kg.

1530 *Fibreboard boxes*

4G

(a) Good quality solid or double-faced (single-wall or multiwall) corrugated fibreboard appropriate to the capacity and intended use of the boxes shall be used. The water-resistance of the outer surface shall be such that the increase in mass, as measured in a test carried out over a period of 30 minutes by the Cobb method of water-absorption determination, is not greater than 155 g/m^2 (in accordance with ISO International Standard 535:1976). The fibreboard shall be capable of bending sufficiently without breaking. It shall be cut, creased without scoring and slotted so as to permit assembly without cracking and without its surfaces tearing or bulging unduly. The fluting of corrugated fibreboard shall be firmly glued to the facings.

(b) Ends of boxes may have a wooden frame or be entirely of wood or other suitable material. Reinforcements of wooden battens or other suitable material may be used.

(c) Joins of boxes shall be taped with adhesive tape, be lapped and glued, or be lapped and metal-stapled. Lapped joints shall have a suitable overlap.

(d) Where closure is effected by gluing or by applying adhesive tape, the adhesive shall be water-resistant.

(e) Maximum net mass: 400 kg.

1531 *Plastics boxes*

4H1 expanded plastics boxes

4H2 solid plastics boxes

(a) The box shall be manufactured from suitable plastics material and be of adequate strength in relation to its capacity and intended use. The box shall be adequately resistant to ageing and to degradation caused either by the substance contained or by ultra-violet radiation.

(b) An expanded plastics box shall comprise two parts made of a moulded expanded plastics material, a bottom section containing cavities for the inner packagings and a top section covering and interlocking with the bottom section. The top and bottom sections shall be designed so that the inner packagings fits snugly. The closure cap for any inner packaging shall not be in contact with the inside of the top section of this box.

(c) For dispatch, an expanded plastics box shall be closed with a self-adhesive tape having sufficient tensile strength to prevent the box from opening. The adhesive tape shall be weather-resistant and its adhesive compatible with the expanded plastics material of the box. Other closing devices at least equally effective may be used.

(d) For solid plastics boxes, protection against ultra-violet radiation, if required, shall be provided by the addition of carbon black or other suitable pigments or inhibitors. These additives shall be compatible with the contents and remain effective throughout the life of the box. Where use is made of carbon black, pigments or inhibitors other than those used in the manufacture of the tested design type, retesting may be waived if the carbon black content does not exceed 2 % by mass or if the pigment content does not exceed 3 % by mass; the content of inhibitors of ultra-violet radiation is not limited.

(e) Solid plastics boxes shall have closure devices made of a suitable material of adequate strength and so designed as to prevent the box from unintentional opening.

1531 *(cont'd)*

(f) Additives serving purposes other than protection against ultra-violet radiation may be included in the composition of the plastics material of boxes 4H1 and 4H2 provided that they do not adversely affect the chemical and physical properties of the material. In such circumstances, retesting may be waived.

(g) Maximum net mass: 4H1: 60 kg;

4H2: 400 kg.

1532 *Steel or aluminium boxes*

4A steel

4B aluminium

(a) The strength of the metal and the construction of the box shall be appropriate to the capacity of the box and to its intended use.

(b) Boxes shall be lined with fibreboard or felt packing pieces as required or shall have an inner liner or coating of suitable material. If a double-seamed metal liner is used, steps shall be taken to prevent the ingress of substances into the recesses of the seams.

(c) Closures may be of any suitable type; they shall remain secured under normal conditions of carriage.

(d) Maximum net mass: 400 kg.

1533 *Textile bags*

5L1 without inner lining or coating

5L2 sift-proof

5L3 water-resistant

(a) The textiles used shall be of good quality. The strength of the fabric and the construction of the bag shall be appropriate to the capacity of the bag and its intended use.

(b) Bags, sift-proof, 5L2:

The bag shall be made sift-proof, for example by the use of:

— paper bonded to the inner surface of the bag by a water-resistant adhesive such as bitumen; or

— plastics film bonded to the inner surface of the bag; or

— one or more inner liners made of paper or plastics material.

(c) Bags, water-resistant, 5L3

To prevent any entry of moisture the bag shall be made waterproof, for example by the use of:

— separate inner liners of water-resistant paper (e. g. waxed kraft paper, tarred paper or plastics-coated kraft paper); or

— plastics film bonded to the inner surface of the bag; or

— one or more inner liners made of plastics material.

(d) Maximum net mass: 50 kg.

1534 *Woven plastics bags*

5H1 without inner lining or coating

5H2 sift-proof

5H3 water-resistant

1534 *(cont'd)*

(a) Bags shall be made from stretched tapes or stretched monofilaments of a suitable plastics material. The strength of the material used and the construction of the bag shall be appropriate to the capacity of the bag and its intended use.

(b) Bags may be fitted with an inner liner of plastics film or given a thin inner coating of plastics material.

(c) If the fabric is woven flat, the bags shall be formed by sewing or some other method ensuring closure of the bottom and one side. If the fabric is tubular, the bottom of the bag shall be closed by sewing, weaving or some other equally strong method of closure.

(d) Bags, sift-proof, 5H2:

The bag shall be made sift-proof, for example by means of:

— paper or a plastics film bonded to the inner surface of the bag; or

— one or more separate inner liners made of paper or plastics material.

(e) Bags, water-resistant, 5H3:

To prevent any entry of moisture, the bag shall be made waterproof, e. g. by means of:

— separate inner liners of water-resistant paper (e. g. waxed kraft paper, double-tarred kraft paper or plastics-coated kraft paper);

— film bonded to the inner or outer surface of the bag; or

— one or more inner plastics liners.

(f) Maximum net mass: 50 kg.

1535 *Plastics film bags*

5H4

(a) Bags shall be made of suitable plastics material. The strength of the material used and the construction of the bag shall be appropriate to the capacity of the bag and its intended use. Seams shall withstand pressures and impacts liable to occur in normal conditions of carriage.

(b) Maximum net mass: 50 kg.

1536 *Paper bags*

5M1, multiwall

5M2, multiwall, water-resistant

(a) Bags shall be made of a suitable kraft paper or of an equivalent paper with at least three plies. The strength of the paper and the construction of the bags shall be appropriate to the capacity of the bag and its intended use. Joins and closures shall be sift-proof.

(b) Paper bags 5M2:

To prevent the entry of moisture, a bag of four plies or more shall be made waterproof by the use of either a water-resistant ply as one of the two outermost plies or a water-resistant barrier made of a suitable protective material between the two outermost plies; a bag of three plies shall be made waterproof by the use of a water-resistant ply as the outermost ply. Where there is a danger of the contained substance reacting with moisture or where it is packed damp, a waterproof ply or barrier such as double-tarred kraft paper, plastic-coated kraft paper, plastics film, bonded to the inner surface of the bag, or one or more inner plastics liners shall also be placed next to the substance. Joins and closures shall be waterproof.

(c) Maximum net mass: 50 kg.

1537 *Composite packagings (plastics material)*

6HA1 plastics receptacle with outer steel drum

6HA2 plastics receptacle with outer steel crate (1) or box

6HB1 plastics receptacle with outer aluminium drum

6HB2 plastics receptacle with outer aluminium crate (1) or box

6HC plastics receptacle with outer wooden box

6HD1 plastics receptacle with outer plywood drum

6HD2 plastics receptacle with outer plywood box

6HG1 plastics receptacle with outer fibre drum

6HG2 plastics receptacle with outer fibreboard box

6HH1 plastics receptacle with outer plastics drum

6HH2 plastics receptacle with outer solid plastics box

(a) Inner receptacle

(1) The provisions of marg. 1526 (a) and (c) to (h) shall apply to plastics inner receptacles.

(2) The plastics inner receptacle shall fit snugly inside the outer packaging, which shall be free of any projection that might abrade the plastics material.

(3) Maximum capacity of inner receptacle:

6HA1, 6HB1, 6HD1, 6HG1, 6HH1: 250 litres

6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HH2: 60 litres.

(4) Maximum net mass:

6HA1, 6HB1, 6HD1, 6HG1, 6HH1: 400 kg

6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HHJ2: 75 kg.

(b) Outer packaging

(1) Plastics receptacle with outer steel or aluminium drum 6HA1 or 6HB1:

the provisions of marg. 1520 (a) to (i) or 1521 (a) to (d), appropriate, shall apply to the construction of the outer packaging.

(2) Plastics receptacle with outer steel or aluminium crate or box 6HA2 or 6HB2:

the provisions of marg. 1532 shall apply to the construction of the outer packaging.

(3) Plastics receptacle with outer wooden box 6HC:

the provisions of marg. 1527 shall apply to the construction of the outer packaging.

(4) Plastics receptacle with outer plywood drum 6HD1:

the provisions of marg. 1523 shall apply to the construction of the outer packaging.

(5) Plastics receptacle with outer plywood box 6HD2:

the provisions of marg. 1528 shall apply to the construction of the outer packaging.

(6) Plastics receptacle with outer fibre drum 6HG1:

the provisions of marg. 1525 (a) to (d) shall apply to the construction of the outer packaging.

(7) Plastics receptacle with outer fibreboard box 6HG2:

the provisions of marg. 1530 (a) to (c) shall apply to the construction of the outer packaging.

(1) Crates are outer packaging with incomplete surfaces.

1537 *(cont'd)*

(8) Plastics receptacle with outer plastics drum 6HH1;

the provisions of marg. 1526 (a) and (c) to (h) shall apply to the construction of the outer packaging.

(9) Plastics receptacle with outer solid pastics box 6HH2;

the relevant provisions of marg. 1531 (a), (d), (e) and (f) shall apply to the construction of the outer packaging.

1538 *Combination packagings*

(a) Inner packagings

The following may be used:

glass, porcelain or stoneware packaging with a maximum permissible capacity of 5 litres for liquids or 5 kg for solids;

plastics packagings with a maximum permissible capacity of 30 litres for liquids of 30 kg for solids;

metal packagings with a maximum permissible capacity of 40 litres for liquids or 40 kg for solids;

paper, textile, woven plastics or plastics-film sachets and bags with a maximum permissible capacity of 5 kg for solids in sachets and 50 kg in bags;

cans, folding cartons and boxes made of fibreboard or plastics with a maximum permissible capacity of 10 kg for solids;

other types of small packagings such as tubes with a maximum permissible capacity of 1 litre for liquids or 1 kg for solids.

(b) Outer packaging

The following may be used:

steel drums, removable head (marg. 1520);

aluminium drums, removable head (marg. 1521);

steel jerricans, removable head (marg. 1522);

aluminium jerricans, removable head (marg. 1522);

plywood drums (marg. 1523);

fibre drums (marg. 1525);

plastics drums, removable head (marg. 1526);

plastics jerricans, removable head (marg. 1526);

natural wood boxes (marg. 1527);

plywood boxes (marg. 1528);

reconstituted wood boxes (marg. 1529);

fibreboard boxes (marg. 1530);

plastics boxes (marg. 1531);

steel or aluminium boxes (marg. 1532).

B. Packagings which may conform to marg. 1510 (1) or (2)

1539 *Composite packaging (glass, porcelain or stoneware)*

6PA1 receptacle with outer steel drum

6PA2 receptacle with outer steel crate [1] or box

6PB1 receptacle with outer aluminium drum

6PB2 receptacle with outer aluminium crate [1] or box

[1] Crates are outer packaging with incomplete surfaces.

1539 *(cont'd)*

6PC receptacle with outer wooden box

6PD1 receptacle with outer plywood drum

6PD2 receptacle with outer wickerwork hamper

6PG1 receptacle with outer fibre drum

6PG2 receptacle with outer fibreboard box

6PH1 receptacle with outer expanded plastics packaging

6PH2 receptacle with outer solid plastics packaging

(a) Inner receptacle

(1) The receptacle shall be suitably moulded (cylindrical or pear-shaped) and be made of good quality material free from any defect that could impair its strength. The walls shall be sufficiently thick at every point and free from internal stresses.

(2) Screw-threaded plastics closures, ground glass stoppers or closures at least equally effective shall be used as closures for receptacles. Any part of the closure likely to come into contact with the contents of the receptacle shall be resistant to those contents.

Care shall be taken to ensure that the closures are so fitted as to be leakproof and are suitably secured to prevent any loosening during carriage.

If vented closures are necessary, they shall be leakproof.

(3) The receptacle shall be firmly secured in the outer packaging by means of cushioning and/or absorbent materials.

(4) Maximum capacity of receptacle: 60 litres.

(5) Maximum net mass: 75 kg.

(b) Outer packaging

(1) Receptacle with outer steel drum 6PA1

The provisions of marg. 1520 (a) to (i) shall apply to the construction of the outer packaging. The removable lid required for this type of packaging may however be in the form of a cap.

(2) Receptacle with outer steel crate or box 6PA2

The provisions of marg. 1532 (a) to (c) shall apply to the construction of the outer packaging. For cylindrical receptacles the outer packaging shall, when upright, rise above the receptacle and its closure. If the protective crate surrounds a pear-shaped receptacle and is of matching shape, the outer packaging shall be fitted with a protective cover (cap).

(3) Receptacle with outer aluminium drum 6PB1

The provisions of marg. 1521 (a) to (d) shall apply to the construction of the outer packaging.

(4) Receptacle with outer aluminium crate or box 6PB2

The provisions of marg. 1532 shall apply to the construction of the outer packaging.

(5) Receptacle with outer wooden box 6PC

The provisions of marg. 1527 shall apply to the construction of the outer packaging.

(6) Receptacle with outer plywood drum 6PD1

The provisions of marg. 1523 shall apply to the construction of the outer packaging.

(7) Receptacle with outer wickerwork hamper 6PD2

The wickerwork hamper shall be properly made with material of good quality. It shall be fitted with a protective cover (cap) so as to prevent damage to the receptacle.

1539 *(cont'd)*

(8) Receptacle with outer fibre drum 6PG1

The provisions of marg. 1525 (a) to (d) shall apply to the construction of the outer packaging.

(9) Receptacle with outer fibreboard box 6PG2

The provisions of marg. 1530 (a) to (c) shall apply to the construction of the outer packaging.

(10) Receptacle with outer expanded plastics or solid plastics packaging (6PH1 or 6PH2).

The materials of both outer packagings shall meet the provisions of marg. 1531 (a) to (f). Solid plastics packaging shall be made of high density polyethylene or other comparable plastics material. The removable lid for this type of packaging may however be in the form of a cap.

C. Packagings conforming only to marg. 1510 (2)

1540 *Light gauge metal packagings*

0A1 non-removable head

0A2 removable head

(a) The sheet metal for the body and ends shall be of suitable steel, and of a gauge appropriate to the capacity and intended use of the packaging.

(b) The joints shall be welded, at least double-seamed by welting or produced by a method ensuring a similar degree of strength and leakproofness.

(c) Inner coatings of zinc, tin, lacquer, etc., shall be tough and shall adhere to the steel at every point, including the closures.

(d) Openings for filling, emptying and venting in the bodies or heads of non-removable head (0A1) packagings shall not exceed 7 cm in diameter. Packagings with larger openings shall be considered to be of the removable head type (0A2).

(e) The closures of non-removable head packagings (0A1) shall either be of the screw-threaded type or be capable of being secured by a screwable device or a device at least equally effective.

The closures of removable head packagings (0A2) shall be so designed and fitted that they stay firmly closed and the packagings remain leakproof in normal conditions of carriage.

(f) Maximum capacity of packagings: 40 litres.

(g) Maximum net mass: 50 kg.

1541-1549

Section IV

Test requirements for packagings

A. Design-type test

Performance and frequency of tests

1550 (1) The design type of each packaging shall be tested and approved by the competent authority or by a body designated by that authority.

(2) Tests in accordance with (1) shall be carried out again after any modification of the design type unless the authorized testing body has agreed to the modification of the design type. In the latter event a new approval of the design type is not required.

1550 *(cont'd)*

A packaging design type is defined by the design, size, material and thickness, manner of construction and packing, by may include various surface treatments. It also includes packagings which differ from the design type only in their lesser design height.

(3) The competent authority may at any time require proof, through tests in accordance with this section, that mass-produced packagings meet the requirements of the design-type tests.

For such tests on paper or fibreboard packagings, preparation at ambient conditions shall be considered equivalent to the provisions of marg. 1551 (3)

(4) For verification purposes the authorized testing body shall keep a record of the materials used, through materials testing or by retaining samples or pieces of the materials.

(5) If an inner coating is required for safety reasons, it shall retain its protective properties even after the test.

(6) The competent authority may permit the selective testing of packagings that differ only in minor respects from a tested type, e. g. smaller sizes of inner packagings or inner packagings of lower net mass; and packagings such as drums, bags and boxes which are produced with small reductions in external dimension(s).

(7) Provided the validity of the test results is not affected and with the approval of the competent authority, several tests may be made on one sample.

Preparation of packagings and packages for testing

1551 (1) Tests shall be carried out on packagings and packages prepared as for despatch, including inner packagings of combination packagings. Inner or single receptacles or packagings shall be filled to not less than 95 % of their *maximum* capacity for solids or 98 % for liquids. For combination packagings where the inner packaging is designed to carry liquids or solids, separate testing is required for the solid or liquid contents.

The substance or articles to be carried in the packages may be replaced by other substances or articles except where this would invalidate the results of the tests.

For solids, when another substance is used it shall have the same physical characteristics (mass, grain size, etc.) as the substance to be carried. It is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass, so long as they are placed so that the test results are not affected.

Suitable mixtures of powdery solids, such as polyethylene or PVC powder with sawdust, fine sand etc., may be used as a substitute filling substance for substances having a viscosity in excess of 2,680 mm^2/s at 23 °C.

(2) In the drop tests for liquids, when another substance is used its relative density and viscosity shall be similar to those of the substance to be carried. Water may also be used for the liquid drop test under the conditions in marg. 1552 (4).

(3) Paper or fibreboard packagings shall be conditioned for at least 24 hours in an atmosphere having a controlled temperature and relative humidity (r.h.). There are three options, one of which shall be chosen. The preferred atmosphere is 23 °C ± 2 °C and 50 % ± 2 % r.h. The two other options are 20 °C ± 2 °C and 65 % ± 2 % r.h. or 27 °C ± 2 °C and 65 % ± 2 % r.h.

Note: Average values shall fall within these limits. Short term fluctuations and measurement limitations may cause individual measurements to vary up to ± 5 % relative humidity without significant impairment of test reproducibility.

(4) Bung-type barrels made of natural wood shall be left filled with water for at least 24 hours before the tests.

1551 *(cont'd)*

(5) To check that their chemical compatibility with the liquids is sufficient, plastics drums and jerricans in accordance with marg. 1526 and, if necessary, composite packagings (plastics material) in accordance with marg. 1537 shall be subjected to storage at ambient temperature for six months, during which time the test samples shall be kept filled with the goods they are intended to carry.

For the first and last 24 hours of storage, the test samples shall be placed with the closure downwards. However, packagings fitted with a vent shall be so placed on each occasion for five minutes only. After this storage, the test samples shall undergo the tests prescribed in marg. 1552 to 1556.

When it is known that the strength properties of the plastics material of the inner receptacles of composite packagings (plastics material) are not significantly altered by the action of the filling substance, it shall not be necessary to check that the chemical compatibility is sufficient.

A significant alteration in strength properties means:

(a) distinct embrittlement; or

(b) a considerable decrease in elasticity, unless related to a not less than proportionate increase in the elongation under load.

Where the behaviour of the plastics material has been established by other means, the above compatibility test may be dispensed with. Such procedures shall be at least equivalent to the above compatibility test and be recognised by the competent authority.

Note: For plastics drums and jerricans and composite packagings (plastics material) made of high molecular mass polyethylene, see also (6) below.

(6) For high molecular mass polyethylene drums and jerricans in accordance with marg. 1526 and if necessary composite packagings of high molecular mass polyethylene in accordance with marg. 1537, conforming to the following specifications:

— relative density at 23 °C after thermal conditioning for one hour at 100 °C $\geq$ 0,940, in accordance with ISO Standard 1183,

— melt flow rat at 190 °C/21,6 kg load $\leq$ 12 g/10 min. in accordance with ISO Standard 1133,

chemical compatibility with the liquids listed in section II of the annex to this Appendix may be verified as follows with standard liquids (see section I of the annex to this Appendix).

The sufficient chemical compatibility of these packagings may be verified by storage for three weeks at 40 °C with the appropriate standard liquid; where this standard liquid is water, proof of chemical compatibility is not required.

For the first and last 24 hours of storage, the test samples shall be placed with the closure downwards. However, packagings fitted with a vent shall be so placed on each occasion for five minutes only. After this storage, the test samples shall undergo the tests prescribed in marg. 1552 to 1556.

When a packaging design-type has satisfied the approval tests with a standard liquid, the comparable filling substances listed in section II of the annex to this Appendix may be accepted for carriage without further testing, subject to the following conditions:

— the relative densities of the filling substances shall not exceed that used to determine the height for the drop test and the mass for the stacking test;

— the vapour pressures of the filling substances at 50 °C or 55 °C shall not exceed that used to determine the pressure for the internal pressure test.

The compatibility test for tert-butyl hydroperoxide with more than 40 % peroxide content of items 3(b), 5(b) and 9(b) and peracetic acid of items 5(b), 7(b) and 9(b) of Class 5.2, marg. 551, shall not be carried out using standard liquids. For these substances, proof of sufficient compatibility of the test samples shall be provided during a storage period of six months at ambient temperature with the substances they are intended to carry.

1551 *(cont'd)* (7) For drums and jerricans conforming to marg. 1526, and where necessary composite packaging conforming to marg. 1537, made of high molecular mass polyethylene, which have passed the test in paragraph (6) of this marg., filling substances other than those listed in section II of the annex may also be approved. Such approval shall be based on laboratory tests proving that the effect of such filling substances on the test specimens is less than that of the standard liquids. The processes of deterioration to be taken into account shall be the following: softening through swelling, cracking under stress and molecular degradation. The same conditions as those set out in (6) above shall apply with respect to relative density and vapour pressure.

Drop test [1]

1552 (1) Number of test samples (per design type and manufacturer) and drop orientation.

For other than flat drops the centre of gravity shall be vertically over the point of impact.

Packaging	No of test samples	Drop orientation
(a) Steel drums Aluminium drums Steel jerricans Aluminium jerricans Plywood drums Wooden barrels Fibre drums Plastics drums and jerricans Composite packagings (plastics material) which are in the shape of a drum Composite packagings (glass, stoneware or porcelain) conforming to marg. 1510 (1) and which are in the shape of a drum, Light gauge metal packagins	Six (three for each drop)	First drop (using three samples): the packaging shall strike the target diagonally on the chime or, if the packaging has no chime, on a circumferential seam or an edge. Second drop (using the other three samples): the packaging shall strike the target on the weakest part not tested by the first drop, for example a closure or, for some cylindrical drums, the welded longitudinal seam of the drum body.
(b) Boxes of natural wood Plywood boxes Reconstituted wood boxes Fibreboard boxes Plastics boxes Steel or aluminium boxes Composite packagings (plastics material) which are in the shape of a box Composite packagings (glass, stoneware or porcelain) conforming to marg. 1510 (1) and wich are in the shape of a box	Five (one for each drop)	First drop: flat on the bottom Second drop: flat on the top Third drop: flat on the long side Fourth drop: flat on the short side Fith drop: on a corner
(c) Textile bags Paper bags	Three (two drops per bag)	Fist drop: flat on a face of the bag Second drop: on the end of the bag

[1] See ISO Standard 2248.

1552 *(cont'd)*

Packaging	No of test samples	Drop orientation
(d) Woven plastics bags Plastics film bags	Three (three drops per bag)	First drop: flat on a wide face Second drop: flat a narrow face Third drop: on the end of the bag
(e) Composite packagings (glass, stoneware or porcelain) conforming to marg. 1510 (2) and which are in the shape of a drum or box	Three (one for each drop)	Diagonally on the bottom chime, or, if there is no chime, on a circumferential seam or the bottom edge.

Where more than one orientation is possible for a given drop test, the orientation most likely to result in failure of the packaging shall be used.

(2) Special preparation of test samples for the drop test

The temperature of the test sample and its contents shall be reduced to – 18 °C or lower for the following packagings:

(a) plastics drums (see marg. 1526)

(b) plastics jerricans (see marg. 1526)

(c) plastics boxes other than expanded polystyrene boxes (see marg. 1531)

(d) composite packagings (plastics material) (see marg. 1537), and

(e) combination packagings with plastics inner packagings other than plastics bags and sachets intended to contain solids or articles (see marg. 1538).

Where the test samples are prepared in this way, the conditioning in marg. 1551 (3) may be waived. Test liquids shall be kept in the liquid state, if necessary by the addition of anti-freeze.

(3) Target

The target shall be a rigid, non-resilient, flat and horizontal surface.

(4) Drop height

For solids:

Packing Group I	Packing Group II	Packing Group III
1,8 m	1,2 m	0,8 m

For liquids:

— If the test is performed, with water:

(a) where the substances, to be carried have a relative density not exceeding 1.2;

Packing Group I	Packing Group II	Packing Group III
1,8 m	1,2 m	0,8 m

1552 *(cont'd)*

(b) where the substances to be carried have a relative density exceeding 1,2, the drop height shall be calculated on the basis of the relative density of the substance to be carried, rounded up to the first decimal, as follows:

Packing Group I	Packing Group II	Packing Group III
Relative density × 1,5 (m)	Relative density × 1,0 (m)	Relative density × 0,67 (m)

(c) for lightgauge metal packagings intended for the carriage of substances having a viscosity at 23 °C greater than 200 mm^2/s corresponding to a flow time of 30 seconds with an ISO flow cup having a jet orifice of 6 mm diameter in accordance with ISO Standard 2431:1984 and for substances of Class 3, item 5(c):

(i) if the relative density does not exceed 1,2:

Packing Group II	Packing Group III
0,6 m	0,4 m

(ii) where the substances to be carried have a relative density exceeding 1,2 the drop height shall be calculated on the basis of the relative density of the substance to be carried, rounded up to the first decimal place, as follows:

Packing Group II	Packing Group III
Relative density × 0,5 (m)	Relative density × 0,33 (m)

— If the test is performed with the substance to be carried or with a liquid of at least equal relative density:

Packing Group I	Packing Group II	Packing Group III
1,8 m	1,2 m	0,8 m

(5) Criteria for passing the test

(a) Every packaging containing liquid shall be leakproof when equilibrium has been reached between the internal and external pressures, except for inner packagings of combination packagings or composite packagings (glass, porcelain or stoneware) when it is not necessary that the pressures be equalized.

(b) Where removable head drums for solids undergo a drop test and their upper faces strike the target, the test sample passes the test if the entire contents are retained by an inner packaging (e.g. a plastics bag) even if the closure on the top face of the drum is no longer sift-proof.

(c) The outermost ply of a bag shall not exhibit any damage liable to affect safety in carriage.

(d) The outer packaging of a composite or combination packaging shall not exhibit any damage liable to affect safety in carriage. There shall be no leakage of the filling substance from the inner packaging.

(e) A slight discharge from the closure(s) upon impact shall not be considered to be a failure of the packaging provided that no further leakage occurs.

1552 *(cont'd)*

(f) No rupture is permitted in packagings for goods of Class 1 which would cause the spillage of loose explosive substances or articles from the outer packaging.

Leakproofness test

1553

(1) The leakproofness test shall be performed on all types of packagings intended to contain liquids; however, this test is not required for:

— inner packagings of combination packagings;

— inner receptacles of composite packagings (glass, porcelain or stoneware) conforming to marg. 1510 (2);

— removable head packagings intended for substances with a viscosity at 23 °C exceeding 200 mm^2/s;

— removable head light gauge metal packagings intended for substances of Class 3, item 5(c).

(2) Number of test samples

Three test samples per design type and manufacturer.

(3) Special preparation of test samples for the test

Test samples shall be pierced for entry of the compressed air at a neutral point, so as also to test the tightness of the closure. Vented closures of packagings shall be replaced by non-vented closures.

(4) Test method

The test samples including their closures shall be restrained under water for 5 minutes while an internal air pressure is applied, the method of restraint shall not affect the results of the test.

(5) Air pressure to be applied

Packing Group I	Packing Group II	Packing Group III
Not less than 30 kPa	Not less than 20 kPa	Not less than 20 kPa

Other methods at least equally effective may be used.

(6) Criterion for passing the test

There shall be no leakage.

Internal pressure (hydraulic) test

1554

(1) The hydraulic pressure test shall be carried out on all types of steel, aluminium and plastics packagings, and on all composite packagings intended to contain liquids. However, this test is not required for:

— inner packagings of combination packagings;

— inner receptacles of composite packagings (glass, porcelain or stoneware) conforming to marg. 1510 (2);

— removable head packagings intended for substances with a viscosity at 23 °C exceeding 200 mm^2/s;

— removable head light gauge metal packagings intended for substances of Class 3, item 5(c).

(2) Number of test samples

Three test samples per design type and manufacturer.

(3) Special preparation of packagings for the test

Test samples shall be pierced for entry of the pressure at a neutral point, so as also to test the tightness of the closure. Vented closures of packagings shall be replaced by non-vented closures.

1554 *(cont'd)*

(4) Test method and pressure to be applied

The packagings shall be subjected for five minutes (30 minutes in the case of plastics packagings) to a hydraulic gauge pressure not lower than:

(a) the total gauge pressure measured in the packaging (i.e. the vapour pressure of the filling substance and the partial pressure of the air or other inert gases, less 100 kPa) at 55 °C, multiplied by a safety factor of 1,5; this total gauge pressure shall be determined on the basis of a maximum degree of filling in accordance with marg. 1500 (4) and a filling temperature of 15 °C, or

(b) 1,75 times the vapour pressure of the filling substance at 50 °C, less 100 kPa, but at a gauge pressure of not less than 100 kPa, or

(c) 1,5 times the vapour pressure of the filling substance at 55 °C, less 100 kPa, but at a gauge pressure of not less than 100 kPa.

The test manner in which the packagings are maintained in place shall not distort the results of the test. Pressure shall be applied continuously and evenly. The test pressure shall be kept constant throughout the test period.

The minimum test pressure for packagings for Packing Group I shall be 250 kPa.

(5) Criterion for passing the test

No packaging shall leak.

Stacking test

1555 (1) All packagings other than bags and non-stackable composite packagings (glass, porcelain, or stoneware) conforming to marg. 1510 (2), shall be subjected to a stacking test.

(2) Number of test samples

Three test samples per design type and manufacturer.

(3) Test method

The test samples shall be subjected to a force applied to the top surface of the test sample equivalent to the total mass of identical packages which might be stacked on them during carriage.

The duration of the test shall be 24 hours, except that plastics drums and jerricans in accordance with marg. 1526, and composite packagings 6HH1 and 6HH2 in accordance with marg. 1537, intended for liquids, shall be subjected to the stacking test for a period of 28 days at a temperature of not less than 40 °C.

The minimum height of the stack including the test sample shall be 3 metres.

For the test in accordance with marg. 1551 (5), the original filling substance shall be used. For the test in accordance with marg. 1551 (6), a stacking test shall be carried out with a standard liquid.

Where the contents of the test samples are non-dangerous liquids with relative density different from that of the liquid to be carried, the force shall be calculated in relation to the latter.

(4) Criteria for passing the test

No test sample shall leak. In composite packagings or combination packagings, there shall be no leakage of the filling substance from the inner receptacle or inner packaging.

No test sample shall show any deterioration which could adversely affect transport safety or any distortion liable to reduce its strength or cause instability in stacks of packages.

Stacking stability may be considered sufficient when, after the stacking test, and in the case of plastics packagings, after cooling to ambient temperature, two filled packagings of the same type placed on the test sample maintain their position for 1 hour.

Supplementary permeability test for plastics drums and jerricans in accordance with marg. 1526 and for composite packagings (plastics material) in accordance with marg. 1537 intended for the carriage of liquids having a flash-point ≤ 61 °C, other than 6HA1 packagings

1556 (1) Polyethylene packagings need be subjected to this test only if they are to be approved for the carriage of benzene, toluene, xylene or mixtures and preparations containing those substances.

(2) Number of test samples

Three packagings.

(3) Special preparation of the test sample for the test

The test samples are to be pre-stored with the original filling substance in accordance with marg. 1551 (5) or, for high molecular mass polyethylene packagings, with the standard liquid mixture of hydrocarbons (white spirit) in accordance with marg. 1551 (6).

(4) Test method

The test samples filled with the substance for which the packaging is to be approved shall be weighed before and after storage for 28 days at 23 °C and 50 % relative atmospheric humidity. For high molecular mass polyethylene packagings, the test may be carried out with the standard liquid mixture of hydrocarbons (white spirit) in place of benzene, toluene or xylene.

(5) Criterion for passing the test

Permeability shall not exceed $\frac{0{,}008\ \text{g}}{1\ \text{h}}$

Supplementary test for natural wood bung type barrels

1557 (1) Number of test samples

One barrel.

(2) Test method

Remove all hoops above the bilge of an empty barrel which has previously stood assembled for at least two days.

(3) Criterion for passing the test

The diameter of the upper part of the barrel shall not increase by more than 10 %.

Approval of combination packagings

Note: Combination packagings shall be tested in accordance with the requirements applicable to the outer packaging.

1558 (1) During design-type tests of combination packagings, approval may at the same time be given for packagings:

a) containing inner packagings of less volume;

b) having a lower net mass than that of the design type tested.

(2) Where several types of combination packagings having different types of inner packaging have been approved, the various inner packagings may also be assembled in a single outer packaging if the consignor certifies that this package meets the test requirements.

1558 *(cont'd)*

(3) Provided that the strength properties of the plastics inner packagings of a combination packaging are not significantly altered by the action of the filling substance, proof of chemical compatibility is not necessary. A significant alteration in strength properties means:

(a) distinct embrittlement,

(b) a considerable decrease in elasticity, unless related to a not less than proportionate increase in elongation under load.

(4) Where an outer packaging of a combination packaging has been successfully tested with different types of inner packagings, a variety of such different inner packagings may also be assembled in this outer packaging. In addition, provided an equivalent level of performance is maintained, the following variations in inner packagings are allowed without further testing of the package.

(a) Inner packagings of equivalent smaller size may be used provided:

(i) the inner packagings are of similar design to the tested inner packagings (e.g. shape — round, rectangular, etc.);

(ii) the material of construction of the inner packagings (glass, plastics, metal, etc.) offers resistance to impact and stacking forces equal to or greater than that of the originally tested inner packaging;

(iii) the inner packagings have the same or smaller openings and the closure is or similar design (e.g. screw cap, friction lid, etc.);

(iv) sufficient additional cushioning material is used to take up void spaces and to prevent significant movement of inner packagings; and

(v) inner packagings are oriented within the outer packaging in the same manner as in the tested package.

(b) A lesser number of the tested inner packagings, or of the alternative types of inner packagings identified in (a) above, may be used provided sufficient cushioning is added to fill the void space(s) and to prevent significant movement of the inner packagings.

(5) Articles or inner packagings of any type for solids or liquids may be assembled and presented for carriage without testing in an outer packaging under the following conditions:

(a) The outer packaging shall have been successfully tested in accordance with marg. 1552 with fragile (e.g. glass) inner packagings containings liquids using the Packing Group I drop height.

(b) The total combined gross mass of inner packagings shall not exceed one half of the gross mass of inner packagings used for the drop test in (a) above.

(c) The thickness of the cushioning material between inner packagings and between inner packagings and the outside of the packaging shall not be reduced below the corresponding thicknesses in the originally tested packaging; and if a single inner packaging was used in the original test, the thickness of cushioning between inner packaging shall not be less than the thickness of cushioning between the outside of the packaging and the inner packaging in the original test. When either fewer or smaller inner packagings are used (as compared to the inner packagings used in the drop test), sufficient additional cushioning material shall be used to take up void spaces.

(d) The outer packaging shall have passed successfully the stacking test in marg. 1555 while empty. The total mass of identical packages shall be based on the combined mass of the inner packagings used for the drop test in (a) above.

(e) Inner packagings containing liquids shall be completely surrounded with a sufficient quantity of absorbent material to absorb the entire liquid contents of the inner packagings.

1558 *(cont'd)*

(f) If the outer packaging is intended to contain inner packagings for liquids and is not leakproof, or is intended to contain inner packagings for solids and is not sift-proof, a means of containing any liquid or solid contents in the event of leakage shall be provided in the form of a leakproof liner, plastics bag or other equally effective means of containment. For packagings containing liquids, the absorbent material required in (e) above shall be placed inside the means of containing liquid contents.

(g) Packagings shall be marked in accordance with marg. 1512 as having been tested to Packing Group I performance for combination packagings. The marked gross mass in kilograms shall be the sum of the mass of the outer packagings plus one half of the mass of the inner packaging(s) as used for the drop test referred to in (a) above. The mark shall contain a letter 'V' in accordance with marg. 1512 (5) as being a special packaging.

Approval of salvage packagings

1559 Salvage packagings [(see marg. 1510 (1)] shall be tested and marked in accordance with the requirements applicable to Packing Group II packagings intended for the carriage of solids or inner packagings, except as follows:

(1) The test substance used in performing the tests shall be water, and the packagings shall be filled to not less 98 % of maximum capacity. It is permissible to use additives such as bags of lead shot, to achieve the requisite total package mass so long as they are placed so that the test results are not affected. Alternatively, in performing the drop test, the drop height may be varied in accordance with marg. 1552 (4) (b).

(2) Packagings shall, in addition, have been successfully subjected to the leakproofness test at 30 kPa, with the results of this test reflected in the test report required by marg. 1560.

(3) Packagings shall be marked with the letter 'T' as described in marg. 1512 (5).

Test report

1560 A test report giving at least the following particulars shall be drawn up and shall be available to the users of the packaging:

1. Testing body
2. Applicant
3. Manufacturer of packaging
4. Description of packaging (e.g. distinctive features such as material, inner lining, dimensions, wall thickness, mass, closures, colouring of plastics materials)
5. Design drawing of packaging and closures (if necessary, photographs)
6. Method of manufacture
7. Maximum capacity
8. Characteristics of test contents, e.g. viscosity and relative density for liquids and particle size for solids
9. Drop height
10. Test pressure in leakproofness test in accordance with marg. 1553
11. Test pressure in internal pressure test in accordance with marg. 1554

1560 *(cont'd)*

12. Stacking height

13. Test results

14. A unique test report identification

15. Date of test report

16. The test report shall be signed with the name and status of the signatory.

The test report shall contain statements that the packaging prepared as for carriage was tested in accordance with the appropriate requirements of Appendix V and that the use of other packaging methods may render it invalid. A copy of the test report shall be available to the competent authority.

B. Leakproofness test for all new or reconditioned packagings intended to contain liquids

1561 (1) Application of the test

Every packaging intended to contain liquids shall successfully undergo a suitable leakproofness test:

(a) before it is first used for carriage;

(b) after remanufacturing or reconditioning, before it is reused for carriage.

For this test, packagings need not have their own clossures fitted.

The inner receptacle of composite packagings may be tested without the outer packaging provided the test results are not affected.

This test is not necessary for:

— inner packaging of combination packagings;

— inner receptacles of composite packagings (glass, porcelain or stoneware) conforming to marg. 1510 (2);

— removable head packagings intended for substances with a viscosity at 23 °C exceeding 200 mm^2/s;

— light gauge metal packagings conforming to marg. 1510 (2).

(2) Test method

Compressed air shall be introduced through the filling orifice of each packaging. The packaging shall be immersed in water; it shall be kept under water in such a way as not to distort the result of the test. The packaging may also be covered with soap solution, heavy oil or other suitable liquid on its seams or at any other place where leakage might occur. Other methods at least equally effective may also be used.

Packagings need not be equipped with their own closures.

(3) Air pressure to be applied

Packing Group I	Packing Group II	Packing Group III
Not less than 30 kPa	Not less than 20 kPa	Not less than 20 kPa

(4) Criterion for passing the test

There shall be no leakage.

1562-1599

Annex to Appendix V

Standard liquids for verifying the chemical compatibility of high molecular mass polyethylene packagings in accordance with marg. 1551 (6)

The following standard liquids shall be used for this plastics material:

(a) Wetting solution for substances causing severe cracking in polyethylene under stress, in particular for all solutions and preparations containing wetting agents.

An aqueous solution of 1-10 % of a wetting agent shall be used. The surface tension of this solution shall be 31 to 35 mN/m at 23 °C .

The stacking test shall be carried out on the basis of a relative density of not less than 1,2.

A compatibility test with acetic acid is not required if adequate chemical compatibility is proved with a wetting solution.

(b) Acetic acid for substances and preparations causing cracking in polyethylene under stress, in particular for manocarboxylic acids and monovalent alcohols.

Acetic acid in 98-100 % concentration shall be used. Relative density = 1,05.

The stacking test shall be carried out on the basis of a relative density not less than 1,1.

In the case of filling substances causing polyethylene to swell more than acetic acid and to such an extent that the polyethylene mass in increased by up to 4 %, adequate chemical compatibility may be proved after preliminary storing for three weeks at 40 °C, in accordance with marg. 1551 (6), but with the original filling matter.

(c) Normal butyl acetate/normal butyl acetate-saturated wetting solution for substances and preparations causing polyethylene to swell to such an extent that the polyethylene mass is increased by up to about 4 % and at the same time causing cracking under stress, in particular for phyto-sanitary products, liquid paints and esters.

Normal butyl acetate in 98-100 % concentration shall be used for preliminary storage in accordance with marg. 1551 (6).

For the stacking test in accordance with marg. 1555, a test liquid consisting of a 1 to 10 % aqueous wetting solution mixed with 2 % normal butyl acetate conforming to (a) above shall be used.

The stacking test shall be carried out on the basis of a relative density not less than 1,0.

In the case of filling substances causing polyethylene to swell more than normal butyl acetate and to such an extent that the polyethylene mass is increased by up to 7,5 %, adequate chemical compatibility may be proved after preliminary storing for three weeks at 40 °C, in accordance with marg. 1551 (6) but with the original filling matter.

(d) Mixture of hydrocarbons (white spirit) for substances and preparations causing polyethylene to swell, in particular for hydrocarbons, esters and ketones.

A mixture of hydrocarbons having a boiling zone of 160 °C-220 °C, a relative density of 0,78-0,80, a flash-point above 50 °C and an aromatics content of 16 to 21 % (C_9 and higher aromatics only) shall be used.

The stacking test shall be carried out on the basis of a relative density not less than 1,0.

In the case of filling substances causing polyethylene to swell to such an extent that the polyethylene mass is increased by more than 7.5 %, adequate chemical compatibility may be proved after preliminary storing for three weeks at 40 °C, in accordance with marg. 1551 (6) but with the original filling matter.

(e) Nitric acid for all substances and preparations having an oxidizing effect on polyethylene and causing molecular degradation identical to or less than 55 % nitric acid.

Nitric acid in a concentration of not less than 55 % shall be used.

The stacking test shall be carried out on the basis of a relative density of not less than 1,4.

In the case of filling substances more strongly oxidizing than 55 % nitric acid or causing degradation of the molecular mass, proceed in accordance with marg. 1551 (5).

(f) Water for substances which do not attack polyethylene in any of the cases referred to under (a) to (e), in particular for inorganic acids and lyes, aqueous saline solutions, polyvalent alcohols and organic substances in aqueous solution.

The stacking test shall be carried out on the basis of a relative density of not less than 1,2.

List of substances to which the standard liquids may be regarded as equivalents in accordance with marg. 1551 (6)

CLASS 3

Item	Substance	Standard liquid
	A. Substances, not toxic and not corrosive, having a flash-point below 23 °C	
3 (b)	Substances having a vapour pressure at 50 °C of not more than 110 kPa (1,10 bar):	
	— Crude petroleums and other crude oils	Mixture of hydrocarbons
	— Hydrocarbons	Mixture of hydrocarbons
	— Halogenated substances	Mixture of hydrocarbons
	— Alcohols	Acetic acid
	— Ethers	Mixture of hydrocarbons
	— Aldehydes	Mixture of hydrocarbons
	— Ketones	Mixture of hydrocarbons
	— Esters	Normal butyl acetate where the swelling effect is up to 4 % (mass): other cases, mixture of hydrocarbons
4 (b)	Mixtures of substances of item 3 (b) having a boiling point or initial boiling point exceeding 35 °C, containing not more than 55 % nitrocellulose with a nitrogen content not exceeding 12,6 %.	Normal butyl acetate/normal butyl acetate-saturated wetting solution and *mixture of hydrocarbons*
5	*Viscous substances*	*Mixture of hydrocarbons*
	B. Toxic substances having a flash-point below 23 °C	
17 (b)	Methanol	Acetic acid
	D. Substances having a flash-point between 23 °C and 61 °C inclusive	
31 (c)	Substance having a flash-point between 23 °C and 61 °C inclusive:	
	— Petroleum, solvent naphtha	Mixture of hydrocarbons
	— White spirit (turpentine substitute)	Mixture of hydrocarbons
	— Hydrocarbons	Mixture of hydrocarbons
	— Halogenated substances	Mixture of hydrocarbons
	— Alcohols	Acetic acid
	— Ethers	Mixture of hydrocarbons
	— Aldehydes	Mixture of hydrocarbons
	— Ketones	Mixture of hydrocarbons
	— Esters	Normal butyl acetate where the swelling effect is up to 4 % (mass): other cases, mixture of hydrocarbons
	— Nitrogenous substances	Mixture of hydrocarbons
34 (c)	Mixtures of substances of item 31 (c) containing not more than 55 % nitrocellulose with a nitrogen content not exceeding 12,6 %.	Normal butyl acetate/normal butyl acetate-saturated wetting solution and *mixture of hydrocarbons*.

CLASS 5.1

Item	Substance	Standard liquid
	A. Liquid oxidizing substances and their aqueous solutions	
	Hydrogen peroxide and its solutions(1):	
1 (b)	Aqueous solutions with not less than 20 % but not more than 60 % hydrogen peroxide	Water
(c)	Aqueous solutions with not less than 8 % but less than 20 % hydrogen peroxide	Water
3 (a)	Perchloric acid with more than 50 % but not more than 72 % acid, by mass	Nitric acid
	B. Aqueous solutions of solid oxidizing substances	
11 (b)	Calcium chlorate solution	Water
	Potassium chlorate solution	Water
	Sodium chlorate solution	Water

(1) Test to be carried out only with vent.

CLASS 5.2

Note: tert-Butyl hydroperoxide with more than 40 % peroxide content and peracetic acids are excluded from the following items:

Item	Substance	Standard liquid
1 (b) 3 (b) 5 (b) 7 (b) 9 (b)	All organic peroxides in a technically pure form or in solution in solvent which, as far as their compatibility is concerned, are covered by the standard liquid mixture of hydrocarbons in this list.	Normal butyl acetate/wetting solution with 2 % normal butyl acetate *and* mixture of hydrocarbonds *and* nitric acid at 55 %

Compatibility for decompression valves and for gaskets with organic peroxides may be verified, also independently of the design type test with nitric acid, by laboratory test.

CLASS 6.1

Item	Substance	Standard liquid
	B. Organic substances which have a flash-point of 23 °C or above or are non-flammable organic substances	
	Nitrogenous substances having a flash-point above 61 °C:	
12 (b)	Aniline	Acetic acid

Item	Substance	Standard liquid
	Oxygenated substances having a flash-point above 61 °C	
14 (c)	Ethylene glycol monobutyl ether	Acetic acid
	Furfuryl alcohol	Acetic acid
	Phenol solution	Acetic acid
	Corrosive, toxic organic substances, articles containing corrosive, toxic organic substances and solutions and mixtures of corrosive, toxic organic substances (such as preparations and wastes)	
27 (b)	Cresols or cresylic acid	Acetic acid

CLASS 6.2

Item	Substance	Standard liquid
3 and 4	All infectious substances considered to be liquids in accordance with marg. 650 (5)	Water

CLASS 8

Item	Substance	Standard liquid

A. Acid substances

	Inorganic acids	
1 (b)	Sulphuric acid	Water
	Sulphuric acid, spent	Water
2 (b)	Nitric acid with not more than 55 % acid	Nitric acid
4 (b)	Perchloric acid with not more than 50 % acid, by mass in aqueous solution	Nitric acid
5 (b) and (c)	Hydrochloric acid solution with not more than 36 % pure acid, hydrobromic acid solution, hydrobromic acid solution, hydriodic acid solution	Water
7 (b)	Hydrofluoric acid with not more than 60 % hydrogen fluoride (1)	Water
8 (b)	Fluoroboric acid with not more than 50 % pure acid	Water
	Fluorosilicic acid	Water
17 (b) and (c)	Chromic acid solution with not more than 30 % pure acid	Nitric acid
17 (c)	Phosphoric acid	Water
	Organic substances	
32 (b)	Acrylic acid Formic acid Acetic acid Thioglycolic acid	Acetic acid Acetic acid Acetic acid Acetic acid

(1) Maximum 60 litres; permissible period of use two years.

Item	Substance	Standard liquid
32 (c)	Methacrylic acid Propionic acid	Acetic acid Acetic acid
40 (c)	Liquid alkylphenols	Acetic acid
	B. Basic substances	
	Inorganic substances	
42 (b) and (c)	Solutions of alkaline substances Potassium hydroxide solution, Sodium hydroxide solution	 Water
43 (c)	Ammonia solution	Water
44 (b)	Aqueous solution of hydrazine containing not more than 64 % hydrazine (N_2H_4) by mass	Water
	C. Other corrosive substances	
61	Chlorite and hypochlorite solution [1]	Nitric acid
63 (c)	Formaldehyde solution	Water

[1] Test to be carried out only with vent. If the test is carried out with nitric acid as the standard liquid, an acid-resistant vent shall be used. For hypochlorite solutions, vents of the same design type, resistant to hypochlorite (e.g. of silicone rubber) but not resistant to nitric acid, are also permitted.

APPENDIX VI

GENERAL CONDITIONS FOR THE USE OF INTERMEDIATE BULK CONTAINERS (IBCs), TYPES OF IBCs, REQUIREMENTS RELATING TO THE CONSTRUCTION OF IBCs AND TEST SPECIFICATIONS FOR IBCs.

1600 'Intermediate Bulk Container' (IBC) means a rigid or flexible portable packaging, other than those specified in Appendix V, that

(a) has a capacity of:

(i) not more than 3,0 m^3 (3,000 litres), for solids and liquids of Packing Groups II and III;

(ii) not more than 1,5 m^3 for solids of Packing Group I when packed in flexible, rigid plastics, composite, fibreboard and wooden IBCs;

(iii) not more than 3,0 m^3 for solids of Packing Group I when packed in metal IBCs;

(b) is designed for mechanical handling;

(c) is resistant to the stresses produced in handling and transport as determined by the tests specified in this Appendix.

Note: 1. The provisions of this Appendix apply to intermediate bulk containers (IBCs) the use of which is expressly authorized in the relevant classes for the carriage of certain dangerous substances.

2. Tank-containers which meet the provisions of Appendix X are not considered to be intermediate bulk containers (IBCs).

3. Intermediate bulk containers (IBCs) which meet the conditions of this Appendix are not considered to be containers for the purposes of this Directive.

4. The letters IBC only will be used in the rest of the text to refer to intermediate bulk containers.

Section I

General conditions applicable to IBCs

1601 (1) IBCs shall be designed, manufactured and tested under a quality assurance programme which satisfies the competent authority, in order to ensure that each IBC meets the provisions of this Appendix.

(2) Every IBC shall correspond in all respects to its design type.

The competent authority may at any time require proof, by conducting tests in accordance with the provisions of this Appendix, that IBCs meet the requirements for design type tests.

(3) Before being filled and handed over for carriage, every IBC shall be inspected to ensure that it is free from corrosion, contamination or other damage and with regard to proper functioning of service equipment. Any IBC which shows signs of reduced strength as compared with the tested design type shall no longer be used or shall be so reconditioned that it is able to withstand the design-type tests.

(4) Where two or more closure systems are fitted in series, that nearest to the substance being carried shall be closed first.

(5) During carriage, no dangerous residue shall adhere to the outside of the IBC.

(6) Where overpressure may develop in an IBC through the emission of gas from the contents (as a result of temperature increase or other causes), the IBC may be fitted with a vent provided that the gas emitted will not cause any danger on account of its toxicity, its flammability, the quantity released, etc. The vent shall be so designed that, when the IBC is in the position in which it is intended to be carried, leakages of liquid and the penetration of foreign matter are prevented under normal conditions of carriage. However, a substance may be carried in such an IBC only where a vent is prescribed for that substance in the conditions of carriage of the relevant Class.

1601 *(cont'd)*

(7) When IBCs are filled with liquids, sufficient ullage shall be left to ensure that no leakage of liquid and no permanent distortion of the IBC occurs as a result of expansion of the liquid, due to temperatures which may be attained during carriage.

For a filling temperature of 15 °C, the maximum degree of filling shall be determined as follows, unless otherwise provided under a particular Class:

Either (a)

Boiling point (initial boiling point) of the substance in °C	> 35 < 60	≥ 60 < 100	≥ 100 < 200	≥ 200 < 300	≥ 300
Degree of filling as a percentage of the capacity of the IBC	90	92	94	96	98

or (b)

$$\text{Degree of filling} = \frac{98}{1 + \alpha\ (50 - t_F)}\ \%\ \text{of the capacity of the IBC.}$$

In this formula, α represents the mean coefficient of cubic expansion of the liquid between 15 °C and 50 °C, that is to say, for a maximum rise in temperature of 35 °C.

α is calculated according to the formula

$$\alpha = \frac{d_{15} - d_{50}}{35 \times d_{50}}$$

d_{15} and d_{50} being the relative densities of the liquid at und 15 °C and 50 °C and t_F the mean temperature of the liquid at the time of filling.

IBCs of Type 31HZ2 shall be filled to not less than 80 % of the capacity of the outer casing.

(8) When IBCs are used for the carriage of liquids with a flash-point of 55 °C (closed cup) or lower, or powders liable to dust explosion, measures shall be taken to prevent a dangerous electrostatic discharge during filling and emptying.

(9) The closure of IBCs containing wetted or diluted substances shall be such that the percentage of liquid (water, solvent or phlegmatizer) does not fall below the prescribed limits during carriage.

(10) Liquids shall be loaded only into rigid plastics IBCs or composite IBCs which have an adequate resistance to the internal pressure that may be developed under normal conditions of carriage. IBCs marked with the hydraulic test pressure as prescribed in marg. 1612 (2) shall be filled only with a liquid having a vapour pressure:

(a) such that the total gauge pressure in the packaging (i.e. the vapour pressure of the filling substance plus the partial pressure of air or other inert gases, less 100 kPa) at 55 °C determined on the basis of a maximum degree of filling in accordance with paragraph (7) and a filling temperature of 15 °C, will not exceed two-thirds of the marked test pressure; or

(b) at 50 °C less than four-sevenths of the sum of the marked test pressure plus 100 kPa; or

(c) at 55 °C than two-thirds of the sum of the marked test pressure plus 100 kPa.

(11) IBCs of Type 31HZ2 shall only be carried in closed wagons.

1602-1609

Section II

Types of IBCs

Definitions

1610 (1) Subject to the particular requirements of each Class, the IBCs mentioned below may be used:

Metal IBCs

Metal IBCs consist of a metal body together with appropriate service and structural equipment.

Flexible IBCs

Flexible IBCs consist of a body constituted of film, woven fabric or any other flexible material or combinations thereof, and if necessary an inner coating or liner, together with any appropriate service equipment and handling devices.

Rigid plastics IBCs

Rigid plastics IBCs consist of a rigid plastics body, which may have structural equipment together with appropriate service equipment.

Composite IBCs with plastics inner receptacle

Composite IBCs consist of structural equipment in the form of a rigid outer casing enclosing a plastics inner receptacle together with any service or other structural equipment. They are so constructed that the inner receptacle and outer casing once assembled form, and are used as, an integrated single unit to be filled, stored, carried or emptied as such.

Fibreboard IBCs

Fibreboard IBCs consist of a fibreboard body with or without separate top and bottom caps, if necessary an inner liner (but no inner packagings), and appropriate service and structural equipment.

Wooden IBCs

Wooden IBCs consist of a rigid or collapsible wooden body, together with an inner liner (but no inner packagings) and appropriate service and structural equipment.

(2) The following definitions apply to the IBCs listed (1):

— *Body* (for all categories of IBC other than composite IBCs):

means the receptacle proper, including openings and their closures, but does not include service equipment (see below);

— *Service equipment* (for all categories of IBC):

means the filling and discharge devices and, according to the category of IBC, pressure relief or venting, safety, heating and heat-insulating devices and measuring instruments;

— *Structural equipment* (for all categories of IBC other than flexible IBCs):

means the reinforcing, fastening, handling, protective or stabilizing members of the body (including the base pallet for composite IBCs with plastics inner receptacle);

— *Maximum permissible gross mass* (for all categories of IBC other than flexible IBCs):

maens the mass of the body, its service equipment and structural equipment and the maximum permissible load authorized to be carried;

1610 *(cont'd)*

— *Maximum permissible load* (for flexible IBCs):

means the maximum net mass for which the IBC is intended to be used and which it is authorized to carry;

— *Protected* (for metal IBCs):

means provided with additional protection against impact, the protection taking the form of, for example, a multi-layer (sandwich) or double-wall construction, or a frame with a metal lattice-work casing;

— *Woven plastics* (for flexible IBCs):

means a material made from stretched tapes or monofilaments of suitable plastics material;

— *Plastics* (for composite IBCs with plastics inner receptacle):

when used in connection with inner receptacles for composite IBCs, is taken to include other polymeric materials such as rubber, etc.;

— *Handling device* (for flexible IBCs):

means any sling, loop, eye or frame attached to the body of the IBC or formed from a continuation of the IBC body material;

— *liner* (for flexible, fibreboard and wooden IBCs):

means a separate tube or bag inserted in the body but not forming an integral part of it, including the closures of its openings.

— *Rigid inner receptacle* (for composite IBCs):

means a receptacle which retains its general shape when empty without its closures in place and without benefit of the outer casing. Any inner receptacle that is not 'rigid' is considered to be 'flexible'.

Coding of IBC design types

1611 (1) Code system for IBCs

The code consists of:

— two Arabic numerals indicating the type of IBC as specified under (a) below;

— a capital letter or letters (Latin characters) as specified under (b) below, indicating the nature of the material (e.g. metal, plastics, etc.);

— where necessary, an Arabic numeral indicating the category of IBC within the type to which the IBC belongs.

For composite IBCs, two capital letters (Latin characters) shall be used. The first shall indicate the material of the inner receptacle of the IBC and the second that of the outer packaging of the IBC.

(a)

Type	For solids, loaded and/or discharged		for liquids
	by gravity	under pressure of more than 10 kPa (0,1 bar)	
Rigid	11	21	31
Flexible	13	—	—

(b) A. Steel (all types and surface treatments)

B. Aluminium

C. Natural wood

D. Plywood

F. Reconstituted wood

1611 *(cont'd)*

G. Fibreboard

H. Plastics material

L. Textile

M. Paper, multiwall

N. Metal (other than steel or aluminium).

(2) The IBC code shall be followed in the marking by a letter indicating the groups of substances for which the design type is approved, i.e.:

X for substances of packing groups I, II and III (IBCs for solids only);

Y for substances of packing groups II and III;

Z for substances of packing group III.

Note: For packing groups, see marg. 1511 (2).

Marking

1612 (1) Primary marking

All IBCs built and intended for use in conformity with these requirements shall bear a durable and legible marking giving the following particulars:

(a) The United Nations packaging symbol: Ⓤ

(for metal IBCs on which the marking is stamped or embossed, the letters UN may be applied instead of the symbol);

(b) the code designating the type of IBC according to marg. 1611 (1);

(c) a letter (X, Y or Z) designating the packing group(s) for which the design type has been approved;

(d) the month and year (last two digits) of manufacture;

(e) the mark [1] of the State in which the approval was issued;

(f) the name or symbol of the manufacturer or any other identification of the IBC as specified by the competent authority;

(g) the stacking test load in kg. The figure '0' shall be affixed to IBCs not designed for stacking;

(h) maximum permissible gross mass or, for flexible IBCs, maximum permissible load, in kg.

The primary marking required above shall be applied in the sequence of the sub-paragraphs above. The marking required by paragraph (2) and any further marking authorized by a competent authority shall be arranged so as to enable the various parts of the marking to be correctly identified. In addition, the inner receptacle of composite IBCs shall be marked with at least the information prescribed in (d), (e) and (f) above.

Examples of primary marking

Ⓤ 11A/Y/0289 NL/Mulder 007/5500/1500	Metal IBC made of steel for solids discharged for instance by gravity/for Packing Groups II and III/manufactured in February 1989/approved by the Netherlands/manufactured by Mulder in conformity with a design type to which the competent authority has allocated serial number 007/load used for the stacking test in kg/maximum permissible gross mass in kg.

[1] Distinguishing sign for motor vehicles in international traffic prescribed in the Vienna Convention on Road Traffic (1968).

1612 *(cont'd)*

11C/X/0193 S/Aurigny/9876/3000/910	Wooden IBC for solids with an inner liner and authorised for Packing Group I solids.
13H3/Z/0389 F/Meunier 1713/1000/500	Flexible IBC for solids discharged e.g. by gravity and made from woven plastics with a liner.
31H1/Y/0489 GB/9099/10800/1200	Rigid plastics IBC for liquids, made from plastics with structural equipment to withstand the stacking load.
31HA1/Y/0589 D/Muller/1683/10800/1200	Composite IBC for liquids with a rigid plastics inner receptacle and a steel outer casing.

(2) Additional marking [1]

For all categories of IBCs other than flexible IBCs:

(i) tare mass in kg [2].

For metal IBCs, rigid plastics IBCs and composite IBCs with plastics inner receptacle:

(j) capacity in litres [2] at 20 °C;

(k) date of last leakproofness test (month and year), if applicable;

(l) date of last inspection (month and year);

(m) maximum filling/discharge pressure in kPa (or in bar) [2], if applicable;

For metal IBCs:

(n) body material and its minimum thickness in mm;

(o) serial number of the manufacturer;

For rigid plastics IBCs and composite IBCs with plastics inner receptacle:

(p) test pressure (gauge) in kPa (or bar) [2], if applicable;

(q) where the outer casing of composite IBCs can be dismantled: each of the detachable parts shall be marked in accordance with marg. 1612(1)(d) and (f).

(3) IBCs marked in accordance with this Appendix but approved in a State which is not a COTIF Contracting State may also be used for carriage under this Directive.

Certification

1613 By affixing marking in accordance with this Appendix, it is certified that mass-produced IBCs correspond to the approved design type and that the conditions referred to in the approval certificate have been met.

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[1] Each flexible IBC may also bear a pictogram indicating recommended lifting methods.
[2] The unit used shall be indicated.

Index of IBCs

1614 The codes corresponding to the various type of IBCs are as follows:

1. IBCs for solids loaded and discharged by gravity

Type	Material	Category	Code	Marg.
11 rigid	steel	metal	11A	1622
	aluminium		11B	
	natural wood	wooden	11C	1627
	plywood		11D	
	reconstituted wood		11F	
	fibreboard	fibreboard	11G	1626
	plastics	rigid plastics (fitted with structural equipment)	11H1	1624
		rigid plastics (freestanding)	11H2	
		composite with plastics inner receptacle (rigid)	11HZ1(1)	1625
		composite with plastics inner receptacle (flexible)	11HZ2(1)	
	other metal	metal	11N	1622
13 flexible	woven plastics without coating or liner	flexible	13H1	1623
	woven plastics, coated		13H2	
	woven plastics with liner		13H3	
	woven plastics, coated and with liner		13H4	
	plastics film		13H5	
	textile without coating or liner		13L1	
	textile, coated		13L2	
	textile with liner		13L3	
	textile, coated and with liner		13L4	
	paper, multiwall		13M1	
	paper, multiwall, water resistant		13M2	

(1) With regard to the letter 'Z', see marg. 1625 (1) (b).

1614 *(cont'd)*

2. IBCs for solids loaded or discharged under pressure of more than 10 kPa (0,1 bar)

Type	Material	Category	Code	Marg.
21 rigid	steel	metal	21A	1622
	aluminium		21B	
	plastics	rigid plastics (fitted with structural equipment)	21H1	1624
		rigid plastics (freestanding)	21H2	
		composite with plastics inner receptacle (rigid)	21HZ1 (1)	1625
		composite with plastics inner receptacle (flexible)	21HZ2 (1)	
	other metal	metal	21N	1622

(1) With regard to the letter 'Z', see marg. 3625 (1) (b).

3. IBCs for liquids

Type	Material	Category	Code	Marg.
31 rigid	steel	metal	31A	1622
	aluminium		31B	
	plastics	rigid plastics (fitted with structural equipment)	31H1	1624
		rigid plastics (freestanding)	31H2	
		composite with plastics inner receptacle (rigid)	31HZ1 (1)	1625
		composite with plastics inner receptacle (flexible)	31HZ2 (1)	
	other metal	metal	31N	1622

(1) With regard to the letter 'Z', see marg. 3625 (1) (b).

1615-1620

Section III

Construction requirements for IBC

General requirements

1621 (1) IBCs shall be resistant to or adequately protected from deterioration due to the environment.

(2) IBCs shall be so constructed and closed that none of the contents can escape under normal conditions of carriage, including the effect of vibration, or by changes in temperature, humidity or pressure.

(3) IBCs and their closures shall be constructed of materials compatible with their contents, or be protected internally, so that they are not liable:

(a) to be attacked by the contents so as to make their use dangerous;

(b) to cause the contents to react or decompose, or form harmful or dangerous compounds with the IBCs.

(4) Gaskets, where used, shall be made of materials not subject to attack by the contents of the IBCs.

(5) All service equipment shall be so positioned or protected as to minimize the risk of escape of the contents owing to damage during handling and carriage.

(6) IBCs, their attachments and their service and structural equipment shall be designed to withstand, without loss of contents, the internal pressure of the contents and the stresses of normal handling and transport. IBCs intended for stacking shall be designed for stacking. Any lifting or securing features of IBCs shall be of sufficient strength to withstand the normal conditions of handling and carriage without gross distortion or failure and shall be so positioned that no undue stress is caused in any part of the IBC.

(7) Where an IBC consists of a body within a framework, it shall be so constructed that:

— the body does not chafe or rub against the framework so as to cause material damage to the body,

— the body is retained within the framework at all times,

— the items of equipment are fixed in such a way that they cannot be damaged if the connections between body and frame allow relative expansion or movement.

(8) Where a bottom discharge valve is fitted, it shall be capable of being made secure in the closed position and the whole discharge system shall be suitably protected from damage. Valves having lever closures shall be able to be secured against accidental opening and the open or closed position shall be readily apparent. For IBCs containing liquids, a secondary means of sealing the discharge aperture shall also be provided, e.g. by a blank flange or equivalent device.

(9) New, reused or reconditioned IBCs shall be capable of passing the prescribed tests.

Special requirements for metal IBCs

1622 (1) These requirements apply to metal IBCs intended for the carriage of solids or liquids.

These IBCs are of the following types:

11A, 11B, 11N

For solids which are loaded or discharged by gravity

21A, 21B, 21N

For solids which are loaded or discharged under a gauge pressure greater than 10 kPa (0,1 bar)

1622 *(cont'd)*

31A, 31B, 31N

For liquids. Metal IBCs intended for the carriage of liquids and which comply with the provisions of this Appendix shall not be used to carry liquids having a vapour pressure of more than 110 kPa (1,1 bar) at 50 °C or more than 130 kPa (1,3 bar) at 55 °C.

(2) Bodies shall be made of a suitable ductile metal of which the weldability has been fully demonstrated. Welds shall be skilfully made and afford complete safety.

(3) If contact between the substance carried and the material used for the construction of the body entails a progressive decrease in the thickness of the walls, this thickness shall be increased at manufacture by an appropriate amount. This extra thickness to allow for corrosion shall be added to the wall thickness as determined according to paragraph (7) [see also marg 1621(3)].

(4) Care shall be taken to avoid damage by galvanic action due to the juxtaposition of dissimilar metals.

(5) Aluminium IBCs intended for the carriage of flammable liquids with a flash-point of not more than 61 °C shall have no movable parts, such as covers, closures etc., made of unprotected steel liable to rust, which might cause a dangerous reaction by coming into frictional or percussive contact with the aluminium.

(6) Metal IBCs shall be made of metals which meet the following requirements:

(a) for steel the elongation at fracture, in percent, shall not be less than $\frac{10\,000}{Rm}$ with an absolute minimum of 20 %

where Rm = guaranteed minimum tensile strength of the steel used in N/mm^2.

(b) for aluminium and its alloys the elongation at fracture, in percent, shall not be less than $\frac{10\,000}{6\,Rm}$ with an absolute minimum of 8 %.

Specimens used to determine the elongation at fracture shall be taken transversely to the direction of rolling and be so secured that:

$L_o = 5\,d$ or $L_o = 5.65\sqrt{A}$

where: L_o = gauge length of the specimen before the test

d = diameter

A = cross-sectional area of test specimen.

(7) Minimum wall thickness:

(a) For a reference steel having a product of Rm x A_0 = 10 000, the wall thickness shall not be less than:

Capacity in m^3	Wall thickness in mm			
	Types: 11A, 11B, 11N		Types: 21A, 21B, 21N, 31A, 31B, 31N	
	Unprotected	Protected	Unprotected	Protected
≤ 1,0	2,0	1,5	2,5	2,0
> 1,0 ≤ 2,0	2,5	2,0	3,0	2,5
> 2,0 ≤ 3,0	3,0	2,5	4,0	3,0

1622 *(cont'd)*

where A_o = minimum elongation (as a percentage) of the reference steel used on fracture under tensile stress [see paragraph (6)].

(b) For metals other than the reference steel described in (a), the minimum wall thickness is calculated by the following equivalence formula:

$$e_1 = \frac{21{,}4 \times e_0}{\sqrt[3]{Rm_1 \times A_1}}$$

where: e_1 = required equivalent wall thickness of the metal to be used (in mm);

e_0 = required minimum wall thickness for the reference steel (in mm);

Rm_1 = guaranteed minimum tensile strength of the metal to be used (in N/mm^2);

A_1 = minimum elongation (as a percentage) of the metal to be used on fracture under tensile stress [see paragraph (6)].

However, in no case shall the wall thickness be less than 1,5 mm.

(8) Pressure relief requirements

IBCs for liquids shall be capable of releasing a sufficient amount of vapour to ensure that, in the event of fire engulfment, no rupture of the body will occur. This can be achieved by conventional pressure relief devices or by other constructional means.

The start-to-discharge pressure shall not be higher than 65 kPa (0,65 bar) and no lower than the total gauge pressure experienced in the IBC (i.e. the vapour pressure of the filling substance plus the partial pressure of the air or other inert gases, minus 100 kPa (1 bar)] at 55 °C, determined on the basis of a maximum degree of filling as defined in marg. 1601(7). The required relief devices shall be fitted in the vapour space.

Special requirements for flexible IBCs

1623 (1) These requirements apply to flexible IBCs intended for the carriage of solids. These IBCs are of the following type:

13H1 woven plastics without coating or liner

13H2 woven plastics, coated

13H3 woven plastics with liner

13H4 woven plastics, coated and with liner

13H5 plastics film

13L1 textile without coating or liner

13L2 textile, coated

13L3 textile with liner

13L4 textile, coated and with liner

13M1 paper, multiwall

13M2 paper, multiwall, water resistant.

(2) Bodies shall be manufactured from suitable materials. The strength of the material and the construction of the flexible IBC shall be appropriate to its capacity and its intended use.

(3) All materials used in the construction of flexible IBCs of types 13M1 and 13M2 shall, after complete immersion in water for not less than 24 hours, retain at least 85 % of the tensile strength as measured originally on the material conditioned to equilibrium at 67 % relative humidity or less.

1623 *(cont'd)*

(4) Seams shall be formed by stitching, heat sealing, glueing or any equivalent method. All stitched seam-ends shall be secured.

(5) Flexible IBCs shall provide adequate resistance to ageing and degradation caused by ultraviolet radiation, climatic conditions or the substance contained, thereby rendering them appropriate to their intended use.

(6) For plastics flexible IBCs, where protection against ultraviolet radiation is required, it shall be provided by the addition of carbon black or other suitable pigments or inhibitors. These additives shall be compatible with the contents and remain effective throughout the life of the body. Where use is made of carbon black, pigments or inhibitors other than those used in the manufacture of the tested design type, retesting may be waived if changes in the carbon black content, the pigment content or the inhibitor content do not adversely affect the physical properties of the material of construction.

(7) Additives may be incorporated into the material of the body to improve the resistance to ageing or to serve other purposes, provided that these do not adversely affect the physical or chemical properties of the material.

(8) No material recovered from used receptacles shall be used in the manufacture of IBC bodies. Production residues or scrap from the same manufacturing process may, however, be used. Component parts such as fittings and pallet bases may also be used, provided such components have not been damaged in any way in previous use.

(9) When filled, the ratio of height to width shall be not more than 2:1.

(10) The liner shall be made of suitable material. The strength of the material used and the construction of the liner shall be appropriate to the capacity of the IBC and the intended use. Joins and closures shall be sift-proof and capable of withstanding pressures and impacts liable to occur under normal conditions of handling and carriage.

Special requirements for rigid plastics IBCs

1624

(1) These requirements apply to rigid plastics IBCs intended for the carriage of solids or liquids. These IBCs are of the following types:

11H1 for solids which are loaded and discharged by gravity, fitted with structural equipment designed to withstand the whole load when IBCs are stacked,

11H2 for solids which are loaded and discharged by gravity, freestanding,

21H1 for solids which are loaded or discharged under pressure of more than 10 kPa (0,1 bar), fitted with structural equipment designed to withstand the whole load when IBCs are stacked,

21H2 for solids which are loaded or discharged under pressures of more than 10 kPa (0,1 bar), freestanding,

31H1 for liquids, fitted with structural equipment designed to withstand the whole load when IBCs are stacked,

31H2 for liquids, freestanding.

(2) The body shall be manufactured from suitable plastics material of known specifications and be of adequate strength in relation to its capacity and its intended use. The material shall be adequately resistant to ageing and to degradation caused by the substance contained or, where relevant, by ultraviolet radiation. Any permeation of the substance contained shall not constitute a danger under normal conditions of carriage.

1624 *(cont'd)*

(3) Where protection against ultraviolet radiation is required, it shall be provided by the addition of carbon black or other suitable pigments or inhibitors. These additives shall be compatible with the contents and remain effective throughout the life of the body. Where use is made of carbon black, pigments or inhibitors, other than those used in the manufacture of the tested design type, retesting may be waived if changes in the carbon black content, the pigment content or the inhibitor content do not adversely affect the physical properties of the material of construction.

(4) Additives may be incorporated in the material of the body to improve the resistance to ageing or to serve other purposes, provided that these do not adversely affect the physical or chemical properties of the material.

(5) No used material other than production residues or regrind from the same manufacturing process may be used in the manufacture of rigid plastics IBCs.

(6) Rigid plastics IBCs for liquids shall be capable of releasing a sufficient amount of vapour to ensure that no rupture of the body will occur. This can be achieved by conventional pressure relief devices or by other constructional means. the start-to-discharge pressure shall not be higher than the pressure used in the hydraulic pressure test.

(7) Unless otherwise approved by the competent authority, the period of use permitted for the carriage of dangerous liquids shall not exceed five years from the date of manufacture of the receptacle of the IBC except where a shorter period of use is prescribed because of the nature of the liquid to be carried.

Special requirements for composite IBCs with plastics inner receptacle

1625 (1) These requirements apply to composite IBCs intended for the carriage of solids or liquids. These IBCs are of the following types:

(a) 11HZ1 for solids loaded and discharged by gravity, fitted with a rigid plastics inner receptacle;

11HZ2 for solids loaded and discharged by gravity, fitted with flexible plastics inner receptacle;

21HZ1 for solids loaded or discharged under pressure of more than 10 kPa (0,1 bar), fitted with a rigid plastics inner receptacle;

21HZ2 for solids loaded or discharged under pressure of more than 10 kPa (0,1 bar), fitted with a flexible plastics inner receptacle;

31HZ1 for liquids, fitted with a rigid plastics inner receptacle;

31HZ2 for liquids, fitted with a flexible plastics inner receptacle.

(b) This code shall be completed by replacing the letter Z with a capital letter in accordance with marg. 1611(1)(b) to indicate the nature of the material used for the outer casing.

(2) *General*

(a) The inner receptacle is not intended to perform a containment function without its outer casing.

(b) The outer casing normally consists of rigid material formed so as to protect the inner receptacle from physical damage during handling and carriage but is not intended to perform the containment function; it includes the base pallet where appropriate.

(c) A composite IBC with a fully enclosing outer casing shall be so designed that the integrity of the inner container may be readily assessed following the leakproofness and hydraulic tests.

(d) IBCs of type 31HZ2 shall be limited to a capacity of not more than 1 250 litres.

1625 *(cont'd)*

(3) *Inner receptacle*

The same requirements as provided for in marg. 1624 (2) to (6) for rigid plastics IBCs apply to the inner receptacle, on the understanding that, in this case, the requirements applicable to the body of rigid plastics IBCs are applicable to the inner receptacle of composite IBCs.

The inner receptacles of IBCs type 31HZ2 shall consist of at least three plies of film.

(4) *Outer casing*

(a) The strength of the material and the construction of the outer casing shall be appropriate to the capacity of the composite IBC and its intended use.

(b) The outer casing shall be free of any projection that might damage the inner receptacle.

(c) Full-walled or mesh-formed metal outer casings shall be constructed of a suitable material of adequate thickness.

(d) Outer casings of natural wood shall be of well seasoned wood, commercially dry and free from defects that would materially lessen the strength of any part of the casing. The tops and bottoms may be made of water-resistant reconstituted wood such as hardboard, particle board or other suitable type.

(e) Outer casings of plywood shall be made of well seasoned rotary cut, sliced or sawn veneer, commercially dry and free from defects that would materially lessen the strength of the casing. All adjacent plies shall be glued with water-resistant adhesive. Other suitable materials may be used with plywood for the construction of casings. Casings shall be firmly nailed or secured to corner posts or ends or be assembled by equally suitable devices.

(f) The walls of outer casings of reconstituted wood shall be made of water-resistant reconstituted wood such as hardboard, particle board or other suitable type. Other parts of the casings may be made of other suitable material.

(g) For fibreboard outer casings, strong and good quality solid or double-faced corrugated fibreboard (single or multiwall) shall be used appropriate to the capacity of the casing and to its intended use. The water resistance of the outer surface shall be such that the increase in mass, as determined in a test carried out over 30 minutes by the Cobb method of determining water absorption, is not greater than 155 g/m^2 — see ISO International Standard 535:1991 (E). It shall have proper bending qualities. Fibreboard shall be cut, creased without scoring, and slotted so as to permit assembly without cracking, surface breaks or undue bending. The fluting of corrugated fibreboard shall be firmly glued to the facings.

(h) The ends of fibreboard casings may have a wooden frame or be entirely of wood. Reinforcements of wooden battens may be used.

(i) Manufacturing joins in the body of fibreboard casings shall be taped, lapped and glued, or lapped and stitched with metal staples. Lapped joins shall have an appropriate overlap. Where closing is effected by glueing or taping, a water-resistant adhesive shall be used.

(j) Where the outer casing is of plastics material, the relevant requirements of marg. 1624 (2) to (5) for rigid plastics IBCs apply, on the understanding that, in this case, the requirements applicable to the body of rigid plastics IBCs are applicable to the outer casing of composite IBCs.

(k) The outer casing of an IBC of type 31HZ2 shall completely enclose the inner on all sides.

(5) *Other structural equipment*

(a) Any integral pallet base forming part of an IBC or any detachable pallet shall be suitable for mechanical handling of the IBC filled to its maximum permissible gross mass.

1625 *(cont'd)*

(b) The pallet or integral base shall be designed so as to avoid any protrusion of the base of the IBC that might be liable to damage in handling.

(c) The outer casing shall be secured to any detachable pallet to ensure stability in handling and carriage. Where a detachable pallet is used, its top surface shall be free from sharp protrusions that might damage the IBC.

(d) Strengthening devices such as timber supports to increase stacking performance may be used, but shall be external to the inner receptacle.

(e) Where IBCs are intended for stacking the bearing surface shall be such as to distribute the load in a safe manner. Such IBCs shall be designed so that the load is not supported by the inner receptacle.

(6) Unless otherwise approved by the competent authority, the period of use permitted for the carriage of dangerous liquids shall not exceed five years from the date of manufacture of the receptacle of the IBC except where a shorter period of use is prescribed because of the nature of the liquid to be carried.

Special requirements for fibreboard IBCs

1626 (1) These requirements apply to fibreboard IBCs for the carriage of solids which are loaded and discharged by gravity.Fibreboard IBCs are of the following type: 11G.

(2) Fibreboard IBCs shall not incorporate top lifting devices.

(3) *Body*

(a) Strong and good quality solid or double-faced corrugated fibreboard (single or multiwall) shall be used, appropriate to the capacity of the IBC and its intended use. The water resistance of the outer surface shall be such that the increase in mass, as determined in a test carried out over a period of 30 minutes by the Cobb method of determining water absorption, is not greater than 155 g/m^2 — see ISO International Standard 535:1991 (E). The fibreboard shall have proper bending qualities. It shall be cut, creased without scoring, and slotted so as to permit assembly without cracking, surface breaks or undue bending. The fluting of corrugated fibreboard shall be firmly glued to the facings.

(b) The walls, including top and bottom, shall have a minimum puncture resistance of 15 J measured according to ISO International Standard 3036:1975.

(c) Manufacturing joins in the body of IBCs shall be made with an appropriate overlap and shall be taped, glued, stitched with metal staples, or fastened by other means at least equally effective. Where joins are effected by glueing or taping, a water-resistant adhesive shall be used. Metal staples shall pass completely through all pieces to be fastened and be formed or protected so that any inner liner cannot be abraded or punctured by them.

(4) *Liner*

The liner shall be made of a suitable material. The strength of the material used and the construction of the liner shall be appropriate to the capacity and intended use of the IBC. Joins and closures shall be sift-proof and capable of withstanding pressures and impacts liable to occur under normal conditions of handling and carriage.

(5) *Structural equipment*

(a) Any integral pallet base forming part of an IBC or any detachable pallet shall be suitable for mechanical handling of the IBC filled to its maximum permissible mass.

(b) The pallet or integral base shall be designed so as to avoid any protrusion of the base of the IBC that might be liable to damage in handling.

1626 *(cont'd)*

(c) The body shall be secured to any detachable pallet to ensure stability in handling and transport. Where a detachable pallet is used, its top surface shall be free from sharp protursions that might damage the IBC.

(d) Strengthening devices such as timber supports to increase stacking performance may be used but shall be external to the liner.

(e) Where IBCs are intended for stacking, the bearing surface shall be such as to distribute the load in a safe manner.

Special requirements for wooden IBCs

1627 (1) These requirements apply to wooden IBCs for the carriage of solids which are loaded and discharged by gravity. Wooden IBCs are of the following types:

11C Natural wood with inner liner

11D Plywood with inner liner

11F Reconstituted wood with inner liner.

(2) Wooden IBCs shall not incorporate top lifting devices.

(3) *Body*

(a) The strength of the materials used and the method of construction shall be appropriate to the capacity and intended use of the IBC.

(b) If bodies are of natural wood, this shall be well seasoned, commercially dry and free from defects that would materially lessen the strength of any part of the IBC. Each part of the IBC shall consist of one piece or be equivalent thereto. Parts are considered equivalent to one piece when a suitable method of glued assembly (as for instance Lindermann joint, tongue and groove joint, ship-lap or rabbet joint), butt joint with at least two corrugated metal fasteners at each joint, or other methods at least equally effective, are used.

(c) If bodies are of plywood, this shall be at least 3-ply. It shall be made of well-seasoned rotary cut, sliced or sawn veneer, commercially dry and free from defects that would materially lessen the strength of the body. All adjacent plies shall be glued with water-resistant adhesive. Other suitable materials may be used with plywood for the constructions of the body.

(d) Bodies of reconstituted wood shall be made of water-resistant reconstituted wood such as hardboard, particle board or other suitable type.

(e) IBCs shall be firmly nailed or secured to corner posts or ends or be assembled by equally suitable devices.

(4) *Liner*

The liner shall be made of a suitable material. The strength of the material used and the construction of the liner shall be appropriate to the capacity and intended use of the IBC. Joins and closures shall be sift-proof and capable of withstanding pressures and impacts liable to occur under normal conditions of handling and carriage.

1627 (5) *Structural equipment*
(cont'd)

(a) Any integral pallet base forming part of an IBC or any detachable pallet shall be suitable for mechanical handling of the IBC filled to its maximum permissible mass.

(b) The pallet or integral base shall be designed so as to avoid any protrusion of the base of the IBC that might be liable to damage in handling.

(c) The body shall be secured to a detachable pallet ot ensure stability in handling and transport. The top surface of the detachable pallet shall be free from sharp protrusions that might damage the IBC.

(d) Strengthening devices such as timber supports to increase stacking performance may be used but shall be external to the liner.

(e) Where IBCs are intended for stacking, the bearing surface shall be such as to distribute the load in a safe manner.

1628-1649

Section IV

Test requirements for IBCs

A. Design-type test

General requirements

1650 (1) The design type of each IBC shall be tested and approved by the competent authority or by a body designated by that authority.

(2) Before use of each design type, a single IBC shall successfully undergo the tests listed in (5) below in the order mentioned in the table and according to the provisions specified in marg. 1652 to 1660. Separate flexible IBCs may be used for each test. All such tests shall be carried out in accordance with procedures established by the Competent Authority. An IBC design type is defined by the design, size, material and thickness, manner of construction and means of filling and discharging but may include various surface treatments. It also includes IBCs which differ from the design type only in their lesser external dimensions.

The competent authority may nevertheless authorize the selective testing of IBCs which differ from a type already tested only in minor respects, for example, slight reductions in the external dimensions.

(3) Tests shall be carried out on IBCs prepared as for dispatch. IBCs shall be filled as indicated for the various tests. The substances to be carried in the IBCs may be replaced by other substances, except where this would invalidate the results of the tests. For solids, if another substance is used, it shall have the same physical characteristics (mass, grain size, etc.) as the substance to be carried. It is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass, provided they are placed so that the test results are not affected.

(4) In the drop tests for liquids, if another substance is used, its relative density and viscosity shall be similar to those of the substance to be carried. Water may also be used for the liquid drop test under the following conditions:

(a) if the substances to be carried have a relative density not exceeding 1,2, the drop heights shall be those shown under the relevant sections for the various types of IBC;

1650 *(cont'd)*

(b) where the substances to be carried have a relative density exceeding 1,2, the drop heights shall be calculated on the basis of the relative density (d) of the substance to be carried, rounded up to the first decimal as follows:

Packing Group I	Packing Group II	Packing Group III
d × 1,5 m	d × 1,0 m	d × 0,67 m

(5) Tests required for every IBC design type

Each X indicates that the IBC category shown at the head of the column has to be subjected to the test indicated on the line in question, in the order listed.

	Metal IBCs	Flexible IBCs	Rigid plastics IBCs	Composite IBCs with plastics inner receptacle	Fibreboard IBCs	Wooden IBCs
Bottom lift	×(1)		×	×	×	×
Top lift	×(1)	×(2)	×(1)	×(1)		
Tear		×				
Stacking	×	×	×	×	×(3)	×
Leakproofness	×(4)		×(4)	×(5)		
Internal hydraulic pressure	×(5)		×(5)	×(5)		
Drop	×(6)	×	×	×(6)	×	×
Topple		×				
Righting		×(2)				

(1) For IBCs designed to be handled in this way.
(2) When the IBCs are designed to be lifted from the top or from the side.
(3) When the IBCs are designed to be stacked.
(4) The leakproofness test is not required for IBCs of type 11A, 11B, 11N, 11H1, 11H2, 11HZ1 and 11HZ2.
(5) The internal hydraulic pressure test is not required for IBCs of type 11A, 11B, 11N, 11H1, 11H2, 11HZ1 and 11HZ2.
(6) Another IBC of the same design may be used for the drop test.

Preparation of IBCs for testing

1651 (1) Flexible IBCs, fibreboard IBCs and composite IBCs with fibreboard outer casing.

Paper IBCs, fibreboard IBCs and composite IBCs with fibreboard outer casings shall be conditioned for at least 24 hours in an atmosphere having a controlled temperature and relative humidity (r.h.). There are three options, one of which shall be chosen. The preferred atmosphere is 23 °C ± 2 °C and 50 % ± 2 % r.h. The other two options are 20 °C ± 2 °C and 65 % ± 2 % r.h. or 27 °C ± 2 °C and 65 % ± 2 % r.h.

Note: These values correspond to average values. In the short term the relative humidity values may vary by 5 % without this having an influence on the test.

(2) Rigid plastics IBCs and composite IBCs with plastics inner receptacle.

Additional steps shall be taken to ascertain that the plastics material used in the manufacture of rigid plastics IBCs of types 31H1 and 31H2 and composite IBCs of types 31HZ1 and 31HZ2 complies with the requirements of marg. 1624(2) to (4).

1651 *(cont'd)* Where the behaviour of the plastics material has been established by other means, the above compatibility test may be dispensed with. Such procedures shall be at least equivalent to the above compatibility test and be recognized by the competent authority.

Testing procedures

1652 Bottom lift test

(1) *Applicability*

For all types of IBC which are fitted with means of lifting from the base.

(2) *Preparation of IBCs for test*

The IBC shall be filled to 1.25 times its maximum permissible gross mass, the load being evenly distributed.

(3) *Method of testing*

The IBC shall be raised and lowered twice by a lift truck with the forks centrally positioned and spaced at three quarters of the dimension of the side of entry (unless the points of entry are fixed). The forks shall penetrate to three quarters of the direction of entry. The test shall be repeated from each possible direction of entry.

(4) *Criteria for passing the test*

No permanent deformation which renders the IBC (including the pallet base for composite IBCs with plastics inner receptacle, fibreboard IBCs and wooden IBCs) unsafe for carriage and no loss of contents.

1653 Top lift test

(1) *Applicability*

For all types of IBC which are fitted with means of lifting from the top or, where appropriate, from the side for flexible IBCs.

(2) *Preparation of IBCs for test*

Metal IBCs, rigid plastics IBCs and composite IBCs with plastics inner receptacle:

The IBC shall be filled to twice its maximum permissible gross mass.

Flexible IBCs:

The IBC shall be filled to six times its maximum permissible load, the load being evenly distributed.

(3) *Method of testing*

Metal and flexible IBCs:

The IBC shall be lifted in the manner for which it is designed until it is clear of the floor and maintained in that position for a period of five minutes.

For flexible IBCs other methods of top lift testing and preparation at least equally effective may be used.

Rigid plastics IBCs and composite IBCs with plastics inner receptacle:

— The IBC shall be lifted by each pair of diagonally opposite lifting devices, so that the hoisting forces are applied vertically, for a period of five minutes; and

1653 *(cont'd)*

— The IBC shall be lifted by each pair of diagonally opposite lifting devices, so that the hoisting forces are applied towards the centre at 45° to the vertical, for a period of five minutes.

(4) *Criteria for passing the test*

Metal IBCs, rigid plastics IBCs, composite IBCs with plastics inner receptacle:

No permanent deformation which renders the IBC (including the pallet base for composite IBCs) unsafe for carriage and no loss of contents.

Flexible IBCs:

No damage to the IBC or its lifting devices which renders the IBC unsafe for carriage or handling.

1654 Tear test

(1) *Applicability*

For all types of flexible IBCs.

(2) *Preparation of IBCs for test*

The IBC shall be filled to not less than 95 % of its capacity and to its maximum permissible load, the load being evenly distributed.

(3) *Method of testing*

Once the IBC is placed on the ground, a 100 mm knife score, completely prenetrating the wall of a wide face, is made at a 45° angle to the principal axis of the IBC, halfway between the bottom surface and the top level of contents. The IBC shall then be subjected to a uniformly distributed superimposed load equivalent to twice the maximum permissible load. The load shall be applied for at least five minutes.

IBCs which are designed to be lifted from the top or the side shall then, after removal of the superimposed load, be lifted clear of the floor and maintained in that position for a period of five minutes. Other equivalent methods may be used.

(4) *Criterion for passing the test*

The cut shall not propagate more than 25 % of its original length.

1655 Stacking test

(1) *Applicability*

For all types of IBC.

(2) *Preparation of IBCs for test*

All categories of IBC other than flexible IBCs:

The IBC shall be filled to its maximum permissible gross mass.

Flexible IBCs:

The IBC shall be filled to not less than 95 % of its capacity and to its maximum permissible load, the load being evenly distributed.

1655 (3) *Method of testing*
(cont'd)

The IBC shall be placed on its base on level hard ground and subjected to a uniformly distributed superimposed test load [see (4) below].

Categories and Types of IBC	Testing time
— Metal IBCs	5 minutes
— Flexible IBCs, rigid plastics IBCs of typs 11H1, 21H1 and 31H1, — Composite IBCs with plastics inner receptacle other than type 11HH1, 11HH2, 21HH2, 31HH1 and 31HH2, — Fibreboard IBCs, wooden IBCs	24 hours
— Rigid plastics IBCs of types 11H2, 21H2 and 31H2, — Composite IBCs with plastics inner receptacle and plastics outer casing of types 11HH1, 11HH2, 21HH2, 31HH1 and 31HH2	28 days at 40 °C

For all categories of IBC other than metal IBCs, the superimposed test load shall be applied by one of the following methods:

— one or more IBCs of the same type loaded to their maximum permissible gross mass (maximum permissible load in the case of flexible IBCs) are stacked on the test IBC;

— appropriate weights are loaded on to a flat plate or a reproduction of the base of the IBC, which is placed on the test IBC.

(4) *Calculation of superimposed test load*

The load to be placed on the IBC shall be a least 1.8 times the combined maximum permissible gross mass of the number of similar IBCs that may be stacked on top of the IBC during carriage.

(5) *Criteria for passing the test*

— IBCs other than flexible IBCs:

No permanent deformation which renders the IBC (including the pallet base for composite IBCs, fibreboard IBCs or wooden IBCs) unsafe for carriage and no loss of contents.

— Flexible IBCs:

No deterioration of the body which renders the IBC unsafe for carriage and no loss of contents.

1656 Leakproofness test

(1) *Applicability*

For all types of metal IBC and for types of plastics IBC and composite IBCs with plastics inner receptacle for the carriage of solids loaded or discharged under pressure or for the carriage of liquids.

(2) *Preparation of IBCs for test*

Vented closures shall either be replaced by similar non-vented closures or the vent shall be sealed. In addition, for metal IBCs, the design-type test shall be carried out before the fitting of any thermal insulation equipment.

For this test the IBC need not have its closures fitted. The inner receptacle of composite IBCs may be tested without the outer packaging provided the test results are not affected.

1656 *(cont'd)*

(3) *Method of testing and pressure to be applied*

The test shall be carried out for a period of at least 10 minutes using air at a constant gauge pressure of not less than 20 kPa (0,2 bar). The airtightness of the IBC shall be determined by a suitable method such as the air-pressure differential test or by immersing the IBC in water. In the latter case a correction factor be applied for the hydrostatic pressure. Other methods at least as effective may be used for rigid plastics IBCs and for composite IBCs.

(4) *Criterion for passing the test*

No leakage of air.

1657 Internal (hydraulic) pressure test

(1) *Applicability*

For IBCs of types:

— 21A, 21B, 21N, 31A, 31B, 31N

— 21H1, 21H2, 31H1, 31H2

— 21HZ1, 21HZ2, 31HZ1, 31HZ2

(2) *Preparation of IBCs for test*

Pressure relief devices shall be removed and their apertures plugged, or shall be rendered inoperative.

In addition, for metal IBCs, the test shall be carried out before the fitting of any thermal insulation equipment.

(3) *Method of testing*

The test shall be carried out for a period of at least 10 minutes applying a hydraulic pressure not less than that indicated in (4). The IBCs shall not be mechanically restrained during the test.

(4) *Pressures to be applied*

(a) Metal IBCs:

1. For all IBCs of types 21A, 21B, and 21N, for Packing Group I solids, a 250 kPa (2,5 bar) gauge pressure;
2. For IBCs of types 21A, 21B, 21N, 31A, 31B and 31N, for Packing Group II or III substances, a 200 kPa (2 bar) gauge pressure;
3. In addition, for IBCs of types 31A, 31B and 31N, a 65 kPa (0,65 bar) gauge pressure. This test shall be performed before the 2 bar test.

(b) Rigid plastics IBCs and composite IBCs with plastics inner receptacle:

1. For IBCs of types 21H1, 21H2, 21HZ1 and 21HZ2: a gauge pressure of 75 kPa (0,75 bar);
2. For IBCs of type 31H1, 31H2, 31HZ1 and 31HZ2: whichever is the greater of the values under (i) or (ii):

(i) the total gauge pressure measured in the IBC (i.e. the vapour pressure of the filling substance and the partial pressure of the air or other inert gases, minus 100 kPa) at 55 °C, multiplied by a safety factor of 1.5; this total gauge pressure shall be determined on the basis of maximum degree of filling in accordance with marg. 1601(7) and a filling temperature of 15 °C; or

1,75 times the vapour pressure at 50 °C of the substance to be carried minus 100 kPa, but with a minimum test pressure of 100 kPa; or

1,5 times the vapour pressure at 55 °C of the substance to be carried minus 100 kPa; but with a minimum test pressure of 100 kPa;

(ii) twice the static pressure of the substance to be carried, with a minimum of twice the static pressure of water.

1657 *(cont'd)*

(5) *Criteria for passing the test(s)*

— Metal IBCs:

For IBCs of types 21A, 21B, 21N, 31A, 31B and 31N when subjected to the test pressure specified in (4) (a) 1 or 2: no leakage.

For IBCs of types 31A, 31B and 31N, when subjected to the test pressure specified in (4) (a) 3 above: neither permanent deformation which would render the IBC unsafe for carriage, nor leakage.

— Rigid plastics IBCs and composite IBCs:

Neither permanent deformation which would render the IBC unsafe for carriage, nor loss of contents.

1658 Drop test

(1) *Applicability*

For all type of IBC.

(2) *Preparation of IBCs for test*

The IBC shall be filled:

— For solids, to not less than 95 % of its capacity,

— For liquids, to not less than 98 % of its capacity in the case of metal IBCs or rigid plastics IBCs, and to not less than 90 % of its capacity in the case of composite IBCs with plastics inner receptacle.

The IBC shall further be filled to its maximum permissible load in accordance with the design type.

For metal IBCs, rigid plastics IBCs and composite IBCs with plastics inner receptacle, pressure relief devices shall be removed and their apertures plugged, or shall be rendered inoperative.

For rigid plastics IBCs and composite IBCs with plastics inner receptacle, testing shall be carried out when the temperature of the test sample and its contents has been reduced to – 18 °C or lower. Where test samples are prepared in this way, the conditioning specified in marg. 1651(1) for composite IBCs with fibreboard outer casings may be waived.

Test liquids shall be kept in the liquid state, if necessary by the addition of anti-freeze.

This conditioning may be disregarded if the ductility and tensile strength of the materials in question are not significantly reduced at – 18 °C or lower.

(3) *Method of testing*

The IBC shall be dropped on to a rigid, non-resilient, smooth, flat and horizontal surface, on its base (for flexible IBCs) or in such a manner as to ensure that the point of impact is on that part of the base of the IBC considered to be the most vulnerable (for all other type of IBC).

IBCs of 0,45 m^3 or less capacity shall also be subject to a drop test on the most vulnerable part other than the part of the base of the IBC tested in the first drop (for metal IBCs); on the most vulnerable side (for flexible IBCs); flat on a side, flat on the top and on a corner (for all other types of IBC). The same or different IBCs may be used for each drop.

1658 *(cont'd)*

(4) *Drop height*

Packing Group I	Packing Group II	Packing Group III
1,8 m	1,2 m	0,8 m

(5) *Criteria for passing the test*

— All IBCs: No loss of contents.

— IBCs other than metal IBCs: A slight discharge from closures (or stitch holes in the case of flexible IBCs) upon impact shall not be considered to be a failure of the IBC, provided that no further leakage occurs.

1659 Topple test

(1) *Applicability*

For all types of IBC.

(2) *Preparation of IBCs for test*

The IBC shall be filled to not less than 95 % of its capacity and to its maximum permissible load, the load being evenly distributed.

(3) *Method of testing*

The IBC shall be caused to topple on to any part of its top on to a rigid, non-resilient, smooth, flat and horizontal surface.

(4) *Topple height*

Packing Group I	Packing Group II	Packing Group III
1,8 m	1,2 m	0,8 m

(5) *Criteria for passing the test*

No loss of contents. A very slight discharge, e.g. from closures or stitch holes, upon impact shall not be considered to be a failure of the IBC, provided that no further leakage occurs.

1660 Righting test

(1) *Applicability*

For all IBCs designed to be lifted from the top or side.

(2) *Preparation of IBCs for test*

The IBC shall be filled to not less than 95 % of its capacity and to its maximum permissible load, the load being evently distributed.

(3) *Method of testing*

The IBC, lying on its side, shall be lifted at a speed of at least 0,1 m/s to upright position, clear of the floor, by one lifting device, or by two lifting devices when four are provided.

1660 (4) *Criterion for passing the test*
(cont'd)

No damage to the IBC or its lifting devices which renders the IBC unsafe for carriage or handling.

1661 Test report

(1) A test report containing at least the following particulars shall be drawn up and shall be available to the users of the IBC:

1. Name and address of the test facility
2. Name and address of the applicant (where appropriate)
3. A unique test report identification
4. Date of the test report
5. Manufacturer of the IBC
6. Description of the IBC design type (e.g. dimensions, materials, closures, thickness, etc.), including method of manufacture (e.g. blow moulding) and which may include drawing(s) and/or photograph(s)
7. Maximum capacity
8. Characteristics of test contents, e.g. viscosity and relative density for liquids and particle size for solids
9. Test descriptions and results
10. The test report shall be signed with the name and status of the signatory.

(2) The test report shall contain statements that the IBC prepared as for carriage was tested in accordance with the appropriate requirements of Appendix VI and that the use of other packaging methods or components may render it invalid. A copy of the test report shall be available to the competent authority.

B. Tests and inspection for every metal IBC, rigid plastics IBC and composite IBC with plastics inner receptacle

1662 Initial and periodic tests

(1) All metal IBCs of type 21A, 21B, 21N, 31A, 31B and 31N, all rigid plastics IBCs of type 21H1, 21H2, 31H1 and 31H2 and all composite IBCs with plastics inner receptacle of type 21HZ1, 21HZ2, 31HZ1 and 31HZ2 shall successfully undergo a sutable leakproofness test, and be capable of meeting the appropriate levels according to mart. 1656 (3) before they are used for carriage for the first time.

(2) The leakproofness test referred to in (1) shall be repeated

— at least once every two and a half years,

— after any repair, before it is reused for carriage.

(3) The results of the tests shall be entered in the test reports to be kept by the owner of the IBC.

(4) Empty IBCs, uncleaned, may be carried after the date of expiry of the deadline for the periodic test in accordance with paragraph (2), for the purpose of testing.

1663 Inspection

(1) All metal IBCs, all rigid plastics IBCs and all composite IBCs with plastics inner receptacle shall be inspected to the satisfaction of the competent authority before they are put into service (and subsequently at least every five years for metal IBCs), with regard to:

— conformity to design type including marking;

— internal and external condition;

— proper functioning of service equipment.

For metal IBCs, thermal insulation need be removed only to the extent necessary for a proper examination of the IBC body.

(2) All IBCs referred to in (1) shall be visually inspected to the satisfaction of the competent authority after not more than two and a half years, with reference to the external condition of the IBC and the proper functioning of service equipment.

For metal IBCs, the insulation need be removed only if this is essential for a proper examination of the IBC body.

(3) Empty IBCs, uncleaned, may be carried after expiry of the date set for the visual inspection in accordance with paragraph (2), for the purpose of inspection.

(4) Every inspection shall be the subject of a report which shall be kept by the owner at least until the following inspection date.

(5) If the structural characteristics of an IBC have been impaired by a violent impact (for example, an accident) or other cause, the IBC shall be repaired and subjected to the leakproofness test according to marg. 1656, if it is required for the design type, and to the inspection prescribed in paragraph (1) above.

1664-1699

APPENDIX VII

REQUIREMENTS RELATING TO RADIOACTIVE MATERIAL OF CLASS 7

This Appendix comprises:

Sections:

I Activity and fissile material limits

II Preparation provisions and controls for carriage and for storage in transit

III Requirements for radioactive material, for packaging and packages and test procedures

IV Approval and administration requirements

V Radioactive material having other hazardous properties

Section I

Activity and fissile material limits

Basis A_1 and A_2 values

1700 A_1/A_2 values for radionuclides are given in Table I

TABLE I

A_1 and A_2 values for radionuclides

Symbol of radionuclide	Element and atomic number	A_1		A_2	
		TBq	(Ci) [approx (1)]	TBq	(Ci) [approx (1)]
^{225}Ac (2)	Actinium (89)	0,6	10	1×10^{-2}	2×10^{-1}
^{227}Ac		40	1 000	2×10^{-5}	5×10^{-4}
^{228}Ac		0,6	10	0,4	10
^{105}Ag	Silver (47)	2	50	2	50
^{108}Ag^{m}		0,6	10	0,6	10
^{110}Ag^{m}		0,4	10	0,4	10
^{111}Ag		0,6	10	0,5	10
^{26}Al	Aluminium (13)	0,4	10	0,4	10
^{241}Am	Americium (95)	2	50	2×10^{-4}	5×10^{-3}
^{242}Am^{m}		2	50	2×10^{-4}	5×10^{-3}
^{243}Am		2	50	2×10^{-4}	5×10^{-3}
^{37}Ar	Argon (18)	40	1 000	40	1 000
^{39}Ar		20	500	20	500
^{41}Ar		0,6	10	0,6	10
^{42}Ar (2)		0,2	5	0,2	5
^{72}As	Arsenic (33)	0,2	5	0,2	5
^{73}As		40	1 000	40	1 000
^{74}As		1	20	0,5	10
^{76}As		0,2	5	0,2	5
^{77}As		20	500	0,5	10
^{211}At	Astatine (85)	30	800	2	50
^{193}Au	Gold (79)	6	100	6	100
^{194}Au		1	20	1	20
^{195}Au		10	200	10	200
^{196}Au		2	50	2	50
^{198}Au		3	80	0,5	10
^{199}Au		10	200	0,9	20

1700 *(cont'd)*

Symbol of radionuclide	Element and atomic number	A_1		A_2	
		TBq	(Ci) [approx (1)]	TBq	(Ci) [approx (1)]
^{131}Ba	Barium (56)	2	50	2	50
^{133}Ba^{m}		10	200	0,9	20
^{133}Ba		3	80	3	80
^{140}Ba (2)		0,4	10	0,4	10
^{7}Be	Beryllium (4)	20	500	20	500
^{10}Be		20	500	0,5	10
^{205}Bi	Bismuth (83)	0,6	10	0,6	10
^{206}Bi		0,3	8	0,3	8
^{207}Bi		0,7	10	0,7	10
^{210}Bi^{m} (2)		0,3	8	3×10^{-2}	8×10^{-1}
^{210}Bi		0,6	10	0,5	10
^{212}Bi (2)		0,3	8	0,3	8
^{247}Bk	Berkelium (97)	2	50	2×10^{-4}	5×10^{-3}
^{249}Bk		40	1 000	8×10^{-2}	2
^{76}Br	Bromine (35)	0,3	8	0,3	8
^{77}Br		3	80	3	80
^{82}Br		0,4	10	0,4	10
^{11}C	Carbon (6)	1	20	0,5	10
^{14}C		40	1 000	2	50
^{41}Ca	Calcium (20)	40	1 000	40	1 000
^{45}Ca		40	1 000	0,9	20
^{47}Ca		0,9	20	0,5	10
^{109}Cd	Cadmium (48)	40	1 000	1	20
^{113}Cd^{m}		20	500	9×10^{-2}	2
^{115}Cd^{m}		0,3	8	0,3	8
^{115}Cd		4	100	0,5	10
^{139}Ce	Cerium (58)	6	100	6	100
^{141}Ce		10	200	0,5	10
^{143}Ce		0,6	10	0,5	10
^{144}Ce (2)		0,2	5	0,2	5
^{248}Cf	Californium (98)	30	800	3×10^{-3}	8×10^{-2}
^{249}Cf		2	50	2×10^{-4}	5×10^{-3}
^{250}Cf		5	100	5×10^{-4}	1×10^{-2}
^{251}Cf		2	50	2×10^{-4}	5×10^{-3}
^{252}Cf		0,1	2	1×10^{-3}	2×10^{-2}
^{253}Cf		40	1 000	6×10^{-2}	1
^{254}Cf		3×10^{-3}	8×10^{-2}	6×10^{-4}	1×10^{-2}
^{36}Cl	Chlorine (17)	20	500	0,5	10
^{38}Cl		0,2	5	0,2	5
^{240}Cm	Curium (96)	40	1 000	2×10^{-2}	5×10^{-1}
^{241}Cm		2	50	0,9	20
^{242}Cm		40	1 000	1×10^{-2}	2×10^{-1}
^{243}Cm		3	80	3×10^{-4}	8×10^{-3}
^{244}Cm		4	100	4×10^{-4}	1×10^{-2}
^{245}Cm		2	50	2×10^{-4}	5×10^{-3}
^{246}Cm		2	50	2×10^{-4}	5×10^{-3}
^{247}Cm		2	50	2×10^{-4}	5×10^{-3}
^{248}Cm		4×10^{-2}	1	5×10^{-5}	1×10^{-3}
^{55}Co	Cobalt (27)	0,5	10	0,5	10
^{56}Co		0,3	8	0,3	8
^{57}Co		8	200	8	200
^{58}Co^{m}		40	1 000	40	1 000
^{58}Co		1	20	1	20
^{60}Co		0,4	10	0,4	10
^{51}Cr	Chromium (24)	30	800	30	800

1700 *(cont'd)*

Symbol of radionuclide	Element and atomic number	A_1		A_2	
		TBq	(Ci) [approx (1)]	TBq	(Ci) [approx (1)]
^{129}Cs	Caesium (55)	4	100	4	100
^{131}Cs		40	1 000	40	1 000
^{132}Cs		1	20	1	20
$^{134}Cs^{m}$		40	1 000	9	200
^{134}Cs		0,6	10	0,5	10
^{135}Cs		40	1 000	0,9	20
^{136}Cs		0,5	10	0,5	10
^{137}Cs (2)		2	50	0,5	10
^{64}Cu	Copper (29)	5	100	0,9	20
^{67}Cu		9	200	0,9	20
^{159}Dy	Dysprosium (66)	20	500	20	500
^{165}Dy		0,6	10	0,5	10
^{166}Dy (2)		0,3	8	0,3	8
^{169}Er	Erbium (68)	40	1 000	0,9	20
^{171}Er		0,6	10	0,5	10
^{147}Eu	Europium (63)	2	50	2	50
^{148}Eu		0,5	10	0,5	10
^{149}Eu		20	500	20	500
^{150}Eu		0,7	10	0,7	10
$^{152}Eu^{m}$		0,6	10	0,5	10
^{152}Eu		0,9	20	0,9	20
^{154}Eu		0,8	20	0,5	10
^{155}Eu		20	500	2	50
^{156}Eu		0,6	10	0,5	10
^{18}F	Fluorine (9)	1	20	0,5	10
^{52}Fe (2)	Iron (26)	0,2	5	0,2	5
^{55}Fe		40	1 000	40	1 000
^{59}Fe		0,8	20	0,8	20
^{60}Fe		40	1 000	0,2	5
^{67}Ga	Gallium (31)	6	100	6	100
^{68}Ga		0,3	8	0,3	8
^{72}Ga		0,4	10	0,4	10
^{146}Gd (2)	Gadolinium (64)	0,4	10	0,4	10
^{148}Gd		3	80	3×10^{-4}	8×10^{-3}
^{153}Gd		10	200	5	100
^{159}Gd		4	100	0,5	10
^{68}Ge (2)	Germanium (32)	0,3	8	0,3	8
^{71}Ge		40	1 000	40	1 000
^{77}Ge		0,3	8	0,3	8
^{172}Hf (2)	Hafnium (72)	0,5	10	0,3	8
^{175}Hf		3	80	3	80
^{181}Hf		2	50	0,9	20
^{182}Hf		4	100	3×10^{-2}	8×10^{-1}
^{194}Hg (2)	Mercury (80)	1	20	1	20
$^{195}Hg^{m}$		5	100	5	100
$^{197}Hg^{m}$		10	200	0,9	20
^{197}Hg		10	200	10	200
^{203}Hg		4	100	0,9	20
^{163}Ho	Holmium (67)	40	1 000	40	1 000
$^{166}Ho^{m}$		0,6	10	0,3	8
^{166}Ho		0,3	8	0,3	8
^{123}I	Iodine (53)	6	100	6	100
^{124}I		0,9	20	0,9	20
^{125}I		20	500	2	50
^{126}I		2	50	0,9	20
^{129}I		Unlimited	Unlimited	Unlimited	Unlimited
^{131}I		3	80	0,5	10
^{132}I		0,4	10	0,4	10

1700 *(cont'd)*

Symbol of radionuclide	Element and atomic number	A_1		A_2	
		TBq	(Ci) [approx (1)]	TBq	(Ci) [approx (1)]
^{133}I		0,6	10	0,5	10
^{134}I		0,3	8	0,3	8
^{135}I		0,6	10	0,5	10
^{111}In	Indium (49)	2	50	2	50
$^{113}In^{m}$		4	100	4	100
$^{114}In^{m}$ (2)		0,3	8	0,3	8
$^{115}In^{m}$		6	100	0,9	20
^{189}Ir	Iridium (77)	10	200	10	200
^{190}Ir		0,7	10	0,7	10
^{192}Ir		1	20	0,5	10
$^{193}Ir^{m}$		10	200	10	200
^{194}Ir		0,2	5	0,2	5
^{40}K	Potassium (19)	0,6	10	0,6	10
^{42}K		0,2	5	0,2	5
^{43}K		1	20	0,5	10
^{81}Kr	Krypton (36)	40	1 000	40	1 000
$^{85}Kr^{m}$		6	100	6	100
^{85}Kr		20	500	10	200
^{87}Kr		0,2	5	0,2	5
^{137}La	Lanthanum (57)	40	1 000	2	50
^{140}La		0,4	10	0,4	10
LSA	Low specific activity material [see marg. 700 (2)]				
^{172}Lu	Lutetium (71)	0,5	10	0,5	10
^{173}Lu		8	200	8	200
$^{174}Lu^{m}$		20	500	8	200
^{174}Lu		8	200	4	100
^{177}Lu		30	800	0,9	20
MFP	For Mixed Fission Products, use formula for mixtures or Table II (marg. 1701)				
^{28}Mg (2)	Magnesium (12)	0,2	5	0,2	5
^{52}Mn	Manganese (25)	0,3	8	0,3	8
^{53}Mn		Unlimited	Unlimited	Unlimited	Unlimited
^{54}Mn		1	20	1	20
^{56}Mn		0,2	5	0,2	5
^{93}Mo	Molybdenum (42)	40	1 000	7	100
^{99}Mo		0,6	10	0,5	10
^{13}N	Nitrogen (7)	0,6	10	0,5	10
^{22}Na	Sodium (11)	0,5	10	0,5	10
^{24}Na		0,2	5	0,2	5
$^{92}Nb^{m}$	Niobium (41)	0,7	10	0,7	10
$^{93}Nb^{m}$		40	1 000	6	100
^{94}Nb		0,6	10	0,6	10
^{95}Nb		1	20	1	20
^{97}Nb		0,6	10	0,5	10
^{147}Nd	Neodymium (60)	4	100	0,5	10
^{149}Nd		0,6	10	0,5	10
^{59}Ni	Nickel (28)	40	1 000	40	1 000
^{63}Ni		40	1 000	30	800
^{65}Ni		0,3	8	0,3	8
^{235}Np	Neptunium (93)	40	1 000	40	1 000
^{236}Np		7	100	1×10^{-3}	2×10^{-2}
^{237}Np		2	50	2×10^{-4}	5×10^{-3}
^{239}Np		6	100	0,5	10
^{185}Os	Osmium (76)	1	20	1	20
$^{191}Os^{m}$		40	1 000	40	1 000
^{191}Os		10	200	0,9	20

1700 *(cont'd)*

Symbol of radionuclide	Element and atomic number	A_1		A_2	
		TBq	(Ci) [approx (1)]	TBq	(Ci) [approx (1)]
^{193}Os		0,6	10	0,5	10
^{194}Os (2)		0,2	5	0,2	5
^{32}P	Phosphorus (15)	0,3	8	0,3	8
^{33}P		40	1 000	0,9	20
^{230}Pa	Protactinium (91)	2	50	0,1	2
^{231}Pa		0,6	10	6×10^{-5}	1×10^{-3}
^{233}Pa		5	100	0,9	20
^{201}Pb	Lead (82)	1	20	1	20
^{202}Pb		40	41 000	2	50
^{203}Pb		3	80	3	80
^{205}Pb		Unlimited	Unlimited	Unlimited	Unlimited
^{210}Pb (2)		0,6	10	9×10^{-3}	2×10^{-1}
^{212}Pb (2)		0,3	8	0,3	8
^{103}Pd	Palladium (46)	40	1 000	40	1 000
^{107}Pd		Unlimited	Unlimited	Unlimited	Unlimited
^{109}Pd		0,6	10	0,5	10
^{143}Pm	Promethium (61)	3	80	3	80
^{144}Pm		0,6	10	0,6	10
^{145}Pm		30	800	7	100
^{147}Pm		40	1 000	0,9	20
^{148}Pm^{m}		0,5	10	0,5	10
^{149}Pm		0,6	10	0,5	10
^{151}Pm		3	80	0,5	10
^{208}Po	Polonium (84)	40	1 000	2×10^{-2}	5×10^{-1}
^{209}Po		40	1 000	2×10^{-2}	5×10^{-1}
^{210}Po		40	1 000	2×10^{-2}	5×10^{-1}
^{142}Pr	Praseodymium (59)	0,2	5	0,2	5
^{143}Pr		4	100	0,5	10
^{188}Pt (2)	Platinum (78)	0,6	10	0,6	10
^{191}Pt		3	80	3	80
^{193}Pt^{m}		40	1 000	9	200
^{193}Pt		40	1 000	40	1 000
^{195}Pt^{m}		10	200	2	50
^{197}Pt^{m}		10	200	0,9	20
^{197}Pt		20	500	0,5	10
^{236}Pu	Plutonium (94)	7	100	7×10^{-4}	1×10^{-2}
^{237}Pu		20	500	20	500
^{238}Pu		2	50	2×10^{-4}	5×10^{-3}
^{239}Pu		2	50	2×10^{-4}	5×10^{-3}
^{240}Pu		2	50	2×10^{-4}	5×10^{-3}
^{241}Pu		40	1 000	1×10^{-2}	2×10^{-1}
^{242}Pu		2	50	2×10^{-4}	5×10^{-3}
^{244}Pu (2)		0,3	8	2×10^{-4}	5×10^{-3}
^{223}Ra (2)	Radium (88)	0,6	10	3×10^{-2}	8×10^{-1}
^{224}Ra (2)		0,3	8	6×10^{-2}	1
^{225}Ra (2)		0,6	10	2×10^{-2}	5×10^{-1}
^{226}Ra (2)		0,3	8	2×10^{-2}	5×10^{-1}
^{228}Ra (2)		0,6	10	4×10^{-2}	1
^{81}Rb	Rubidium (37)	2	50	0,9	20
^{83}Rb		2	50	2	50
^{84}Rb		1	20	0,9	20
^{86}Rb		0,3	8	0,3	8
^{87}Rb		Unlimited	Unlimited	Unlimited	Unlimited
Rb (natural)		Unlimited	Unlimited	Unlimited	Unlimited
^{183}Re	Rhenium (75)	5	100	5	100
^{184}Re^{m}		3	80	3	80
^{184}Re		1	20	1	20
^{186}Re		4	100	0,5	10
^{187}Re		Unlimited	Unlimited	Unlimited	Unlimited
^{188}Re		0,2	5	0,2	5
^{189}Re		4	100	0,5	10

1700 *(cont'd)*

Symbol of radionuclide	Element and atomic number	A_1		A_2	
		TBq	(Ci) [approx (1)]	TBq	(Ci) [approx (1)]
Re (natural)		Unlimited	Unlimited	Unlimited	Unlimited
^{99}Rh	Rhodium (45)	2	50	2	50
^{101}Rh		4	100	4	100
^{102}Rh^{m}		2	50	0,9	20
^{102}Rh		0,5	10	0,5	10
^{103}Rh^{m}		40	1 000	40	1 000
^{105}Rh		10	200	0,9	20
^{222}Rn (2)	Radon (86)	0,2	5	4×10^{-3}	1×10^{-1}
^{97}Ru	Ruthenium (44)	4	100	4	100
^{103}Ru		2	50	0,9	20
^{105}Ru		0,6	10	0,5	10
^{106}Ru (2)		0,2	5	0,2	5
^{35}S	Sulphur (16)	40	1 000	2	50
^{122}Sb	Antimony (51)	0,3	8	0,3	8
^{124}Sb		0,6	10	0,5	10
^{125}Sb		2	50	0,9	20
^{126}Sb		0,4	10	0,4	10
^{44}Sc	Scandium (21)	0,5	10	0,5	10
^{46}Sc		0,5	10	0,5	10
^{47}Sc		9	200	0,9	20
^{48}Sc		0,3	8	0,3	8
SCO	Surface Contaminated Objects [see marg. 700 (2)]				
^{75}Se	Selenium (34)	3	80	3	80
^{79}Se		40	1 000	2	50
^{31}Si	Silicon (14)	0,6	10	0,5	10
^{32}Si		40	1 000	0,2	5
^{145}Sm	Samarium (62)	20	500	20	500
^{147}Sm		Unlimited	Unlimited	Unlimited	Unlimited
^{151}Sm		40	1 000	4	100
^{153}Sm		4	100	0,5	10
^{113}Sn (2)	Tin (50)	4	100	4	100
^{117}Sn^{m}		6	100	2	50
^{119}Sn^{m}		40	1 000	40	1 000
^{121}Sn^{m}		40	1 000	0,9	20
^{123}Sn		0,6	10	0,5	10
^{125}Sn		0,2	5	0,2	5
^{126}Sn (2)		0,3	8	0,3	8
^{82}Sr (2)	Strontium (38)	0,2	5	0,2	5
^{85}Sr^{m}		5	100	5	100
^{85}Sr		2	50	2	50
^{87}Sr^{m}		3	80	3	80
^{89}Sr		0,6	10	0,5	10
^{90}Sr (2)		0,2	5	0,1	2
^{91}Sr		0,3	8	0,3	8
^{92}Sr (2)		0,2	5	0,2	5
T (all forms)	Tritium (1)	40	1 000	40	1 000
^{178}Ta	Tantalum (73)	1	20	1	20
^{179}Ta		30	800	30	800
^{182}Ta		0,8	20	0,5	10
^{157}Tb	Terbium (65)	40	1 000	10	200
^{158}Tb		1	20	0,7	10
^{160}Tb		0,9	20	0,5	10
^{95}Tc^{m}	Technetium (43)	2	50	2	50
^{96}Tc^{m} (2)		0,4	10	0,4	10
^{96}Tc		0,4	10	0,4	10
^{97}Tc^{m}		40	1 000	40	1 000
^{97}Tc		Unlimited	Unlimited	Unlimited	Unlimited
^{98}Tc		0,7	10	0,7	10
^{99}Tc^{m}		8	200	8	200
^{99}Tc		40	1 000	0,9	20

1700 *(cont'd)*

Symbol of radionuclide	Element and atomic number	A_1		A_2	
		TBq	(Ci) [approx (1)]	TBq	(Ci) [approx (1)]
^{118}Te (2)	Tellurium (52)	0,2	5	0,2	5
^{121}Te^{m}		5	100	5	100
^{121}Te		2	50	2	50
^{123}Te^{m}		7	100	7	100
^{125}Te^{m}		30	800	9	200
^{127}Te^{m} (2)		20	500	0,5	10
^{127}Te		20	500	0,5	10
^{129}Te^{m} (2)		0,6	10	0,5	10
^{129}Te		0,6	10	0,5	10
^{131}Te^{m}		0,7	10	0,5	10
^{132}Te (2)		0,4	10	0,4	10
^{227}Th	Thorium (90)	9	200	1×10^{-2}	2×10^{-1}
^{228}Th (2)		0,3	8	4×10^{-4}	1×10^{-2}
^{229}Th		0,3	8	3×10^{-5}	8×10^{-4}
^{230}Th		2	50	2×10^{-4}	5×10^{-3}
^{231}Th		40	1 000	0,9	20
^{232}Th		Unlimited	Unlimited	Unlimited	Unlimited
^{234}Th (2)		0,2	5	0,2	5
Th (natural)		Unlimited	Unlimited	Unlimited	Unlimited
^{44}Ti (2)	Titanium (22)	0,5	10	0,2	5
^{200}Ti	Thallium (81)	0,8	20	0,8	20
^{201}Tl		10	200	10	200
^{202}Tl		2	50	2	50
^{204}Tl		4	100	0,5	10
^{167}Tm	Thulium (69)	7	100	7	100
^{168}Tm		0,8	20	0,8	20
^{170}Tm		4	100	0,5	10
^{171}Tm		40	1 000	10	200
^{230}U	Uranium (92)	40	1 000	1×10^{-2}	2×10^{-1}
^{232}U		3	80	3×10^{-4}	8×10^{-3}
^{233}U		10	200	1×10^{-3}	2×10^{-2}
^{234}U		10	200	1×10^{-3}	2×10^{-2}
^{235}U		Unlimited (3)	Unlimited (3)	Unlimited (3)	Unlimited (3)
^{236}U		10	200	1×10^{-3}	2×10^{-2}
^{238}U		Unlimited	Unlimited	Unlimited	Unlimited
U (natural)		Unlimited	Unlimited	Unlimited	Unlimited
U (enriched 5 % or less)		Unlimited (3) (4)	Unlimited (3) (4)	Unlimited (3) (4)	Unlimited (3) (4)
U (enriched more than 5 %)		10 (3) (4)	200 (3) (4)	1×10^{-3} (3) (4)	2×10^{-2} (3) (4)
U (depleted)		Unlimited (4)	Unlimited (4)	Unlimited (4)	Unlimited (4)
^{48}V	Vanadium (23)	0,3	8	0,3	8
^{49}V		40	1 000	40	1 000
^{178}W (2)	Tungsten (74)	1	20	1	20
^{181}W		30	800	30	800
^{185}W		40	1 000	0,9	20
^{187}W		2	50	0,5	10
^{188}W (2)		0,2	5	0,2	5
^{122}Xe (2)	Xenon (54)	0,2	5	0,2	5
^{123}Xe		0,2	5	0,2	5
^{127}Xe		4	100	4	100
^{131}Xe^{m}		40	1 000	40	1 000
^{133}Xe		20	500	20	500
^{135}Xe		4	100	4	100
^{87}Y	Yttrium (39)	2	50	2	50
^{88}Y		0,4	10	0,4	10
^{90}Y		0,2	5	0,2	5

1700 *(cont'd)*

Symbol of radionuclide	Element and atomic number	A_1		A_2	
		TBq	(Ci) [approx (1)]	TBq	(Ci) [approx (1)]
$^{91}Y^{m}$		2	50	2	50
^{91}Y		0,3	8	0,3	8
^{92}Y		0,2	5	0,2	5
^{93}Y		0,2	5	0,2	5
^{169}Yb	Ytterbium (70)	3	80	3	80
^{175}Yb		30	800	0,9	20
^{65}Zn	Zinc (30)	2	50	2	50
$^{69}Zn^{m}$ (2)		2	50	0,5	10
^{69}Zn		4	100	0,5	10
^{88}Zr	Zirconium (40)	3	80	3	80
^{93}Zr		40	1 000	0,2	5
^{95}Zr		1	20	0,9	20
^{97}Zr		0,3	8	0,3	8

(1) The curie values quoted are obtained by rounding down from the TBq figure after conversion to Ci. This ensures that the magnitude of A_1 or A_2 in Ci is always less than that in TBq.
(2) A_1 and/or A_2 value limited by daughter product decay.
(3) A_1 and A_2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the control placed on fissile material.
(4) These values do not apply to reprocessed uranium.

Determination of A_1 and A_2

1701 (1) For individual radionuclides whose identities are known, but which are not listed in Table I, the determination of the values of A_1 and A_2 shall require multilateral approval.

Alternatively, the values of A_1 and A_2 in Table II may be used without obtaining competent authority approval.

TABLE II

General values for A_1 and A_2

Contents	A_1		A_2	
	TBq	(Ci) (1)	TBq	(Ci) (1)
Only beta or gamma emitting nuclides are known to be present	0,2	5	0,02	0,5
Alpha emitting nuclides are known to be present or no relevant data are available	0,10	2	2×10^{-5}	5×10^{-4}

(1) The curie values quoted are obtained by rounding down from the TBq figure after conversion to Ci.

(2) In the calculations of A_1 and A_2 for a radionuclide not in Table I, a single radioactive decay chain in which the radionuclides are present in their naturally occurring proportions and in which no daughter nuclide has a half-life either longer than 10 days or longer than that of the parent nuclide shall be considered as a single radionuclide, and the activity to be taken into account and the A_1 or A_2 value to be applied shall be those corresponding to the parent nuclide of that chain. In the case of radioactive decay chains in which any daughter nuclide has a half-life either longer than 10 days or greater than that of the parent nuclide, the parent and such daughter nuclides shall be considered as mixtures of different nuclides.

1701 *(cont'd)*

(3) For mixtures of radionuclides whose identities and respective activities are known, the following conditions shall apply:

(a) for special form radioactive material:

$$\Sigma_i \frac{B\,(i)}{A_1\,(i)} \text{ less than or equal to 1}$$

(b) for other forms of radioactive material:

$$\Sigma_i \frac{B\,(i)}{A_2\,(i)} \text{ less than or equal to 1}$$

where B (i) is the activity of radionuclide i and A_1 (i) and A_2 (i) are the A_1 and A_2 values for radionuclide i, respectively.

Alternatively, an A_2 value for mixtures may be determined as follows:

$$A_2 \text{ for mixture} = \frac{1}{\Sigma_i \frac{f(i)}{A_2(i)}}$$

where f (i) is the fraction of activity of nuclide i in the mixture and A_2 (i) is the appropriate A_2 value for nuclide i.

(4) When the identity of each radionuclide is known but the individual activities of some of the radionuclides are not known, the radionuclides may be grouped and the lowest A_1 or A_2 value, as appropriate, for the radionuclides in each group may be used in applying the formulae in paragraph (3) above. Groups may be based on the total alpha activity and the total beta/gamma activity when these are known, using the lowest A_1 or A_2 values for the alpha emitters or beta/gamma emitters, respectively.

(5) For individual radionuclides or for mixtures of radionuclides for which relevant data are not available, the values shown in Table II shall be used.

Contents limits for packages

1702 The quantity of radioactive material in a package shall not exceed the relevant limits specified in this marg.

(1) Excepted packages

(a) For radioactive material other than articles manufactured of natural uranium, depleted uranium or natural thorium, an excepted package shall not contain activities greater than the following:

(i) where the radioactive material is enclosed in or forms a component part of an instrument or other manufactured article, such as a clock or electronic apparatus, the limits specified in marg. 1713 (4) for each individual item and each package, respectively; and

(ii) where the radioactive material is not so enclosed or manufactured, the limits specified in marg. 1713 (5).

(b) for articles manufactured of natural uranium, depleted uranium or natural thorium, and excepted package may contain any quantity of such material provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

(2) Industrial packages

The total activity in a single package of LSA material or in a single package of SCO shall be so restricted that the radiation level specified in marg. 1714 (1) shall not be exceeded, and the activity in a single package shall also be so restricted that the activity limits for a wagon specified in marg. 1714 (6) shall not be exceeded.

1702 *(cont'd)*

(3) Type A packages

Type A packages shall not contain activities greater than the following:

(a) for special form radioactive material-A_1; or

(b) for all other radioactive material-A_2.

Values for A_1 and A_2 are listed in Tables I and II of marg. 1700 and 1701 respectively.

(4) Type B packages

Type B packages shall not contain:

(a) activities greater than those authorized for the package design,

(b) radionuclides different from those authorized for the package design, or

(c) contents in a form, or a physical or chemical state different from those authorized for the package design,

as specified in their certificates of approval.

(5) Packagings containing fissile material

All packagings containing fissile material shall comply with the applicable activity limits for packages specified in paragraphs (1) to (4) above.

Packagings containing fissile material, other than those containing materials which comply with the provisions of marg. 1703, shall not contain:

(a) a mass of fissile material greater than that authorized for the package design,

(b) any radionuclide for fissile material different from those authorized for the package design, or

(c) contents in a form or physical or chemical state, or in a spatial arrangement, different from those authorized for the package design,

as specified in their certificates of approval.

1703 Packages meeting one of the conditions of this marg. shall be excepted from the requirements specified in marg. 1741 and from the other requirements of this Appendix that apply specifically to fissile material; such packages, however, shall be regulated as non-fissile radioactive material packages, as applicable, and shall still be subject to those requirements of this Appendix which pertain to their radioactive nature and properties.

(a) Packages containing individually not more than 15 g of fissile material, provided that the smallest external dimension of each package is not less than 10 cm. For unpackaged material, the quantity limitation shall apply to the consignment being carried in or on the wagon.

(b) Packages containing homogeneous hydrogenous solutions or mixtures satisfying the conditions listed in Table III. For unpackaged material, the quantity limitations in Table III shall apply to the consignment being carried in or on the wagon.

(c) Packages containing uranium enriched in uranium-235 to a maximum of 1 % by mass, and with a total plutonium and uranium-233 content not exceeding 1 % of the mass of uranium-235, provided that the fissile material is distributed essentially homogeneously throughout the material. In addition, if uranium-235 is present in metallic, oxide, or carbide forms, it shall not form a lattice arrangement within the package.

1703 *(cont'd)*

(d) Packages containing not more than 5 g of fissile material in any 10 litre volume, provided that the radioactive material is contained in packages which will maintain the limitations on fissile material distribution under conditions likely to be encountered during routine carriage.

(e) Packages containing individually not more than 1 kg of total plutonium, of which not more than 20 % by mass may consist of plutonium-239, plutonium-241, or any combination of those radionuclides.

(f) Packages containing liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2 % by mass, with a total plutonium and uranium-233 content not exceeding 0,1 % of the mass of uranium-235, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2.

TABLE III

Limitations on homogeneous hydrogenous solutions or mixtures of fissile material

Parameters	Uranium-235 only	Any other fissile material (including mixtures)
Minimum H/X [1]	5 200	5 200
Maximum concentration of fissile material (g/L)	5	5
Maximum mass of fissile material in a package or wagon (g)	800 [2]	500

[1] Where H/X is the ratio of the number of hydrogen atoms to the number of atoms of fissile nuclide.
[2] With a total plutonium and uranium-233 content of not more than 1 % of the mass of uranium-235.

1704-1709

Section II

Preparation requirements and controls for carriage and for storage in transit

Package inspection requirements

1710

(1) Before the first consignment of any package, the following requirements shall be fulfilled:

(a) if the design pressure of the containment system exceed 35 kPa (0,35 bar) (gauge), it shall be ensured that the containment system of each package conforms to the approved design provisions relating to the capability of that system to maintain its integrity under pressure;

(b) for each Type B package and for each packaging containing fissile material, it shall be ensured that the effectiveness of its shielding, containment system, and, where necessary, the heat transfer characteristics, are within the limits applicable to or specified for the approved design;

(c) for each packaging containing fissile material, where neutron poisons are specifically included as component of the package, in order to comply with the requirements of marg. 1741, tests shall be performed to confirm the presence and distribution of those neutron poisons.

(2) Before each consignment of any package, the following requirements shall be fulfilled:

(a) it shall be ensured that lifting attachments which do not meet the requirements of marg. 1732 have been removed or otherwise rendered incapable of being used for lifting the package;

(b) for each Type B package and for each packaging containing fissile material, it shall be ensured that all the requirements specified in the approval certificates and the relevant requirements of this Appendix have been satisfied;

1710 *(cont'd)*

(c) each Type B package shall be held until equilibrium conditions have been approached closely enough to demonstrate compliance with the carriage requirements for temperature and pressure unless an exemption from these requirements has received unilateral approval;

(d) for each Type B package, it shall be ensured by examination and/or appropriate tests that all closures, valves and other openings of the containment system through which the radioactive contents might escape are properly closed and, where appropriate, sealed in the manner for which the demonstrations of compliance with the requirements of marg. 1738 were made.

Carriage of other goods

1711 (1) A package shall not contain any other items except such articles and documents s are necessary for the use of the radioactive material. This requirement shall not preclude the carriage of low specific activity material or surface contaminated objects with other items. The carriage of such articles and documents in a package, or of low specific activity material or surface contaminated objects with other items may be permitted provided that there is no interaction between them and the packaging or its contents that would reduce the safety of the package.

(2) Tank wagons and tank-containers used for the carriage of radioactive material shall not be used for the storage or carriage of other goods.

(3) The carriage of other goods with consignments being carried under exclusive use shall be permitted provided the arrangements are controlled only by the consignor and it is not prohibited by other regulations.

(4) Consignments shall be segregated from other dangerous goods during carriage and storage in accordance with the requirements of marg. 703 under heading 7.

(5) Radioactive material shall be sufficiently segregated from undeveloped photographic film. The basis for determining segregation distances for this purpose shall be that the radiation exposure of undeveloped photographic film due to the carriage of radioactive material be limited to 0,1 mSv (10 mrem) per consignment of such film in accordance with marg. 771(1).

Requirements and Controls for Contamination and for Leaking Packages

1712 (1) The non-fixed contamination on the external surfaces of a package shall be kept as low as practicable and, under conditions likely to be encountered in routine carriage, shall not exceed the levels specified in Table IV.

(2) In the case of overpacks and containers, the level of non-fixed contamination on the external and the internal surfaces shall not exceed the limits specified in Table IV.

(3) If it is evident that a package is damaged or leaking, or if it is suspected that the package may have leaked or been damaged, access to the package shall be restricted and a qualified person shall, as soon as possible, assess the extent of contamination and the resultant radiation level of the package. The scope of the survey shall include the package, the wagon, the adjacent loading and unloading areas, and, if necessary, all other material which has been carried in the wagon. When necessary, additional steps for the protection of human health, in accordance with requirements established by the relevant competent authority, shall be taken to overcome and minimize the consequences of such leakage or damage.

(4) Packages leaking radioactive contents in excess of allowable limits for normal conditions of carriage may be removed under supervision but shall not be forwarded until repaired or reconditioned and decontaminated.

1712
(cont'd)

TABLE IV

Limits of non-fixed contamination on surfaces

Type of package, overpack, container, tank-container, tank wagon or wagon and its equipment	Contaminant	
	Limit (1) of beta and gamma emitters and low toxicity alpha emitters Bq/cm² (μCi/cm²)	Limit (1) of all other alpha emitters Bq/cm² (μCi/cm²)
External surfaces of:		
excepted packages	0,4 (10^{-5})	0,04 (10^{-6})
other than excepted packages	4 (10^{-4})	0,4 (10^{-5})
External and internal surfaces of overpacks, containers, wagons and their equipment when carrying or being prepared to carry:		
loads including excepted packages and/or non-radioactive goods	0,4 (10^{-5})	0,04 (10^{-6})
loads consisting only of radioactive material in packages other han excepted packages	4 (10^{-4})	0,4 (10^{-5})
External surfaces of containers, tank-containers, tank wagons and wagons and their equipment used in the carriage of unpackaged radioactive material	4 (10^{-4})	0,4 (10^{-5})

(1) The limits are applicable when averaged over any area of 300 cm² of any part of the surface.

(5) A wagon and equipment used routinely for the carriage of radioactive material shall be periodically checked to determine the level of contamination. The frequency of such chechs shall be related to the likelihood of contamination and the extent to which radioactive material is carried.

(6) Except as provide in paragraph (7) below, any wagon, equipment, or part thereof which has become contaminated above the limits specified in Table IV or which shows radiation level in excess of 5 μSv/h (0,5 mrem/h) in the course of the carriage of radioactive material shall be decontaminated as soon as possible by a quality person and shall not be re-used unless the non-fixed radioactive contamination does not exceed the levels specified in Table IV, and the radiation level resulting from the fixed contamination on surfaces after decontamination is less thn 5 μSv/h (0,5 mrem/h).

(7) An overpack, container or wagon intended for the carriage of low specific activity material or surface contaminated objects under exclusive use shall be excepted from the requirements of paragraphs (2) and (6) above solely with regard to its internal surface and only for as long as it remains under that specific exclusive use.

Requirements and controls for carriage of excepted packages

1713 (1) Excepted packages shall be subject only to the following requirements:

(a) In sections II, III and V, only the requirements specified in:

(i) paragraphs (2) to (6) of this marg., as applicable, and marg. 1770 and

(ii) the general requirements for all packagings and packages specified in marg. 1732.

(b) If the excepted package contains fissile material, the requirements of marg. 1703.

(c) The requirement of marg. 705 (1).

1713 *(cont'd)*

(2) The radiation level at any point on the external surface of an excepted package shall not exceed 5 μmSv/h (0,5 mrem/h).

(3) The non-fixed radioactive contamination on any external surface of an excepted package shall not exceed the limits specified in Table IV.

(4) Radioactive material which is enclosed in or forms a component part of an instrument or other manufactured article, with activity not exceeding the item and package limits specified in columns 2 and 3 respectively in Table V, may be carried in any excepted package provided that:

(a) The radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article is not greater than 0,1 mSv/h (10 mrem/h); and

(b) each instrument or article (except radioluminescent time-pieces or devices) bears the marking 'Radioactive'.

(5) Radioactive material in forms other than as specified in paragraph (4) above, with an activity not exceeding the limit specified in column 4 of Table V, may be carried in a excepted package provided that:

(a) the package retains its contents under conditions likely to be encountered in routine carriage; and

(b) the package bears the marking 'Radioactive' on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

TABLE V

Activity limits for excepted packages

Physical state of contents	Instruments and articles		Material
	Item limits	Package limits	Package limits
Solids:			
special form	10^{-2} A_1	A_1	10^{-3} A_1
other forms	10^{-2} A_2	A_2	10^{-3} A_2
Liquids:	10^{-3} A_2	10^{-1} A_2	10^{-4} A_2
Gases:			
tritium	2×10^{-2} A_2	2×10^{-1} A_2	2×10^{-2} A_2
special forms	10^{-3} A_1	10^{-2} A_1	10^{-3} A_1
other forms	10^{-3} A_2	10^{-2} A_2	10^{-3} A_2

Note: For mixtures of radionuclides, see marg. 1701 (3) to (5).

(6) A manufactured article in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium may be carried as an excepted package provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

Requirements and controls for carriage of LSA material and SCO in industrial packages or unpackaged

1714 (1) The quantity of LSA material or SCO in a single industrial package (IP-1, IP-2 or IP-3) or object or collection of objects, whichever is appropriate, shall be so restricted that the external radiation level at 3 m from the unshielded material or object or collection of objects does not exceed 10 mSv/h (1 000 mrem/h).

1714 *(cont'd)*

(2) LSA material and SCO which is or contains fissile material shall meet the applicable requirements of marg. 714 (2) and (3) and 1741.

(3) Packages, including tank wagons, tank-containers or containers, containing LSA material or SCO shall be subject to the requirements of marg. 1712 (1) and (2).

(4) LSA material and SCO in groups LSA-I and SCO-I may be carried unpackaged under the following conditions:

(a) All unpackaged material other than ores containing only naturally occuring radionuclides shall be carried in such a manner that under conditions likely to be encountered in routine carriage there will be no escape of the contents from the wagon nor will there be any loss of shielding.

(b) Each wagon shall be under exclusive use, except when only carrying SCO-1 on which the contamination on the accessible and the inaccessible surfaces is not greater than then times the applicable level specified in marg. 700 (2).

(c) For SCO-I where it is suspected that non-fixed contamination exists on inaccessible surfaces in excess of the values specified in marg. 700 (2), measures shall be taken to ensure that the radioactive material is not released into the wagon.

(5) LSA material and SCO, except as otherwise specified in paragraph (4) above, shall be packaged in accordance with the package integrity levels specified in Table VI in such a manner that, under conditions likely to be encountered in routine carriage, ther will be no escape of contents from packages, nor will there be any loss of shielding afforded by the packaging.

LSA-II material, LSA-III material and SCO-II shall not be carried unpackaged.

TABLE VI

Industrial packages requirements for LSA material and SCO

Contents	Industrial package type [1]	
	Exclusive use	Not under exclusive use
LSA-I [2]		
Solid	IP-1	IP-1
Liquid	IP-1	IP-2
LSA-II		
Solid	IP-2	IP-2
Liquid and gas	IP-2	IP-3
LSA-III	IP-2	IP-3
SCO-I [2]	IP-1	IP-1
SCO-II	IP-2	IP-2

[1] See marg. 700 (2).
[2] Under the conditions specified in paragraph (4) above, LSA-I material and SCO-I may be carried unpackaged.

(6) The total activity of LSA material and SCO in any single wagon shall not exceed the limits shown in Table VII.

1714 *(cont'd)*

TABLE VII

Wagon activity limits for LSA material and SCO in industrial packages or unpackaged

Nature of material	Activity limit for wagon
LSA-I	No limit
LSA-II and LSA-III non-combustible solids	No limit
LSA-II and LSA-III combustible solids, and all liquids and gases	100 A_2
SCO	100 A_2

Determination of Transport Index (TI)

1715 (1) The transport index (TI) based on radiation exposure control for a package, overpack, tank wagon, tank-container or container, or for unpackaged LSA-I or SCO-I, shall be the number derived in accordance with the following procedure:

(a) Determine the maximum radiation level at a distance of 1 m from the external surfaces of the package, overpack, tank wagon, tank-container or container, or unpackaged LSA-I and SCO-I. Where the radiation level is determined in units of millisievert per hour (mSv/h), the value determined shall be multiplied by 100. Where the radiation level is determined in units of millirem per hour (mrem/h), the value determined is not changed.

For uranium and thorium ores and concentrates, the maximum radiation dose rate at any point 1 m from the external surface of the load may be taken as:

0,4 mSv/h (40 mrem/h) for the ores and physical concentrates of uranium and thorium,

0,3 mSv/h (30 mrem/h) for chemical concentrates of thorium,

0,02 mSv/h (2 mrem/h) for chemical concentrates of uranium, other than uranium hexafluoride.

(b) For tank wagons, tank-containers and containers and unpackaged LSA-I and SCO-I, the value determined in step (a) above shall be multiplied by the appropriate factor from Table VIII.

(c) The figure obtained in steps (a) and (b) above shall be rounded up to the first decimal place (e. g.: 1,13 becomes 1,2), except that a value of 0,05 or less may be considered as zero.

TABLE VIII

Multiplication factors for large dimension loads

Size of load (Largest cross-sectional area of the load being measured)	Multiplication factor
size of load $\leq$ 1 m^2	1
1 m^2 < size of load $\leq$ 5 m^2	2
5 m^2 < size of load $\leq$ 20 m^2	3
20 m^2 < size of load	10

(2) The transport idex (TI) based on nuclear criticality control shall be obtained by dividing the number 50 by the value of N derived using the procedures specified in marg. 1741 (i.e. Transport Index = 50/N). The value of the transport index for nuclear criticality control may be zero, provided that an unlimited number of packages is subcritical (i.e. N is effectively equal to infinity).

1715 *(cont'd)*

(3) The transport index for each consignment shall be determined in accordance with Table IX.

TABLE IX

Determination of transport index

Item	Contents	Method of determining Transport Index
Packages	Non-fissile material	TI for radiation exposure control
	Fissile material	The larger of the TI for radiation exposure control or the TI for nuclear criticality control
Non-rigid overpacks	Packages	Sum of TIs of all packages contained
Rigid overpacks	Packages	The sum of the TIs of all packages contained, or, for the original consignor either the TI for radiation exposure control or the sum of the TIs of all the packages
Containers	Packages or overpacks	Sum of the TIs of all packages and overpacks contained
	LSA material or SCO	Either the sum of the TIs or the larger of the TI for radiation exposure control or the TI for nuclear criticality control
Container under exclusive use	Packages or overpacks	Either the sum of the TIs or the larger of the TI for radiation exposure control or the TI for nuclear critically control
Tanks-containers	Non-fissile material	Ti for radiation exposure control
Tank Wagons	Fissile material	The larger of the TI for radiation exposure control or the TI for nuclear criticality control
Unpackaged	LSA-I and SCO-I	The TI for radiation exposure control

Additional requirements for overpacks

1716 The following additional requirements shall apply to overpacks:

(a) Packages of fissile material for which the transport index for nuclear criticality control is 0 and packages of non-fissile radioactive material may be combined together in an overpack for carriage, provided that each package contained therein meets the applicable requirement of this Appendix.

1716 *(cont'd)*

(b) Packages of fissile material for which the transport idex for nuclear criticality control exceeds 0 shall not be carried in an overpack.

(c) Only the original consignor of the packages contained within the overpacks shall be permitted to use the method of direct measurement of radiation level to determine the transport index of a rigid overpack.

Limits on transport index and radiation level for packages and overpacks

1717 (1) Except for consignements under exclusive use, the transport idenx of any individual package or overpack shall not exceed 10.

(2) Except for packages or overpacks carried under exclusive use under the conditions specified in marg. 713 (1) (a), the maximum radiation level at any point on any external surface of a package or overpack shall not exceed 2 mSv/h (200 mrem/h).

(3) The maximum radiation level at any point on any external surface of a package carried under exclusive use shall not exceed 10 mSv/h (1 000 mrem/h).

Categories

1718 Packages and overpacks shall be assigned to either category I-WHITE, II-YELLOW or III-YELLOW in accordance with the conditions specified in Tables X and XI, as applicable, and with the following requirements:

(a) For a package, both the transport index and the surface radiation level conditions shall be taken into account in determining which is the appropriate category. Where the transport index satisfies the condition for one category but the surface radiation level satisfies the condition for a different category, the package shall be assigned to the higher category of the two. For this purpose, category I-WHITE shall be regarded as the lowest category.

(b) The transport index shall be determined following the procedures specified in marg. 1715 and subject to the limitation of marg. 1716 (c).

(c) If the transport index is greater than 10, the package or overpack shall be carried under exclusive use.

(d) If the surface radiation level is greater than 2 mSv/h (200 mrem/h), the package or overpack shall be carried under exclusive use and under the requirements of marg. 713 (1) (a).

(e) A package carried under a special arrangement shall be assigned to category III-YELLOW.

(f) An overpack which contains packages carried under special arrangement shall be assigned to category III-YELLOW.

TABLE X

Categories of packages

Conditions		
Transport Index	Maximum radiation level at any point on external surface	Category
0 [1]	Not more than 0,005 mSv/h (0.5 mrem/h)	I-WHITE
More than 0 but not more than 1 [1]	More than 0,005 mSv/h (0.5 mrem/h) but not more than 0,5 mSv/h (50 mrem/h)	II-YELLOW
More than 1 but not more than 10	More than 0,5 mSv/h (50 mrem/h) but not more than 2 mSv/h (200 mrem/h)	III-YELLOW
More than 10	More than 2 mSv/h (200 mrem/h) but not more than 10 mSv/h (1 000 mrem/h)	III-YELLOW and also under exclusive use

[1] If the measured TI is not greater than 0,05, the value quoted may be zero in accordance with marg. 1715 (1) (c).

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(cont'd)

TABLE XI

Categories of overpacks including containers when used as overpacks

Transport Index	Category
0	I-WHITE
Greater than 0 but less than or equal to 1	II-YELLOW
Greater than 1	III-YELLOW

Notification of competent authorities

1719 (1) Before the first consignment of any package requiring competent authority approval, the consignor shall ensure that copies of each applicable competent authority certificate applying to that package design have been submitted to the competent authority of each country through or into which the consignment is to be carried. The consignor is not required to await an acknowledgement from the competent authority, nor is the competent authority required to make such acknowledgement of receipt of the certificate.

(2) For each consignment listed in (a), (b) or (c) below, the consignor shall notify the competent authority of each country through or into which the consignement is to be carried. This notification shall be in the hands of each competent authority prior to the commencement of the consignment, and preferably at least 7 days in advance.

(a) Type B(U) packages containing radioactive material with an activity greater than 3×10^3 A_1 or 3×10^3 A_2, as appropriate, or 1 000 TBq (20 kCi), whichever is the lower.

(b) Type B(M) packages.

(c) Carriage under special arrangement.

(3) The consignment notification shall include:

(a) Sufficient information to enable the identification of the package including all applicable certificate numbers and identification marks;

(b) Information on the date of consignment, the expected date of arrival and proposed routeing;

(c) The name of the radioactive material or nuclide;

(d) A description of the physical and chemical form of the radioactive material, or whether it is special form radioactive material; and

(e) The maximum activity of the radioactive contents during carriage expressed in units of becquerel(Bq) (and, if desired, curie (Ci)] with an appropriate SI prefix [see marg. 4 (1)]. For fissile material, the total mass of fissile material in units of gram (g), or multiples thereof, may be used in place of activity.

(4) The consignor is not required to send a separate notification if the required information has been included in the application for consignment approval. See marg. 1757 (3).

Possession of certificates and operating instructions

(5) The consignor shall have in his possession a copy of each certificate required under Section III of this Appendix, and a copy of the instructions with regard to the proper closing of the package and other preparations for carriage before any carriage under the terms of the certificates.

1720-
1729

Section III

Requirements for radioactive material, for packaging and packages and test procedures

Note: The requirements in Section III are the same as those prescribed in the 1985 Edition of IAEA Regulations for the Safe Transport of Radioactive Material (as amended 1990). The paragraph numbers mentioned under marg. 1730 to 1742 are the numbers of the applicable paragraphs of the 1985 Edition.

1730 Requirements for LSA-III Material
Paragraph 501

1731 Requirements for special form radioactive material
Paragraphs 502-504

1732 General requirements for all packagings and packages
Paragraphs 505-514

1733 Requirements for industrial packages type 1 (IP-1)
Paragraph 518

1734 Additional requirements for industrial packages type 2 (IP-2)
Paragraph 519

1735 Additional requirements for industrial packages type 3 (IP-3)
Paragraph 520

1736 Alternative requirements for tank wagons, tank-containers and containers to quality as IP-2 and IP-3
Paragraphs 521-523

1737 Requirements for Type A packages
Paragraphs 524-540

1738 Requirements for Type B packages
Paragraphs 541-548

1739 Requirements for Type B (U) package
Paragraphs 549-556

1740 Requirements for Type B (M) packages
Paragraphs 557-558

1741 Requirements for packages containing fissile material
Paragraphs 559-568

1742 Test procedures
Paragraphs 601-633

1743-1749

Section IV

Approval and administrative requirements

Note: Where the requirements in Section IV are the same as those prescribed in the 1985 Edition of the IAEA Regulations for the Safe Transport of Radioactive Material (as amended 1990) the numbers mentioned under marg. 1761 to 1764 are the numbers of the applicable paragraphs of the 1985 Edition.

General

1750 Competent authority approval shall be required for the following:

(a) special form radioactive material (see marg. 1751).

(b) all packages containing fissile material (see marg. 1754 and 1755).

(c) type B packages — Type B(U) and Type B(M) (see marg. 1752, 1753 and 1755).

(d) special arrangements (see marg. 1758).

(e) certain shipments (see marg. 1757).

(f) calculation of unlisted A_1 and A_2 value [see marg. 1701 (1)].

Approval of special form radioactive material

1751 (1) The design for special form radioactive material shall require unilateral approval. An application for approval shall include:

(a) a detailed description of the radioactive material or, if a capsule, the contents; particular reference shall be made to both physical and chemical states;

(b) a detailed statement of the design of any capsule to be used;

(c) a statement of the tests which have been done and their results, or evidence based on calculative methods to show that the radioactive material is capable of meeting the performance standards, or other evidence that the special form radioactive material meets the applicable requirements of this Appendix; and

(d) evidence of a quality assurance programme.

(2) The competent authority shall issure an approval certificate stating that the approved design meets the requirements for special form radioactive material and shall allocate to that design an identification mark. The certificate shall specify the details of the special form radioactive material.

Approval of package designs

Approval of Type B(U) package designs

1752 (1) Any design of Type B(U) package originating in a country party to COTIF shall be approved by the competent authority of that country; if the country where the package has been designed is not a party to COTIF carriage is possible on condition that:

(a) a certificate has been supplied by that country, proving that the package satisfies the technical requirements of this Directive, and that this certificate is countersigned by the competent authority of the first COTIF country reached by the consignment;

(b) if no certificate has been supplied, the package design is approved by the competent authority of the first COTIF country reached by the consignment.

Any design of Type B(U) package for fissile material, which is also subject to marg. 1741, shall require multilateral approval.

1752 *(cont'd)*

(2) An application for approval shall include:

(a) a detailed description of the proposed radioactive contents with particular reference to their physical and chemical states and the nature of the radiation emitted;

(b) a detailed statement of the design, including complete engineering drawings and schedules of materials and methods of construction to be used;

(c) a statement of the tests which have been done and their results, or evidence based on calculative methods or other evidence that the design is adequate to meet the applicable requirements;

(d) the proposed operating and maintenance instructions for the use of the packaging;

(e) if the package is designed to have a maximum normal operating pressure in excess of 100 kPa (1,0 bar) gauge, the application for approval shall, in particular, state, in respect of the materials of construction of the containment system, the specifications, the samples to be taken, and the tests to be made;

(f) where the proposed radioactive contents are irradiated fuel, the applicant shall state and justify any assumption in the safety analysis relating to the characteristics of the fuel;

(g) any special stowage requirements necessary to ensure the sfe dissipation of heat from the package; consideration shall be given to the various modes of carriage to be used and type of wagon or container;

h) a reproducible illustration not larger than 30 cm showing the make-up of the package; and

i) evidence of a quality assurance programme.

(3) The competent authority shall issue an approval certificate stating that the design meets the requirements for Type B(U) packages.

Approval of Type B(M) package designs

1753 (1) Each Type B(M) package design, including those for fissile material which are also subject to marg. 1754, shall require multilateral approval.

(2) An application for approval of a Type B(M) package design shall include, in addition to the information required in marg. 1752 (2) for Type B(U) packages:

(a) a list of the specific requirements for Type B(U) packages specified in marg. 1738-1739 with which the package does not conform;

(b) any proposed supplementary operational controls to be applied during carriage not routinely provided for in this Appendix, but which are necessary to ensure the safety of the package or to compensate for the deficiences listed in (a) above, such as human intervention for temperature or pressure measurements or for periodic venting, taking into account the possibility of unexpected delay;

(c) particulars of any restrictions on the mode of carriage and any special loading, carriage, unloading or handling procedures; and

(d) the maximum and minimum ambient conditions (temperature, solar radiation) expected to be encountered during carriage and which have been taken into account in the design.

(3) The competent authority shall issue an approval certificate stating that the design meets the applicable requirements for Type B(M) packages.

Approval of package designs for fissile material

1754 (1) Each package design for fissile material shall require multilateral approval.

(2) An application for approval shall include all information necessary to satisfy the competent authority that the design meets the requirements of marg. 1741 and evidence of a quality assurance programme.

(3) The competent authority shall issue an approval certificate stating that the design meets the applicable requirements of marg. 1741.

Transitional arrangements

1755 Type B(U) and Type B(M) packagings and packagings containing fissile material which do not fully conform to the requirements of this Appendix but which nevertheless could be used in accordance with the requirements of RID applicable on 31 December 1989 for the corresponding material of Class 7 may still be used under the following conditions for the carriage of this material:

(a) multilateral approval shall be required on the expiry of the unilateral approval, and

(b) a serial number according to the requirements of marg. 705 (3) shall be assigned to and marked on the outside of each packaging.

Changes in the design of the packaging or in the nature or quantity of the authorized radioactive contents which, as determined by the competent authority, would significantly affect safety shall meet the requirements of this Appendix.

Notification and registration of serial numbers

1756 The competent authority of the country of origin of design approval shall be informed of the serial number of each packaging manufactured to a design approved under marg. 1752, 1753 (1), 1754 (1) and 1755. The competent authority shall maintain a register of such serial numbers.

Approval of shipments

1757 (1) Except as allowed in paragraph (2) below, multilateral approval shall be required for:

(a) the shipment of Type B(M) packages especially designed to allow controlled intermittent venting;

(b) the shipment of ype B(M) packages containing radioactive material with an activity greater than 3×10^3 A_1 or 3×10^3 A_2, as appropriate, or 1 000 TBq (20 kCi), whichever is the lower;

(c) the shipment of packages containing fissile material if the sum of the transport indexes of the individual packages exceeds 50 as provided in marg. 712 (4).

(2) A competent authority may authorize carriage into or through its country without shipment approval, by a specific provision in its design approval (see marg. 1759).

(3) An application for shipment approval shall include:

(a) the period of time related to the shipment for which the approval is sought;

(b) the actual radioactive contents, the expected modes of transport, the type of wagon and the probable or proposed route; and

(c) the details of how the special precautions and special administrative or operational controls, referred to in the package design approval certificates issued under marg. 1752 (3), 1753 (3) and 1754 (3) are to be put into effect.

(4) Upon approval of the shipment, the competent authority shall issue an approval certificate.

Approval of the shipment under special arrangement

1758 (1) Each consignment shipped under special arrangement shall require multilateral approval.

(2) An application for approval of a shipment under special arrangement shall include all the information necessary to satisfy the competent authority that the overall level of safety in carriage is at least equivalent to that which would be provided if all the applicable requirements of this Appendix had been met. The application shall include:

(a) a statement of the respects in which, and of the reasons why, the consignment cannot be made in full accordance with the applicable requirements of this Appendix; and

(b) a statement of any special precautions or special administrative or operational controls which are to be employed during carriage to compensate for the failure to meet the applicable requirements of this Appendix.

(3) Upon approval of a shipment under special arrangement, the competent authority shall issue an approval certificate.

Competent authority approval certificates

1759 Four types of approval certificates may be issued: special form radioactive material, special arrangement, shipment and package design. The package design and shipment approval certificates may be combined into a single certificate.

Competent authority identification marks

1760 (1) Each approval certificate issued by a competent authority shall be assigned an identification mark. The mark shall be of the following generalized type:

Symbol of nationality of country/number/type code:

(a) The symbol of nationality represents the distinguishing sign for motor vehicles in international traffic in the Vienna Convention on Road Traffic (1968).

(b) The number shall be assigned by the competent authority, and shall be unique and specific with regard to the particular design or shipment.

The shipment approval identification mark shall be clearly related to the design approval identification mark.

(c) The following type codes shall be used in the order listed to indicate the types of approval certificates issued:

AF	Type A package design for fissile material
B(U)	Type B(U) package design; B(U)F if for fissile material
B(M)	Type B(M) package design; B(M)F if for fissile material
IF	Industrial package design for fissile material
S	Special form radioactive material
T	Shipment
X	Special arrangement.

(d) For package design approval certificates, other than those issued under the provisions of marg. 1755, the symbol '-85' [1] shall be added to the type code of the package design.

[1] This symbol denotes that the package design satisfies the provisions of the Regulations for the Safe Transport of Radioactive Material, Safety Series No 6, 1985 Edition.

1760 *(cont'd)*

(2) These type codes shall be applied as follows:

(a) Each certificate and each package shall bear the appropriate identification mark, comprising the symbols prescribed in paragraph (1) above, except that, for packages, only the applicable design type codes including, if applicable the symbol '-85' [1], shall appear following the second stroke, that is, the 'T' or 'X' shall not appear in the identification marking on the package. Where the design approval and shipment approval are combined, the applicable type codes do not need to be repeated.

For example:

A/132/B(M)F-85: A Type B(M) package design approved for fissile material, requiring multilateral approval, for which the competent authority of Austria has assigned the design number 132 (to be marked on both the package and on the package design approval certificate);

A/132/B(M)F-85T: The shipment approval issued for a package bearing the identification mark elaborated above (to be marked on the certificate only);

A/137/X-85: A special arrangement approval issued by the competent authority of Austria, to which the number 137 has been assigned (to be marked on the certificate only);

A/139/IF-85: An industrial package design for fissile material approved by the competent authority of Austria, to which package design number 139 has been assigned (to be marked on both the package and on the package design approval certificate).

(b) Where multilateral approval is effected by validation, only the identification mark issued by the country of origin of the design or shipment shall be used. Where multilateral approval is effected by issue of certificates by successive countries, each certificate shall bear the appropriate mark and the package whose design was so approved shall bear all appropriate identification marks. For example

A/132/B(M)F-85

CH/28/B(M)F-85

would be the identification mark of a package which was originally approved by Austria and was subsequently approved, by separate certificate, by Switzerland. Additional identification marks would be displayed in a similar manner on the package.

(c) The revision of a certificate shall be indicated by a parenthetical expression following the identification mark on the certificate. For example, A/132/B(M)F-85(Rev.2) would indicate revision 2 of the Austrian package design approval certificate; or A/132/B(M)F-85(Rev.0) would indicate the original issue of the Austrian package design approval certificate. For original issues, the parenthetical entry is optional and other words such as 'original issue' may also be used in place of 'Rev.0'. Certificate revision numbers may only be issued by the country issuing the original approval certificate.

(d) Additional symbols (as may be necessitated by national requirements) may be added in brackets to the end of the identification mark; for example A/132/B(M)F-85(SP503).

(e) It is not necessary to alter the identification mark on the packaging each time that a revision to the design certificate is made. Such re-marking shall be made only in those cases where the revision to the package design certificate involves a change in the letter type codes for the package design following the second stroke.

Contents of approval certificates

(See introductory note to this section)

1761 Special form radioactive material approval certificates

Paragraph 726

[1] This symbol denotes that the package design satisfies the provisions of the Regulations for the Safe Transport of Radioactive Material, Safety Series No 6, 1985 Edition.

1762 Special arrangement approval certificates

Paragraph 727

1763 Shipment approval certificates

Paragraph 728

1764 Package design approval certificates

Paragraph 729

Validation of certificates

1765 Multilatera approval may be by validation of the original certificate issued by the competent authority of the country of origin of the design or shipment. Such validation may take the form of an endorsement on the original certificate or the issue of a separate endorsement, annex, supplement, etc., by the competent authority of the country through or into which the shipment is made.

General requirement for quality assurance programme

1766 Quality assurance programmes shall be established for the design, manufacture, testing documentation, use, maintenance and inspection of all packages and for carriage and intransit storage operations to ensure compliance with the relevant requirements of this Appendix. Where competent authority appoval for design or shipment is required, such approval shall take into account and be contingent upon the adequacy of the quality assurance programme. Certification that the design specification has been fully implemented shall be available to the competent authority. The manufacturer, consignor, or user of any package design shall be prepared to provide facilities for competent authority inspection of the packaging during construction and use and to demonstrate to any relevant competent authority that:

(a) The construction methods and materials used for the construction of the packaging are in accordance with the approved design specifications; and

(b) All packagings manufactured to an approved design are periodically inspected and, as necessary, repaired and maintained in good condition so that they continue to comply with all relevant requirements and specifications, even after repeated use.

1767-1769

Section V

Radioactive material having other hazardous properties

1770 (1) Radioactive material having other hazardous properties shall be packaged:

(a) in accordance with the requirements for Class 7; and

(b) unless carried as a Type A or Type B package, also in accordance with the requirements of the appropriate Class.

(2) Pyrophoric radioactive material shall be packaged in Type A or Type B packages and shall also be suitably inerted.

(3) For radioactive material in excepted packages having other hazardous properties, see marg. 3 (5) and (6).

(4) Packagings for uranium hexafluoride shall be designed, constructed and used in accordance with the requirements of marg. 1771.

Requirements for the packaging and carriage of uranium hexafluoride

1771 (1) Packagings for uranium hexafluoride shall be designed as pressure vessels and manufactured from an appropriate carbon steel or other appropriate alloy steel.

(2) (a) The packagings and their service equipment shall be designed for working temperatures of at least – 40 °C up to 121 °C and for a working pressure of 1,4 MPa (14 bar).

(b) The packagings and their service and structural equipement shall be so designed as to prevent any leakage or permanent deformation when they are subjected for five minutes to a hydraulic test pressure of 2,8 MPa (28 bar).

(c) The packagings and their structural equipment (if this is permanently attached to the packaging) shall be so designed as to withstand an external gauge pressure of 150 kPa (1,5 bar) without permanent deformation.

(d) The packagings and their service equipment shall be so designed as to remain leakproof so that the limit specified in paragraph (4) (f) is observed.

(e) Pressure relief valves are not permitted and the number of openings shall be as few as possible.

(f) Packagings with a capacity of more than 450 l and their service and structural equipment (if this is permanently attached to the packaging) shall be so designed that they remain leakproof when they are subjected to the drop test specified in marg. 1742.

(3) After manufacture, the inside of the pressure bearing parts shall be thoroughtly cleaned of grease, oil, scale, slag and other foreign matter by an appropriate procedure.

(4) (a) Every manufactured packaging and its service and structural equipment shall, either jointly or separately, undergo an inspection initially before being put into service and periodically thereafter. These inspections shall be performed and certified by agreement with the competent authority.

(b) The initial inspection shall consist of a check of the design characteristics, the strength test, the leakproofness test, the water capacity test and a check of satisfactory operation of the service equipment.

(c) The periodic inspections shall consist of a visual inspection, the strength test, the leakproofness test and a check of satisfactory operation of the service equipment. The interval for periodic inspections shall be not more than five years. Packagings which have not been inspected within this five-year period shall be examined before carriage in accordance with a programme approved by the competent authority. They shall not be refilled before completion of the full programme for periodic inspections.

(d) The check of design characteristics shall demonstrate compliance with the design type specifications and the manufacturing programme.

(e) The strength test before first being put into service shall be conducted by means of a hydraulic test with an internal pressure of 2,8 MPa (28 bar). For the periodic inspections, any other equivalent non-destructive examination procedure recognized by the competent authority may be applied.

(f) The leakproofness test shall be performed in accordance with a procedure which is capable of indicating leakages in the containment system with a sensitivity of 0,1 Pa.l/s (10^{-6} bar.l/s).

(g) The water capacity of the packagings shall be established with an accuracy of ± 0,25 % at a reference temperature of 15 °C. The volume shall be stated on the plate described in paragraph (6).

(5) With the exception of packagings for less than 10 kg of uranium hexafluoride, the competent authority of the country of origin shall, for every design type of uranium hexafluoride package, confirm that it complies with the requirements of this marg and issue and approval. This approval may be part of the approval for a Type B package and/or for a package with fissile contents in accordance with Section IV of this Appendix.

1771 *(cont'd)*

(6) A plate made of non-corroding metal shall be durably attached to every packaging in a readily accessible place. The method of attaching the plate shall not impair the strength of the packaging. The following particulars, at least, shall be marked on the place by stamping or by any other equivalent method:

— approval number;

— manufacture's serial number;

— maximum working pressure (gauge pressure) 1,4 MPa (14 bar);

— test pressure (gauge pressure) 2,8 MPa (28 bar);

— contents: uranium hexafluoride;

— capacity in litres;

— maximum permissible filling mass of uranium hexafluoride;

— tare mass;

— date (month, year) of the initial test and the most recent periodic test;

— stamp of the expert who performed the test.

(7) (a) The uranium hexafluoride shall be in solid form when carried.

(b) The degree of filling shall only be such that the capacity is not more than 95 % filled at 121 °C.

(c) The cleaning of packagings shall be performed only by a suitable procedure.

(d) The execution of repairs is permissible only in accordance with design and manufacturing programmes laid down in writing. Outherwise, repair programmes require the prior approval of the competent authority.

(e) Uncleaned empty packagings shall be as tightly closed, during carriage and intermediate storage, as when full.

(f) For maintenance, a programme approved by the competent authority shall be operated.

(8) Packagings constructed in accordance with the United States Standard ANSI N 14.1-1982 [1], or equivalent, may be used, with the consent of the competent authority concerned, if the tests specified in these standards have been performed by the expert named therein and continue to be performed and certified in agreement with the competent autority in accordance with paragraph (4) (c).

1772-1799

[1] ANSI N 14.1-1982, published in 1982 and obtainable from the American National Standards Institute, 10430 Broadway, New York, NY-10018.

APPENDIX VIII

REQUIREMENTS RELATING TO MARKING AND LIST OF DANGEROUS GOODS

Marking of tank wagons, battery-wagons, wagons with demountable tanks and tank-containers and wagons, large containers and small containers for carriage in bulk and full wagon loads made up of packages containing one and the same dangerous substance

1800 (1) On each side of

— tank wagons,

— battery-wagons,

— wagons with demountable tanks,

— tank-containers,

— wagons for carriage in bulk,

— large and small containers for carriage in bulk,

carrying a substance covered by marg. 1802, the consignor shall affix a non-reflectorized orange-coloured marking with a base of 40 cm and a height of not less than 30 cm. The marking shall have a black border of 15 mm. The marking shall be affixed by means of a plate, a self-adhesive sheet, paint or any other equivalent process, on condition that the material used for this purpose is weather-resistant and guarantees durable marking.

The consignor may also affix this marking on each side of full wagon loads made up of packages containing one and the same substance covered by marg. 1802.

Note: The orange colour of the marking, in conditions of normal use, should have chromaticity co-ordinates lying within the area on the chromaticity diagram formed by joining the following co-ordinates.

Chromaticity co-ordinates of points at the corners of the area on the chromaticity diagram				
x	0,52	0,52	0,578	0,618
y	0,38	0,40	0,422	0,38

Luminance factor of non-reflectorized colour: $\beta \geq 0{,}22$.
Reference centre E, Standard Illuminant C.
Normal incidence 45° and viewed at 0°.

(2) Each marking shall bear the identification numbers alloted in the tables of marg. 1802 to the substance carried.

(3) The identification numbers shall be made up of black digits 100 mm high and of 15 mm stroke thickness. The hazard identification number shall appear in the upper part of the marking and the substance identification number in the lower part; they shall be separated by a horizontal line 15 mm thick extending from side to side of the marking at mid-height (see marg. 1803).

(4) When a number of different substances are carried in a battery-wagon with demountable tank, tank wagon or tank-container in separate tanks or separate compartments of the same tank, the consignor shall affix the orange-coloured marking as required in (1), bearing the appropriate numbers, on each side of the tanks or tank compartments, parallel to the longitudinal axis of the wagon or tank-container and so as to be clearly visible.

(5) The requirements of (1) to (4) shall be valid also for empty battery-wagons, wagons with demountable tanks, tank wagons or tank-containers which have not been cleaned or de-gassed and for uncleaned empty wagons, large containers and small containers for bulk goods. Once the dangerous substances have been unloaded and the tanks cleaned and de-gassed, the orange markings shall no longer be visible.

List of identification numbers

1801 (1) The hazard identification number for substances and articles of classes 2 to 9 consists of two or three figures.

In general, the figures indicate the following hazards:

2 Emission of gas due to pressure or to chemical reaction

3 Flammability of liquids (vapours) and gases or self-heating liquid

4 Flammability of solids or self-heating solid

5 Oxidizing (fire-intensifying) effect

6 Toxicity or risk of infection

7 Radioactivity

8 Corrosivity

9 Risk of spontaneous violent reaction

Note: Spontaneous violent reactions within the meaning of figure 9 include the possibility following from the nature of a substance of a risk of explosion, disintegration and polymerization reaction following the release of considerable heat or flammable and/or toxic gases.

Doubling of a figure indicates an intensification of that particular hazard. Where the hazard associated with a substance can be adequately indicated by a single figure, this is followed by a zero.

The following combinations of figures, however, have a special meanng: 22, 323, 333, 362, 382, 423, 44, 446, 462, 482, 539, 606, 623, 642, 823, 842 and 90 [see (2)].

If a hazard identification number is prefixed by the letter 'X', this indicates that the substance will react dangerously with water. For such substances, water may not be used except with expert approval.

For substances and articles of Class 1, the classification code in accordance with marg. 100(4) shall be used as the hazard identification number. The classification code consists of:

— the division number in accordance with marg. 100(6) and

— the compatibility group letter in accordance with marg. 100(7).

(2) The hazard identification numbers listed in marg. 1802 have the following meanings:

20	asphyxiant gas or gas which poses no subsidiary risk
22	refrigerated liquefied gas, asphyxiant
223	refrigerated liquefied gas, flammable
225	refrigerated liquefied gas, oxidizing (fire-intensifying)
23	flammable gas
239	flammable gas, which can spontaneously lead to violent reaction [1]
25	oxidizing (fire-intensifying) gas
26	toxic gas
263	toxic, flammable gas
265	toxic gas, oxidizing (fire-intensifying)
268	toxic gas, corrosive
30	— flammable liquid (flash-point from 23 °C to 61 °C inclusive) or — flammable liquid or solid in the molten state with a flash-point above 61 °C, heated to a temperature equal to or above its flash-point, or self-heating liquid
323	flammable liquid which reacts with water, emitting flammable gases
X323	flammable liquid which reacts dangerously with water, emitting flammable gases [2]
33	highly flammable liquid (flash-point below 23 °C)
333	pyrophoric liquid
X333	pyrophoric liquid, which reacts dangerously with water [2]
336	highly flammable liquid, toxic
338	highly flammable liquid, corrosive
X338	highly flammable liquid, corrosive, which reacts dangerously with water [2]
339	highly flammable liquid which can spontaneously lead to violent reaction

[1] Hazard identification number 239 concerns Nos 1001, 1010, 1041, 1060, 1085, 1086, 1087, 1860 and 1959.
[2] Water may not be used except with the approval of an expert.

1801 *(cont'd)*

36	flammable liquid (flash-point between 23 °C and 61 °C inclusive), slightly toxic, or self-heating liquid, toxic
362	flammable liquid, toxic, which reacts with water, emitting flammable gases
X362	flammable liquid, toxic, which reacts dangerously with water, emitting flammable gases (1)
368	flammable liquid, toxic, corrosive
38	flammable liquid (flash-point between 23 °C and 61 °C inclusive), slightly corrosive or self-heating liquid, corrosive.
382	flammable liquid, corrosive, which reacts with water, emitting flammable gases
X382	flammable liquid, corrosive, which reacts dangerously with water, emitting flammable gases (1)
39	flammable liquid, which can spontaneously lead to violent reaction
40	flammable solid or self-reactive or self-heating substance
423	solid which reacts with water, emitting flammable gases
X423	flammable solid which reacts dangerously with water, emitting flammable gases (1)
43	spontaneously flammable (pyrophoric) solid
44	flammable solid, in the molten state at an elevated temperature
446	flammable solid, toxic, in the molten state, at an elevated temperature
46	flammable or self-heating solid, toxic
462	toxic solid which reacts with water, emitting flammable gases
X462	solid which, in contact with water, emits toxic gases (1)
48	flammable or self-heating solid, corrosive
482	corrosive solid which reacts with water, emitting flammable gases
X482	solid which, in contact with water, emits corrosive gases (1)
50	oxidizing (fire-intensifying) substance
539	flammable organic peroxide
55	strongly oxidizing (fire-intensifying) substance
556	strongly oxidizing (fire-intensifying) substance, toxic
558	strongly oxidizing (fire-intensifying) substance, corrosive
559	strongly oxidizing (fire-intensifying) substance, which can spontaneously lead to violent reaction
56	oxidizing (fire-intensifying) substance, toxic
568	oxidizing (fire-intensifying) substance, toxic, corrosive
58	oxidizing (fire-intensifying) substance, corrosive
59	oxidizing (fire-intensifying) substance which can spontaneously lead to violent reaction
60	toxic or slightly toxic substance
606	infectious substance
623	toxic liquid which reacts with water, emitting flammable gases
63	toxic substance, flammable (flash-point between 23 °C and 61 °C inclusive)
638	toxic substance, flammable (flash-point between 23 °C and 61 °C inclusive)
639	toxic substance, flammable (flash-point less than or equal to 61 °C), which can spontaneously lead to violent reaction
64	toxic solid, flammable or self-heating
642	toxic solid which reacts with water, emitting flammable gases
65	toxic solid, oxidizing (fire-intensifying)
66	highly toxic substance
663	highly toxic substance, flammable (flash-point not above 61 °C)
664	highly toxic solid, flammable or self-heating
665	highly toxic substance, oxidizing (fire-intensifying)
668	highly toxic substance, corrosive
669	highly toxic substance wich can spontaneously lead to violent reaction
68	toxic substance, corrosive
69	toxic substance, which can spontaneously lead to violent reaction
70	radioactive material
72	radioactive gas
723	radioactive gas, flammable
73	radioactive liquid, flammable (flash-point not above 61 °C)
74	radioactive solid, flammable
75	radioactive material, oxidizing
76	radioactive material, toxic
78	radioactive material, corrosive
80	corrosive or slightly corrosive substance

(1) Water may not be used except with the approval of an expert.

1801 *(cont'd)*

X80 corrosive or slightly corrosive substance, which reacts dangerously with water [1]
823 corrosive liquid which reacts with water, emitting flammable gases
83 corrosive or slightly corrosive substance, flammable (flash-point between 23 °C and 61 °C inclusive)
X83 corrosive or slightly corrosive substance, flammable (flash-point between 23 °C and 61 °C), which reacts dangerously with water [1]
839 corrosive or slightly corrosive substance, flammable (flash-point between 23 °C and 61 °C inclusive), which can spontaneously lead to violent reaction
X839 corrosive or slightly corrosive substance, flammable (flash-point between 23 °C and 61 °C), which can spontaneously lead to violent reaction and which reacts dangerously with water [1]
84 corrosive solid, flammable or self-heating
842 corrosive solid which reacts with water, emitting flammable gases
85 corrosive or slightly corrosive substance, oxidizing (fire-intensifying)
856 corrosive or slightly corrosive substance, oxidizing (fire-intensifying) and toxic
86 corrosive or slightly corrosive substance, toxic
88 highly corrosive substance
X88 highly corrosive substance, which reacts dangerously with water [1]
883 highly corrosive substance, flammable (flash-point between 23 °C and 61 °C inclusive)
884 highly corrosive solid, flammable or self-heating
885 highly corrosive substance, oxidizing (fire-intensifying)
886 highly corrosive substance, toxic
X886 highly corrosive substance, toxic, which reacts dangerously with water [1]
89 corrosive or slightly corrosive substance, which can spontaneously lead to violent reaction
90 environmentally hazardous substance
miscellaneous dangerous substance
99 miscellaneous dangerous substance at an elevated temperature

(3) The identification numbers referred to in paragraph (2) are listed in the list of dangerous goods (Tables I, II and III) of marg. 1802.

Note: The identification numbers to be shown on the orange plates should be looked for first in Table I. If in the case of substances of classes 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 7, 8 and 9 the name of the substance to be carried or the collective heading which covers it is not listed in Table I, the identification numbers are to be taken from Table II. Table III contains all the entries in Tables I and II in substances identification number order.

1802 Lists of dangerous goods

The lists contain 6 columns:

(a) Hazard identification number

This column contains the hazard identification number in accordance with marg. 1801(2).

(b) Substance identification number

This column contains the substance identification numbers from the lists of substances in the various classes. The identification numbers are taken from the UN Recommendations on the Transport of Dangerous Goods.

(c) Name of the substance or article

This column includes:

— the names of substances and articles, including n.o.s. entries, printed in italics in the lists of substances in the various classes,
— substances and articles mentioned by name which, in accordance with the requirements of this Directive, are listed as not to be accepted for carriage,
— substances and articles mentioned by name which are not subject to the requirements of this Directive (alphabetical list only),
— for substances and articles mentioned by name not to be accepted for carriage, the words '***not to be accepted for carriage***' are included,
— for substances and articles mentioned by name which are not subject to the requirements of this Directive, the words '***not subject to RID***' are included (alphabetical list only).

The names in the list are those prescribed for the consignment note. In addition, synonyms mentioned in the substance lists are given, with a cross-reference to the main description.

The descriptions of mixtures and preparations etc contained in this Directive but not printed in italics are not in this list because these descriptions may not be used as a description of the goods in the consignment note. For the classification of these mixtures and preparations, see marg 3(3) and the substance lists in the various classes.

The substances of this Directive which may be carried in tanks or in bulk are printed in bold.

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[1] Water may not be used except with the approval of an expert.

1802 *(cont'd)*

(d) Class, item and, if necessary, group

This column contains the Class, item number and, where appropriate, the group, with the following special features:

— for substances and articles of Class 1: the classification code and the item,

— for substances and articles of Class 7: the Class and Schedule.

(e) Danger labels

This column contains the relevant danger label model numbers.

Where additional danger labels are prescribed for tank wagons and tank-containers, the model numbers of these labels are listed in brackets.

Where label model No. 8 is listed in brackets for certain organic peroxides, this additional label is not required for all peroxides of this type (see marg. 551).

For radioactive materials (Class 7), the danger label column lists the marg. where requirements concerning Class 7 danger labels can be found. Sections 8 and 9 of the marg. referred to contain the relevant information.

(f) NHM Code (Nomenclature Harmonisée Marchandises — 'Harmonized Goods List')

This column contains the NHM Code of the goods in accordance with the harmonized goods list (Annex 3 to UIC-leaflet 221). As dangerous goods are assigned to NHM codes in accordance with principles which do not reflect the classification principles of this Directive, it is not possible in all cases to assign a single NHM code to each substance description of this Directive. This is especially true of collective entries and n.o.s. entries. In the cases, the correct NHM code can only be found if the chemical or technical description of the goods is known. If the correct NHM code can only be given in part, the missing figures are replaced with asterisks.

The information in column 6 is not legally binding.

Explanation of symbols:

* dependent upon the last goods loaded

** NHM code varies according to the contents of the receptacle

*** NHM code varies according to the type of goods

Table I. Alphabetical list

This alphabetical list contains the substances and articles listed in the various classes of this Directive in accordance with the above notes for the 'substance or article' column.

If a substance or article is not listed by name, it shall be ascertained whether the substance or article:

— is not to be accepted for carriage on the basis of the requirements of a restrictive Class [see marg. 1(3)], or

— can be assigned to a collective entry or n.o.s. entry, or

— can be carried without special requirements on the basis of the requirements of a non-restrictive Class [see marg. 1(4)].

The names of the substances and articles are listed in alphabetical order. Arabic numbers or prefixes such as o-, m-, p-, n-, sec-, tert-, n-, alpha-, beta-, omega- are ignored for the purposes of alphabetical listing. However, prefixes Bis- and Iso- are counted as the first part of a name.

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	1088	**Acetal**	3,3(b)	3	291100
33	1089	**Acetaldehyde**	3,1(a)	3	291212
90	1841	**Acetaldehyde ammonia**	9,31(c)	9	292219
30	2332	**Acetaldehyde oxime**	3,31(c)	3	292990
	2790	Acetic acid solution with not more than 25 % pure acid, by mass: *Not subject to RID*			
80	2790	**Acetic acid solution, with more than 25 % but less than 50 % acid, by mass**	8,32(c)	8	291521
80	2790	**Acetic acid solution, with more than 50 % but less than 80 % acid, by mass**	8,32(b)1	8	291521
83	2789	**Acetic acid, glacial or acetic acid solution, with more than 80 % acid, by mass**	8,32(b)2	8+3	291521
83	1715	**Acetic anhydride**	8,32(b)2	8+3	291524
30	2621	**Acetoin**	3,31(c)	3	290519
33	1090	**Acetone**	3,3(b)	3	291411
669	1541	**Acetone cyanohydrin, stabilized**	6.1,12(a)	6.1	292690
33	1091	**Acetone oils**	3,3(b)	3	380700
33	1648	**Acetonitrile**	3,3(b)	3	292690
		Acetopolysilanes, see Corrosive liquid, acidic, organic, n.o.s.			
		Acetoxysilanes, see Corrosive liquid, acidic, organic, n.o.s.			
36	2310	**Acetyl acetone**	3,32(c)	3+6.1	291419
		Acetyl acetone peroxide, see Organic, peroxide type D, liquid			
		Acetyl acetone peroxide, see Organic, peroxide type D, solid			
		Acetyl benzoly peroxide, see Organic, peroxide type D, liquid			
80	1716	**Acetyl bromide**	8,35(b)1	8	291590
X338	1717	**Acetyl chloride**	3,25(b)	3+8	291590
80	1898	**Acetyl iodide**	8,35(b)1	8	290330
30	2621	**Acetyl methyl carbinol**	3,31(c)	3	290519
60	2504	**Acetylene tetrabromide**	6.1,15(c)	6.1	290330
60	1702	**Acetylene tetrachloride**	6.1,15(b)	6.1	290319
239	1001	**Acetylene, dissolved**	2,4F	3(+13)	290129
		2-Acetylthiophene, see Toxic liquid, organic, n.o.s.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
886	1786	**Acid mixture, hydrofluoric and sulphuric**	8,7(a)	8+6.1	281119
80/885	1796	**Acid mixture, nitrating**	8,3(a),(b)	8+05	280800
60	2713	**Acridine**	6.1,12(c)	6.1	293390
39	2607	**Acrolein dimer, stabilized**	3,31(c)	3	293299
663	1092	**Acrolein, inhibited**	6.1,8(a)	6.1+3	291219
60	2074	**Acrylamide**	6.1,12(c)	6.1	292410
839	2218	**Acrylic acid, inhibited**	8,32(b)2	8+3	291611
336	1093	**Acrylonitrile, inhibited**	3,11(a)	3+6.1	292610
90	2590	**Actinolite**	9,(c)	9	252400
33	1133	**Adhesives containing flammable liquid**	3,5(a),(b),(c)	3	350699
30	1133	**Adhesives containing flammable liquid**	3,31(c)	3	350699
60	2205	**Adiponitrile**	6.1,12(c)	6.1	292690
		Adrenalin, see Toxic solid, organic, n.o.s.			
20	1950	Aerosol dispensers	2,5A	2	**
25	1950	Aerosol dispensers	2,5O	2+05	**
23	1950	Aerosol dispensers	2,5F	3	**
26	1950	Aerosol dispensers	2,5T	6.1	**
263	1950	Aerosol dispensers	2,5TF	6.1+3	**
268	1950	Aerosol dispensers	2,5TC	6.1+8	**
265	1950	Aerosol dispensers	2,5TO	6.1+05	**
263	1950	Aerosol dispensers	2,5TFC	6.1+3+8	**
265	1950	Aerosol dispensers	2,5TOC	6.1+05+8	**
90	3268	Air bag inflators	9,8(c)	9	870899
90	3268	Air bag modules	9,8(c)	9	870899
20	1002	**Air, compressed**	2,1A	2(+13)	285100
225	1003	**Air, refrigerated liquid**	2,3O	2+05(+13)	285100
336	3165	Aircraft hydraulic power unit fuel tank (containing a mixture of anhydrous hydrazine and methylhydrazine) (M86 fuel)	3,28	3+6.1+8	880330
338	3274	**Alcoholates solution, n.o.s., in alcohol**	3,24(b)	3+8	290550
33/30	3065	**Alcoholic beverages**	3,3(b),31(c)	3	220710
					220890

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
336/36	1986	**Alcohols, flammable, toxic, n.o.s.**	3,17(a),(b),32(c)	3+6.1	2905**
33/30	1987	**Alcohols, n.o.s.**	3,2(b),3(b),31(c)	3	2905**
336/36	1988	**Alcohols, flammable, toxic, n.o.s.**	3,17(a),(b),32(c)	3+6.1	2912**
33/30	1989	**Aldehydes n.o.s.**	3,2(a),(b),3(b), 31(c)	3	2912**
		Aldicarb (pesticide), see Carbamate pesticides			
60	2839	**Aldol**	6.1,14(b)	6.1	291249
		Aldrin (pesticide), see Organochlorine pesticides			
48	3206	**Alkali metal alcoholates, self-heating, corrosive, n.o.s.**	4.2,15(b),(c)	4.2+8	290550
X423	1421	**Alkali metal alloy, liquid, n.o.s.**	4.3,11(a)	4.3	2280519
X423	1389	**Alkali metal amalgam**	4.3,11(a)	4.3	811299
423	1390	**Alkali metal amides**	4.3,19(b)	4.3	285100
X423	1391	**Alkali metal dispersion**	4.3,11(a)	4.3	811299
40	3205	**Alkaline earth metal alcoholates, n.o.s.**	4.2,14(b),(c)	4.2	290550
423	1393	**Alkaline earth metal alloy, n.o.s.**	4.3,11(b)	4.3	280519
X423	1392	**Alkaline earth metal amalgam**	4.3,11(a)	4.3	811299
X423	1391	**Alkaline earth metal dispersion**	4.3,11(a)	4.3	811299
		Alkaline residues, see Caustic alkali liquid, n.o.s.			
		Alkaloid pesticides, see under Pesticide etc.			
66/60	3140	**Alkaloids, liquid, n.o.s. or alkaloid salts, liquid, n.o.s.**	6.1,90(a),(b),(c)	6.1	293990
66/60	1544	**Alkaloids, solid, n.o.s. or alkaloid salts, solid, n.o.s.**	6.1,90(a),(b),(c)	6.1	293990
		Alkyloxyphenols, liquid, see Toxic liquid, organic, n.o.s.			
		Alkyloxyphenols, solid, see Toxic solid, organic, n.o.s.			
88/80	3145	**Alkyohenols, liquid, n.o.s. (including C_2-C_{12} homologues**	8,40(a),(b),(c)	8	290719
88/80	2430	**Alkyohenols, solid, n.o.s. (including C_2-C_{12} homologues**	8,39(a),(b),(c)	8	290719
80	2584	**Alkylsulphonic acids, liquid, with more than 5 % free sulphuric acid**	8,1(b)	8	290410
80	2586	**Alkylsulphonic acids, liquid, with more than 5 % free sulphuric acid**	8,34(c)	8	290410

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	2583	**Alkylsulphonic acids, liquid, with more than 5 % free sulphuric acid**	8,1(b)	8	290410
80	2585	**Alkylsulphonic acids, liquid, with more than 5 % free sulphuric acid**	8,34(c)	8	290410
80	2571	**Alkylsulphuric acids**	8,34(b)	8	290410
		Allidochlor (pesticide), see Organochlorine pesticides			
336	2333	**Allyl acetate**	3,17(b)	3+6.1	291590
663	1098	**Allyl alcohol**	6.1,8(a)	6.1+3	290529
336	1099	**Allyl bromide**	3,16(a)	3+6.1	290330
330	1100	**Allyl chloride**	3,16(a)	3+6.1	290329
668	1722	**Allyl chloroformate**	6.1,28(a)	6.1+3+8	291590
336	2335	**Allyl ethyl ether**	3,17(b)	3+6.1	290919
336	2336	**Allyl formate**	3,17(a)	3+6.1	291513
30	2219	**Allyl glycidyl ether**	3,31(c)	3	291090
338	1723	**Allyl iodide**	3,25(b)	3+8	290330
639	1545	**Allyl isothiocyanate, inhibited**	6.1,20(b)	6.1+3	293090
663	2334	**Allylamine**	6.1,7(a)2	6.1+3	292119
X839	1724	**Allyltrichlorosilane, stabilized**	8,37(b)	8+3	293100
X333	3052	**Aluminium alkyl halides**	4.2,32(a)	4.2.+4.3	293100
X333	3076	**Aluminium alkyl hydrides**	4.2,32(a)	4.2.+4.3	293100
X333	3051	**Aluminium alkyls**	4.2,31(a)	4.2.+4.3	293100
X333	2870	**Aluminium borohydride**	4.2,17(a)	4.2.+4.3	285000
X333	2870	Aluminium borohydride in devices	4.2,17(a)	4.2.+4.3	285000
		Aluminium bromide hexahydrate: *Not subject to RID*	8,11(b),*Note*		
80	2580	**Aluminium bromide solution**	8,5(c)	8	282759
80	1725	**Aluminium bromide, anhydrous**	8,11(b)	8	282759
423	1394	**Aluminium carbide**	4.3,17(b)	4.3	284990
		Aluminium chloride monohydrate: *Not subjec to RID*	8,11(b),*Note*		
80	2581	**Aluminium chloride solution**	8,5(c)	8	282732
80	1726	**Aluminium chloride, anhydrous**	8,11(b)	8	282732
		Aluminium chloride, hexahydrate: *Not subject to RID*	8,11(b),*Note*		

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
462	1395	**Aluminium ferrosilicon powder**	4.3,15(b)	4.3+6.1	760120
X423	2463	Aluminium hydride	4.3,16(a)	4.3	285000
50	1438	**Aluminium nitrate**	5.1,22(c)	5.1	283429
X462	1397	Aluminium phosphide	4.3,18(a)	4.3+6.1	284800
642	3048	Aluminium phosphide pesticide	6.1,43(a)	6.1	284800
40	1309	**Aluminium powder, coated**	4.1,13(b),(c)	4.1	760310
423	1396	**Aluminium powder, uncoated**	4.3,13(b)	4.3	760310
423	3170	**Aluminium remelting by-products**	4.3,13(b),(c)	4.3	262040
40	2715	**Aluminium resinate**	4.1,12(c)	4.1	380620
423	1398	**Aluminium silicon powder, uncoated**	4.3,13(c)	4.3	285000
423	3170	**Aluminium smelting by-products**	4.3,13(b),(c)	4.3	262040
		Aluminium teluride, see Tellurium compound, n.o.s.			
338/38	2733	**Amines, flammable, corrosive, n.o.s.**	3,22(a),(b),33(c)	3+8	2921**
883/83	2734	**Amines, liquid, corrosive, flammable, n.o.s.**	8,54(a),(b)	3+8	2921**
88/80	2735	**Amines, liquid, corrosive, n.o.s.**	8,53(a),(b),(c)	8	2921**
88/80	3259	**Amines, solid, corrosive, n.o.s.**	8,52(a),(b),(c)	8	2921**
		Aminocarb (pesticide), see Carbamate pesticides			
60	2673	**2-Amino-4-chlorophenol**	6.1,12(b)	6.1	292229
60	2946	**2-Amino-5-diethylaminopentane**	6.1,12(c)	6.1	292129
40	3317	2-Amino-4,6-dinitrophenol, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	292229
80	3055	**2-(2-Aminoethoxy)ethanol**	8,53(c)	8	292219
		Aminonitrobenzonitrile, see Toxic solid, organic, n.o.s.			
		2-Aminonitrobenzonitrile, see Toxic solid, organic, n.o.s.			
80	2815	**N-Aminoethylpiperazine**	8,53(c)	8	293390
60	2512	**Aminophenols (o-, m-, p-)**	6.1,12(c)	6.1	292229
		Aminothiophenol, see Toxic liquid, organic, n.o.s.			
80	2672	**Ammonia solution, relative density between 0,880 and 0,957 at 15 °C in water, with more than 10% but not more than 35 % ammonia**	8,43(c)	8	281420

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
20	2073	**Ammonia solution, relative density less than 0,880 at 15 °C *in water, with more than 35 % but not more than 50 % ammonia***	2,4A	2(+13)	281420
268	3318	**Ammonia solution, relative density less than 0,880 at 15 °C *in water, with more than 50 % ammonia***	2,4TC	6.1+8(+13)	281410
268	1005	**Ammonia, anhydrous**	2,2TC	6.1+8(+13)	281410
60	1546	**Ammonium arsenate**	6.1,51(b)	6.1	284290
86	2817	**Ammonium bifluoride solution**	8,7(b),(c)	8+6.1	282619
80	2506	**Ammonium bisulphate**	8,13(b)	8	283329
50	1439	**Ammonium dichromate**	5.1,27(b)	5.1	284150
60	1843	**Ammonium dinitro-o-cresolate**	6.1,12(b)	6.1	290890
60	2505	**Ammonium fluoride**	6.1,63(c)	6.1	282611
60	2854	**Ammonium fluorosilicate**	6.1,64(c)	6.1	282690
80	2506	**Ammonium hydrogen sulphate**	8,13(b)	8	283329
80	1727	**Ammonium hydrogendifluoride, solid**	8,9(b)	8	282619
86	2817	**Ammonium hydrogendifluoride solution**	8,7(b),(c)	8+6.1	282619
60	2859	**Ammonium metavanadate**	6.1,58(b)	6.1	284190
50	1942	**Ammonium nitrate**	5.1,21(c)	5.1	310230
	2072	Ammonium nitrate fertilizer, n.o.s.: *Not to be accepted for carriage*	5.1,21(c), *footnote*		
	0223	Ammonium nitrate fertilizer, which is more liable to explode than ammonium nitrate with 0,2 % combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance			
50	2067	**Ammonium nitrate fertilizers, type A1**	5.1,21(c)	5.1	310230
50	2068	**Ammonium nitrate fertilizers, type A2**	5.1,21(c)	5.1	310230
50	2069	**Ammonium nitrate fertilizers, type A3**	5.1,21(c)	5.1	310240
50	2070	**Ammonium nitrate fertilizers, type A4**	5.1,21(c)	5.1	310229
	2071	Ammonium nitrate fertilizers: *Not subject to RID*	9, see marg. 900(3)		
	0222	Ammonium nitrate with more than 0,2 % combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	1.1D,4	1+13	310230
59	2426	**Ammonium nitrate, liquid**	5.1,20	5.1	310230
		Ammonium perchlorate	1.1D,4	1+13	282990

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
50	1442	**Ammonium perchlorate**	5.1,12(b)	5.1	282990
50	1444	**Ammonium persulphate**	5.1,18(c)	5.1	283340
	0004	Amonium picrate dry or wetted with less than 10 % water, by mass	1.1D,4	1+13	360200
40	1310	Ammonium picrate, wetted with not less than 10 % water, by mass	4.1,21(a)1	4.1	360200
86	2818	**Ammonium polysulphide solution**	8,45(b)1,(c)	8+6.1	283090
60	2861	**Ammonium polyvanadate**	6.1,58(b)	6.1	284190
86	2683	**Ammonium sulphide solution**	8,45(b)2	8+3+6.1	283090
		Ammonium thiocyanate: *Not subject to RID*	6.1,41, *Note 1*		
	0171	Ammunition, illuminating with or without burster, expelling charge or propelling charge	1.2G,21	1	930690
	0254	Ammunition, illuminating with or without burster, expelling charge or propelling charge	1.3G,30	1	930690
	0297	Ammunition, illuminating with or without burster, expelling charge or propelling charge	1.4G,43	1.4	930690
	0009	Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.2G,21	1	930690
	0010	Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.3G,30	1	930690
	0247	Ammunition, incendiary, or gel with burster, expelling charge or propelling charge	1.3J,32	1+13	930690
	0243	Ammunition, incendiary, white phosphorus with burster, expelling charge or propelling charge	1.2H,22	1+13	930690
	0244	Ammunition, incendiary, white phosphorus with burster, expelling charge or propelling charge	1.3H,31	1+13	930690
	0300	Ammunition, incendiary, with or without burster, expelling charge or propelling charge	1.4G,43	1.4	930690
	0362	Ammunition, practice	1.4G,43	1.4	930690
	0488	Ammunition, practice	1.3G,30	1	930690
	0363	Ammunition, proof	1.4G,43	1.4	930690
	0015	Ammunition, smoke with or without burster, expelling charge or propelling charge	1.2G,21	1+8	930690
	0016	Ammunition, smoke with or without burster, expelling charge or propelling charge	1.3G,30	1+8	930690

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0303	Ammunition, smoke with or without burster, expelling charge or propelling charge	1.4G,43	1.4	930690
	0245	Ammunition, smoke white phosphorus with burster, expelling charge or propelling charge	1.2H,22	1+13	930690
	0246	Ammunition, smoke white phosphorus with burster, expelling charge or propelling charge	1.3H,31	1+13	930690
	0018	Ammunition, tear-producing with burster, expelling charge or propelling charge	1.2G,21	1+6,1+8	930690
	0019	Ammunition, tear-producing with burster, expelling charge or propelling charge	1.3G,30	1+6,1+8	930690
	0310	Ammunition, tear-producing with burster, expelling charge or propelling charge	1.4G,43	1.4+6,1+8	930690
60	2017	Ammunition, tear-producing, non-explosive without burster or expelling charge, non-fuzed	6.1,27(b)	6.1	930690
	0020	Ammunition, toxic with burster, expelling charge or propelling charge: *Not to be accepted for carriage*	1.2K, *See marg. 100(8)*		
	0021	Ammunition, toxic with burster, expelling charge or propelling charge: *Not to be accepted for carriage*	1.3K, *See marg. 100(8)*		
60	2016	Ammunition, toxic, non-explosive without burster or expelling charge, non-fuzed	6.1,25(b)	6.1	930690
90	2212	Amosite	9,1(b)	9	252400
30	1104	Amyl acetates	3,31(c)	3	291590
80	2819	Amyl acid phosphate	8,38(c)	8	291900
		sec-Amyl alcohol, see Amyl alcohols			
		tert-Amyl alcohol, see Amyl alcohols			
33	1105	**Amyl alcohols**	3,3(b)	3	290515
30	1105	**Amyl alcohols**	3,31(c)	3	290515
338	1106	**Amylamine**	3,22(b)	3+8	292119
38	1106	**Amylamine**	3,33(c)	3+8	292119
30	2620	**Amyl butyrates**	3,31(c)	3	291590
33	1107	**Amyl chloride**	3,3(b)	3	290319
33	1108	**N-Amylene**	3,1(a)	3	290129
30	1109	**Amyl formates**	3,31(c)	3	291513
		tert-Amyl hydroperoxide, see Organic peroxide type E, liquid			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	1111	**Amyl mercaptan**	3,3(b)	3	293090
30	1110	**N-Amyl methyl ketone**	3,31(c)	3	291419
30	1112	**Amyl nitrate**	3,31(c)	3	292090
33	1113	**Amyl nitrite**	3,3(b)	3	292090
		tert-Amyl peroxy-2-ethylhexyl carbonate, see Organic peroxide type D, liquid			
		tert-Amyl peroxy-3,5,5-trimethylhexanoate, see Organic peroxide type B, liquid			
		tert-Amyl peroxyacetate, see Organic peroxide type E, liquid			
		tert-Amyl peroxybenzoate, see Organic peroxide type D, liquid			
X80	1728	**Amyltrichlorosilane**	8,36(b)	8	293100
60	1547	**Aniline**	6.1,12(b)	6.1	292141
60	1548	**Aniline hydrochloride**	6.1,12(c)	6.1	292141
60	2431	**Anisidines**	6.1,12(c)	6.1	292222
30	2222	**Anisole**	3,31(c)	3	290930
80	1729	**Anisoly chloride**	8,35(b)1	8	291639
90	2590	**Athophyllite**	9,1(c)	9	252400
66	1649	**Anti-knock additive**	6.1,31(a)	6.1	293100
		Antimony and lead, ashes of, see Toxic, solid, inorganic, n.o.s.			
60	3141	**Antimony compound, inorganic, liquid, n.o.s.**	6.1,59(c)	6.1	**
60	1549	**Antimony compound, inorganic, solid, n.o.s.**	6.1,59(c)	6.1	**
		Antimony compound, organic, liquid, see Organometallic compound, toxic, n.o.s.			
		Antimony compound, organic, solid, see Organometallic compound, n.o.s.			
		Antimony compound, residues and wastes, liquid, see Antimony compound, inorganic, liquid, n.o.s.			
		Antimony compound, residues and wastes, solid, see Antimony compound, inorganic, solid, n.o.s.			
60	1550	**Antimony lactate**	6.1,59(c)	6.1	291811
		Antimony oxides, see Antimony compound, inorganic, solid, n.o.s.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	1731	**Antimony pentachloride solution**	8,12(b),(c)	8	282739
X80	1730	**Antimony pentachloride, liquid**	8,12(b)	8	282739
86	1732	**Antimony pentafluoride**	8,10(b)	8+6.1	282619
60	1551	**Antimony potassium tartrate**	6.1,59(c)	6.1	291813
60	2871	**Antimony powder**	6.1,59(c)	6.1	811000
		Antimony salts, see Antimony compound inorganic, solid, n.o.s.			
80	1733	**Antimony trichloride**	8,11(b)	8	282739
		Antimony ashes of, see Antimony compound inorganic, solid, n.o.s.			
		ANTU (pesticide), see under Pesticide, etc.			
		Apparatus such as transformes, condensers and hydraulic apparatus containing PCBs or PCTs or mixtures thereof	9,3		
20	1006	**Argon, compressed**	2,1A	2(+13)	280421
22	1951	**Argon, refrigerated liquid**	2,3A	2(+13)	280421
		Arsenates, liquid, see Arsenic compound, liquid, n.o.s.			
		Arsenates, solid, see Arsenic compound solid, n.o.s.			
60	1558	**Arsenic**	6.1,51(b)	6.1	280480
66	1553	**Arsenic acid, liquid**	6.1,51(a)	6.1	281119
60	1554	**Arsenic acid, solid**	6.1,51(b)	6.1	281119
60	1555	**Arsenic bromide**	6.1,51(b)	6.1	282759
66/60	1556	**Arsenic compound, liquid, n.o.s.**	6.1,51(a),(b),(c)	6.1	**
66/60	1557	**Arsenic compound, solid, n.o.s.**	6.1,51(a),(b),(c)	6.1	**
60	1559	**Arsenic pentoxide**	6.1,51(b)	6.1	282590
		Arsenic sulphides, liquid, see Arsenic compound, liquid, n.o.s.			
		Arsenic sulphides, solid, see Arsenic compound, solid, n.o.s.			
66	1560	**Arsenic trichloride**	6.1,51(a)	6.1	281210
60	1561	**Arsenic trioxide**	6.1,51(b)	6.1	282590
		Arsenic trioxide (pesticide), see Arsenical pesticides			
66/60	1556	**Arsenical compound, liquid, n.o.s.**	6.1,51(a),(b),(c)	6.1	**

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66/60	1557	**Arsenical compound, solid, n.o.s.**	6.1,51(a),(b),(c)	6.1	**
60	1562	**Arsenical dust**	6.1,51(b)	6.1	280480
336	2760	**Arsenical pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6	380810
663/63	2993	**Arsenical pesticide, liquid, toxic, flammable, flash point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	2994	**Arsenical pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2759	**Arsenical pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
		Arsenites, liquid, see Arsenic compound, liquid, n.o.s.			
		Arsenites, solid, see Arsenic compound, solid, n.o.s.			
263	2188	Arsine	2,2TF	6.1+3	285000
		Articles impregnated with pesticides: *Not subject to RID*	6.1, *Note 2(a)*		
	0486	Articles, explosive, extremely insensitive	1.6N,50	1.6	360490
		(Articles, EEI)			
	0349	Articles, explosive, n.o.s.	1.4S,47	1.4	930690
	0350	Articles, explosive, n.o.s.	1.4B,35	1.4	930690
	0351	Articles, explosive, n.o.s.	1.4C,37	1.4	930690
	0352	Articles, explosive, n.o.s.	1.4D,39	1.4	930690
	0353	Articles, explosive, n.o.s.	1.4G,43	1.4	930690
	0354	Articles, explosive, n.o.s.	1.1L,12	1+13	930690
	0355	Articles, explosive, n.o.s.	1.2L,25	1+13	930690
	0356	Articles, explosive, n.o.s.	1.3L,34	1+13	930690
	0462	Articles, explosive, n.o.s.	1.1C,3	1+13	930690
	0463	Articles, explosive, n.o.s.	1.1D,5	1+13	930690
	0464	Articles, explosive, n.o.s.	1.1E,6	1+13	930690
	0465	Articles, explosive, n.o.s.	1.1F,7	1+13	930690
	0466	Articles, explosive, n.o.s.	1.2C,15	1	930690
	0467	Articles, explosive, n.o.s.	1.2D,17	1	930690
	0468	Articles, explosive, n.o.s.	1.2E,18	1	930690
	0469	Articles, explosive, n.o.s.	1.2F,19	1+13	930690
	0470	Articles, explosive, n.o.s.	1.3C,27	1	930690
	0471	Articles, explosive, n.o.s.	1.4E,40	1.4	930690

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0472	Articles, explosive, n.o.s.	1.4F,41	1.4	930690
20	3164	Articles, pressurized, pneumatic or hydraulic (containing non-flammable gas)	2,6A	2	***
	0380	Articles, pyrophoric	1.2L,25	1+13	930690
	0428	Articles, pyrotechnic for technical purposes	1.1G,9	1+13	360490
	0429	Articles, pyrotechnic for technical purposes	1.2G,21	1	360490
	0430	Articles, pyrotechnic for technical purposes	1.3G,30	1	360490
	0431	Articles, pyrotechnic for technical purposes	1.4G,43	1.4	360490
	0432	Articles, pyrotechnic for technical purposes	1.4S,47	1.4	360490
80	2584	**Arylsulphonic acids liquid, with more than 5 % free sulphuric acid**	8,1(b)	8	290410
80	2586	**Arylsulphonic acids liquid, with more than 5 % free sulphuric acid**	8,34(c)	8	290410
80	2583	**Arylsulphonic acids liquid, with more than 5 % free sulphuric acid**	8,1(b)	8	290410
80	2585	**Arylsulphonic acids solid, with not more than 5 % free sulphuric acid**	8,34(c)	8	290410
		Azinphos-ethyl (pesticide), see Organophosphorus pesticides			
		Azinphos-methyl (pesticide), see Organophosphorus pesticides			
40	3242	Azodicarbonamide	4.1,26(b)	4.1	292990
		Azodicarbonamide formulation type C, see Self-reactive solid type C			
		Azodicarbonamide formulation type D, see Self-reactive solid type D			
		1,1-Azodi(hexahydrobenzonitrile), see Self-reactive solid type D			
423	1400	**Barium**	4.3,11(b)	4.3	280522
43	1854	Barium alloys, pyrophoric	4.2,12(a)	4.2	280521
	0224	Barium azide, dry or wetted with less than 50 % water or alcohol, by mass: *Not to be accepted for carriage*	1.1A,*See marg.4 100(8)*		
46	1571	Barium azide, wetted with not less than 50 % water, by mass	4.1,25(a)	4.1+6.1	285000

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
56	2719	**Barium bromate**	5.1,29(b)	5.1+6.1	282990
		Barium carbonate, see Barium compound, n.o.s.			
56	1445	**Barium chlorate**	5.1,29(b)	5.1+6.1	282919
		Barium chloride, see Barium compound, n.o.s.			
60	1564	**Barium compound, n.o.s.**	6.1,60(b),(c)	6.1	**
66	1565	Barium cyanide	6.1,41(a)	6.1	283719
		Barium fluoride, see Barium compound, n.o.s.			
		Barium hydroxide, see Barium compound, n.o.s.			
56	2741	**Barium hypochlorite with more than 22 % available chlorine**	5.1,29(b)	5.1+6.1	282890
56	1446	**Barium nitrate**	5.1,29(b)	5.1+6.1	283429
60	1884	**Barium oxide**	6.1,60(c)	6.1	251120
56	1447	**Barium perchlorate**	5.1,29(b)	5.1+6.1	282990
56	1448	**Barium permanganate**	5.1,29(b)	5.1+6.1	284169
56	1449	**Barium peroxide**	5.1,29(b)	5.1+6.1	281630
		Barium selenate, see Selenates			
		Barium selenite, see Selenites			
		Barium silicofluoride, see under Pesticide, etc.			
		Barium stearate: *Not subject to RID*	6.1,60(c), *Note 3*		
		Barium sulphate: *Not subject to RID*	6.1,60(c), *Note 3*		
		Barium sulphide, see Barium compound, n.o.s.			
		Barium titanate: *Not subject to RID*	6.1,60(c), *Note 3*		
423	3292	**Batteries, containing sodium**	4.3,31(b)	4.3	8506**
80	3028	**Batteries, dry, containing potassium hydroxide solid, electric storage**	8,81(c)	8	8507**
80	2794	**Batteries, wet, filled with acid, electric storage**	8,81(c)	8	8507**
80	2795	**Batteries, wet, filled with alkali, electric storage**	8,81(c)	8	8507**
80	2800	**Batteries, wet, non-spillable, storage**	8,81(c)	8	8507**
80	2796	**Battery fluid, acid**	8,1(b)	8	280700
80	2797	**Battery fluid, alkali**	8,42(b)	8	2815**

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	3171	Battery-powered equipment (wet battery): *Not subject to RID*	9, *see marg. 900(3)*		
	3171	Battery-powered vehicle (wet battery): *Not subject to RID*	9 *see marg. 900(3)*		
		Bendiocarb (pesticide), see Carbamate pesticides			
		Benfuracarb (pesticide), see Carbamate pesticides			
		Benquinox (pesticide), see under Pesticides, etc.			
90	1990	**Benzaldehyde**	9,34(c)	9	2912**
33	1114	**Benzene**	3,3(b)	3	290220
80	2225	**Benzene sulphonyl chloride**	8,35(c)	8	293090
		Benzene sulphonylhydrazide, see Self-reactived solid, type D			
		Benzene-1,3-disulphonylhydrazide, see Self-reactive solid, type D			
60	1885	**Benzidine**	6.1,12(b)	6.1	292159
		Benzidine dihydrochloride, see Toxic solid, organic, n.o.s.			
		Benzidine sulphate, see Toxic solid, organic, n.o.s.			
		3-Benzidine sulphonic acid, see Aryl sulphonic acids			
336	2770	**Benzoic derivative pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663/63	3003	**Benzoic derivative pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3004	**Benzoic derivative pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2769	**Benzoic derivative pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
60	2224	**Benzonitrile**	6.1,12(b)	6.1	292690
60	2587	**Benzoquinone**	6.1,14(b)	6.1	291469
80	2226	**Benzotrichloride**	8,66(b)	8	290369
33	2338	**Benzotrifluoride**	3,3(b)	3	290369
80	1736	**Benzoyl chloride**	8,35(b)1	8	291632
		Benzoyl cyanide, see Toxic liquid, organic, n.o.s.			
68	1737	**Benzyl bromide**	6.1,27(b)	6.1+8	290369
68	1738	**Benzyl chloride**	6.1,27(b)	6.1+8	290369

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
88	1739	**Benzyl chloroformate**	8,64(a)	8	291590
83	2619	**Benzyl dimethylamine**	8,54(b)	8+3	292149
60	2653	**Benzyl iodide**	6.1,15(b)	6.1	290369
		Benzylamine, see Corrosive liquid, basic, organic, n.o.s.			
		[4-Benzyl(ethyl)amino]-3-ethoxybenzenediazonium zinc chloride, see Self-reactive solid, type D			
60	1886	**Benzylidine chloride**	6.1,15(b)	6.1	290369
60	1566	**Beryllium compound, n.o.s.**	6.1,54(b)2,(c)	6.1	**
56	2464	**Beryllium nitrate**	5.1,29(b)	5.1+6.1	283429
64	1567	**Beryllium powder**	6.1,54(b)1	6.1+4.1	811211
339	2251	**Bicyclo-(2.2.1)-hepta-2,5-diene, inhibited**	3,3(b)	3	290219
		Bifluorides, see Hydrogendifluorides, n.o.s.			
		Binapacryl (pesticide), see Substituted nitrophenol pesticides			
336	2782	**Bipyridillium pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663/63	3015	**Bipyridillium pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3016	**Bipyridillium pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2781	**Bipyridillium pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
80	2269	**bis-Aminopropylamine**	8,53(c)	8	292129
80	2837	**Bisulphates, aqueous solution, n.o.s.**	8,1(b),(c)	8	283319
80	2693	**Bisulphites, aqueous solution, n.o.s.**	8,17(c)	8	283220
	0028	Black powder, compressed	1.1D,4	1+13	360200
	0027	Black powder, granular or as a meal	1.1D,4	1+13	360200
	0028	Black powder, in pellets	1.1D,4	1+13	360200
		Blasticidine-S-3 (pesticide), see under Pesticide, etc.			
90	2212	**Blue asbestos (crocidolite)**	9,1(b)	9	252400
	0033	Bombs with bursting charge	1.1F,7	1+13	930690
	0034	Bombs with bursting charge	1.1D,5	1+13	930690
	0035	Bombs with bursting charge	1.2D,17	1	930690
	0291	Bombs with bursting charge	1.2F,19	1+13	930690

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0399	Bombs with flammable liquid with bursting charge	1.1J,10	1+13	930690
	0400	Bombs with flammable liquid with bursting charge	1.2J,23	1+13	930690
	0037	Bombs, photoflash	1.1F,7	1+13	930690
	0038	Bombs, photoflash	1.1D,5	1+13	930690
	0039	Bombs, photoflash	1.2G,21	1	930690
	0299	Bombs, photoflash	1.3G,30	1	930690
80	2028	Bombs, smoke, non-explosive with corrosive liquid, without initiating device	8,82(b)	8	930690
	0225	Boosters with detonator	1.1B,1	1+13	360300
	0268	Boosters with detonator	1.2B,13	1+13	360300
	0042	Boosters without detonator	1.1D,5	1+13	360300
	0283	Boosters without detonator	1.2D,17	1	360300
40	1312	**Borneol**	4.1,6(c)	4.1	290619
X88	2692	**Boron bromide**	8,12(a)	8	281290
X88	2692	**Boron tribromide**	8,12(a)	8	281290
268	1741	Boron trichloride	2,2TC	6.1+8	282210
80	1742	**Boron trifluoride acetic acid complex**	8,33(b)	8	293100
883	2604	**Boron trifluoride diethyl etherate**	8,33(a)	8+3	293100
80	2851	**Boron trifluoride dihydrate**	8,10(b)	8	281290
382	2965	**Boron trifluoride dimethyl etherate**	4.3,2(a)	4.3+3+8	293100
883	2604	**Boron trifluoride ether complex**	8,33(a)	8+3	293100
		Boron trifluoride phenol complex, see corrosive liquid, acidic, organic, n.o.s.			
80	1743	**Boron trifluoride propionic acid complex**	8,33(b)	8	293100
268	1008	**Boron trifluoride, compressed**	2,1TC	6.1+8	281290
		Brodifacoum (pesticide), see Courmarin derivative pesticides			
50	3213	**Bromates, inorganic, aqueous solution, n.o.s.**	5.1,16(b),(c)	5.1	282990
50	1450	**Bromates, inorganic, n.o.s.**	5.1,16(b)	5.1	282990
265	2901	**Bromine chloride**	2,2TOC	6.1+05+8, (+13)	281210
886	1744	**Bromine or Bromine solutions**	8,14	8+6.1	280130
568	1745	**Bromine pentafluoride**	5.1,5	5.1+6.1+8	281290

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
568	1746	**Bromine trifluoride**	5.1,5	5.1+6.1+8	281290
80	1938	**Bromoacetic acid**	8,31(b)	8	291590
63	1569	**Bromoacetone**	6.1,16(b)	6.1+3	291470
X80	2513	**Bromoacetyl bromide**	8,35(b)1	8	291590
		Bromoanilines, liquid, see Toxic liquid, organic, n.o.s.			
		Bromoanilines, solid, see Toxic solid, organic, n.o.s.			
30	2514	**Bromobenzene**	3,31(c)	3	290369
		Bromobenzyl chloride, see Toxic liquid, organic, n.o.s.			
66	1694	**Bromobenzyl cyanides**	6.1,17(a)	6.1	292690
33	1126	**1-Bromobutane (n-butyl bromide)**	3,3(b)	3	290330
33	2339	**2-Bromobutane**	3,3(b)	3	290330
60	1887	**Bromochloromethane**	6.1,15(c)	6.1	290349
60	2688	**1-Bromo-3-chloropropane**	6.1,15(c)	6.1	290349
33	2340	**2-Bromoethyl ethyl ether**	3,3(b)	3	290919
60	2515	**Bromoform**	6.1	15(c),6.1	290330
30	2341	**1-Bromo-3-methylbutane**	3,31(c)	3	290330
33	2342	**Bromomethylpropanes**	3,3(b)	3	290330
40	3241	**2-Bromo-2-nitropropane-1.3-diol**	4.1,26(c)	4.1	290550
33	2343	**2-Bromopentane**	3,3(b)	3	290330
		Bromophos-ethyl (pesticide), see Organophosphorus pesticides			
		1-Bromopropane, see Bromopropanes			
		2-Bromopropane, see Bromopropanes			
33	2344	**Bromopropanes**	3,3(b)	3	290330
33	2345	**3-Bromopropyne**	3,3(b)	3	290330
23	2349	**Bromotrifluoroethylene**	2,2F	3(+13)	290347
20	1009	**Bromotrifluoromethane (refrigerant gas R 13B1)**	2,2A	2(+13)	290346
		Bromoxynil (pesticide), see under Pesticide, etc.			
90	2212	**Brown asbestos (amosite or mysorite)**	9,1(b)	9	252400
66	1570	**Brucine**	6.1,90(a)	6.1	293990
	0043	Bursters, explosive	1.1D,5	1+13	930690

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
239	1010	**1,2-Butadiene, inhibited**	2,2F	3(+13)	290124
239	1010	**1.3-Butadiene mixture with hydrocarbons, inhibited**	2,2F	3(+13)	271114
239	1010	**1.3-Butadiene, inhibited**	2,2F	3(+13)	290129
23	1011	**Butane**	2,2F	3(+13)	290110
		Butane (commercial name): see Hydrocarbon gas mixture, liquefied, n.o.s. (mixture A, AO)			
33	2346	**Butanedione**	3,3(b)	3	291419
		n-Butanol-2, see Butanols			
		Butanol, secondary, see Butanols			
		Butanol, tertiary, see Butanols			
33	1120	**Butanols**	3,3(b)	3	290514
30	1120	**Butanols**	3,31(c)	3	290514
23	1012	**1-Butene**	2,2F	3(+13)	290123
23	1012	**cis-2-Butene**	2,2F	3(+13)	290123
23	1012	**trans-2-Butene**	2,2F	3(+13)	290123
23	1012	**Butenes mixture**	2,2F	3(+13)	290123
		Butocarboxim pesticide, see Carbamate pesticides			
		n-Butyl acetate, see Butyl acetates			
		n-Butyl-4.4-di-(tert-butylperoxy)valerate, see Organic peroxide type C, liquid			
		n-Butyl-4.4-di-(tert-butylperoxy)valerate, see Organic peroxide type D, solid			
		n-Butyl-4.4-di-(tert-butylperoxy)valerate, see Organic peroxide type E, solid			
338	1125	**N-Butylamine**	3,22(b)	3+8	292119
60	2738	**N-Butylaniline**	6.1,12(b)	6.1	292142
33	1123	**Butyl acetates**	3,3(b)	3	291590
30	1123	**Butyl acetates**	3,31(c)	3	291590
80	1718	**Butyl acid phosphate**	8,38(c)	8	291900
39	2348	**Butyl acrylates, inhibited**	3,31(c)	3	291612
		Butyl alcohol, normal, see Butyl alcohols			
		Butyl alcohol, secondary, see Butyl alcohols			
		Butyl alcohol, tertiary, see Butyl alcohols			
33	1126	**N-butyl bromide (1-bromobutane)**	3,3(b)	3	290330

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	1127	**Butyl chlorides**	3,3(b)	3	290319
638	2743	**N-Butyl chloroformate**	6.1,28(b)	6.1+3+8	291590
		tert-Butylcumyl peroxide, see Organic peroxide type D, liquid and solid			
60	2747	**tert-Butylcyclohexyl chloroformate**	6.1,17(c)	6.1	291590
339	3022	**1.2-Butylene oxide, stabilized**	3,3(b)	3	291090
		n-Butyl ether, see Dibutyl ethers			
		Butyl ethyl ether, see Ethyl butyl ether			
33	1128	**N-Butyl formate**	3,3(b)	3	291513
		tert-Butyl hydroperoxide+di-tert-butyl-peroxide, see Organic peroxide type C, liquid			
		tert-Butyl hydroperoxide, see Organic peroxide type C, liquid			
		tert-Butyl hydroperoxide, see Organic peroxide type D, liquid			
		tert-Butyl hydroperoxide, see Organic peroxide type F, liquid			
60	2680	**N,n-Butylimidazole**	6.1,12(b)	6.1	293329
663	2485	**N-Butyl isocyanate**	6.1,6(a)	6.1+3	292910
663	2484	**tert-Butyl isocyanate**	6.1,6(a)	6.1+3	292910
		tert-Butyl isocyanide, see Flammable liquid, toxic, n.o.s.			
33	2347	**Butyl mercaptan**	3, 3(b)	3	293090
39	2227	**N-Butyl methacrylate, inhibited**	3,31(c)	3	291614
33	2350	**Butyl methyl ether**	3,3(b)	3	290919
		tert-Butyl monoperoxymaleate, see Organic peroxide type B, solid			
		tert-Butyl monoperoxymaleate, see Organic peroxide type C, liquid			
		tert-Butyl monoperoxymaleate, see Organic peroxide type E, solid			
		tert-Butyl monoperoxyphthalate, see Organic peroxide type B, solid			
33/30	2351	**Butyl nitrites**	3,3(b),31(c)	3	292090
		tert-Butyl peroxyacetate, see Organic peroxide type B, liquid			
		tert-Butyl peroxyacetate, see Organic peroxide type C, liquid			
		tert-Butyl peroxyacetate, see Organic peroxide type F, liquid			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		tert-Butyl peroxybenzoate, see Organic peroxide type C, liquid			
		tert-Butyl peroxybenzoate, see Organic peroxide type D, liquid and solid			
		tert-Butyl peroxybutyl fumerate, see Organic peroxide type D, liquid			
		tert-Butyl peroxycrotonate, see Organic peroxide type D, liquid			
		tert-Butyl peroxydiethylacetate+tert-butyl peroxybenzoate, see Organic peroxide type D, liquid			
		tert-Butyl peroxy-2-ethylhexanoate+2.2-di-(tert-butylperoxy)butane, see Organic peroxide type D, solid			
		tert-Butyl peroxy-2-ethylhexylcarbonate, see Organic peroxide type D, liquid			
		tert-Butyl peroxy isopropylcarbonate, see Organic peroxide type C, liquid			
		1-(2-tert-Butylperoxy isopropyl)-3-isopropenylbenzene, see Organic peroxide type D, liquid			
		1-(2-tert-Butylperoxy isopropyl)-3-isopropenylbenzene, see Organic peroxide type E, solid			
		2.2-Di-(4.4-di(tert-butylperoxy) cyclohexyl) propane, see Organic peroxide type D, solid			
		2.2-Di-(tert-butylperoxy)butane, see Organic peroxide type C, liquid			
		tert-Butyl peroxy-2-methylbenzoate, see Organic peroxide type C, liquid			
		3-tert-Butylperoxy-3-phenylphthalide, see Organic peroxide type D, solid			
		2.2-Di-(tert-butylperoxy) propane, see Organic peroxide type D, liquid			
		2.2-Di-(tert-butylperoxy) propane, see Organic peroxide type D, solid			
		tert-Butylperoxy stearylcarbonate, see Organic peroxide type D, solid			
		tert-Butyl peroxy-3.5.5-trimethylhexanoate, see Organic peroxide type D, liquid			
		tert-Butyl peroxy-3.5.5-trimethylhexanoate, see Organic peroxide type F, liquid			

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	1914	**Butyl propionates**	3,31(c)	3	291590
40	2956	5-ter-Butyl-2,4.6-trinitro-m-xylene (muskxylene)	4.1,26(c)	4.1	290420
339	2352	**Butyl vinyl ether, inhibited**	3,3(b)	3	290919
30	2709	**Butylbenzenes**	3,31(c)	3	290290
		Butyltin trichloride, see Corrosive liquid, n.o.s.			
60	2667	**Butyltoluenes**	6.1,25(c)	6.1	290290
X83	1747	**Butyltrichlorosilane**	8,37(b)	8+3	293100
339	1144	**2-Butyne**	3,1(a)	3	290129
60	2716	**1.4-Butynediol**	6.1,14(c)	6.1	290539
33	1129	**Butylraldehyde**	3,3(b)	3	291213
30	2840	**Butyraldoxime**	3,31(c)	3	292990
80	2820	**Butyric acid**	8,32(c)	8	291560
80	2739	**Butyric anhydride**	8,32(c)	8	291560
336	2411	**Butyronitrile**	3,11(b)	3+6.1	292690
338	2353	**Butyryl chloride**	3,25(b)	3+8	291590
60	1572	**Cacodylic acid**	6.1,51(b)	6.1	293100
		Cadmium acetate, see Cadmium compound			
		Cadmium carbonate, see Cadmium compound			
66/60	2370	**Cadmium compound**	6.1,61(a),(b),(c)	6.1	**
		Cadmium nitrate, see Cadmium compound			
		Cadmium pigments: *Not subject to RID*	6.1,61(c), *Note*		
		Cadmium salts of higher fatty acid (e.g. cadmium stearate): *Not subject to RID*	6.1,61(c), *Note*		
		Cadmium sulphate, see Cadmium compound			
		Cadmium sulphide: *Not subject to RID*	6.1,61(c), *Note*		
		Cadmium sulphoselenides: *Not subject to RID*	6.1, 61(c), *Note*		
		Cadmium telluride, see Cadmium compound			
X423	1407	**Caesium**	4.3,11(a)	4.3	280519
80	2682	**Caesium hydroxide**	8,41(b)	8	282590
80	2681	**Caesium hydroxide solution**	8,42(b),(c)	8	282590

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
50	1451	**Caesium nitrate**	5.1,22(c)	5.1	283429
423	1401	**Calcium**	4.3,11(b)	4.3	280521
43	1855	Caesium alloys, pyrophoric	4.2,12(a)	4.2	280521
60	1573	**Calcium arsenate**	6.1,51(b)	6.1	284290
		Calcium arsenate (pesticide), see Arsenical pesticides			
60	1574	**Calcium arsenate and calcium arsenite mixture, solid**	6.1,51(b)	6.1	284290
423	1402	**Calcium carbide**	4.3,17(b)	4.3	284910
50	1452	**Calcium chlorate**	5.1,11(b)	5.1	282919
50	2429	**Calcium chlorate, aqueous solution**	5.1,11(b),(c)	5.1	282919
50	1453	**Calcium chlorite**	5.1,14(b)	5.1	282890
423	1403	**Calcium cyanamide with more than 0,1% calcium carbide**	4.3,19(c)	4.3	310270
66	1575	Calcium cyanide	6.1,41(a)	6.1	283719
40	1923	**Calcium dithionite**	4.2,13(b)	4.2	283190
X423	1404	Calcium hydride	4.3,16(a)	4.3	285000
		Calcium hydrosulphite, see Calcium dithionite			
50	2208	**Calcium hypochlorite mixture, dry with more than 10% but not more than 39 % available chlorine**	5.1,15(c)	5.1	282810
50	1748	**Calcium hypochlorite mixture, dry with more than 39 % available chloride (8,8 % available oxygen)**	5.1,15(b)	5.1	282810
50	1748	**Calcium hypochlorite, dry**	5.1, 15(b)	5.1	282810
50	2880	**Calcium hypochlorite, hydrated**	5.1,15(b)	5.1	282810
50	2880	**Calcium hypochlorite, hydrated mixture with not less than 5,5 % but not more than 10 % water**	5.1,15(b)	5.1	282810
423	2844	**Calcium manganese silicon**	4.3,12(c)	4.3	285000
50	1454	**Calcium nitrate**	5.1,22(c)	5.1	283429
1910		Calcium oxide: *Not subject to RID*	8, *see marg. 800(a)*		282590
50	1455	**Calcium perchlorate**	5.1,13(b)	5.1	282990
50	1456	**Calcium permanganate**	5.1,17(b)	5.1	284169
50	1457	**Calcium peroxide**	5.1,25(b)	5.1	282590
X462	1360	Calcium phosphide	4.3,18(a)	4.3+6.1	284800
40	1313	**Calcium resinate**	4.1,12(c)	4.1	380620

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
40	1314	**Calcium resinate, fused**	4.1,12(c)	4.1	380620
66	2630	**Calcium selenate**	6.1,55(a)	6.1	291590
423	1405	**Calcium silicide**	4.3,12(b),(c)	4.3	285000
43	1855	Calcium, pyrophoric	4.2,12(a)	4.2	280521
		Calomel, see Environmentally hazardous substance, solid, n.o.s.			
		Camphechlor (pesticide), see Organochlorine pesticides			
30	1130	**Camphor oil**	3,31(c)	3	151590
40	2717	**Camphor, synthetic**	4.1,6(c)	4.1	291421
80	2829	**Caproic acid**	8,32(c)	8	291590
336	2758	**Carbamate pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663	2991	**Carbamate pesticide, liquid, toxic, flammable, toxic, flash-point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	2992	**Carbamate pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2757	**Carbamate pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
		Carbaryl (pestidide), see Carbamate pesticides			
		Carbofuran (pesticides), see Carmate pesticides			
20	1013	**Carbon dioxide**	2,2A	2(+13)	281121
239	1041	**Carbon dioxide and ethylene oxide mixture with more than 9 % but not more than 87 % ethylene oxide**	2,2F	3(+13)	291010
20	1015	**Carbon dioxide and nitrous oxide mixture**	2,2A	2(+13)	281121
25	1014	**Carbon dioxide and oxygen mixture, compressed**	2,1O	2+05(+13)	280440
22	2187	**Carbon dioxide, refrigerated liquid**	2,3A	2(+13)	281121
	1845	Carbon dioxide, solid (dry ice): *Not subject to RID*	9, *see marg. 900(3)*	2(+13)	281121
336	1131	**Carbon disulphide**	3,18(a)	3+6.1	281310
263	2600	**Carbon monoxide and hydrogen mixture, compressed**	2,ITF	6.1+3(+13)	270500
263	1016	**Carbon monoxide, compressed**	2,ITF	6.1+3(+13)	281129
60	2516	**Carbon tetrabromide**	6.1,15(c)	6.1	290330
60	1846	**Carbon tetrachloride**	6.1,15(b)	6.1	290314
40	1362	**Carbon, activated**	4.2,1(c)	4.2	280330

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
40	1361	**Carbon, animal or vegetable origin**	4.2,1(b),(c)	4.2	280300
268	2417	**Carbonyl fluoride, compressed**	2,ITC	6.1+8(+13)	281290
263	2204	**Carbon sulphide**	2,2TF	6.1+3(+13)	281390
		Carbophenothion (pesticide), see Organophosphorus pesticides			
		Cartap hydrochloride (pesticide), see Carbamate pesticides			
	0005	Cartridges for weapons with bursting charge	1.1F,7	1+13	930630
	0006	Cartridges for weapons with bursting charge	1.1E,6	1+13	930630
	0007	Cartridges for weapons with bursting charge	1.2F,19	1+13	930630
	0321	Cartridges for weapons with bursting charge	1.2E,18	1	930630
	0348	Cartridges for weapons with bursting charge	1.4F,41	1.4	930630
	0412	Cartridges for weapons with bursting charge	1.4E,40	1.4	930630
	0014	Cartridges for weapons, blank	1.4S,47	1.4	930630
	0326	Cartridges for weapons, blank	1.1C,3	1+13	930630
	0327	Cartridges for weapons, blank	1.3C,27	1	930630
	0338	Cartridges for weapons, blank	1.4C,37	1.4	930630
	0413	Cartridges for weapons, blank	1.2C,15	1	930630
	0012	Cartridges for weapons, inert projectile	1.4S,47	1.4	930630
	0328	Cartridges for weapons, inert projectile	1.2C,15	1	930630
	0339	Cartridges for weapons, inert projectile	1.4C,37	1.4	930630
	0417	Cartridges for weapons, inert projectile	1.3C,27	1	930630
	0049	Cartridges, flash	1.1G,9	1+13	360490
	0050	Cartridges, flash	1.3G,30	1	360490
	0277	Cartridges, oil well	1.3C,27	1	930630
	0278	Cartridges, oil well	1.4C,37	1.4	930630
	0275	Cartridge, power device	1.3C,27	1	930630
	0276	Cartridges, power device	1.4C,37	1.4	930630
	0323	Cartridges, power device	1.4S,47	1.4	930630
	0381	Cartridges, power device	1.2C,15	1	930630
	0054	Cartridges, signal	1.3G,30	1	360490
	0312	Cartridges, signal	1.4G,43	1.4	360490

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0405	Cartridges, signal	1.4S,47	1.4	360490
	0012	Cartridges, small arms	1.4S,47	1.4	930630
	0339	Cartridges, small arms	1.4C,37	1.4	930630
	0417	Cartridges, small arms	1.3C,27	1	930630
	0014	Cartridges, small arms, blank	1.4S,47	1.4	930630
	0327	Cartridges, small arms, blank	1.3C,27	1	930630
	0338	Cartridges, small arms, blank	1.4C,37	1.4	930630
	0055	Cases, cartridge, empty, with primer	1.4S,47	1.4	930690
	0379	Cases, cartridge, empty, with primer	1.4C,37	1.4	930690
	0446	Cases, combustible, empty, without primer	1.4C,37	1.4	930690
	0447	Cases, combustible, empty, without primer	1.3C,27	1	930690
90	2969	**Castor beans or castor meal or castor pomace or castor flake**	9,35(b)	9	120890 120730 230690
80	1719	**Caustic alkali liquid, n.o.s.**	8,42(b),(c)	8	**
80	1814	**Caustic potash**	8,42(b),(c)	8	281520
80	1824	**Caustic soda**	8,42(b),(c)	8	281512
423	3292	**Cells, containing sodium**	4.3,31(b)	4.3	8506**
40	2000	Celluloid, in blocks, rods, rolls, sheets, tubes, etc., except scrap	4.1,3(c)	4.1	391220
40	2002	**Celluloid, scrap**	4.2,4(c)	4.2	391220
		Cereal grains, impregnated with pesticide or other toxic substance	6.1, *See Note 2b to section F*		
40	1333	Cerium, slabs, ingots or rods	4.1,13(b)	4.1	811299
423	3078	**Cerium, turnings or gritty powder**	4.3,13(b)	4.3	811299
	0457	Charges, bursting, plastics bonded	1.1D,5	1+13	930690
	0458	Charges, bursting, plastics bonded	1.2D,17	1	930690
	0459	Charges, bursting, plastics bonded	1.4D,39	1.4	930690
	0460	Charges, bursting, plastics bonded	1.4S,47	1.4	930690
	0048	Charges, demolition	1.1D,5	1+13	930690
	0056	Charges, depth	1.1D,5	1+13	930690
	0442	Charges, explosive, commercial without detonator	1.1D,5	1+13	930690
	0443	Charges, explosive, commercial without detonator	1.2D,17	1	930690
	0444	Charges, explosive, commercial without detonator	1.4D,39	1.4	930690

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0445	Charges, explosive, commercial without detonator	1.4S,47	1.4	930690
	0271	Charges, propelling	1.1C,3	1+13	930690
	0272	Charges, propelling	1.3C,27	1	930690
	0415	Charges, propelling	1.2C,15	1	930690
	0491	Charges, propelling	1.4C,39	1.4	930690
	0242	Charges, propelling, for cannon	1.3C,27	1	930690
	0279	Charges, propelling, for cannon	1.1C,3	1+13	930690
	0414	Charges, propelling, for cannon	1.2C,15	1	930690
	0059	Charges, shaped, commercial without detonator	1.1D,5	1+13	930690
	0439	Charges, shaped, commercial without detonator	1.2D,17	1	930690
	0440	Charges, shaped, commercial without detonator	1.4D,39	1.4	930690
	0441	Charges, shaped, commercial without detonator	1.4S,47	1.4	930690
	0237	Charges, shaped, flexible, linear	1.4D,39	1.4	930690
	0288	Charges, shaped, flexible, linear	1.1D,5	1+13	930690
	0060	Charges, supplementary, explosive	1.1D,5	1+13	930690
90	3316	Chemical kit	9,36(b),(c)	9	382200
66	3315	Chemical sample, toxic, liquid or solid	6.1,90(a)	6.1	***
		Chinomethionate (pesticide), see under Pesticide, etc.			
69	2075	**Chloral, anhydrous, inhibited**	6.1,17(b)	6.1	291300
50	1458	**Chlorate and borate mixture**	5.1,11(b)	5.1	284290
50	1459	**Chlorate and magnesium chloride mixture**	5.1,11(b)	5.1	284290
50	3210	**Chlorates, inorganic, aqueous solution, n.o.s.**	5.1,11(b),(c)	5.1	282919
50	1461	**Chlorates, inorganic, n.o.s.**	5.1,11(b)	5.1	282919
		Chlordane (pesticide), see Organochlorine pesticides			
		Chlordimeform (pesticide), see Organochlorine pesticides			
		Chlordimeform hydrochloride (pesticide), see Organichlorine pesticides			
		Chlorfenvinphos (pesticide), see Organophosphorus pesticides			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
50	2626	**Chloric acid, aqueous solution with not more than 10 % chloric acid** Chloric acid with more than 10 % chloric acid: *Not be to be accepted for carriage*	5.1,4(b)	5.1	281119
268	1017	**Chlorine**	2, 2TC	6.1+8(+13)	280110
265	2548	**Chlorine plentafluoride**	2,2TOC	6.1+05+8	281210
265	1749	**Chlorine trifluoride**	2,2TOC	6.1+05+8(+13)	281210
80	1908	**Chlorine solution**	8,61(b),(c)	8	282890
50	1462	**Chlorites, inorganic, n.o.s.**	5.1, 14(b)	5.1	282890
		Chlormephos (pesticide), see Organophosphorus pesticides			
		Chloro-methoxyethyl mercury (pesticide), see Mercury-based pesticides			
		Chloro-phenoxyacetic pesticides, see Phenoxy pesticides			
66	2232	**Chloroacetaldehyde**	6.1,17(a)	6.1	291300
		Chloroacetic acid mixture, see Corrosive liquid, acidic, organic, n.o.s.			
68	1750	**Chloroacetic acid solution**	6.1,27(b)	6.1+8	291540
68	3250	**Chloroacetic acid, molten**	6.1,24(b)2	6.1+8	291540
68	1751	**Chloroacetic acid, solid**	6.1,27(b)	6.1+8	291540
663	1695	**Chloroacetone, stabilized**	6.1,10(a)	6.1+3+8	291470
63	2668	**Chloroacetonitrile**	6.1,11(b)	6.1+3	292690
60	1697	**Chloroacetophenone**	6.1,17(b)	6.1	291479
668	1752	**Chloroacetyl chloride**	6.1,27(a)	6.1+8	291590
		2-Chloroacrylonitrile, see Flammable liquid, toxic, n.o.s.			
60	2019	**Chloroanilines, liquid**	6.1,12(b)	6.1	292142
60	2018	**Chloroanilines, solid**	6.1,12(b)	6.1	292142
60	2233	**Chloroanisidines**	6.1,17(c)	6.1	292250
		Chlorobenzaldehyde, liquid, see Toxic liquid, organic, n.o.s.			
		Chlorobenzaldehyde, solid, see Toxic solid, organic, n.o.s.			
		o-Chlorobenzaldehyde, see Toxic liquid, organic, n.o.s.			
30	1134	**Chlorobenzene**	3,31(c)	3	290361
30	2234	**Chlorobenzotrifluorides**	3,31(c)	3	290369
		o-Chlorobenzoyl chloride, see Corrosive liquid, acidic, organic, n.o.s.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		p-Chlorobenzoyl chloride, see Corrosive liquid, acidic, organic, n.o.s.			
60	2235	**Chlorobenzyl chlorides**	6.1,17(c)	6.1	290369
60	2688	**1-Chloro-3-bromopropane**	6.1,15(c)	6.1	290349
33	1127	**Chlorobutanes**	3,3(b)	3	290319
60	2669	**Chlorocresols**	6.1,14(b)	6.1	290810
		3-Chloro-4-diethylaminobenzenediazonium zinc chloride, see Self-reactive solid, type D			
20	1974	**Chlorodifluorobromemethane (refrigerant gas R 12B1)**	2,2A	2(+13)	290346
23	2517	**1-Chloro-11-difluoroethane (refrigerant gas R 142b)**	2,2F	3(+13)	290349
20	1018	**Chlorodifluoromethane (refrigerant gas R 22)**	2,2A	2(+13)	290349
20	1973	**Chlorodifluoromethane and chloropentafluoroethane mixture with fixed boiling point, with approximately 49 % chlorodifluoromethane (refrigerant gas R 502)**	2,2A	2(+13)	382471
		Chlorodimethyl sulphate, see Toxic liquid, organic, n.o.s.			
60	1577	**Chlorodinitrobenzenes**	6.1,12(b)	6.1	290490
		Chloroethyl isocyanate, see Isocyanates, toxic, flammable, n.o.s.			
60	1888	**Chloroform**	6.1,15(c)	6.1	290313
638	2742	**Chloroformates, toxic, corrosive, flammable, n.o.s.**	6.1,28(b)	6.1+3+8	291590
68	3277	**Chloroformates, toxic, corrosive, n.o.s.**	6.1,27(b)	6.1+8	291590
68	2745	**Chloromethyl chloroformate**	6.1,27(b)	6.1+8	291590
336	2354	**Chloromethyl ethyl ether**	3,16(b)	3+6.1	290919
60	2236	**3-Chloro-4-methylphenyl isocyanate**	6.1,19(b)	6.1	292910
60	2237	**Chloronitroanilines**	6.1,17(c)	6.1	292142
60	1578	**Chloronitrobenzenes**	6.1,12(b)	6.1	290490
		1-Chloro-1-nitropropane, see Toxic liquid, organic n.o.s.			
60	2433	**Chloronitrotoluenes**	6.1,17(c)	6.1	290490
20	1020	**Chloropentafluoroethane (refrigerant gas R 115)**	2,2A	2(+13)	290344
		3-Chloroperoxybenzoic acid, see Organic peroxide type B, solid			
		3-Chloroperoxybenzoic acid, see Organic peroxide type D, solid			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Chlorophacinone (pesticide), see Organochlorine pesticides			
		2-Chlorophenol, see Chlorophenols, liquid			
		4-Chlorophenol, see Chlorophenols, liquid			
80	2904	**Chlorophenolates, liquid**	8,62(c)	8	290711
80	2905	**Chlorophenolates, solid**	8,62(c)	8	290810
60	2021	**Chlorophenols, liquid**	6.1,17(c)	6.1	290810
60	2020	**Chlorophenols, solid**	6.1,17(c)	6.1	290810
		3-Chlorophenyl isocyanate, see Isocyanates, toxic, n.o.s.			
		4-Chlorophenyl isocyanate, see Isocyanates, toxic, n.o.s.			
X80	1753	**Chlorophenyl trichlorosilane**	8,36(b)	8	293100
66	1580	**Chloropicrin**	6.1,17(a)	6.1	290490
26	1581	**Chloropicrin and methyl bromide mixture**	2,2T	6.1	294200
26	1582	**Chloropicrin and methyl chloride mixture**	2,2T	6.1	294200
66/60	1583	**Chloropicrin mixture, n.o.s.**	6.1,17(a),(b),(c)	6.1	290490
80	2507	**Chloroplatinic acid, solid**	8,16(c)	8	281119
336	1991	**Chloroprene, inhibited**	3,16(a)	3+6.1	2912**
33	1278	**1-Chloropropane**	3,2(b)	3	290319
33	2356	**2-Chloropropane**	3,2(a)	3	290319
60	2849	**3-Chloropropanol-1**	6.1,17(c)	6.1	290550
33	2456	**2-Chloropropene**	3,1(a)	3	290329
80	2511	**2-Chloropropionic acid**	8,32(c)	8	291590
60	2822	**2-Chloropyridine**	6.1,12(b)	6.1	293339
		Chloropyriphos (pesticide), see Organophosphorus pesticides			
X83	2986	**Chlorosilanes, corrosive, flammable, n.o.s.**	8,37(b)	8+3	293100
X80	2987	**Chlorosilanes, corrosive, n.o.s.**	8,36(b)	8	293100
X333	2985	**Chlorosilanes, flammable, corrosive, n.o.s.**	3,21(b)	3+8	293100
X338	2988	**Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.**	4.3,1(a)	4.3+3+8	293100
X88	1754	**Chlorosulphonic acid**	8,12(a)	8	280620
20	1021	**1-Chloro-1,2,2,2-tetrafluoroethane (refrigerant gas R 124)**	2,2A	2(+13)	290349

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Chlorothiophos (pesticide), see Organophosphorus pesticides			
30	2238	**Chlorotoluenes**	3,31(c)	3	290369
60	1579	**4-Chloro-o-toluidine hydrochloride**	6.1,17(c)	6.1	292143
60	2239	**Chlorotoluidines**	6.1,17(c)	6.1	292143
		1-Chloro-1,2,2-trifluoroethane (refrigerant R 133) *Not subject to RID*	2,2A *Note*		
20	1983	**1-Chloro-2,2,2-trifluoroethane (refrigerant R 133a)** *Not subject to RID*	2,2A	2(+13)	290349
		1-Chloro-1,1,2-trifluoroethane (refrigerant R 133b) *Not subject to RID*	2,2A *Note*		
263	1082	**Chlorotrifluoroethylene, inhibited**	2,2TF	6.1+3(+13)	290345
20	1022	**Chlorotrifluoromethane (refrigerant gas R 13)**	2,2A	2(+13)	290345
20	2599	**Chlorotrifluoromethane and trifluoromethane azeotropic mixture, with approximately 60 % chlorotrifluoromethane (refrigerant gas R 503)**	2,2A	2(+13)	382471
		Chlorotrifluoropyrimidine, see Toxic liquid organic, n.o.s.			
		5-Chlorovaleric acid, see Corrosive liquid, acidic, organic, n.o.s.			
80	1755	**Chromic acid solution**	8,17(b),(c)	8	281910
		Chromic acid, solid, see Chromium trioxide, anhydrous			
80	1757	**Chromic fluoride solution**	8,8(b),(c)	8	282619
80	1756	**Chromic fluoride, solid**	8,9(b)	8	282619
		Chromium carbonyl, see Metal carbonyls, n.o.s.			
50	2720	**Chromium nitrate**	5.1,22(c)	5.1	283429
X88	1758	**Chromium oxychloride**	8,12(a)	8	282749
58	1463	**Chromium trioxide, anhydrous**	5.1,31(b)	5.1+8	281910
88	2240	**Chromosulphuric acid**	8,1(a)	8	340290
X88	1758	**Chromyl chloride**	8,12(a)	8	282749
90	2590	**Chrysotile**	9,1(c)	9	252400
		Cinnabar: *Not subject to RID*	6.1,52, *Note 2*		
606	3291	**Clinical waste, unspecified, n.o.s.**	6.2,4(b)	6.2	382490
263	1023	**Coalg gas, compressed**	2,1TF	6.1+3(+13)	270500
33	1136	**Coal tar distillates, flammable**	3,3(b)	3	2707**

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	1136	**Coal tar distillates, flammable**	3,31(c)	3	2707**
		Coal tar naphtha, see Petroleum distillates, n.o.s.			
		Coals tar oil, flammable, see Coal tar distillates			
33/30	1139	**Coating solution (includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining)**	3,5(a),(b),(c), 31(c)	3	321000
		Cobalt carbonyl, see Metal carbonyls, n.o.s.			
		Cobalt catalyst, dry, see Metal catalyst, dry			
		Cobalt catalyst, wetted, see Metal catalyst, wetted			
		Cobalt chloride, see Toxic solid, inorganic, n.o.s.			
40	2001	**Cobalt naphthenates, powder**	4.1,12(c)	4.1	291639
40	1318	**Cobalt resinate, precipitated Colchicine, see Alkaloids, solid, n.o.s.**	4.1,12(c)	4.1	380620
		Collodion solutions, see Nitrocellulose solution, flammable			
	0382	Components, explosive train, n.o.s.	1.2B, 13	1+13	360300
	0383	Components, explosive train, n.o.s.	1.4B, 35	1.4	360300
	0384	Components, explosive train, n.o.s.	1.4S, 47	1.4	360300
	0461	Components, explosive train, n.o.s.	1.1B, 1	1+13	360300
23	1954	**Compressed gas, flammable, n.o.s.**	2,1F	3(+13)	**
20	1956	**Compressed gas, n.o.s.**	2,1A	2(+13)	**
25	3156	**Compressed gas, oxidizing, n.o.s.**	2,1O	2+05(+13)	**
268	3304	**Compressed gas, toxic, corrosive, n.o.s.**	2,1TC	6.1+8(+13)	**
263	3305	**Compressed gas, toxic, flammable, corrosive, n.o.s.**	2,1TFC	6.1+3+8(+13)	**
263	1953	**Compressed gas, toxic, flammable, n.o.s.**	2,1TF	6.1+3=(+13)	**
26	1955	**Compressed gas, toxic, n.o.s.**	2,1T	6.1(+13)	**
265	3306	**Compressed gas, toxic, oxidizing, corrosive, n.o.s.**	2,1TOC	6.1+05+8(+13)	**
265	3303	**Compressed gas, toxic, oxidizing, n.o.s.**	2,1TO	6.1+05(+13)	**
	0248	Contrivances, water-activated with burster, expelling charge or propelling charge	1.2L,25	1+13	930690
	0249	Contrivances, water-activated with burster, expelling charge or propelling charge	1.3L,34	1+13	930690

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	1585	**Copper acetoarsenite**	6.1,51(b)	6.1	284290
60	1586	**Copper arsenite**	6.1,51(b)	6.1	284290
336	2776	**Copper based pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663/63	3009	**Copper based pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3010	**Copper based pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2775	**Copper based pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
		Copper catalyst, dry, see Metal catalyst, dry			
		Copper catalyst, wetted, see Metal catalyst, wetted			
50	2721	**Copper chlorate**	5.1,11(b)	5.1	282919
80	2802	**Copper chloride**	8,11(c)	8	282739
60	1587	**Copper cyanide**	6.1,41(b)	6.1	283719
		Copper oxychloride (pesticide), see Copper based pesticides			
		Copper selenate, see Selenates			
		Copper selinite, see Selenites			
		Copper sulphate (pesticide), see Copper base pesticides			
40	1363	**Copra**	4.2,2(c)	4.2	120300
	0102	Cord (fuse), detonating, metal clad	1.2D,17	1	360300
	0290	Cord (fuse), detonating, metal clad	1.1D,5	1+13	360300
	0104	Cord (fuse), detonating, mild effect, metal clad	1.4D,39	1.4	360300
	0065	Cord, detonating, flexible	1.1D,5	1+13	360300
	0289	Cord, detonating, flexible	1.4D,39	1.4	360300
	0066	Cord, igniter	1.4G,43	1.4	360300
88/80	3264	**Corrosive liquid, acidic, inorganic, n.o.s.**	8,17(a),(b),(c)	8	**
88/80	3265	**Corrosive liquid, acidic, organic, n.o.s.**	8,40(a),(b),(c)	8	**
88/80	3266	**Corrosive liquid, acidic, organic, n.o.s.**	8,47(a),(b),(c)	8	**
88/80	3267	**Corrosive liquid, acidic, organic, n.o.s.**	8,56(a),(b),(c)	8	**
883/83	2920	**Corrosive liquid, flammable, n.o.s.**	8,68(a),(b)	8+3	**
88/80	1760	**Corrosive liquid, n.o.s.**	8,66(a),(b),(c)	8	**
885/85	3093	**Corrosive liquid, oxidizing, n.o.s.**	8,74(a),(b)	8+05	**
884/84	3301	**Corrosive liquid, self-heating, n.o.s.**	8,70(a),(b)	8+4.2	**

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
886/86	2922	**Corrosive liquid, toxic, n.o.s.**	8,76(a),(b),(c)	8+6.1	**
823	3094	**Corrosive liquid, water-reactive, n.o.s.**	8,72(a),(b)	8+4.3	**
88/80	3260	Corrosive solid, acidic, inorganic, n.o.s.	8,16(a),(b),(c)	8	**
88/80	3261	**Corrosive solid, acidic, organic, n.o.s.**	8,39(a),(b),(c)	8	**
88/80	3262	**Corrosive solid, basic, inorganic, n.o.s.**	8,46(a),(b),(c)	8	**
88/80	3263	**Corrosive solid, basic, organic, n.o.s.**	8,55(a),(b),(c)	8	**
884/80	2921	**Corrosive solid, flammable, n.o.s.**	8,67(a),(b)	8+4.1	**
88/80	1759	**Corrosive solid, n.o.s.**	8,65(a),(b),(c)	8	**
885/85	3084	**Corrosive solid, oxidizing, n.o.s.**	8,73(a),(b)	8+0.5	**
885/84	3095	Corrosive solid, self-heating, n.o.s.	8,69(a),(b)	8+4.2	**
886/86	2923	**Corrosive solid, toxic, n.o.s.**	8,75(a),(b),(c)	8+6.1	**
842	3096	Corrosive solid, water-reactive, n.o.s.	8,71(a),(b)	8+4.3	**
40	1364	**Cotton waste, oily**	4.2,3(c)	4.2	5202299
40	1365	**Cotton, wet**	4.2,3(c)	4.2	520100
		Coumachlor (pesticide), see Coumarin derivative pesticides			
		Coumafuryl (pesticide), see Coumarin derivative pesticides			
		Coumaphos (pesticide), see Coumarin derivative pesticides			
336	3024	**Coumarin derivative pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663/63	3025	**Coumarin derivative pesticide, liquid, toxic, flammable, flash point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3026	**Coumarin derivative pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	3027	**Coumarin derivative pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
		Coumatetralyl (Racumin) (pesticide), see Coumarin derivative pesticides			
68	2076	**Cresols**	6.1,27(b)	6.1+8	290712
		Cresols, alkaline solutions, see Corrosive liquid, n.o.s.			
68	2022	**Cresylic acid**	6.1,27(b)	6.1+8	290712
		Crimidin (pesticide), see Organochlorine pesticides			
90	2212	**Crocidolite**	9,1(b)	9	252400
663	1143	**Crotonaldehyde, stabilized**	6.1,8(a)	6.1+3	291219
80	2823	**Crotonic acid**	8,31(c)	8	291619

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
339	1144	**Crotonylene** Crotoxyphos (pesticide), see Organophosphorus pesticides Crufomate (pesticide), see Organophosphorus pesticides	3,1(a)	3	290129
30	1918	**Cumene** Cumyl hydroperoxide, see Organic peroxide type E, liquid Cumyl hydroperoxide, see Organic peroxide type F, liquid	3,31(c)	3	290270
86	1761	**Cupriethylenediamine solution**	8,53(b),(c)	8+6.1	292121
	0070	Cutters, cable, explosive Cyanazine (pesticide), see Triazine pesticides	1.4S,47	1.4	930690
66/60	1935	**Cyanide solution, n.o.s.**	6.1,41(a),(b),(c)	6.1	283719
66/60	1588	Cyanides, inorganic, solid, n.o.s.	6.1,41(a),(b),(c)	6.1	283719
263	1026	**Cyanogen**	2,2TF	6.1+3(+13)	292690
668	1889	**Cyanogen bromide**	6.1,27(a)	6.1+(8)	292690
268	1589	**Cyanogen chloride, inhibited** Cyanophos (pesticide), see Organophosphorus pesticides	2,2TC	6.1+8	292690
80	2670	**Cyanuric chloride**	8,39(b)	8	293369
23	2601	**Cyclobutane**	2,2F	3(+13)	290219
638	2744	**Cyclobutyl chloroformate**	6.1,28(b)	6.1+3+8	291590
60	2518	**1,5,9-Cyclododecatriene**	6.1,25(c)	6.1	290219
33	2241	**Cycloheptane**	3,3(b)	3	290219
336	2603	**1,3,5-Cycloheptatriene**	3,19(b)	3+6.1	290219
33	2242	**Cycloheptene**	3,3(b)	3	290219
33	145	**Cyclohexane**	3,3(b)	3	290211
30	1915	**Cyclohexanone** Cyclohexanone peroxide(s), see Organic peroxide type C, solid Cyclohexanone peroxide(s), see Organic peroxide type D, liquid Cyclohexanone peroxide(s), see Organic peroxide type D, solid	3,31(c)	3	291422
33	2256	**Cyclohexene**	3,3(b)	3	290219
X80	1762	**Cyclohexenyltrichlorosilane** Cycloheximide (pesticide), see under Pesticide, etc.	8,36(b)	8	293100
30	2243	**Cyclohexyl acetate** Cyclohexyl chloroformate, see Chloroformates, toxic, corrosive, flammable, n.o.s.	3,31(c)	3	291539

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
663	2488	**Cyclohexyl isocyanate**	6.1,18(a)	6.1+3	292910
30	3054	**Cyclohexyl mercaptan**	3,31(c)	3	293090
83	2357	**Cyclohexylamine**	8,54(b)	8+3	292130
X80	1763	**Cyclochexyltrichlorosilane**	8,36(b)	8	293100
		Cyclonite, see Cyclotrimethylenetrinitramine			
30	2520	**Cyclooctadienes**	3,31(c)	3	290219
33	2358	**Cyclooctatetraene**	3,3(b)	3	290219
33	1146	**Cyclopentane**	3,3(b)	3	290219
30	2244	**Cyclopentanol**	3,31(c)	3	290619
30	2245	**Cyclopentanone**	3,31(c)	3	291429
33	2246	**Cyclopentene**	3,2(b)	3	290219
23	1027	**Cyclopropane**	2,2F	3(+13)	290219
	0226	Cyclotetramethylenetetranitramine (HMX, octogen), wetted with not less than 15 % water, by mass	1.1D,4	1+15	360200
	0484	Cyclotetramethylenetetranitramine (octogen; HMX), desensitized	1.1D,4	1	360200
	0391	Cyclotrimethylenetrinitramine (cyclonite; hexogen; RDX) and cyclotetramethylenetranitramine (HMX; octogen) mixture, desensitized with not less than 10 % phlegmatizer, by mass	1.1D,4	1+15	360200
	0391	Cyclotrimethylenetrinitramine (cyclonite; hexogen; RDX) and cyclotetramethylenetranitramine mixture, wetted with not less than 15 % water, by mass	1.1D,4	1+15	360200
	0483	Cyclotrimethylenetrinitramine (cyclonite; hexogen; RDX), desensitized	1.1D,4	1+13	360200
	0072	Cyclotrimethylenetrinitramine, (cyclonite; hexogen; RDX) wetted with not less than 15 % water by mass	1.1D,4	1+13	360200
		Cyhexatin (Tricyclohexyl-tin hydroxide) (pesticide), see Organotin pesticides			
30	2046	**Cymenes**	3,31(c)	3	290290
		Cypermethrin (pesticide), see under Pesticide, etc.			
		2,4-D (pesticide), see Phenoxy pesticides			
		Dazomet (pesticide), see under Pesticide, etc.			
		2,4-DB (pesticide), see Phenoxy pesticides			
		DDT (pesticide), see Organochlorine pesticides			
43	1866	**Decaborane**	4.1,16(b)	4.1+6.1	285000
30	1147	**Decahydronaphtalene**	3,31(c)	3	290219
30	1147	**Decalin**	3,31(c)	3	290219

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	2247	**1-Decane** DEF (pesticide), see Organophosphorus pesticides	3,31(c)	3	290110
	0132	Deflagrating metal salts of aromatic nitro-derivatives, n.o.s. Demephion (pesticide), see Organophosphorus pesticides Demeton (pesticide), see Organophosphorus pesticides Demeton-O (Systox) (pesticide), see Organophosphorus pesticides Demeton-O-methyl (pesticide), see Organophosphorus pesticides Demeton-S-methyl (pesticide), see Organophosphorus pesticides Demeton-S-methyl-sulfone (pesticide), see Organophosphorus pesticides	1.3C,26	1+13	360200
	0360	Detonator assemblies, non-electric for blasting	1.1B,1	1+13	3603300
	0361	Detonator assemblies, non-electric for blasting	1.4B,35	1.4	360300
	0500	Detonator assemblies, non-electric for blasting	1.4S,47	1.4	360300
	0364	Detonators for ammunition	1.2B,13	1+13	360300
	0365	Detonators for ammunition	1.4B,35	1.4	360300
	0366	Detonators for ammunition	1.4S,47	1.4	360300
	0073	Detonators for ammunition	1.1B,1	1+13	360300
	0030	Detonators, electric for blasting	1.1B,1	1+13	360300
	0255	Detonators, electric for blasting	1.4B,35	1.4	360300
	0456	Detonators, electric for blasting	1.4S,47	1.4	360300
	0029	Detonators, non-electric for blasting	1.1B,1	1+13	360300
	0267	Detonators, non-electric for blasting	1.4B,35	1.4	360300
	0455	Detonators, non-electric for blasting	1.4S,47	1.4	360300
23	1957	**Deuterium, compressed**	2,1F	3(+13)	284590
23	3150	Devices, small, hydrocarbon gas powered Di-(1-hydroxycyclohexyl) peroxide, see Organic peroxide type D, solid Di-(2-phenoxyethyl) peroxydicarbonate, see Organic peroxide type B, solid Di-(2-phenoxyethyl) peroxydicarbonate, see Organic peroxide type D, solid Di-(2-tert-butylperoxyisopropyl)benzene(s), see Organic peroxide type D, solid Di-(4-methylbenzoyl)peroxide, see Organic peroxide type D, solid Di-(tert-butylperoxy)phthalate, see Organic peroxide type D, liquid	2,6F	3	***

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Di-(tert-butylperoxy)phthalate, see Organic peroxide type D, solid			
		Di-(tert-butylperoxy)phthalate, see Organic peroxide type E, liquid			
		Di-2,4-dichlorobenzoyl peroxide, see Organic peroxide type B, solid			
		Di-2,4-dichlorobenzoyl peroxide, see Organic peroxide type D, solid			
		Di-4-chlorobenzoyl peroxide, see Organic peroxide type B, solid			
		Di-4-chlorobenzoyl peroxide, see Organic peroxide type D, solid			
		Di-allate (pesticide), see Carbamate pesticides			
		Di-isopropylbenzene dihydroperoxide, see Organic peroxide type D, solid			
36	2841	**Di-n-amylamine**	3,32(c)	3+6.1	292119
		Di-n-butyl ether, see Dibutyl ethers			
83	2248	**Di-n-butylamine**	8,54(b)	8+3	292119
60	2650	**1,1-Dichloro-1-nitroethane**	6,1,17(b)	6.1	290490
33	2372	**1,2-Di(dimethylamino)ethane**	3,3(b)	3	292130
33	2384	**Di-n-propyl ether**	3,3(b)	3	290919
		Di-tert-amyl peroxide, see Organic peroxide type E, liquid			
		Di-tert-butyl peroxide, see Organic peroxide type E, liquid			
		Di-tert-butyl peroxide, see Organic peroxide type F, liquid			
		Di-tert-butyl peroxyazelate, see Organic peroxide type D, liquid			
		1,1-Di-(tert-amylperoxy)cyclohexane, see Organic peroxide type C, liquid			
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane, see Organic peroxide type B, liquid			
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane, see Organic peroxide type D, solid			
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane, see Organic peroxide type E, liquid			
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane, see Organic peroxide type C, liquid			
		1,1-Di-(tert-butylperoxy)cylcohexane, see Organic peroxide type B, liquid			
		1,1-Di-(tert-butylperoxy)cyclohexane, see Organic peroxide type C, liquid			
		1,1-Di-(tert-butylperoxy)cyclohexane, see Organic peroxide type D, liquid			
		1,1-Di-(tert-butylperoxy)cyclohexane, see Organic peroxide type E, liquid			
		1,1-Di-(tert-butylperoxy)cyclohexane, see Organic peroxide type F, liquid			

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	1148	**Diacetone alcohol, chemically pure**	3,31(c)	3	291440
33	1148	**Diacetone alcohol, technically pure**	3,3(b)	3	291440
33	2346	**Diacetyl** Dialifos (pesticide), see Organophosphorus pesticides	3,3(b)	3	291419
336	2360	**Diallyl ether**	3,17(b)	3+8+6.1	292119
338	2359	**Diallylamine**	3,27(b)	3+8+6.1	292119
60	2651	**4,4'-Diaminodiphenylmethane** **Diazinon (pesticide), see Organophosphorus pesticides**	6.1,12(c)	6.1	292159
40	3222	**2-Diazo-1-naphthol-4-sulphochloride**	4.1,32(b)	4.1	***
40	3222	**2-Diazo-1-naphthol-5-sulphochloride**	4.1,32(b)	4.1	***
	0074	Diazonitrophenol, wetted with not less than 40 % water, or mixture of alchohol and water by mass: *Not to be accepted for carriage* Dibenzoyl peroxide, see Benzoyl peroxide Dibenzoyl peroxide, see Organic peroxide type B, solid Dibenzoyl peroxide, see Organic peroxide type C, solid Dibenzoyl peroxide, see Organic peroxide type D, solid Dibenzoyl peroxide, see Organic peroxide type E, liquid Dibenzoyl peroxide, see Organic peroxide type E, solid Dibenzoyl peroxide, see Organic peroxide type F, liquid	1.1A, *See marg. 100(8)*		
X80	2434	**Dibenzyldichlorosilane**	8,36(b)	8	293100
263	1911	Diborane	2,1TF	6.1+3	285000
60	2648	**1,2-Dibromobutan-3-one** 1,2-Dibromo-3-chrloropropane (pesticide), see Organochlorine pesticides 1,2-Dibromo-3-chloropropane, see Dibromochloropropanes	6.1,17(b)	6.1	291470
60	2872	**Dibromochloropropanes**	6.1,15(b),(c)	6.1	290349
90	1941	**Dibromodifluoromethane**	9,33(c)	9	290347
60	2664	**Dibromomethane**	6.1,15(c)	6.1	290330
30	1149	**Dibuthyl ethers** Dibutyl tin chloride, see Organotin compound, solid, n.o.s. Dibutyl tin compounds (other than dibutyl tin chloride), see Organotin compound, solid, n.o.s.	3,31(c)	3	290919
60	2873	**Dibutylaminoethanol** Dichlofenthion (pesticide), see Organophosphorus pesticides	6.1,12(c)	6.1	292219

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	1764	**Dichloracetic acid 8,32(b)1**	8,32(b)1	8	291540
60	2649	**1,3-Dichloroacetone**	6.1,17(b)	6.1	291470
X80	1765	**Dichloroacetyl chloride**	8,35(b)1	8	291590
60	1590	**Dichloroanilines**	6.1,12(b)	6.1	292142
60	1591	**o-Dichlorobenzene**	6.1,15(c)	6.1	290361
63	1916	**2,2'-Dichlorodiethyl ether**	6.1,16(b)	6.1+3	290919
20	1028	**Dichlorodifluoromethane (refrigerant gas R 12)**	2,2A	2(+13)	290342
20	2602	**Dichlorodifluoromethane and 1,1-difluoroethane, azeotropic mixture, with approximately 74 % dichlorodifluoromethane (refrigerant gas R 500)**			
20	3070	**Dichlorodifluoromethane and ethylene oxide mixture with not more than 12,5 % ethylene oxide**	2,2A	2(+13)	291010
	2249	Dichlorodimethyl ether, symmetrical: *Not to be accepted for carriage*	6.1,26(a), *Note*		
33	1184	**1,1-Dichloroethane**	3,3(b)	3	290319
33	2362	**1,1-Dichloroethane**	3,16(b)	3+6.1	290315
33	1150	**1,2-Dichloroethylene**	3,3(b)	3	290329
63	1916	**2,2'-Dichloroethyl ether**	6.1,16(b)	6.1+3	290919
20	1029	**Dichlorofluoromethane (refrigerant gas R 21)**	2,2A	2(+13)	290349
50	2465	**Dichloroisocyanuric acid salts**	5.1,26(b)	5.1	293369
50	2465	**Dichloroisocyanuric acid, dry**	5.1,26(b)	5.1	293369
60	2490	**Dichlorisopropyl ether**	6.1,17(b)	6.1	290919
60	1593	**Dichloromethane**	6.1,15(c)	6.1	290312
30	1152	**Dichloropentanes**	3,31(c)	3	290319
		Dichlorophenols, liquid, see Chlorophenols, liquid			
		Dichlorophenols, solid, see Chlorophenols, solid			
50	2250	**Dichlorophenyl isocyanates**	6.1,19(b)	6.1	292910
X80	1766	**Dichlorophenyltrichlorosilane**	8,36(b)	8	293100
33	1279	**1,2-Dichloropropane**	3,3(b)	3	290316
60	2750	**1,3-Dichloropropanol-2**	6.1,17(b)	6.1	290550
33/30	2047	**Dichloropropenes**	3,3(b),31(c)	3	290329
		Dichloroquinoxaline-carbonyl chloride, see Corrosive solid, acidic, organic, n.o.s.			

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
263	2189	**Dichlorosilane**	2,2TFC	6.1+3+8,(+13)	293100
20	1958	**1,2-Dichloro-1,1,2,2-tetrafluoroethane (refrigerant gas R 114)** Dichlorotoluidines, see Toxic solid, organic, n.o.s. Dichlorvos (pesticide), see Organophosphorus pesticides Dicoumarol (pesticide), see Coumarin derivative pesticides Dicrotophos (pesticide), see Organophosphorus pesticides Dicumyl peroxide, see Organic peroxide type F, solid	2,2A	2(+13)	290344
339	2251	**Dicycloheptadiene**	3,3(b)	3	290219
80	2251	**Dicyclohexylamine**	8,53(c)	8	292130
40	2687	**Dicyclohexylammonium nitrite**	4.1,11(c)	4.1	292130
30	2048	**Dicyclopentadiene**	3,31(c)	3	290219
50	1465	**Didymium nitrate** Dieldrin (pesticide), see Organochlorine pesticides	5.1,22(c)	5.1	283429
30	1202	**Diesel fuel**	3,31(c)	3	274100
33	1088	**1,1-Diethoxyethane**	3,3(b)	3	291100
30	1153	**1,2-Diethoxyethane**	3,31(c)	3	290919
33	2373	**Diethoxymethane**	3,3(b)	3	290919
33	2374	**3,3-Diethoxypropene**	3,3(b)	3	291100
60	2432	**N,N-Diethylaniline**	6.1,12(c)	6.1	292142
30	2366	**Diethyl carbonate**	3,31(c)	3	292090
83	2685	**N,N-Diethylethylenediamine**	8,54(b)	8+3	292129
33	1155	**Diethyl ether**	3,2(a)	3	290911
33	1156	**Diethyl ketone**	3,3(b)	3	291419
60	1594	**Diethyl sulphate**	6.1,14(b)	6.1	292090
33	2375	**Diethyl sulphide**	3,3(b)	3	293090
338	1154	**Diethylamine** Diethylaminoacetonitrile, see Toxic liquid, organic n.o.s.	3,22(b)	3+8	292112
83	2686	**Diethylaminoethanol**	8,54(b)	8+3	292219
38	2684	**Diethylaminopropylamine**	3,33(c)	3+8	292129
30	2049	**Diethylbenzene**	3,31(c)	3	290290
X83	1767	**Diethyldichlorosilane**	8,37(b)	8+3	293100
80	2579	**Diethylenediamine**	8,52(c)	8	293390

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0075	Diethyleneglycol dinitrate, desensitized with not less than 25 % non-volatile, water-insoluble phlegmatizer, by mass			
80	2079	**Diethylenetriamine**	8,53(b)	8	292129
80	2751	**Diethylthiophosphoryl chloride**	8,35(b)1	8	292010
X333	1366	**Diethylzinc**	4.2,31(a)	4.2+4.3	293100
		Difenacoum (pesticide), see Coumarin derivative pesticides			
		Difenzoquat (pesticide), see under Pesticide, etc.			
23	2517	**1,1-Difluoro-1-chloroethane (refrigerant gas R 142b)**	2,2F	3(+13)	290349
23	1030	**1,1-Difluoroethane (refrigerant gas R 152a)**	2,2F	3(+13)	290330
239	1959	**1,1-Difluoroethylene (refrigerant gas R 1132a)**	2,2F	3(+13)	290330
23	3252	**Difluoromethane (refrigerant R32)**	2,2F	3(+13)	290330
80	1768	**Difluorophosphoric acid, anhydrous**	8,8(b)	8	281119
		2.2-Dihydroperoxypropane, see Organic peroxide type B, solid			
33	2376	**2,3-Dihydropyran**	3,3(b)	3	290920
		Diisoamyl ether, see Flammable liquid n.o.s.			
30	1157	**Diisobutyl ketone**	3,31(c)	3	291419
38	2361	**Diisobutylamine**	3,33(c)	3+8	292119
33	2050	**Diisobutylene, isomeric compounds**	3,3(b)	3	290129
80	1902	**Diisooctyl acid phosphate**	8,38(c)	8	291900
33	1159	**Diisopropyl ether**	3,3(b)	3	290919
338	1158	**Diisopropylamine**	3,22(b)	3+8	292119
663	2521	**Diketene, inhibited**	6.1,13(a)	6.1+3	291450
		Dilauroyl peroxide, see Organic peroxide type D, solid			
		Dilauroyl peroxide, see Organic peroxide type F, liquid			
		Dimefox (pesticide), see Organophosphorus pesticides			
		Dimetan (pesticide), see Carbamate pesticides			
		Dimethoate (pesticide), see Organophosphorus pesticides			
33	2377	**1,1-Dimethoxyethane**	3,3(b)	3	291100
33	2252	**1,2-Dimethoxyethane**	3,3(b)	3	291100
33	1234	**Dimethoxymethane**	3,2(b)	3	291100
336	2378	**2-Dimethylaminoacetonitrile**	3,11(b)	3+6.1	292690

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
83	2051	**2-Dimethylaminoethanol**	8,54(b)	8+3	292219
60	3302	**2-Dimethylaminoethyl acrylate**	6.1,12(b)	6.1	292250
69	2522	**2-Dimethylaminoethyl methacrylate**	6.1,12(b)	6.1	292219
60	2253	**N,N-Dimethylaniline** 2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane, see Organic peroxide type B, solid 2,5-Dimethyl-2,5-di-(benzoylperoxyl)hexane, see Organic peroxide type C, solid 2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane, see Organic peroxide type D, solid	6.1,12(b)	6.1	292142
33	2457	**2,3-Dimethylbutane**	3,3(b)	3	290110
338	2379	**1,3-Dimethylbutylamine**	3,22(b)	3+8	292119
33	1161	**Dimethyl carbonate** 2,5-Dimethyl-2,5-dihydroperoxyhexane, see Organic peroxide type C, solid	3,3(b)	3	292090
33	2381	**Dimethyl disulphide**	3,3(b)	3	293090
23	1033	**Dimethyl ether**	2,2F	3(+13)	290919
668	1595	**Dimethyl sulphate**	6.1,27(a)	6.1+8	292090
33	1164	**Dimethyl sulphide** Dimethyl tin chloride, see Organotin compound, liquid, n.o.s.	3,2(b)	3	293090
338	2266	**Dimethyl-N-propylamine**	3,22(b)	3+8	292119
338	1160	**Dimethylamine aqueous solution**	3,22(b)	3+8	292111
23	1032	**Dimethylamine, anhydrous**	2,2F	3(+13)	292111
33/30	1307	**Dimethylbenzenes** 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane, see Organic peroxide type D, liquid 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane, see Organic peroxide type E, solid 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane, see Organic peroxide type F, liquid 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane, see Organic peroxide type D, liquid 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexyne-3, see Organic peroxide type C, liquid 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexyne-3, see Organic peroxide type D, solid	3,3(b),31(c)	3	2902**
80	2262	**Dimethylcarbamoyl chloride**	8,35(b)1	8	291590

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	2263	**Dimethylcyclohexanes**	3,3(b)	3	290219
83	2264	**Dimethylcyclohexylamine**	8,54(b)	8+3	292130
X338	1162	**Dimethyldichlorosilane**	3,21(b)	3+8	293100
33	2380	**Dimethyldiethoxysilane**	3,3(b)	3	293100
33/30	2707	**Dimethyldioxanes**	3,3(b),31(c)	3	233299
30	2265	**N,N-Dimethylformamide**	3,31(c)	3	292410
663	2382	**Dimethylhydrazine, symmetrical**	6.1,7(a)2	6.1+3	292800
663	1163	**Dimethylhydrazine, unsymmetrical**	631,7(a)1	6.1+3+8	292800
23	2044	**2,2-Dimethylpropane** Dimethylpyridine, see Toxic liquid, flammable, organic, n.o.s.	2,2F	3(+13)	290110
263	1953	**Dimethylsilane**	2,1TF	6.1+3(+13)	**
68	2267	**Dimethylthiophosphoryl chloride** 2,5-Dimethyl-2,5-di-(3,5,5-trimethylhexanoylperoxy)hexane, see Organic peroxide type D, liquid	6.1,27(b)	6.1+8	292010
X333	1370	**Dimethylzinc** Dimetilan (pesticide), see Carbamate pesticides Dimexano (pesticide), see under Pesticide, etc.	4.2,31(a)	4.2+4.3	293100
60	1598	**Dinitro-o-cresol** Dinitro-o-cresol (pesticide), see Substituted nitrophenol pesticides	6.1,12(b)	6.1	380830
60	1596	**Dinitroanilines**	6.1,12(b)	6.1	292142
60	1597	**Dinitrobenzenes**	6.1,12(b)	6.1	290420
265	1067	**Dinitrogen tetroxide (nitrogen dioxide)**	2,2TOC	6.1+05+8 (+13)	281129
	0489	**Dinitroglycoluril (DINGU)**	1.1D,4	1+13	360200
60	1599	**Dinitrophenol solution**	6.1,12(b),(c)	6.1	360200
	0076	Dinitrophenol, dry or wetted with less than 15 % water, by mass	1.1D,4	1+6,1+13	360200
46	1320	Dinitrophenol, wetted with not less than 15 % water by mass	4.1,22(a)1	4.1+6.1	360200
	0077	Dinitrophenolates, alkali metals, dry or wetted with less than 15 % water, by mass	1.3C,26	1+6,1+13	360200
46	1321	Dinitrophenolates, wetted with not less than 15 % water, by mass	4.1,22(a)1	4.1+6.1	360200
	0078	Dinitroresorcinol, dry or wetted less than 15 % water, by mass	1.1D,4	1+13	360200
40	1322	Dinitroresorcinol, wetted with not less than 15 % water, by mass	4.1,21(a)1	4.1	360200

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0406	Dinitrosobenzene N,N'-Dinitroso-N,N'-dimethylterephthalamide, see Self-reactive solid, type C N,N'-Dinitrosopentamethylenetetramine, see Self-reactive solid, type C	1.3C,26	1+13	360200
60	2038	**Dinitrotoluenes**	6.1,12(b)	6.1	290420
60	1600	**Dinitrotoluenes, molten** Dinobuton (pesticide), see Substituted nitrophenol pesticides Dinoseb (pesticide), see Substituted nitrophenol pesticides Dinoseb acetate (pesticide), see Substituted nitrophenol pesticides Dinoterb (pesticide), see Substituted nitrophenol pesticides Dinoterb acetate (pesticide), see Substituted nitrophenol pesticides Dioxacarb (pesticide), see Carbamate pesticides	6.1,24(b)1	6.1	290420
33	1165	**Dioxane** Dioxathion (pesticide), see Organophosphorus	3,3b	3	293299
33	1166	**Dioxolane**	3,3(b)	3	293299
30	2052	**Dipentene** Diphacinone (pesticide), see under Pesticide, etc.	3,31(c)	3	290219
66	1698	**Diphenylamine chloroarsine**	6.1,34(a)	6.1	293490
66	1699	**Diphenylchloroarsine**	6.1,34(a)	6.1	293100
X80	1769	**Diphenyldichlorosilane**	8,36(b)	8	293100
80	1770	**Diphenylmethyl bromide** Diphenyloxide-4,4'-disulphonyldrazide, see Self-reactive solid, type D	8,65(b)	8	290330
	0401	Dipicryl sulphide, dry or wetted with less than 10 % water, by mass	1.1D,4	1+13	360200
40	2852	Dipicryl sulphide, wetted with not less than 10 % water, by mass Dipicrylamine, see Hexanitrodiphenylamine Dipropyl acid phosphate, see Corrosive liquid, acidic, organic n.o.s. 4-Dipropylaminobenzenediazonium zinc chloride, see Self-reactive solid, type D	4.1,21(a)2	4.1	360200
30	2710	**Dipropyl ketone**	3,31(c)	3	291419
338	2383	**Dipropylamine**	3,22(b)	3+8	292119
80	2269	**Dipropylenetriamine**	8,53(c)	8	292129

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Diquat (pesticide), see Bipyridilium pesticides			
88/80	1903	**Disinfectant, liquid, corrosive, n.o.s.**	8,66(a),(b),(c)	8	380840
66/60	3142	**Disinfectant, liquid, toxic, n.o.s.**	6.1,25(a),(b),(c)	6.1	380840
66/60	1601	**Disinfectant, solid, toxic, n.o.s.**	6.1,25(a),(b),(c)	6.1	380840
80	3253	**Disodium trioxosilicate** Distearyl peroxydicarbonate, see Organic peroxide type D, solid Disuccinic acid peroxide, see Organic peroxide type B, solid Disulfoton (pesticide), see Organophosphorus pesticides Disulphur dichloride, see Sulphur chlorides	8,41(c)	8	283911
336	2772	**Dithiocarbamate pesticide, liquid, flammable, toxic, flash-point less than 23 *°C***	3,41(a),(b)	3+6.1	380810
663/63	3005	**Dithiocarbamate pesticide, liquid, toxic, flammable, flash-point not less than 23 *°C***	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3006	**Dithiocarbamate pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2771	**Dithiocarbamate pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
339	1167	**Divinyl ether inhibited** DNOC (pesticide), see Substituted nitrophenol pesticides	3,2(a)	3	290919
X80	1771	**Dodecyltrichlorosilane** Drazoxolon (pesticide), see Under Pesticide, etc.	8,36(b)	8	293100
88/80	2801	**Dye intermediate, liquid, corrosive, n.o.s.**	8,66(a),(b),(c)	8	**
66/60	1602	**Dye intermediate, liquid, toxic, n.o.s.**	6.1,25(a),(b),(c)	6.1	321000
80	3147	**Dye intermediate, solid, corrosive, n.o.s.**	8,65(b),(c)	8	**
66/60	3143	**Dye intermediate, solid, toxic, n.o.s.**	61,25(a),(b),(c)	6.1	**
88/80	2801	**Dye, liquid, corrosive, n.o.s.**	8,66(a),(b),(c)	8	320649
66/60	1602	**Dye, liquid, toxic, n.o.s.**	6.1.,25(a),(b),(c)	6.1	321000
80	3147	**Dye, solid, corrosive, n.o.s.**	8,65(b),(c)	8	320649
66/60	3143	**Dye, solid, toxic, n.o.s.** Edifenphos (pesticide), see Organophosphorus pesticides	6.1,25(a),(b),(c)	6.1	321000
30	3256	**Elevated temperature liquid, flammable, n.o.s. with flash-point above 61 *°C at or above its flash-point***	3,61(c)	3	**
99	3257	**Elevated temperature liquid, n.o.s., at or above 100 *°C and, for a substance with a flash-point, below its flash-point (including molten metals, molten salts, etc.)***	9,20(c)	9	**
99	3258	**Elevated temperature solid, n.o.s., at or above 240 *°C***	9,21(c)	9	**
*	*	Empty demountable tanks	2,8	*	***

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
*		Empty battery wagons	2,8	*	*
*		Empty receptacles	2,8	*	*
	—	Empty IBCs	3,71	*	860900
	—	Empty IBCs	4.1,51	*	860900
	—	Empty IBCs	4.2,41	*	860900
	—	Empty IBCs	4.3,41	*	860900
	—	Empty IBCs	5.1,41	*	860900
539	—	Empty IBCs	5.2,31	*	860900
	—	Empty IBCs	6.1,91	*	860900
	—	Empty IBCs	6.2,11	*	860900
	—	Empty IBCs	8,91	*	860900
90	—	Emtpy IBCs	9,71	*	860900
*		Empty tank wagons	2,8	*	*
*	*	Empty tank wagons	3,71	*	***
*	*	Empty tank wagons	4.1,51	*	***
*	*	Empty tank wagons	4.2,41	*	***
*	*	Empty tank wagons	4.3,41	*	***
*	*	Empty tank wagons	5.1,41	*	***
539	*	Empty tank wagons	5.2,31	*	***
*	*	Empty tank wagons	6.1,91	*	***
*	*	Empty tank wagons	5.2,11	*	***
*	*	Empty tank wagons	8,91	*	***
90	*	Empty tank wagons	9,71	*	***
		Empty small containers	4.1,51	*	860900
		Empty small containers	4.2,41	*	860900
		Empty small containers	4.3,41	*	860900
		Empty small containers	5.1,41	*	860900
		Empty small containers	6.1,91	*	860900
		Empty small containers	8,91	*	860900
*		Empty tank-containers	2,8	*	*
*	*	Empty tank-containers	3,71	*	***
*	*	Empty tank-containers	4.1,51	*	***
*	*	Empty tank-containers	4.2,41	*	***
*	*	Empty tank-containers	4.3,41	*	***
*	*	Empty tank-containers	5.1,41	*	***
539	*	Empty tank-containers	5.2,31	*	***

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
*	*	Empty tank-containers	6.1,91	*	***
*	*	Empty tank-containers	6.2,11	*	***
*	*	Empty tank-containers	8,91	*	***
90	*	Empty tank-containers	9,71	*	***
	—	Empty packagings	1,91	*	**
		Empty packagings	3,71	*	**
	—	Empty packagings	4.1,51	*	**
	—	Empty packagings	4.2,41	*	**
	—	Empty packagings	4.3,41	*	**
	—	Empty packagings	5.1,41	*	**
539	—	Empty packagings	5.2,31	*	**
		Empty packagings	6.1,91	*	**
		Empty packagings	6.2,11	*	**
		Empty packagings	8,91	*	**
90	—	Empty packagings	9,71	9	**
	*	Empty wagons	4.1,51	*	—
	*	Empty wagons	4.2,41	*	—
	*	Empty wagons	4.3,41	*	-
	*	Empty wagons	5.1,41	*	—
	*	Empty wagons	6.1,91	*	—
	*	Empty wagons	6.2,11	*	—
	*	Empty wagons	8,91	*	—
		Endosulfan (pesticide), see Organochlorine pesticides			
		Endothal-sodium (pesticide), see under Pesticide, etc.			
		Endothion (pesticide), see Organophosphorus pesticides			
		Endrin (pesticide), see Organochlorine pesticides			
	3166	Engines, internal combustion, including when fitterd in machinery or vehicles: *Not subject to RID*	9, *See marg. 900(3)*		
90	3082	**Environmentally hazardous substance, liquid, n.o.s.**	9,11(c)	9	**
90	3077	**Environmentally hazardous substance, solid, n.o.s.**	9,12(c)	9	**
663	2558	**Epibromohydrin**	6.1,16(a)	6.1+3	291090
63	2023	**Epichlorohydrin**	6.1,16(b)	6.1+3	291030
		EPN (pesticide), see Organophosphorus pesticides			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	2752	**1,2-Epoxy-3-ethoxypropane**	3,31(c)	3	291090
33/30	3272	**Esters, n.o.s.**	3,3(b),31(c)	3	**
33	1089	**Ethanal**	3,1(a)	3	291212
23	1035	**Ethane**	2,2F	3(+13)	290110
223	1961	**Ethane, refrigerated liquid**	2,3F	3(+13)	290110
33/30	1170	**Ethanol or Ethanol solution**	3,3(b),31(c)	3	220710
80	2491	**Ethanolamine or Ethanolamine solution**	8,53(c)	8	292211
33/30	3271	**Ethers, n.o.s.**	3,3(b),31(c)	3	2909**
		Ethion (pesticide) see Organophosphorus pesticides			
		Ethoate-methyl (pesticide), see Organophosphorus pesticides			
		Ethoprophos (pesticide), see Organophosphorus pesticides			
		2-(N,N-Ethoxycarbonylphenylamino)-3-methoxy-4-(N-methyl-N-cyclohexylamino)-benzene diazonium zinc chloride, see Self-reactive solid, type D			
30	1171	**2-Ethoxyethanol**	3,31(c)	3	290944
30	1172	**2-Ethoxyethyl acetate**	3,31(c)	3	291590
30	1935	**Ethyl 2-chloropropionate**	3,31(c)	3	291590
		Ethyl 3,3-di-(tert-amylperoxy)butyrate, see Organic peroxide type D, liquid			
		Ethyl 3,3-di-(tert-butylperoxy)butyrate, see Organic peroxide type D, solid			
		Ethyl 3,3-di-(tert-butylperoxy)butyrate, see Organic peroxide type C, liquid			
33	1173	**Ethyl acetate**	3,3(b)	3	291531
339	1917	**Ethyl acrylate, inhibited**	3,3(b)	3	291612
33/30	1170	**Ethyl alcohol**	3,3(b),31(c)	3	220710
33/30	1170	**Ethyl alcohol solution**	3,3(b),31(c)	3	220710
30	2271	**Ethyl emyl ketones**	3,31(c)	3	291419
60	2272	**N-Ethylaniline**	6.1,12(c)	6.1	292142
60	2273	**2-Ethylaniline**	6.1,12(c)	6.1	292142
60	2274	**N-Ethyl-N-benzylaniline**	6.1,12(c)	6.1	292142
60	2753	**N-Ethylbenzyltoluidines**	6.1,12(c)	6.1	292143
		N-Ethylbutylamine, see Flammable liquid, n.o.s.			
33	1176	**Ethyl borate**	3,3(b)	3	292090
60	1891	**Ethyl bromide**	6.1,15(b)	6.1	290330
63	1603	**Ethyl bromoacetate**	6.1,16(b)	6.1+3	291590
30	2275	**2-Ethylbutanol**	3,31(c)	3	290519

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	1179	**Ethyl butyl ether**	3,3(b)	3	290919
33	1178	**2-Ethylbutyraldehyde**	3,3(b)	3	291219
30	1180	**Ethyl butyrate**	3,31(c)	3	291560
23	1037	**Ethyl chloride**	2,2F	3(+13)	290311
63	1181	**Ethyl chloroacetate**	6.1,16(b)	6.1+3	291590
663	1182	**Ethyl chloroformate**	6.1,10(a)	6.1+3+8	291590
83	2826	**Ethyl chlorothioformate**	8,64(b)	8+3	291590
33	1862	**Ethyl crotonate**	3,3(b)	3	291590
60	2666	**Ethyl cyanoacetate**	6.1,12(c)	6.1	291590
33	1155	**Ethyl ether** Ethyl fluid, see Motor fuel anti-knock mixture	3,2(a)	3	290911
23	2453	**Ethyl fluoride (refrigerant gas R 161)**	2,2F	3(+13)	290330
33	1190	**Ethyl formate** **2-Ethyl hexaldehyde, see Octyl aldehydes, flammable** **2-Ethylhexyl chloride, see Flammable liquid, n.o.s.**	3,3(b)	3	291513
68	2748	**2-Ethylhexyl chloroformate**	6.1,27(b)	6.1+8	291590
38	2276	**2-Ethylhexylamine**	3,33(c)	3+8	292119
33	2385	**Ethyl isobutyrate**	3,3(b)	3	291590
336	2481	Ethyl isocyanate Ethyl isothiocyanate, see Toxic liquid, flammable, organic, n.o.s.	3,13	3+6.1	292910
30	1192	**Ethyl lactate**	3,31(c)	3	291819
33	2363	**Ethyl mercaptan**	3,2(a)	3	293090
339	2277	**Ethyl methacrylate**	3,3(b)	3	291614
23	1039	**Ethyl methyl ether**	2,2F	3+(13)	290919
33	1193	**Ethyl methyl ketone**	3,3(b)	3	291412
336	1194	**Ethyl nitrite solution**	3,15(a)	3+6.1	292090
30	2524	**Ethyl orthoformate**	3,31(c)	3	291513
60	2525	**Ethyl oxalate**	6.1,14(c)	6.1	291711
33	1195	**Ethyl propionate**	3,3(b)	3	291550
33	2615	**Ethyl propyl ether**	3,3(b)	3	290919
239	2452	**Ethylacetylene, inhibited**	3,3(b)	3	292090
23	1036	**Ethylamine**	2,2F	3(+13)	290129
338	2270	**Ethylamine, aqueous solution with not less than 50 % but not more than 70 % ethylamine**	3,22(b)	3+8	292119

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	1175	**Ethylbenzene**	3,3(b)	3	290260
30	1177	**Ethylbutyl acetate**	3,31(c)	3	291590
66	1892	**Ethyldichloroarsine**	6.1,34(a)	6.1	293100
X338	1183	**Ethyldichlorosilane**	4.3,1(a)	4.3+3+8	293100
		Ethyldiphenylphosphine, see Toxic liquid organic, n.o.s.			
663	1135	**Ethylene chlorohydrin**	6.1,16(a)	6.1+3	290550
66	1605	**Ethylene dibromide**	6.1,15(a)	6.1	290330
66	1647	**Ethylene dibromide and methyl bromide mixture, liquid**	6.1,15(a)	6.1	382490
336	1184	**Ethylene dichloride**	3,16(b)	3+6.1	290315
30	1153	**Ethylene glycol diethyl ether**	3,31(c)	3	290919
30	1171	**Ethylene glycol monoethyl ether**	3,31(c)	3	290944
30	1172	**Ethylene glycol monoethyl ether acetate**	3,31(c)	3	291590
30	1188	**Ethylene glycol monomethyl ether**	3,31(c)	3	290942
30	1189	**Ethylene glycol monomethyl ether acetate**	3,31(c)	3	291539
263	1040	Ethylene oxide	2,2TF	6.1+3	291010
20	1952	**Ethylene oxide and carbon dioxide mixture with not more than 9 % ethylene oxide**	2,2A	2(+13)	281121
263	3300	**Ethylene oxide and carbon dioxide mixture with more than 87 % ethylene oxide**	2,2TF	6.1+3(+13)	291010
239	1041	**Ethylene oxide and carbon dioxide mixture with more than 9 % but not more than 87 % ethylene oxide**	2,2F	3(+13)	291010
20	3297	**Ethylene oxide and chlorotetrafluoroethane mixture with not more than 8,8 % ethylene oxide**	2,2A	2(+13)	291010
20	3070	**Ethylene oxide and dichlorodifluoromethane mixture with not more than 12,5 % ethylene oxides**	2,2A	2(+13)	291010
263	1953	**Ethylene oxide and methyl formate mixtures**	2,1TF	6.1+3(+13)	**
20	3298	**Ethylene oxide and pentafluoroethane mixture with not more than 7,9 % ethylene oxide**	2,2A	2(+13)	291010
336	2983	**Ethylene oxide and propylene oxide mixture, with not more than 30 % ethylene oxide**	3,17(a)	3+6.1	291020
20	3299	**Ethylene oxide and tetrafluoroethane mixture with not more than 5,6 % ethylene oxide**	2,2A	2(+13)	291010

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
263	1040	**Ethylene oxide with nitrogen up to a total pressure of 1 Mpa (10 bar) at 50°C**	2,2TF	6.1+3(+13)	291010
223	3138	**Ethylene, acetylene and propylene mixture, refrigerated liquid containing at least 71,5 % ethylene with not more than 22,5 % acetylene and not more than 6 % propylene**	2,3F	3(+13)	271119
23	1962	**Ethylene, compressed**	2,1F	3(+13)	290121
223	1038	**Ethylene, refrigerated liquid**	2,3F	3(+13)	290121
83	1604	**Ethylenediamine**	8,54(b)	8+3	292121
663	1185	**Ethyleneimine, inhibited**	6.1,4	6.1+3	293390
33	2362	**Ethylidene chloride**	3,3(b)	3	290319
X80	2435	**Ethylphenyldichlorosilane**	8,36(b)	8	293100
338	2386	**1-Ethylpiperidine**	3,23(b)	3+8	293390
		2-Ethylthiophene, see Toxic, liquid, flammable, organic, n.o.s.			
60	2754	**N-Ethyltoluidines**	6.1,12(b)	6.1	292143
		Ethyltriacetoxysilane, see corrosive liquid, acidic, organic, n.o.s.			
X338	1196	**Ethyltrichlorosilane**	3,21(b)	3+8	293100
	0081	Explosive, blasting, type A	1.1D,4	1+13	360100
	0082	Explosive, blasting, type B	1.1D,4	1+13	360200
	0331	Explosive, blasting, type B	1.5D,48	1.5	360200
	0083	Explosive, blasting, type C	1.1D,4	1+13	360200
	0084	Explosive, blasting, type D	1.1D,4	1+13	360200
	0241	Explosive, blasting, type E	1.1D,4	1+13	360200
	0332	Explosive, blasting, type E	1.5D,48	1.5	360200
33/30	1169	Extracts, aromatic, liquid	3,5(a),(b),(c), 31(c)	3	330190
33/3030	1197	**Extracts, flavouring, liquid**	3,5(a),(b),(c), 31(c)	3	130219
		Fenaminosulph (pesticide), see under Pesticide, etc.			
		Fenaminphos (pesticide), see Organophosphorus pesticides			
		Fenitrothion (pesticide), see Organophosphorus pesticides			
		Fenpropathrin (pesticide), see under Pesticide, etc.			
		Fensulfothion (pesticide), see Organophosphorus pesticides			
		Fenthion (pesticide), see Organophosphorus pesticides			
		Fentin acetate (pesticide), see Organotin pesticides			
		Fentin hydroxide (pesticide), see Organotin pesticides			
60	1606	**Ferric arsenate**	6.1,51(b)	6.1	284290

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	1607	**Ferric arsenite**	6.1,51(b)	6.1	284290
		Ferric chloride hexahydrate: *Not subject to RID*	8,11(c),*Note*		
80	2582	**Ferric chloride solution**	8,5(c)	8	282733
80	1773	**Ferric chloride, anhydrous**	8,11(c)	8	282733
50	1466	**Ferric nitrate**	5.1,22(c)	5.1	283429
		Ferricyanides: *Not subject to RID*	6.1,41,*Note*		
40	1323	**Ferrocerium**	4.1,13(b)	4.1	720299
		Ferrocerium, stabilized against corrosion, with a minimum iron content of 10 %: *Not subject to RID*	4.1,13(b),*Note 1*		
		Ferrocyanides: *Not subject to RID*	6.1,41,*Note*		
462	1408	**Ferrosilicon**	4.3,15(c)	4.3+6.1	72022*
60	1608	**Ferrous arsenate**	6.1,51(b)	6.1	284290
40	2793	**Ferrous metal borings, shavings, turnings or cuttings**	4.2,12(c)	4.2	**
40	1373	**Fibres or fabrics animal or vegetable or synthetic, n.o.s., with oil**	4.2,3(c)	4.2	**
40	1353	Fibres or fabrics impregnated with weakly nitrated nitrocellulose, n.o.s.	4.1,3(c)	4.1	391220
40	1324	Films, nitrocellulose base, gelatin coated, except scrap	4.1,3(c)	4.1	391220
80	1774	Fire extinguisher charges, corrosive liquid	8,82(b)	8	842410
20	1044	Fire extinguishers, with compressed or liquefied gas	2,6A	2	842410
40	2623	Firelighters, solid with flammable liquid	4.1,2(c)	4.1	360690
	0333	Fireworks	1.1G,9	1+13	360410
	0334	Fireworks	1.2G,21	1	360410
	0335	Fireworks	1.3G,30	1	360410
	0336	Fireworks	1.4G,43	1.4	360410
	0337	Fireworks	1.4S,47	1.4	360410
90	3316	First aid kit	9,36(b),(c)	9	382200
263	2600	**Fischer Tropsch gas**	2,1TF	6.1+3(+13)	270500
	2216	Fish meal (fisch scrap), stabilized: *Not subject to RID*	9, *See marg.900(3)*		
40	1374	Fish meal (fisch scrap), unstabilized	4.2,2(b)	4.2	230120
338/38	2924	**Flammable liquid, corrosive, n.o.s.**	3,26(a),(b),33(c)	3+8	**
33/30	1993	**Flammable liquid, n.o.s.**	3,1(a),2(a),2(b), 3(b),5(c),31(c)	3	**
368	3286	**Flammable liquid, toxic, corrosive, n.o.s.**	3,27(a),(b)	3+6.1+8	**
336/36	1992	**Flammable liquid, toxic, n.o.s.**	3,19(a),(b),32(c)	3+6.1	**
48	3180	**Flammable solid, corrosive, inorganic, n.o.s.**	4.1,17(b),(c)	4.1+8	**

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
48	2925	**Flammable solid, corrosive, organic, n.o.s.**	4.1,8(b),(c)	4.1+8	**
40	3178	**Flammable solid, inorganic, n.o.s.**	4.1,11(b),(c)	4.1	**
44	3176	**Flammable solid, organic, molten, n.o.s**	4.1,5	4.1	**
40	1325	**Flammable solid, organic, n.o.s.**	4.1,6(b),(c)	4.1	**
	3097	Flammable solid, oxidizing, n.o.s.: *Not to be accepted for carriage*	4.1, *See marg. 400(11)*		
46	3179	**Flammable solid, toxic, inorganic, n.o.s.**	4.1,16(b),(c)	4.1+6.1	**
46	2926	**Flammable solid, toxic, organic, n.o.s.**	4.1,7(b),(c)	4.1+6.1	**
	0093	Flares, aerial	1.3G,30	1	360490
	0403	Flares, aerial	1.4G,43	1.4	360490
	0404	Flares, aerial	1.4S,47	1.4	360490
	0420	Flares, aerial	1.1G,9	1+13	360490
	0421	Flares, aerial	1.2G,21	1	360490
	0092	Flares, surface	1.3G,30	1	360490
	0418	Flares, surface	1.1G,9	1+13	360490
	0419	Flash, surface	1.2G,21	1	360490
	0094	Flash powder	1.1G,8	1+13	360490
	0305	Flares powder	1.3G,29	1	360490
		Flowers of sulphur, see Sulphur			
		Fluoracetamide (pesticide), see under Pesticide, etc.			
		Fluorides, soluble in water, see Toxic solid, inorganic, n.o.s.			
265	1045	**Fluorine, compressed**	2,1TOC	6.1+05+8	280130
66	2642	**Fluoroacetic acid**	6.1,17(a)	6.1	291590
60	2941	**Fluoroanilines**	6.1,12(c)	6.1	292142
33	2387	**Fluorobenzene**	3,3(b)	3	290369
80	1775	**Fluoroboric acid**	8,8(b)	8	281119
80	1776	**Fluorophosphoric acid, anhydrous**	8,8(b)	8	281119
60	2856	**Fluorosilicates, n.o.s.**	6.1,64(c)	6.1	282690
80	1778	**Fluorosilicic acid**	8,8(b)	8	281119
88	1777	**Fluorosulphonic acid**	8,8(a)	8	281119
33	2388	**Fluorotoluenes**	3,3(b)	3	290369
		Fonofos (pesticide), see Organophosphorus pesticides			
80	2209	**Formaldehyde solution with not less than 25 % formaldehyde**	8,63(c)	8	291211
38	1198	**Formaldehyde solution, flammable**	3,33(c)	3+8	291211
		Formaldehyde solutions, non-flammable, with less than 25 % formaldehyde	8,63(c), *Note*		
80	1779	**Formic acid**	8,32(b)1	8	291511
		Formothion (pesticide), see Organophosphorus pesticides			
	0099	Fracturing devices, explosive without detonator, for oil wells			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
			1.1D,5	1+13	930690
33/30	1863	**Fuel, aviation, turbine engine**	3,1(a),2(a),2(b), 3(b),31(c)	3	272600 273100
		Fulminates of mercury: *Not to be accepted for carriage*	6.1,52,*Note 3*		
80	1780	**Fumaryl chloride**	8,35(b)1	8	291590
33	2389	**Furan**	3,1(a)	3	293219
63	1199	**Furfural**	6.1,13(b)	6.1+3	293212
63	1199	**Furfuraldehydes**	6.1,13(b)	6.1+3	293212
60	2874	**Furfuryl alcohol**	6.1,14(c)	6.1	293213
		Furfuryl mercaptan, see Tosic liquid, flammable, organic, n.o.s.			
38	2526	**Furfurylamine**	3,33(c)	3+8	292250
	0103	Fuse, igniter, tubular, metal clad	1.4G,43	1.4	360300
	0101	Fuse, non detonating	1.3G,30	1	360300
	0105	**Fuse, satefy**	1.4S,47	1.4	360300
33/30	1201	**Fusel oil**	3,3(b),31(c)	3	382490
	0106	Fuzes, detonating	1.1B,1	1+13	360300
	0107	Fuzes, detonating	1.2B,13	1+13	360300
	0257	Fuzes, detonating	1.4B,35	1.4	360300
	0367	Fuzes, detonating	1.4S,47	1.4	360300
	0408	Fuzes, detonating with protective features	1.1D,5	1+13	360300
	0409	Fuzes, detonating with protective features	1.2D,17	1	360300
	0410	Fuzes, detonating with protective features	1.4D,39	1.4	360300
	0368	Fuzes, igniting	1.4S,47	1.4	360300
	0316	Fuzes, igniting	1.3G,30	1	360300
	0317	Fuzes, igniting	1.4G,43	1.4	360300
80	2803	**Gallium**	8,65(c)	8	811299
		Gas cartridges, without a release device, non-refillable: see Receptacles, small, containing gas			
		Gas drips, hydrocarbon, see Hydrocarbons, liquid			
30	1202	**Gas oil**	3,31(c)	3	274200
23	3167	Gas sample, non-pressurized, flammable, n.o.s., not refrigerated liquid	2,7F	3	**
263	3168	Gas sample, non-pressurized, toxic, flammable, n.o.s., not refrigerated liquid	2,7TF	6.1+3	**
26	3169	Gas sample, non-pressurized, toxic, n.o.s., not refrigerated liquid	2,7TF	6.1	**
223	3312	**Gas, refrigerated liquid, flammable, n.o.s.**	2,3A	2(+13)	**
225	3331	**Gas, refrigerated liquid, oxidizing, n.o.s.**	2,3O	2+05(+13)	**
33	1203	**Gasoline**	3,3(b)	3	272400
90	3245	Genetically modified micro-organisms	9,13(b)	9	**
		Genetically modified organisms	9,14		

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
263	2192	Germane	2,2TF	6.1+3	285000
60	2689	**Glycerol alpha-monochlorohydrin**	6.1,17(c)	6.1	290550
336	2622	**Glycidaldehyde**	3,17(b)	3+6.1	291249
	0284	Grenades, hand or rifle, with bursting charge	1.1D,5	1+13	930690
	0285	Grenades, hand or rifle, with bursting charge	1.2D,17	1	930690
	0292	Grenades, hand or rifle, with bursting charge	1.1F,7	1+13	930690
	0293	Grenades, hand or rifle, with bursting charge	1.2F,19	1+13	930690
	0110	Grenades, practice, hand or rifle	1.4S,47	1.4	930690
	0318	Grenades, practice, hand or rifle	1.3G,30	1	930690
	0372	Grenades, practice, hand or rifle	1.2G,21	1	930690
	0452	Grenades, practice, hand or rifle	1.4G,43	1.4	930690
50	1467	**Guanidine nitrate**	5.1,22(c)	5.1	292520
	0113	Guanyl nitrosaminoguanylidene hydrazine, wetted with not less than 30 % water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100(8)*		
	0114	Guanyl nitrosaminoguanyltetrazene (tetrazene), wetted with not less than 30 % water, or mixture of alcohol and water, by mass: *Not to be accepted for carriage*	1.1A,*See marg. 100(8)*		
		Gunpowder, see Black powder			
43/40	2545	Hafnium powder, dry	4.2,12(a),(b),(c)	4.2	811291
40	1326	**Hafnium powder, wetted with not less than 25 % water (a visible excess of water must be present) — (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns**	4.1,13(b)	4.1	811291
30	1202	**Heating oil, light**	3,31(c)	3	274300
23	1957	**Heavy hydrogen**	21F	3(+13)	284590
20	1046	**Helium, compressed**	2,1A	2(+13)	280429
22	1963	**Helium, refrigerated liquid,**	2,3A	2(+13)	280429
		Heptachlor (pesticide), see Organochlorine pesticides			
		Heptafluorobutyric acid, see Corrosive liquid, acidic, organic, n.o.s.			
20	3296	**Heptafluoropropane (refrigerant gas R 227)**	2,2A	2(+13)	290330
30	3056	**n-Heptaldehyde**	3,31(c)	3	291219
33	1206	**Heptanes**	3,3(b)	3	290110
33	2278	**n-Heptene**	3,3(b)	3	290129
		Heptenophos (pesticide), see Organophosphorus pesticides			
60	2661	**Hexachloroacetone**	6.1,17(c)	6.1	291470

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	2729	**Hexachlorobenzene**	6.1,15(c)	6.1	290362
60	2279	**Hexachlorobutadiene**	6.1,15(c)	6.1	290329
66	2646	**Hexachlorocyclopentadiene**	6.1,15(a)	6.1	290359
60	2875	**Hexachlorophene**	6.1,15(c)	6.1	290810
X80	1781	**Hexadecyltrichlorosilane**	8,36(b)	8	293100
33	2458	**Hexadiene**	3,3(b)	3	290129
60	1611	**Hexaethyl tetraphosphate**	6.1,23(b)	6.1	291900
26	1612	**Hexaethyl tetraphosphate and compressed gas mixture**	2,1T	6.1+(13)	291900
268	2420	**Hexafluoroacetone**	2,2TC	6.1+8(+13)	291470
60	2552	**Hexafluoroacetone hydrate**	6.1,17(b)	6.1	291470
20	2193	**Hexafluoroethane, compressed (refrigerant gas R 116, compressed)**	2,1A	2(+13)	290330
80	1782	**Hexafluorophosphoric acid**	8,8(b)	8	281119
20	1858	**Hexafluoropropylene (refrigerant gas R 1216)**	2,2A	2(+13)	290330
30	1207	**Hexaldehyde**	3,31(c)	3	291219
60	2281	**Hexamethylene diisocyanate**	6.1,19(b)	6.1	292910
80	2280	**Hexamethylenediamine, solid**	8,52(c)	8	292122
80	1783	**Hexamethylenediamine solution**	8,53(b),(c)	8	292122
338	2493	**Hexamethyleneimine**	3,23(b)	3+8	292520
40	1328	**Hexamethylenetetramine**	4.1,6(c)	4.1	293390
		3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane, see Organic peroxide type B, solid			
		3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane, see Organic peroxide type D, liquid			
		3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane, see Organic peroxide type D, solid			
33	1208	**Hexanes**	3,3(b)	3	290110
	0079	Hexanitrodiphenylamine	1.1D,4	1+13	292144
	0392	Hexanitrostilbene	1.1D,4	1+13	360200
30	2282	**Hexanols**	3,31(c)	3	290519
33	2370	**1-Hexene**	3,3(b)	3	290129
		Hexogen, see Cyclotrimethylenetrinitramine			
	0118	Hexolite (hexolite), dry or wetted with less than 15 % water, by mass			
		Hexotol, see Hexolite			
	0393	Hexotonal	1.1D,4	1+13	360200
		Hexyl, see Hexanitrodiphenylamine			

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0393	Hexotonal	1.1D,4	1+13	360200
		Hexyl, see Hexanitrodiphenylamine			
X80	1784	Hexyltrichlorosilane	8,36(b)	8	293100
		HMX, see Cyclotetramethylenetetranitramine			
		Hydrazine, dihydrobromide, see Toxic solid, inorganic, n.o.s.			
		Hydrazine, dihydrochloride, see Toxic solid, inorganic, n.o.s.			
86	2030	**Hydrazine hydrate**	8,44(b)	8+6.1	282510
		Hydrazine monohydrobromide, see Toxic solid, inorganic, n.o.s.			
		Hydrazine monohydrochloride, see Toxic solid, inorganic, n.o.s.			
		Hydrazine sulphate, see Toxic solid, inorganic, n.o.s.			
886	2029	Hydrazine, anhydrous	8,44(a)	8+3+6.1	282510
86	2030	**Hydrazine, aqueous solution with not less than 37 % but not more than 64 % hydrazine, by mass**	8,44(b)	8+6.1	282510
60	3293	**Hydrazine, aqueous solution with not more than 37 % hydrazine by mass**	6.1,65(c)	6.1	282510
80	1787	**Hydriodic acid**	8,5(b),(c)	8	281119
80	1788	**Hydrobromic acid**	8,5(b),(c)	8	281119
23	1964	**Hydrocarbon gas mixture, compressed, n.o.s.**	2,1F	3(+13)	271129
23	1965	**Hydrocarbon gas mixture, liquefied, n.o.s. (Mixtures A,AO,A1,B,C, butane, propane)**	2,2F	3(+13)	271119
23	3150	**Hydrocarbon gas refills for small devices with release device**	2,6F	3	**
33/30	3295	**Hydrocarbons, liquid, n.o.s.**	3,1(a),2(a),(b), 3(b),31(c)	3	290**
80	1789	**Hydrochloric acid**	8,5(b),(c)	8	280610
		Hydrocyanic acid and solutions, see Hydrogen cyanide and solutions			
886/86	1790	**Hydrofluoric acid**	8,6	7(a),(b)8+6.1	281111
		Hydrofluoric acid, anhydrous, see Hydrogen fluoride, anhydrous			
		Hydrofluoric acid, aqueous solution, mixtures, with inorganic acids, see Corrosive liquid, acidic, inorganic, n.o.s.			
886	1786	**Hydrofluoric and sulphuric acid mixture**	8,7(a)	8+6.1	281119
23	2034	**Hydrogen and methane mixtures, compressed**	2,1F	3(+13)	280410
268	1048	**Hydrogen bromide, anhydrous**	2,2TC	6.1+8(+13)	281119

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
268	1050	**Hydrogen chloride, anhydrous**	2,2TC	6.1+8(+13)	280610
	2186	Hydrogen chloride, refrigerated liquid: *Not to be accepted for carriage*	2,3TC,*Note*		
663	1613	**Hydrogen cyanide, aqueous solution with not more than 20 % hydrogen cyanide**	6.1,2	6.1+3	281115
663	3294	**Hydrogen cyanide, solution in alcohol with not more than 45 % hydrogen cyanide**	6.1,2	6.1+3	281119
663	1051	Hydrogen cyanide, stabilized containing less than 3 % water	6.1,1	6.1+3	281119
663	1614	Hydrogen cyanide, stabilized, containing less than 3 % water and absorbed in a porous inert material	6.1,1	6.1+3	281115
886	1052	**Hydrogen fluoride**	8,6	8+6.1	281119
268	2197	**Hydrogen iodide, anhydrous**	2,2TC	6.1+8(+13)	281119
58	3149	**Hydrogen peroxide and peroxyacetic acid mixture, stabilized**	5.1,1(b)	5.1+8	284700
		Hydrogen peroxide, aqueous solution with less than 8 % hydrogen peroxide: *Not subject to RID*	5.1,1(c)*Note*		
58	2014	**Hydrogen peroxide, aqueous solution with not less than 20 % but not more than 60 % hydrogen peroxide**	5.1,1(b)	5.1+8	284700
50	2984	**Hydrogen peroxide, aqueous solution with not less than 8 % but less than 20 % hydrogen peroxide**	5.1,1(c)	5.1	284700
559	2015	**Hydrogen peroxide, aqueous solution, stabilized with more than 60 % hydrogen peroxide**	5.1,1(a)	5.1+8	284700
559	2015	**Hydrogen peroxide, stabilized**	5.1,1(a)	5.1+8	284700
		Hydrogen peroxide, non-stabilized or hydrogen peroxide solution, non-stabilized containing more than 60 % hydrogen peroxide: *Not to be accepted for carriage*	5.1,*1(a)*,*Note 2*		
263	2202	**Hydrogen selenide, anhydrous**	2,2TF	6.1+3	281119
80	2837	**Hydrogen sulphates, aqueous solution**	8,1(b),(c)	8	283319
263	1053	**Hydrogen sulphide**	2,2TF	6.1+3(+13)	281119
		Hydrogen sulphides, aqueous solutions, see Caustic alkali liquid, n.o.s.			
23	1049	**Hydrogen, compressed**	2,1F	3(+13)	280410
223	1966	**Hydrogen, refrigerated liquid**	2,3F	3(+13)	280410
80	1740	**Hydrogendifluorides, n.o.s;**	8,9(b),(c)	8	282619
60	2662	**Hydroquinone**	6.1,14(c)	6.1	290722
80	2865	**Hydroxylamine sulphate**	8,16(c)	8	282510
		Hypochlorite in mixtures	5.1,*15*,*Note 3*		

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	1791	**Hydrochlorite solution**	8,61(b)(c)	8	282890
50	3212	**Hypochlorites, inorganic, n.o.s.**	5.1,15(b)	5.1	282890
	0121	Igniters	1.1G,9	1+13	360300
	0314	Igniters	1.2G,21	1	360300
	0315	Igniters	1.3G,30	1	360300
	0325	Igniters	1.4G,43	1.4	360300
	0454	Igniters	1.4S,47	1.4	360300
		Imazalil (pesticide), see under Pesticide, etc.			
80	2269	**3,3'-Iminodipropylamine**	8,53(c)	8	292129
606	2900	Infectious substance, affecting animals	6.2,1,2,3(b)	6.2	**
606	2814	Infectious substance, affecting humans	6.2,1,2,3(b)	6.2	**
33/30	1210	**Ink, printing, flammable**	3,5(a),(b),(c), 31(c) (See Note to Section E)	3	321519
20	1968	**Insecticide gas, n.o.s.**	2,2A	2(+13)	380810
26	1967	**Insecticide gas, toxic, n.o.s.**	2,2T	6.1(+13)	380810
80	1792	**Iodine monochloride**	8,12(b)	8	281210
568	2495	**Iodine pentafluoride**	5.1,5	5.1+6.1+8	281290
33	2390	**2-Iodobutane**	3,3(b)	3	290330
33	2391	**Iodomethylpropanes**	3,3(b)	3	290330
30	2392	**Iodopropanes**	3,31(c)	3	290330
		Ioxynil (pesticide), see under Pesticide, etc.			
		Iprobenfos (pesticide), see Organophosphorus pesticides			
80	1773	**Iron (III) chloride, anhydrous**	8,11(c)	8	282733
80	2582	**Iron chloride solution**	8,5(c)	8	282733
40	1376	**Iron oxide, spent**	4.2,16(c)	4.2	282110
663	1994	**Iron pentacarbonyl**	6.1,3	6.1+3	293100
40	1376	**Iron sponge, spent**	4.2,16(c)	4.2	282100
33	2561	**2-Isoamylene**	3,1(a)	3	290129
		Isoamyl formate, see Amyl formates			
		Isobenzane (pesticide), see Organochlorine pesticides			
23	1969	**Isobutane**	2,2F	3(+13)	271113
30	1212	**Isobutanol**	3,31(c)	3	290514
23	1055	**Isobutene**	2,2F	3(+13)	290123
33	1213	**Isobutyl acetate**	3,3(b)	3	291534
39	2527	**Isobutyl acrylate, inhibited**	3,31(c)	3	290619
30	1212	**Isobutyl alcohol**	3,31(c)	3	290514

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	2045	**Isobutyl aldehyde**	3,3(b)	3	291219
33	2393	**Isobutyl formate**	3,3(b)	3	291513
30	2528	**Isobutyl isobutyrate**	3,31(c)	3	291590
336	2486	**Isobutyl isocyanate**	3,14(b)	3+6.1	292910
39	2283	**Isobutyl methacrylate inhibited**	3,31(c)	3	291614
33	2394	**Isobutyl propionate**	3,3(b)	3	291590
338	1214	**Isobutylamine**	3,22(b)	3+8	292119
23	1055	**Isobutylene**	2,2F	3(+13)	290123
33	2045	**Isobutyraldehyde**	3,3(b)	3	291219
38	2529	**Isobutyric acid**	3,33(c)	3+8	291560
38	2530	**Isobutyric anhydride**	3,33(c)	3+8	291560
336	2284	**Isobutyronitrile**	3,11(b)	3+6.1	292690
338	2395	**Isobutyryl chloride**	3,25(b)	3+8	291590
336/36	2478	**Isocyanates, flammable, toxic, n.o.s. or Isocyanate solution, flammable, toxic, n.o.s.**	3,14(b),32(c)	3+6.1	292910
63	3080	**Isocyanates, toxic, flammable, n.o.s. or Isocyanate solution, toxic, flammable, n.o.s.**	6.1,18(b)	6.1+3	292910
60	2206	**Isocyanates, toxic, n.o.s. or Isocyanate solution, toxic, n.o.s.**	6.1,19(b),(c)	6.1	292910
63	2285	**Isocyanatobenzotrifluorides**	6.1,18(b)	6.1+3	292910
30	2286	**Isododecane**	3,31(c)	3	290110
		Isodrin (pesticide), see Organochlorine pesticides			
		Isofenphos (pesticide), see Organophosphorus pesticides			
33	2287	**Isoheptene**	3,3(b)	3	290129
33	2288	**Isohexene**	3,3(b)	3	290129
		Isolan (pesticide), see Carbamate pesticides			
	1262	Isooctane, see Octanes	3,3(b)		
33	1216	**Isooctene**	3,3(b)	3	290129
		Isooctyl acid phosphate, see Corrosive liquid, acidic, organic, n.o.s.			
33	1265	**Isopentane**	3,1(a)	3	290110
33	2371	**Isopentenes**	3,1(a)	3	290129
60	2290	**Isophorone diisocyanate**	6.1,19(c)	6.1	292910
80	2289	**Isophoronediamine**	8,53(c)	8	292230
		Isophthaloyl chloride, see Corrosive solid, acidic, organic, n.o.s.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
339	1218	**Isoprene, inhibited**	3,2(a)	3	290124
		Isoprocarb (pesticide), see Carbamate pesticides			
33	1219	**Isopropanol**	3,3(b)	3	290512
33	2403	**Isopropenyl acetate**	3,3(b)	3	291590
30	2303	**Isopropenylbenzene**	3,31(c)	3	290290
30	2934	**Isopropyl 2-chloropropionate**	3,31(c)	3	291590
33	1220	**Isopropyl acetate**	3,3(b)	3	291539
80	1793	**Isopropyl acid phosphate**	8,38(c)	8	291900
33	1219	**Isopropyl alcohol**	3,3(b)	3	290512
30	2405	**Isopropyl butyrate**	3,31(c)	3	291590
		Isopropyl chloride, see 2-Chloropropane			
30	2947	**Isopropyl chloroacetate**	3,31(c)	3	291590
663	2407	Isopropyl chloroformate	6.1,10(a)	6.1+3+8	291590
33	2406	**Isopropyl isobutyrate**	3,3(b)	3	291590
336	2483	**Isopropyl isocyanate**	3,14(a)	3+6.1	292910
		Isopropyl isothiocyanate, see Flammable liquid, toxic, n.o.s.			
33	1222	**Isopropyl nitrate**	3,3(b)	3	292090
33	2409	**Isopropyl propionate**	3,3(b)	3	291590
338	1221	**Isopropylamine**	3,22(a)	3+8	292119
30	1918	**Isopropylbenzene**	3,31(c)	3	290270
		Isopropylcumyl hydroperoxide, see Organic peroxide type F, liquid			
33	2561	**Isopropylethylene**	3,1(a)	3	290129
40	2907	Isosorbide dinitrate mixture	4.1,23(b)	4.1	360200
40	3251	Isosorbide-5-mononitrate	4.1,26(c)	4.1	293299
		Isothioate (pesticide), see Organophosphorus pesticides			
		Isothiocyanate solutions, flash-point below 23 °C, see Flammable liquid, toxic, n.o.s.			
		Isoxathion (pesticide), see Organophosphorus pesticides			
	0124	Jet perforating guns, charged, oil well, without detonator	1.1D,5	1+13	930690
	0494	Jet perforating guns, charged, oil well, without detonator	1.4D,39	1.4	930690
		Kelevan (pesticide), see under Pesticide, etc.			
30	1223	**Kerosene**	3,31(c)	3	273100
33/30	1224	**Ketones, liquid, n.o.s.**	3,2(b),3(b),31(c)	3	2914**

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
20	1056	**Krypton, compressed**	2,1A	2(+13)	280429
22	1970	**Krypton, refrigerated liquid**	2,3A	2(+13)	280429
		Lacquer, nitrocellulose, see Nitrocellulose solution			
		Lactonitrile, see Toxic liquid, organic, n.o.s.			
60	1616	**Lead acetate**	6.1,62(c)	6.1	291529
		Lead alkyls, mixtures, see Motor fuel anti-knock mixture			
60	1617	**Lead arsenates**	6.1,51(b)	6.1	284290
60	1618	**Lead arsenites**	6.1,51(b)	6.1	284290
	0129	Lead azide, wetted with not less than 20 % water, or mixture of alcohol and water, by mass: *Not to be accepted to carriage*	1.1A, *See marg. 100 (8)*	6.1	284290
		Lead chloride, see Lead compound, soluble, n.o.s.			
		Lead chromate, see Lead compound, soluble, n.o.s.			
60	2291	**Lead compound, soluble, n.o.s.**	6.1,62(c)	6.1	**
		Lead compounds, residues, see Lead compound, soluble, n.o.s.			
60	1620	**Lead cyanide**	6.1,41(b)	6.1	283719
56	1872	**Lead dioxide**	5.1,25(c)	5.1+6.1	282490
56	1469	**Lead nitrate**	5.1,29(b)	5.1+6.1	283429
56	1470	**Lead perchlorate**	5.1,29(b)	5.1+6.1	282990
40	2989	**Lead phosphite dibasic**	4.1,11(b),(c)	4.1	283510
		Lead salts, see Lead compound, soluble, n.o.s.			
		Lead sludge, with less than 3 % free sulphuric acid, see Lead compound, soluble, n.o.s.			
	0130	Lead styphnate (lead trinitroresorcinate), wetted with not less than 20 % water, or mixture of alcohol and water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100 (8)*		
80	1794	**Lead sulphate with more than 3 % free acid**	8,1(b)	8	283329
		Lead tetraethyl, see Motor fuel anti-knock mixture			
		Lead tetramethyl, see Motor fuel anti-knock mixture			
		Lead, ashes of, see Lead compound, soluble, n.o.s.			
90	3072	Life-saving appliances, not self-inflating	9,7	9	630720
90	2990	Life-saving appliances, self-inflating, such as aircraft evacuation chutes and aircraft survival kits	9,6	9	630720
23	1057	Lighter refills (cigarettes) containing flammable gas	2,6F	3	961390

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
23	1057	Lighters containing flammable gas	2,6F	3	961390
	0131	Lighters, fuse	1.4S,47	1.4	360300
		Lignite tar oil, see Tars, liquid			
30	2052	**Limonene, inactive**	3,31(c)	3	290219
		Lindane (pesticide), see Organochlorine pesticides			
23	3161	**Liquefied gas, flammable, n.o.s.**	2,2F	3(+13)	**
20	3163	**Liquefied gas, n.o.s.**	2,2A	2(+13)	**
25	3157	**Liquefied gas, oxidizing, n.o.s.**	2,2O	2+05(+13)	**
268	3308	**Liquefied gas, toxic, corrosive, n.o.s.**	2,2TC	6.1+8(+13)	**
263	3309	**Liquefied gas, toxic, flammable, corrosive, n.o.s.**	2,2TFC	6.1+3+8(+13)	**
263	3160	**Liquefied gas, toxic, flammable, n.o.s.**	2,2TF	6.1+3(+13)	**
26	3162	**Liquefied gas, toxic, n.o.s.**	2,2T	6.1(+13)	**
265	3310	**Liquefied gas, toxic, oxidizing, corrosive, n.o.s.**	2,2TOC	6.1+05+8(+13)	**
265	3307	**Liquefied gas, toxic, oxidizing, n.o.s.**	2,2TO	6.1+05(+13)	**
20	1058	**Liquefied gases, non-flammable, charged with nitrogen, carbon dioxide or air**	2,2A	2(+13)	**
223	1972	**Liquefied natural gas**	2,3F	3(+13)	271111
X423	1415	**Lithium**	4.3,11(a)	4.3	280519
X333	2445	**Lithium alkyls**	4.2,31(a)	4.2+4.3	293100
X423	1410	Lithium aluminium hydride	4.3,16(a)	4.3	285000
X423	1411	Lithium aluminium hydride, ethereal	4.3,16(a)	4.3	285000
90	3090	Lithium batteries	9,5	9	850650
90	3091	Lithium batteries contained in equipment	9,5	9	850650
X423	1413	Lithium borohydride	4.3,16(a)	4.3	285000
423	2830	**Lithium ferrosilicon**	4.3,12(b)	4.3	285000
X423	1414	Lithium hydride	4.3,16(a)	4.3	285000
X423	2805	**Lithium hydride, fused, solid**	4.3,16(b)	4.3	285000
80	2680	**Lithium hydroxide monohydrate**	8,41(b)	8	282520
80	2679	**Lithium hydroxide solution**	8,42(b),(c)	8	282590
50	1471	**Lithium hypochlorite, dry**	5.1,15(b)	5.1	282890
50	1471	**Lithium hypochlorite, mixture**	5.1,15(b)	5.1	282890
50	2722	**Lithium nitrate**	5.1,22(c)	5.1	283429
X423	2806	**Lithium nitride**	4.3,17(a)	4.3	285000

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
50	1472	**Lithium peroxide**	5.1,25(b)	5.1	282590
423	1417	**Lithium silicon**	4.3,12(b)	4.3	285000
223	1972	**LNG**	2,3F	3(+13)	271111
60	1621	**London purple** London purple (pesticide), see Arsenical pesticides	6.1,51(b)	6.1	284290
80	1823	**Lye**	8,41(b)	8	281511
X333	3053	**Magnesium alkyls**	4.2,31(a)	4.2+4.3	293100
40	1869	**Magnesium alloys with more than 50 % magnesium, pellets, turnings or ribbons**	4.1,13(c)	4.1	810411
423	1418	**Magnesium alloys, powder**	4.3,14(b)	4.3+4.2	810430
X462	1419	Magnesium aluminium phosphide	4.3,18(a)	4.3+6.1	284800
60	1622	**Magnesium arsenate**	6.1,51(b)	6.1	284290
50	1473	**Magnesium bromate**	5.1,16(b)	5.1	282990
50	2723	**Magnesium chlorate**	5.1,11(b)	5.1	282919
40	2004	**Magnesium diamide**	4.2,16(b)	4.2	285100
X333	2005	**Magnesium diphenyl**	4.2,31(a)	4.2+4.3	293100
60	2853	**Magnesium fluorosilicate**	6.1,64(c)	6.1	282690
423	2950	**Magnesium granules, coated**	4.3,11(c)	4.3	810430
X423	2010	Magnesium hydride	4.3,16(a)	4.3	285000
40	1869	**Magnesium in pellets, turnings or ribbons**	4.1,13(c)	4.1	810419
50	1474	**Magnesium nitrate**	5.1,22(c)	5.1	283429
50	1475	**Magnesium perchlorate**	5.1,13(b)	5.1	282990
50	1476	**Magnesium peroxide**	5.1,25(b)	5.1	281610
X462	2011	Magnesium phosphide	4.3,18(a)	4.3+6.1	284800
423	1418	**Magnesium powder**	4.3,14(b)	4.3+4.2	810430
423	2624	**Magnesium silicide**	4.3,12(b)	4.3	285000
	2807	Magnetized material: *Not subject to RID*	9,*See marg. 900(3)*		
80	2215	**Maleic anhydride**	8,31(c)	8	291714
60	2647	**Malononitrile**	6.1,12(b)	6.1	292690
40	2210	**Maneb**	4.2,16(c)	4.2+4.3	380820
40	2210	**Maneb preparation**	4.2,16(c)	4.2+4.3	380820
423	2968	**Maneb preparation, stabilized**	4.3,20(c)	4.3	380820
423	2968	**Maneb, stabilized**	4.3,20(c)	4.3	380820

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Manganese catalyst, dry, see Metal catalyst, dry			
		Manganese catalyst, wetted, see Metal catalyst, wetted			
		Manganese ethylene 1,2-bis (dithiocarbamate), see Maneb and Maneb, stabilized			
50	2724	**Manganese nitrate**	5.1,22(c)	5.1	283429
40	1330	**Manganese resinate**	4.1,12(c)	4.1	380620
	0133	Mannitol hexanitrate (nitromannite), wetted with not less than 40 % water, or mixture of alcohol and water, by mass	1.1D,4	1+15	360200
40	1331	**Matches, « strike anywhere »**	4.1,2(c)	4.1	360500
40	2254	**Matches, fusee**	4.1,2(c)	4.1	360500
40	1944	**Matches, safety**	4.1,2(c)	4.1	360500
40	1945	Matches, wax, « vesta »	4.1,2(c)	4.1	360500
336/36	3248	**Medicine, liquid, flammable, toxic, n.o.s.**	3,19(b),32(c)	3+6.1	300390
60	1851	**Medicine, liquid, toxic, n.o.s.**	6.1,90(b),(c)	6.1	300390
60	3249	**Medicine, solid, toxic, n.o.s.**	6.1,90(b),(c)	6.1	300390
		Medinoterb, see Substituted nitrophenol pesticides			
		p-Menthyl hydroperoxide, see Organic peroxide type D, liquid			
		p-Menthyl hydroperoxide, see Organic peroxide type F, liquid			
		Mephosfolan (pesticide), see Organophosphorus pesticides			
336/36	1228	**Mercaptan mixture, liquid, flammable toxic, n.o.s.**	3,18(b),32(c)	3+6.1	293090
336/36	1228	**Mercaptans, liquid, flammable, toxic, n.o.s.**	3,18(b),32(c)	3+6.1	293090
63	3071	**Mercaptans, liquid, toxic, flammable, n.o.s. or Mercaptan mixture, liquid, toxic, flammable, n.o.s.**	6.1,20(b)	6.1+3	293090
		Mercapto-dimethur (pesticide), see Carbamate pesticides			
	0448	5-Mercaptotetrazol-1-acetic acid	1.4C,36	1.4	360200
60	1623	**Mercuric arsenate**	6.1,51(b)	6.1	284290
60	1624	**Mercuric chloride**	6.1,52(b)	6.1	282739
		Mercuric chloride (pesticide), see Mercury based pesticides			
60	1625	**Mercuric nitrate**	6.1,52(b)	6.1	283429
66	1626	**Mercuric potassium cyanide**	6.1,41(a)	6.1	283719
		Mercurous chloride, see Environmentally hazardous substance, solid, n.o.s.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	1627	**Mercurous nitrate**	6.1,52(b)	6.1	283429
80	2809	**Mercury**	8,66(c)	8	280540
60	1629	**Mercury acetate**	6.1,52(b)	6.1	291529
60	1630	**Mercury ammonium chloride**	6.1,52(b)	6.1	282739
336	2778	**Mercury based pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/63	3011	**Mercury based pesticide, liquid, toxic, flammable, flash-point not less than 23°C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3012	**Mercury based pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2777	**Mercury based pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
60	1631	**Mercury benzoate**	6.1,52(b)	6.1	291631
60	1634	**Mercury bromides**	6.1,52(b)	6.1	282759
66/60	2024	**Mercury compound, liquid, n.o.s.**	6.1,52(a),(b),(c)	6.1	**
66/60	2025	**Mercury compound, solid, n.o.s.**	6.1,52(a),(b),(c)	6.1	**
60	1636	**Mercury cyanide**	6.1,41(b)	6.1	283719
	0135	Mercury fulminate, wetted with not less than 20 % water, or mixture of alcohol and water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100(8)*		
60	1637	**Mercury gluconate**	6.1,52(b)	6.1	291816
60	1638	**Mercury iodide**	6.1,52(b)	6.1	282760
60	1639	**Mercury nucleate**	6.1,52(b)	6.1	293490
60	1640	**Mercury oleate**	6.1,52(b)	6.1	291615
60	1641	**Mercury oxide** Mercury oxide (pesticide), see Mercury based pesticides	6.1,52(b)	6.1	282590
60	1642	**Mercury oxycyanide, desensitized**	6.1,41(b)	6.1	283719
60	1643	**Mercury potassium iodide**	6.1,52(b)	6.1	282760
60	1644	**Mercury salicylate**	6.1,52(b)	6.1	291821
60	1645	**Mercury sulphate**	6.1,52(b)	6.1	283329
60	1646	**Mercury thiocyanate**	6.1,52(b)	6.1	283800
30	1229	**Mesityl oxide**	3,31(c)	3	291419
30	2325	**Mesitylene**	3,31(c)	3	290290
X333	3049	**Metal alkyl halides, n.o.s. or metal aryl halides, n.o.s.**	4.2,32(a)	4.2+4.3	293100
X333	3050	**Metal alkyl hybrides, n.o.s. or metal aryl hydrides, n.o.s.**	4.2,32(a)	4.2+4.3	293100
X333	2003	**Metal alkyls, n.o.s. or metal aryls, n.o.s.**	4.2,31(a)	4.2+4.3	293100

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66/60	3281	**Metal carbonyls, n.o.s.**	6.1,36(a),(b),(c)	6.1	293100
43/40	2881	Metal catalyst, dry	4.2,12(a),(b),(c)	4.2	81****
40	1378	**Metal catalyst, wetted**	4.2,12(b)	4.2	81****
40	3182	**Metal hybrides, flammable, n.o.s.**	4.1,14(b),(c)	4.1	285000
X423	1409	Metal hydrides, water-reactive, n.o.s.	4.3,16(a),(b)	4.3	285000
40	3089	**Metal powder, flammable, n.o.s.**	4.1,13(b),(c)	4.1	**
40	3189	**Metal powder, self-heating, n.o.s.**	4.2,16(b),(c)	4.2	**
40	3181	**Metal salts of organic compounds, flammable, n.o.s.**	4.1,12(b),(c)	4.1	**
40	1332	**Metaldehyde**	4.1,6(c)	4.1	291250
X423/423	3208	Metallic substance, water-reactive, n.o.s.	4.3,13(a),(b),(c)	4.3	**
X423/423	3209	Metallic substance, water-reactive, self-heating, n.o.s.	4.3,14(a),(b),(c)	4.3+4.2	**
		Metam-sodium (pesticide), see Dithiocarbamate pesticides			
336	2396	**Methacrylaldehyde, inhibited**	3,17(b)	3+6.1	291219
89	2531	**Methacrylic acid, inhibited**	8, 32(c)	8	291613
336	3079	**Methacrylonitrile, inhibited**	3,11(a)	3+6.1	292690
30	2614	**Methallyl alcohol**	3,31(c)	3	290519
		Methamidophos (pesticide), see Organophosphorus pesticides			
23	2034	**Methane and hydrogen mixture**	2,1F	3(+13)	280410
23	1971	**Methane, compressed**	2,1F	3(+13)	271121
223	1972	**Methane, refrigerated liquid**	2,3F	3(+13)	271119
		Methanesulphonic acid, see Alkyl sulphonic acids			
668	3246	**Methanesulphonyl chloride**	6.1,27(a)	6.1+8	290490
336	1230	**Methanol**	3,17(b)	3+6.1	290511
		Methasulfocarb (pesticide), see Carbamate pesticides			
		Methidathion (pesticide), see Organophosphorus pesticides			
		Methomyl (pesticide), see Carbamate pesticides			
30	1188	**2-Methoxyethanol**	3,31(c)	3	290942
336	2605	**Methoxymethyl isocyanate**	3,14(a)	3+6.1	292910
30	2293	**4-Methoxy-4-methylpentan-2-one**	3,31(c)	3	291450
30	3092	**1-Methoxy-2-propanol**	3,31(c)	3	290949
		Methoxypropionitrile, see Toxic liquid, organic, n.o.s.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	2933	**Methyl 2-chloropropionate**	3,31(c)	3	291590
33	1231	**Methyl acetate**	3,3(b)	3	291539
239	1060	**Methylacetylene and propadiene mixture, stabilized (Mixtures P1,P2)**	2,2F	3(+13)	271119
339	1919	**Methyl acrylate inhibited**	3,3(b)	3	291612
336	1230	**Methyl alcohol**	3,17(b)	3+6.1	290511
60	2294	**N-Methylaniline**	6.1,12(c)	6.1	292142
		4-Methylbenzenesulphonylhydrazide, see Self-reactive solid, type D			
60	2937	**alpha-Methylbenzyl alcohol**	6.1,14(c)	6.1	290629
26	1062	**Methyl bromide**	2,2T	6.1(+13)	290330
26	1581	**Methyl bromide and cholorpicrin mixture**	2,2T	6.1	294200
263	1953	**Methyl bromide and ethylene dibromide, gas mixtures**	2,1TF	6.1+3(+13)	**
66	1647	**Methyl bromide and ethylene dibromide, liquid mixtures**	6.1,15(a)	6.1	382490
60	2643	**Methyl bromoacetate**	6.1,17(b)	6.1	291590
33	2397	**3-Methylbutan-2-one**	3,3(b)	3	291419
33	2459	**2-Methyl-1-butene**	3,1(a)	3	290129
33	2460	**2-Methyl-2-butene**	3,2(b)	3	290129
33	2561	**3-Methyl-1-butene**	3,1(a)	3	290129
338	2945	**N-Methylbutylamine**	3,22(b)	3+8	292119
33	1237	**Methyl butyrate**	3,3(b)	3	291590
23	1063	**Methyl chloride (refrigerant gas R 40)**	2,2F	3(+13)	290311
26	1582	**Methyl chloride and chloropicrin mixture**	2,2T	6.1	294200
23	1912	**Methyl chloride and methylene chloride mixture**	2,2F	3(+13)	294200
663	2295	**Methyl chloroacetate**	6.1,16(a)	6.1+3	291590
663	1238	**Methyl chloroformate**	6.1,10(a)	6.1+3+8	291590
663	1239	**Methyl chloromethyl ether**	6.1,9(a)	6.1+3	290919
		Methyl chlorothioformate, see Flammable liquid, toxic, n.o.s.			
33	1648	**Methyl cyanide**	3,3(b)	3	292690
60	2299	**Methyl dichloroacetate**	6.1,17(c)	6.1	291590

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	1193	**Methyl ethyl ketone** Methyl ethyl ketone peroxide(s), see Organic peroxide type B, liquid Methyl ethyl ketone peroxide(s), see Organic peroxide type D, liquid Methyl ethyl ketone peroxide(s), see Organic peroxide type E, liquid	3,3(b)	3	291412
60	2300	**2-Methyl-5-ethylpyridine**	6.1,12(c)	6.1	293339
23	2454	**Methyl fluoride (refrigerant gas R 41)**	2,2F	3(+13)	290730
33	1243	**Methyl formate**	3,1(a)	3	291513
33	2301	**2-Methylfuran**	3,3(b)	3	293219
30	2302	**5-Methylhexan-2-one**	3,31(c)	3	291419
66	2644	**Methyl iodide**	6.1,15(a)	6.1	290330
30	2053	**Methyl isobutyl carbinol**	3,31(c)	3	290519
33	1245	**Methyl isobutyl ketone** Methyl isobutyl ketone peroxide(s), see Organic peroxide type D, liquid	3,3(b)	3	291413
663	2480	Methyl isocyanate	6.1,5	6.1+3	292910
339	1246	**Methyl isopropenyl ketone, inhibited**	3,3(b)	3	291419
30	2046	**Methyl isopropenyl benzenes** Methyl isopropyl ether, see Flammable liquid, n.o.s.	3,31(c)	3	290290
663	2477	**Methyl isothiocyanate**	6.1,20(a)	6.1+3	293090
33	2400	**Methyl isovalerate**	3,3(b)	3	291590
X323	1928	**Methyl magnesium bromide in ethyl ether**	4.3,3(a)	4.3+3	293100
263	1064	**Methyl mercaptan**	2,2TF	6.1+3(+13)	293090
339	1247	**Methyl methacrylate monomer, inhibited**	3,3(b)	3	291614
	2455	Methyl nitrite: *Not to be accepted for carriage*	2,2A, *Note*		
663	2606	**Methyl orthosilicate**	6.1,8(a)	6.1+3	292090
30	2560	**2-Methylpentan-2-ol**	3,31(c)	3	290519
338	2399	**1-Methylpiperdine**	3,23(b)	3+8	293390
33	1248	**Methyl propionate**	3,3(b)	3	291590
33	2612	**Methyl propyl ether**	3,2(b)	3	290919
33	1249	**Methyl propyl ketone**	3,3(b)	3	291419
33	2398	**Methyl tert-butyl ether**	3,3(b)	3	290919
60	2533	**Methyl trichloroacetate**	6.1,17(c)	6.1	291590
239	1087	**Methyl vinyl ether, inhibited**	2,2F	3(+13)	290919

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
663	1251	**Methyl vinyl ketone, stabilized**	6.1,8(a)1	6.1+3+8	291419
33	1234	**Methylal**	3,2(b)	3	291100
30	2614	**Methylallyl alcohol**	3,31(c)	3	290519
33	2554	**Methylallyl chloride**	3,3(b)	3	290329
23	1061	**Methylamine, anhydrous**	2,2F	3(+13)	292111
338	1235	**Methylamine, aqueous solution**	3,22(b)	3+8	292111
30	1233	**Methylamyl acetate**	3,31(c)	3	291590
30	2053	**Methylamyl alcohol**	3,31(c)	3	290519
263	2534	Methylchlorosilane	2,2TFC	6.1+3+8	293100
33	2296	**Methylcyclohexane**	3,3(b)	3	290219
30	2617	**Methylcyclohexanols**	3,31(c)	3	290612
30	2297	**Methylcyclohexanone**	3,31(c)	3	291422
33	2298	**Methylcyclopentane**	3,3(b)	3	290219
X338	1242	**Methyldichlorosilane**	4.3,1(a)	4.3+3+8	293100
60	1593	**Methylene chloride**	6.1,15(c)	6.1	290312
23	1912	**Methylene chloride and methyl chloride mixture**	2,2F	3(+13)	294200
663	1244	**Methylhydrazine**	6.1,7(a)1	6.1+3+8	292800
338	2535	**4-Methylmorpholine (N-methylmorpholine)**	3,23(b)	3+8	293390
33	2461	**Methylpentadiene**	3,3(b)	3	290129
80	2705	**3-Methyl-2-pentene-4-yne-1-ol**	8,66(b)	8	290519
X80	2437	**Methylphenyldichlorosilane**	8,36(b)	8	293100
30	2313	**Methylpyridines**	3,31(c)	3	293339
23	1954	**Methylsilane**	2,1F	3(+13)	**
33	2536	**Methyltetrahydrofuran**	3,3(b)	3	293219
X338	1250	**Methyltrichlorosilane**	3,21(a)	3+8	293100
		Methyltrithion (pesticide), see Organophosphorus pesticides			
33	2367	**alpha-Methylvaleraldehyde**	3,3(b)	3	291219
		Mevinphos (pesticide), see Organophosphorus pesticides			
		Mexacarbate (pesticide), see Carbamate pesticides			
	0136	Mines with bursting charge	1.1F,7	1+13	930690
	0137	Mines with bursting charge	1.1D,5	1+13	930690

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0138	Mines with bursting charge	1.2D,17	1	930690
	0294	Mines with bursting charge Mirex (pesticide), see Organochlorine pesticides	1.2F,19	1+13	930690
239	1010	**Mixtures of 1,3-butadiene and hydrocarbons, inhibited** Mobam (pesticide), see Carbamate pesticides	2,2F	3(+13)	271114
80	2508	**Molybdenum pentachloride** Molybdenum trioxide, see Toxic solid, inorganic, n.o.s. Monoalkyl tin chlorides, see Organotin compound, liquid, n.o.s. Monocrotophos (pesticide), see Organophosphorus pesticides Mononitroanilines, see Nitroanilines (o-, m-,p-) Mononitrotoluenes, see Nitrotoluenes (o-, m-,p-)	8,11(c)	8	282739
30	2054	**Morpholine**	3,31(c)	3	293490
66	1649	**Motor fuel anti-knock mixture** Motor fuel, in tanks of vehicles: *Not subject to RID*	6.1,31(a) 3,*See marg. 301a*	6.1	293100
33	1203	**Motor spirit** Muritan (pesticide), see Carbamate pesticides	3,3(b)	3	272400
40	2956	Musk xylene (5-tert-Butyl-2,4,6-trinitro-m-xylene)	4.1,26(c)	4.1	290420
90	2212	**Mysorite** Nabam (pesticide), see Dithiocarbamate pesticides Naled (pesticide), see Organophosphorus pesticides Naphtha, petroleum, see Petroleum distillates, n.o.s. Naphtha, see Petroleum distillates, n.o.s. Naphta, solvent, see Petroleum distillates, n.o.s.	9,1(b)	9	252400
44	2304	**Naphthalene, molten**	4.1,5	4.1	290290
40	1334	**Naphthalene, refined**	4.1,6(c)	4.1	270740
60	2077	**alpha-Naphlylamine**	6.1,12(c)	6.1	292145
60	1650	**beta-Naphthylamine** alpha-Naphthyl isocyanate, see Isocyanates, toxic, n.o.s. or Isocyanate solution, toxic, n.o.s.	6.1,12(b)	6.1	292145
60	1651	**Naphythylthiourea**	6.1,21(b)	6.1	293090

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	1652	**Naphthylurea**	6.1,12(b)	6.1	292421
23	1971	**Natural gas, compressed** Natural gas, condensation products, see Petroleum products	2,1F	3(+13)	271121
223	1972	**Natural gas, refrigerated liquid** Natural gasoline, see Motor spirit	2,3F	3(+13)	271111
20	1065	**Neon, compressed**	2,1A	2(+13)	280429
22	1913	**Neon, refrigerated liquid**	2,3A	2(+13)	280429
663	1259	**Nickel carbonyl** Nickel catalyst, dry, see Metal catalyst, dry Nickel catalyst, wetted, see Metal catalyst, wetted	6.1,3	6.1+3	293100
60	1653	**Nickel cyanide**	6.1,41(b)	6.1	283719
50	2725	**Nickel nitrate**	5.1,22(c)	5.1	283429
50	2726	**Nickel nitrate**	5.1,23(c)	5.1	283410
663	1259	**Nickel tetracarbonyl**	6.1,3	6.1+3	293100
60	1654	**Nicotine**	6.1,90(b)	6.1	293970
66/60	3144	**Nicotine compound, liquid, n.o.s. or Nicotine preparation, liquid, n.o.s.**	6.1,90(a),(b),(c)	6.1	293970
66/60	1655	**Nicotine compound, solid, n.o.s. or Nicotine preparation, solid, n.o.s.**	6.1,90(a),(b),(c)	6.1	293970
60	1656	**Nicotine hydrochloride or nicotine hydrochloride solution** Nicotine preparations (pesticide), see under Pesticide, etc	6.1,90(b)	6.1	293970
60	1657	**Nicotine salicylate**	6.1,90(b)	6.1	293970
60	1658	**Nicotine sulphate, solid or solution**	6.1,90(b)	6.1	293970
60	1659	**Nicotine tartrate**	6.1,90(b)	6.1	293970
50	3218	**Nitrates, inorganic, aqueous solution, n.o.s.**	5.1,22(b),(c)	5.1	283429
50	1477	**Nitrates, inorganic, n.o.s.**	5.1,22(b),(c)	5.1	283429
885/80	1796	**Nitrating acid mixture**	8,3(a),(b)	8	280800
885/80	1826	**Nitrating acid mixture, spent** Nitric acid, mixtures with hydrochloric acid: *Not to be accepted for carriage* Nitric acid, mixtures, with acetic acid and phosphoric acid, see Corrosive liquid, acidic, inorganic, n.o.s.	8,3(a),(b) 8,3,*Note 1*	8/8+05	382490
88/80	2031	**Nitric aid, other than red fuming**	8,2(a)1,(b)	8	280800

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
856	2032	**Nitric acid, red fuming**	8,2(a)2	8+05+6.1	280800
265	1975	Nitric oxide an dinitrogen tetroxide mixture (nitric oxide and nitrogen dioxide mixture)	2,2TOC	6.1+05+8	281129
265	1660	Nitric oxide, compressed	2,1TOC	6.1+05+8	281129
336	3273	**Nitriles, flammable, toxic, n.o.s.**	3,11(a),(b)	3+6.1	292690
663/63	3275	**Nitriles, toxic, flammable, n.o.s.**	6.1,11(a),(b)	6.1+3	292690
66/60	3276	**Nitriles, toxic, n.o.s.**	6.1,12(a),(b),(c)	6.1	292690
50	3219	**Nitrites, inorganic, aqueous solution, n.o.s.**	5.1,23(b),(c)	5.1	283410
50	2627	**Nitrites, inorganic, n.o.s.**	5.1,23(b)	5.1	283410
	0147	**Nitro urea**	1.1D,4	1+13	360200
60	1661	**Nitroanilines (o-,m-,p-)**	6.1,12(b)	6.1	292142
60	2730	**Nitroanisole**	6.1,12(c)	6.1	290930
60	1662	**Nitrobenzene**	6.1,12(b)	6.1	290420
80	2305	**Nitrobenzenesulphonic acid** Nitrobenzenesulphonyl chloride, see Corrosive solid, acidic, organic, n.o.s.	8,34(b)	8	290410
	0385	**5-Nitrobenzotriazol**	1.1D,4	1+13	360200
60	2306	**Nitrobenzotrifluorides** p-Nitrobenzoyl chloride, see Corrosive solid, acidic, organic, n.o.s. Nitrobenzyl bromide, see Toxic solid, organic, n.o.s.	6.1,12(b)	6.1	290490
60	2732	**Nitrobromobenzene**	6.1,12(c)	6.1	290490
40	3270	Nitrocellulose membrane filters	4.1,3(b)	4.1	
33/30	2059	**Nitrocellulose solution, flammable, with not more than 12,6 % nitrogen, by mass, and not more than 55 % nitrocellulose**	3,4(a),(b),34(c)	3	391220
40	2556	Nitrocellulose with alcohol not less than 25 % alcohol, by mass, not more than 12,6 % nitrogen, by dry mass	4.1,24(b)	4.1	391220
40	2557	Nitrocellulose with or without plasticizer and with or without pigment	4.1,24(b)	4.1	391220
40	2555	Nitrocellulose with water (not less than 25 % water, by mass)	4.1,24(b)	4.1	391220
	0340	Nitrocellulose, dry or wetted with less than 25 % water or alcohol, by mass	1.1D,4	1+15	391220
	0343	Nitrocellulose, plasticized with not less than 18 % plasticizer, by mass	1.3C,26	1+13	391220

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0341	Nitrocellulose, unmodified or plasticized with less than 18 % plasticizing substance, by mass	1.1D,4	1+15	391220
	0342	Nitrocellulose, wetted with not less than 25 % alcohol, by mass	1.3C,26	1+13	391220
60	2307	**3-Nitro-4-chlorobenzotrifluoride**	6.1,12(b)	6.1	290490
60	2446	**Nitrocresols**	6.1,12(c)	6.1	290890
30	2842	**Nitroethane**	3,31(c)	3	290420
20	1981	**Nitrogen mixture with rare gases**	2,1A	2(+13)	280429
265	1660	**Nitrogen monoxide**	2,1TOC	6.1+05+8	281129
265	2451	**Nitrogen trifluoride, compressed**	2,1TO	6.1+05(+13)	282619
	2421	Nitrogen trioxide: *Not to be accepted for carriage*	2,2TOC Section C, *Note*	4.1	360200
20	1066	**Nitrogen, compressed**	2,1A	2(+13)	280430
22	1977	**Nitrogen, refrigerated liquid**	2,3A	2(+13)	280430
40	3319	Nitroglycerin mixture with more than 2 % but not more than 10 % nitroglycerin, by mass, desensitized; See marg. 401, Section C, Note 2	4.1,13(b) Note 2		
33	3064	Nitroglycerin solution in alcohol with more than 1 % but not more than 5 % nitroglycerin	3,6	3	300390
	0143	Nitroglycerin, desensitized with not less than 40 % non-volatile water-insoluble phlegmatizer, by mass	1.1D,4	1+6 1+15	360200
	0144	Nitroglycerin solution in alcohol with more than 1 % not more than 10 % nitroglycerin	1.1D,4	1+13	300390
33	1204	Nitroglycerin solution in alcohol with not more than 1 % nitroglycerin	3,7(b)	3	300390
	0282	Nitroguanidine (picrite), dry or wetted with less than 20 % water, by mass	1.1D,4	1+13	360200
40	1336	Nitroguanidine, (picrite), wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	360200
	1798	Nitrohydrochloric acid: *Not to be accepted for carriage*	8,3, *Note 1*		
		Nitromannite, see Mannitol hexanitrate			
33	1261	Nitromethane	3,3(b)	3	290420
40	2538	**Nitronaphthalene**	4.1,6(c)	4.1	290420
60	1663	**Nitrophenols (o-,m-,p-)**	6.1,12(c)	6.1	290890
30	2608	**Nitropropanes**	3,31(c)	3	290420

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
40	1369	**p-Nitrosodimethylaniline**	4.2,5(b)	4.2	292990
	0146	Nitrostarch, dry or wetted with less than 20 % water, by mass	1.1D,4	1+15	360200
40	1337	Nitrostarch, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	360200
268	1069	Nitrosyl chloride	2,2TC	6.1+8	281210
X80	2308	**Nitrosylsulphuric acid**	8,1(b)	8	281119
60	1664	**Nitrotoluenes (o-,m-,p-)**	6.1,12(b)	6.1	290420
60	2660	**Nitrotoluidines**	6.1,12(c)	6.1	292143
	0490	Nitrotriazolone (NTO)	1.1D,4	1+13	360200
25	1070	**Nitrous oxide**	2,2O	2+05(+13)	281129
225	2201	**Nitrous oxide, refrigerated liquid**	2,3O	2+05(+13)	281129
60	1665	**Nitroxylenes (o-,m-,p-)**	6.1,12(b)	6.1	290420
30	1920	**Nonanes**	3,31(c)	3	290110
X80	1799	**Nonyltrichlorosilane**	8,36(b)	8	293100
		Norbormide (pesticide), see under Pesticide n.o.s.			
339	2251	**2,5-Norbornadiene (dicycloheptadiene), inhibited**	3,3(b)	3	290219
X80	1800	**Octadecyltrichlorosilane**	8,36(b)	8	293100
33	2309	**Octadiene**	3,3(b)	3	290129
20	2422	**Octafluorobut-2-ene (refrigerant R 1318)**	2,2A	2(+13)	290330
20	1976	**Octafluorocyclobutane (refrigerant gas RC 318)**	2,2A	2(+13)	290359
20	2424	**Octafluoropropane (refrigerant R 218)**	2,2A	2(+13)	290330
33	1262	**Octanes**	3,3(b)	3	290110
		Octenes, see Flammable liquid, n.o.s.			
		Octogen, see Cyclotetramethylenetetranitramine			
		Octol, see Octolite			
	0266	Octolite (octol), dry or wetted with less than 15 % water by mass	1.1D,4	1+13	360200
	0496	Octoral	1.1D,4	1+13	360200
30	1191	**Octyl aldehydes, flammable**	3,31(c)	3	291219
663	3023	**tert-Octyl mercaptan**	6.1,20(a)	6.1+3	293090
X80	1801	**Octyltrichlorosilane**	8,36(b)	8	293100
263	1071	**Oil gas, compressed**	2,1TF	6.1+3(+13)	270500
		Oil, petroleum crude, see Petroleum crude oil			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
X886	1831	**Oleum** Omethoate (pesticide), see Organophosphorus pesticides	8,1(a)	8+6.1	280700
539	3101	Organic peroxide type B, liquid	5.2,1(b)	5.2+01+(08)	**
539	3102	Organic peroxide type B, solid	5.2,2(b)	5.2+01	**
539	3103	Organic peroxide type C, liquid	5.2,3(b)	5.2+(8)	**
539	3104	Organic peroxide type C, solid	5.2,4(b)	5.2+(8)	**
539	3105	Organic peroxide type D, liquid	5.2,5(b)	5.2+(8)	**
539	3106	Organic peroxide type D, solid	5.2,6(b)	5.2	**
539	3107	Organic peroxide type E, liquid	5.2,7(b)	5.2+(8)	**
530	3108	Organic peroxide type E, solid	5.2,8(b)	5.2	**
539	3109	**Organic peroxide type F, liquid**	5.2,9(b)	5.2+(8)	**
539	3110	**Organic peroxide type F, solid** Organic peroxide type G : see marg. 550(6)	5.2,10(b)	5.2	**
40	3313	**Organic pigments, self-heating**	4.2,5(b),(c)	4.2	***
66/60	3280	**Organoarsenic compound, n.o.s.**	6.1,34(a),(b),(c)	6.1	293100
336	2762	**Organochlorine pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2996	**Organochlorine pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
663/63	2995	**Organochlorine pesticide, liquid, toxic, flammable, flash-point less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	2761	**Organochlorine pesticide, solid, toxic** **Organomercury pesticides, see Mercury based pesticides**	6.1,73(a),(b),(c)	6.1	380810
X323/323	3207	**Organometallic compound or compound solution or compound dispersion, water-reactive, flammable n.o.s.**	4.3,3(a),(b),(c)	4.3+3	293100
66/60	3282	**Organometallic compound, toxic, n.o.s.**	6.1,35(a),(b),(c)	6.1	293100
663/63	3279	**Organophosphorus compound, toxic flammable, n.o.s.**	6.1,22(a),(b)	6.1+3	**
66/60	3278	**Organophosphorus compound, toxic, n.o.s.**	6.1,23(a),(b),(c)	6.1	**
336	2784	**Organophosphorus pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663/63	3017	**Organophosphorus pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3018	**Organophosphorus pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66/60	2783	**Organophosphorus pesticide, solid, toxic**	6.1,73(a)(b),(c)	6.1	380810
66/60	2788	**Organotin compound, liquid, n.o.s.**	6.1,32(a),(b),(c)	6.1	293100
66/60	3146	**Organotin compound, solid, n.o.s.**	6.1,32(a),(b),(c)	6.1	293100
336	2787	**Organotin pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663/63	3019	**Organotin pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3020	**Organotin pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2786	**Organotin pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
		Osmium compounds, liquid, see Toxic liquid, inorganic, n.o.s.			
		Osmium compounds, solid, see Toxic id, inorganic, n.o.s.			
66	2471	Osmium tetroxide	6.1,56(a)	6.1	282590
		Oxamyl pesticide, see Carbamate pesticides			
558/58	3098	Oxidizing liquid, corrosive, n.o.s.	5.1,32(a),(b),(c)	5.1+8	**
55/50	3139	Oxidizing liquid, n.o.s.	5.1,28(a),(b),(c)	5.1	**
556/56	3099	Oxidizing liquid, toxic, n.o.s.	5.1,30(a),(b),(c)	5.1+6.1	**
	3133	Oxidizing liquid, water-reactive, n.o.s.: *Not to be accepted for carriage*	*See marg. 470(11)*		
558/58	3085	Oxidizing solid, corrosive, n.o.s.	5.1,31(a),(b),(c)	5.1+8	**
	3137	Oxidizing solid, flammable, n.o.s.: *Not to be accepted for carriage*	5.1,*See marg. 500(12)*		
55/50	1479	Oxidizing solid, n.o.s.	5.1,27(a),(b),(c)	5.1	**
	3100	Oxidizing solid, self-heating, n.o.s.: *Not to be accepted for carriage*	5.1,*See marg. 500(12)*		
556/56	3087	Oxidizing solid, toxic, n.o.s.	5.1,29(a),(b),(c)	5.1+6.1	**
	3121	Oxidizing solid, water-reactive, n.o.s.: *Not to be accepted for carriage*	5.1,*See marg. 500(12)*		
		Oxydemeton-methyl (pesticide), see Organophosphorus pesticides			
		Oxydisulfoton (pesticide), see Organophosphorus pesticides			
265	2190	Oxygen difluoride, compressed	2,1TOC	6.1+05+8	281290
25	1072	**Oxygen, compressed**	2,1O	2+05(+13)	280440
225	1073	**Oxygen, refrigerated liquid**	2,3O	2+05(+13)	280440

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HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33/30	1263	**Paint**	3,5(a),(b),(c), 31(c) (See Note to Section E)	3	320419
80	3066	**Paint**	8,66(b),(c)	8	320419
33/30	1263	**Paint related material**	3,5(a),(b),(c), 31(c)	3	320419
80	3066	**Paint related material** Paint, nitrocellulose, see Nitrocellulose solution, flammable	8,66(b),(c)	8	320419
40	1379	**Paper, unsaturated, oil treated**	4.2,3(c)	4.2	481140
40	2213	**Paraformaldehyde**	4.1,6(c)	4.1	291260
30	1264	**Paraldehyde** Paraoxon (pesticide), see Organophosphorus pesticides Paraquat (pesticide), see Bipyridilium pesticides Parathion (pesticide), see Organophosphorus pesticides Parathion-methyl (pesticide), see Organophosphorus pesticides	3,31(c)	3	291250
90	2315	**PCBs**	9,2(b)	9	290369
90	2315	**PCTs** Peat tar oil, see Tars, liquid	9,2(b)	9	290369
333	1380	**Pentaborane**	4.2,19(a)	4.2+6.1	285000
60	1669	**Pentachloroethane**	6.1,15(b)	6.1	290319
60	3155	**Pentachlorophenol** 1.4-Pentadiene, see Flammable liquid, n.o.s.	6.1,17(b)	6.1	290810
	0411	Pentaerythrite tetranitrate (pentaerythritol tetranitrate: PETN) with not less than 7 % was, by mass	1.1D,4	1+15	360200
	0150	Pentaerythrite tetranitrate, desensitized with not less than 15 % phlegmatizer, by mass	1.1D,4	1+15	360200
	0150	Pentaerythrite tetranitrate, wetted with not less than 25 % water, by mass Pentaerythritol tetranitrate (PETN), see Pentaerythrite tetranitrate Pentaethylenehexamine, see Amines, liquid, corrosive, n.o.s. Pentafluorobenzaldehyde, see Toxic liquid, organic, n.o.s.	1.1D,4	1+15	360200
20	3320	**Pentafluoroethane (refrigerant gas R 125)**	2,2A	2(+13)	290330
30	2286	**Pentamethylheptane**	3,31(c)	3	290110
36	2310	**Pentan-2,4-dione**	3,32(c)	3+6.1	291419

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	1265	**n-Pentane**	3,2(b)	3	290110
33	1265	**Pentanes, liquid**	3,1(a),2(b)	3	290110
33	1108	**1-Pentene**	3,1(a)	3	290129
		2-Pentene, see Flammable liquid, n.o.s.			
80	2705	**1-Pentol**	8,66(b)	8	290519
	0151	Pentolite, dry or wetted with less than 15 % water, by mass	1.1D,4	1+13	360200
50	3211	**Perchlorates, inorganic, aqueous solution, n.o.s.**	5.1,13(b)	5.1	282990
50	1481	**Perchlorates, inorganic, n.o.s.**	5.1,13(b)	5.1	282990
558	1873	**Perchloric acid in aqueous solution with more than 50 % but not more than 72 % acid**	5.1,3(a)	5.1+8	281110
85	1802	**Perchloric acid, not more than 50 % acid, by mass**	8,4(b)	8+05	281119
		Perchloric acid, with more than 72 % acid: *Not to be accepted for carriage*	8,4,*Note*		
66	1670	**Perchloromethyl mercaptan**	6.1,17(a)	6.1	293090
265	3083	**Perchloryl fluoride**	2,2TO	6.1+05(+13)	281210
23	3154	**Perfluoro(ethyl vinyl ether)**	2,2F	3(+13)	290920
23	3153	**Perfluoro(methyl vinyl ether)**	2,2F	3(+13)	290920
33/30	1266	**Perfumery products with flammable solvents**	3,5(a),(b),(c), 31(c)	3	330300
50	3214	**Permanganates, inorganic, aqueous solution, n.o.s.**	5.1,17(b)	5.1	284169
50	1482	**Permanganates, inorganic, n.o.s.**	5.1,17(b)	5.1	284169
50	1483	**Peroxides, inorganic, n.o.s.**	5.1,25(b)	5.1	282590
		Peroxyacetic acid, type D, stabilized, see Organic peroxide type D, liquid			
		Peroxyacetic acid, type E, stabilized, see Organic peroxide type E, liquid			
		Peroxyacetic acid, type F, stabilized, see Organic peroxide type F, liquid			
50	3216	**Persulphates, inorganic, aqueous solutions, n.o.s.**	5.1,18(c)	5.1	283340
50	3215	**Persulphates, inorganic, n.o.s.**	5.1,18(c)	5.1	283340
336	3021	**Pesticide, liquid, flammable, toxic, n.o.s., flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
663/63	2903	**Pesticide, liquid, toxic, flammable, n.o.s. flash point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	2902	**Pesticide, liquid, toxic, n.o.s.**	6.1,71(a),(b),(c)	6.1	380810
66/60	2588	**Pesticide, solid, toxic, n.o.s.**	6.1,73(a),(b),(c)	6.1	380810
		Pesticides, halogenated organic compounds, see Organochlorine pesticides			
		PETN, see Pentaerythrite tetranitrate			
33	1203	**Petrol**	3,3(b)	3	272400
33/30	1267	**Petroleum crude oil**	3,1(a),2(a),(b), 3(b),31(c)	3	270900
33/30	1268	**Petroleum distillates, n.o.s.**	3,1(a),2(a),(b), 3(b),31(c)	3	272900
		Petroleum ether, see Petroleum distillates, n.o.s.			
23	1075	**Petroleum liquefied gases**	2,2F	3(+13)	271119
		Petroleum oil, see Petroleum distillates, n.o.s.			
33/30	1268	**Petroleum products, n.o.s.**	3,1(a),2(a),(b), 3(b),31(c)	3	272900
		Petroleum spirit, see Petroleum distillates, n.o.s.			
60	2645	**Phenacyl bromide**	6.1,17(b)	6.1	291470
60	2311	**Phenetidines**	6.1,12(c)	6.1	292222
		Phenkapton (pesticide), see Organophosphorus pesticides			
		Phenobarbital, see Toxic solid, organic, n.o.s.			
60	2821	**Phenol solution**	6.1,14(b),(c)	6.1	290711
		Phenol, alkaline solutions, see Corrosive liquid, n.o.s.			
60	2312	**Phenol, molten**	6.1,24(b)1	6.1	290711
60	1671	**Phenol, solid**	6.1,14(b)	6.1	290711
80	2904	**Phenolates, liquid**	8,62(c)	8	290711
80	2905	**Phenolates, solid**	8,62(c)	8	290711
80	1803	**Phenolsulphonic acid, liquid**	8,34(b)	8	290410
336	2766	**Phenoxy pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	3000	**Phenoxy pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66/63	2999	**Phenoxy pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	2765	**Phenoxy pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
		Phenthoat (pesticide), see Organophosphorus pesticides			
30	1134	**Phenyl chloride**	3,31(c)	3	290361
68	2746	**Phenyl chloroformate**	6.1,27(b)	6.1+8	291590
663	2487	**Phenyl isocyanate**	6.1,18(a)	6.1+3	292910
663	2337	**Phenyl mercaptan**	6.1,20(a)	6.1+3	293090
30	2222	**Phenyl methyl ether**	3,31(c)	3	290930
336	2768	**Phenyl urea pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663/63	3001	**Phenyl urea pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3002	**Phenyl urea pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2767	**Phenyl urea pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
60	2470	**Phenylacetonitrile, liquid**	6.1,12(c)	6.1	292690
80	2577	**Phenylacetyl chloride**	8,35(b)1	8	291639
66	1672	**Phenylcarbylamine chloride**	6.1,17(a)	6.1	292520
60	1673	**Phenylenediamines (o-, m-, p-)**	6.1,12(c)	6.1	292151
60	2572	**Phenylhydrazine**	6.1,12(b)	6.1	292800
60	1674	**Phenylmercuric acetate**	6.1,33(b)	6.1	380820
		Phenylmercuric acetate (PMA) (pesticide), see Mercury based pesticides			
66/60	2026	**Phenylmercuric compound, n.o.s.**	6.1,33(a),(b),(c)	6.1	293100
60	1894	**Phenylmercuric hydroxide**	6.1,33(b)	6.1	293100
60	1895	**Phenylmercuric nitrate**	6.1,33(b)	6.1	293100
		Phenylmercuric pyrocatechin (PMB) (pesticide), see Mercury based pesticides			
80	2798	**Phenylphosphorus dichloride**	8,35(b)1	8	293100
80	2799	**Phenylphosphorus thiodichloride**	8,35(b)1	8	292010
X80	1804	**Phenyltrichlorosilane**	8,36(b)	8	X80
		Phorate (pesticide), see Organophosphorus pesticides			
		Phosalone (pesticide), see Organophosphorus pesticides			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Phosfolan (pesticide), see Organophosphorus pesticides			
268	1076	**Phosgene**	2,2TC	6.1+8(+13)	281210
		Phosmet (Phthalophos) (pesticide), see Organophosphorus pesticides			
40	2940	**9-Phosphabicyclononanes (cyclooctadiene phosphines)**	4.2,5(b)	4.2	293100
		Phosphamidon (pesticide), see Organophosphorus pesticides			
263	2199	Phosphine	2,2TF	6.1+3	285000
80	1805	**Phosphoric acid**	8,17(c)	8	280920
80	1807	**Phosphoric acid, anhydrous**	8,16(b)	8	280910
80	2834	**Phosphorous acid**	8,16(c)	8	281119
40	1339	**Phosphorus heptasulphide**	4.1,11(b)	4.1	281390
80	1939	**Phosphorus oxybromide**	8,11(b)	8	281290
80	2576	**Phosphorus oxybromide, molten**	8,15	8	281290
X80	1810	**Phosphorus oxychloride**	8,12(b)	8	281210
80	2691	**Phosphorus pentabromide**	8,11(b)	8	281290
80	1806	**Phosphorus pentachloride**	8,11(b)	8	281210
268	2198	**Phosphorus pentafluoride, compressed**	2,1TC	6.1+8	281290
423	1340	**Phosphorus pentasulphide**	4.3,20(b)	4.3	281390
		Phosphorus pentasulphide containing phosphorus, white or yellow: *Not to be accepted for carriage*	4.3,20(b), *Note*		
80	1807	**Phosphorus pentoxide**	8,16(b)	8	280910
40	1341	**Phosphorus sesquisulphide**	4.1,11(b)	4.1	281390
		Phosphorus sulphides containing phosphorus, white or yellow: *Not to be accepted for carriage*	4.1,11(b), *Note*		
X80	1808	**Phosphorus tribromide**	8,12(b)	8	281290
668	1809	**Phosphorus trichloride**	6.1,67(a)	6.1+8	281210
80	2578	**Phosphorus trioxide**	8,16(c)	8	281129
40	1343	**Phosphorus trisulphide**	4.1,11(b)	4.1	281390
40	1338	**Phosphorus, amorphous**	4.1,11(c)	4.1	280470
46	1381	**Phosphorus, white or yellow, dry or under water or in solution**	4.2,11(a)	4.2+6.1	280470
446	2447	**Phosphorus, white, molten**	4.2,22	4.2+6.1	280470

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
X80	1810	**Phosphoryl chloride**	8,12(b)	8	281210
80	2214	**Phthalic anhydride**	8,31(c)	8	291735
336	2774	**Phthalimide derivative pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663/63	3007	**Phthalimide derivative pesticide, liquid, toxic, flash-point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3008	**Phthalimide derivative pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2773	**Phthalimide derivative pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
		Phthalophos (pesticide), see Organophosphorus pesticides			
30	2313	**Picolines**	3,31(c)	3	293339
		Picramide, see Trinitroaniline			
		Picric acid, see Trinitrophenol			
		Picrite, see Nitroguanidine			
		Picryl chloride, see Trinitrochlorobenzene			
		Pinanyl hydroperoxide, see Organic peroxide type D, liquid			
		Pinanyl hydroperoxide, see Organic peroxide type F, liquid			
		Pindone (and salts of) (pesticide), see under Pesticide, etc.			
30	2368	**alpha-Pinene**	3,31(c)	3	290219
30	1272	**Pine oil**	3,31(c)	3	130219
80	2579	**Piperazine**	8,52(c)	8	293390
338	2401	**Piperidine**	3,23(b)	3+8	293332
		Pirimicarb (pesticide), see Carbamate pesticides			
		Pirimiphos-ethyl (pesticide), see Organophosphorus pesticides			
90	3314	**Plastics moulding compound in dough, sheet or extruded rope form evolving flammable vapour**	9,4(c)	—	**
40	2006	Plastics, nitrocellulose-based, self-heating, n.o.s.	4.2,4(c)	4.2	391220
338/38	2733	**Polyamines, flammable, corrosive, n.o.s.**	3,22(a),(b),33(c)	3+8	2921**
		Polyamines, liquid, corrosive, flammable, n.o.s., see Amines, etc., n.o.s.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Polyamines, liquid, corrosive, n.o.s., see Amines, etc., n.o.s.			
		Polyamines, solid, corrosive, n.o.s., see Amines, etc., n.o.s.			
90	2315	**Polychlorinated biphenyls**	9,2(b)	9	290369
33/30	3269	Polyester resin kit	3,5(b),(c),31(c)	3	390791
90	3151	**Polyhalogenated biphenyls, liquid or polyhalogenated terphenyls, liquid**	9,2(b)	9	290369
90	3152	**Polyhalogenated biphenyls, solid or polyhalogenated terphenyls, solid**	9,2(b)	9	290369
90	2211	**Polymeric beads, expandable**	9,4(c)		39****
80	1814	**Potash lye**	8,42(b),(c)	8	281520
X423	2257	**Potassium**	4.3,11(a)	4.3	280519
60	1677	**Potassium arsenate**	6.1,51(b)	6.1	284290
60	1678	**Potassium arsenite**	6.1,51(b)	6.1	284290
86	1811	**Potassium bifluoride**	8,9(b)	8+6.1	282619
		Potassium bisulphate, aqueous solutions, see Potassium hydrogen sulphate			
X423	1870	Potassium borohydride	4.3,16(a)	4.3	285000
50	1484	**Potassium bromate**	5.1,16(b)	5.1	282990
50	1485	**Potassium chlorate**	5.1,11(b)	5.1	282919
50	2427	**Potassium chlorate, aqueous solution**	5.1,11(b),(c)	5.1	282919
60	1679	**Potassium cuprocyanide**	6.1,41(b)	6.1	283719
66	1680	Potassium cyanide	6.1,41(a)	6.1	283719
40	1929	**Potassium dithionite**	4.2,13(b)	4.2	283190
60	1812	**Potassium fluoride**	6.1,63(c)	6.1	282619
66	2628	**Potassium fluoroacetate**	6.1,17(a)	6.1	291590
60	2655	**Potassium fluorosilicate**	6.1,64(c)	6.1	282620
80	2509	**Potassium hydrogen sulphate**	8,13(b)	8	283329
86	1811	**Potassium hydrogendifluoride**	8,9(b)	8+6.1	282619
		Potassium hydrosulphite, see Potassium dithionite			
80	1814	**Potassium hydroxide solution (potash lye)**	8,42(b),(c)	8	281520
80	1813	**Potassium hydroxide, solid**	8,41(b)	8	281520
		Potassium hypochlorite solution, see Hypochlorite solution			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
X423	1420	**Potassium metal alloys**	4.3,11(a)	4.3	811299
60	2864	**Potassium metavanadate**	6.1,58(b)	6.1	284190
80	2033	**Potassium monoxide**	8,41(b)	8	282590
50	1486	**Potassium nitrate**	5.1,22(c)	5.1	283421
50	1487	**Potassium nitrate and sodium nitrite mixtures**	5.1,24(b)	5.1	283421
50	1488	**Potassium nitrite**	5.1,23(b)	5.1	283410
		Potassium oxide, see Potassium monoxide			
50	1489	**Potassium perchlorate**	5.1,13(b)	5.1	282990
50	1490	**Potassium permanganate**	5.1,17(b)	5.1	284161
55	1491	Potassium peroxide	5.1,25(a)	5.1	281530
50	1492	**Potassium persulphate**	5.1,18(c)	5.1	283340
X462	2012	Potassium phosphide	4.3,18(a)	4.3+6.1	284800
		Potassium selenate, see Selenates			
		Potassium selenite, see Selenites			
X423	1422	**Potassium sodium alloys**	4.3,11(a)	4.3	811299
40	1382	**Potassium sulphide**	4.2,13(b)	4.2	283090
40	1382	**Potassium sulphide, anhydrous or Potassium sulphide with less than 30 % water of crystallization**	4.2,13(b)	4.2	283090
		Potassium sulphide, aqueous solutions, see Potassium sulphide, hydrated			
80	1847	**Potassium sulphide, hydrated, containing not less than 30 % water of crystallization**	8,45(b)1	8	283090
55	2466	Potassium superoxide	5.1,25(a)	5.1	281530
	0159	Powder cake (powder paste), wetted with not less than 25 % water, by mass	1.3C,26	1+13	360100
	0433	Powder cake (powder paste), wetted, with not less than 17 % alcohol, by mass	1.1C,2	1+13	360100
		Powder paste, see Powder cake			
	0160	Powder, smokeless	1.1C,2	1+15	360100
	0161	Powder, smokeless	1.3C,26	1+13	360100
	0044	Primers, cap type	1.4S,47	1.4	360300
	0377	Primers, cap type	1.1B,1	1+13	360300
	0378	Primers, cap type	1.4B,35	1.4	360300
	0319	Primers, tubular	1.3G,30	1	360300

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0320	Primers, tubular	1.4G,43	1.4	360300
	0376	Primers, tubular	1.4S,47	1.4	360300
33/30	1210	**Printing ink, flammable**	3,5(a),(b),(c), 31(c) (See Note to Section E)	3	321519
	0346	Projectiles with burster or expelling charge	1.2D,17	1	930690
	0347	Projectiles with burster or expelling charge	1.4D,39	1.4	930690
	0426	Projectiles with burster or expelling charge	1.2F,19	1+13	930690
	0427	Projectiles with burster or expelling charge	1.4F,41	1.4	930690
	0434	Projectiles with burster or expelling charge	1.2G,21	1	930690
	0435	Projectiles with burster or expelling charge	1.4G,43	1.4	930690
	0617	Projectiles with bursting charge	1.1F,7	1+13	930690
	0168	Projectiles with bursting charge	1.1D,5	1+13	930690
	0169	Projectiles with bursting charge	1.2D,17	1	930690
	0324	Projectiles with bursting charge	1.2F,19	1+13	930690
	0344	Projectiles with bursting charge	1.4D,39	1.4	930690
	0345	Projectiles, inert with tracer	1.4S,47	1.4	930690
	0424	Projectiles, inert with tracer	1.3G,30	1	930690
	0425	Projectiles, inert with tracer	1.4G,43	1.4	930690
		Promecarb (pesticide), see Carbamate pesticides			
		Promorit (Muritan) (pesticide), see Carbamate pesticides			
		Propadiene with 1 % to 4 % methyl acetylene, stabilized, see Methyl acetylene and propadiene mixtures, stabilized			
239	2200	**Propadiene, inhibited**	2,2F	3(+13)	290129
		Propane (commercial name): see Hydrocarbon gas mixture, liquefied, n.o.s.			
		(Mixture C)			
23	1978	**Propane**	2,2F	3(+13)	271112
33	2402	**Propanethiols**	3,3(b)	3	293090
33/30	1274	**n-Propanol**	3,3(b),31(c)	3	290512
		Propaphos (pesticide), see Organophosphorus pesticides			
	0495	Propellant, liquid	1.3C,26	1+13	360200

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0497	Propellant, liquid	1.1C,2	1+13	360200
	0498	Propellant, solid	1.1C,2	1+13	360200
	0499	Propellant, solid	1.3C,26	1+13	360200
23	1077	**Propene**	2,2F	3(+13)	290122
33	1275	**Propionaldehyde**	3,3(b)	3	291219
80	1848	**Propionic acid**	8,32(c)	8	291550
		Propionic acid with less than 50 % acid: *Not subject to RID*	8,32(c), *Note*		
80	2496	**Propionic anhydride**	8,32(c)	8	291590
336	2404	**Propionitrile**	3,11(b)	3+6.1	292690
338	1815	**Propionyl chloride**	3,25(b)	3+8	291590
		Propoxur (pesticide), see Carbamate pesticides			
33	1276	**n-Propyl acetate**	3,3(b)	3	291539
33/30	1274	**Propyl alcohol, normal**	3,3(b),31(c)	3	290512
33	1278	**Propyl chloride**	3,2(b)	3	290319
668	2740	**n-Propyl chloroformate**	6.1,28(a)	6.1+8+3	291590
33	1281	**Propyl formates**	3,3(b)	3	291513
33	2402	**Propyl mercaptan**	3,3(b)	3	293090
338	1277	**Propylamine**	3,22(b)	3+8	292119
30	2364	**n-Propylbenzene**	3,31(c)	3	290290
23	1077	**Propylene**	2,2F	3(+13)	290122
63	2611	**Propylene chlorohydrin**	6.1,16(b)	6.1+3	290550
83	2258	**1,2-Propylenediamine**	8,54(b)	8+3	292129
33	1279	**Propylene dichloride**	3,3(b)	3	290316
33	1280	**Propylene oxide**	3,2(a)	3	291020
30	2850	**Propylene tetramer**	3,31(c)	3	290129
30	2057	**Propylene trimer**	3,31(c)	3	290129
336	1921	**Propyleneimine, inhibited**	3,12	3+6.1	293390
663	2482	**n-Propyl isocyanate**	6.1,6(a)	6.1+3	292910
33	1865	n-Propyl nitrate	3,3(b)	3	292090
X83	1816	**Propyltrichlorosilane**	8,37(b)	8+3	293100
		Prothoate (pesticide), see Organophosphorus pesticides			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Pyrazophos (pesticide) see Organophosphorus pesticides			
		Pyrazoxon (pesticide) see Organophosphorus pesticides			
33	1282	**Pyridine**	3,3(b)	3	293331
		Pyrocatechol, see Toxic solid, organic, n.o.s.			
43	1383	Pyrophoric alloy, n.o.s.	4.2,12(a)	4.2	81****
333	3194	**Pyrophoric liquid, inorganic, n.o.s.**	4.2,17(a)	4.2+4.3	**
333	2845	**Pyrophoric liquid, organic, n.o.s.**	4.2,6(a)	4.2	**
43	1383	Pyrophoric metal, n.o.s.	4.2,12(a)	4.2	81****
X333	3203	**Pyrophoric organometallic compound, n.o.s.**	4.2,33(a)	4.2+4.3	**
43	3200	Pyrophoric solid, inorganic, n.o.s.	4.2,16(a)	4.2	**
43	2846	Pyrophoric solid, organic, n.o.s.	4.2,5(a)	4.2	**
X80	1817	**Pyrosulphuryl chloride**	8,12(b)	8	281210
338	1922	**Pyrrolidine**	3,23(b)	3+8	293390
		Quickmatch, see Fuse instantaneous, non-detonating			
		Quinalphos (pesticide), see Organophosphorus pesticides			
		Quinhydrone, see Toxid solid, organic, n.o.s.			
60	2656	**Quinoline**	6.1,12(c)	6.1	293340
		R 11: *Not subject to RID*	2,2A *Note*		
		R 113: *Not subject to RID*	2,2A *Note*		
239	1959	**R 1132a**	2,2F	3(+13)	290330
		R 113a: *Not subject to RID*	2,2A *Note*		
20	1958	**R 114**	2,2A	2(+13)	290344
20	1020	**R 115**	2,2A	2(+13)	290344
20	2193	**R 116**	2,2A	2(+13)	290330
20	1028	**R 12**	2,2A	2(+13)	290342
20	1858	**R 1216**	2,2A	2(+13)	290330
20	1021	**R 124**	2,2A	2(+13)	290349
20	3220	**R 125**	2,2A	2(+13)	290330
20	1974	**R 12B1**	2,2A	2(+13)	290346

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
20	1022	**R 13**	2,2A	2(+13)	290345
20	2422	**R 1318**	2,2A	2(+13)	290330
		R 133: *Not subject to RID*	2,2A *Note*		
20	1983	**R 133a**	2,2A	2(+13)	290349
		R 133b: *Not subject to RID*	2,2A *Note*		
20	3159	**R 134a**	2,2A	2(+13)	290330
20	1009	**R 13B1**	2,2A	2(+13)	290346
20	1982	**R 14**	2,1A	2(+13)	290330
23	2517	**R 142b**	2,2F	3(+13)	290349
23	2035	**R 143a**	2,2F	3(+13)	290330
23	1030	**R 152a**	2,2F	3(+13)	290330
23	2453	**R 161**	2,2F	3(+13)	290330
20	1029	**R 21**	2,2A	2(+13)	290349
20	2424	**R 218**	2,2A	2(+13)	290330
20	1018	**R 22**	2,2A	2(+13)	290349
20	3296	**R 227**	2,2A	2(+13)	290330
20	1984	**R 23**	2,2A	2(+13)	290330
23	3252	**R 32**	2,2F	3(+13)	290330
23	1063	**R 40**	2,2F	3(+13)	290311
23	2454	**R 41**	2,2F	3(+13)	290730
20	2602	**R 500**	2,2A	2(+13)	382471
20	1973	**R 502**	2,2A	2(+13)	382471
20	2599	**R 503**	2,2A	2(+13)	382471
		Racumin (pesticide), see Coumarin derivative pesticides			
70	2918	Radioactive material, fissile, n.o.s.	7,Sch13	(703)	284440
		— under special arrangement			
70	2918	Radioactive material, fissile, n.o.s.	7,Sch12	(703)	284440
		— in Type 1F, AF, B(U)F or B(M)F packagings			
70	2910	Radioactive material, limited quantities in excepted package	7	—	284440
70	2910	— articles manufactured from natural or depleted uranium or natural thorium	7,Sch3	—	284440

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
70	2910	— empty packaging	7,Sch4	—	284440
70	2910	— instruments or articles	7,Sch2	—	284440
70	2910	— limited quantity of material	7,Sch1	—	284440
70	2912	**Radioactive material, low specific activity (LSA), not otherwise specified**	7	(703)	284440
70	2912	**— LSA-I**	7,Sch5	(703)	284440
70	2912	**— LSA-II**	7,Sch6	(703)	284440
70	2912	**— LSA-III**	7,Sch7	(703)	284440
70	2912	**— under special arrangement**	7,Sch13	(703)	284440
	2982	**Radioactive material, n.o.s.**	7		
70	2982	**— in Type A packages**	7,Sch9	(703)	284440
70	2982	**— in Type B(M) packages**	7,Sch11	(703)	284440
70	2982	**— in Type B(U) packages**	7,Sch10	(703)	284440
70	2982	**— under special arrangement**	7,Sch13	(703)	284440
	2974	Radioactive material, special form, n.o.s.	7		
70	2974	— in Type A packages	7,Sch9	(703)	284440
70	2974	— in Type B(M) packages	7,Sch11	(703)	284440
70	2974	— in Type B(U) packages	7,Sch10	(703)	284440
70	2974	— under special arrangement	7,Sch13	(703)	284440
70	2913	Radioactive material, surface contaminated objects (SCO)	7	(703)	284440
70	2913	— SCO-I and SCO-II	7,Sch8	(703)	284440
70	2913	— under special arrangement	7,Sch13	(703)	284440
20	1981	**Rare gases and nitrogen mixtures, see rare gases mixture, compressed**	2,1A	2(+13)	280429
20	1980	**Rare gases and oxygen mixtures, see rare gases mixture, compressed**	2,1A	2(+13)	280429
20	1979	**Rare gases mixture, compressed**	2,1A	2(+13)	280429
20	1976	**RC 318**	2,2A	2(+13)	290359
		RDX, see Cyclotrimethylenetrinitramine			
20	2037	Receptacles, small, containing gas without release device, non-refillable	2,5A	2	**
25	2037	Receptacles, small, containing gas without release device, non-refillable	2,5O	2+05	**
23	2037	Receptacles, small, containing gas without release device, non-refillable	2,5F	3	**

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
26	2037	Receptacles, small, containing gas without release device, non-refillable	2,5T	6.1	**
263	2037	Receptacles, small, containing gas without release device, non-refillable	2,5TF	6.1+3	**
268	2037	Receptacles, small containing gas without release device, non-refillable	3,5TC	6.1+8	**
265	2037	Receptacles, small, containing gas without release device, non-refillable	2,5TO	6.1+05	**
263	2037	Receptacles, small, containing gas without release device, non-refillable	2,5TFC	6.1+3+8	**
265	2037	Receptacles, small, containing gas without release device, non-refillable	2,5TOC	6.1+05+8	**
20	1078	**Refrigerant gas, n.o.s.**	2,2A	2(+13)	382471
20	2857	Refrigerating machines containing non-flammable, non-toxic, liquefied gas or ammonia solutions (UN 2672)	2,6A	2	841861
	0173	Release device, explosive	1.4S,47	1.4	360300
33/30	1866	**Resin solution, flammable**	3,5(a),(b),(c), 31(c)	3	**
60	2876	**Resorcinol**	6.1,14(c)	6.1	290721
	0174	Rivets, explosive	1.4S,47	1.4	930690
	0186	Rocket motors	1.3C,27	1	930690
	0280	Rocket motors	1.1C,3	1+13	930690
	0281	Rocket motors	1.2C,15	1	930690
	0250	Rocket motors with hypergolic liquids with or without expelling charge	1.3L,34	1+13	930690
	0322	Rocket motors with hypergolic liquids with or without expelling charge	1.2L,25	1+13	930690
	0395	Rocket motors, liquid fuelled	1.2J,23	1+13	930690
	0396	Rocket motors, liquid fuelled	1.3J,32	1+13	930690
	0180	Rockets with bursting charge	1.1F,7	1+13	930690
	0181	Rockets with bursting charge	1.1E,6	1+13	930690
	0182	Rockets with bursting charge	1.2E,18	1	930690
	0295	Rockets with bursting charge	1.2F,19	1+13	930690
	0436	Rockets with expelling charge	1.2C,15	1	930690
	0437	Rockets with expelling charge	1.3C,27	1	930690
	0438	Rockets with expelling charge	1.4C,37	1.4	930690
	0183	Rockets with inert head	1.3C,27	1	930690

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0238	Rockets, line-throwing	1.2G,21	1	930690
	0240	Rockets, line-throwing	1.3G,30	1	930690
	0453	Rockets, line-throwing	1.4G,43	1.4	930690
	0397	Rockets, liquid fuelled with bursting charge	1.1J,10	1+13	930690
	0398	Rockets, liquid fuelled with bursting charge	1.2J,23	1+13	930690
33/30	1286	**Rosin oil**	3,5(a),(b),(c), 31(c)	3	380690
		Rotenone (pesticide), see under Pesticide, etc.			
40	1345	**Rubber scrap**	4.1,1(b)	4.1	400400
40	1345	**Rubber shoddy**	4.1,1(b)	4.1	400400
33/30	1287	**Rubber solution**	3,5(a),(b),(c), 31(c)	3	400520
X423	1423	**Rubidium**	4.3,11(a)	4.3	280519
80	2678	**Rubidium hydroxide**	8,41(b)	8	282590
80	2677	**Rubidium hydroxide solution**	8,42(b),(c)	8	282590
		Salithion (pesticide), see Organophosphorus pesticides			
	0190	Samples, explosive, other than initiating explosive	1,51	*	360200
		Schradan (pesticide), see Organophosphorus pesticides			
90	3268	Seat-belt pre-tensioners	9,8(c)	9	870899
40	1386	**Seed cake with more than 1,5 % oil and not more than 11 % moisture**	4.2,2(c)	4.2	230690
40	2217	**Seed cake with not more than 1,5 % oil and not more than 11 % moisture**	4.2,2(c)	4.2	230690
		Seed, dressed impregnated with pesticide or other toxic substance	6.1, *See Note 2b to Section F*		
66	2630	Selenates	6.1,55(a)	6.1	291590
88	1905	**Selenic acid**	8,16(a)	8	281119
66	2630	Selenites	6.1,55(a)	6.1	291590
66/60	3283	**Selenium compound, n.o.s.**	6.1,55(a),(b),(c)	6.1	**
		Selenium dioxide, see Selenium compound, n.o.s.			
60	2657	**Selenium disulphide**	6.1,55(b)	6.1	283090

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
2068	2194	Selenium hexafluoride	2,2TC	6.1+8	281290
X886	2879	**Selenium oxychloride**	8,12(a)	8+6.1	282749
38	3188	**Self-heating liquid, corrosive, inorganic, n.o.s.**	4.2,21(b),(c)	4.2+8	**
38	3185	**Self-heating liquid, corrosive, organic, n.o.s.**	4.2,10(b),(c)	4.2+8	**
30	3186	**Self-heating liquid, inorganic, n.o.s.**	4.2,17(b),(c)	4.2	**
30	3183	**Self-heating liquid, organic, n.o.s.**	4.2,6(b),(c)	4.2	**
36	3187	**Self-heating liquid, toxic, inorganic, n.o.s.**	4.2,19(b),(c)	4.2+6.1	**
36	3184	**Self-heating liquid, toxic, organic, n.o.s.**	4.2,8(b),(c)	4.2+6.1	**
40	3189	**Self-heating metal powder, n.o.s.**	4.2,12(b),(c)	4.2	**
48	3192	**Self-heating solid, corrosive, inorganic, n.o.s.**	4.2,20(b),(c)	4.2+8	**
48	3126	**Self-heating solid, corrosive, organic, n.o.s.**	4.2,9(b),(c)	4.2+8	**
40	3190	**Self-heating solid, inorganic, n.o.s.**	4.2,16(b),(c)	4.2	**
40	3088	**Self-heating solid, organic, n.o.s.**	4.2,5(b),(c)	4.2	**
	3127	Self-heating solid, oxidizing, n.o.s.: *Not to be accepted for carriage*	4.2, *See marg. 430 (11)*		
46	3191	**Self-heating solid, toxic, inorganic, n.o.s.**	4.2,18(b),(c)	4.2+6.1	**
46	3128	**Self-heating solid, toxic, organic, n.o.s.**	4.2,7(b),(c)	4.2+6.1	**
		Self-reactive liquid, sample, see Self-reactive liquid, type C			
40	3221	Self-reactive liquid, type B	4.1,31(b)	4.1	***
40	3223	Self-reactive liquid, type C	4.1,33(b)	4.1	***
40	3225	Self-reactive liquid, type D	4.1,35(b)	4.1	***
40	3227	Self-reactive liquid, type E	4.1,37(b)	4.1	***
40	3229	Self-reactive liquid, type F	4.1,39(b)	4.1	***
		Self-reactive solid, sample, see Self-reactive solid, type C			
40	3222	Self-reactive solid, type B	4.1,32(b)	4.1	***
40	3224	Self-reactive solid, type C	4.1,34(b)	4.1	***
40	3226	Self-reactive solid, type D	4.1,36(b)	4.1	***
40	3228	Self-reactive solid, type E	4.1,38(b)	4.1	***
40	3230	Self-reactive solid, type F	4.1,40(b)	4.1	***
33/30	1288	**Shale oil**	3,3(b),31(c)	3	270900

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0191	Signal devices, hand	1.4G,43	1.4	360490
	0373	Signal devices, hand	1.4S,47	1.4	360490
	0194	Signals, distress, ship	1.1G,9	1+13	360490
	0195	Signals, distress, ship	1.3G,30	1	360490
	0192	Signals, railway track, explosive	1.1G,9	1+13	360490
	0193	Signals, railway track, explosive	1.4S,47	1.4	360490
	0492	Signals, railway track, explosive	1.3G,30	1	360490
	0493	Signals, railway track, explosive	1.4G,43	1.4	360490
	0196	Signals, smoke	1.1G,9	1+13	360490
	0197	Signals, smoke	1.4G,43	1.4	360490
	0313	Signals, smoke	1.2G,21	1	360490
	0487	Signals, smoke	1.3G,30	1	360490
23	2203	**Silane, compressed**	2,1F	3(+13)	285000
		Silicofluorides, see Fluorosilicates, n.o.s.			
40	1346	**Silicon powder, amorphous**	4.1,13(c)	4.1	280461
X80	1818	**Silicon tetrachloride**	8,12(b)	8	281210
268	1859	**Silicon tetrafuoride, compressed**	2,1TC	6.1+8(+13)	281290
60	1683	**Silver arsenite**	6.1,51(b)	6.1	284290
60	1684	**Silver cyanide**	6.1,41(b)	6.1	283719
50	1493	**Silver nitrate**	5.1,22(b)	5.1	284321
40	1347	Silver picrate, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	284329
80	1906	**Sludge acid**	8,1(b)	8	383490
80	1907	**Soda lime**	8,41(c)	8	282590
80	1824	**Soda lye**	8,42(b),(c)	8	281512
X423	1428	**Sodium**	4.3,11(a)	4.3	280511
		Sodium 2-diazo-1-naphthol-4-sulphonate, see Self-reactive solid, type D			
		Sodium 2-diazo-1-naphthol-5-sulphonate, see Self-reactive solid, type D			
80	1819	**Sodium aluminate solution**	8,42(b),(c)	8	284110
	2812	Sodium aluminate, solid: *Not subject to RID*	8, *See marg. 800 (9)*		
423	2835	**Sodium aluminium hydride**	4.3,16(b)	4.3	285000

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	2863	**Sodium ammonium vanadate**	6.1,58(b)	6.1	284190
60	2473	**Sodium arsanilate**	6.1,34(c)	6.1	293100
60	1685	**Sodium arsenate**	6.1,51(b)	6.1	284290
		Sodium arsenite (pesticide), see Arsenical pesticides			
60	1686	**Sodium arsenite, aqueous solution**	6.1,51(b),(c)	6.1	284290
60	2027	**Sodium arsenite, solid**	6.1,51(b)	6.1	284290
60	1687	Sodium azide	6.1,42(b)	6.1	285000
80	2439	**Sodium bifluoride**	8,9(b)	8	282619
		Sodium bisulphate, aqueous solutions, see Bisulphates, aqueous solution			
X423	1426	Sodium borohydride	4.3,16(a)	4.3	285000
80	3320	**Sodium borohydride and sodium hydroxide solution with not more than 12 % sodium borohydride and not more than 40 % sodium hydroxide, by mass**	8,42(b),(c)	8	285000
50	1494	**Sodium bromate**	5.1,16(b)	5.1	282990
60	1688	**Sodium cacodylate**	6.1,51(b)	6.1	293100
50	1495	**Sodium chlorate**	5.1,11(b)	5.1	282911
50	2428	**Sodium chlorate, aqueous solution**	5.1,11(b),(c)	5.1	282911
50	1496	**Sodium chlorite**	5.1,14(b)	5.1	282890
60	2659	**Sodium chloroacetate**	6.1,17(c)	6.1	291590
66	2317	**Sodium cuprocyanide solution**	6.1,41(a)	6.1	283720
66	2316	Sodium cuprocyanide, solid	6.1,41(a)	6.1	283720
66	1689	Sodium cyanide	6.1,41(a)	6.1	283711
		Sodium dimethylarsenate, see Sodium cacodylate			
	0234	Sodium dinitro-o-cresolate, dry or wetted with less than 15 % water, by mass	1.3C,26	1+13	360200
46	1348	Sodium dinitro-o-cresolate, wetted with not less than 15 % water, by mass	4.1,22(a)1	4.1+6.1	360200
40	1384	**Sodium dithionite (sodium hydrosulphite)**	4.2,13(b)	4.2	283110
60	1690	**Sodium fluoride**	6.1,63(c)	6.1	282611
66	2629	**Sodium fluoroacetate**	6.1,17(a)	6.1	291590
60	2674	**Sodium fluorosilicate**	6.1,64(c)	6.1	282620
X423	1427	Sodium hydride	4.3,16(a)	4.3	285000

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Sodium hydrogen sulphate, aqueous solutions, see Bisulphates, aqueous solution			
80	2439	**Sodium hydrogendifluoride**	8,9(b)	8	282619
40	2318	**Sodium hydrosulphide with less than 25 % water of crystallization**	4.2,13(b)	4.2	283010
80	2949	**Sodium hydrosulphide with not less than 25 % water of crystallization**	8,45(b)1	8	283010
		Sodium hydrosulphite, see Sodium dithionite			
80	1824	**Sodium hydroxide solution**	8,42(b),(c)	8	281512
80	1823	**Sodium hydroxide, solid**	8,41(b)	8	281511
		Sodium hypochlorite solution, see Hypochlorite solution			
		Sodium metasilicate, see Disodium trioxosilicate			
48	1431	**Sodium methylate**	4.2,15(b)	4.2+8	290550
338/38	1289	**Sodium methylate solution in alcohol**	3,24(b),33(c)	3+8	290550
80	1825	**Sodium monoxide**	8,41(b)	8	282590
50	1498	**Sodium nitrate**	5.1,22(c)	5.1	310250
50	1499	**Sodium nitrate and potassium nitrate mixture**	5.1,22(c)	5.1	283429
50	1500	**Sodium nitrite**	5.1,23(c)	5.1	283410
80	1825	**Sodium oxide**	8,41(b)	8	282590
60	2567	**Sodium pentachlorophenate**	6.1,17(b)	6.1	290810
50	1502	**Sodium perchlorate**	5.1,13(b)	5.1	282990
50	1503	**Sodium permanganate**	5.1,17(b)	5.1	284169
55	1504	Sodium peroxide	5.1,25(a)	5.1	281530
50	3247	**Sodium peroxoborate, anhydrous**	5.1,27(b)	5.1	284030
50	1505	**Sodium persulphate**	5.1,18(c)	5.1	283340
X462	1432	Sodium phosphide	4.3,18(a)	4.3+6.1	284800
	0235	Sodium picramate, dry or wetted with less than 20 % water, by mass	1.3C,26	1+13	360200
40	1349	Sodium picramate, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	360200
		Sodium selenate, see Selenates			
		Sodium selenite, see Selenites			
		Sodium silicofluoride, see under Pesticide, etc.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
40	1385	**Sodium sulphide with less than 30 % water of crystallization**	4.2,13(b)	4.2	283010
40	1385	**Sodium sulphide, anhydrous**	4.2,13(b)	4.2	283010
80	1849	**Sodium sulphide, hydrated, not less than 30 % water of crystalization**	8,45(b)1	8	283010
55	2547	Sodium superoxide	5.1,25(a)	5.1	281530
80	3244	**Solids containing corrosive liquid, n.o.s.**	8,65(b)	8	**
40	3175	**Solids containing flammable liquid, n.o.s.**	4.1,4(c)	4.1	**
60	3243	**Solids containing toxic liquid, n.o.s.**	6.1,65(b)	6.1	**
	0204	Sounding devices, explosive	1.2.F,19	1+13	360490
	0296	Sounding devices, explosive	1.1F,7	1+13	360490
	0374	Sounding devices, explosive	1.1D,5	1+13	360490
	0375	Sounding devices, explosive	1.2D,17	1	360490
X80	1827	**Stannic chloride, anhydrous**	8n12(b)	8	282739
80	2440	**Stannic chloride, pentahydrate**	8,11(c)	8	282739
X462	1433	Stannic phosphides	4.3,18(a)	4.3+6.1	284800
263	2676	Stibine	2,2TF	6.1+3	285000
60	1691	**Strontium arsenite**	6.1,51(b)	6.1	284290
50	1506	**Strontium chlorate**	5.1,11(b)	5.1	282919
50	1507	**Strontium nitrate**	5.1,22(c)	5.1.	283429
50	1508	**Strontium perchlorate**	5.1,13(b)	5.1	282990
50	1509	**Strontium peroxide**	5.1,25(b)	5.1	281620
X462	2013	Strontium phosphide	4.3,18(a)	4.3+6.1	284800
66	1692	**Strychnine**	6.1,90(a)	6.1	293990
		Strychnine (pesticide), see under Pesticide; etc.			
66	1692	**Strychnine salts**	6.1,90(a)	6.1	293990
		Styphnic acid, see Trinitroresorcinol			
39	2055	**Styrene monomer, inhibited**	3,31(c)	3	290250
	0357	Substances, explosive, n.o.s.	1.1L,11	1+13	360200
	0358	Substances, explosive, n.o.s.	1.2L,24	1+13	360200
	0359	Substances, explosive, n.o.s.	1.3L,33	1+13	360200
	0474	Substances, explosive, n.o.s.	1.1C,2	1+13	360200
	0475	Substances, explosive, n.o.s.	1.1D,4	1+13	360200
	0476	Substances, explosive, n.o.s.	1.1G,8	1+13	360200

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	0477	Substances, explosive, n.o.s.	1.3C,26	1+13	360200
	0478	Substances, explosive, n.o.s.	1.3G,29	1	360200
	0479	Substances, explosive, n.o.s.	1.4C,36	1.4	360200
	480	Substances, explosive, n.o.s.	1.4D,38	1.4	360200
	481	Substances, explosive, n.o.s.	1.4S,46	1.4	360200
	0485	Substances, explosive, n.o.s.	1.4G,42	1.4	360200
	0473	Substances, explosive, n.o.s.: *Not to be accepted for carriage*	1.1A,*See marg. 100 (8)*		
	0482	Substances, explosive, very insensitive (substances, EVI), n.o.s.	1.5D,48	1.5	360200
336	2780	**Substituted nitrophenol pesticide, liquid, flammable, toxic, flash-point less than 23° C**	3,41(a),(b)	3+6.1	380810
663/63	3013	**Substituted nitrophenol pesticide, liquid, toxic, flammable, flash-point not less than 23° C**	6.1,72(a),(b),(c)	6.1+3	380810
66/60	3014	**Substituted nitrophenol pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2779	**Substituted nitrophenol pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
		Sulfotep (pesticide), see Organophosphorus pesticides			
80	2967	**Sulphamic acid**	8,16(c)	8	281119
		Sulphides, aqueous solutions, see Corrosive liquid, basic inorganic, n.o.s.			
40	1350	**Sulphur**	4.1.,11(c)	4.1	250300
X88	1828	**Sulphur chlorides**	8,12(a)	8	281210
269	1079	**Sulphur dioxide**	2,2TC	6.1+8(+13)	281123
20	1080	**Sulphur hexafluoride**	2,2A	2(+13)	281290
268	2418	Sulphur tetrafluoride	2,2TC	6.1+8	281290
X88	1829	**Sulphur trioxide, inhibited**	8,1(a)	8	281129
		Sulphur trioxide, uninhibited, *Not to be accepted for carriage*			
44	2448	**Sulphur, molten**	4.1,15	4.1	250300
80	1830	**Sulphuric acid with more than 51 % acid**	8,1(b)	8	280700
80	2796	**Sulphuric acid with not more than 51 % acid**	8,1(b)	8	280700
X886	1831	**Sulphuric acid, fuming**	8,1(a)	8+6.1	280700
		Sulphuric acid, mixtures with hydrochloric acid, see Corrosive liquid, acidic, inorganic, n.o.s.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Sulphuric acid, residual mixtures with nitric acid: *Not to be accepted for carriage*	8,3*Note2*		
80	1832	**Sulphuric acid, spent**	8,1(b)	8	382490
886	1786	**Sulphuric and hydrofluoric acid mixture**	8,7(a)	8+6.1	281119
		Sulphuric anhydride, inhibited, see Sulphur trioxide, inhibited			
80	1833	**Sulphurous acid**	8,1(b)	8	281123
X88	1834	**Sulphuryl chloride**	8,12(a)	8	281210
26	2191	**Sulphuryl fluoride**	2,2T	6.1(+13)	281290
		Sulprofos (pesticide), see Organophosphorus pesticides			
263	2600	Synthesis gas	2,1TF	6.1+3(+13)	270500
		Systox (pesticide), see Organophosphorus pesticides			
		Talc	91*Note 1*		
33/30	1999	**Tars, liquid**	3,5(b),(c),31(c)	3	270600
60	1700	Tear gas candles	6.1,26(b)2	6.1	930690
66/60	1693	**Tear gas substance, liquid or solid, n.o.s.**	6.1,25(a),(b)	6.1	**
66/60	3284	**Tellurium compound, n.o.s.**	6.1,57(a),(b),(c)	6.1	**
		Tellurium dioxide, see Tellurium compound, n.o.s.			
268	2195	Tellurium hexafluoride	2,2TC	6.1+8	281290
		Temephos (pesticide), see Organophosphorus pesticides			
		TEPP (pesticide), see Organophosphorus pesticides			
		Terbufos (pesticide), see Organophosphorus pesticides			
		Terbumeton (pesticide), see Triazine pesticides			
30	2319	**Terpene hydrocarbons, n.o.s.**	3,31(c)	3	290219
30	2541	**Terpinolene**	3,31(c)	3	290614
60	2504	**Tetrabromoethane**	6.1,15(c)	6.1	290330
		Tetrachlorobenzenes, see Toxic solid, organic, n.o.s.			
60	1702	**Tetrachloroethane**	6.1,15(b)	6.1	290319
60	1897	**Tetrachloroethylene**	6.1,15(c)	6.1	290323
		Tetrachlorophenols, see Chlorophenols, liquid			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	1704	**Tetraethyl dithiopyrophosphate**	6.1,23(b)	6.1	292090
66	1649	**Tetraethyl lead**	6.1,31(a)	6.1	293100
30	1292	**Tetraethyl silicate**	3,31(c)	3	292090
80	2320	**Tetraethylenepentamine**	8,53(c)	8	292129
20	3159	**1,1,1,2-Tetrafluoroethane (refrigerant gas R 134a)**	2,2A	2(+13)	290330
239	1081	Tetrafluoroethylene, inhibited	2,2F	3	290330
20	1982	**Tetrafluoromethane (refrigerant gas R 14), compressed**	2,1A	2(+13)	290330
30	2498	**1,2,3,6-Tetrahydrobenzaldehyde**	3,31(c)	3	291229
33	2056	**Tetrahydrofuran**	3,3(b)	3	293211
30	2943	**Tetrahydrofurfurylamine**	3,31(c)	3	292250
		Tetrahydronaphthyl hydroperoxide, see Organic peroxide type D, solid			
80	2698	**Tetrahydrophthalic anhydrides**	8,31(c)	8	291739
33	2410	**1,2,3,6-Tetrahydropyridine**	3,3(b)	3	293339
33	2412	**Tetrahydrothiophene**	3,3(b)	3	293490
		Tetramethyl lead, see Motor fuel, anti-knock mixture			
80	1835	**Tetramethylammonium hydroxide**	8,51(b)	8	292390
		1,1,3,3-Tetramethylbutyl hydroperoxide, see Organic peroxide type D, liquid			
33	2372	**Tetramethylethylenediamine**	3,3(b)	3	292130
33	2749	**Tetramethylsilane**	3,1(a)	3	293100
	0207	Tetranitroaniline	1.1D,4	1+13	360200
559	1510	**Tetranitromethane**	5.1,2(a)	5.1+6.1	290420
30	2413	**Tetrapropyl orthotitanate**	3,31(c)	3	292090
30	2850	**Tetrapropylene**	3,31(c)	3	290129
	0407	**Tetrazol-1-acetic acid**	1.4C,36	1.4	360200
		Tetryl, see Trinitrophenylmethylnitramine			
56	2573	**Thallium chlorate**	5.1,29(b)	5.1+6.1	282919
60	1707	**Thallium compound, n.o.s.**	6.1,53(b)	6.1	**
65	2727	**Thallium nitrate**	6.1,68(b)	6.1+05	283429
		Thallium sulphate (pesticide), see under Pesticide, etc.			
60	2785	**4-Thiapentanal**	6.1,20(c)	6.1	293090

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	2436	**Thioacetic acid**	3,3(b)	3	293090
		Thiocyanates, alkaline: *Not subject to RID*	6.1,41,*Note 1*		
60	2966	**Thioglycol**	6.1,21(b)	6.1	293090
80	1940	**Thioglycolic acid**	8,32(b)1	8	293090
60	2936	**Thiolactic acid**	6.1,21(b)	6.1	293090
		Thiolanne, see Tetrahydrothiophene Thiomethon (pesticide), see Organophosphorus pesticides			
		Thionazin (pesticide), see Organophosphorus pesticides			
X88	1836	**Thionyl chloride**	8,12(a)	8	281210
33	2414	**Thiophene**	3,3(b)	3	293090
60	2474	**Thiophosgene**	6.1,21(b)	6.1	293090
X80	1837	**Thiophosphoryl chloride**	8,12(b)	8	281210
	2975	Thorium metal, pyrophoric	7		
70	2975	— in Type A packages	7,Sch9	(703)	284430
70	2975	— in Type B(M) packages	7,Sch11	(703)	284430
70	2975	— in Type B(U) packages	7,Sch10	(703)	284430
70	2975	— under special arrangement	7,Sch13	(703)	284430
	2976	Thorium nitrate, solid	7		
70	2976	— in Type A packages	7,Sch9	(703)	284430
70	2976	— in Type B(M) packages	7,Sch11	(703)	284430
70	2976	— in Type B(U) packages	7,Sch10	(703)	284430
70	2976	— LSA-I	7,Sch5	(703)	284430
70	2976	— LSA-II	7,Sch6	(703)	284430
70	2976	— under special arrangement	7,Sch13	(703)	284430
33/30	1293	**Tinctures, medicinal**	3,3(b),31(c)	3	300390
40	3174	**Titanium disulphide**	4.2,13(c)	4.2	283090
40	1871	**Titanium hydride**	4.2,14(b)	4.1	285000
43/40	2546	Titanium powder, dry	4.2,12(a),(b),(c)	4.2	810810
40	1352	**Titanium powder, wetted**	4.1,13(b)	4.1	810810
40	2878	**Titanium sponge granules**	4.1,13(c)	4.1	810810
40	2878	**Titanium sponge powders**	4.1,13(c)	4.1	810810
X80	1838	**Titanium tetrachloride**	8,12(b)	8	282739
80	2869	**Titanium trichloride mixture**	8,11(b),(c)	8	282739

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
48	2441	Titanium trichloride, pyrophoric	4.2,15(a)	4.2+8	282739
		TNT, see Trinitrotoluene			
		Tolite, see Trinitrotoluene			
33	1294	**Toluene**	3,3(b)	3	290230
60	2078	**Toluene diisocyanate**	6.1,19(b)	6.1	292910
		Toluene sulphonic acid, see Aryl sulphonic acids			
60	1708	**Toluidines**	6.1,12(b)	6.1	292143
60	1709	**2,4-Toluylenediamine**	6.1,12(c)	6.1	292159
		Tolyl isocyanates, see Isocyanates, toxic, n.o.s. or Isocyanate solution, toxic, n.o.s.			
	0329	Torpedoes with bursting charge	1.1E,6	1+13	930690
	0330	Torpedoes with bursting charge	1.1F,7	1+13	930690
	0451	Torpedoes with bursting charge	1.1D,5	1+13	930690
	0450	Torpedoes, liquid fuelled with inert head	1.3J,32	1+13	930690
	0449	Torpedoes, liquid fuelled with or without bursting charge	1.1J,10	1+13	930690
		Tosyl isocyanate, see Isocyanates, toxic, n.o.s. or Isocyanate solution, toxic, n.o.s.			
263	1023	**Town gas**	2,1TF	6.1+3(+13)	270500
668/68	3289	**Toxic liquid, corrosive, inorganic, n.o.s.**	6.1,67(a),(b)	6.1+8	**
668/68	2927	**Toxic liquid, corrosive, organic, n.o.s.**	6.1,27(a),(b)	6.1+8	**
663/63	2929	**Toxic liquid, flammable, organic, n.o.s.**	6.1,26(a)1,(b)1	6.1+3	**
66/60	3287	**Toxic liquid, inorganic, n.o.s.**	6.1,65(a),(b),(c)	6.1	**
66/60	2810	**Toxic liquid, organic, n.o.s.**	6.1,25(a),(b),(c)	6.1	**
665/65	3122	**Toxic liquid, oxidizing, n.o.s.**	6.1,68(a),(b)	6.1+05	**
623	3123	**Toxic liquid, water-reactive, n.o.s.**	6.1,44(a),(b)	6.1+4.3	**
668/68	3290	**Toxic solid, corrosive, inorganic, n.o.s.**	6.1,67(a),(b)	6.1+8	**
668/68	2928	**Toxic solid, corrosive, organic, n.o.s.**	6.1,27(a),(b)	6.1+8	**
664/64	2930	**Toxic solid, flammable, organic, n.o.s.**	6.1,26(a)2,(b)2	6.1+4.1	**
66/60	3288	**Toxic solid, inorganic, n.o.s.**	6.1,65(a),(b),(c)	6.1	**
66/60	2811	**Toxic solid, organic, n.o.s.**	6.1,25(a),(b),(c)	6.1	**
665/65	3086	**Toxic solid, oxidizing, n.o.s.**	6.1,68(a),(b),(c)	6.1+05	**
664/64	3124	**Toxic solid, self-heating, n.o.s.**	6.1,66(a),(b)	6.1+4.2	**
642	3125	**Toxic solid, water-reactive, n.o.s.**	6.1,44(a),(b)	6.1+4.3	**
66/60	3172	**Toxins, extracted from living sources, n.o.s.**			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
			6.1,90(a),(b),(c)	6.1	300290
	0212	Tracers for ammunition	1.3G,30	1	360490
	0306	Tracers for ammunition	1.4G,43	1.4	360490
90	2590	**Tremolite**	9,1(c)	9	252400
		Triadimefon (pesticide), see Phenoxy pesticides			
60	2609	**Triallyl borate**	6.1,14(c)	6.1	292090
38	2610	**Triallylamine**	3,33(c)	3+8	292119
		Triamiphos (pesticide), see Organophosphorus pesticides			
336	2764	**Triazine pesticide, liquid, flammable, toxic, flash-point less than 23° C**	3,41(a),(b)	3+6.1	380810
663/63	2997	**Triazine pesticide, liquid, toxic, flammable, flash-point not less than 23° C**	6.1,72(a),(b).(c)	6.1+3	380810
66/60	2998	**Triazine pesticide, liquid, toxic**	6.1,71(a),(b),(c)	6.1	380810
66/60	2763	**Triazine pesticide, solid, toxic**	6.1,73(a),(b),(c)	6.1	380810
		Triazophos (pesticide), see Organophosphorus pesticides			
60	2542	**Tributylamine**	6.1,12(b)	6.1	292119
		Tricamba (pesticide), see Benzoic derivative pesticides			
		Trichlorfon (pesticide), see Organophosphorus pesticides			
80	1839	**Trichloroacetic acid**	8,31(b)	8	291540
80	2564	**Trichloroacetic acid solution**	8,32(b)1,(c)	8	291540
		Trichloroacetic anhydride, see Corrosive solid, acidic, organic, n.o.s.			
		Trichloroacetonitrile, see Toxic liquid, organic, n.o.s.			
X80	2442	**Trichloroacetyl chloride**	8,35(b)1	8	291590
60	2321	**Trichlorobenzenes, liquid**	6.1,15(c)	6.1	290369
60	2322	**Trichlorobutene**	6.1,15(b)	6.1	290319
60	2831	**1,1,1-Trichloroethane**	6.1,15(c)	6.1	290319
60	1710	**Trichloroethylene**	6.1,15(c)	6.1	290322
		Trichlorofluoromethane (refrigerant R 11): *Not subject to RID*	2,2A *Note*		
50	2468	**Trichloroisocyanuric acid, dry**	5.1,26(b)	5.1	293369
80	2226	**Trichloromethylbenzene**	8,66(b)	8	290369
		Trichloronat (pesticide), see Organophosphorus pesticides			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
		Trichloronitroethane, see Toxic liquid, flammable, organic, n.o.s.			
		Trichlorophenols, see Chlorophenols, solid			
		Trichloropropane, see Toxic liquid, organic, n.o.s.			
X338	1295	**Trichlorosilane**	4.3,1(a)	4.3+3+8	100
		1,1,2-Trichloro-1,2,2-trifluoroethane (refrigerant R 113): *Not subject to RID*	2,2A *Note*		
		1,1,1-Trichloro-2,2,2-trifluoroethane (refrigerant R 113a): *Not subject to RID*	2,2A *Note*		
60	2574	**Tricresyl phosphate with more than 3° ortho isomer**	6.1,23(b)	6.1	291900
		Triethyl phosphine, see Toxic liquid, flammable, organic, n.o.s.			
30	2323	**Triethyl phosphite**	3,31(c)	3	291900
338	1296	**Triethylamine**	3,22(b)	3+8	292119
80	2259	**Triethylenetetramine**	8,53(b)	8	292129
88	2699	**Trifluoroacetic acid**	8,32(a)	8	291590
268	3057	**Trifluoroacetyl chloride**	2,2TC	6.1+8(+13)	291590
263	1082	**Trifluorochloroethylene, inhibited**	2,2TF	6.1+3(+13)	290345
23	2035	**1,1,1-Trifluoroethane (refrigerant gas R 143a)**	2,2F	3(+13)	290330
20	1984	**Trifluoromethane (refrigerant gas R 23)**	2,2A	2(+13)	290330
22	3136	**Trifluoromethane, refrigerated liquid**	2,3A	2(+13)	290330
60	2942	**2-Trifluoromethylaniline**	6.1,12(c)	6.1	292142
60	2948	**3-Trifluoromethylaniline**	6.1,17(b)	6.1	292142
30	2324	**Triisobutylene**	3,31(c)	3	290129
33	2616	**Triisopropyl borate**	3,3(b)	3	292090
30	2616	**Triisopropyl borate, chemically pure**	3,31(c)	3	292090
33	2416	**Trimethyl borate**	3,3(b)	3	292090
30	2329	**Trimethyl phosphite**	3,31(c)	3	291900
663	2438	**Trimethylacetyl chloride**	6.1,10(a)	6.1+3+8	291590
23	1083	**Trimethylamine, anhydrous**	2,2F	3(+13)	292111
338/38	1297	**Trimethylamine, aqueous solution, not more than 50 % trimethylamine, by mass**	3,22(a),(b),33(c)	3+8	292111
30	2325	**1,3,5-Trimethylbenzene**	3,31(c)	3	290290

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
X338	1298	**Trimethylchlorosilane**	3,21(b)	3+8	293100
80	2326	**Trimethylcyclohexylamine**	8,53(c)	8	292130
60	2328	**Trimethylhexamethylene diisocyanate**	6.1,19(c)	6.1	292910
80	2327	**Trimethylhexamethylenediamines**	8,53(c)	8	292129
263	1953	**Trimethylsilane**	2,1TF	6.1+3(+13)	**
	0216	Trinitro-m-cresol	1.1D,4	1+13	360200
	0153	Trinitroaniline (picramide)	1.1D,4	1+13	360200
	0213	Trinitroanisole	1.1D,4	1+13	360200
	0214	Trinitrobenzene, dry or wetted less than 30 % water, by mass	1.1D,4	1+13	360200
40	1354	Trinitrobenzene, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	360200
	0386	Trinitrobenzenesulphonic acid	1.1D,4	1+13	360200
	0215	Trinitrobenzoic acid, dry or wetted with less than 30 % water, by mass	1.1D,4	1+13	360200
40	1355	Trinitrobenzoic acid, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	360200
	0155	Trinitrochlorobenzene (picryl chloride)	1.1D,4	1+13	360200
	0387	Trinitrofluorenome	1.1D,4	1+13	360200
	0217	Trinitronaphtalene	1.1D,4	1+13	360200
	0218	Trinitrophenetole	1.1D,4	1+13	360200
	0154	Trinitrophenol (pricric acid), dry or wetted with less than 30 % water, by mass	1.1D,4	1+13	290890
40	1344	Trinitrophenol, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	360200
	0208	Trinitrophenylmethylnitramine (tetryl)	1.1D,4	1+15	360200
	0219	Trinitroresorcinol (styphnic acid), dry or wetted with less than 20 % water, or mixture of alcohol and water, by mass	1.1D,4	1+15	360200
	0394	Trinitroresorcinol (styphnic acid), wetted with not less than 20 % water, or mixture of alcohol and water, by mass	1.1D,4	1+15	360200
	0388	Trinitrotoluene (TNT) and hexanitrostilbene mixture	1.1D,4	1+13	360200
	0388	Trinitrotoluene (TNT) and trinitrobenzene mixture	1.1D,4	1+13	360200
	0389	Trinitrotoluene (TNT) mixture containing trinitrobenzene and hexanitrostilbene	1.1D,4	1+13	360200
	0209	Trinitrotoluene (TNT), dry or wetted with less than 30 % water, by mass	1.1D,4	1+13	360200

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
40	1356	Trinitrotoluene, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	360200
		Triphenylphosphine oxide, see Toxic solid, organic, n.o.s.			
38	2260	**Tripropylamine**	3,33(c)	3+8	292129
33/30	2057	**Tripropylene**	3,3(b),31(c)	3	290129
60	2501	**Tris-(1-aziridinyl) phosphine oxide solution**	6.1,23(b),(c)	6.1	293100
	0390	Tritonal	1.1D,4	1+13	360200
268	2196	Tungsten hexafluoride	2,2TC	6.1+8	282619
30	1299	**Turpentine**	3,31(c)	3	130190
33/30	1300	**Turpentine substitute**	3,31(b),31(c)	3	272900
30	2330	**Undecane**	3,31(c)	3	290110
	2977	Uranium hexafluoride, fissile	7		
78	2977	— in approved packages	7,Sch12	(703)	2844**
78	2977	— under special arrangement	7,Sch13	(703)	2844**
	2978	Uranium hexafluoride, non fissile or fissile-excepted	7		
78	2978	— LSA-I	7,Sch5	(703)	2844**
78	2978	— LSA-II	7,Sch6	(703)	2844**
78	2978	— under special arrangement	7,Sch13	(703)	2844**
	2979	Uranium metal, pyrophoric	7		
70	2979	— in Type A packages	7,Sch9	(703)	2844**
70	2979	— in Type B(M) packages	7,Sch11	(703)	2844**
70	2979	— in Type B(U) packages	7,Sch10	(703)	2844**
70	2979	— under special arrangement	7,Sch13	(703)	2844**
	2980	Uranyl nitrate hexahydrate solution	7		
70	2980	— in Type A packages	7,Sch9	(703)	2844**
70	2980	— in Type B(M) packages	7,Sch11	(703)	2844**
70	2980	— in Type B(U) packages	7,Sch10	(703)	2844**
78	2980	**— LSA-I**	7,Sch5	7A,7B,7C+8	2844**
78	2980	**— LSA-II**	7,Sch6	7A,7B,7C+8	2844**
		— under special arrangement			
	2981	Uranyl nitrate, solid	7		
70	2981	— in Type A packages	7,Sch9	(703)	2844**
70	2981	— in Type B(M) packages	7,Sch11	(703)	2844**

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
70	2981	— in Type B(U) packages	7,Sch10	(703)	2844**
70	2981	— LSA-I	7,Sch5	(703)	2844**
70	2981	— LSA-II	7,Sch6	(703)	2844**
70	2981	— under special arrangement	7,Sch13	(703)	2844**
58	1511	**Urea hydrogen peroxide**	5.1,31(c)	5.1+8	292990
	0220	Urea nitrate, dry or wetted with less than 20 % water, by mass	1.1D,4	1+13	360200
40	1357	Urea nitrate, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	360200
33	2058	**Valeraldehyde**	3,3(b)	3	291219
83	2502	**Valeryl chloride**	8,35(b)2	8+3	291590
		Vamidothion (pesticide), see Organophosphorus pesticides			
66/60	3285	**Vanadium compound, n.o.s.**	6.1,58(a),(b),(c)	6.1	**
80	2443	**Vanadium oxytrichloride**	8,12(b)	8	282749
		Vanadium pentoxide, fused: *Not subject to RID*	6.1,58(b)*Note*		
60	2862	**Vanadium pentoxide, non-fused form**	6.1,58(b)	6.1	282530
X88	2444	**Vanadium tetrachloride**	8,12(a)	8	282739
80	2475	**Vanadium trichloride**	8,11(c)	8	282739
60	2931	**Vanadyl sulphate**	6.1,58(b)	6.1	283329
		Varnish, nitrocellulose, see Nitrocellulose solution: flammable			
339	1301	**Vinyl acetate, inhibited**	3,3(b)	3	291532
239	1085	**Vinyl bromide, inhibited**	2,2F	3(+13)	290330
339	2838	**Vinyl butyrate, inhibited**	3,3(b)	3	291590
239	1086	**Vinyl chloride, inhibited**	2,2F	3(+13)	290321
239	1086	**Vinyl chloride, stabilized**	2,2F	3(+13)	290321
63	2589	**Vinyl chloroacetate**	6.1,16(b)	6.1+3	291590
339	1302	**Vinyl ethyl ether inhibited**	3,2(a)	3	290919
239	1860	**Vinyl fluoride, inhibited**	2,2F	3(+13)	290330
339	1304	**Vinyl isobutyl ether, inhibited**	3,3(b)	3	290919
239	1087	**Vinyl methyl ether, inhibited**	2,2F	3(+13)	290919
39	2055	**Vinylbenzene**	3,31(c)	3	290250
339	1303	**Vinylidene chloride, inhibited**	3,1(a)	3	290329
239	1959	**Vinylidene fluoride (refrigerant gas R 1132a)**	2,2F	3(+13)	290330

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
638	3073	**Vinylpyridines, inhibited**	6.1,11(b)1	6.1+3+8	293339
39	2618	**Vinyltoluenes, inhibited**	3,31(c)	3	290290
X338	1305	**Vinyltrichlorosilane, inhibited**	3,21(a)	3+8	293100
		Warfarin (and salts of) (pesticide) see Coumarin derivative pesticides			
	0370	Warheads, rocket with burster or expelling charge	1.4D,39	1.4	930690
	0371	Warheads, rocket with burster or expelling charge	1.4F,41	1.4	930690
	0286	Warheads, rocket with bursting charge	1.1D,5	1+13	930690
	0287	Warheads, rocket with bursting charge	1.2D,17	1	930690
	0369	Warheads, rocket with bursting charge	1.1F,7	1+13	930690
	0221	Warheads, torpedo with bursting charge	1.1D,5	1+13	930690
263	2600	**Water gas**	2,1TF	6.1+3(+13)	270500
X382/382	3129	**Water-reactive liquid, corrosive, n.o.s.**	4.3,25(a),(b),(c)	4.3+8	**
X323/323	3148	**Water-reactive liquid, n.o.s.**	4.3,21(a),(b),(c)	4.3	**
X362/362	3130	Water-reactive liquid, toxic, n.o.s.	4.3,23(a),(b),(c)	4.3+6.1	**
X482/482	3131	Water-reactive solid, corrosive, n.o.s.	4.3,24(a),(b),(c)	4.3+8	**
	3132	Water-reactive solid, flammable, n.o.s.: *Not to be accepted for carriage*	4.3,*See marg. 470(11)*		
X423/423	2813	Water-reactive solid, n.o.s.	4.3,20(a),(b),(c)	4.3	**
	3133	Water-reactive solid, oxidizing, n.o.s.: *Not to be accepted for carriage*	4.3,*See marg. 470(11)*		
	3135	Water-reactive solid, self-heating, n.o.s.: *Not to be accepted for carriage*	4.3,*See marg. 470(11)*		
X462/462	3134	Water-reactive solid, toxic, n.o.s.	4.3,22(a),(b),(c)	4.3+6.1	**
90	2590	**White asbestos (chrysotile, actinolite, anthophyllite, tremolite)**	9,1(c)	9	252400
		White lead, see Lead compound, soluble, n.o.s.			
46	1381	**White or yellow phosphorus, dry or under water or in solution**	4.2,11(a)	4.2+6.1	280470
33/30	1300	**White spirit**	3,3(b),31(c)	3	272900
33/30	1306	**Wood preservatives, liquid**	3,5(b),(c),31(c)	3	**
		Wood tar oil, see Tars, liquid			
20	2036	**Xenon, compressed**	2,1A	2(+13)	280429
22	2591	**Xenon, refrigerated liquid**	2,3A	2(+13)	280429
		O-Xylene, see Xylenes			
33/30	1307	**Xylenes**	3,3(b),31(c)	3	2902**
60	2261	**Xylenols**	6.1,14(b)	6.1	290714
		Xylenols, alkaline solutions, see Corrosive liquid, n.o.s.			

1802 *(cont'd)*

HIN	UN No	Substances or articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	1711	**Xylidines**	6.1,12(b)	6.1	292149
60	1701	**Xylyl bromide**	6.1,15(b)	6.1	290369
50	1512	**Zinc ammonium nitrite**	5.1,23(b)	5.1	283410
60	1712	**Zinc arsenate, zinc arsenite, or zinc arsenate and zinc arsenite mixtures**	6.1,51(b)	6.1	284290
423	1435	**Zinc ashes**	4.3,13(c)	4.3	262019
50	2469	**Zinc bromate**	5.1,16(c)	5.1	282990
50	1513	**Zinc chlorate**	5.1,11(b)	5.1	282919
80	2331	**Zinc chloride, anhydrous**	8,11(c)	8	282736
80	1840	**Zinc chloride, solution**	8,5(c)	8	282736
66	1713	Zinc cyanide	6.1,41(a)	6.1	283719
90	1931	**Zinc dithionite (zinc hydrosulphite)**	9,32(c)	9	283190
X423/423	1436	Zinc dust	4.3,14(a),(b),(c)	4.3+4.2	790390
60	2855	**Zinc fluorosilicate**	6.1,64(c)	6.1	282690
50	1514	**Zinc nitrate**	5.1,22(b)	5.1	283429
50	1515	**Zinc permanganate**	5.1,17(b)	5.1	284169
50	1516	**Zinc peroxide**	5.1,25(b)	5.1	281700
X462	1714	Zinc phosphide	4.3,18(a)	4.3+6.1	284800
X423/423	1436	Zinc powder	4.3,14(a),(b),(c)	4.3+4.2	790390
40	2714	**Zinc resinate**	4.1,12(c)	4.1	380620
		Zinc selenate, see Selenates			
		Zinc selenite, see Selenites			
		Zinc telluride, see Tellurium compound, n.o.s.			
40	1437	**Zirconium hydride**	4.1,14(b)	4.1	285000
50	2728	**Zirconium nitrate**	5.1,22(c)	5.1	283429
	0236	Zirconium picramate, dry or wetted with less than 20 % water, by mass	1.3C,26	1+13	360200
40	1517	Zirconium picramate, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	260200
43/40	2008	Zirconium powder, dry	4.2,12(a),(b),(c)	4.2	810910
40	1358	**Zirconium powder, wetted**	4.1,13(b)	4.1	810910
40	1932	**Zirconium scrap**	4.2,12(c)	4.2	810910
33/30	1308	**Zirconium suspended in a flammable liquid**	3,1(a),2(a),(b), 3(b),31(c)	3	810910
80	2503	**Zirconium tetrachloride**	8,11(c)	8	282739
40	2858	**Zirconium, dry, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)**	4.1,13(c)	4.1	810910
40	2009	Zirconium, dry, finished sheets, strip or coiled wire	4.2,12(c)	4.2	810910

1802 II. Table II: List of collective headings or n.o.s. entries
(cont'd)

Note: For the carriage of substances assigned to a collective heading or to an n.o.s. entry, the name of the goods in the consignment note shall consist of the name of the collective heading or the n.o.s. entry, followed by the chemical or technical name of the substance.

This table includes two types of headings:

— specific collective headings or specific n.o.s. entries applicable to groups of chemical compounds of the same type;

— general collective headings, or n.o.s. entries applicable to groups of substances which present similar primary and secondary hazards.

Substances may only be classified under a general n.o.s. entry if they cannot be classified under a specific collective heading or specific n.o.s. entry.

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
CLASS 1: EXPLOSIVE SUBSTANCES AND ARTICLES CONTAINING EXPLOSIVES				
Specific n.o.s. entries				
Components, explosive train, n.o.s..	1.1B,1	1.1B	0461	1+13
Components, explosive train, n.o.s.	1.2B,13	1.2B	0382	1+13
Deflagrating metal salts of aromatic nitroderivatives, n.o.s.	1.3C,26	1.3C	0132	1+13
Components, explosive train, n.o.s.	1.4B,35	1.4B	0383	1.4
Components, explosive train, n.o.s.	1.4S,47	1.4S	0384	1.4
General n.o.s. entries				
Substances, explosive, n.o.s.	1.1C,2	1.1C	0474	1+13
Articles, explosive, n.o.s.	1.1C,3	1.1C	0462	1+13
Substances, explosive, n.o.s.	1.1D,4	1.1D	0475	1+13
Articles, explosive, n.o.s.	1.1D,5	1.1D	0463	1+13
Articles, explosive, n.o.s.	1.1E,6	1.1E	0464	1+13
Articles, explosive, n.o.s.	1.1F,7	1.1F	0465	1+13
Substances, explosive, n.o.s.	1.1G,8	1.1G	0476	1+13
Substances, explosive, n.o.s.	1.1L,11	1.1L	0357	1+13
Articles, explosive, n.o.s.	1.1L,12	1.1L	0354	1+13
Articles, explosive, n.o.s.	1.2C,15	1.2C	0466	1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Articles, explosive, n.o.s.	1.2D,17	1.2D	0467	1
Articles, explosive, n.o.s.	1.2E,18	1.2E	0468	1
Articles, explosive, n.o.s.	1.2F,19	1.2F	0469	1+13
Substances, explosive, n.o.s.	1.2L,24	1.2L	0358	1+13
Articles, explosive, n.o.s.	1.2L,25	1.2L	0355	1+13
Substances, explosive, n.o.s.	1.3C,26	1.3C	0477	1+13
Articles, explosive, n.o.s.	1.3C,27	1.3C	0470	1
Substances, explosive, n.o.s.	1.3G,29	1.3G	0478	1
Substances, explosive, n.o.s.	1.3L,33	1.3L	0359	1+13
Articles, explosive, n.o.s.	1.3L,34	1.3L	0356	1+13
Articles, explosive, n.o.s.	1.4B,35	1.4B	0350	1.4
Substances, explosive, n.o.s.	1.4C,36	1.4C	0479	1.4
Articles, explosive, n.o.s.	1.4C,37	1.4C	0351	1.4
Substances, explosive, n.o.s.	1.4D,38	1.4D	0480	1.4
Articles, explosive, n.o.s.	1.4D,39	1.4D	0352	1.4
Articles, explosive, n.o.s.	1.4E,40	1.4E	0471	1.4
Articles, explosive, n.o.s.	1.4F,41	1.4F	0472	1.4
Substances, explosive, n.o.s.	1.4G,42	1.4G	0485	1.4
Articles, explosive, n.o.s.	1.4G,43	1.4G	0353	1.4
Substances, explosive, n.o.s.	1.4S,46	1.4S	0481	1.4
Articles, explosive, n.o.s.	1.4S,47	1.4S	0349	1.4
Substances, explosive, very insensitive (substances, EVI), n.o.s.	1.5D,48	1.5D	0482	1.5
CLASS 2: GASES				
Specific n.o.s. entries				
Hydrocarbon gas mixture, compressed, n.o.s.	2,1F	23	1964	3(+13)
Refrigerant gas, n.o.s.	2,2A	20	1078	2(+13)
Insecticide gas, n.o.s.	2,2A	20	1968	2(+13)
Hydrocarbon gas mixture, liquefied, n.o.s.	2,2F	23	1965	3(+13)
Insecticide gas, toxic, n.o.s.	2,2T	26	1967	6.1(+13)

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
General n.o.s. entries				
Compressed gas, n.o.s.	2,1A	20	1956	2(+13)
Compressed gas, oxidizing, n.o.s.	2,1O	25	3156	2+05(+13)
Compressed gas, flammable, n.o.s.	2,1F	23	1954	3(+13)
Compressed gas, toxic, n.o.s.	2,1T	26	1955	6.1(+13)
Compressed gas, toxic, flammable, n.o.s.	2,1TF	263	1953	6.1+3(+13)
Compressed gas, toxic, corrosive, n.o.s.	2,1TC	268	3304	6.1+8(+13)
Compressed gas, toxic, oxidizing, n.o.s.	2,1TO	265	3303	6.1+05(+13)
Compressed gas, toxic, flammable, corrosive, n.o.s.	2,1TFC	263	3305	6.1+3+8 (+13)
Compressed gas, toxic, oxidizing, corrosive, n.o.s.	2,1TOC	265	3306	6.1+05+8 (+13)
Liquified gas, n.o.s.	2,2A	20	3163	2(+13)
Liquified gas, oxidizing, n.o.s.	2,2O	25	3157	2+05(+13)
Liquified, gas, flammable, n.o.s.	2,2F	23	3161	3(+13)
Liquified gas, toxic, n.o.s.	2,2T	26	3162	6.1(+13)
Liquified gas, toxic, flammable, n.o.s.	2,2TF	263	3160	6.1+3(+13)
Liquified gas, toxic, corrosive, n.o.s.	2,2TC	268	3308	6.1+8(+13)
Liquified gas, toxic, oxidizing, n.o.s.	2,2TO	265	3307	6.1+05(+13)
Liquidified gas, toxic, flammable, corrosive, n.o.s.	2,2TFC	263	3309	6.1+3+8 (+13)
Liquified gas, toxic, oxidizing, corrosive, n.o.s.	2,2TOC	265	3310	6.1+05+8 (+13)
Gas, refrigerated liquid, n.o.s.	2,3A	22	3158	2(+13)
Gas, refrigerated liquid, oxidizing, n.o.s.	2,3O	225	3311	2+05(+13)
Gas, refrigerated liquid, flammable, n.o.s.	2,3F	223	3312	3(+13)
CLASS 3: FLAMMABLE LIQUIDS				
Specific n.o.s. entries or specific collective headings				
Petroleum distillates, n.o.s.	3,1(a) 3,2(a) 3,2(b) 3,3(b) 3,31(c)	33 33 33 33 30	1268 1268 1268 1268 1268	3 3 3 3 3
Petroleum products, n.o.s.	3,1(a) 3,2(a) 3,2(b) 3,3(b) 3,31(c)	33 33 33 33 30	1268 1268 1268 1268 1268	3 3 3 3 3

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Hydrocarbons, liquid, n.o.s.	3,1(a) 3,2(a) 3,2(b) 3,3(b) 3,31(c)	33 33 33 33 30	3295 3295 3295 3295 3295	3 3 3 3 3
Aldehydes, n.o.s.	3,2(b) 3,3(b) 3,31(c)	33 33 30	1989 1989 1989	3 3 3
Alcohols, n.o.s.	3,2(b) 3,3(b) 3,31(c)	33 33 30	1987 1987 1987	3 3 3
Ketones, n.o.s.	3,2(b) 3,3(b) 3,31(c)	33 33 30	1224 1224 1224	3 3 3
Ethers, n.o.s.	3,3(b) 3,31(c)	33 30	3271 3271	3 3
Esters, n.o.s.	3,3(b) 3,31(c)	33 30	3272 3272	3 3
Nitriles, flammable, toxic, n.o.s.	3,11(a) 3,11(b)	336 336	3273 3273	3+6.1 3+6.1
Isocyanates or isocyanate solution, flammable, toxic, n.o.s.	3,14(b) 3,32(c)	336 36	2478 2478	3+6.1 3+6.1
Alcohols, flammable, toxic, n.o.s.	3,17(a) 3,17(b) 3,32(c)	336 336 36	1986 1986 1986	3+6.1 3+6.1 3+6.1
Aldehydes, flammable, toxic, n.o.s.	3,17(a) 3,17(b) 3,32(c)	336 336 36	1988 1988 1988	3+6.1 3+6.1 3+6.1
Mercaptans or mercaptan mixture, liquid, flammable, toxic, n.o.s.	3,18(b) 3,32(c)	336 36	1228 1228	3+6.1 3+6.1
Medicine, liquid, flammable, toxic, n.o.s.	3,19(b) 3,32(c)	336 36	3248 3248	3+6.1 3+6.1
Chlorosilanes, flammable, corrosive, n.o.s.	3,21(b)	X338	2985	3+8
Amines or polyamines, flammable, corrosive, n.o.s.	3,22(a) 3,22(b) 3,33(c)	338 338 38	2733 2733 2733	3+8 3+8 3+8

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Alcoholates solution, n.o.s.	3,24(b)	338	3274	3+8
Terpene hydrocarbons, n.o.s.	3,31(c)	30	2319	3
Pesticides				
Carbamate pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2758 2758	3+6.1 3+6.1
Arsenical pesticide, liquid, flammable, toxic,	3,41(a) 3,41(b)	336 336	2760 2760	3+6.1 3+6.1
Organochlorine pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2762 2762	3+6.1 3+6.1
Triazine pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2764 2764	3+6.1 3+6.1
Phenoxyl pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2766 2766	3+6.1 3+6.1
Phenyl urea pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2768 2768	3+6.1 3+6.1
Benzoic derivative pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2770 2770	3+6.1 3+6.1
Dithiocarbamate pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2772 2772	3+6.1 3+6.1
Phthalimide derivative pesticide, liquid, flammable toxic	3,41(a) 3,41(b)	336 336	2774 2774	3+6.1 3+6.1
Copper based pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2776 2776	3+6.1 3+6.1
Mercury based pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2778 2778	3+6.1 3+6.1
Substituted nitrophenol pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2780 2780	3+6.1 3+6.1
Bipyridilium pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2782 2782	3+6.1 3+6.1
Organophosphorus pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2784 2784	3+6.1 3+6.1
Organotin pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	2787 2787	3+6.1 3+6.1
Coumarin derivative pesticide, liquid, flammable, toxic	3,41(a) 3,41(b)	336 336	3024 3024	3+6.1 3+6.1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Pesticide, liquid, flammable, toxic, n.o.s.	3,41(a) 3,41(b)	336 336	3021 3021	3+6.1 3+6.1
General n.o.s. entries				
Flammable liquid, n.o.s.	3,1(a) 3,2(a) 3,2(b) 3,3(b) 3,5(c) 3,31(c)	33 33 33 33 33 30	1993 1993 1993 1993 1993 1993	3 3 3 3 3 3
Flammable liquid, toxic, n.o.s.	3,19(a) 3,19(b) 3,32(c)	336 336 36	1992 1992 1992	3+6.1 3+6.1 3+6.1
Flammable liquid, corrosive, n.o.s.	3,26(a) 3,26(b) 3,33(c)	338 338 38	2924 2924 2924	3+8 3+8 3+8
Flammable liquid, toxic, corrosive, n.o.s.	3,27(a) 3,27(b)	368 368	3286 3286	3+6.1+8 3+6.1+8
Elevated temperature liquid, flammable, n.o.s.	3,61(c)	30	3256	3
CLASS 4.1: FLAMMABLE SOLIDS				
Specific n.o.s. entries				
Fibres impregnated with weakly nitrated nitrocellulose, n.o.s.	4.1,3(c)	40	1353	4.1
Fabrics impregnated with weakly nitrated nitrocellulose, n.o.s.	4.1,3(c)	40	1353	4.1
Metal hydrides, flammable, n.o.s.	4.1,14(b) 4.1,14(c)	40 40	3182 3182	4.1 4.1
Specific collective headings				
Self-reactive liquid, Type B	4.1,31(b)	40	3221	4.1
Self-reactive solid, Type B	4.1,32(b)	40	3222	4.1
Self-reactive liquid, Type C	4.1,33(b)	40	3223	4.1
Self-reactive solid, Type C	4.1,34(b)	40	3224	4.1
Self-reactive liquid, Type D	4.1,35(b)	40	3225	4.1
Sellf-reactive solid, Type D	4.1,36(b)	40	3226	4.1
Self-reactive liquid, Type E	4.1,37(b)	40	3227	4.1
Self-reactive solid, Type E	4.1,38(b)	40	3228	4.1
Self-reactive liquid, Type F	4.1,39(b)	40	3229	4.1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Self-reactive solid, Type F	4.1,40(b)	40	3230	4.1
General n.o.s. entries				
Solids containing flammable liquid, n.o.s.	4.1,4(c)	40	3175	4.1
Flammable solid, organic, molten, n.o.s.	4.1,5	44	3176	4.1
Flammable solid, organic, n.o.s.	4.1,6(b) 4.1,6(c)	40 40	1325 1325	4.1 4.1
Flammable solid, toxic, organic, n.o.s.	4.1,7(b) 4.1,7(c)	46 46	2926 2926	4.1+6.1 4.1+6.1
Flammable solid, corrosive, organic, n.o.s.	4.1,8(b) 4.1,8(c)	48 48	2925 2925	4.1+8 4.1+8
Flammable solid, inorganic, n.o.s.	4.1,11(b) 4.1,11(c)	40 40	3178 3178	4.1 4.1
Metal salts of organic compounds, flammable, n.o.s.	4.1,12(b) 4.1,12(c)	40 40	3181 3181	4.1 4.1
Metal powder, flammable, n.o.s.	4.1,13(b) 4.1,13(c)	40 40	3089 3089	4.1 4.1
Flammable solid, toxic, inorganic, n.o.s.	4.1,16(b) 4.1,16(c)	46 46	3179 3179	4.1+6.1 4.1+6.1
Flammable solid, corrosive, inorganic, n.o.s.	4.1,17(b) 4.1,17(c)	48 48	3180 3180	4.1+8 4.1+8
CLASS 4.2: SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION				
Specific n.o.s. entries				
Fibres or fabrics, animal, vegetable or synthetic n.o.s.	4.2,3(c)	40	1373	4.2
Plastic, nitrocellulose-based, self-heating, n.o.s.	4.2,4(c)	40	2006	4.2
Pyrophoric metal, n.o.s.	4.2,12(a)	43	1383	4.2
Pyrophoric alloy, n.o.s.	4.2,12(a)	43	1383	4.2
Alkaline earth metal alcoholates, n.o.s.	4.2,14(b) 4.2,14(c)	40 40	3205 3205	4.2 4.2
Alkaline metal alcoholates, self-heating, corrosive, n.o.s.	4.2,15(b) 4.2,15(c)	48 48	3206 3206	4.2+8 4.2+8
Metal alkyls, n.o.s. or metal aryls, n.o.s.	4.2,31(a)	X333	2003	4.2+4.3

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Metal alkyl halides, n.o.s. or metal aryl halides, n.o.s.	4.2,32(a)	X333	3049	4.2+4.3
Metal alkyl hydrides, n.o.s. or metal aryl hydrides, n.o.s.	4.2,32(a)	X333	3050	4.2+4.3
General n.o.s. entries				
Pyrophoric solid, organic, n.o.s.	4.2,5(a)	43	2846	4.2
Self-heating solid, organic, n.o.s.	4.2,5(b)	40	3088	4.2
	4.2,5(c)	40	3088	4.2
Pyrophoric liquid, organic, n.o.s.	4.2,6(a)	333	2845	4.2
Self-heating liquid, organic, n.o.s.	4.2,6(b)	30	3183	4.2
	4.2,6(c)	30	3183	4.2
Self-heating solid, toxic, organic, n.o.s.	4.2,7(b)	46	3128	4.2+6.1
	4.2,7(c)	46	3128	4.2+6.1
Self-heating liquid, toxic, organic, n.o.s.				
	4.2,8(b)	36	3184	4.2+6.1
	4.2,8(c)	36	3184	4.2+6.1
Self-heating solid, corrosive, organic, n.o.s.				
	4.2,9(b)	48	3126	4.2+8
	4.2,9(c)	48	3126	4.2+8
Self-heating liquid, corrosive, organic, n.o.s.				
	4.2,10(b)	38	3185	4.2+8
	4.2,10(c)	38	3185	4.2+8
Self-heating metal powder n.o.s.	4.2,12(b)	40	3189	4.2
	4.2,12(c)	40	3189	4.2
Pyrophoric solid, inorganic, n.o.s.	4.2,16(a)	43	3200	4.2
Self-heating solid, inorganic, n.o.s.	4.2,16(b)	40	3190	4.2
	4.2,16(c)	40	3190	4.2
Pyrophoric liquid, inorganic, n.o.s.	4.2,17(a)	333	3194	4.2+4.3
Self-heating liquid, inorganic, n.o.s.	4.2,17(b)	30	3186	4.2
	4.2,17(c)	30	3186	4.2
Self-heating solid, toxic, inorganic, n.o.s.				
	4.2,18(b)	46	3191	4.2+6.1
	4.2,18(c)	46	3191	4.2+6.1
Self-heating liquid, toxic, inorganic, n.o.s.	4.2,19(b)	36	3187	4.2+6.1
	4.2,19(c)	36	3187	4.2+6.1
Self-heating solid, corrosive, inorganic, n.o.s.				
	4.2,20(b)	48	3192	4.2+8
	4.2,20(c)	48	3192	4.2+8
Self-heating liquid, corrosive, inorganic, n.o.s.	4.2,21(b)	38	3188	4.2+8
	4.2,21(c)	38	3188	4.2+8
Pyrophoric organometallic compound, n.o.s.	4.2,33(a)	X333	3203	4.2+4.3

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
CLASS 4.3: SUBSTANCES, WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES				
Specific n.o.s. entries				
Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.	4.3,1(a)	X338	2988	4.3+3+8
Alkali metal alloy, liquid, n.o.s.	4.3,11(a)	X423	1421	4.3
Alkaline earth metal alloy, n.o.s.	4.3,11(b)	423	1393	4.3
Metal hydrides, water-reactive, n.o.s.	4.3,16(a)	X423	1409	4.3
Metal hydrides, water-reactive, n.o.s.	4.3,16(b)	423	1409	4.3
General n.o.s. entries				
Organometallic compound or solution or dispersion, water-reactive, flammable, n.o.s.	4.3,3(a) 4.3,3(b) 4.3,3(c)	X323 323 323	3207 3207 3207	4.3+3 4.3+3 4.3+3
Metalic substances, water-reactive, n.o.s.	4.3,13(a)	X423	3208	4.3
Metalic substance, water-reactive, n.o.s.	4.3,13(b) 4.3,13(c)	423 423	3208 3208	4.3 4.3
Metalic substance, water-reactive, self-heating, n.o.s.	4.3,14(a)	X423	3209	4.3+4.2
Metalic substances, water-reactive, self-heating, n.o.s.	4.3,14(b) 4.3,14(c)	423 423	3209 3209	4.3+4.2 4.3+4.2
Water-reactive solid, n.o.s.	4.3,20(a)	X423	2813	4.3
Water-reactive solid, n.o.s.	4.3,20(b) 4.3,20(c)	423 423	2813 2813	4.3 4.3
Water reactive liquid, n.o.s.	4.3,21(a) 4.3,21(b) 4.3,21(c)	X323 323 323	3148 3148 3148	4.3 4.3 4.3
Water-reactive solid, toxic, n.o.s.	4.3,22(a)	X462	3134	4.3+6.1
Water-reactive liquid, toxic, n.o.s.	4.3,22(b) 4.3,22(c)	462 462	3134 3134	4.3+6.1 4.3+6.1
Water-reactive liquid, toxic, n.o.s.	4.3,23(a) 4.3,23(b) 4.3,23(c)	X362 362 362	3130 3130 3130	4.3+6.1 4.3+6.1 4.3+6.1
Water-reactive solid, corrosive, n.o.s.	4.3,24(a)	X482	3131	4.3+8

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Water-reactive solid, corrosive, n.o.s.	4.3,24(b) 4.3,24(c)	482 482	3131 3131	4.3+8 4.3+8
Water-reactive liquid, corrosive, n.o.s.	4.3,25(a) 4.3,25(b) 4.3,25(c)	X382 382 382	3129 3129 3129	4.3+8 4.3+8 4.3+8
CLASS 5.1: OXIDIZING SUBSTANCES				
Specific n.o.s. entries				
Chlorates, inorganic, n.o.s.	5.1,11(b)	50	1461	5.1
Chlorates, inorganic, aqueous solution, n.o.s.	5.1,11(b) 5.1,11(c)	50 50	3210 3210	5.1 5.1
Perchlorates, inorganic, n.o.s.	5.1,13(b)	50	1481	5.1
Perchlorates, inorganic, aqueous solution, n.o.s.	5.1,13(b) 5.1,13(c)	50 50	3211 3211	5.1 5.1
Chlorites, inorganic, n.o.s.	5.1,14(b)	50	1462	5.1
Hypochlorites, inorganic, n.o.s.	5.1,15(b)	50	3212	5.1
Bromates, inorganic, n.o.s.	5.1,16(b)	50	1450	5.1
Bromates, inorganic, aqueous solution, n.o.s.	5.1,16(b) 5.1,16(c)	50 50	3213 3213	5.1 5.1
Permanganates, inorganic, n.o.s.	5.1,17(b)	50	1482	5.1
Permanganates, inorganic, aqueous, solution, n.o.s.	5.1,17(b)	50	3214	5.1
Persulphates, inorganic, n.o.s.	5.1,18(c)	50	3215	5.1
Persulphates, inorganic, aqueous solution, n.o.s.	5.1,18(c)	50	3216	5.1
Nitrates, inorganic, n.o.s.	5.1,22(b) 5.1,22(c)	50 50	1477 1477	5.1 5.1
Nitrates, inorganic, aqueous solution, n.o.s.	5.1,22(b) 5.1,22(c)	50 50	3218 3218	5.1 5.1
Nitrites, inorganic, n.o.s.	5.1,23(b)	50	2627	5.1
Nitrites, inorganic, aqueous, solution, n.o.s.	5.1,23(b) 5.1,23(c)	50 50	3219 3219	5.1 5.1
Peroxides, inorganic, n.o.s.	5.1,25(b)	50	1483	5.1
General n.o.s. entries				
Oxidizing solid, n.o.s.	5.1,27(a)	55	1479	5.1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Oxidizing solid, n.o.s.	5.1,27(b)	50	1479	5.1
	5.1,27(c)	50	1479	5.1
Oxidizing liquid, n.o.s.	5.1,28(a)	55	3139	5.1
Oxidizing solid, toxic, n.o.s.	5.1,28(b)	50	3139	5.1
	5.1,28(c)	50	3139	5.1
Oxidizing solid, toxic, n.o.s.	5.1,29(a)	556	3087	5.1+6.1
Oxidizing solid, n.o.s.	5.1,29b)	56	3087	5.1+6.1
	5.1,29c)	56	3087	5.1+6.1
Oxidizing liquid, toxic, n.o.s.	5.1,30(a)	556	3099	5.1+6.1
	5.1,30(b)	56	3099	5.1+6.1
	5.1,30(c)	56	3099	5.1+6.1
Oxidizing solid, corrosive, n.o.s.	5.1,31(a)	558	3085	5.1+8
Oxidizing solid, corrosive, n.o.s.	5.1,31(b)	58	3085	5.1+8
	5.1,31(c)	58	3085	5.1+8
Oxidizing liquid, corrosive, n.o.s.				
	5.1,32(a)	558	3098	5.1+8
	5.1,32(b)	58	3098	5.1+8
	5.1,32(c)	58	3098	5.1+8
CLASS 5.2: ORGANIC PEROXIDES				
Specific collective headings				
Organic peroxide, Type B, liquid	5.2,1(b)	539	3101	5.2+01+(8)
Organic peroxide, Type B, solid	5.2,2(b)	539	3102	5.2+01
Organic peroxide, Typ C, liquid	5.2,3(b)	539	3103	5.2+(8)
Organic peroxide, Typ C, solid	5.2,4(b)	539	3104	5.2+(8)
Organic peroxide, Typ D, liquid	5.2,5(b)	539	3105	5.2+(8)
Organic peroxide, Typ D, solid	5.2,6(b)	539	3106	5.2
Organic peroxide, Typ E, liquid	5.2,7(b)	539	3107	5.2+(8)
Organic peroxide, Typ E, solid	5.2,8(b)	539	3108	5.2
Organic peroxide, Type F, liquid	5.2,9(b)	539	3109	5.2+(8)
Organic peroxide, Type F, solid	5.2,10(b)	539	3110	5.2

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
CLASS 6.1: TOXIC SUBSTANCES				
Specific n.o.s. entries or specific collective headings				
Organic substances				
Organophosphorus compound, toxic, flammable, n.o.s.	6.1,9(a)	63	3279	6.1+3
Nitriles, toxic, flammmable, n.o.s.	6.1,11(a)	663	3275	6.1+3
	6.1,11(b)2	63	3275	6.1+3
Nitriles, toxic, n.o.s.	6.1,12(a)	66	3276	6.1
	6.1,12(b)	60	3276	6.1
	6.1,12(c)	60	3276	6.1
Chloropicrin mixture, n.o.s.	6.1,17(a)	66	1583	6.1
	6.1,17(b)	60	1583	6.1
	6.1,17(c)	60	1583	6.1
Isocyanates, toxic, flammable, n.o.s.	6.1,18(b)	63	3080	6.1+3
Isocyanate solution, toxic, flammable, n.o.s.	6.1,18(b)	63	3080	6.1+3
Isocyanate, toxic, n.o.s.	6.1,19(b)	60	2206	6.1
	6.1,19(c)	60	2206	6.1
Isocyanate solution, toxic, n.o.s.	6.1,19(b)	60	2206	6.1
	6.1,19(c)	60	2206	6.1
Mercaptans, liquid, toxic, flammable, n.o.s.	6.1,20(b)	63	3071	6.1+3
Mercaptans mixture, liquid, toxic, flammable, n.o.s.	6.1,20(b)	63	3071	6.1+3
Organophosphorus compound, toxic, flammable, n.o.s.	6.1,22(a)	663	3279	6.1+3
	6.1,22(b)	63	3279	6.1+3
Organophosphorus compound, toxic, n.o.s.	6.1,23(a)	66	3278	6.1
	6.1,23(b)	60	3278	6.1
	6.1,23(c)	60	3278	6.1
Disinfectant, liquid, toxic, n.o.s.	6.1,25(a)	66	3142	6.1
	6.1,25(b)	60	3142	6.1
	6.1,25(c)	60	3142	6.1
Disinfectant, solid, toxic, n.o.s.	6.1,25(a)	66	1601	6.1
	6.1,25(b)	60	1601	6.1
	6.1,25(c)	60	1601	6.1
Dye, liquid, toxic, n.o.s.	6.1,25(a)	66	1602	6.1
	6.1,25(b)	60	1602	6.1
	6.1,25(c)	60	1602	6.1
Dye, intermediate, liquid, toxic, n.o.s.	6.1,25(a)	66	1602	6.1
	6.1,25(b)	60	1602	6.1
	6.1,25(c)	60	1602	6.1
Dye, solid, toxic, n.o.s.	6.1,25(a)	66	3143	6.1
	6.1,25(b)	60	3143	6.1
	6.1,25(c)	60	3143	6.1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Dye intermediate, solid, toxic, n.o.s.	6.1,25(a) 6.1,25(b) 6.1,25(c)	66 60 60	3143 3143 3143	6.1 6.1 6.1
Tear gas substance, liquid or solid, n.o.s.	6.1,25(a) 6.1,25(b)	66 60	1693 1693	6.1 6.1
Chloroformates, toxic, corrosive, n.o.s.	6.1,27(b)	68	3277	6.1+8
Chloroformates, toxic, corrosive, flammable, n.o.s.	6.1,28(b)	638	2742	6.1+3+8
Organometallic substances				
Organotin compound, liquid, n.o.s.	6.1,32(a) 6.1,32(b) 6.1,32(c)	66 60 60	2788 2788 2788	6.1 6.1 6.1
Organotin compound, solid, n.o.s.	6.1,32(a) 6.1,32(b) 6.1,32(c)	66 60 60	3146 3146 3146	6.1 6.1 6.1
Phenylmercuric compound, n.o.s.	6.1,33(a) 6.1,33(b) 6.1,33(c)	66 60 60	2026 2026 2026	6.1 6.1 6.1
Organoarsenic compound, n.o.s.	6.1,34(a) 6.1,34(b) 6.1,34(c)	66 60 60	3280 3280 3280	6.1 6.1 6.1
Metal carbonyls, n.o.s.	6.1,36(a) 6.1,36(b) 6.1,36(c)	66 60 60	3281 3281 3281	6.1 6.1 6.1
Inorganic substances				
Cyanides, inorganic, solid, n.o.s.	6.1,41(a) 6.1,41(b) 6.1,41(c)	66 60 60	1588 1588 1588	6.1 6.1 6.1
Cyanide solution, n.o.s.	6.1,41(a) 6.1,41(b) 6.1,41(c)	66 60 60	1935 1935 1935	6.1 6.1 6.1
Arsenic compound, liquid, n.o.s. (arsenates, arsenites and arsenic sulphides)	6.1,51(a) 6.1,51(b) 6.1,51(c)	66 60 60	1556 1556 1556	6.1 6.1 6.1
Arsenic compound, solid, n.o.s. (arsenates, arsenites and arsenic sulphides)	6.1,51(a) 6.1,51(b) 6.1,51(c)	66 60 60	1557 1557 1557	6.1 6.1 6.1
Mercury compound, liquid, n.o.s.	6.1,52(a) 6.1,52(b) 6.1,52(c)	66 60 60	2024 2024 2024	6.1 6.1 6.1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Mercury compound, solid, n.o.s.	6.1,52(a)	66	2025	6.1
	6.1,52(b)	60	2025	6.1
	6.1,52(c)	60	2025	6.1
Thallium compound, n.o.s.	6.1,53(b)	60	1707	6.1
Beryllium compound, n.o.s.	6.1,54(b)2	60	1566	6.1
	6.1,54(c)	60	1566	6.1
Selenium compound, n.o.s.	6.1,55(a)	66	3283	6.1
	6.1,55(b)	60	3283	6.1
	6.1,55(c)	60	3283	6.1
Tellurium compound, n.o.s.	6.1,57(b)	60	3284	6.1
	6.1,57(c)	60	3284	6.1
Vanadium compound, n.o.s.	6.1,58(b)	60	3285	6.1
	6.1,58(c)	60	3285	6.1
Antimony compound, inorganic, liquid, n.o.s.	6.1,59(c)	60	3141	6.1
Antimony compound, inorganic, solid, n.o.s.	6.1,59(c)	60	1549	6.1
Barium compound, n.o.s.	6.1,60(b)	60	1564	6.1
	6.1,60(c)	60	1564	6.1
Cadmium compound	6.1,61(a)	66	2570	6.1
	6.1,61(b)	60	2570	6.1
	6.1,61(c)	60	2570	6.1
Lead compound, soluble, n.o.s.	6.1,62(c)	60	2291	6.1
Fluorosilicates, n.o.s.	6.1,64(c)	60	2856	6.1
Pesticides				
Carbamate pesticide, liquid, toxic	6.1,71(a)	66	2992	6.1
	6.1,71(b)	60	2992	6.1
	6.1,71(c)	60	2992	6.1
Arsenical pesticide, liquid, toxic,	6.1,71(a)	66	2994	6.1
	6.1,71(b)	60	2994	6.1
	6.1,71(c)	60	2994	6.1
Organochlorine pesticide, liquid, toxic	6.1,71(a)	66	2996	6.1
	6.1,71(b)	60	2996	6.1
	6.1,71(c)	60	2996	6.1
Triazine pesticide, liquid, toxic	6.1,71(a)	66	2998	6.1
	6.1,71(b)	60	2998	6.1
	6.1,71(c)	60	2998	6.1
Phenoxy pesticide, liquid, toxic	6.1,71(a)	66	3000	6.1
	6.1,71(b)	60	3000	6.1
	6.1,71(c)	60	3000	6.1
Phenyl urea pesticide, liquid, toxic	6.1,71(a)	66	3002	6.1
	6.1,71(b)	60	3002	6.1
	6.1,71(c)	60	3002	6.1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Benzoic derivative pesticide, liquid, toxic	6.1,71(a)	66	3004	6.1
	6.1,71(b)	60	3004	6.1
	6.1,71(c)	60	3004	6.1
Dithiocarbamate pesticide, liquid, toxic	6.1,71(a)	66	3006	6.1
	6.1,71(b)	60	3006	6.1
	6.1,71(c)	60	3006	6.1
Phthalimide derivative pesticide, liquid, toxic	6.1,71(a)	66	3008	6.1
	6.1,71(b)	60	3008	6.1
	6.1,71(c)	60	3008	6.1
Copper based pesticide, liquid, toxic	6.1,71(a)	66	3010	6.1
	6.1,71(b)	60	3010	6.1
	6.1,71(c)	60	3010	6.1
Mercury based pesticide, liquid, toxic	6.1,71(a)	66	3012	6.1
	6.1,71(b)	60	3012	6.1
	6.1,71(c)	60	3012	6.1
Substituted nitrophenol pesticide, liquid, toxic	6.1,71(a)	66	3014	6.1
	6.1,71(b)	60	3014	6.1
	6.1,71(c)	60	3014	6.1
Bipyridilium pesticide, liquid, toxic	6.1,71(a)	66	3016	6.1
	6.1,71(b)	60	3016	6.1
	6.1,71(c)	60	3016	6.1
Organophosphorus pesticide, liquid, toxic	6.1,71(a)	66	3018	6.1
	6.1,71(b)	60	3018	6.1
	6.1,71(c)	60	3018	6.1
Organotin pesticide, liquid, toxic	6.1,71(a)	66	3020	6.1
	6.1,71(b)	60	3020	6.1
	6.1,71(c)	60	3020	6.1
Coumarin derivative pesticide, liquid, toxic	6.1,71(a)	66	3026	6.1
	6.1,71(b)	60	3026	6.1
	6.1,71(c)	60	3026	6.1
Pesticide, liquid, toxic, n.o.s.	6.1,71(a)	66	2902	6.1
	6.1,71(b)	60	2902	6.1
	6.1,71(c)	60	2902	6.1
Carbamate pesticide, liquid, toxic, flammable	6.1,72(a)	663	2991	6.1+3
	6.1,72(b)	63	2991	6.1+3
	6.1,72(c)	63	2991	6.1+3
Arsenical pesticide, liquid, toxic, flammable	6.1,72(a)	663	2993	6.1+3
	6.1,72(b)	63	2993	6.1+3
	6.1,72(c)	63	2993	6.1+3
Organochlorine pesticide, liquid, toxic, flammable	6.1,72(a)	663	2995	6.1+3
	6.1,72(b)	63	2995	6.1+3
	6.1,72(c)	63	2995	6.1+3
Triazine pesticide, liquid, toxic, flammable	6.1,72(a)	663	2997	6.1+3
	6.1,72(b)	63	2997	6.1+3
	6.1,72(c)	63	2997	6.1+3

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Phenoxy pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	2999 2999 2999	6.1+3 6.1+3 6.1+3
Phenyl urea pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3001 3001 3001	6.1+3 6.1+3 6.1+3
Benzoic derivative pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3003 3003 3003	6.1+3 6.1+3 6.1+3
Dithiocarbamate pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3005 3005 3005	6.1+3 6.1+3 6.1+3
Phthalimide derivative pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3007 3007 3007	6.1+3 6.1+3 6.1+3
Copper based pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3009 3009 3009	6.1+3 6.1+3 6.1+3
Mercury based pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3011 3011 3011	6.1+3 6.1+3 6.1+3
Substituted nitrophenol pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3013 3013 3013	6.1+3 6.1+3 6.1+3
Bipyridilium pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3015 3015 3015	6.1+3 6.1+3 6.1+3
Organophosphorus pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3017 3017 3017	6.1+3 6.1+3 6.1+3
Organotin pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3019 3019 3019	6.1+3 6.1+3 6.1+3
Coumarin derivative pesticide, liquid, toxic, flammable	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	3025 3025 3025	6.1+3 6.1+3 6.1+3
Pesticide, liquid, toxic, flammable, n.o.s.	6.1,72(a) 6.1,72(b) 6.1,72(c)	663 63 63	2903 2903 2903	6.1+3 6.1+3 6.1+3
Carbamate pesticide, solid, toxic	6.1,73(a) 6.1,73(b) 6.1,73(c)	66 60 60	2757 2757 2757	6.1 6.1 6.1
Arsenical pesticide, solid toxic	6.1,73(a) 6.1,73(b) 6.1,73(c)	66 60 60	2759 2759 2759	6.1 6.1 6.1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Organochlorine pesticide, solid, toxic	6.1,73(a)	66	2761	6.1
	6.1,73(b)	60	2761	6.1
	6.1,73(c)	60	2761	6.1
Triazine pesticide, solid, toxic	6.1,73(a)	66	2763	6.1
	6.1,73(b)	60	2763	6.1
	6.1,73(c)	60	2763	6.1
Phenoxy pesticide, solid, toxic	6.1,73(a)	66	2765	6.1
	6.1,73(b)	60	2765	6.1
	6.1,73(c)	60	2765	6.1
Phenyl urea presticide, solid, toxic	6.1,73(a)	66	2767	6.1
	6.1,73(b)	60	2767	6.1
	6.1,73(c)	60	2767	6.1
Benzoic derivative pesticide, solid, toxic	6.1,73(a)	66	2769	6.1
	6.1,73(b)	60	2769	6.1
	6.1,73(c)	60	2769	6.1
Dithiocarbamate derivative pesticide, solid, toxic	6.1,73(a)	66	2771	6.1
	6.1,73(b)	60	2771	6.1
	6.1,73(c)	60	2771	6.1
Phthalimide derivative pesticide, solid, toxic	6.1,73(a)	66	2773	6.1
	6.1,73(b)	60	2773	6.1
	6.1,73(c)	60	2773	6.1
Copper based pesticide, solid, toxic	6.1,73(a)	66	2775	6.1
	6.1,73(b)	60	2775	6.1
	6.1,73(c)	60	2775	6.1
Mercury based pesticide, solid, toxic	6.1,73(a)	66	2777	6.1
	6.1,73(b)	60	2777	6.1
	6.1,73(c)	60	2777	6.1
Substituted nitrophenol pesticide, solid, toxic	6.1,73(a)	66	2779	6.1
	6.1,73(b)	60	2779	6.1
	6.1,73(c)	60	2779	6.1
Bipyridilium pesticide, solid, toxic	6.1,73(a)	66	2781	6.1
	6.1,73(b)	60	2781	6.1
	6.1,73(c)	60	2781	6.1
Organophosphorus pesticide, solid, toxic	6.1,73(a)	66	2783	6.1
	6.1,73(b)	60	2783	6.1
	6.1,73(c)	60	2783	6.1
Organotin pesticide, solid, toxic	6.1,73(a)	66	2786	6.1
	6.1,73(b)	60	2786	6.1
	6.1,73(c)	60	2786	6.1
Coumarin derivative pesticide, solid, toxic	6.1,73(a)	66	3027	6.1
	6.1,73(b)	60	3027	6.1
	6.1,73(c)	60	3027	6.1
Pesticide, solid, toxic, n.o.s.	6.1,73(a)	66	2588	6.1
	6.1,73(b)	60	2588	6.1
	6.1,73(c)	60	2588	6.1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Active Substances				
Alkaloids or Alkaloid salts, liquid, n.o.s.	6.1,90(a) 6.1,90(b) 6.1,90(c)	66 60 60	3140 3140 3140	6.1 6.1 6.1
Alkaloids or Alkaloid salts, solid, n.o.s.	6.1,90(a) 6.1,90(b) 6.1,90(c)	66 60 60	1544 1544 1544	6.1 6.1 6.1
Nicotine compound or nicotine preparation, liquid, n.o.s.	6.1,90(a) 6.1,90(b) 6.1,90(c)	66 60 60	3144 3144 3144	6.1 6.1 6.1
Nicotine compound or nicotine preparation, solid, n.o.s.	6.1,90(a) 6.1,90(b) 6.1,90(c)	66 60 60	1655 1655 1655	6.1 6.1 6.1
Toxins, extracted from living sources, n.o.s.	6.1,90a) 6.1,90b) 6.1,90c)	66 60 60	3172 3172 3172	6.1 6.1 6.1
Medicine, liquid, toxic, n.o.s.	6.1,90(b) 6.1,90(c)	60 60	1851 1851	6.1 6.1
Medicine, solid, toxic, n.o.s.	6.1,90(b) 6.1,90(c)	60 60	3249 3249	6.1 6.1
General n.o.s. entries				
Organic substances				
Toxic liquid, flammable, organic, n.o.s.	6.1,9(a)	663	2929	6.1+3
Toxic liquid, organic, n.o.s.	6.1,25(a) 6.1,25(b) 6.1,25(c)	66 60 60	2810 2810 2810	6.1 6.1 6.1

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Toxic, solid, organic, n.o.s.	6.1,25(a) 6.1,25(b) 6.1,25(c)	66 60 60	2811 2811 2811	6.1 6.1 6.1
Toxic liquid, flammable, organic, n.o.s.	6.1,26(a)1 6.1,26(b)1	663 63	2929 2929	6.1+3 6.1+3
Toxic solid, flammable, organic, n.o.s.	6.1,26(a)2 6.1,26(b)2	664 64	2930 2930	6.1+4.1 6.1+4.1
Toxic liquid, corrosive, organic, n.o.s.	6.1,27(a) 6.1,27(b)	668 68	2927 2927	6.1+8 6.1+8
Toxic solid, corrosive, organic, n.o.s.	6.1,27(a) 6.1,27(b)	668 68	2928 2928	6.1+8 6.1+8
Organometallic substances				
Organometallic compound, toxic, n.o.s.	6.1,35(a) 6.1,35(b) 6.1,35(c)	66 60 60	3282 3282 3282	6.1 6.1 6.1
Inorganic substances				
Toxic liquid, water-reactive, n.o.s.	6.1,44(a) 6.1,44(b)	623 623	3123 3123	6.1+4.3 6.1+4.3
Toxic solid, water-reactive, n.o.s.	6.1,44(a) 6.1,44(b)	642 642	3125 3125	6.1+4.3 6.1+4.3
Solids containing toxic liquid, n.o.s.	6.1,65(b)	60	3243	6.1
Toxic liquid, inorganic, n.o.s.	6.1,65(a) 6.1,65(b) 6.1,65(c)	66 60 60	3287 3287 3287	6.1 6.1 6.1
Toxic solid, inorganic, n.o.s.	6.1,65(a) 6.1,65(b) 6.1,65(c)	66 60 60	3288 3288 3288	6.1 6.1 6.1
Toxic solid, self-heating, n.o.s.	6.1,66(a) 6.1,66(b)	664 64	3124 3124	6.1+4.2 6.1+4.2
Toxic liquid, corrosive, inorganic, n.o.s.	6.1,67(a) 6.1,67(b)	668 68	3289 3289	6.1+8 6.1+8
Toxic solid, corrosive, inorganic, n.o.s.	6.1,67(a) 6.1,67(b)	668 68	3290 3290	6.1+8 6.1+8
Toxic liquid, oxidizing, n.o.s.	6.1,68(a) 6.1,68b)	665 65	3122 3122	6.1+05 6.1+05
Toxic solid, oxidizing, n.o.s.	6.1,68(a) 6.1,68(b)	665 65	3086 3086	6.1+05 6.1+05

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
CLASS 6.2: INFECTIOUS SUBSTANCES				
Specific collective headings				
Infectious substance, affecting humans	6.2,1	606	2814	6.2
Infectious substance, affecting animals	6.2,1	606	2900	6.2
Infectious substance, affecting humans	6.2,2	606	2814	6.2
Infectious substance, affecting animals	6.2,2	606	2900	6.2
Infectious substance, affecting humans	6.2,3(b)	606	2814	6.2
Infectious substance, affecting animals	6.2,3(b)	606	2900	6.2
General n.o.s. entry				
Clinical waste, unspecified, n.o.s.	6.2,4(b)	606	3291	6.2
CLASS 7: RADIOACTIVE MATERIAL				
Specific n.o.s. entries				
Radioactive material, low specific activity (LSA), n.o.s.	7, Sch. 5, 6, 7 or 13	70	2912	7A, 7B or 7C
gas		72	2912	7A, 7B or 7C
gas, flammable		723	2912	7A, 7B or 7C+3
liquid, flammable with flash-point not above 61°C		73	2912	7A, 7B or 7C+3
solid, flammable		74	2912	7A, 7B or 7C+4.1
oxidizing		75	2912	7A, 7B or 7C+05
toxic		76	2912	7A, 7B or 7C+6.1
corrosive		78	2912	7A, 7B or 7C+8
Radioactive material, special form, n.o.s. — in Type A packages	7, Sch 9	70	2974	(703)
Radioactive material, special form, n.o.s. — in Type B(U) packages	7, Sch 10	70	2974	(703)
Radioactive material, special form, n.o.s. — in Type B(M) packages	7, Sch 11	70	2974	(703)

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Radioactive material, special form, n.o.s. — under special arrangement	7, Sch 13	70	2974	(703)
Radioactive material, fissile, n.o.s. — in Type I-F-, Type AF-, Type B(U)F- or Type B(M)F-packages	7, Sch 12	70	2918	(703)
— under special arrangement	7, Sch 13	70	2918	(703)
General n.o.s. entries				
Radioactive material, n.o.s.	7, Sch 9, 10, 11 or 13	70	2982	7A, 7B or 7C
gas		72	2982	7A, 7B or 7C
gas, flammable		723	2982	7A, 7B or 7C+3
liquid, flammable with flash-point not above 61°C		73	2982	7A, 7B or 7C+3
solid, flammable		74	2982	7A, 7B or 7C+4.1
oxidizing		75	2982	7A, 7B or 7C+05
toxic		76	2982	7A, 7B or 7C+6.1
corrosive		78	2982	7A, 7B or 7C+8
CLASS 8: CORROSIVE SUBSTANCES				
Specific n.o.s. entries				
Inorganic substances				
Hydrogendifluorides, n.o.s.	8,9(b) 8,9(c)	80 80	1740 1740	8 8
Bisulphites, aqueous solution, n.o.s.	8,17(c)	80	2693	8
Organic substances				
Chlorosilanes, corrosive, n.o.s.	8,36(b)	X80	2987	8
Chlorosilanes, corrosive, flammable, n.o.s.	8,37(b)	X83	2986	8+3
Alkylphenols, solid, n.o.s.	8,39(a) 8,39(b) 8,39(c)	88 80 80	2430 2430 2430	8 8 8

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Alkylphenols, liquid, n.o.s.	8,40(a)	88	3145	8
	8,40(b)	80	3145	8
	8,40(c)	80	3145	8
Amines or polyamines, solid, corrosive, n.o.s.	8,52(a)	88	3259	8
	8,52(b)	80	3259	8
	8,52(c)	80	3259	8
Amines or polyamines, liquid, corrosive, n.o.s.	8,53(a)	88	2735	8
	8,53(b)	80	2735	8
	8,53(c)	80	2735	8
Amines or polyamines, liquid corrosive, flammable, n.o.s.	8,54(a)	883	2734	8+3
	8,54(b)	83	2734	8+3
Dye or dye intermediate, solid, corrosive, n.o.s.	8,65(b)	80	3147	8
	8,65(c)	80	3147	8
Dye or dye intermediate, liquid, corrosive, n.o.s.	8,66(a)	88	2801	8
	8,66(b)	80	2801	8
	8,66(c)	80	2801	8
Disinfectant, liquid, corrosive, n.o.s.	8,66(a)	88	1903	8
	8,66(b)	80	1903	8
	8,66(c)	80	1903	8
General n.o.s. entries				
Acid substances				
Inorganic substances				
Corrosive solid, acidic, inorganic, n.o.s.	8,16(a)	88	3260	8
Corrosive solid, acidic, inorganic, n.o.s.	8,16(b)	80	3260	8
	8,16(c)	80	3260	8
Corrosive liquid, acidic, inorganic, n.o.s.	8,17(a)	88	3264	8
	8,17(b)	80	3264	8
	8,17(c)	80	3264	8

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Organic substances				
Corrosive solid, acidic, organic, n.o.s.	8,39(a)	88	3261	8
	8,39(b)	80	3261	8
	8,39(c)	80	3261	8
Corrosive liquid, acidic, organic, n.o.s.	8,40(a)	88	3265	8
	8,40(b)	80	3265	8
	8,40(c)	80	3265	8
Basic substances				
Inorganic substances				
Caustic alkali liquid, n.o.s.	8,42(b)	80	1719	8
	8,42(c)	80	1719	8
Corrosive solid, basic, inorganic, n.o.s.	8,46(a)	88	3262	8
Corrosive solid, basic, inorganic, n.o.s.	8,46(b)	80	3262	8
	8,46(c)	80	3262	8
Corrosive liquid, basic, inorganic, n.o.s.	8,47(a)	88	3266	8
	8,47(b)	80	3266	8
	8,47(c)	80	3266	8
Organic substances				
Corrosive solid, basic, organic, n.o.s.	8,55(a)	88	3263	8
	8,55(b)	80	3263	8
	8,55(c)	80	3263	8
Corrosive liquid, basic, organic, n.o.s.	8,56(a)	88	3267	8
	8,56(b)	80	3267	8
	8,56(c)	80	3267	8
Other corrosive substances				
Solids containing corrosive liquid, n.o.s.	8,65(b)	80	3244	8
Corrosive solid, n.o.s.	8,65(a)	88	1759	8
	8,65(b)	80	1759	8
	8,65(c)	80	1759	8
Corrosive liquid, n.o.s.	8,66(a)	88	1760	8
	8,66(b)	80	1760	8
	8,66(c)	80	1760	8
Corrosive solid, flammable, n.o.s.	8,67(a)	884	2921	8+4.1
	8,67(b)	84	2921	8+4.1
Corrosive liquid, flammable, n.o.s.	8,68(a)	883	2920	8+3
	8,68(b)	83	2920	8+3
Corrosive solid, self-heating, n.o.s.	8,69(a)	884	3095	8+4.2
Corrosive solid, self-heating, n.o.s.	8,69(b)	84	3095	8+4.2

1802 *(cont'd)*

Group of substances	Class, item number	Hazard Identification No (Upper part)	Substance Identification No. (Lower part)	Label
(c)	(d)	(a)	(b)	(e)
Corrosive liquid, self-heating, n.o.s.	8,70(a) 8,70(b)	884 84	3301 3301	8+4.2 8+4.2
Corrosive solid, water-reactive, n.o.s.	8,71(a)	842	3096	8+4.3
Corrosive solid, water-reactive, n.o.s.	8,71(b)	842	3096	8+4.3
Corrosive liquid, water-reactive, n.o.s.	8,72(a) 8,72(b)	823 823	3094 3094	8+4.3 8+4.3
Corrosive solid, oxidizing, n.o.s.	8,73(a) 8,73(b)	885 85	3084 3084	8+05 8+05
Corrosive liquid, oxidizing, n.o.s.	8,74(a) 8,74(b)	885 85	3093 3093	8+05 8+05
Corrosive solid, toxic, n.o.s.	8,75(a) 8,75(b) 8,75(c)	886 86 86	2923 2923 2923	8+6.1 8+6.1 8+6.1
Corrosive liquid, toxic, n.o.s.	8,76(a) 8,76(b) 8,76(c)	886 86 86	2922 2922 2922	8+6.1 8+6.1 8+6.1
CLASS 9: MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES				
Specific n.o.s. entries				
Environmentally hazardous substances				
Environmentally harzardous substance, liquid, n.o.s.	9,11(c)	90	3082	9
Environmentally hazardous substance, solid, n.o.s.	9,12(c)	90	3077	9
Elevated temperature substances				
Elevated temperature liquid, n.o.s.	9,20(c)	90	3257	9
Elevated temperature solid, n.o.s.	9,21(c)	90	3258	9

III. Numerical list

This numerical list contains all those substances and articles, including collective entries and n.o.s. entries, for which there is a substance identification number in the lists of substances in the various classes.

Where different goods are listed under the same identification number, or the same collective entry or n.o.s. entry is listed several times under the same identification number with different information (e.g. Class, item, hazard identification number), the relevant information shall be extracted on the basis of additional information such as flash-point or packing group of the substance (see also the classification criteria of each Class).

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.1D	0004	Ammonium picrate dry or wetted with less than 10 % water, by mass	1.1D,4	1+13	360200
1.1F	0005	Cartridges for weapons with bursting charge	1.1F,7	1+13	930630
1.1E	0006	Cartridges for weapons with bursting charge	1.1E,6	1+13	930630
1.2F	0007	Cartridges for weapons with bursting charge	1.2F,19	1+13	930630
1.2G	0009	Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.2G,21	1	930690
1.3G	0010	Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.3G,30	1	930690
1.4S	0012	Cartridges for weapons, inert projectile	1.4S,47	1.4	930630
1.4S	0012	Cartridges, small arms	1.4S,47	1.4	930630
1.4S	0014	Cartridges for weapons, blank	1.4S,47	1.4	930630
1.4S	0014	Cartridges, small arms, blank	1.4S,47	1.4	930630
1.2G	0015	Ammunition, smoke with or without burster, expelling charge or propelling charge	1.2G,21	1+8	930690
1.3G	0016	Ammunition, smoke with or without burster, expelling charge or propelling charge	1.3G,30	1+8	930690
1.2G	0018	Ammunition, tear-producing with burster, expelling charge or propelling charge	1.2G,21	1+61 +8	930690
1.3G	0019	Ammunition, tear-producting with burster, expelling charge or propelling charge	1.3G,30	1+61 +8	930690
1.2K	0020	Ammunition, toxic with burster, expelling charge or propelling charge: *Not to be accepted for carriage*	1.2K, *See marg. 100 (8)*		
1.3K	0021	Ammunition, toxic with burster, expelling charge or propelling charge: *Not to be accepted for carriage*	1.3K, *See marg. 100 (8)*		
1.1D	0027	Black powder, granular or as a meal	1.1D,4	1+13	360200
1.1D	0028	Black powder, compressed	1.1D,4	1+13	360200
1.1D	0028	Black powder, in pellets	1.1D,4	1+13	360200
1.1B	0029	Detonators, non-electric for blasting	1.1B,1	1+13	360300
1.1B	0030	Detonators, electric for blasting	1.1B,1	1+13	360300
1.1F	0033	Bombs with bursting charge	1.1F,7	1+13	930690
1.1D	0034	Bombs with bursting charge	1.1D,5	1+13	930690
1.2D	0035	Bombs with bursting charge	1.2D,17	1	930690
1.1F	0037	Bombs, photoflash	1.1F,7	1+13	930690
1.1D	0038	Bombs, photoflash	1.1D,5	1+13	930690
1.2G	0039	Bombs, photoflash	1.2G,21	1	930690
1.1D	0042	Boosters without detonator	1.1D,5	1+13	360300
1.1D	0043	Bursters, explosive	1.1D,5	1+13	930690
1.4S	0044	Primers, cap type	1.4S,47	1.4	360300
1.1D	0048	Charges, demolition	1.1D,5	1+13	930690
1.1G	0049	Cartridges, flash	1.1G,9	1+13	360490
1.3G	0050	Cartridges, flash	1.3G,30	1	360490
1.3G	0054	Cartridges, sinal	1.3G,30	1	360490
1.4S	0055	Cases, cartridge, empty, with primer	1.4S,47	1.4	930690
1.1D	0056	Charges, depth	1.1D,5	1+13	930690
1.1D	0059	Charges, shaped, commercial without detonator	1.1D,5	1+13	930690
1.1D	0060	Charges, supplementary, explosive	1.1D,5	1+13	930690
1.1D	0065	Cord, detonating, flexible	1.1D,5	1+13	360300
1.4G	0066	Cord, igniter	1.4G,43	1.4	360300

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.4S	0070	Cutters, cable, explosive	1.4S,47	1.4	930690
1.1D	0072	Cyclotrimethylentrinitramine, (cyclonite; hexogen; RDX) wetted with not less than 15 % water, bij mass	1.1D,4	1+15	360200
1.1B	0073	Detonators for ammunition	1.1B,1	1+13	360300
1.1A	0074	Diazonitrophenol, wetted with not less than 40 % water, or mixture of alcohol and water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100(8)*		
1.1D	0075	Diethyleneglycol dinitrate, desensitized with not less than 25 % non-volatile, water-insoluble phlegmatizer, by mass	1.1D,4	1+15	360200
1.1D	0076	Dinitrophenol, dry or wetted with less than 15 % water, by mass	1.1D,4	1+61 +13	360200
1.3C	0077	Dinitrophenolates, alkali metals, dry or wetted with less than 15 % water, by mass	1.3C,26	1+61 +13	360200
1.1D	0078	Dinitroresorcinol, dry or wetted with less than 15 % by mater, by mass	1.1D,4	1+13	360200
1.1D	0079	Hexanitrodiphenylamine	1.1D,4	1+13	292144
1.1D	0081	Explosive, blasting, type A	1.1D,4	1+13	360100
1.1D	0082	Explosive, blasting, type B	1.1D,4	1+13	360200
1.1D	0083	Explosive, blasting type C	1.1D,4	1+15	360200
1.1D	0084	Explosive, blasting type D	1.1D,4	1+13	360200
1.3G	0092	Flares, surface	1.3G,30	1	360490
1.3G	0093	Flares, aerial	1.3G,30	1	360490
1.1G	0094	Flash powder	1.1G,8	1+13	360490
1.1D	0099	Fracturing devices, explosive without detonator, for oil wells	1.1D,5	1+13	930690
1.3G	0101	Fuse, non-detonating	1.3G,30	1	360300
1.2D	0102	Cord (fuse), detonating, metal clad	1.2D,17	1	360300
1.4G	0103	Fuse, igniter, tubular, metal clad	1.4G,43	1.4	360300
1.4D	0104	Cord (fuse), detonating, mild effect, metal clad	1.4D,39	1.4	360300
1.4S	0105	Fuse, safety	1.4S,47	1.4	360300
1.1B	0106	Fuzes, detonating	1.1B,1	1+13	360300
1.2B	0107	Fuzes, detonating	1.2B,13	1+13	360300
1.4S	0110	Grenades, practice, hand or rifle	1.4S,47	1.4	930690
1.1A	0113	Guanyl nitrosaminoguanylidene hydrazine, wetted with not less than 30 % water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100 (8)*		
1.1A	0114	Guanyl nitrosaminoguanyltetrazene (tetrazene), wetted with not less than 30 % water, or mixture of alcohol and water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100 (8)*		
1.1D	0118	Hexolite (hexotol), dry or wetted with less than 15 % water, by mass	1.1D,4	1+13	360200
1.1G	0121	Igniters	1.1G,9	1+13	360300
1.1D	0124	Jet perforating guns, charged, oil well, without detonator	1.1D,5	1+13	930690
1.1A	0129	Lead azide, wetted with not less than 20 % water, or mixture of alcohol and water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100 (8)*		
1.1A	0130	Lead styphnate (lead trinitroresorcinate), wetted with not less than 20 % water, or mixture of alcohol and water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100 (8)*		
1.4S	0131	Lighters, fuse	1.4S,47	1.4	360300
1.3C	0132	Deflagrating metal salts of aromatic nitroderivatives, n.o.s.	1.3C,26	1+13	360200
1.1D	0133	Mannitol hexanitrate (nitromannite), wetted with not less than 40 % watern or mixture of alcohol and water, by mass	1.1D,4	1+15	360200
1.1A	0135	Mercury fulminate, wetted with not less than 20 % water, or mixture of alcohol and water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100 (8)*		
1.1F	0136	Mines with bursting charge	1.1F,7	1+13	930690
1.1D	0137	Mines with bursting charge	1.1D,5	1+13	930690
1.2D	0138	Mines with bursting charge	1.2D,17	1	930690
1.1D	0143	Nitroglycerin, desensitized with not less than 40 % non-volatile water-insoluble phlegmatizer, by mass	1.1D,4	1+6.1 +15	360200
1.1D	0144	Nitroglycerin solution in alcohol with more than 1 % not more than 10 % nitroglycerin	1.1D,4	1+13	300390

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.1D	0146	Nitrostarch, dry or wetted with less than 20 % water, by mass	1.1D,4	1+15	360200
1.1D	0147	Nitro urea	1.1D,4	1+13	360200
1.1D	0150	Pentaerythrite tetranitrate, desensitized with not less than 15 % phlegmatizer, by mass	1.1D,4	1+15	360200
1.1D	0150	Pentaerythrite tetranitrate, wetted with not less than 25 % water, by mass	1.1D,4	1+15	
1.1D	0151	Pentolite, dry or wetted with less than 15 % water, by mass	1.1D,4	1+13	360200
1.1D	0153	Trinitroaniline (picramide)	1.1D,4	1+13	360200
1.1D	0154	Trinitrophenol (picric acid), dry or wetted with less than 30 % water, by mass	1.1D,4	1+13	290890
40	0154	Trinitrophenol (picric acid) ≤ 500 g	4.1,21(a)2	4.1	360200
40	0155	Trinitrochlorobenzene (picryl chloride) ≤ 500 g	4.1,21(a)2	4.1	360200
1.1D	0155	Trinitrochlorobenzene (picryl chloride)	1.1D,4	1+13	360200
1.3C	0159	Powder cake (powder paste), wetted with not less than 25 % water, by mass	1.3C,26	1+13	360100
1.1C	0160	Powder, smokeless	1.1C,2	1+15	360100
1.3C	0161	Powder, smokeless	1.3C,26	1+13	360100
1.1F	0167	Projectiles with bursting charge	1.1F,7	1+13	930690
1.1D	0168	Projectiles with bursting charge	1.1D,5	1+13	930690
1.2D	0169	Projectiles with bursting charge	1.2D,17	1	930690
1.2G	0171	Ammunition, illuminating with or without burster, expelling charge or propelling charge	1.2G,21	1	930690
1.4S	0173	Release devices, explosive	1.4S,47	1.4	360300
1.4S	0174	Rivets, explosive	1.4S,47	1.4	930690
1.1F	0180	Rockets with bursting charge	1.1F,7	1+13	930690
1.1E	0181	Rockets with bursting charge	1.1E,6	1+13	930690
1.2E	0182	Rockets with bursting charge	1.2E,18	1	930690
1.3C	0183	Rockets with inert head	1.3C,27	1	930690
1.3C	0186	Rockets motors	1.3C,27	1	930690
*	0190	Samples, explosive, other than initiating explosive	51	*	360200
1.4G	0191	Singal devices, hand	1.4G,43	1.4	360490
1.1G	0192	Signals, railway track, explosive	1.1G,9	1+13	360490
1.4S	0193	Signals, railway track, explosive	1.4S,47	1.4	360490
1.1G	0194	Signals, distress, ship	1.1G,9	1+13	360490
1.3G	0195	Signals, distress, ship	1.3G,30	1	360490
1.1G	0196	Signals, smoke	1.1G,9	1+13	360490
1.4G	0197	Signals, smoke	1.4G,43	1.4	360490
1.2F	0204	Souding devices, explosive	1.2F,19	1+13	360490
1.1D	0207	Tetranitroaniline	1.1D,4	1+13	360200
1.1D	0208	Trinitrophenylmethylnitramine (tetryl)	1.1D,4	1+15	360200
1.1D	0209	Trinitrotoluene (TNT), dry or wetted with less than 30 % water, by mass	1.1D,4	1+13	360200
40	0209	Trinitrotoluene (TNT), wetted, ≤ 500 g	4.1,21(a)2	4.1	360200

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.3G	0212	Tracers for ammunition	1.3G,30	1	360490
1.1D	0213	Trinitroanisole	1.1D,4	1+13	360200
1.1D	0214	Trinitrobenzene, dry or wetted with less than 30 % water, by mass	1.1D,4	1+13	360200
40	0214	Trinitrobenzene, wetted, ≤ 500 g	4.1,21(a)2	4.1	360200
1.1D	0215	Trinitrobenzoic acid, dry or wetted with less than 30 % water, by mass	1.1D,4	1+13	360200
1.1D	0216	Trinitro-m-cresol	1.1D,4	1+13	360200
1.1D	0217	Trinitronaphthalene	1.1D,4	1+13	360200
1.1D	0218	Trinitrophenetole	1.1D,4	1+13	360200
1.1D	0219	Trinitroresorcinol (styphnic acid), dry or wetted with less than 20 % water, or mixture of alcohol and water, by mass	1.1D,4	1+15	360200
1.1D	0220	Urea nitrate, dry or wetted with less than 20 % water, by mass	1.1D,4	1+13	360200
40	0220	Urea nitrate, wetted, ≤ 11,5 kg	4.1,21(a)3	4.1	360200
1.1D	0221	Warheads, torpedo with bursting charge	1.1D,5	1+13	930690
1.1D	0222	Ammonium nitrate with more than 0,2 % combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	1.1D,4	1+13	310230
1.1D	0223	Ammonium nitrate fertilizer, which is more liable to explode than ammonium nitrate with 0,2 % combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	1.1D,4	1+13	310230
1.1A	0224	Barium azide, dry or wetted with less than 50 % water, by mass: *Not to be accepted for carriage*	1.1A, *See marg. 100 (8)*		
1.1B	0225	Boosters with detonator	1.1B,1	1+13	360300
1.1D	0226	Cyclotetramethylenetetranitramine (HMX, octogen), wetted with not less than 15 % water by mass	1.1D,4	1+15	360200
1.3C	0234	Sodium dinitro-o-cresolate, dry or wetted with less than 15 % water, by mass	1.3C,26	1+13	360200
46	0234	Sodium dinitro-o-cresolate, wetted, ≤ 500 g	4.1,22(a)2	4.1+6.1	360200
1.3C	0235	Sodium picramate, dry or wetted with less than 20 % water, by mass	1.3C,26	1+13	360200
1.3C	0236	Zirconium picramate, dry or wetted with less than 20 % water, by mass	1.3C,26	1+13	360200
1.4D	0237	Charges, shaped, flexible, linear	1.4D,39	1.4	930690
1.2G	0238	Rockets, line-throwing	1.2G,21	1	930690
1.3G	0240	Rockets, line-throwing	1.3G,30	1	930690
1.1D	0241	Explosive, blasting, type E	1.1D,4	1+13	360200
1.3C	0242	Charges, propelling, for cannon	1.3C,27	1	930690
1.2H	0243	Ammunition, incendiary, white phosphorus with burster, expelling charge or propelling charge	1.2H,22	1+13	930690
1.3H	0244	Ammunition, incendiary, white phosphorus with burster, expelling charge or propelling charge	1.3H,31	1+13	930690
1.2H	0245	Ammunition, smoke, white phosphorus with burster, expelling charge or propelling charge	1.2H,22	1+13	930690
1.3H	0246	Ammunition, smoke, white phosphorus with burster, expelling charge or propelling charge	1.3H,31	1+13	930690
1.3J	0247	Ammunition, icnendiary, liquid or gel, with burster, expelling charge or propelling charge	1.3J,32	1+13	930690
1.2L	0248	Contrivances, water-activated with burster, expelling charge or propelling charge	1.2L,25	1+13	930690
1.3L	0249	Contrivances, water-activated, with burster, expelling charge or propelling charge	1.3L,34	1+13	930690
1.3L	0250	Rocket motors with hypergolic liquids with or without expelling charge	1.3L,34	1+13	930690
1.3G	0254	Ammunition, illuminating with or without burster, expelling charge or propelling charge	1.3G,30	1	930690
1.4B	0255	Detonators, electric for blasting	1.4B,35	1.4	360300
1.4B	0257	Fuzes, detonating	1.4B,35	1.4	360300

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.1D	0266	Octolite (octol), dry or wetted with less than 15 % water, by mass	1.1D,4	1+13	360200
1.4B	0267	Detonators, non-electric for blasting	1.4B,35	1.4	360300
1.2B	0268	Boosters with detonator	1.2B,13	1+13	360300
1.1C	0271	Charges, propelling	1.1C,3	1+13	930690
1.3C	0272	Charges, propelling	1.3C,27	1	930690
1.3C	0275	Cartridges, power device	1.3C,27	1	930630
1.4C	0276	Cartridges, power device	1.4C,37	1.4	930630
1.3C	0277	Cartridges, oil well	1.3C,27	1	930630
1.4C	0278	Cartridges, oil well	1.4C,37	1.4	930630
1.1C	0279	Charges, propelling, for cannon	1.1C,3	1+13	930690
1.1C	0280	Rocket motors	1.1C,3	1+13	930690
1.2C	0281	Rocket motors	1.2C,15	1	930690
1.1D	0282	Nitroguanidine (picrite), dry or wetted with less than 20 % water, by mass	1.1D,4	1+13	360200
1.2D	0283	Boosters without detonator	1.2D,17	1	360300
1.1D	0284	Grenades, hand or rifle, with bursting charge	1.1D,5	1+13	930690
1.2D	0285	Grenades, hand or rifle, with bursting charge	1.2D,17	1	930690
1.1D	0286	Warheads, rocket with bursting charge	1.1D,5	1+13	930690
1.2D	0287	Warheads, rocket with bursting charge	1.2D,17	1	930690
1.1D	0288	Charges, shaped, flexible, linear	1.1D,5	1+13	930690
1.4D	0289	Cord, detonating, flexible	1.4D,39	1.4	360300
1.1D	0290	Cord (fuse), dtonating, metal clad	1.1D,5	1+13	360300
1.2F	0291	Bombs with bursting charge	1.2F,19	1+13	930690
1.1F	0292	Grenades, hand or rifle, with bursting charge	1.1F,7	1+13	930690
1.2F	0293	Grenades, hand or rifle, with bursting charge	1.2F,19	1+13	930690
1.2F	0294	Mines with bursting charge	1.2F,19	1+13	930690
1.2F	0295	Rockets with bursting charge	1.2F,19	1+13	930690
1.1F	0296	Sounding devices, explosive	1.1F,7	1+13	360490
1.4G	0297	Ammunition, illuminating with or without burster, expelling charge or propelling charge	1.4G,43	1.4	930690
1.3G	0299	Bombs, photoflash	1.3G,30	1	930690
1.4G	0300	Ammunition, incendiary, with or without burster, expelling charge or propelling charge	1.4G,43	1.4	930690
1.4G	0301	Ammunition, tear-producing with burster, expelling charge or propelling charge	1.4G,43	1.4+6.1 +8	930690
1.4G	0303	Ammunition, smoke with or without burster, expelling charge or propelling charge	1.4G,43	1.4	930690
1.3G	0305	Flash powder	1.3G,29	1	360490
1.4G	0306	Tracers for ammunition	1.4G,43	1.4	360490
1.4G	0312	Cartridges, signal	1.4G,43	1.4	360490
1.2G	0313	Signals, smoke	1.2G,21	1	360490
1.2G	0314	Igniters	1.2G,21	1	360300
1.3G	0315	Igniters	1.3G,30	1	360300

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.3G	0316	Fuzes, igniting	1.3G,30	1	360300
1.4G	0317	Fuzes, igniting	1.4G,43	1.4	360300
1.3G	0318	Grenades, practice, hand or rifle	1.3G,30	1	930690
1.3G	0319	Primers, tubular	1.3G,30	1	360300
1.4G	0320	Primers, tubular	1.4G,43	1.4	360300
1.2E	0321	Cartridges for weapons with bursting charge	1.2E,18	1	930630
1.2L	0322	Rocket motors with hypergolic liquids with or without expelling charge	1.2L,25	1+13	930690
1.4S	0323	Cartridges, power device	1.4S,47	1.4	930630
1.2F	0324	Projectiles with bursting charge	1.2F,19	1+13	930690
1.4G	0325	Igniters	1.4G,43	1.4	360300
1.1C	0326	Cartridges for weapons, blank	1.1C,3	1+13	930630
1.3C	0327	Cartridges for weapons, blank	1.3C,27	1	930630
1.3C	0327	Cartridges, small arms, blank	1.3C,27	1	930630
1.2C	0328	Cartridges for weapons, inert projectile	1.2C,15	1	930630
1.1E	0329	Torpedoes with bursting charge	1.1E,6	1+13	930690
1.1F	0330	Torpedoes with bursting charge	1.1F,7	1+13	930690
1.5D	0331	Explosive, blasting, type B	1.5D,48	1.5	360200
1.5D	0332	Explosive, blasting, type E	1.5D,48	1.5	360200
1.1G	0333	Fireworks	1.1G,9	1+13	360410
1.2G	0334	Fireworks	1.2G,21	1	360410
1.3G	0335	Fireworks	1.3G,30	1	360410
1.4G	0336	Fireworks	1.4G,43	1.4	360410
1.4S	0337	Fireworks	1.4S,47	1.4	360410
1.4C	0338	Cartridges for weapons, blank	1.4C,37	1.4	930630
1.4C	0338	Cartridges, small arms, blank	1.4C,37	1.4	930630
1.4C	0339	Cartridges for weapons, inert projectile	1.4C,37	1.4	930630
1.4C	0339	Cartridges, small arms	1.4C,37	1.4	930630
1.1D	0340	Nitrocellulose, dry or wetted with less than 25 % water (or alcohol), by mass	1.1D,4	1+15	391220
1.1D	0341	Nitrocellulose, unmodified or plasticized with less than 18 % plasticizing substance, by mass	1.1D,4	1+15	391220
1.3C	0342	Nitrocellulose, wetted with not less than 25 % alcohol, by mass	1.3C,26	1+13	391220
1.3C	0343	Nitrocellulose, plasticized with not less than 18 % plasticizer, by mass	1.3C,26	1+13	391220
1.4D	0344	Projectiles with bursting charge	1.4D,39	1.4	930690
1.4S	0345	Projectiles, inert with tracer	1.4S,47	1.4	930690
1.2D	0346	Projectiles with burster or expelling charge	1.2D,17	1	930690
1.4D	0347	Projectiles with burster or expelling charge	1.4D,39	1.4	930690
1.4F	0348	Cartridges for weapons with bursting charge	1.4F,41	1.4	930630
1.4S	0349	Articles, explosive, n.o.s.	1.4S,47	1.4	930690
1.4B	0350	Articles, explosive, n.o.s.	1.4B,35	1.4	930690

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.4C	0351	Articles, explosive, n.o.s.	1.4C,37	1.4	930690
1.4D	0352	Articles, explosive, n.o.s.	1.4D,39	1.4	930690
1.4G	0353	Articles, explosive, n.o.s.	1.4G,43	1.4	930690
1.1L	0354	Articles, explosive, n.o.s.	1.1L,12	1+13	930690
1.2L	0355	Articles, explosive, n.o.s.	1.2L,25	1+13	930690
1.3L	0356	Articles, explosive, n.o.s.	1.3L,34	1+13	930690
1.1L	0357	Substances, explosive, n.o.s.	1.1L,11	1+13	360200
1.2L	0358	Substances, explosive, n.o.s.	1.2L,24	1+13	360200
1.3L	0359	Substances, explosive, n.o.s.	1.3L,33	1+13	360200
1.1B	0360	Detonator assemblies, non-electric for blasting	1.1B,1	1+13	360300
1.4B	0361	Detonator assemblies, non-electric for blasting	1.4B,35	1.4	360300
1.4G	0362	Ammunition, practice	1.4G,43	1.4	930690
1.4G	0363	Ammunition, proof	1.4G,43	1.4	930690
1.2B	0364	Detonators for ammunition	1.2B,13	1+13	360300
1.4B	0365	Detonators for ammunition	1.4B,35	1.4	360300
1.4S	0366	Detonators for ammunition	1.4S,47	1.4	360300
1.4S	0367	Fuzes, detonating	1.4S,47	1.4	360300
1.4S	0368	Fuzes, igniting	1.4S,47	1.4	360300
1.1F	0369	Warheads, rocket with bursting charge	1.1F,7	1+13	930690
1.4D	0370	Warheads, rocket with burster or expelling charge	1.4D,39	1.4	930690
1.4F	0371	Warheads, rocket with burster or expelling charge	1.4F,41	1.4	930690
1.2G	0372	Grenades, practice, hand or rifle	1.2G,21	1	930690
1.4S	0373	Signal devices, hand	1.4S,47	1.4	360490
1.1D	0374	Sounding devices, explosive	1.1D,5	1+13	360490
1.2D	0375	Souding devices, explosive	1.2D,17	1	360490
1.4S	0376	Primers, tubular	1.4S,47	1.4	360300
1.1B	0377	Primers, cap type	1.1B,1	1+13	360300
1.4B	0378	Primers, cap type	1.4B,35	1.4	360300
1.4C	0379	Cases, cartridge, empty, with primer	1.4C,37	1.4	930690
1.2L	0380	Articles, pyrophoric	1.2L,25	1+13	930690
1.2C	0381	Cartridges, power device	1.2C,15	1	930630
1.2B	0382	Components, explosive train, n.o.s.	1.2B,13	1+13	360300
1.4B	0383	Components, explosive train, n.o.s.	1.4B,35	1.4	360300
1.4S	0384	Components, explosive train, n.o.s.	1.4S,47	1.4	360300
1.1D	0385	5-Nitrobenzotriazol	1.1D,4	1+13	360200
1.1D	0386	Trinitrobenzenesulphonic acid	1.1D,4	1+13	360200
1.1D	0387	Trinitrofluorenone	1.1D,4	1+13	360200
1.1D	0388	Trinitrotoluene (TNT) and hexanitrostilbene mixture	1.1D,4	1+13	360200

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.1D	0389	Trinitrotoluene (TNT) mixture containing trinitrobenzene and hexanitrostilbene	1.1D,4	1+13	360200
1.1D	0390	Tritonal	1.1D,4	1+13	360200
1.1D	0391	Cyclotrimethylenetrinitramine (cyclonite; hexogen; RDX) and cyclotetramethylenetetranitramine (HMX; octogen) mixture, desensitized with not less than 10 % phlegmatizer, by mass	1.1D,4	1+15	360200
1.1D	0391	Cyclotrimethylenetrinitramine (cyclonite; hexogen; RDX) and cyclotetramethylenetetranitramine (HMX; octogen) mixture, with not less than 15 % phlegmatizer, by mass	1.1D,4	1+15	360200
1.1D	0392	Hexanitrostilbene	1.1D,4	1+13	360200
1.1D	0393	Hexotonal	1.1D,4	1+13	360200
1.1D	0394	Trinitroresorcinol (styphnic acid), wetted with not less than 20 % water, or mixture of alcohol and water, by mass	1.1D,4	1+15	360200
1.2J	0395	Rocket motors, liquid fuelled	1.2J,23	1+13	930690
1.3J	0396	Rocket motors, liquid fuelled	1.3J,32	1+13	930690
1.1J	0397	Rockets, liquid fuelled with bursting charge	1.1J,10	1+13	930690
1.2J	0398	Rockets, liquid fuelled with bursting charge	1.2J,23	1+13	930690
1.1J	0399	Bombs with flammable liquid with bursting charge	1.1J,10	1+13	930690
1.2J	0400	Bombs with flammable liquid with bursting charge	1.2J,23	1+13	930690
1.1D	0401	Dipicryl sulphide, dry or wetted with less than 10 % water, by mass	1.1D,4	1+13	360200
1.1D	0402	Ammonium perchlorate	1.1D,4	1+13	282990
1.4G	0403	Flares, aerial	1.4G,43	1.4	360490
1.4S	0404	Flares, aerial	1.4S,47	1.4	360490
1.4S	0405	Cartridges, signal	1.4S,47	1.4	360490
1.3C	0406	Dinitrosobenzene	1.3C,26	1+13	360200
1.4C	0407	Tetrazol-1-acetic acid	1.4C,36	1.4	360200
1.1D	0408	Fuzes, detonating with protective features	1.1D,5	1+13	360300
1.2D	0409	Fuzes, detonating with protective features	1.2D,17	1	360300
1.4D	0410	Fuzes, detonating with protective features	1.4D,39	1.4	360300
1.1D	0411	Pentaerythrite tetranitrate (pentaeythritol tetranitrate; PETN) with not less than 7 % wax, by mass	1.1D,4	1+15	360200
1.4E	0412	Cartridges for weapons with bursting charge	1.4E,40	1.4	930630
1.2C	0413	Cartridges for weapons, blank	1.2C,15	1	930630
1.2C	0414	Charges, propelling, for cannon	1.2C,15	1	930690
1.2C	0415	Charges, propelling	1.2C,15	1	930690
1.3C	0417	Cartridges for weapons, inert projectile	1.3C,27	1	930630
1.3C	0417	Cartridges, small arms	1.3C,27	1	930630
1.1G	0418	Flares, surface	1.1G,9	1+13	360490

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.2G	0419	Flares, surface	1.2G,21	1	360490
1.1G	0420	Flares, aerial	1.1G,9	1+13	360490
1.2G	0421	Flares, aerial	1.2G,21	1	360490
1.3G	0424	Projectiles, inert with tracer	1.3G,30	1	930690
1.4G	0425	Projectiles, inert with tracer	1.4G,43	1.4	930690
1.2F	0426	Projectiles with burster or expelling charge	1.2F,19	1+13	930690
1.4F	0427	Projectiles with burster or expelling charge	1.4F,41	1.4	930690
1.1G	0428	Articles, pyrotechnic for technical purposes	1.1G,9	1+13	360490
1.2G	0429	Articles, pyrotechnic for technical purposes	1.2G,21	1	360490
1.3G	0430	Articles, pyrotechnic for technical purposes	1.3G,30	1	360490
1.4G	0431	Articles, pyrotechnic for technical purposes	1.4G,43	1.4	360490
1.4S	0432	Articles, pyrotechnic for technical purposes	1.4S,47	1.4	360490
1.1C	0433	Powder cake (powder paste), wetted, with not less than 17 % alcohol, by mass	1.1C,2	1+13	360100
1.2G	0434	Projectiles with burster or expelling charge	1.2G,21	1	930690
1.4G	0435	Projectiles with burster or expelling charge	1.4G,43	1.4	930690
1.2C	0436	Rockets with expelling charge	1.2C,15	1	930690
1.3C	0437	Rockets with expelling charge	1.3C,27	1	930690
1.4C	0438	Rockets with expelling charge	1.4C,37	1.4	930690
1.2D	0439	Charges, shaped, commercial without detonator	1.2D,17	1	930690
1.4D	0440	Charges, shaped, commercial without detonator	1.4D,39	1.4	930690
1.4S	0441	Charges, shaped, commercial without detonator	1.4S,47	1.4	930690
1.1D	0442	Charges, explosive, commercial without detonator	1.1D,5	1+13	930690
1.2D	0443	Charges, explosive, commercial without detonator	1.2D,17	1	930690
1.4D	0444	Charges, explosive, commercial without detonator	1.4D,39	1.4	930690
1.4S	0445	Charges, explosive, commercial without detonator	1.4S,47	1.4	930690
1.4C	0446	Cases, combustible, empty, without primer	1.4C,37	1.4	930690
1.3C	0447	Cases, combustible, empty, without primer	1.3C,27	1	930690
1.4C	0448	5-Mercaptotetrazol-1-acetic acid	1.4C,36	1.4	360200
1.1J	0449	Torpedoes, liquid fuelled with or without bursting charge	1.1J,10	1+13	930690
1.3J	0450	Torpedoes, liquid fuelled with inert head	1.3J,32	1+13	930690
1.1D	0451	Torpedoes with bursting charge	1.1D,5	1+13	930690
1.4G	0452	Grenades, practice, hand or rifle	1.4G,43	1.4	930690
1.4G	0453	Rockets, line-throwing	1.4G,43	1.4	930690
1.4S	0454	Igniters	1.4S,47	1.4	360300
1.4S	0455	Detonators, non-electric for blasting	1.4S,47	1.4	360300
1.4S	0456	Detonators, electric for blasting	1.4S,47	1.4	360300
1.1D	0457	Charges, bursting, plastics bonded	1.1D,5	1+13	930690
1.2D	0458	Charges, bursting, plastics bonded	1.2D,17	1	930690

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.4D	0459	Charges, bursting, plastics bonded	1.4D,39	1.4	930690
1.4S	0460	Charges, bursting, plastics bonded	1.4S,47	1.4	930690
1.1B	0461	Components, explosive train, n.o.s.	1.1B,1	1+13	360300
1.1C	0462	Articles, explosive, n.o.s.	1.1C,3	1+13	930690
1.1D	0463	Articles, explosive, n.o.s.	1.1D,5	1+13	930690
1.1E	0464	Articles, explosive, n.o.s.	1.1E,6	1+13	930690
1.1F	0465	Articles, explosive, n.o.s.	1.1F,7	1+13	930690
1.2C	0466	Articles, explosive, n.o.s.	1.2C,15	1	930690
1.2D	0467	Articles, explosive, n.o.s.	1.2D,17	1	930690
1.2E	0468	Articles, explosive, n.o.s.	1.2E,18	1	930690
1.2F	0469	Articles, explosive, n.o.s.	1.2F,19	1+13	930690
1.3C	0470	Articles, explosive, n.o.s.	1.3C,27	1	930690
1.4E	0471	Articles, explosive, n.o.s.	1.4E,40	1.4	930690
1.4F	0472	Articles, explosive, n.o.s.	1.4F,41	1.4	930690
1.1A	0473	Substances, explosive, n.o.s.: *Not to be accepted for carriage*	1.1A, *See marg. 100 (8)*		
1.1C	0474	Substances, explosive, n.o.s.	1.1C,2	1+13	360200
1.1D	0475	Substances, explosive, n.o.s.	1.1D,4	1+13	360200
1.1G	0476	Substances, explosive, n.o.s.	1.1G,8	1+13	360200
1.3C	0477	Substances, explosive, n.o.s.	1.3C,26	1+13	360200
1.3G	0478	Substances, explosive, n.o.s.	1.3G,29	1	360200
1.4C	0479	Substances, explosive, n.o.s.	1.4C,36	1.4	360200
1.4D	0480	Substances, explosive, n.o.s.	1.4D,38	1.4	360200
1.4S	0481	Substances, explosive, n.o.s.	1.4S,46	1.4	360200
1.5D	0482	Substances, explosive, very insentive (substances, EVI), n.o.s.	5D,48	1.5	360200
1.1D	0483	Cyclotrimethylenetrinitramine (cyclonite; hexogen; RDX), desensitized	1.1D,4	1+13	360200
1.1D	0484	Cyclotetramethylenetetranitramine (octogen; HMX), desensitized	1.1D,4	1	360200
1.4G	0485	Substances, explosive, n.o.s.	1.4G,42	1.4	360200
1.6N	0486	Articles, explosive, extremely insensitive (Articles, EEI)	1.6N,50	1.6	360490
1.3G	0487	Signals, smoke	1.3G,30	1	360490
1.3G	0488	Ammunition, practice	1.3G,30	1	930690
1.1D	0489	Dinitroglycoluril (DINGU)	1.1D,4	1+13	360200
1.1D	0490	Nitrotriazolone (NTO)	1.1D,4	1+13	360200
1.4C	0491	Charges, propelling	1.4C,39	1.4	930690
1.3G	0492	Signals, railway track, explosive	1.3G,30	1	360490
1.4G	0493	Signals, railway track, explosive	1.4G,43	1.4	360490

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HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
1.4D	0494	Jet perforating guns, charged, oil well, without detonator	1.4D,39	1.4	930690
1.3C	0495	Propellant, liquid	1.3C,26	1+13	360200
1.1D	0496	Octonal	1.1D,4	1+13	360200
1.1C	0497	Propellant, liquid	1.1C,2	1+13	360200
1.1C	0498	Propellant, solid	1.1C,2	1+13	360200
1.3C	0499	Propellant, solid	1.3C,26	1+13	360200
1.4S	0500	Detonator assemblies, non-electric, for blasting	1.4S,47	1.43	360300
239	1001	Acetylene, dissolved	2,4F	3(+13)	290129
20	1002	Air, compressed	2,1A	2(+13)	285100
225	1003	Air, refrigerated liquid	2,3O	2+05(+13)	285100
268	1005	Ammonia, anhydrous	2,2TC	6.1+8(+13)	281410
20	1006	Argon, compressed	2,1A	2(+13)	280421
268	1008	Boron trifluoride, compressed	2,1TC	6.1+8(+13)	281290
20	1009	Bromtrifluormethane (refrigerant gas R 13B1)	2,2A	2(+13)	290346
239	1010	1.2-Butadiene, inhibited	2,2F	3(+13)	290129
239	1010	1.3-Butadiene mixture with hydrocarbons, inhibited	2,2F	3(+13)	290124
239	1010	1.3-Butadiene, inhibited	2,2F	3(+13)	271114
23	1011	Butane	2,2F	3(+13)	290110
23	1012	1-Butene	2,2F	3(+13)	290123
23	1012	cis-2-Butene	2,2F	3(+13)	290123
23	1012	trans-2-Butene	2,2F	3(+13)	290123
23	1012	Butenes mixture	2,2F	3(+13)	290123
20	1013	Carbon dioxide	2,2A	2(+13)	281121
25	1014	Carbon dioxide and oxygen mixture, compressed	2,1O	2+05(+13)	280440
20	1015	Carbon dioxide and nitrous oxide mixture	2,2A	2(+13)	281121
263	1016	Carbon monoxide, compressed	2,1TF	6.1+3(+13)	281129
268	1017	Chlorine	2,2TC	6.1+8(+13)	280110
20	1018	Chlordifluormethane (refrigerant gas R 22)	2,2A	2(+13)	290349
20	1020	Chlorpentafluorethane (refrigerant gas R 115)	2,2A	2(+13)	290344
20	1021	1-Chloro-1,2,2,2-tetrafluorethane (refrigerant gas R 124)	2,2A	2(+13)	290349
20	1022	Chlorotrifluoromethane (refrigerant gas R 13)	2,2A	2(+13)	290345
263	1023	Coal gas, compressed	2,1TF	6.1+3(+13)	270500

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
263	1023	Town gas	2,1TF	6.1+3(+13)	270500
263	1026	Cyanogen	2,2TF	6.1+3(+13)	292690
23	1027	Cyclopropane	2,2F	3(+13)	290219
20	1028	Dichlorodifluoromethane (refrigerant gas R 12)	2,2A	2(+13)	290342
20	1029	Dichlormonofluormethane (refrigerant gas R 21)	2,2A	2(+13)	290349
23	1030	1,1-Difluoroethane (refrigerant gas R 152a)	2,2F	3(+13)	290330
23	1032	Dimethylamine, anhydrous	2,2F	3(+13)	292111
23	1033	Dimethyl ether	2,2F	3(+13)	290919
23	1035	Ethane	2,2F	3(+13)	290110
23	1036	Ethylamine	2,2F	3(+13)	292119
23	1037	Ethyl chloride	2,2F	3(+13)	290311
223	1038	Ethylene, refrigerated liquid	2,3F	3(+13)	290121
23	1039	Ethyl methyl ether	2,2F	3(+13)	290919
263	1040	Ethylene oxide	2,2TF	6.1+3	291010
263	1040	Ethylene oxide with nitrogen up to a total pressure of 1 Mpa (10 bar) at 50 °C	2,2TF	6.1+3(+13)	291010
239	1041	Carbon dioxide and ethylene oxide mixture with more than 9 % but not more than 87 % ethylene oxide	2,2F	3(+13)	291010
239	1041	Ethylene oxide and carbon dioxide mixture with more than 9 % but not more than 87 % ethylene oxide	2,2F	3(+13)	291010
20	1044	Fire extinguishers, with compressed or liquefied gas	2,6A	2	842410
265	1045	Fluorine, compressed	2,1TOC	6.1+05+8	280130
20	1046	Helium, compressed	2,1A	2(+13)	280429
268	1048	Hydrogen bromide, anhydrous	2,2TC	6.1+8(+13)	281119
23	1049	Hydrogen, compressed	2,1F	3(+13)	280410
268	1050	Hydrogen chloride, anhydrous	2,2TC	6.1+8(+13)	280610
663	1051	Hydrogen cyanide, stabilized containing less than 3 % water	6.1,1	6.1+3	281119
886	1052	Hydrogen, fluoride	8,6	8+6.1	281119
263	1053	Hydrogen sulphide	2,2TF	6.1+3(+13)	281119
23	1055	Isobutene	2,2F	3(+13)	290123
20	1056	Krypton, compressed	2,1A	2(+13)	280429
23	1057	Lighter refills (cigarettes) containing flammable gas	2,6F	3	961390
23	1057	Lighters containing flammable gas	2,6F	3	961390
20	1058	Liquefied gases, non-flammable, charged with nitrogen, carbon dioxide or air	2,2A	2(+13)	**
239	1060	Methylmacetylene and propadiene mixture, stabilized (Mixtures P1, P2)	2,2F	3(+13)	271119
23	1061	Methylamine, anhydrous	2,2F	3(+13)	292111
26	1062	Methyl bromide	2,2T	6.1(+13)	290330
23	1063	Methyl chloride (refrigerant gas R 40)	2,2F	3(+13)	290311
263	1064	Methyl mercaptan	2,2TF	6.1+3(+13)	293090
20	1065	Neon, compressed	2,1A	2(+13)	280429

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
20	1066	Nitrogen, compressed	2,1A	2(+13)	280430
265	1067	Dinitrogen tetroxide (nitrogen dioxide)	2,2TOC	6.1+05+8(+13)	281129
268	1069	Nitrosyl chloride	2,2TC	6.1+8	281210
25	1070	Nitrous oxide	2,2O	2+05(+13)	281129
263	1071	Oil gas, compressed	2,1TF	6.1+3(+13)	270500
25	1072	Oxygen, compressed	2,1O	2+05(+13)	280440
225	1073	Oxygen, refrigerated liquid	2,3O	2+05(+13)	280440
23	1075	Petroleum gases, liquefied	2,2F, *Note 2*	3(+13)	271119
268	1076	Phosgene	2,2TC	6.1+8(+13)	281210
23	1077	Propylene	2,2F	3(+13)	290122
20	1078	Refrigerant gas, n.o.s. (Mixtures F1, F2, F3)	2,2A	2(+13)	382471
269	1079	Sulphur dioxide	2,2TC	6.1+8(+13)	281123
20	1080	Sulphur hexafluoride	2,2A	2(+13)	281290
239	1081	Tetrafluoroethylene, inhibited	2,2F	3	290330
263	1082	Chlorotrifluoroethylene, inhibited	2,2TF	6.1+3(+13)	290345
263	1082	Trifluorochloroethylene, inhibited	2,2TF	6.1+3(+13)	290345
23	1083	Trimethylamine, anhydrous	2,2F	3(+13)	292111
239	1085	Vinyl bromide, inhibited	2,2F	3(+13)	290330
239	1086	Vinyl chloride, inhibited	2,2F	3(+13)	290321
239	1086	Vinyl chloride, stabilized	2,2F	3(+13)	290321
239	1087	Vinyl methyl ether, inhibited	2,2F	3(+13)	290919
33	1088	Acetal	3,3(b)	3	291100
33	1089	Acetaldehyde	3,1(a)	3	291212
33	1090	Acetone	3,3(b)	3	291411
33	1091	Acetone oils	3,3(b)	3	380700
663	1092	Acrolein, inhibited	6.1,8(a)	6.1+3	291219
336	1093	Acrylonitrile, inhibited	3,11(a)	3+6.1	292610
663	1098	Allyl alcohol	6.1,8(a)	6.1+3	290529
336	1099	Allyl bromide	3,16(a)	3+6.1	290330
330	1100	Allyl chloride	3,16(a)	3+6.1	290329
30	1104	Amyl acetates	3,31(c)	3	291590
33	1105	Amyl alcohols	3,3(b)	3	290515
30	1105	Amyl alcohols	3,31(c)	3	290515
338	1106	Amylamine	3,22(b)	3+8	292119
38	1106	Amylamine	3,33(c)	3+8	292119
33	1107	Amyl chloride	3,3(b)	3	290319
33	1108	1-Pentene (n-Amylene)	3,1(a)	3	290129
30	1109	Amyl formates	3,31(c)	3	291513

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	1110	n-Amyl methyl ketone	3,31(c)	3	291419
33	1111	Amyl mercaptan	3,3(b)	3	293090
30	1112	Amyl nitrate	3,31(c)	3	292090
33	1113	Amyl nitrite	3,3(b)	3	292090
33	1114	Benzene	3,3(b)	3	290220
33	1120	Butanols	3,3(b)	3	290514
30	1120	Butanols	3,31(c)	3	290514
33	1123	Butyl acetates	3,3(b)	3	291590
30	1123	Butyl acetates	3,31(c)	3	291590
338	1125	n-Butylamine	3,22(b)	3+8	292119
33	1126	1-Brombutane	3,3(b)	3	290330
33	1127	Chlorobutanes	3,3(b)	3	290319
33	1128	n-Butyl formate	3,3(b)	3	291513
33	1129	Butyraldehyde	3,3(b)	3	291213
30	1130	Camphor oil	3,31(c)	3	151590
336	1131	Carbon disulphide	3,18(a)	3+6.1	281310
33	1133	Adhesives containing flammable liquid	3,5(a),(b),(c)	3	350699
30	1133	Adhesives containing flammable liquid	3,31(c)	3	350699
30	1134	Chlorobenzene	3,31(c)	3	290361
663	1135	Ethylene chlorohydrin	6.1,16(a)	6.1+3	290550
33	1136	Coal tar distillates, flammable	3,3(b)	3	2707**
30	1136	Coals tar distillates, flammable	3,31(c)	3	2707*
33/30	1139	Coating solution (includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining)	3,5(a),(b), (c)31(c)	3	321000
663	1143	Crotonaldehyde, stabilized	6.1,8(a)	6.1+3	291219
339	1144	Crotonylene	3,1(a)	3	290129
33	1145	Cyclohexane	3,3(b)	3	290211
33	1146	Cyclopentane	3,3(b)	3	290219
30	1147	Decahydronaphthalene	3,31(c)	3	290219
30	1148	Diacetone alcohol, chemically pure	3,31(c)	3	291440
33	1148	Diacetone alcohol, technically pure	3,3(b)	3	291440
30	1149	Dibutyl ethers	3,31(c)	3	290919
33	1150	1,2-Dichlorethylene	3,3(b)	3	290329
30	1152	Dichloropentanes	3,31(c)	3	290319

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	1153	Ethylene glycol diethyl ether	3,31(c)	3	290919
338	1154	Diethylamine	3,22(b)	3+8	292112
33	1155	Diethyl ether (Ethyl ether)	3,2(a)	3	290911
33	1156	Diethyl ketone	3,3(b)	3	291419
30	1157	Diisobutyl ketone	3,31(c)	3	291419
338	1158	Diisopropylamine	3,22(b)	3+8	292119
33	1159	Diisopropyl ether	3,3(b)	3	290919
338	1160	Dimethylamine, aqueous solution	3,22(b)	3+8	292111
33	1161	Dimethyl carbonate	3,3(b)	3	292090
X338	1162	Dimethyldichlorosilane	3,21(b)	3+8	293100
663	1163	Dimethylhydrazine, unsymmetrical	6.1,7(a)1	6.1+3+8	292800
33	1164	Dimethyl sulphide	3,2(b)	3	293090
33	1165	Dioxane	3,3(b)	3	293299
33	1166	Dioxolane	3,3(b)	3	293299
339	1167	Divinyl ether, inhibited	3,2(a)	3	290919
33/30	1169	Extracts, aromatic, liquid	3,5(a),(b), (c),31(c)	3	330190
33/30	1170	Ethanol or Ethanol solution	3,3(b),31(c)	3	220710
33/30	1170	Ethyl alcohol	3,3(b),31(c)	3	220710
33/30	1170	Ethyl alcohol solution	3,3(b),31(c)	3	220710
30	1171	Ethylene glycol monoethyl ether	3,31(c)	3	290944
30	1172	Ethylene glycol monoethyl ether acetate	3,31(c)	3	291590
33	1173	Ethyl acetate	3,3(b)	3	291531
33	1175	Ethylbenzene	3,3(b)	3	290260
33	1176	Ethyl borate	3,3(b)	3	292090
30	1177	Ethylbutyl acetate	3,31(c)	3	291590
33	1178	2-Ethylbutyraldehyde	3,3(b)	3	291219
33	1179	Ethyl butyl ether	3,3(b)	3	290919
30	1180	Ethyl butyrate	3,31(c)	3	291560
63	1181	Ethyl chloroacetate	6.1,16(b)	6.1+3	291590
663	1182	Ethyl chloroformate	6.1,10(a)	6.1+3+8	291590
X338	1183	Ethyldichlorosilane	4.3,1(a)	4.3+3+8	293100

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
336	1184	Ethylene dichloride (1,2-Dichloroethane)	3,16(b)	3+6.1	290315
663	1185	Ethyleneimine, inhibited	6.1,4	6.1+3	293390
30	1188	Ethylene glycol monomethyl ether	3,31(c)	3	290942
30	1189	Ethylene glycol monomethyl ether acetate	3,31(c)	3	291539
33	1190	Ethyl formate	3,3(b)	3	291513
30	1191	Octyl aldehydes, flammable	3,31(c)	3	291219
30	1192	Ethyl lactate	3,31(c)	3	291819
33	1193	Ethyl methyl ketone (Methyl ethyl ketone)	3,3(b)	3	291412
336	1194	Ethyl nitrite solution	3,15(a)	3+6.1	292090
33	1195	Ethyl propionate	3,3(b)	3	291550
X338	1196	Ethyltrichlorsilane	3,21(b)	3+8	293100
33	1197	Extracts, flavouring, liquid	3,5(a),(b), (c)	3	130219
30			31(c)		
38	1198	Formadelhyde solution, flammable	3,33(c)	3+8	291211
63	1199	Furaldehydes (furfuraldehyde)	6.1,13(b)	6.1+3	293212
33/30	1201	Fusel oil	3,3(b),31(c)	3	382490
30	1202	Diesel fuel	3,31(c)	3	274100
30	1202	Gas oil	3,31(c)	3	274200
30	1202	Heating oil, light	3,31(c)	3	274300
33	1203	Gasoline	3,3(b)	3	272400
33	1203	Motor spirit	3,3(b)	3	272400
33	1203	Petrol	3,3(b)	3	272400
33	1204	Nitroglycerin solution in alcohol with not more than 1% nitroglycerin	3,7(b)	3	300390
33	1206	Heptanes	3,3(b)	3	290110
30	1207	Hexaldehyde	3,31(c)	3	291219
33	1208	Hexanes	3,3(b)	3	290110
33/30	1210	Colours for rotogravures, flammable	3,5(a),(b), (c),31(c) *(See Note to Section E)*	3	321519
30	1212	Isobutanol (Isobutyl alcohol)	3,31(c)	3	290514
33	1213	Isobutyl acetate	3,3(b)	3	291534
338	1214	Isobutylamine	3,22(b)	3+8	292119
33/30	1216	Isooctene	3,3(b)	3	290129
339	1218	Isoprene, inhibited	3,2(a)	3	290124
33	1219	Isopropanol (Isopropyl alcohol)	3,3(b)	3	290512

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	1220	Isopropyl acetate	3,3(b)	3	291539
338	1221	Isopropylamine	3,22(a)	3+8	292119
33	1222	Isopropyl nitrate	3,3(b)	3	292090
30	1223	Kerosene	3,31(c)	3	273100
33/30	1224	Ketones, liquid, n.o.s.	3,2(b),3(b), 31(c)	3	2914**
336/36	1228	Mercaptan mixture, liquid, flammable toxic, n.o.s.	3,18(b),32(c)	3+6.1	293090
336/36	1228	Mercaptans, liquid, flammable, toxic, n.o.s.	3,18(b),32(c)	3+6.1	293090
30	1229	Mesityl oxide	3,31(c)	3	291419
336	1230	Methanol	3,17(b)	3+6.1	290511
33	1231	Methyl acetate	3,3(b)	3	291539
30	1233	Methylamyl acetate	3,31(c)	3	291590
33	1234	Methylal	3,2(b)	3	291100
338	1235	Methylamine, aqueous solutions	3,22(b)	3+8	292111
33	1237	Methyl butyrate	3,3(b)	3	291590
663	1238	Methyl chloroformate	6.1,10(a)	6.1+3+8	291590
663	1239	Methyl chloromethyl ether	6.1,9(a)	6.1+3	290919
X338	1242	Methyldichlorosilane	4.3,1(a)	4.3+3+8	293100
33	1243	Methyl formate	3,1(a)	3	291513
663	1244	Methylhydrazine	6.1,7(a)1	6.1+3+8	292800
33	1245	Methyl isobutyl ketone	3,3(b)	3	291413
339	1246	Methyl isopropenyl ketone, inhibited	3,3(b)	3	291419
339	1247	Methyl methacrylate, monomer, inhibited	3,3(b)	3	291614
33	1248	Methyl propionate	3,3(b)	3	291590
33	1249	Methyl propyl ketone	3,3(b)	3	291419
X338	1250	Methyltrichlorosilane	3,21(a)	3+8	293100
663	1251	Methyl vinyl ketone, stabilized	6.1,8(a)1	6.1+3+8	291419
663	1259	Nickel carbonyl	6.1,3	6.1+3	293100
33	1261	Nitromethane	3,3(b)	3	290420
33	1262	Octanes	3,3(b)	3	290110
33/30	1263	Paint	3,5(a),(b), (c),31(c) *(See Note to Section E)*	3	320419
33/30	1263	Paint related material	3,5(a),(b), (c), *(See Note to Section E)*	3	320419

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	1264	Paraldehyde	3,31c)	3	291250
33	1265	Pentanes, liquid	3,1(a),2(b)	3	290110
33/30	1266	Perfumery products with flammable solvents	3,5(a),(b), (c),31(c)	3	330300
33/30	1267	Petroleum crude oil	3,1(a),2(a), (b),3,(b), 31(c)	3	270900
33/30	1268	Petroleum distillates, n.o.s.	3,1(a),2(a), (b),3(b), 31(c)	3	272900
33/30	1268	Petroleum products, n.o.s.	3,1(a),2(a), (b),3(b), 31(c)	3	272900
30	1272	Pine oil	3,31(c)	3	130219
33/30	1274	n-Propanol (Propyl alcohol, normal)	3,3(b),31(c)	3	290512
33	1275	Propionaldehyde	3,3(b)	3	291219
33	1276	n-Propyl acetate	3,3(b)	3	291539
338	1277	Propylamine	3,22(b)	3+8	292119
33	1278	Propyl chloride	3,2(b)	3	290319
33	1279	1,2-Dichlorpropane	3,3(b)	3	290316
33	1280	Propylene oxide	3,2(a)	3	291020
33	1281	Propyl formates	3,3(b)	3	291513

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	1282	Pyridine	3,3(b)	3	293331
33/30	1286	Rosin oil	3,5(a),(b),(c), 31(c)	3	380690
33/30	1287	Rubber solution	3,5(a),(b),(c), 31(c)	3	400520
33/30	1288	Shale oil	3,3(b),31(c)	3	270900
338/38	1289	Sodium methylate solution in alcohol	3,24(b),33(c)	3+8	290550
30	1292	Tetraethyl silicate	3,31(c)	3	292090
33/30	1293	Tinctures, medicinal	3,3(b),31(c)	3	300390
33	1294	Toluene	3,3(b)	3	290230
X338	1295	Trichlorosilane	4.3,1(a)	4.3+3+8	293100
338	1296	Triethylamine	3,22(b)	3+8	292119
338/38	1297	Trimethylamine, aqueous solution, not more than 50 % trimethylamine, by mass	3,22(a),(b), 33(c)	3+8	292111
X338	1298	Trimethylchlorosilane	3,21(b)	3+8	293100
30	1299	Turpentine	3,31(c)	3	130190
33/30	1300	Turpentine substitute (White Spirit)	3,3(b), 31(c)	3	272900
339	1301	Vinyl acetate, inhibited	3,3(b)	3	291532
339	1302	Vinyl ethyl ether, inhibited	3,2(a)	3	290919
339	1303	Vinylidene chloride, inhibited	3,1(a)	3	290329
339	1304	Vinyl isobutyl ether, inhibited	3,3(b)	3	290919
X338	1305	Vinyltrichlorosilane, inhibited	3,21(a)	3+8	293100
33/30	1306	Wood preservatives, liquid	3,5(b),(c), 31(c)	3	**
33/30	1307	Xylenes	3,3(b),31(c)	3	2902**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33/30	1308	Zirconium suspended in a flammable liquid	3,1(a),2(a),(b),3,(b),31(c)	3	810910
40	1309	Aluminium powder, coated	4.1,13(b),(c)	4.1	760310
40	1310	Ammonium picrate, wetted with not less than 10 % water, by mass	4.1,21(a)1	4.1	360200
40	1312	Borneol	4.1,6(c)	4.1	290619
40	1313	Calcium resinate	4.1,12(c)	4.1	380620
40	1314	Calcium resinate, fused	4.1,12(c)	4.1	380620
40	1318	Cobalt resinate, precipitated	4.1,12(c)	4.1	380620
46	1320	Dinitrophenol, wetted with not less than 15 % water, by mass	4.1,22(a)1	4.1+6.1	360200
46	1321	Dinitrophenolates, wetted with not less than 15 % water, by mass	4.1,22(a)1	4.1+6.1	360200
40	1322	Dinitroresorcinol, wetted with not less than 15 % water, by mass	4.1,21(a)1	4.1	360200
40	1323	Ferrocerium	4.1,13(b)	4.1	720299
40	1324	Films, nitrocellulose base, gelatin coated, except scrap	4.1,3(c)	4.1	391220
40	1325	Flammable solid, organic n.o.s.	4.1,6(b),(c)	4.1	**
40	1326	Hafnium powder, wetted with not less than 25 % water (a visible excess of water must be present) — (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns	4.1,13(b)	4.1	811291
40	1328	Hexamethylentetramine	4.1,6(c)	4.1	293390
40	1330	Manganese resinate	4.1,12(c)	4.1	380620
40	1331	Matches, 'strike anywhere'	4.1,2(c)	4.1	360500
40	1332	Metaldehyde	4.1,6(c)	4.1	291250
40	1333	Cerium, slabs, ingots or rods	4.1,13(b)	4.1	811299
40	1334	Naphthalene, refined or crude	4.1,6(c)	4.1	270740
40	1336	Nitroguanidine, (picrite), wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	360200
40	1337	Nitrostarch, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	360200
40	1338	Phosphorus, amorphous	4.1,11(c)	4.1	280470
40	1339	Phosphorus heptasulphide	4.1,11(b)	4.1	281390
423	1340	Phosphorus pentasulphide	4.3,20(b)	4.3	281390
40	1341	Phosphorus sesquisulphide	4.1,11(b)	4.1	281390

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
40	1343	Phosphorus trisulphide	4.1,11(b)	4.1	281390
40	1344	Trinitrophenol, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	360200
40	1345	Rubber scrap	4.1,1(b)	4.1	400400
40	1345	Rubber shoddy	4.1,1(b)	4.1	400400
40	1346	Silicon powder, amorphous	4.1,13(c)	4.1	280461
40	1347	Silver picrate, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	284329
46	1348	Sodium dinitro-o-cresolate, wetted with not less than 15 % water, by mass	4.1,22(a)1	4.1+6.1	360200
40	1349	Sodium picramate, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	360200
40	1350	Sulphur	4.1,11(c)	4.1	250300
40	1352	Titanium powder, wetted	4.1,13(b)	4.1	810810
40	1353	Fibres or fabrics impregnated with weakly nitrated nitrocellulose, n.o.s.	4.1,3(c)	4.1	391220
40	1354	Trinitrobenzene, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	391220
40	1355	Trinitrobenzoic acid, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	360200
40	1356	Trinitrotoluene, wetted with not less than 30 % water, by mass	4.1,21(a)1	4.1	360200
40	1357	Urea nitrate, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	360200
40	1358	Zirconium powder, wetted	4.1,13(b)	4.1	810910
X462	1360	Calcium phosphide	4.3,18(a)	4.3+6.1	284800
40	1361	Carbon, animal or vegetable origin	4.2,1(b), (c)	4.2	280300
40	1362	Carbon activated	4.2,1(c)	4.2	280300
40	1363	Copra	4.2,2(c)	4.3	120300
40	1364	Cotton waste, oily	4.2,3(c)	4.2	520299
40	1365	Cotton, wet	4.2,3(c)	4.2	520100
X333	1366	Diethylzinc	4.2,31(a)	4.2+4.3	293100
40	1369	p-Nitrosodimethylaniline	4.2,5(b)	4.2	292990
X333	1370	Dimethylzinc	4.2,31(a)	4.2+4.3	293100
40	1373	Fibres or fabrics animal or vegetable or synthetic, n.o.s., with oil	4.2,3(c)	4.2	**
40	1374	Fish meal (fish scrap), unstabilized	4.2,2(b)	4.2	230120
40	1376	Iron oxide, spent	4.2,16(c)	4.2	282110
40	1376	Iron sponge, spent	4.2,16(c)	4.2	282100
40	1378	Metal catalyst, wetted	4.2,12(b)	4.2	81****

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
40	1379	Paper, unsaturated, oil treated	4.2,3(c)	4.2	481140
333	1380	Pentaborane	4.2,19(a)	4.2+6.1	285000
46	1381	Phosphorus, white or yellow, dry or under water or in solution	4.2,11(a)	4.2+6.1	280470
40	1382	Potassium sulphide, anhydrous or Potassium sulphide with less than 30 % water of crystallization	4.2,13(b)	4.2	283090
43	1383	Pyrophoric allow, n.o.s.	4.2,12(a)	4.2	81****
43	1383	Pyrophoric metal, n.o.s.	4.2,12(a)	4.2	81****
40	1384	Sodium dithionite (sodium hydrosulphite)	4.2,13(b)	4.2	283110
40	1385	Sodium sulphide, anhydrous or Sodium sulphide with less than 30 % water of crystallization	4.2,13(b)	4.2	283010
40	1386	Seed cake with more than 1,5 % oil and not more than 11 % moisture	4.2,2(c)	4.2	230690
X423	1389	Alkali metal amalgam	4.3,11(a)	4.3	811299
423	1390	Alkali metal amides	4.3,19(b)	4.3	285100
X423	1391	Alkali metal dispersion	4.3,11(a)	4.3	811299
X423	1391	Alkaline earth metal dispersion	4.3,11(a)	4.3	811299
X423	1392	Alkaline earth metal amalgam	4.3,11(a)	4.3	811299
423	1393	Alkaline earth metal alloy, n.o.s.	4.3,11(b)	4.3	280519
423	1394	Aluminium carbide	4.3,17(b)	4.3	284990
462	1395	Aluminium ferrosilicon powder	4.3,15(b)	4.3+6.1	760120
423	1396	Aluminium powder, uncoated	4.3,13(b)	4.3	760310
X462	1397	Aluminium phosphide	4.3,18(a)	4.3+6.1	284800
423	1398	Aluminium silicon powder, uncoated	4.3,13(c)	4.3	285000
423	1400	Barium	4.3,11(b)	4.3	280522
423	1401	Calcium	4.3,11(b)	4.3	280521
423	1402	Calcium carbide	4.3,17(b)	4.3	824910
423	1403	Calcium cyanamide with more than 0,1 % calcium carbide	4.3,19(c)	4.3	310270
X423	1404	Calcium hydride	4.3,16(a)	4.3	285000
423	1405	**Calcium silicide**	4.3,12(b),(c)	4.3	285000
X423	1407	Caesium	4.3,11(a)	4.3	280519
462	1408	Ferrosilicon	4.3,15(c)	4.3+6.1	72022*
X423	1409	Metal hydrides, water-reactive, n.o.s.	4.3,16(a)	4.3	285000

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HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
423	1409	Metal hydrides, water-reactive n.o.s.	4.3,16(b)	4.3	285000
X423	1410	Lithium aluminium hydride	4.3,16(a)	4.3	285000
X423	1411	Lithium aluminium hydride, ethereal	4.3,16(a)	4.3	285000
X423	1413	Lithium borohydride	4.3,16(a)	4.3	285000
X423	1414	Lithium hydride	4.3,16(a)	4.3	285000
X423	1415	Lithium	4.3,11(a)	4.3	280519
423	1417	Lithium silicon	4.3,12(b)	4.3	285000
423	1418	Magnesium alloys, powder	4.3,14(b)	4.3+4.2	810430
423	1418	Magnesium powder	4.3,14(b)	4.3+4.2	810430
X462	1419	Magnesium aluminium phosphide	4.3,18(a)	4.3+6.1	284800
X423	1420	Potassium metal alloys	4.3,11(a)	4.3	811299
X423	1421	Alkali metal alloy, liquid, n.o.s.	4.3,11(a)	4.3	280519
X423	1422	Potassium sodium alloys	4.3,11(a)	4.3	811299
X423	1423	Rubidium	4.3,11(a)	4.3	280519
X423	1426	Sodium borohydride	4.3,16(a)	4.3	285000
X423	1427	Sodium hydride	4.3,16(a)	4.3	285000
X423	1428	Sodium	4.3,11(a)	4.3	280511
48	1431	Sodium methylate	4.2,15(b)	4.2+8	290550
X462	1432	Sodium phosphide	4.3,18(a)	4.3+6.1	284800
X462	1433	Stannic phosphides	4.3,18(a)	4.3+6.1	284800
423	1435	Zinc ashes	4.3,13(c)	4.3	262019
X423/423	1436	Zinc dust	4.3,14(a), (b),(c)	4.3+4.2	790390
X423/423	1436	Zinc powder	4.3,14(a), (b),(c)	4.3+4.2	790390
40	1437	Zirconium hydride	4.1,14(b)	4.1	285000
50	1438	Aluminium nitrate	5.1,22(c)	5.1	283429
50	1439	Ammonium dichromate	5.1,27(b)	5.1	284150
50	1442	Ammonium perchlorate	5.1,12(b)	5.1	282990
50	1444	Ammonium persulphate	5.1,18(c)	5.1	283340
56	1445	Barium chlorate	5.1,29(b)	5.1+6.1	282919
56	1446	Barium nitrate	5.1,29(b)	5.1+6.1	283429
56	1447	Barium perchlorate	5.1,29(b)	5.1+6.1	282990
56	1448	Barium permanganate	5.1,29(b)	5.1+6.1	284169
58	1449	Barium peroxide	5.1,29(b)	5.1+6.1	281630
50	1450	Bromates, inorganic, n.o.s.	5.1,16(b)	5.1	282990

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
50	1451	Caesium nitrate	5.1,22(c)	5.1	283429
50	1452	Calcium chlorate	5.1,11(b)	5.1	282919
50	1453	Calcium chlorite	5.1,14(b)	5.1	282890
50	1454	Calcium nitrate	5.1,22(c)	5.1	283429
50	1455	Calcium perchlorate	5.1,13(b)	5.1	282990
50	1456	Calcium permanganate	5.1,17(b)	5.1	284169
50	1457	Calcium peroxide	5.1,25(b)	5.1	282590
50	1458	Chlorate and borate mixture	5.1,11(b)	5.1	284290
50	1459	Chlorate and magnesium chloride mixture	5.1,11(b)	5.1	284290
50	1461	Chlorates, inorganic, n.o.s.	5.1,11(b)	5.1	282919
50	1462	Chlorites, inorganic, n.o.s.	5.1,14(b)	5.1	282890
58	1463	Chromium trioxide, anhydrous	5.1,31(b)	5.1+8	281910
50	1465	Didymium nitrate	5.1,22(c)	5.1	283429
50	1466	Ferric nitrate	5.1,22(c)	5.1	283429
50	1467	Guanidine nitrate	5.1,22(c)	5.1	292520
56	1469	Lead nitrate	5.1,29(b)	5.1+6.1	283429
56	1470	Lead perchlorate	5.1,29(b)	5.1+6.1	282990
50	1471	Lithium hypochlorite, dry	5.1,15(b)	5.1	282890
50	1471	Lithium hypochlorite, mixture	5.1,15(b)	5.1	282890
50	1472	Lithium peroxide	5.1,25(b)	5.1	282590
50	1473	Magnesium bromate	5.1,16(b)	5.1	282990
50	1474	Magnesium nitrate	5.1,22(c)	5.1	283429
50	1475	Magnesium perchlorate	5.1,13(b)	5.1	282990
50	1476	Magnesium peroxide	5.1,25(b)	5.1	281610
50	1477	Nitrates, inorganic, n.o.s.	5.1,22(b), (c)	5.1	283429
55	1479	Oxidizing solid, n.o.s.	5.1,27(a)	5.1	**
50	1479	Oxidizing solid, n.o.s.	5.1,27(b), (c)	5.1	**
50	1481	Perchlorates, inorganic, n.o.s.	5.1,13(b)	5.1	282990
50	1482	Permanganates, inorganic, n.o.s.	5.1,17(b)	5.1	284169
50	1483	Peroxides, inorganic, n.o.s.	5.1,25(b)	5.1	282590
50	1484	Potassium bromate	5.1,16(b)	5.1	282990
50	1485	Potassium chlorate	5.1,11(b)	5.1	282919

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
50	1486	Potassium nitrate	5.1,22(c)	5.1	283421
50	1487	Potassium nitrate and sodium nitrite mixture	5.1,24(b)	5.1	283421
50	1488	Potassium nitrite	5.1,23(b)	5.1	283410
50	1489	Potassium perchlorate	5.1,13(b)	5.1	282990
50	1490	Potassium permanganate	5.1,17(b)	5.1	284161
55	1491	Potassium peroxide	5.1,25(a)	5.1	281530
50	1492	Potassium persulphate	5.1,18(c)	5.1	283340
50	1493	Silver nitrate	5.1,22(b)	5.1	284321
50	1494	Sodium bromate	5.1,16(b)	5.1	282990
50	1495	Sodium chlorate	5.1,11(b)	5.1	282911
50	1496	Sodium chlorite	5.1,14(b)	5.1	282890
50	1498	Sodium nitrate	5.1,22(c)	5.1	310250
50	1499	Sodium nitrate and potassium nitrate mixture	5.1,22(c)	5.1	283429
50	1500	Sodium nitrite	5.1,23(c)	5.1	283410
50	1502	Sodium perchlorate	5.1,13(b)	5.1	282990
50	1503	Sodium permanganate	5.1,17(b)	5.1	284169
55	1504	Sodium peroxide	5.1,25(a)	5.1	281530
50	1505	Sodium persulphate	5.1,18(c)	5.1	283340
50	1506	Strontium chlorate	5.1,11(b)	5.1	282919
50	1507	Strontium nitrate	5.1,22(c)	5.1	283429
50	1508	Strontium perchlorate	5.1,13(b)	5.1	282990
50	1509	Strontium peroxide	5.1,25(b)	5.1	281620
559	1510	Tetranitromethane	5.1,2(a)	5.1+6.1	290420
58	1511	Urea hydrogen peroxide	5.1,31(c)	5.1+8	292990
50	1512	Zinkc ammonium nitrite	5.1,23(b)	5.1	283410
50	1513	Zinc chlorate	5.1,11(b)	5.1	282919
50	1514	Zinc nitrate	5.1,22(b)	5.1	283429
50	1515	Zinc permanganate	5.1,17(b)	5.1	284169
50	1516	Zinc peroxide	5.1,25(b)	5.1	281700
40	1517	Zirconium picramate, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	360200
669	1541	Acetone cyanohydrin, stabilized	6.1,12(a)	6.1	292690
66/60	1544	Alkaloids, solid, n.o.s. or alkaloid salts, solid n.o.s.	6.1,90(a), (b),(c)	6.1	293990

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
639	1545	Allyl isothiocyanate, inhibited	6.1,20(b)	6.1+3	293090
60	1546	Ammonium arsenate	6.1,51(b)	6.1	284290
60	1547	Aniline	6.1,12(b)	6.1	292141
60	1548	Aniline hydrochloride	6.1,12(c)	6.1	292141
60	1549	Antimony compound, inorganic, solid n.o.s.	6.1,59(c)	6.1	**
60	1550	Antimony lactate	6.1,59(c)	6.1	291811
60	1551	Antimony potassium tartrate	6.1,59(c)	6.1	291813
66	1553	Arsenic acid, liquid	6.1,51(a)	6.1	281119
60	1554	Arsenic acid, solid	6.1,51(b)	6.1	281119
60	1555	Arsenic bromide	6.1,51(b)	6.1	282759
66/60	1556	Arsenic compound, liquid, n.o.s.	6.1,51(a), (b),(c)	6.1	**
66/60	1557	Arsenic compound, n.o.s.	6.1,51(a), (b),(c)	6.1	**
60	1558	Arsenic	6.1,51(b)	6.1	280480
60	1559	Arsenic pentoxide	6.1,51(b)	6.1	282590
66	1560	Arsenic trichloride	6.1,51(a)	6.1	281210
60	1561	Arsenic trioxide	6.1,51(b)	6.1	282590
60	1562	Arsenical dust	6.1,51(b)	6.1	280480
60	1564	Barium compound, n.o.s.	6.1,60(b),(c)	6.1	**
66	1565	Barium cyanide	6.1,41(a)	6.1	283719
60	1566	Beryllium compound, n.o.s.	6.1,54(b)2, (c)	6.1	**
64	1567	Beryllium powder	6.1,54(b)1	6.1+4.1	811211
63	1569	Bromoacetone	6.1,16(b)	6.1+3	291470
66	1570	Brucine	6.1,90(a)	6.1	293990
46	1571	Barium azide, wetted with not less than 50 % water, by mass	4.1,25(a)	4.1+6.1	285000
60	1572	Cacodylic acid	6.1,51(b)	6.1	293100
60	1573	Calcium arsenate	6.1,51(b)	6.1	284290
60	1574	Calcium arsenate and calcium arsenite mixture, solid	6.1,51(b)	6.1	284290
66	1575	Calcium cyanide	6.1,41(a)	6.1	283719
60	1577	Chlorodinitrobenzenes	6.1,12(b)	6.1	290490
60	1578	Chloronitrobenzenes	6.1,12(b)	6.1	290490
60	1579	4-Chloro-o-toluidine-hydrochloride	6.1,17(c)	6.1	292143

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66	1580	Chloropicrin	6.1,17(a)	6.1	290490
26	1581	Chloropicrin and methyl bromide mixture	2,2T	6.1	294200
26	1582	Chlorpicrin and methyl chloride mixture	2,2T	6.1	294200
66/60	1583	Chloropicrin, mixture, n.o.s.	6.1,17(a), (b),(c)	6.1	290490
60	1585	Copper acetoarsenite	6.1,51(b)	6.1	284290
60	1586	Copper arsenite	6.1,51(b)	6.1	284290
60	1587	Copper cyanide	6.1,41(b)	6.1	283719
66/60	1588	Cyanides, inorganic, solid, n.o.s.	6.1,41(a), (b),(c)	6.1	283719
268	1589	Cyanogen chloride, inhibited	2,2TC	6.1+8	292690
60	1590	Dichloranilines	6.1,12(b)	6.1	292142
60	1591	o-Dichlorobenzene	6.1,15(c)	6.1	290361
60	1593	Dichloromethane	6.1,15(c)	6.1	290312
60	1594	Diethyl sulphate	6.1,14(b)	6.1	292090
668	1595	Dimethyl sulphate	6.1,27(a)	6.1+8	292090
60	1596	Dinitroanilines	6.1,12(b)	6.1	292142
60	1597	Dinitrobenzenes	6.1,12(b)	6.1	290420
60	1598	Dinitro-o-cresol	6.1,12(b)	6.1	380830
60	1599	Dinitrophenol, solution	6.1,12(b),(c)	6.1	360200
60	1600	Dinitrotoluenes, molten	6.1,24(b)1	6.1	290420
66/60	1601	Disinfectants, solid, toxic, n.o.s.	6.1,25(a), (b),(c)	6.1	380840
66/60	1602	Dye intermediate, liquid, toxic, n.o.s.	6.1,25(a), (b),(c)	6.1	**
66/60	1602	Dye, liquid, toxic, n.o.s.	6.1,25(a), (b),(c)	6.1	**
63	1603	Ethyl bromoacetate	6.1,16(b)	6.1+3	291590
83	1604	Ethylendiamine	8,54(b)	8+3	292121
66	1605	Ethylene dibromide	6.1,15(a)	6.1	290330

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	1606	Ferric arsenate	6.1,51(b)	6.1	284290
60	1607	Ferric arsenite	6.1,51(b)	6.1	284290
60	1608	Ferrous arsenate	6.1,51(b)	6.1	284290
60	1611	Hexaethyl tetraphosphate	6.1,23(b)	6.1	291900
26	1612	Hexaethyl tetraphosphate and compressed gas mixture	2,1T	6.1(+13)	291900
663	1613	Hydrogen cyanide, aqueous solution with not more than 20 % hydrogen cyanide	6.1,2	6.1+3	281115
663	1614	Hydrogen cyanide, stabilized, containing less than 3 % water, and absorbed in a porous inert material	6.1,1	6.1+3	281115
60	1616	Lead acetate	6.1,62(c)	6.1	291529
60	1617	Lead arsenates	6.1,51(b)	6.1	284290
60	1618	Lead arsenites	6.1,51(b)	6.1	284290
60	1620	Lead cyanide	6.1,41(b)	6.1	283719
60	1621	London purple	6.1,51(b)	6.1	284290
60	1622	Magnesium arsenate	6.1,51(b)	6.1	284290
60	1623	Mercuric arsenate	6.1,51(b)	6.1	284290
60	1624	Mercuric chloride	6.1,52(b)	6.1	282739
60	1625	Mercuric nitrate	6.1,52(b)	6.1	283429
66	1626	Mercuric potassium cyanide	6.1,41(a)	6.1	283719
60	1627	Mercurous nitrate	6.1,52(b)	6.1	283429
60	1629	Mercury acetate	6.1,52(b)	6.1	291529
60	1630	Mercury ammonium chloride	6.1,52(b)	6.1	282739
60	1631	Mercury benzoate	6.1,52(b)	6.1	291631
60	1634	Mercury bromides	6.1,52(b)	6.1	282759
60	1636	Mercury cyanide	6.1,41(b)	6.1	283719
60	1637	Mercury gluconate	6.1,52(b)	6.1	291816
60	1638	Mercury iodide	6.1,52(b)	6.1	282760
60	1639	Mercury nucleate	6.1,52(b)	6.1	293490
60	1640	Mercury oleate	6.1,52(b)	6.1	291615
60	1641	Mercury oxide	6.1,52(b)	6.1	282590
60	1642	Mercury oxycyanide, desensitized	6.1,41(b)	6.1	283719
60	1643	Mercury potassium iodide	6.1,52(b)	6.1	282760
60	1644	Mercury salicylate	6.1,52(b)	6.1	291821
60	1645	Mercury sulphate	6.1,52(b)	6.1	283329
60	1646	Mercury thiocyanate	6.1,52(b)	6.1	283800
66	1647	Methyl bromide and ethylene dibromide mixture, liquid	6.1,15(a)	6.1	382490
33	1648	Acetonitrile	3,3(b)	3	292690

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66	1649	Motor fuel anti-knock mixture	6.1,31(a)	6.1	293100
60	1650	beta-Naphthylamine	6.1,12(b)	6.1	292145
60	1651	Naphthylthiourea	6.1,21(b)	6.1	293090
60	1652	Naphthylurea	6.1,12(b)	6.1	292421
60	1653	Nickel cyanide	6.1,41(b)	6.1	283719
60	1654	Nicotine	6.1,90(a), (b),(c)	6.1	293970
66/60	1655	Nicotine compound, solid, n.o.s. or Nicotine preparation, solid, n.o.s.			
60	1656	Nicotine hydrochloride or nicotine hydrochloride sodium	6.1,90(b)	6.1	293970
60	1657	Nicotine salicylate	6.1,90(b)	6.1	293970
60	1658	Nicotine sulphate, solid or solution	6.1,90(b)	6.1	293970
60	1659	Nicotine tartrate	6.1,90(b)	6.1	293970
265	1660	Nitric oxide, compressed	2,1TOC	6.1+05+8	281129
60	1661	Nitroanilines (o-, m-, p-)	6.1,12(b)	6.1	292142
60	1662	Nitrobenzene	6.1,12(b)	6.1	290420
60	1663	Nitrophenols (o-, m-, p-)	6.1,12(c)	6.1	290890
60	1664	Nitrotoluenes (o-, m-, p-)	6.1,12(b)	6.1	290420
60	1665	Nitroxylenes (o-, m-, p-)	6.1,12(b)	6.1	290420
60	1669	Pentachloroethane	6.1,15(b)	6.1	290319
66	1670	Perchloromethyl mercaptan	6.1,17(a)	6.1	293090
60	1671	Phenol, solid	6.1,14(b)	6.1	290711
66	1672	Phenylcarbylamine chloride	6.1,17(a)	6.1	292520
60	1673	Phenylendiamines (o-, m-, p-)	6.1,12(c)	6.1	292151
60	1674	Phenylmercuric acetate	6.1,33(b)	6.1	380820
60	1677	Potassium arsenate	6.1,51(b)	6.1	284290
60	1678	Potassium arsenite	6.1,51(b)	6.1	284290
60	1679	Potassium cuprocyanide	6.1,41(b)	6.1	283719
66	1680	Potassium cyanide	6.1,41(a)	6.1	283719
60	1683	Silver arsenite	6.1,51(b)	6.1	284290
60	1684	Silver cyanide	6.1,41(b)	6.1	283719

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	1685	Sodium arsenate	6.1,51(b)	6.1	284290
60	1686	Sodium arsenite, aqueous solution	6.1,51(b), (c)	6.1	284290
60	1687	Sodium azide	6.1,42(b)	6.1	285000
60	1688	Sodium cacodylate	6.1,51(b)	6.1	293100
66	1689	Sodium cyanide	6.1,41(a)	6.1	283711
60	1690	Sodium fluoride	6.1,63(c)	6.1	282611
60	1691	Strontium arsenite	6.1,51(b)	6.1	284290
66	1692	Strychnine	6.1,90(a)	6.1	293990
66	1692	Strychnine salts	6.1,90(a)	6.1	293990
66/60	1693	Tear gas substance, liquid or solid, n.o.s.	6.1,25(a), (b)	6.1	**
66	1694	Bromobenzyl cyanides	6.1,17(a)	6.1	292690
663	1695	Chloroacetone, stabilized	6.1,10(a)	6.1+3+8	291470
60	1697	Chloracetophenone	6.1,17(b)	6.1	291479
66	1698	Diphenylamine chloroarsine	6.1,34(a)	6.1	293490
66	1699	Diphenylchloroarsine	6.1,34(a)	6.1	293100
60	1700	Tear gas candles	6.1,26(b)2	6.1	930690
60	1701	Xylyl bromide	6.1,15(b)	6.1	290369
60	1702	Tetrachloroethane	6.1,15(b)	6.1	290319
60	1704	Tetraethyl dithiopyrophosphate	6.1,23(b)	6.1	292090
60	1707	Thallium compound, n.o.s.	6.1,53(b)	6.1	**
60	1708	Toluidines	6.1,12(b)	6.1	292143
60	1709	2,4-Toluylenediamine	6.1,12(c)	6.1	292159
60	1710	Trichlorethylene	6.1,15(c)	6.1	290322
60	1711	Xylidines	6.1,12(b)	6.1	292149
60	1712	Zinc arsenate, zinc arsenite, or zinc arsenate and zinc arsenite mixtures	6.1,51(b)	6.1	284290
66	1713	Zinc cyanide	6.1,41(a)	6.1	283719
X462	1714	Zinc phosphide	4.3,18(a)	4.3+6.1	284800
83	1715	Acetic anhydride	8,32(b)2	8+3	291524
80	1716	Acetyl bromide	8,35(b)1	8	291590
X338	1717	Acetyl chloride	3,25(b)	3+8	291590
80	1718	Butyl acid phosphate	8,38(c)	8	291900
80	1719	Caustic alkali liquid, n.o.s.	8,42(b), (c)	8	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
668	1722	Allyl chlorformate	6.1,28(a)	6.1+3+8	291590
338	1723	Allyl iodide	3,25(b)	3+8	290330
X839	1724	Allyltrichlorosilane, stabilized	8,37(b)	8+3	293100
80	1725	Aluminium bromide, anhydrous	8,11(b)	8	282759
80	1726	Aluminium chloride, anhydrous	8,11(b)	8	282732
80	1727	Ammonium hydrogendifluoride, solid	8,9(b)	8	282619
X80	1728	Amyltrichlorsilane	8,36(b)	8	293100
80	1729	Anisoyl chloride	8,35(b)1	8	291639
X80	1730	Antimony pentachloride, liquid	8,12(b)	8	282739
80	1731	Antimony pentachloride solution	8,12(b), (c)	8	282739
86	1732	Antimony pentafluoride	8,10(b)	8+6.1	282619
80	1733	Antimony trichloride	8,11(b)	8	282739
80	1736	Benzoyl chloride	8,35(b)1	8	291632
68	1737	Benzyl bromide	6.1,27(b)	6.1+8	290369
68	1738	Benzyl chloride	6.1,27(b)	6.1+8	290369
88	1739	Benzyl chloroformate	8,64(a)	8	291590
80	1740	Hydrogendifluorides, n.o.s.	8,9(b), (c)	8	282619
268	1741	Boron trichloride	2,2TC	6.1+8	282210
80	1742	Boron trifluoride acetic acid complex	8,33(b)	8	293100
80	1743	Boron trifluoride propionic acid complex	8,33(b)	8	293100
886	1744	Bromine or Bromine solutions	8,14	8+6.1	280130
568	1745	Bromine pentafluoride	5.1,5	5.1+6.1+8	281290
568	1746	Bromine trifluoride	5.1,5	5.1+6.1+8	281290
X83	1747	Butyltrichlorosilane	8,37(b)	8+3	293100
50	1748	Calcium hypochlorite, dry	5.1,15(b)	5.1	282810
50	1748	Calcium hypochlorite mixture, dry with more than 39 % available chloride (8,8 % available oxygen)	5.1,15(b)	5.1	282810
265	1749	Chlorine trifluoride	2,2TOC	6.1+05+8(+13)	281210
68	1750	Chloroacetic acid solution	6.1,27(b)	6.1+8	291540
68	1751	Chloroacetic acid, solid	6.1,27(b)	6.1+8	291540
668	1752	Chloracetyl chloride	6.1,27(a)	6.1+8	291590
X80	1753	Chlorophenyl trichlorosilane	8,36(b)	8	293100
X88	1754	Chlorosulphonic acid	8,12(a)	8	280620
80	1755	Chromic acid solution	8,17(b),(c)	8	281910

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	1756	Chromic fluoride, solid	8,9(b)	8	282619
80	1757	Chromic fluoride solution	8,8(b),(c)	8	282619
X88	1758	Chromium oxychloride	8,12(a)	8	282749
88/80	1759	Corrosive solid, n.o.s.	8,65(a), (b),(c)	8	**
88/80	1760	Corrosive liquid, n.o.s.	8,66(a), (b),(c)	8	**
86	1761	Cupriethylenediamine solution	8,53(b), (c)	8+6.1	292121
X80	1762	Cyclohexenyltrichlorosilane	8,36(b)	8	293100
X80	1763	Cyclohexyltrichlorosilane	8,36(b)	8	293100
80	1764	Dichloroacetic acid	8,32(b)1	8	291540
X80	1765	Dichloroacetyl chloride	8,35(b)1	8	291590
X80	1766	Dichlorophenyltrichlorosilane	8,36(b)	8	293100
X83	1767	Diethyldichlorosilane	8,37(b)	8+3	293100
80	1768	Difluorophosphoric acid, anhydrous	8,8(b)	8	281119
X80	1769	Diphenyldichlorosilane	8,36(b)	8	293100
80	1770	Diphenylmethyl bromide	8,65(b)	8	290330
X80	1771	Dodecyltrichlorosilane	8,36(b)	8	293100
80	1773	Ferric chloride, anhydrous	8,11(c)	8	282733
80	1774	Fire extinguisher charges, corrosive liquid	8,82(b)	8	842410
80	1775	Fluoroboric acid	8,8(b)	8	281119
	1775	Fluoroboric acid, aqueous solutions over 78 % acide: *Note to be accepted for carriage*	8,8(b), *Note*		
80	1776	Fluorophosphoric acide, anhydrous	8,8(b)	8	281119
88	1777	Fluorosulphonic acid	8,8(a)	8	281119
80	1778	Fluorosilicic acid	8,8(b)	8	281119
80	1779	Formic acid	8,32(b)1	8	291511
80	1780	Fumaryl chloride	8,35(b)1	8	291590
X80	1781	Hexadecyltrichlorosilane	8,36(b)	8	293100
80	1782	Hexafluorophosphoric acid	8,8(b)	8	281119
80	1783	Hexamethylenediamine solution	8,53(b), (c)	8	292122
X80	1784	Hexyltrichlorosilane	8,36(b)	8	293100

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
886	1786	Hydrofluoric and sulphuric acid mixture	8,7(a)	8+6.1	281119
80	1787	Hydriodic acid	8,5(b),(c)	8	281119
80	1788	Hydrobromic acid	8,5(b),(c)	8	281119
80	1789	Hydrochloric acid	8,5(b),(c)	8	280610
886/86	1790	Hydrofluoric acid	8,6,7(a), (b)	8+6.1	281111
80	1791	Hypochlorite solution	8,61(b),(c)	8	282890
80	1792	Iodine monochloride	8,12(b)	8	281210
80	1793	Isopropyl acide phosphate	8,38(c)	8	291900
80	1794	Lead sulphate with 3 % or more free acid	8,1(b)	8	283329
885/80	1796	Nitrating acid mixture	8,3(a),(b)	8	280800
	1798	Nitrohydrochloric acid: *Not to be accepted for carriage*	8,3 *Note 1*		
X80	1799	Nonyltrichlorosilane	8,36(b)	8	293100
X80	1800	Octadecyltrichlorosilane	8,36(b)	8	293100
X80	1801	Octyltrichlorosilane	8,36(b)	8	293100
85	1802	Perchloric acid, not more than 50 % acid, by mass	8,4(b)	8+05	281119
80	1803	Phenolsulphonic acid, liquid	8,34(b)	8	290410
X80	1804	Phenyltrichlorosilane	8,36(b)	8	X80
80	1805	Phosphoric acid	8,17(c)	8	280920
80	1806	Phosphorus pentachloride	8,11(b)	8	281210
80	1807	Phosphorus pentoxide	8,16(b)	8	280910
X80	1808	Phosphorus tribromide	8,12(b)	8	281290
668	1809	Phosphorus trichloride	6.1,67(a)	6.1+8	281210
X80	1810	Phosphorus oxychloride	8,12(b)	8	281210
86	1811	Potassium hydrogendifluoride	8,9(b)	8+6.1	282619
60	1812	Potassium fluoride	6.1,63(c)	6.1	282619
80	1813	Potassium hydroxide, solid	8,41(b)	8	281520

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	1814	Potassium hydroxide	8,42(b),(c)	8	281520
338	1815	Propionyl chloride	3,25(b)	3+8	291590
X83	1816	Propyltrichlorosilane	8,37(b)	8+3	293100
X80	1817	Pyrosulphuryl chloride	8,12(b)	8	281210
X80	1818	Silicon tetrachloride	8,12(b)	8	281210
80	1819	Sodium aluminate solution	8,42(b),(c)	8	284110
80	1823	Sodium hydroxide, solid	8,41(b)	8	281511
80	1824	Sodium hydroxide solution	8,42(b), (c)	8	281512
80	1825	Sodium monoxide	8,41(b)	8	282590
80/885	1826	Nitrating acid mixture, spent	8,3(a), (b)	05/8+8	382490
X80	1827	Stannic chloride, anhydrous	8,12(b)	8	282739
X88	1828	Sulphur chlorides	8,12(a)	8	281210
X88	1829	Sulphur trioxide, inhibited	8,1(a)	8	281129
80	1830	Sulphuric acid with more than 51 % acid	8,1(b)	8	280700
X886	1831	Sulphuric acid, fuming	8,1(a)	8+6.1	280700
80	1832	Sulphuric acid, spent	8,1(b)	8	382490
80	1833	Sulphurous acid	8,1(b)	8	281123
X88	1834	Sulphuryl chloride	8,12(a)	8	281210
80	1835	Tetramethylammonium hydroxide	8,51(b)	8	292390
X88	1836	Thionyl chloride	8,12(a)	8	281210
X80	1837	Thiophosphoryl chloride	8,12(b)	8	281210
X80	1838	Titanium tetrachloride	8,12(b)	8	282739
80	1839	Trichloroacetic acid	8,31(b)	8	291540
80	1840	Zinc chloride, solution	8,5(c)	8	282736
90	1841	Acetaldehyde ammonia	9,31(c)	9	292219
60	1843	Ammonium dinitro-o-cresolate	6.1,12(b)	6.1	290890
	1845	Carbon dioxide, solid (dry ice): *Not subject to RID*	9, *See marg. 900(3)*		281121
60	1846	Carbon tetrachloride	6.1,15(b)	6.1	290314

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	1847	Potassium sulphide, hydrated, with not less than 30 % water of crystallization	8,46(b)1	8	283090
80	1848	Propionic acid	8,32(c)	8	291550
80	1849	Sodium sulphide, hydrated, with not less than 30 % water of crystallization	8,45(b)1	8	283010
60	1851	Medicine, liquid, toxic, n.o.s.	6.1,90(b), (c)	6.1	300390
43	1854	Barium alloys, pyrophoric	4.2,12(a)	4.2	280521
43	1855	Calcium alloys, pyrophoric	4.2,12(a)	4.2	280521
43	1855	Calcium, pyrophoric	4.2,12(a)	4.2	280521
20	1858	Hexafluoropropylene (refrigerant gas R 1216)	2,2A	2(+13)	290330
268	1859	Silicon tetrafluoride, compressed	2,1TC	6.1+8(+13)	281290
239	1860	Vinyl fluoride, inhibited	2,2F	3(+13)	290330
33	1862	Ethyl crotonate	3,3(b)	3	291590
33/30	1863	Fuel, aviation, turbine engine	3,1(a),2(a), 2(b),3,(b), 31(c)	3	272600 273100
33	1865	n-Propyl nitrate	3,3(b)	3	292090
33/30	1866	Resins in solution in flammable liquids	3,5(a),(b), (c),31(c)	3	**
46	1868	Decaborane	4.1,16(b)	4.1+6.1	285000
40	1869	Magnesium alloys with more than 50 % magnesium pellets, turnings, or ribbons	4.1,13(c)	4.1	810411
40	1869	Magnesium in pellets, turnings or ribbons	4.1,13(c)	4.1	810419
X423	1870	Potassium borohydride	4.3,16(a)	4.3	285000
40	1871	Titanium hydride	4.1,14(b)	4.1	285000
56	1872	Lead dioxide	5.1,29(c)	5.1+6.1	282490
558	1873	Perchloric acid in aqueous solution with more than 50 % but not more than 72 % acid	5.1,3(a)	5.1+8	281110
60	1884	Barium oxide	6.1,60(c)	6.1	251120
60	1885	Benzidine	6.1,12(b)	6.1	292159
60	1886	Benzylidene chloride	6.1,15(b)	6.1	290369
60	1887	Bromochloromethane	6.1,15(c)	6.1	290349
60	1888	Chloroform	6.1,15(c)	6.1	290313
668	1889	Cyanogen bromide	6.1,27(a)	6.1+8	292690
60	1891	Ethyl bromide	6.1,15(b)	6.1	290330

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66	1892	Ethyldichloroarsine	6.1,34(a)	6.1	293100
60	1894	Phenylmercuric hydroxide	6.1,33(b)	6.1	293100
60	1895	Phenylmercuric nitrate	6.1,33(b)	6.1	293100
60	1897	Tetrachloroethylene	6.1,15(c)	6.1	290323
80	1898	Acetyl iodide	8,35(b)1	8	290330
80	1902	Diisooctyl acid phosphate	8,38(c)	8	291900
88/80	1903	Disinfectant, liquid, corrosive, n.o.s.	8,66(a),(b), (c)	8	380840
88	1905	Selenic acid	8,16(a)	8	281119
80	1906	Sludge acid	8,1(b)	8	383490
80	1907	Soda lime	8,41(c)	8	282890
80	1908	Chlorite solution	8,61(b), (c)	8	282590
	1910	Calcium oxide: *Not subject to RID*	8, *See marg. 800(9)*		
263	1911	Diborane	2,1TF	6.1+3	285000
23	1912	Methyl chloride and methylene chloride mixture	2,2F	3(+13)	294200
22	1913	Neon, refrigerated liquid	2,3A	2(+13)	280429
30	1914	Butyl propionates	3,31(c)	3	291590
30	1915	Cyclohexanone	3,31(c)	3	291422
63	1916	2,2'-Dichlorodiethyl ether	6.1,16(b)	6.1+3	290919
339	1917	Ethyl acrylate, inhibited	3,3(b)	3	291612
30	1918	Isopropylbenzene (Cumene)	3,31(c)	3	290270
339	1919	Methyl acrylate inhibited	3,3(b)	3	291612
30	1920	Nonanes	3,31(c)	3	290110
336	1921	Propyleneimine, inhibited	3,12	3+6.1	293390
338	1922	Pyrrolidine	3,23(b)	3+8	293390
40	1923	Calcium dithionite	4.2,13(b)	4.2	283190
X323	1928	Methyl magnesium bromide in ethyl ether	4.3,3(a)	4.3+3	293100
40	1929	Potassium dithionite (Potassium hydrosulphite)	4.2,13(b)	4.2	283190
90	1931	Zinc dithionite (zinc hydrosulphite)	9,32(c)	9	283190
40	1932	Zirconium scrap	4.2,12(c)	4.2	810910
66/60	1935	Cyanide solution, n.o.s.	6.1,41(a),(b), (c)	6.1	283719
80	1938	Bromoacetic acid	8,31(b)	8	291590
80	1939	Phosphorus oxybromide	8,11(b)	8	281290

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	1940	Thioglycolic acid	8,32(b)1	8	293090
90	1941	Dibromodifluoromethane	9,33(c)	9	290347
50	1942	Ammonium nitrate	5.1,21(c)	5.1	310230
40	1944	Matches, safety	4.1,2(c)	4.1	360500
40	1945	Matches, wax, 'vesta'	4.1,2(c)	4.1	360500
20	1950	Aerosol dispensers	2,5A	2	**
25	1950	Aerosol dispensers	2,5O	2+05	**
23	1950	Aerosol dispensers	2,5F	3	**
26	1950	Aerosol dispensers	2,5T	6.1	**
263	1950	Aerosol dispensers	2,5TF	6.1+3	**
268	1950	Aerosol dispensers	2,5TC	6.1+8	**
265	1950	Aerosol dispensers	2,5TO	6.1+05	**
263	1950	Aerosol dispensers	2,5TFC	6.1+3+8	**
265	1950	Aerosol dispensers	2,5TOC	6.1+05+8	**
22	1951	Argon, refrigerated liquid	2,3A	2(+13)	280421
20	1952	Ethylene oxide and carbon dioxide mixture with not more than 9 % ethylene oxide	2,2A	2(+13)	281121
263	1953	Compressed gas, toxic, flammable, n.o.s.	2,1TF	6.1+3(+13)	**
23	1954	Compressed gas, flammable, n.o.s.	2,1F	3(+13)	**
26	1955	Compressed gas, toxic, n.o.s.	2,1T	6.1(+13)	**
20	1956	Compressed gas, n.o.s.	2,1A	2(+13)	**
23	1957	Deuterium, compressed	2,1F	3(+13)	284590
20	1958	1,2-Dichloro-1,1,2,2-tetrafluoroethane (refrigerant gas R 114)	2,2A	2(+13)	290344
239	1959	1,1-Difluoroethylene (refrigerant gas R 1132a)	2,2F	3(+13)	290330
223	1961	Ethane, refrigerated liquid	2,3F	3(+13)	290110
23	1962	Ethylene, compressed	2,1F	3(+13)	290121
22	1963	Helium, refrigerated liquid	2,3A	2(+13)	280429
23	1964	Hydrocarbon gas mixture, compressed, n.o.s.	2,1F	3(+13)	271129
23	1965	Hydrocarbon gas mixture, liquefied, n.o.s. (Mixtures A, A0, A1, B, C, butane, propane)	2,2F	3(+13)	271119
223	1966	Hydrogen, refrigerated liquid	2,3F	3(+13)	280410
26	1967	Insecticide gas, toxic, n.o.s.	2,2T	6.1(+13)	380810
20	1968	Insecticide gas, n.o.s.	2,2A	2(+13)	380810
23	1969	Isobutane	2,2F	3(+13)	271113

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
22	1970	Krypton, refrigerated liquid	2,3A	2(+13)	280429
23	1971	Methane, compressed or Natural gas, compressed	2,1F	3(+13)	271121
223	1972	Methane, refrigerated liquid or Natural gas, refrigerated liquid	2,3F	3(+13)	271111
20	1973	Chlorodifluoromethane and chloropentafluoroethane mixture with fixed boiling point, with approximately 49 % chlorodifluoromethane (refrigerant gas R 502)	2,2A	2(+13)	382471
20	1974	Chlorodifluorobromomethane (refrigerant gas R 12B1)	2,2A	2(+13)	290346
265	1975	Nitric oxide and dinitrogen tetroxide mixture (nitric oxide and nitrogen dioxide mixture)	2,2TOC	6.1+05+8	281129
20	1976	Octafluorocyclobutane (refrigerant gas RC 318)	2,2A	2(+13)	290359
22	1977	Nitrogen, refrigerated liquid	2,3A	2(+13)	280430
23	1978	Propane, technically pure	2,2F	3(+13)	271112
20	1979	Rare gases mixture, compressed	2,1A	2(+13)	280429
20	1980	Rare gases and oxygen mixtures, compressed	2,1A	2(+13)	280429
20	1981	Rares gases and nitrogen mixture, compressed	2,1A	2(+13)	280429
20	1982	Tetrafluoromethane, compressed (refrigerant gas R 14 compressed)	2,1A	2(+13)	290330
20	1983	1-Chloro-2,2,2-trifluoroethane (refrigerant gas R 133a)	2,2A	2(+13)	290349
20	1984	Trifluoromethane (refrigerant gas R 23)	2,2A	2(+13)	290330
336/36	1986	Alcohols, flammable, toxic, n.o.s.	3,17(a),(b), 32(c)	3+6.1	2905**
33/30	1987	Alcohols, n.o.s.	3,2(b),3(b), 31(c)	3	2905**
336/36	1988	Aldehydes, flammable, toxic, n.o.s.	3,17(a),(b), 32(c)	3+6.1	2912**
33/30	1989	Aldehydes, n.o.s.	3,2(b),3(b), 31(c)	3	2912**
90	1990	Benzaldehyde	9,34(c)	9	2912**
336	1991	Chloroprene, inhibited	3,16(a)	3+6.1	2912**
336/36	1992	Flammable liquid, toxic, n.o.s.	3,19(a),(b), 32(c)	3+6.1	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33/30	1993	Flammable liquid, n.o.s.	3,1(a),2(a), 2(b) 3,(b),5(c), 31(c)	3	**
663	1994	Iron pentacarbonyl	6.1,3	6.1+3	293100
33/30	1999	Tars, liquid	3,5(b),(c), 31(c)	3	270600
40	2000	Celluloid, in blocks, rods, rolls, sheets, tubs etc., except scrap	4.1,3(c)	4.1	391220
40	2001	Cobalt naphthenates, powder	4.1,12(c)	4.1	291639
40	2002	Celluloid, scrap	4.2,4(c)	4.2	391220
X333	2003	Metal alkyls, n.o.s. or metal aryls, n.o.s.	4.2,31(a)	4.2+4.3	293100
40	2004	Magnesium diamide	4.2,16(b)	4.2	285100
X333	2005	Magnesium diphenyl	4.2,31(a)	4.2+4.3	293100
40	2006	Plastics, nitrocellulose-based, self-heating, n.o.s.	4.2,4(c)	4.2	391220
43/40	2008	Zirconium powder dry	4.2,12(a),(b), (c)	4.2	810910
40	2009	Zirconium, dry, finished sheets, strip or colled wire	4.2,12(c)	4.2	810910
X423	2010	Magnesium hydride	4.3,16(a)	4.3	285000
X462	2011	Magnesium phosphide	4.3,18(a)	4.3+6.1	284800
X462	2012	Potassium phosphide	4.3,18(a)	4.3+6.1	284800
X462	2013	Strontium phosphide	4.3,18(a)	4.3+6.1	284800
58	2014	Hydrogen peroxide, aqueous solution with not less than 20 % but not more than 60 % hydrogen peroxide	5.1,1(b)	5.1+8	284700
559	2015	Hydrogen peroxide, aqueous solution, stabilized with more than 60 % hydrogen peroxide	5.1,1(a)	5.1+8	284700
559	2015	Hydrogen peroxide, stabilized	5.1,1(a)	5.1+8	284700
60	2016	Ammunition, toxic, non-explosive without burster or expelling charge, non-fuzed	6.1,25(b)	6.1	930690
60	2017	Ammunition, tear-producing, non-explosive without burster or expelling charge, non-fuzed	6.1,27(b)	6.1	930690
60	2018	Chloroanilines, solid	6.1,12(b)	6.1	292142
60	2019	Chloroanilines, liquid	6.1,12(b)	6.1	292142
60	2020	Chlorophenols, solid	6.1,17(c)	6.1	290810
60	2021	Chlorophenols, liquid	6.1,17(c)	6.1	290810

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
68	2022	Cresylic acid	6.1,27(b)	6.1+8	290712
63	2023	Epichlorohydrin	6.1,16(b)	6.1+3	291030
66/60	2024	Mercury compound, liquid, n.o.s.	6.1,52(a),(b),(c)	6.1	**
66/60	2025	Mercury compound, solid, n.o.s.	6.1,52(a),(b),(c)	6.1	**
66/60	2026	Phenylmercuric compound, n.o.s.	6.1,33(a),(b),(c)	6.1	293100
60	2027	Sodium arsenite, solid	6.1,51(b)	6.1	284290
80	2028	Bombs, smoke, non-explosive with corrosive liquid, without initiating device	8,82(b)	8	930690
886	2029	Hydrazine, anydrous	8,44(a)	8+3+6.1	282510
86	2030	Hydrazine, hydrate or Hydrazine, aqueous solution with not less than 37% but not more than 64% hydrazine, by mass	8,44(b)	8+6.1	282510
88/80	2031	Nitric acid, other than red fuming	8,2(a)1,(b)	8	280800
856	2032	Nitric acid, red fuming	8,2(a)2	8+05+6.1	280800
80	2033	Potassium monoxide	8,41(b)	8	282590
23	2034	Hydrogen and methane mixture, compressed	2,1F	3(+13)	280410
23	2035	1,1,1-Trifluoroethane (refrigerant gas R 143a)	2,2F	3(+13)	290330
20	2036	Xenon, compressed	2,1A	2(+13)	280429
20	2037	Receptacles, small, containing gas (Gas cartridges) without release device, non-refillable	2,5A	2	**
25	2037	Receptacles, small, containing gas (Gas cartridges) without release device, non-refillable	2,5O	2+05	**
23	2037	Receptacles, small, containing gas (Gas cartridges) without release device, non-refillable	2,5F	3	**
26	2037	Receptacles, small, containing gas (Gas cartridges) without release device, non-refillable	2,5T	6.1	**
263	2037	Receptacles, small, containing gas (Gas cartridges) without release device, non-refillable	2,5TF	6.1+3	**
268	2037	Receptacles, small, containing gas (Gas cartridges) without release device, non-refillable	2,5TC	6.1+8	**
265	2037	Receptacles, small, containing gas (Gas cartridges) without release device, non-refillable	2,5TO	6.1+05	**
263	2037	Receptacles, small, containing gas (Gas cartridges) without release device, non-refillable	2,5TFC	6.1+3+8	**
265	2037	Receptacles, small, containing gas (Gas cartridges) without release device, non-refillable	2,5TOC	6.1+05+8	**
60	2038	Dinitrotoluenes	6.1,12(b)	6.1	290420
23	2044	2,2-Dimethylpropane	2,2F	3(+13)	290110
33	2045	Isobutyraldehyde (Isobutyl aldehyde)	3,3(b)	3	291219

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	2046	Cymenes	3,31(c)	3	290290
33/30	2047	Dichloropropenes	3,3(b),31(c)	3	290329
30	2048	Dicyclopentadiene	3,31(c)	3	290219
30	2049	Diethylbenzene	3,31(c)	3	290290
33	2050	Diisobutylene, isomeric compounds	3,3(b)	3	290129
83	2051	2-Dimethylaminoethanol	8,54(b)	8+3	292219
30	2052	Dipentene	3,31(c)	3	290219
30	2053	Methyl isobutyl carbinol	3,31(c)	3	290519
30	2054	Morpholine	3,31(c)	3	293490
39	2055	Styrene monomer, inhibited	3,31(c)	3	290250
33	2056	Tetrahydrofuran	3,3(b)	3	293211
33/30	2057	Tripropylene	3,3(b),31(c)	3	290129
33	2058	Valeraldehyde	3,3(b)	3	291219
33/30	2059	Nitrocellulose solution, flammable, with not more than 12,6 % nitrogen, by mass, and not more than 55 % nitrocellulose	3,4(a),(b), 34(c)	3	391220
50	2067	Ammonium nitrate fertilizers, type A1	5.1,21(c)	5.1	310230
50	2068	Ammonium nitrate fertilizers, type A2	5.1,21(c)	5.1	310230
50	2069	Ammonium nitrate fertilizers, type A3	5.1,21(c)	5.1	310240
50	2070	Ammonium nitrate fertilizers, type A4	5.1,21(c)	5.1	310229
	2071	Ammonium nitrate fertilizers: *Not subject to RID*	9 *See marg. 900(3)*		
	2072	Ammonium nitrate fertilizers, n.o.s.: *Not to be accepted for carriage*	5.1,21(c) *footnote*		
20	2073	Ammonia solution, relative density less than 0,880 at 15 °C in water, with more than 35 % but not more than 50 % ammonia	2,4A	2(+13)	281420
60	2074	Acrylamide	6.1,12(c)	6.1	292410
69	2075	Chloral, anhydrous, inhibited	6.1,17(b)	6.1	291300
68	2076	Cresols	6.1,27(b)	6.1+8	290712
60	2077	alpha-Naphthylamine	6.1,12(c)	6.1	292145
60	2078	Toluene diisocyanate	6.1,19(b)	6.1	292910
80	2079	Diethylenetriamine	8,53(b)	8	292129

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
	2186	Hydrogen chloride, refigerated liquid: *Not to be accepted for carriage*	2,3TC, *Note*		
22	2187	Carbon dioxide, refrigerated liquid	2,3A	2(+13)	281121
263	2188	Arsine	2,2TF	6.1+3	285000
263	2189	Dichlorosilane	2,2TFC	6.1+3+8(+13)	293100
265	2190	Oxygen difluoride, compressed	2,1TOC	6.1+05+8	281290
26	2191	Sulphuryl fluoride	2,2T	6.1(+13)	281290
263	2192	Germane	2,2TF	6.1+3	285000
20	2193	Hexafluoroethane, compressed (refrigerant gas R 116, compressed)	2,1A	2(+13)	290330
268	2194	Selenium hexafluoride	2,2TC	6.1+8	281290
268	2195	Tellurium hexafluoride	2,2TC	6.1+8	281290
268	2196	Tungsten hexafluoride	2,2TC	6.1+8	282619
268	2197	Hydrogen iodide, anhydrous	2,2TC	6.1+8(+13)	281119
268	2198	Phosphorus pentafluoride, compressed	2,1TC	6.1+8	281290
263	2199	Phosphine	2,2TF	6.1+3	285000
239	2200	Propadiene, inhibited	2,2F	3(+13)	290129
225	2201	Nitrous oxide, refrigerated liquid	2,3O	2+05(+13)	281129
263	2202	Hydrogen selenide, anhydrous	2,2TF	6.1+3	281119
23	2203	Silane, compressed	2,1F	3(+13)	285000
263	2204	Carbonyl sulphide	2,2TF	6.1+3(+13)	281390
60	2205	Adiponitrile	6.1,12(c)	6.1	292690
60	2206	Isocyanates, toxic, n.o.s. or Isocyanate solution, toxic, n.o.s.	6.1,19(b), (c)	6.1	292910
50	2208	Calcium hypochlorite mixture, dry with more than 10 % but not more than 39 % available chlorine	5.1,15(c)	5.1	282810
80	2209	Formaldehyde solution with not less than 25 % formaldehyde	8,63(c)	8	291211
40	2210	Maneb or Maneb preparation with not less than 60 % maneb	4.2,16(c)	4.2+4.3	380820
90	2211	Polymeric beads, expandable	9,4(c)	-	39****
90	2212	Blue asbestos (crocidolite) or Brown asbestos (amosite or mysorite)	9,1(b)	9	252400

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
40	2213	Paraformaldehyde	4.1,6(c)	4.1	291260
80	2214	Phthalic anhydride	8,31(c)	8	291735
80	2215	Maleic anhydride	8,31(c)	8	291714
	2216	Fish meal (fish scrap), stabilized: *Not subject to TID*	9 *See marg. 900(3)*		
40	2217	Seed cake with not more than 1,5 % oil and not more than 11 % moisture	4.2,2(c)	4.2	230690
839	2218	Acrylic acid, inhibited	8,32(b)2	8+3	291611
30	2219	Allyl glycidyl ether	3,31(c)	3	291090
30	2222	Anisole	3,31(c)	3	290930
60	2224	Benzonitrile	6.1,12(b)	6.1	292690
80	2225	Benzene sulphonyl chloride	8,35(c)	8	293090
80	2226	Benzotrichloride	8,66(b)	8	290369
39	2227	n-Butyl methacrylate, inhibited	3,31(c)	3	291614
66	2232	Chloroacetaldehyde	6.1,17(a)	6.1	291300
60	2233	Chloroanisidines	6.1,17(c)	6.1	292250
30	2234	Chlorobenzotrifluorides	3,31(c)	3	290369
60	2235	Chlorbenzyl chlorides	6.1,17(c)	6.1	290369
60	2236	3-Chloro-4-methylphenyl isocyanate	6.1,19(b)	6.1	292910
60	2237	Chlornitroanilines	6.1,17(c)	6.1	292142
30	2238	Chlorotoluenes	3,31(c)	3	290369
60	2239	Chlorotoluidines	6.1,17(c)	6.1	292143
88	2240	Chromiumsulphuric acid	8,1(a)	8	340290
33	2241	Cycloheptane	3,3(b)	3	290219
33	2242	Cycloheptene	3,3(b)	3	290219
30	2243	Cyclohexyl acetate	3,31(c)	3	291539
30	2244	Cyclopentanol	3,31(c)	3	290619
30	2245	Cyclopentanone	3,31(c)	3	291429
33	2246	Cyclopentene	3,2(b)	3	290219
30	2247	n-Decane	3,31(c)	3	290110
83	2248	Di-n-butylamine	8,54(b)	8+3	292119
	2249	Dichlordimethyl ether, symmetrical: *Not to be accepted for carriage*	6.1,26(a), *Note*		
60	2250	Dichlorphenyl isocyanates	6.1,19(b)	6.1	292910
339	2251	Bicyclo-[2,2,1]-hepta-2,5-diene, inhibited (2,5-Norbornadiene, inhibited)	3,3(b)	3	290219
33	2252	1,2-Dimethoxyethane	3,3(b)	3	291100
60	2253	N,N-Dimethylaniline	6.1,12(b)	6.1	292142

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
40	2254	Matches, fusee	4.1,2(c)	4.1	360500
33	2256	Cyclohexene	3,3(b)	3	290219
X423	2257	Potassium	4.3,11(a)	4.3	280519
83	2258	1,2-Propylenediamine	8,54(b)	8+3	292129
80	2259	Triethylentetramine	8,53(b)	8	292129
38	2260	Tripropylamine	3,33(c)	3+8	292129
60	2261	Xylenols	6.1,14(b)	6.1	290714
80	2262	Dimethylcarbamoyl chloride	8,35(b)1	8	291590
33	2263	Dimethylcyclohexanes	3,3(b)	3	290219
83	2264	Dimethylcyclohexylamine	8,54(b)	8+3	292130
30	2265	N,N-Dimethylformamide	3,31(c)	3	292410
338	2266	Dimethyl-N-propylamine	3,22(b)	3+8	292119
68	2267	Dimethylthiophosphoryl chloride	6.1,27(b)	6.1+8	292010
80	2269	3,3'-Iminobispropylamine	8,53(c)	8	292129
338	2270	Ethylamine, aqueous solution with not less than 50 % but not more than 70 % ethylamine	3,22(b)	3+8	292119
30	2271	Ethyl amyl ketones	3,31(c)	3	291419
60	2272	N-Ethylaniline	6.1,12(c)	6.1	292142
60	2273	2-Ethylaniline	6.1,12(c)	6.1	292142
60	2274	N-Ethyl-N-benzylaniline	6.1,12(c)	6.1	292142
30	2275	2-Ethylbutanol	3,31(c)	3	290519
38	2276	2-Ethylhexylamine	3,33(c)	3+8	292119
339	2277	Ethyl methacrylate	3,3(b)	3	291614
33	2278	n-Heptene	3,3(b)	3	290129
60	2279	Hexachlorobutadiene	6.1,15(c)	6.1	290329
80	2280	Hexamethylenediamine, solid	8,52(c)	8	292122
60	2281	Hexamethylene diisocyanate	6.1,19(b)	6.1	292910
30	2282	Hexanols	3,31(c)	3	290519
39	2283	Isobutyl methacrylate inhibited	3,31(c)	3	291614
336	2284	Isobutyronitrile	3,11(b)	3+6.1	292690
63	2285	Isocyanatobenzotrifluorides	6.1,18(b)	6.1+3	292910
30	2286	Pentamethylheptane	3,31(c)	3	290110
33	2287	Isoheptene	3,3(b)	3	290129
33	2288	Isohexene	3,3(b)	3	290129
80	2289	Isophoronediamine	8,53(c)	8	292230
60	2290	Isophorone diisocyanate	6.1,19(c)	6.1	292910
60	2291	Lead compound, soluble, n.o.s.	6.1,62(c)	6.1	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	2293	4-Methoxy-4-methylpentan-2-one	3,31(c)	3	291450
60	2294	N-Methylaniline	6.1,12(c)	6.1	292142
663	2295	Methyl chloroacetate	6.1,16(a)	6.1+3	291590
33	2296	Methylcyclohexane	3,3(b)	3	290219
30	2297	Methylcyclohexanone	3,31(c)	3	291422
33	2298	Methylcyclopentane	3,3(b)	3	290219
60	2299	Methyl dichloroacetate	6.1,17(c)	6.1	291590
60	2300	2-Methyl-5-ethylpyridine	6.1,12(c)	6.1	293339
33	2301	2-Methylfuran	3,3(b)	3	293219
30	2302	5-Methylhexan-2-one	3,31(c)	3	291419
30	2303	Isopropenylbenzene	3,31(c)	3	290290
44	2304	Naphthalene, molten	4.1,5	4.1	290290
80	2305	Nitrobenzenesulphonic acid	8,34(b)	8	290410
60	2306	Nitrobenzotrifluorides	6.1,12(b)	6.1	290490
60	2307	3-Nitro-4-chlorobenzotrifluoride	6.1,12(b)	6.1	290490
X80	2308	Nitrosylsuphuric acid	8,1(b)	8	281119
33	2309	Octadiene	3,3(b)	3	290129
36	2310	Pentan-2,4-dione	3,32(c)	3+6.1	291419
60	2311	Phenetidines	6.1,12(c)	6.1	292222
60	2312	Phenol, molten	6.1,24(b)1	6.1	290711
30	2313	Picolines	3,31(c)	3	293339
90	2315	Polychlorinated biphenyls	9,2(b)	9	290369
66	2316	Sodium cuprocyanide, solid	6.1,41(a)	6.1	283720
66	2317	Sodium cuprocyanide solution	6.1,41(a)	6.1	283720
40	2318	Sodium hydrosulphide with less than 25 % water of crystallization	4.2,13(b)	4.2	283010
30	2319	Terpene hydrocarbons, n.o.s.	3,31(c)	3	290219
80	2320	Tetraethylenpenetamine	8,53(c)	8	292129
60	2321	Trichlorbenzenes, liquid	6.1,15(c)	6.1	290369
60	2322	Trichlorbutene	6.1,15(b)	6.1	290319
30	2323	Triethyl phosphite	3,31(c)	3	291900
30	2324	Triisobutylene	3,31(c)	3	290129
30	2325	1,3,5-Trimethylbenzene	3,31(c)	3	290290
80	2326	Trimethylcyclohexylamine	8,53(c)	8	292130
80	2327	Trimethylhexamethylenediamines	8,53(c)	8	292129
60	2328	Trimethylhexamethylene diisocyanate	6.1,19(c)	6.1	292910
30	2329	Trimethyl phosphite	3,31(c)	3	291900
30	2330	Undecane	3,31(c)	3	290110

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	2331	Zinc chloride, anhydrous	8,11(c)	8	282736
30	2332	Acetaldehyde oxime	3,31(c)	3	292990
336	2333	Allyl acetate	3,17(b)	3+6.1	291590
663	2334	Allylamine	6.1,7(a)2	6.1+3	292119
336	2335	Allyl ethyl ether	3,17(b)	3+6.1	290919
336	2336	Allyl formate	3,17(a)	3+6.1	291513
663	2337	Phenyl mercaptan	6.1,20(a)	6.1+3	293090
33	2338	Benzotrifluoride	3,3(b)	3	290369
33	2339	2-Bromobutane	3,3(b)	3	290330
33	2340	2-Bromoethyl ethyl ether	3,3(b)	3	290919
30	2341	1-Bromo-3-methylbutane	3,31(c)	3	290330
33	2342	Bromomethylpropanes	3,3(b)	3	290330
33	2343	2-Bromopentane	3,3(b)	3	290330
33	2344	Bromopropanes	3,3(b)	3	290330
33	2345	3-Bromopropyne	3,3(b)	3	290330
33	2346	Butanedione	3,3(b)	3	291419
33	2347	Butyl mercaptan	3,3(b)	3	293090
39	2348	Butyl acrylates, inhibited	3,31(c)	3	291612
33	2350	Butyl methyl ether	3,3(b)	3	290919
33/30	2351	Butyl nitrites	3,3(b),31(c)	3	292090
339	2352	Butyl vinyl ether, inhibited	3,3(b)	3	290919
338	2353	Butyryl chloride	3,25(b)	3+8	291590
336	2354	Chloromethyl ethyl ether	3,16(b)	3+6.1	290919
33	2356	2-Chloropropane	3,2(a)	3	290319
83	2357	Cyclohexylamine	8,54(b)	8+3	292130
33	2358	Cyclooctatetraene	3,3(b)	3	290219
338	2359	Diallylamine	3,27(b)	3+8+6.1	292119
336	2360	Diallyl ether	3,17(b)	3+6.1	290919
38	2361	Diisobutylamine	3,33(c)	3+8	292119
33	2362	1,1-Dichloroethane	3,3(b)	3	290319
33	2363	Ethyl mercaptan	3,2(a)	3	293090
30	2364	n-Propylbenzene	3,31(c)	3	290290
30	2366	Diethyl carbonate	3,31(c)	3	292090
33	2367	alpha-Methylvaleraldehyde	3,3(b)	3	291219
30	2368	alpha-Pinene	3,31(c)	3	290219
33	2370	1-Hexene	3,3(b)	3	290129
33	2371	Isopentenes	3,1(a)	3	290129

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
33	2372	1,2-Di-(dimethylamino)-ethane	3,3(b)	3	292130
33	2373	Diethoxymethane	3,3(b)	3	290919
33	2374	3,3-Diethoxypropene	3,3(b)	3	291100
33	2375	Diethylsulphide	3,3(b)	3	293090
33	2376	2,3-Dihydropyran	3,3(b)	3	290920
33	2377	1,1-Dimethoxyethane	3,3(b)	3	291100
336	2378	2-Dimethylaminoacetonitrile	3,11(b)	3+6.1	292690
338	2379	1,3-Dimethylbutylamine	3,22(b)	3+8	292119
33	2380	Dimethyldiethoxysilane	3,3(b)	3	293100
33	2381	Dimethyl disulphide	3,3(b)	3	293090
663	2382	Dimethylhydrazine, symmetrical	6.1,7(a)2	6.1+3	292800
338	2383	Dipropylamine	3,22(b)	3+8	292119
33	2384	Di-n-propyl ether	3,3(b)	3	290919
33	2385	Ethyl isobutyrate	3,3(b)	3	291590
338	2386	1-Ethylpiperidine	3,23(b)	3+8	293390
33	2387	Fluorobenzene	3,3(b)	3	290369
33	2388	Fluorotoluenes	3,3(b)	3	290369
33	2389	Furan	3,1(a)	3	293219
33	2390	2-Iodobutane	3,3(b)	3	290330
33	2391	Iodomethylpropanes	3,3(b)	3	290330
30	2392	Iodopropane	3,31(c)	3	290330
33	2393	Isobutyl formate	3,3(b)	3	291513
33	2394	Isobutyl propionate	3,3(b)	3	291590
338	2395	Isobutyryl chloride	3,25(b)	3+8	291590
336	2396	Methacrylaldehyde, inhibited	3,17(b)	3+6.1	291219
33	2397	3-Methylbutan-2-one	3,3(b)	3	291419
33	2398	Methyl-tert-butyl ether	3,3(b)	3	290919
338	2399	1-Methylpiperidine	3,23(b)	3+8	293390
33	2400	Methyl isovalerate	3,3(b)	3	291590
338	2401	Piperidine	3,23(b)	3+8	293332
33	2402	Propanethiols	3,3(b)	3	293090
33	2403	Isopropenyl acetate	3,3(b)	3	291590
336	2404	Propionitrile	3,11(b)	3+6.1	292690
30	2405	Isopropyl butyrate	3,31(c)	3	291590
33	2406	Isopropyl isobutyrate	3,3(b)	3	291590
663	2407	Isopropyl chlorformate	6.1,10(a)	6.1+3+8	291590
33	2409	Isopropyl propionate	3,3(b)	3	291590
33	2410	1,2,3,6-Tetrahydropyridine	3,3(b)	3	293339

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
336	2411	Butyronitrile	3,11(b)	3+6.1	292690
33	2412	Tetrahydrothiophene	3,3(b)	3	293490
30	2413	Tetrapropyl orthotitanate	3,31(c)	3	292090
33	2414	Thiophene	3,3(b)	3	293090
33	2416	Trimethyl borate	3,3(b)	3	292090
268	2417	Carbonyl fluoride, compressed	2,1TC	6.1+8(+13)	281290
268	2418	Sulphur tetrafluoride	2,2TC	6.1+8(+13)	281290
23	2419	Bromotrifluoroethylene	2,2F	3(+13)	290347
268	2420	Hexafluoroacetone	2,2TC	6.1+8(+13)	291470
	2421	Nitrogen trioxide: *Not to be accepted for carriage*	2,2TOC *Note*		
20	2422	Octafluorobut-2-ene (refrigerant gas R 1318)	2,2A	2(+13)	290330
20	2424	Octafluoropropane (refrigerant gas R 218)	2,2A	2(+13)	290330
59	2426	Ammonium nitrate, liquid	5.1,20	5.1	310230
50	2427	Potassium chlorate, aqueous solution	5.1,11(b), (c)	5.1	282919
50	2428	Sodium chlorate, aqueous solution	5.1,11(b), (c)	5.1	282911
50	2429	Calcium chlorate, aqueous solution	5.1,11(b), (c)	5.1	282919
88/80	2430	Alkylphenols, solid, n.o.s. (including C_2-C_{12} homologues)	8,39(a),(b), (c)	8	290719
60	2431	Anisidines	6.1,12(c)	6.1	292222
60	2432	N,N-Diethylaniline	6.1,12(c)	6.1	292142
60	2433	Chlornitrotoluenes	6.1,17(c)	6.1	290490
X80	2434	Dibenzyldichlorosilane	8,36(b)	8	293100
X80	2435	Ethylphenyldichlorosilane	8,36(b)	8	293100
33	2436	Thioacetic acid	3,3(b)	3	293090
X80	2437	Methylphenyldichlorosilane	8,36(b)	8	293100
663	2438	Trimethylacetyl chloride	6.1,10(a)	6.1+3+8	291590
80	2439	Sodium hydrogendifluoride	8,9(b)	8	282619
80	2440	Stannic chloride, pentahydrate	8,11(c)	8	282739
48	2441	Titanium trichloride, pyrophoric	4.2,15(a)	4.2+8	282739

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
X80	2442	Trichloracetyl chloride	8,35(b)1	8	291590
80	2443	Vanadium oxytrichloride	8,12(b)	8	282749
X88	2444	Vanadium tetrachloride	8,12(a)	8	282739
X333	2445	Lithium alkyls	4.2,31(a)	4.2+4.3	293100
60	2446	Nitrocresols	6.1,12(c)	6.1	290890
446	2447	Phosphorus, white, molten	4.2,22	4.2+6.1	280470
44	2448	Sulphur, molten	4.1,15	4.1	250300
265	2451	Nitrogen trifluoride, compressed	2,1TO	6.1+05(+13)	282619
239	2452	Ethylacetylene, inhibited	2,2F	3(+13)	290129
23	2453	Ethyl fluoride (refrigerant gas R 161)	2,2F	3(+13)	290330
23	2454	Methyl fluoride (refrigerant gas R 41)	2,2F	3(+13)	290730
	2455	Methyl nitrite: *Not to be accepted for carriage*	2,2A *Note*		
33	2456	2-Chloropropene	3,1(a)	3	290329
33	2457	2,3-Dimethylbutane	3,3(b)	3	290110
33	2458	Hexadiene	3,3(b)	3	290129
33	2459	2-Methyl-1-butene	3,1(a)	3	290129
33	2460	2-Methyl-2-butene	3,2(b)	3	290129
33	2461	Methylpentadiene	3,3(b)	3	290129
X423	2463	Aluminium hydride	4.3,16(a)	4.3	285000
56	2464	Beryllium nitrate	5.1,29(b)	5.1+6.1	283429
50	2465	Dichloroisocyanuric acid salts	5.1,26(b)	5.1	293369
50	2465	Dichloroisocyanuric acid, dry	5.1,26(b)	5.1	293369
55	2466	Potassium superoxide	5.1,25(a)	5.1	281530
50	2468	Trichloroisocyanuric acid, dry	5.1,26(b)	5.1	293369
50	2469	Zinc bromate	5.1,16(c)	5.1	282990
60	2470	Phenylacetonitrile, liquid	6.1,12(c)	6.1	292690
66	2471	Osmium tetroxide	6.1,56(a)	6.1	282590
60	2473	Sodium arsanilate	6.1,34(c)	6.1	293100
60	2474	Thiophosgene	6.1,21(b)	6.1	293090
80	2475	Vanadium trichloride	8,11(c)	8	282739
663	2477	Methyl isothiocyanate	6.1,20(a)	6.1+3	293090
336/36	2478	Isocyanates, flammable, toxic, n.o.s. or Isocyanate solution, flammable, toxic, n.o.s.	3,14(b), 32(c)	3+6.1	292910
663	2480	Methyl isocyanate	6.1,5	6.1+3	292910

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
336	2481	Ethyl isocyanate	3,13	3+6.1	292910
663	2482	n-Propyl isocyanate	6.1,6(a)	6.1+3	292910
336	2483	Isopropyl isocyanate	3,14(a)	3+6.1	292910
663	2484	tert-Butyl isocyanate	6.1,6(a)	6.1+3	292910
663	2485	n-Butyl isocyanate	6.1,6(a)	6.1+3	292910
336	2486	Isobutyl isocyanate	3,14(b)	3+6.1	292910
663	2487	Phenyl isocyanate	6.1,18(a)	6.1+3	292910
663	2488	Cyclohexyl isocyanate	6.1,18(a)	6.1+3	292910
60	2490	Dichloroisopropyl ether	6.1,17(b)	6.1	290919
80	2491	Ethanolamine or Ethanolamine solution	8,53(c)	8	292211
338	2493	Hexamethyleneimine	3,23(b)	3+8	292520
568	2495	Iodine pentafluoride	5.1,5	5.1+6.1+8	281290
80	2496	Propionic anhydride	8,32(c)	8	291590
30	2498	1,2,3,6-Tetrahydrobenzaldehyde	3,31(c)	3	291229
60	2501	**Tris-(1-aziridinyl) phosphine oxide solution**	6.1,23(b),(c)	6.1	293100
83	2502	**Valeryl chloride**	8,35(b)2	8+3	291590
80	2503	**Zirconium tetrachloride**	8,11(c)	8	282739
60	2504	**Tetrabromoethane**	6.1,15(c)	6.1	290330
60	2505	**Ammonium fluoride**	6.1,63(c)	6.1	282611
80	2506	**Ammonium hydrogen sulphate**	8,13(b)	8	283329
80	2507	**Chloroplatinic acid, solid**	8,16(c)	8	281119
80	2508	**Molybdenum pentachloride**	8,11(c)	8	282739
80	2509	**Potassium hydrogen sulphate**	8,13(b)	8	283329
80	2511	**2-Chloropropionic acid**	8,32(c)	8	291590
60	2512	**Aminophenols** (o-, m-, p-)	6.1,12(c)	6.1	292229
X80	2513	**Bromacetyl bromide**	8,35(b)1	8	291590
30	2514	**Bromobenzene**	3,31(c)	3	290369
60	2515	**Bromoform**	6.1,15(c)	6.1	290330
60	2516	**Carbon tetrabromide**	6.1,15(c)	6.1	290330
23	2517	**1-Chloro-1,1-difluoroethane (refrigerant gas R 142b)**	2,2F	3(+13)	290349
60	2518	**1,5,9-Cyclododecatriene**	6.1,25(c)	6.1	290219
30	2520	**Cyclooctadienes**	3,31(c)	3	290219
663	2521	**Diketene, inhibited**	6.1,13(a)	6.1+3	291450
69	2522	**2-Dimethylaminoethyl methacrylate**	6.1,12(b)	6.1	292219
30	2524	**Ethyl orthoformate**	3,31(c)	3	291513

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	2525	**Ethyl oxalate**	6.1,14(c)	6.1	291711
38	2526	**Furfurylamine**	3,33(c)	3+8	292250
39	2527	**Isobutyl acrylate, inhibited**	3,31(c)	3	291619
30	2528	**Isobutyl isobutyrate**	3,31(c)	3	291590
38	2529	**Isobutyric acid**	3,33(c)	3+8	291560
38	2530	**Isobutyric anhydride**	3,33(c)	3+8	291560
89	2531	**Methacrylic acid, inhibited**	8,32(c)	8	291613
60	2533	**Methyl trichloroacetate**	6.1,17(c)	6.1	291590
263	2534	Methylchlorosilane	2,2TFC	6.1+3+8	293100
338	2535	**4-Methylmorpholine (N-methylmorpholine)**	3,23(b)	3+8	293390
33	2536	**Methyltetrahydrofuran**	3,3(b)	3	293219
40	2538	**Nitronaphthalene**	4.1,6(c)	4.1	290420
30	2541	**Terpinolene**	3,31(c)	3	290614
60	2542	**Tributylamine**	6.1,12(b)	6.1	292119
43/40	2545	Hafnium powder, dry	4.2,12(a), (b),(c)	4.2	811291
43/40	2546	Titanium powder, dry	4.2,12(a), (b),(c)	4.2	810810
55	2547	Sodium superoxide	5.1,25(a)	5.1	281530
265	2548	Chlorine pentafluoride	2,2TOC	6.1+05+8	281210
60	2552	**Hexafluoracetone hydrate**	6.1,17(b)	6.1	291470
33	2554	**Methylallyl chloride**	3,3(b)	3	290329
40	2555	Nitrocellulose with water (not less than 25 % water, by mass)	4.1,24(b)	4.1	391220
40	2556	Nitrocellulose with alcohol (not less than 25 % alcohol, by mass, not more than 12,6 % nitrogen, by dry mass)	4.1,24(b)	4.1	391220
40	2557	Nitrocellulose with or without plasticizer and with or without pigment	4.1,24(b)	4.1	391220
663	2558	**Epibromohydrin**	6.1,16(a)	6.1+3	291090
30	2560	**2-Methylpentan-2-ol**	3,31(c)	3	290519
33	2561	**3-Methyl-1-butene**	3,1(a)	3	290129
80	2564	**Trichloroacetic acid solution**	8,32(b)1	8	291540
80	2565	**Dicyclohexylamine**	8,53(c)	8	292130
60	2567	**Sodium pentachlorophenate**	6.1,17(b)	6.1	290810
66/60	2570	**Cadmium compound**	6.1,61(a), (b),(c)	6.1	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	2571	**Alkylsulphuric acids**	8,34(b)	8	290410
60	2572	**Phenylhydrazine**	6.1,12(b)	6.1	292800
56	2573	**Thallium chlorate**	5.1,29(b)	5.1+6.1	282919
60	2574	**Tricresyl phosphate with more than 3 % ortho isomer**	6.1,23(b)	6.1	291900
80	2576	**Phosphorus oxybromide, molten**	8,15	8	281290
80	2577	**Phenylacetyl chloride**	8,35(b)1	8	291639
80	2578	**Phosphorus trioxide**	8,16(c)	8	281129
80	2579	**Piperazine**	8,52(c)	8	293390
80	2580	**Aluminium bromide solution**	8,5(c)	8	282759
80	2581	**Aluminium chloride solution**	8,5(c)	8	282732
80	2582	**Ferric chloride solution**	8,5(c)	8	282733
80	2583	**Alkylsulphonic acids, solid with more than 5 % free sulphuric acid**	8,1(b)	8	290410
80	2583	**Arylsulphonic acids solid with more than 5 % free sulphuric acid**	8,1(b)	8	290410
80	2584	**Alkylsulphonic acids, liquid with more than 5 % free sulphuric acid**	8,1(b)	8	290410
80	2584	**Arylsulphonic acids, liquid with more than 5 % free sulphuric acid**	8,1(b)	8	290410
80	2585	**Alkylsulphonic acids, solid with not more than 5 % free sulphuric acid**	8,34(c)	8	290410
80	2585	**Arylsulphonic acids, solid with not more than 5 % free sulphuric acid**	8,34(c)	8	290410
80	2586	**Alkylsulphonic acids, liquid with not more than 5 % sulphuric acid**	8,34(c)	8	290410
80	2586	**Arylsulphonic acids, liquid with not more than 5 % free sulphuric acid**	8,34(c)	8	290410
60	2587	**Benzoquinone**	6.1,14(b)	6.1	291469
66/60	2588	**Pesticide, solid, toxic, n.o.s.**	6.1,73(a), (b),(c)	6.1	380810
63	2589	**Vinyl chloroacetate**	6.1,16(b)	6.1+3	291590
90	2590	**White asbestos (chrysotile, actinolite, anthophyllite, tremolite)**	9,1(c)	9	252400
22	2591	**Xenon, refrigerated liquid**	2,3A	2(+13)	280429
20	2599	**Chlorotrifluoromethane and trifluoromethane azeotropic mixture, with approximately 60 % chlorotrifluoromethane (refrigerant gas R 503)**	2,2A	2(+13)	382471
263	2600	**Carbon monoxide and hydrogen mixture, compressed**	2,1TF	6.1+3(+13)	270500

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
23	2601	**Cyclobutane**	2,2F	3(+13)	290219
20	2602	**Dichlorodifluoromethane and 1,1-difluoroethane, azeotropic mixture, with approximately 74 % dichlorodifluoromethane (refrigerant gas R 500)**	2,2A	2(+13)	382471
336	2603	**1,3,5-Cycloheptatriene**	3,19(b)	3+6.1	290219
883	2604	**Boron trifluoride diethyl etherate**	8,33(a)	8+3	293100
336	2605	**Methoxymethyl isocyanate**	3,14(a)	3+6.1	292910
663	2606	**Methyl orthosilicate**	6.1,8(a)	6.1+3	292090
39	2607	**Acrolein dimer, stabilized**	3,31(c)	3	293299
30	2608	**Nitropropanes**	3,31(c)	3	290420
60	2609	**Triallyl borate**	6.1,14(c)	6.1	292090
38	2610	**Triallylamine**	3,33(c)	3+8	292119
63	2611	**Propylene chlorohydrin**	6.1,16(b)	6.1+3	290550
33	2612	**Methyl propyl ether**	3,2(b)	3	290919
30	2614	**Methallyl alcohol**	3,31(c)	3	290519
33	2615	**Ethyl propyl ether**	3,3(b)	3	290919
33	2616	**Triisopropyl borate**	3,3(b)	3	292090
30	2616	**Triisopropyl borate, chemically pure**	3,31(c)	3	292090
30	2617	**Methylcyclohexanols, flammable**	3,31(c)	3	290612
39	2618	**Vinyltoluenes, inhibited**	3,31(c)	3	290290
83	2619	**Benzyl dimethylamine**	8,54(b)	8+3	292149
30	2620	**Amyl butyrates**	3,31(c)	3	291590
30	2621	**Acetyl methyl carbinol**	3,31(c)	3	290519
336	2622	**Glycidaldehyde**	3,17(b)	3+6.1	291249
40	2623	Firelighters, solid with flammable liquid	4.1,2(c)	4.1	360690
423	2624	**Magnesium silicide**	4.3,12(b)	4.3	285000
50	2626	**Chloric acid, aqueous solution with not more than 10 % chloric acid**	5.1,4(b)	5.1	281119
50	2627	**Nitrites, inorganic, n.o.s.**	5.1,23(b)	5.1	283410
66	2628	**Potassium fluoroacetate**	6.1,17(a)	6.1	291590
66	2629	**Sodium fluoroacetate**	6.1,17(a)	6.1	291590
66	2630	Selenates	6.1,55(a)	6.1	291590
66	2630	Selenites	6.1,55(a)	6.1	291590
66	2642	**Fluoroacetic acid**	6.1,17(a)	6.1	291590
60	2643	**Methyl bromoacetate**	6.1,17(b)	6.1	291590
66	2644	**Methyl iodide**	6.1,15(a)	6.1	290330
60	2645	**Phenacyl bromide**	6.1,17(b)	6.1	291470
66	2646	**Hexachlorocyclopentadiene**	6.1,15(a)	6.1	290359
60	2647	**Malononitrile**	6.1,12(b)	6.1	292690

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	2648	**1,2-Dibromobutan-3-one**	6.1,17(b)	6.1	291470
60	2649	**1,3-Dichloroacetone**	6.1,17(b)	6.1	291470
60	2650	**1,1-Dichloro-1-nitroethane**	6.1,17(b)	6.1	290490
60	2651	**4,4'-Diaminodiphenylmethane**	6.1,12(c)	6.1	292159
60	2653	**Benzyl iodide**	6.1,15(b)	6.1	290369
60	2655	**Potassium fluorosilicate**	6.1,64(c)	6.1	282620
60	2656	**Quinoline**	6.1,12(c)	6.1	293340
60	2657	**Selenium disulphide**	6.1,55(b)	6.1	283090
60	2659	**Sodium chloroacetate**	6.1,17(c)	6.1	291590
60	2660	**Nitrotoluidines**	6.1,12(c)	6.1	292143
60	2661	**Hexachloroacetone**	6.1,17(c)	6.1	291470
60	2662	**Hydroquinone**	6.1,14(c)	6.1	290722
60	2664	**Dibromomethane**	6.1,15(c)	6.1	290330
60	2666	**Ethyl cyanoacetate**	6.1,12(c)	6.1	291590
60	2667	**Butyltoluenes**	6.1,25(c)	6.1	290290
63	2668	**Chloroacetonitrile**	6.1,11(b)	6.1+3	292690
60	2669	**Chlorocresols**	6.1,14(b)	6.1	290810
80	2670	**Cyanuric chloride**	8,39(b)	8	293369
60	2671	**Aminopyridines (o-, m-, p-)**	6.1,12(b)	6.1	293339
80	2672	**Ammonia solution, relative density between 0,880 and 0,957 at 15 °C in water, with more than 10 % but not more than 35 % ammonia**	8,43(c)	8	281420
60	2673	**2-Amino-4-chlorophenol**	6.1,12(b)	6.1	292229
60	2674	**Sodium fluorosilicate**	6.1,64(c)	6.1	282620
263	2676	Stibine	2,2TF	6.1+3	285000
80	2677	**Rubidium hydroxide solution**	8,42(b),(c)	8	282590
80	2678	**Rubidium hydroxide**	8,41(b)	8	282590
80	2679	**Lithium hydroxide solution**	8,42(b),(c)	8	282590
80	2680	**Lithium hydroxide monohydrate**	8,41(b)	8	282520
80	2681	**Caesium hydroxide solution**	8,42(b),(c)	8	282590
80	2682	**Caesium hydroxide**	8,41(b)	8	282590
86	2683	**Ammonium sulphide solution**	8,45(b)2	8+3+6.1	283090
38	2684	**Diethylaminopropylamine**	3,33(c)	3+8	292129
83	2685	**N,N-Diethylethylenediamine**	8,54(b)	8+3	292129
83	2686	**Diethylaminoethanol**	8,54(b)	8+3	292219
40	2687	**Dicyclohexylammonium nitrite**	4.1,11(c)	4.1	292130

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	2688	**1-Bromo-3-chloropropane**	6.1,15(c)	6.1	290349
60	2689	**Glycerol alpha-monochlorohydrin**	6.1,17(c)	6.1	290550
60	2690	**N,n-Butylimidazole**	6.1,12(b)	6.1	293329
80	2691	**Phosphorus pentabromide**	8,11(b)	8	281290
X88	2692	**Boron tribromide**	8,12(a)	8	281290
80	2693	**Bisulphites, aqueous solution, n.o.s.**	8,17(c)	8	283220
80	2698	**Tetrahydrophthalic anhydrides**	8,31(c)	8	291739
88	2699	**Trifluoroacetic acid**	8,32(a)	8	291590
80	2705	**1-Pentol**	8,66(b)	8	290519
33/30	2707	**Dimethyldioxanes**	3,3(b),31(c)	3	293299
30	2709	**Butylbenzenes**	3,31(c)	3	290290
30	2710	**Dipropyl ketone**	3,31(c)	3	291419
60	2713	**Acridine**	6.1,12(c)	6.1	293390
40	2714	**Zinc resinate**	4.1,12(c)	4.1	380620
40	2715	**Aluminium resinate**	4.1,12(c)	4.1	380620
60	2716	**1,4-Butynediol**	6.1,14(c)	6.1	290539
40	2717	**Camphor, synthetic**	4.1,6(c)	4.1	291421
56	2719	**Barium bromate**	5.1,29(b)	5.1+6.1	282990
50	2720	**Chromium nitrate**	5.1,22(c)	5.1	283429
50	2721	**Copper chlorate**	5.1,11(b)	5.1	282919
50	2722	**Lithium nitrate**	5.1,22(c)	5.1	283429
50	2723	**Magnesium chlorate**	5.1,11(b)	5.1	282919
50	2724	**Manganese nitrate**	5.1,22(c)	5.1	283429
50	2725	**Nickel nitrate**	5.1,22(c)	5.1	283429
50	2726	**Nickel nitrite**	5.1,23(c)	5.1	283410
65	2727	**Thallium nitrate**	6.1,68(b)	6.1+05	283429
50	2728	**Zirconium nitrate**	5.1,22(c)	5.1	283429
60	2729	**Hexachlorobenzene**	6.1,15(c)	6.1	290362
60	2730	**Nitroanisole**	6.1,12(c)	6.1	290930
60	2732	**Nitrobromobenzene**	6.1,12(c)	6.1	290490
338/38	2733	**Amines, flammable, corrosive, n.o.s.**	3,22(a),(b), 33(c)	3+8	2921**
338/38	2733	**Polyamines, flammable, corrosive, n.o.s.**	3,22(a),(b), 33(c)	3+8	2921**
883/83	2734	**Amines, liquid, corrosive, flammable, n.o.s.**	8,54(a),(b)	8+3	2921**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
883/83	2734	**Polyamines, liquid, corrosive, flammable, n.o.s.**	8,54(a),(b)	8+3	2921**
88/80	2735	**Amines, liquid, corrosive, n.o.s.**	8,53(a), (b),(c)	8	2921**
88	2735	**Polyamines, liquid, corrosive, n.o.s.**	8,53(a),(b), (c)	8	2921**
60	2738	**N-Butylaniline**	6.1,12(b)	6.1	292142
80	2739	**Butyric anhydride**	8,32(c)	8	291560
668	2740	**n-Propyl chloroformate**	6.1,28(a)	6.1+8+3	291590
56	2741	**Barium hypochlorite with more than 22 % available chlorine**	5.1,29(b)	5.1+6.1	282890
638	2742	**Chloroformates, toxic, corrosive, flammable, n.o.s.**	6.1,28(b)	6.1+3+8	291590
638	2743	**n-Butyl chloroformate**	6.1,28(b)	6.1+3+8	291590
638	2744	**Cyclobutyl chloroformate**	6.1,28(b)	6.1+3+8	291590
68	2745	**Chloromethyl chloroformate**	6.1,27(b)	6.1+8	291590
68	2746	**Phenyl chloroformate**	6.1,27(b)	6.1+8	291590
60	2747	**tert-Butylcyclohexyl chloroformate**	6.1,17(c)	6.1	291590
68	2748	**2-Ethylhexyl chloroformate**	6.1,27(b)	6.1+8	291590
33	2749	**Tetramethylsilane**	3,1(a)	3	293100
60	2750	**1,3-Dichloropropanol-2**	6.1,17(b)	6.1	290550
80	2751	**Diethylthiophosphoryl chloride**	8,35(b)1	8	292010
30	2752	**1,2-Epoxy-3-ethoxypropane**	3,31(c)	3	291090
60	2753	**N-Ethylbenzyltoluidines**	6.1,12(c)	6.1	292143
60	2754	**N-Ethyltoluidines**	6.1,12(b)	6.1	292143
66/60	2757	**Carbamate pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2758	**Carbamate pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2759	**Arsenical pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
336	2760	**Arsenical pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6	380810
66/60	2761	**Organochlorine pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2762	**Organochlorine pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2763	**Triazine pesticide, solid toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2764	**Triazine pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2765	**Phenoxy pesticide, solid, toxic**	6.1,73(a), b),(c)	6.1	380810
336	2766	**Phenoxy pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2767	**Phenyl urea pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2768	**Phenyl urea pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2769	**Benzoic derivative pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2770	**Benzoic derivative pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2771	Dithiocarbamate pesticide, solid, toxic	6.1,73(a), (b),(c)	6.1	380810
336	2772	**Dithiocarbamate pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66/60	2773	**Phthalimide derivative pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2774	**Phthalimide derivative pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2775	**Copper based pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2776	**Copper based pesticide, liquid, flammable, toxic, flash-point les than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2777	**Mercury based pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2778	**Mercury based pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2779	**Substituted nitrophenol pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2780	**Substituted nitrophenol pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2781	**Bipyridilium pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2782	**Bipyridilium pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2783	**Organophosphorus pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
336	2784	**Organophosphorus pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
60	2785	**4-Thiapentanal**	6.1,2(c)	6.1	293090
66/60	2786	**Organotin pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
336	2787	**Organotin pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
66/60	2788	**Organotin compound, liquid, n.o.s.**	6.1,32(a), (b),(c)	6.1	293100
83	2789	**Acetic acid, glacial or acetic acid solution, with more than 80 % acid, by mass**	8,32(b)2	8+3	291521
80	2790	**Acetic acid solution, with more than 25 % but not more than 50 % acid, by mass**	8,32(c)	8	291521
80	2790	**Acetic acid solution, with more than 50 % but not more than 80 % acid, by mass**	8,32(b)1	8	291521
40	2793	**Ferrous metal borings, shavings, turnings or cuttings**	4.2,12(c)	4.2	**
80	2794	**Batteries, wet, filled with acid, electric storage**	8,81(c)	8	8507**
80	2795	**Batteries, wet, filled with alkali, electric storage**	8,81(c)	8	8507**
80	2796	**Sulphuric acid with not more than 51 % acid or Battery fluid, acid**	8,1(b)	8	280700
80	2797	**Battery fluid, alkali**	8,42(b)	8	2815**
80	2798	**Phenylphosphorus dichloride**	8,35(b)1	8	293100
80	2799	**Phenylphosphorus thiodichloride**	8,35(b)1	8	292010
80	2800	**Batteries, wet, non-spillable, electric storage**	8,81(c)	8	8507**
88/80	2801	**Dye intermediate, liquid, corrosive, n.o.s.**	8,66(a),(b), (c)	8	**
80/88	2801	**Dye, liquid, corrosive, n.o.s.**	8,66(a),(b), (c)	8	320649

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	2802	**Copper chloride**	8,11(c)	8	282739
80	2803	**Gallium**	8,65(c)	8	811299
X423	2805	**Lithium hydride, fused, solid**	4.3,16(b)	4.3	285000
X423	2806	Lithium nitride	4.3,17(a)	4.3	285000
	2807	Magnetized material: *Not subject to RID*	9, *See marg. 900(3)*		
80	2809	**Mercury**	8,66(c)	8	280540
66/60	2810	**Toxic liquid, organic, n.o.s.**	6.1,25(a), (b),(c)	6.1	**
66/60	2811	**Toxic solid, organic, n.o.s.**	6.1,25(a), (b),(c)	6.1	**
	2812	Sodium aluminate, solid: *Not subject to RID*	8, *See marg. 800(9)*		
X423/ 423	2813	Water-reactive solid, n.o.s.	4.3,20(a), (b),(c)	4.3	**
606	2814	Infectious substance, affecting humans	6.2,1,2 or 3(b)	6.2	**
80	2815	**N-Aminoethylpiperazine**	8,53(c)	8	293390
86	2817	**Ammonium hydrogendifluoride solution**	8,7(b),(c)	8+6.1	282619
86	2818	**Ammonium polysulphide solution**	8,45(b)1,(c)	8+6.1	283090
80	2819	**Amyl acid phosphate**	8,38(c)	8	291900
80	2820	**Butyric acid**	8,32(c)	8	291560
60	2821	**Phenol solution**	6.1,14(b),(c)	6.1	290711
60	2822	**2-Chloropyridine**	6.1,12(b)	6.1	293339
80	2823	**Crotonic acid**	8,31(c)	8	291619
83	2826	**Ethyl chlorothioformate**	8,64(b)	8+3	291590
80	2829	**Caproic acid**	8,32(c)	8	291590
423	2830	**Lithium ferrosilicon**	4.3,12(b)	4.3	285000
60	2831	**1,1,1-Trichloroethane**	6.1,15(c)	6.1	290319

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	2834	**Phosphorous acid**	8,16(c)	8	281119
423	2835	**Sodium aluminium hydride**	4.3,16(b)	4.3	285000
80	2837	**Bisulphates, aqueous solution, n.o.s.**	8,1(b),(c)	8	283319
339	2838	**Vinyl butyrate, inhibited**	3,3(b)	3	291590
60	2839	**Aldol**	6.1,14(b)	6.1	291249
30	2840	**Butyraldoxime**	3,31(c)	3	292990
36	2841	**Di-n-amylamine**	3,32(c)	3+6.1	292119
30	2842	**Nitroethane**	3,31(c)	3	290420
423	2844	**Calcium manganese silicon**	4.3,12(c)	4.3	285000
333	2845	**Pyrophoric liquid, organic, n.o.s.**	4.2,6(a)	4.2	**
43	2846	Pyrophoric solid, organic, n.o.s.	4.2,5(a)	4.2	**
60	2849	**3-Chloropropanol-1**	6.1,17(c)	6.1	290550
30	2850	**Propylene tetramer**	3,31(c)	3	290129
80	2851	**Boron trifluoride dihydrate**	8,10(b)	8	281290
40	2852	Dipicryl sulphide, wetted with not less than 10 % water, by mass	4.1,21(a)2	4.1	360200
60	2853	**Magnesium fluorosilicate**	6.1,64(c)	6.1	282690
60	2854	**Ammonium fluorosilicate**	6.1,64(c)	6.1	282690
60	2855	**Zinc fluorosilicate**	6.1,64(c)	6.1	282690
60	2856	**Fluorosilicates, n.o.s.**	6.1,64(c)	6.1	282690
20	2857	Refrigerating machines containing non-flammable, non-toxic, liquefied gas or ammonia solutions (UN 2672)	2,6A	2	841861
40	2858	**Zirconium, dry, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)**	4.1,13(c)	4.1	810910
60	2859	**Ammonium metavanadate**	6.1,58(b)	6.1	284190
60	2861	**Ammonium polyvanadate**	6.1,58(b)	6.1	284190
60	2862	**Vanadium pentoxide, non-fused form**	6.1,58(b)	6.1	282530
60	2863	**Sodium ammonium vanadate**	6.1,58(b)	6.1	284190
60	2864	**Potassium metavanadate**	6.1,58(b)	6.1	284190
80	2865	**Hydroxylamine sulphate**	8,16(c)	8	282510
80	2869	**Titanium trichloride mixture**	8,11(b),(c)	8	282739
X333	2870	**Aluminium borohydride**	4.2,17(a)	4.2+4.3	285000
X333	2870	Aluminium borohydride in devices	4.2,17(a)	4.2+4.3	285000
60	2871	**Antimony powder**	6.1,59(c)	6.1	811000
60	2872	**Dibromochloropropanes**	6.1,15(b),(c)	6.1	290349
60	2873	**Dibutylaminoethanol**	6.1,12(c)	6.1	292219
60	2874	**Furfuryl alcohol**	6.1,14(c)	6.1	293213

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
60	2875	**Hexachlorophene**	6.1,15(c)	6.1	290810
60	2876	**Resorcinol**	6.1,14(c)	6.1	290721
40	2878	Titanium sponge granules or Titanium sponge powders	4.1,13(c)	4.1	810810
X886	2879	**Selenium oxychloride**	8,12(a)	8+6.1	282749
50	2880	**Calcium hypochlorite, hydrated or Calcium hypochlorite, hydrated mixture with not less than 5,5 % but not more than 10 % water**	5.1,15(b)	5.1	282810
43/40	2881	Metal catalyst, dry	4.2,12(a),(b),(c)	4.2	81****
606	2900	Infectious substance, affecting animals	6.2,1,2,3(b)	6.2	**
265	2901	**Bromine chloride**	2,2TOC	6.1+05+8(+13)	281210
66/60	2902	**Pesticide, liquid, toxic, n.o.s.**	6.1,71(a),(b),(c)	6.1	380810
663/63	2903	**Pesticide, liquid, toxic, flammable, n.o.s. flash point not less than 23 °C**	6.1,72(a),(b),(c)	6.1+3	380810
80	2904	**Chlorophenolates, liquid or Phenolates, liquid**	8,62(c)	8	290711
80	2905	**Chlorophenolates, solid or Phenolates, solid**	8,62(c)	8	290711
40	2907	Isosorbide dinitrate mixture	4.1,23(b)	4.1	360200
70	2910	Radioactive material, limited quantities in excepted package	7	—	284440
70	2910	— articles manufactured from natural or depleted uranium or natural thorium	7,Sch 3	—	284440
70	2910	— empty packaging	7,Sch 4	—	284440
70	2910	— instruments or articles	7,Sch 2	—	284440
70	2910	— limited quantity of material	7,Sch 1	—	284440

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
70	2912	**Radioactive material, low specific activity (LSA), not otherwise specified**	7	(703)	284440
70	2912	**— LSA-I**	7,Sch 5	(703)	284440
70	2912	**— LSA-II**	7,Sch 6	(703)	284440
70	2912	**— LSA-III**	7,Sch 7	(703)	284440
70	2912	**— under special arrangement**	7,Sch 13	(703)	284440
70	2913	Radioactive material, surface contaminated objects (SCO)	7	(703)	284440
70	2913	— SCO-I and SCO-II	7,Sch 8	(703)	284440
70	2913	— under special arrangement	7,Sch 13	(703)	284440
70	2918	Radioactive material, fussile, n.o.s. — under special arrangement	7,Sch 13	(703)	284440
70	2918	Radioactive material, fissile, n.o.s. — in Type IF, AF, B(U)F or B(M)F packagings	7,Sch 12	(703)	284440
883/83	2920	**Corrosive liquid, flammable, n.o.s.**	8,68(a),(b)	8+3	**
884/84	2921	**Corrosive solid, flammable, n.o.s.**	8,67(a),(b)	8+4.1	**
886/86	2922	**Corrosive liquid, toxic, n.o.s.**	8,76(a),(b),(c)	8+6.1	**
886/86	2923	**Corrosive solid, toxic, n.o.s.**	8,75(a),(b),(c)	8+6.1	**
338/38	2924	**Flammable liquid, corrosive, n.o.s.**	3,26(a),(b),33(c)	3+8	**
48	2925	**Flammable solid, corrosive, organic, n.o.s.**	4.1,8(b),(c)	4.1+8	**
46	2926	**Flammable solid, toxic, organic, n.o.s.**	4.1,7(b),(c)	4.1+6.1	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
668/68	2927	**Toxic liquid, corrosive, organic, n.o.s.**	6.1,27(a),(b)	6.1+8	**
668/68	2928	**Toxic solid, corrosive, oorganic, n.o.s.**	6.1,27(a),(b)	6.1+8	**
663/63	2929	**Toxic liquid, flammable, organic, n.o.s.**	6.1,26(a)1, (b)1	6.1+3	**
664/64	2930	**Toxic solid, flammable, organic, n.o.s.**	6.1,26(a)2, (b)2	6.1+4.1	**
60	2931	**Vanadyl sulphate**	6.1,58(b)	6.1	283329
30	2933	**Methyl 2-chloropropionate**	3,31(c)	3	291590
30	2934	**Isopropyl 2-chloropropionate**	3,31(c)	3	291590
30	2935	**Ethyl 2-chloropropionate**	3,31(c)	3	291590
60	2936	**Thiolactic acid**	6.1,21(b)	6.1	293090
60	2937	**alpha-Methylbenzyl alcohol**	6.1,14(c)	6.1	290629
40	2940	**9-Phosphabicyclononanes (cyclooctadiene phosphines)**	4.2,5(b)	4.2	293100
60	2941	**Fluoranilines**	6.1,12(c)	6.1	292142
60	2942	**2-Trifluormethylaniline**	6.1,12(c)	6.1	292142
30	2943	**Tetrahydrofurfurylamine**	3,31(c)	3	292250
338	2945	**N-Methylbutylamine**	3,22(b)	3+8	292119
60	2946	**2-Amino-5-diethylaminopentane**	6.1,12(c)	6.1	292129
30	2947	**Isopropyl chloroacetate**	3,31(c)	3	291590
60	2948	**3-Trifluormethylaniline**	6.1,17(b)	6.1	292142
80	2949	**Sodium hydrosulphide with not less than 25 % water of crystallization**	8,45(b)1	8	283010
423	2950	**Magnesium granules, coated**	4.3,11(c)	4.3	810430
40	2956	5-tert-Butyl-2,4,6-trinitro-m-xylene(muskxylene)	4.1,26(c)	4.1	290420
382	2965	**Boron trifluoride dimethyl etherate**	4.3,2(a)	4.3+3+8	293100
60	2966	**Thioglycol**	6.1,21(b)	6.1	293090

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	2967	**Sulphamic acid**	8,16(c)	8	281119
423	2968	**Maneb, stabilized or Maneb preparation, stabilized**	4.3,20(c)	4.3	380820
90	2969	**Castor beans or castor meal or castor pomace or castor flake**	9,35(b)	9	120890 (castor meal) 120730 (castor flake and beans) 230690 (castor pomace)
	2974	Radioactive material, special form, n.o.s.	7		
70	2974	— in Type A packages	7,Sch 9	(703)	284440
70	2974	— in Type B(M) packages	7,Sch 11	(703)	284440
70	2974	— in Type B(U) packages	7,Sch 10	(703)	284440
70	2974	— under special arrangement	7,Sch 13	(703)	284440
	2975	Thorium metal, pyrophoric	7		
70	2975	— in Type A packages	7,Sch 9	(703)	284430
70	2975	— in Type B(M) packages	7,Sch 11	(703)	284430
70	2975	— in Type B(U) packages	7,Sch 10	(703)	284430
70	2975	— under special arrangement	7,Sch 13	(703)	284430
	2976	Thorium nitrate, solid	7		
70	2976	— in Type A packages	7,Sch 9	(703)	284430
70	2976	— in Type B(M) packages	7,Sch 11	(703)	284430
70	2976	— in Type B(U) packages	7,Sch 10	(703)	284430
70	2976	— LSA-I	7,Sch 5	(703)	284430
70	2976	— LSA-II	7,Sch 6	(703)	284430
70	2976	— under special arrangement	7,Sch 13	(703)	284430
	2977	Uranium hexafluoride, fissile	7		
78	2977	— in approved packages	7,Sch 12	(703)	2844**

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HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
78	2977 2978	— under special arrangement Uranium hexafluoride, non fissile or fissile-excepted	7,Sch 13 7	(703)	2844**
78	2978	— LSA-I	7,Sch 5	(703)	2844**
78	2978	— LSA-II	7,Sch 6	(703)	2844**
78	2978	— under special arrangement	7,Sch 13	(703)	2844**
	2979	Uranium metal, pyrophoric	7		
70	2979	— in Type A packages	7,Sch 9	(703)	2844**
70	2979	— in Type B(M) packages	7,Sch 11	(703)	2844**
70	2979	— in Type B(U) packages	7,Sch 10	(703)	2844**
70	2979	— under special arrangement	7,Sch 13	(703)	2844**
	2980	**Uranyl nitrate hexahydrate solution**	7		
70	2980	— in Type A packages	7,Sch 9	(703)	2844**
70	2980	— in Type B(M) packages	7,Sch 11	(703)	2844**
70	2980	— in Type B(U) packages	7,Sch 10	(703)	2844**
78	2980	**— LSA-I**	7,Sch 5	7A,7B,7C+8	2844**
78	2980	**— LSA-II**	7,Sch 6	7A,7B,7C+8	2844**
70	2981	— under special arrangement	7,Sch 13	(703)	2844**
70	2981	Uranyl nitrate solid	7		
70	2981	— in Type A packages	7,Sch 9	(703)	2844**
70	2981	— in Type B(M) packages	7,Sch 11	(703)	2844**
70	2981	— in Type B(U) packages	7,Sch 10	(703)	2844**
70	2981	— LSA-I	7,Sch 5	(703)	2844**
70	2981	— LSA-II	7,Sch 6	(703)	2844**
70	2981	— under special arrangement	7,Sch 13	(703)	2844**
70	2982	**Radioactive material, n.o.s.**	7		
70	2982	**— in Type A packages**	7,Sch 9	(703)	284440
70	2982	**— in Type B(M) packages**	7,Sch 11	(703)	284440

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
70	2982	**— in Type B(U) packages**	7,Sch 10	(703)	284440
70	2982	**— under special arrangement**	7,Sch 13	(703)	284440
336	2983	**Ethylene oxide and propylene oxide mixture, with not more than 30 % ethylene oxide**	3,17(a)	3+6.1	291020
50	2984	**Hydrogen peroxide, aqueous solution with not less than 8 % but less than 20 % hydrogen peroxide**	5.1,1(c)	5.1	284700
X338	2985	**Chlorosilanes, flammable, corrosive, n.o.s.**	3,21(b)	3+8	293100
X83	2986	**Chlorosilanes, corrosive, flammable, n.o.s.**	8,37(b)	8+3	293100
X80	2987	**Chlorosilanes, corrosive, n.o.s.**	8,36(b)	8	293100
X338	2988	**Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.**	4.3,1(a)	4.3+3+8	293100
40	2989	**Lead phosphite dibasic**	4.1,11(b),(c)	4.1	283510
90	2990	Life-saving appliances, self-inflating, such as aircraft evacuation chutes and aircraft survival kits	9,6	9	630720
663	2991	**Carbamate pestice, liquid, toxic, flammable, flash point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	2992	**Carbamate pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	2993	**Arsenical pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	2994	**Arsenical pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	2995	**Organochlorine pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	2996	**Organochlorine pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	2997	**Triazine pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810

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HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66/60	2998	**Triazine pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	2999	**Phenoxy pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3000	**Phenoxy pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	3001	**Phenyl urea pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3002	**Phenyl urea pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	3003	**Benzoic derivative pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3004	**Benzoic derivative pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	3005	**Dithiocarbamate pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3006	**Dithiocarbamate pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	3007	**Phthalimide derivative pesticide, liquid, toxic, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810

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HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66/60	3008	**Phthalimide derivative pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	3009	**Copper based pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3010	**Copper based pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	3011	**Mercury based pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3012	**Mercury based pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	3013	**Substituted nitrophenol pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3014	**Substituted nitrophenol pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	3015	**Bipyridilium pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3016	**Bipyridilium pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810

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HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
663/63	3017	**Organophosphorus pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3018	**Organophosphorus pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
663/63	3019	**Organotin pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3020	**Organotin pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
336	3021	**Pesticide, liquid, flammable, toxic, n.o.s., flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
339	3022	**1,2-Butylene oxide, stabilized**	3,3(b)	3	291090
663	3023	**tert-Octyl mercaptan**	6.1,20(a)	6.1+3	293090
336	3024	**Coumarin derivative pesticide, liquid, flammable, toxic, flash-point less than 23 °C**	3,41(a),(b)	3+6.1	380810
663/63	3025	**Coumarin derivative pesticide, liquid, toxic, flammable, flash-point not less than 23 °C**	6.1,72(a), (b),(c)	6.1+3	380810
66/60	3026	**Coumarin derivative pesticide, liquid, toxic**	6.1,71(a), (b),(c)	6.1	380810
66/60	3027	**Coumarin derivative pesticide, solid, toxic**	6.1,73(a), (b),(c)	6.1	380810
80	3028	**Batteries, dry, containing potassium hydroxide solid, electric storage**	8,81(c)	8	8507**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
642	3048	Aluminium phosphide pesticide	6.1,43(a)	6.1	284800
X333	3049	**Metal alkyl halides, n.o.s. or metal aryl halides, n.o.s.**	4.2,32(a)	4.2+4.3	293100
X333	3050	**Metal alkyl hydrides, n.o.s. or metal aryl hydrides, n.o.s.**	4.2,32(a)	4.2+4.3	293100
X333	3051	**Aluminium alkyls**	4.2,31(a)	4.2+4.3	293100
X333	3052	**Aluminium alkyl halides**	4.2,32(a)	4.2+4.3	293100
X333	3053	**Magnesium alkyls**	4.2,31(a)	4.2+4.3	293100
30	3054	**Cyclohexyl mercaptan**	3,31(c)	3	293090
80	3055	**2-(2-Aminoethoxy)ethanol**	8,53(c)	8	292219
30	3056	**n-Heptaldehyde**	3,31(c)	3	291219
268	3057	**Trifluoracetyl chloride**	2,2TC	6.1+8(+13)	291590
33	3064	Nitroglycerin solution in alcohol with more than 1 % but not more than 5 % nitroglycerin	3,6	3	300390
33/30	3065	**Alcoholic beverages**	3,3(b),31(c)	3	220710
80	3066	**Paint or Paint related material**	8,66(b),(c)	8	320419
20	3070	**Ethylene oxide and dichlorodifluoromethane mixture with not more than 12,5 % ethylene oxide**	2,2A	2(+13)	291010
63	3071	**Mercaptans, liquid, toxic, flammable, n.o.s.**	6.1,20(b)	6.1+3	293090
90	3072	Life-saving appliances, not self-inflating	9,7	9	630720
638	3073	**Vinylpyridines, inhibited**	6.1,11(b)1	6.1+3+8	293339
X333	3076	**Aluminium alkyl hydrides**	4.2,32(a)	4.2+4.3	293100
90	3077	**Environmentally hazardous substance, solid, n.o.s.**	9,12(c)	9	**
423	3078	**Cerium, turnings or gritty powder**	4.3,13(b)	4.3	811299
336	3079	**Methacrylonitrile, inhibited**	3,11(a)	3+6.1	292690
63	3080	**Isocyanates, toxic, flammable, n.o.s. or Isocyanate solution, toxic, flammable, n.o.s.**	6.1,18(b)	6.1+3	292910
90	3082	**Environmentally hazardous substance, liquid, n.o.s.**	9,11(c)	9	**
265	3083	**Perchloryl fluoride**	2,2TO	6.1+05(+13)	281210
885/85	3084	**Corrosive solid, oxidizing, n.o.s.**	8,73(a),(b)	8+05	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
558/58	3085	Oxidizing solid, corrosive, n.o.s.	5.1,31(a),(b),(c)	5.1+8	**
665/65	3086	**Toxic solid, oxidizing, n.o.s.**	6.1,68(a),(b)	6.1+05	**
556/56	3087	Oxidizing solid, toxic, n.o.s.	5.1,29(a),(b),(c)	5.1+6.1	**
40	3088	**Self-heating solid, organic, n.o.s.**	4.2,5(b),(c)	4.2	**
40	3089	**Metal powder, flammable, n.o.s.**	4.1,13(b),(c)	4.1	**
90	3090	Lithium batteries	9,5	9	850650
90	3091	Lithium batteries contained in equipment	9,5	9	850650
30	3092	**1-Methoxy-2-propanol**	3,31(c)	3	290949
885/85	3093	**Corrosive liquid, oxidizing, n.o.s.**	8,74(a),(b)	8+05	**
823	3094	**Corrosive liquid, water-reactive, n.o.s.**	8,72(a),(b)	8+4.3	**
884/84	3095	Corrosive solid, self-heating, n.o.s.	8,69(a),(b)	8+4.2	**
842	3096	Corrosive solid, water-reactive, n.o.s.	8,71(a),(b)	8+4.3	**
	3097	Flammable solid, oxidizing, n.o.s.: *Not to be accepted for carriage*	4.1, *See marg. 400(11)*		

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
558/58	3098	Oxidizing liquid, corrosive, n.o.s.	5.1,32(a),(b),(c)	5.1+8	**
556/56	3099	Oxidizing liquid, toxic, n.o.s.	5.1,30(a),(b),(c)	5.1+6.1	**
	3100	Oxidizing solid, self-heating, n.o.s.: *Not to be accepted for carriage*	5.1, *See marg. 500(12)*		
539	3101	Organic peroxide type B, liquid	5.2,1(b)	5.2+01+(8)	**
539	3102	Organic peroxide type B, solid	5.2,2(b)	5.2+01	**
539	3103	Organic peroxide type C, liquid	5.2,3(b)	5.2+(8)	**
539	3104	Organic peroxide type C, solid	5.2,4(b)	5.2+(8)	**
539	3105	Organic peroxide type D, liquid	5.2,5(b)	5.2+(8)	**
539	3106	Organic peroxide type D, solid	5.2,6(b)	5.2	**
539	3107	Organic peroxide type E, liquid	5.2,7(b)	5.2+(8)	**
539	3108	Organic peroxide type E, solid	5.2,8(b)	5.2	**
539	3109	**Organic peroxide type F, liquid**	5.2,9(b)	5.2+(8)	**
539	3110	**Organic peroxide type F, solid**	5.2,10(b)	5.2	**
	3121	Oxidizing solid, water-reactive, n.o.s.: *Not to be accepted for carriage*	5.1,*See marg. 500(12)*		
665/65	3122	**Toxic liquid, oxidizing, n.o.s.**	6.1,68(a),(b)	6.1+05	**
623	3123	**Toxic liquid, water-reactive, n.o.s.**	6.1,44(a),(b)	6.1+4.3	**
664/64	3124	**Toxic solid, self-heating, n.o.s.**	6.1,66(a),(b)	6.1+4.2	**
642	3125	**Toxic solid, water-reactive, n.o.s.**	6.1,44(a),(b)	6.1+4.3	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
48	3126	**Self-heating solid, corrosive, organic, n.o.s.**	4.2,9(b),(c)	4.2+8	**
	3127	Self-heating solid, oxidizing, n.o.s.: *Not to be accepted for carriage*	4.2,*See marg. 430(11)*		
46	3128	**Self-heating solid, toxic, organic, n.o.s.**	4.2,7(b),(c)	4.2+6.1	**
X382/382	3129	**Water-reactive liquid, corrosive, n.o.s.**	4.3,25(a), (b),(c)	4.3+8	**
X362/362	3130	**Water-reactive liquid, toxic, n.o.s.**	4.3,23(a), (b),(c)	4.3+6.1	**
X482/482	3131	Water-reactive solid, corrosive, n.o.s.	4.3,24(a), (b),(c)	4.3+8	**
	3132	Water-reactive solid, flammable, n.o.s.: *Not to be accepted for carriage*	4.3,*See marg. 470(11)*		
	3133	Water-reactive solid, oxidizing, n.o.s.: *Not to be accepted for carriage*	4.3,*See marg. 470(11)*		
X462/462	3134	Water-reactive solid, toxic, n.o.s.	4.3,22(a), (b),(c)	4.3+6.1	**
	3135	Water-reactive solid, self-heating, n.o.s.: *Not to be accepted for carriage*	4.3,*See marg. 470(11)*		
22	3136	**Trifluoromethane, refrigerated liquid**	2,3A	2(+13)	290330
	3137	Oxidizing solid, flammable, n.o.s.: *Not to be accepted for carriage*	5.1,*See marg. 500(12)*		

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
223	3138	**Ethylene, acetylene and propylene mixture, refrigerated liquid containing at least 71,5 % ethylene with not more than 22,5 % acetylene and not more than 6 % propylene**	2,3F	3(+13)	271119
55/50	3139	Oxidizing liquid, n.o.s.	5.1,28(a),(b),(c)	5.1	**
66/60	3140	**Alkaloids, liquid, n.o.s. or alkaloid salts, liquid, n.o.s.**	6.1,90(a),(b),(c)	6.1	293990
60	3141	**Antimony compound, inorganic, liquid, n.o.s.**	6.1,59(c)	6.1	**
66/60	3142	**Disinfectant, liquid, toxic, n.o.s.**	6.1,25(a),(b),(c)	6.1	380840
66/60	3143	**Dye intermediate, solid, toxic, n.o.s.**	6.1,25(a),(b),(c)	6.1	**
66/60	3143	**Dye, solid, toxic, n.o.s.**	6.1,25(a),(b),(c)	6.1	321000
66/60	3144	**Nicotine compound, liquid, n.o.s. or Nicotine preparation, liquid, n.o.s.**	6.1,90(a),(b),(c)	6.1	293970
88/80	3145	**Alkylphenols, liquid, n.o.s. (including C_2-C_{12} homologues)**	8,40(a),(b),(c)	8	290719
66/60	3146	**Organotin compound, solid, n.o.s.**	6.1,32(a),(b),(c)	6.1	293100
80	3147	**Dye intermediate, solid, corrosive, n.o.s.**	8,65(b),(c)	8	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
80	3147	**Drye, solid, corrosive, n.o.s.**	8,65(b),(c)	8	320649
X323/323	3148	**Water-reactive liquid, n.o.s.**	4.3,21(a), (b),(c)	4.3	**
58	3149	**Hydrogen peroxide and peroxyacetic acid mixture, stabilized**	5.1,1(b)	5.1+8	284700
23	3150	Devices, small, hydrocarbon gas powered or Hydrocarbon gas refills for small devices with release device	2,6F	3	***
90	3151	**Polyhalogenated biphenyls, liquid or polyhalogenated terphenyls, liquid**	9,2(b)	9	290369
90	3152	**Polyhalogenated biphenyls, solid or polyhalogenated terphenyls, solid**	9,2(b)	9	290369
23	3153	**Perfluor(methyl vinyl ether)**	2,2F	3(+13)	290920
23	3154	**Perfluoro(ethyl vinyl ether)**	2,2F	3(+13)	290920
60	3155	**Pentachlorophenol**	6.1,17(b)	6.1	290810
25	3156	**Compressed gas, oxidizing, n.o.s.**	2,1O	2+05(+13)	**
25	3157	**Liquefied gas, oxidizing, n.o.s.**	2,2O	2+05(+13)	**
22	3158	**Gas, refrigerated liquid, n.o.s.**	2,3A	2(+13)	**
20	3159	**1,1,1,2-Tetrafluoroethane (refrigerant gas R 134a)**	2,2A	2(+13)	290330
263	3160	**Liquefied gas, toxic, flammable, n.o.s.**	2,2TF	6.1+3(+13)	**
23	3161	**Liquefied gas, flammable, n.o.s.**	2,2F	3(+13)	**
26	3162	**Liquefied gas, toxic, n.o.s.**	2,2T	6.1(+13)	**
20	3163	Liquefied gas, n.o.s.	2,2A	2(+13)	**
20	3164	Articles, pressurized, pneumatic or hydraulic (containing non-flammable gas)	2,6A	2	***
336	3165	Aircraft hydraulic power unit fuel tank (containing a mixture of anhydrous hydrazine and methylhydrazine) (M86 fuel)	3,28	3+6.1+8	880330
	3166	Engines, internal combustion, including when fitted in machinery or vehicles: *Not subject to RID*	9,*See marg. 900(3)*		
23	3167	Gas sample, non-pressurized, flammable, n.o.s., not refrigerated liquid	2,7F	3	**
263	3168	Gas sample, non-pressurized, toxic, flammable, n.o.s., not refrigerated liquid	2,7TF	6.1+3	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
26	3169	Gas sample, non-pressurized, toxic, n.o.s. not refrigerated liquid	2,7T	6.1	**
423	3170	**Aluminium smelting by-products or Aluminium remelting by-products**	4.3,13(b),(c)	4.3	262040
	3171	Battery-powered equipment (wet battery): *Not subject to RID*	9,*See marg. 900(3)*		
	3171	Battery-powered vehicle (wet battery): *Not subject to RID*	9,*See marg. 900(3)*		
66/60	3172	**Toxins, extracted from living sources, n.o.s.**	6.1,90(a),(b),(c)	6.1	300290
40	3174	**Titanium disulphide**	4.2,13(c)	4.2	283090
40	3175	**Solids containing flammable liquid, n.o.s.**	4.1,4(c)	4.1	**
44	3176	**flammable solid, organic, molten, n.o.s.**	4.1,5	4.1	**
40	3178	**Flammable solid, inorganic, n.o.s.**	4.1,11(b),(c)	4.1	**
46	3179	**Flammable solid, toxic, inorganic, n.o.s.**	4.1,16(b),(c)	4.1+6.1	**
48	3180	**Flammable solid, corrosive, inorganic, n.o.s.**	4.1,17(b),(c)	4.1+8	**
40	3181	**Metal salts of organic compounds, flammable, n.o.s.**	4.1,12(b),(c)	4.1	**
40	3182	**Metal hydrides, flammable, n.o.s.**	4.1,14(b),(c)	4.1	285000
30	3183	**Self-heating liquid, organic, n.o.s.**	4.2,6(b),(c)	4.2	**
36	3184	**Self-heating liquid, toxic, organic, n.o.s.**	4.2,8(b),(c)	4.2+6.1	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
38	3185	**Self-heating liquid, corrosive, organic, n.o.s.**	4.2,10(b),(c)	4.2+8	**
30	3186	**Self-heating liquid, inorganic, n.o.s.**	4.2,17(b),(c)	4.2	**
36	3187	**Self-heating liquid, toxic, inorganic, n.o.s.**	4.2,19(b),(c)	4.2+6.1	**
38	3188	**Sel-heating liquid, corrosive, inorganic, n.o.s.**	4.2,21(b),(c)	4.2+8	**
40	3189	**Metal powder, self-heating, n.o.s.**	4.2,12(b),(c)	4.2	**
40	3190	**Self-heating solid, inorganic, n.o.s.**	4.2,16(b),(c)	4.2	**
46	3191	**Self-heating solid, toxic, inorganic, n.o.s.**	4.2,18(b),(c)	4.2+6.1	**
48	3192	**Self-heating solid, corrosive, inorganic, n.o.s.**	4.2,20(b),(c)	4.2+8	**
333	3194	**Pyrophoric liquid, inorganic, n.o.s.**	4.2,17(a)	4.2+4.3	**
43	3200	Pyrophoric solid, inorganic, n.o.s.	4.2,16(a)	4.2	**
X333	3203	**Pyrophoric organometallic compound, n.o.s.**	4.2,33(a)	4.2+4.3	**
40	3205	**Alkaline earth metal alcoholates, n.o.s.**	4.2,14(b),(c)	4.2	290550
48	3206	**Alkali metal alcoholates, self-heating, corrosive, n.o.s.**	4.2,15(b),(c)	4.2+8	290550

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
X323/323	3207	**Organometallic compound or compound solution or compound dispersion, water-reactive, flammable, n.o.s.**	4.3,3(a),(b),(c)	4.3+3	293100
X423/423	3208	Metallic substance, water-reactive, n.o.s.	4.3,13(a),(b),(c)	4.3	**
X423/423	3209	Metallic substance, water-reactive, self-heating, n.o.s.	4.3,14(a),(b),(c)	4.3+4.2	**
50	3210	**Chlorates, inorganic, aqueous solution, n.o.s.**	5.1,11(b),(c)	5.1	282919
50	3211	**Perchlorates, inorganic, aqueous solution, n.o.s.**	5.1,13(b),(c)	5.1	282990
50	3212	**Hypochlorites, inorganic, n.o.s.**	5.1,15(b)	5.1	282890
50	3213	**Bromates, inorganic, aqueous solution, n.o.s.**	5.1,16(b),(c)	5.1	282990
50	3214	**Permanganates, inorganic, aqueous solution, n.o.s.**	5.1,17(b)	5.1	284169
50	3215	**Persulphates, inorganic, n.o.s.**	5.1,18(c)	5.1	283340
50	3216	**Persulphates, inorganic, aqueous solution, n.o.s.**	5.1,18(c)	5.1	283340

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
50	3218	**Nitrates, inorganic, aqueous solution, n.o.s.**	5.1,22(b),(c)	5.1	283429
50	3219	**Nitrites, inorganic, aqueous solution, n.o.s.**	5.1,23(b),(c)	5.1	283410
20	3220	**Pentafluoroethane (refrigerant gas R 125)**	2,2A	2(+13)	290330
40	3221	Self-reactive liquid, type B	4.1,31(b)	4.1	***
40	3222	Self-reactive solid, type B	4.1,32(b)	4.1	***
40	3223	Self-reactive liquid, type C	4.1,33(b)	4.1	***
40	3224	Self-reactive solid, type C	4.1,34(b)	4.1	***
40	3225	Self-reactive liquid, type D	4.1,35(b)	4.1	***
40	3226	Self-reactive solid, type D	4.1,36(b)	4.1	***
40	3227	Self-reactive liquid, type E	4.1,37(b)	4.1	***
40	3228	Self-reactive solid, type E	4.1,38(b)	4.1	***
40	3229	Self-reactive liquid, type F	4.1,39(b)	4.1	***
40	3230	Self-reactive solid, type F	4.1,40(b)	4.1	***
40	3241	**2-Bromo-2-nitropropane-1,3-diol**	4.1,26(c)	4.1	290550
40	3242	Azodicarbonamide	4.1,26(b)	4.1	292990
60	3243	**Solids containing toxic liquid, n.o.s.**	6.1,65(b)	6.1	**
80	3244	**Solids containing corrosive liquid, n.o.s.**	8,65(b)	8	**
90	3245	Genetically modified micro-organisms	9,13(b)	9	**
668	3246	**Methanesulphonyl chloride**	6.1,27(a)	6.1+8	290490
50	3247	**Sodium peroxoborate, anhydrous**	5.1,27(b)	5.1	284030
336/36	3248	**Medicine, liquid, flammable, toxic, n.o.s.**	3,19(b),32(c)	3+6.1	300390
60	3249	**Medicine, solid, toxic, n.o.s.**	6.1,90(b),(c)	6.1	300390
68	3250	**Chloroacetic acid, molten**	6.1,24(b)2	6.1+8	291540
40	3251	Isosorbide-5-mononitrate	4.1,26(c)	4.1	293299
23	3252	**Difluoromethane (refrigerant gas R 32)**	2,2F	3(+13)	290330
80	3253	**Disodium trioxosilicate**	8,41(c)	8	283911

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
30	3256	**Elevated temperature liquid, flammable, n.o.s. with flash-point above 61 °C at or above its flash-point**	3,61(c)	3	**
99	3257	**Elevated temperature liquid, n.o.s., at or above 100 °C and, for a substance with a flash-point, below its flash-point (including molten metals, molten salts, etc.)**	9,20(c)	9	**
99	3258	**Elevated temperature solid, n.o.s., at or above 240 °C**	9,21(c)	9	**
88/80	3259	**Amines, solid, corrosive, n.o.s.**	8,52(a),(b),(c)	8	2921**
88/80	3259	**Polyamines, solid, corrosive, n.o.s.**	8,52(a),(b),(c)	8	2921**
88/80	3260	Corrosive solid, acidic, inorganic, n.o.s.	8,16(a),(b),(c)	8	**
88/80	3261	**Corrosive solid, acidic, organic, n.o.s.**	8,39(a),(b),(c)	8	**
88/80	3262	**Corrosive solid, basic, inorganic, n.o.s.**	8,46(a),(b),(c)	8	**
88/80	3263	**Corrosive solid, basic, organic, n.o.s.**	8,55(a),(b),(c)	8	**
88/80	3264	**Corrosive liquid, acidic, inorganic, n.o.s.**	8,17(a),(b),(c)	8	**
88/80	3265	**Corrosive liquid, acidic, organic, n.o.s.**	8,40(a),(b),(c)	8	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
88/80	3266	**Corrosive liquid, basic, inorganic, n.o.s.**	8,47(a),(b),(c)	8	**
88/80	3267	**Corrosive liquid, basic, organic, n.o.s.**	8,56(a),(b),(c)	8	**
90	3268	Air bag inflators	9,8(c)	9	870899
90	3268	Air bag modules	9,8(c)	9	870899
90	3268	Seat-belt pre-tensioners	9,8(c)	9	870899
33/30	3269	Polyester resin kit	3,5(b),(c),31(c)	3	390791
40	3270	Nitrocellulose membrane filters	4.1,3(b)	4.1	
33/30	3271	**Ethers, n.o.s.**	3,3(b),31(c)	3	2909**
33/30	3272	**Esters, n.o.s.**	3,3(b),31(c)	3	**
336	3273	**Nitriles, flammable, toxic, n.o.s.**	3,11(a),(b)	3+6.1	292690
338	3274	**Alcoholates solution, n.o.s., in alcohol**	3,24(b)	3+8	290550
663/63	3275	**Nitriles, toxic, flammable, n.o.s.**	6.1,11(a),(b)2	6.1+3	292690
66/60	3276	**Nitriles, toxic, n.o.s.**	6.1,12(a),(b),(c)	6.1	292690
68	3277	**Chloroformates, toxic, corrosive, n.o.s.**	6.1,27(b)	6.1+8	291590
66/60	3278	**Organophosphorus compound, toxic, n.o.s.**	6.1,23(a),(b),(c)	6.1	**
663/63	3279	**Organophosphorus compound, toxic, flammable, n.o.s.**	6.1,9(a),22(a),(b)	6.1+3	**

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
66/60	3280	**Organoarsenic compound, n.o.s.**	6.1,34(a),(b),(c)	6.1	293100
66/60	3281	**Metal carbonyls, n.o.s.**	6.1,36(a),(b),(c)	6.1	293100
66/60	3282	**Organometallic compound, toxic, n.o.s.**	6.1,35(a),(b),(c)	6.1	293100
66/60	3283	**Selenium compound, n.o.s.**	6.1,55(a),(b),(c)	6.1	**
66/60	3284	**Tellurium compound, n.o.s.**	6.1,57(a),(b),(c)	6.1	**
66/60	3285	**Vanadium compound, n.o.s.**	6.1,58(b),(c)	6.1	**
368	3286	**Flammable liquid, toxic, corrosive, n.o.s.**	3,27(a),(b)	3+6.1+8	**
66/60	3287	**Toxic liquid, inorganic, n.o.s.**	6.1,65(a),(b),(c)	6.1	**
66/60	3288	**Toxic solid, inorganic, n.o.s.**	6.1,65(a),(b),(c)	6.1	**
668/68	3289	**Toxic liquid, corrosive, inorganic, n.o.s.**	6.1,67(a),(b)	6.1+8	**
668/68	3290	**Toxic liquid, corrosive, inorganic, n.o.s.**	6.1,67(a),(b)	6.1+8	**

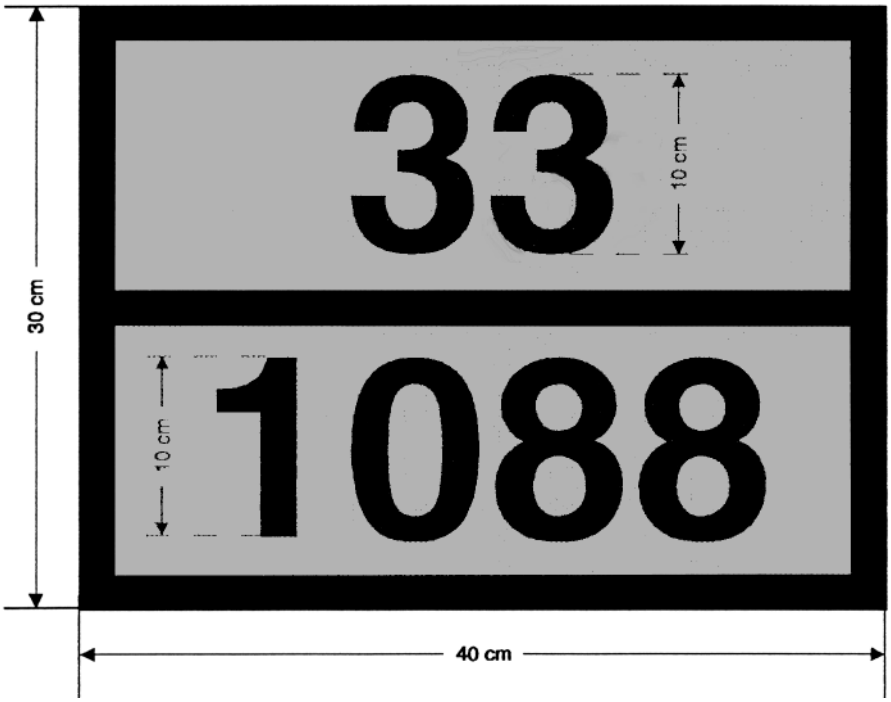
1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
606	3291	**Clinical waste, unspecified, n.o.s.**	6.2,4(b)	6.2	382490
423	3292	Batteries, containing sodium or Cells, containing sodium	4.3,31(b)	4.3	8506**
60	3293	**Hydrazine, aqueous solution with not more than 37 % hydrazine by mass**	6.1,65(c)	6.1	282510
663	3294	**Hydrogen cyanide, solution in alcohol with not more than 45 % hydrogen cyanide**	6.1,2	6.1+3	281119
33/30	3295	**Hydrocarbons, liquid, n.o.s.**	3,1(a),2(a),(b),3(b),31(c)	3	290***
20	3296	**Heptafluoropropane (refrigerant gas R 227)**	2,2A	2(+13)	290330
20	3297	**Ethylene oxide and chlorotetrafluoroethane mixture with not more than 8,8 % ethylene oxide**	2,2A	2(+13)	291010
20	3298	**Ethylene oxide and pentafluoroethane mixture with not more than 7,9 % ethylene oxide**	2,2A	2(+13)	291010
20	3299	**Ethylene oxide and tetrafluoroethane mixture with not more than 5,6 % ethylene oxide**	2,2A	2(+13)	291010
263	3300	**Ethylene oxide and carbon dioxide mixture with more than 87 % ethylene oxide**	2,2TF	6.1+3(+13)	291010
884/84	3301	**Corrosive liquid, self-heating, n.o.s.**	8,70(a),(b)	8+4.2	**
60	3302	**2-Dimethylaminoethyl acrylate**	6.1,12(b)	6.1	292250
265	3303	**Compressed gas, toxic, oxidizing, n.o.s.**	2,1TO	6.1+05(+13)	**
268	3304	**Compressed gas, toxic, corrosive, n.o.s.**	2,1TC	6.1+8(+13)	**
263	3305	**Compressed gas, toxic, flammable, corrosive, n.o.s.**	2,1TFC	6.1+3+8(+13)	**
265	3306	**Compressed gas, toxic, oxidizing, corrosive, n.o.s.**	2,1TOC	6.1+05+8(+13)	**
265	3307	**Liquefied gas, toxic, oxidizing, n.o.s.**	2,2TO	6.1+05(+13)	**
268	3308	**Liquefied gas, toxic, corrosive, n.o.s.**	2,2TC	6.1+8(+13)	**
263	3309	**Liquefied gas, toxic, flammable, corrosive, n.o.s.**	2,2TFC	6.1+3+8(+13)	**
265	3310	**Liquefied gas, toxic, oxidizing, corrosive, n.o.s.**	2,2TOC	6.1+05+8(+13)	**
225	3311	**Gas, refrigerated liquid, oxidizing, n.o.s.**	2,3O	2+05(+13)	**
223	3312	**Gas, refrigerated liquid, flammable, n.o.s.**	2,3F	3(+13)	**
40	3313	**Organic pigments, self-heating**	4.2,5(b),(c)	4.2	***

1802 *(cont'd)*

HIN	UN No	Substance or Articles	Class, item No	Labels	NHM Code
(a)	(b)	(c)	(d)	(e)	(f)
90	3314	**Plastics moulding compound in dough, sheet or extruded rope form evolving flammable vapour**	9,4(c)	—	**
66	3315	Chemical sample, toxic, liquid or solid	6.1,90(a)	6.1	***
90	3316	Chemical kit or First aid kit	9,36(b),(c)	9	382200
40	3317	2-Amino-4,6-dinitrophenol, wetted with not less than 20 % water, by mass	4.1,21(a)1	4.1	292229
268	3318	**Ammonia solution, relative density less than 0,880 at 15 °C in water, with more than 50 % ammonia**	2,4TC	6.1+8(+13)	281410
40	3319	Nitroglycerin mixture with more than 2 % but not more than 10 % nitroglycerin, by mass, desensitized	4.1, *See marg. 401, Note 2, Section C*	4.1	360200
80	3320	**Sodium borohydride and sodium hydroxide solution with not more than 12 % sodium borohydride and not more than 40 % sodium hydroxide, by mass**	8,42(b),(c)	8	285000

1803 Identification numbers shall be shown as follows:



Identification number of danger (2 or 3 figures, preceded, where appropriate, by the letter 'X')

Identification number of substance (4 figures)

Background: orange;

Border, horizontal line and figures: black, 15 mm thickness.

1804-1899

APPENDIX IX

1. Requirements relating to danger labels

Note: For packages, see also marg. 14.

1900 (1) (a) For packages, labels Nos 1, 1.4, 1.5, 1.6, 01, 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 05, 6.1, 6.2, 7A, 7B, 7C, 8 and 9 shall take the form of a diamond-shaped square each side of which measures at least 100 mm.

If the size of a package so requires, the dimensions of the labels may be reduced, provided that they remain visible. [see also marg. 224 (4)].

(b) For wagons, labels Nos 1, 1.4, 1.5, 1.6, 01, 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 05, 6.1, 6.2, 7D, 8 and 9 shall take the form of a diamond-shaped square each side of wwhich measures at least 150 mm. This also applies to labels Nos 7A, 7B or 7C when these are used instead of label No 7D.

Danger labels shall be affixed to wagons in such a way that they remain clearly visible during carriage.

It shall not be necessary to affix danger labels to wagons carrying large containers or tank-containers where the large containers or tank-containers bear the prescribed danger labels. The labels shall remain clearly visible during carriage. In other circumstances, danger labels shall also be affixed to the wagons.

(c) Danger labels for tank-containers of more than 3 m^3 capacity or large containers shall measure at least 250 × 250 mm. This also applies to labels Nos 7A, 7B or 7C when these are used instead of label No 7D.

(2) Label 11 shall be rectangular, of standard format A5 (148 mm × 210 mm). If the size of a package so requires, the dimensions of the label may be reduced, provided that it remains clearly visible.

(3) Labels Nos 13 and 15 shall have the shape of a rectangle not smaller than A7 format (74 mm × 105 mm).

(4) An inscription, in figures or letters, concerning the nature of the danger may be placed on the lower part of the labels.

(5) Inscriptions on danger labels shall be clearly legible and indelible.

1901 (1) Danger labels shall be stuck on packages, on wagons and tank wagons, on tank-containers and on small containers or affixed in some other suitable manner. Only where the external state of a package will not allow this shall they be stuck on cards or tablets securely attached to the package. In place of labels, consignors may affix on packing cases, on wagons and tank wagons, on tank-containers and on private small containers indelible danger markings corresponding exactly to the prescribed models. However, where an indelible marking conforming to model No 13 is affixed to wagons and tank wagons, this may simply consist of the red triangle with a black exclamation mark (at least 100 mm base by 70 mm height).

(2) It is consignor's duty to affix the labels:

(a) on packages whether handed over for carriage in full wagon loads or otherwise;

(b) on all containers;

(c) on wagons carrying full wagon loads;

(d) on wagons containing packages loaded by the consignor.

(3) In all other cases, it is the duty of the railway to label the wagons.

1901 *(cont'd)*

(4) In addition to the danger labels prescribed in this Directive, danger labels conforming to the requirements of other modes of transport may be affixed on packages, small containers large containers and tank-containers containing dangerous goods which are carried at the beginning and end of the journey by rail and whose labelling shall comply with the provisions of the said requirements.

(5) After all dangerous goods have been unloaded and, where necessary, after the wagon, tank wagon, tank-container or container has been cleaned, the labels shall be removed or covered up.

2. Explantation of the diagrams

1902 The danger labels prescribed for substances and articles of classes 1 to 9 (see illustrations pages 698-699) denote:

No 1	black on orange background: bomb blast in upper half; appropriate division number and compatibility group letter in lower half; small figure '1' in bottom corner;	liable to explosion, divisions 1.1, 1.2 and 1.3;
No 1.4	black on orange background: division number '1.4' filling most of the upper half; appropriate compatibility group letter in the lower half; small figure '1' in bottom corner;	liable to explosion, dvision 1.4;
No 1.5	black on orange background: division number '1.5' filling most of the upper half; appropriate compatibility group letter in the lower half; small figure '1' in bottom corner;	liable to explosion, division 1.5;
No 1.6	black on orange background: division number '1.6' filling most of the upper half; compatibility group letter 'N' in the lower half; small figure '1' in bottom corner;	liable to explosion, division 1.6;
No 01	black on orange background: bomb blast in upper half;	liable to explosion;
No 2	gas cylinder, black or white, on green background, small figure '2' in bottom corner;	non-flammable, non-toxic gas;
No 3	black or white flame on red background;	danger of fire (flammable liquid);
No 4.1	black flame on background consisting of equidistant vertical stripes alternately red and white;	danger of fire (flammable solid);
No 4.2	black flame on white background, the lower triangle of the label being red;	liable to spontaneous combustion;
No 4.3	black or white flame on black background;	danger of release of flammable gases on contact with water;
No 5.1	flame over a circle, black on yellow background, small figure '5.1' in bottom corner;	oxidizing substance;
No 5.2	flame over a circle, black on yellow background, small figure '5.2' in bottom corner;	organic perodixe, danger of fire;

1902 *(cont'd)*	No 05	flame over a circle, black on yellow background;	fire-intensifying danger;
	No 6.1	skull and cross bnes, black on white background;	toxic substance; to be kept apart in wagons and goods depots from foodstuffs, other articles of consumption or animal feedstuffs;
	No 6.2	symbol of three crescents superimposed on a circle;	infectious: to be kept apart in wagons and at goods depots from foodstuffs, other articles of consumption and animal feedstuffs. In case of damage or leakage, immediately notify public health authority;
	No 7A	stylised trefoil, inscription 'RADIOACTIVE' followed by a vertical stripe in the lower half, with the following text (1): Contents... Activity... small figure '7' in bottom corner. symbol and inscription black on white background, red vertical stripe;	radioactive material in packages of Category I-WHITE; in the event of damage to packages, danger to health by ingestion or inhalation, or contact with, spilled contents;
	No 7B	as above, but with two vertical stripes in the lower half, with the following text (1): Contents... Activity... Transport Index... (in the rectangular black-bordered box); small figure '7' in bottom corner; symbol and inscription black; upper half of background yellow; lower half of background white: red vertical stripes;	radioactive material in packages of Category II-YELLOW; packages to be kept away from packages bearing a label with the word 'FOTO' [see marg. 711 (1)]; in the event of damage to packages, danger to health by ingestion, or inhalation of, or contact with, spilled contents, as well as risk from external radiation at a distance;
	No 7C	as above, but with three vertical stripes in the lower half;	radioactive material in packages of Category III-YELLOW; packages to be kept away from packages bearing a label with the word 'FOTO' [see marg. 711 (1)]; in the event of damage to packages, danger to health by ingestion or inhalation of, or contact with, spilled contents, as well as risk from external radiation at a distance;
	No 7D	stylised trefoil, inscription 'RADIOACTIVE' and figure '7'; black symbol and inscription; upper half of background yellow, lower half of background white. Instead of the word 'RADIOACTIVE', the substance identification number may appear in the lower half.	radioactive material presenting the dangers described under 7A, 7B or 7C;
	No 8	drops falling from a test-tube on to a plate and from another test-tube on to a hand; black on white background, the lower half of the label being black with a white border;	corrosive substance;

(1) The text must be printed in an official language of the country of origin and, if this language is not French, German, Italian or English, also in French, German, Italian or in English unless international tariffs or agreements concluded between railway administrations provide otherwise.

1902 *(Cont'd)*	No 9	white background with seven black vertical stripes in the upper half and small black figure '9' in the lower half;	miscellaneous substances and articles, which, during carriage, present dangers other than those covered by the other Classes;
	No 10	reserved	
	No 11	two black arrows on white or suitable contrasting background;	this side up; label to be affixed, arrows pointing upwards;
	No 12	reserved	
	No 13	red triangle with an exclamation mark in black on white background;	shunt with care;
	No 14	(reserved)	
	No 15	three triangles, red with black exclamation mark;	loose shunting or hump shunting forbidden. Shall be accompanied by a motive power unit. Shall not bump, or be bumped by, other wagons.

Transitional provisions

1903 Danger labels which until 1 January 1988 conformed to the prescribed models Nos 7A, 7B, 7C, 11 and 13 may be used until stocks are exhausted.

1904-1909

3. Mark for elevated temperature substances

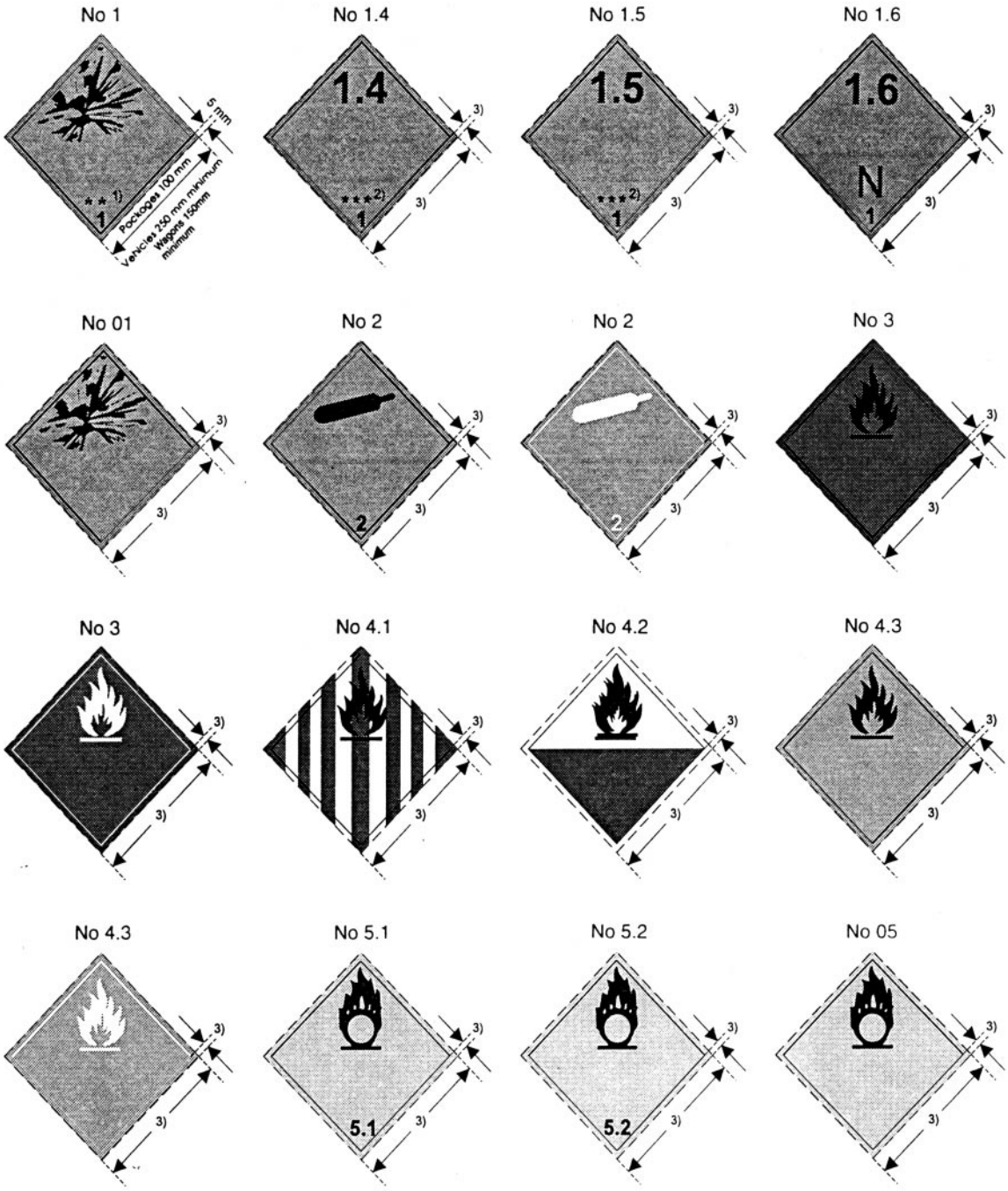
1910 The mark for elevated temperature substances required in marg. 918 (4) and in 9.6 (Appendices X and XI) is a triangular shaped mark with sides of at least 250 mm, to be shown in red, as reproduced below:



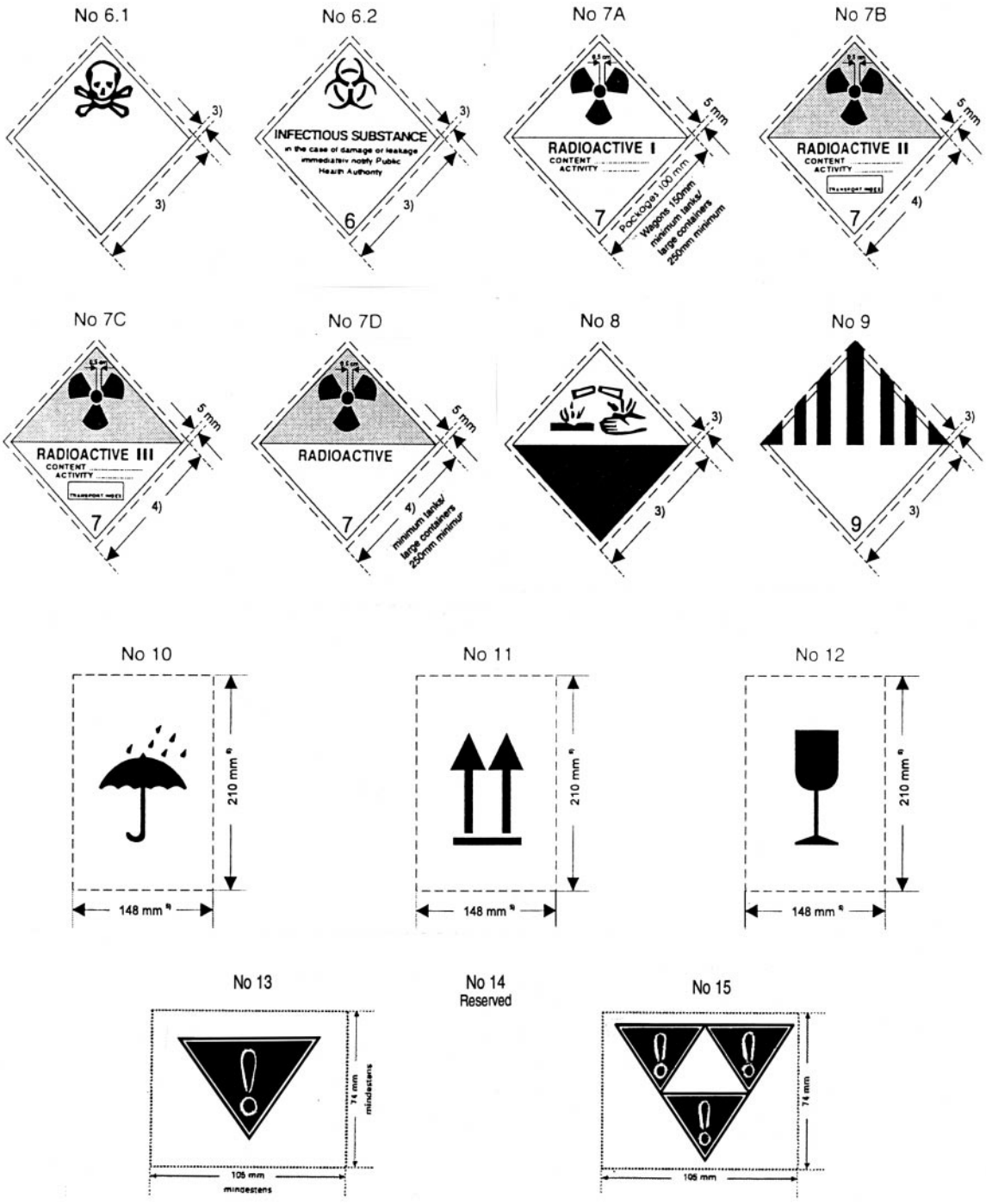
1911-1999

Danger labels

For explanation, see Appendix IX (marg. 1902)



[1]) Indication of the appropriate division number and compatibility group letter.
[2]) Indication of the appropriate compatibility group letter.
[3]) For dimensions, see label No 1.
[4]) Indication of Class number authorised [see marg. 1900 (4)].



[3]) For dimensions, see label No 1.
[4]) For dimensions, see label No 7A.
[5]) The dimensions of the labels to be affixed to packages may be reduced to format A7 (74 mm × 105 mm).
[6]) Indication of Class number authorised [see marg. 1900 (4)].

APPENDIX X

REQUIREMENTS CONCERNING THE USE, CONSTRUCTION AND TESTING OF TANK-CONTAINERS

1. Requirements applicable to all classes

1.1 ***General; Scope; Definitions***

Note: For the purposes of this Directive, swap tanks are considered to be tank-containers.

1.1.1 These requirements shall apply to tank-containers of a capacity of more than 0,45 cubic metre which are used for the carriage of liquid, powdery or granular substances, and to their fittings and accessories. For substances of Class 2, the requirements shall apply to tank-containers of more than 1 000 litres capacity.

Note: For the purposes of the requirements of this Appendix, the following shall be considered to be substances carried in the liquid state :

— substances which are liquid at normal temperatures and pressures

— solids handed over for carriage at elevated temperatures, or hot, in the molten state.

1.1.2 Part 1 sets out the requirements applicable to tank-containers intended for the carriage of substances of all Classes. Parts 2 to 9 contain special requirements supplementing or modifying the requirements of Part 1.

1.1.3 A tank-container shall comprise a shell and items of equipment, including equipment to facilitate movement of the tank-container without significant change of attitude.

1.1.4. In the following requirements:

1.1.4.1 — 'shell' means the sheathing containing the substance (including the openings and their closures);

— 'service equipment' of the shell means the filling, emptying, venting, safety, heating and heat-insulating devices, and measuring instruments;

— 'structural equipment' means the internal or external reinforcing, fastening, protective or stabilizing members of the shell.

1.1.4.2 — 'calculations pressure' means a theoretical pressure, at least equal to the test pressure, which according to the degree of danger exhibited by the substance being carried may to a greater or lesser degree exceed the working pressure. It is used solely to determine the thickness of the walls of the shell, independently of any external or internal reinforcing device;

— 'test pressure' means the highest effective pressure which arises in the shell during the pressure test;

— 'filling pressure' means the maximum pressure actually built up in the shell when it is being filled under pressure;

— 'discharge pressure' means the maximum pressure actually built up in the shell when it is being discharged under pressure;

— 'maximum working pressure (gauge pressure)' means the highest of the following three pressures:

a) the highest effective pressure allowed in the shell during filling (maximum filling pressure allowed);

b) the highest effective pressure allowed in the shell during discharge ('maximum discharge pressure allowed'); and

c) the effective gauge pressure to which the shell is subjected by its contents (including such extraneous gases as it may contain) at the maximum working temperature.

Unless specially prescribed otherwise in the various classes, the numerical value of this working pressure (gauge pressure) shall not be lower than the vapour pressure (absolute pressure) of the filling substance at 50 °C.

For shells equipped with safety valves (with or without bursting disc), the maximum working pressure (gauge pressure) shall however be equal to the prescribed opening pressure of such safety valves.

1.1.4.3 — 'leakproofness test' means a test which consists of subjecting the shell to an effective internal pressure equal to the maximum working pressure, but not less than 20 kPa (0,2 bar) (gauge pressure), by a method recognized by the competent authority.

For shells equipped with venting systems and a safety device to prevent the contents spilling out if the shell overturns, the pressure for the leakproofness test shall be equal to the static pressure of the filling substance.

1.2 ***Construction***

1.2.1 Shells shall be designed and constructed in accordance with the provisions of a technical code recognized by the competent authority, in which the material is chosen and the wall thickness determided taking into account maximum and minimum filling and working temperatures, but the following minimum requirements shall be met:

1.2.1.1 Shells shall be made of suitable metallic materials which, unless other temperature ranges are prescribed in the various classes, shall be resistant to brittle fracture and to stress corrosion cracking at a temperature between − 20 °C und + 50 °C. However, suitable non-metallic materials may be used to manufacture equipmend and accessories.

1.2.1.2 For welded shells, only materials of faultless weldability whose adequate impact strength at an ambient temperature − 20 °C can be guaranteed, particularly in the weld seams and the zones adjacent thereto, shall be used.

Water-quenched steel shall not be used for welded steel shells. If fine-grained steel is used, the guaranteed value of the yield stress Re shall not exceed 460 N/mm^2 and the value of the upper limit of guaranteed tensile strength Rm shall not exceed 725 N/mm^2 in accordance with the specifications relating to the material.

1.2.1.3 Welds shall be skilfully made and shall afford the fullest safety.

With regard to the execution and checking of weld beads, see also 1.2.8.6.

Shells whose minimum wall thicknesses have been determined in accordance with 1.2.8.3 and 1.2.8.4 shall be checked by the methods bescribed in the definition of the weld coefficient 0,8.

1.2.1.4 The materials of shells or their protective linings which are in contact with the contents shall not contain substances liable to react dangerously with the latter, to form dangerous compounds, or substantially to weaken the material.

1.2.1.5 The protective lining shall be so designed that its leakproofness remains intact whaterver the deformation liable to occur in normal conditions of carriage (1.2.8.1).

1.2.1.6 If contact between the substance carried and the material used for the construction of the shell entails a progressive decrease in the thickness of the walls, this thickness shall be increased at manufacture by an appropriate amount.

This additional thickness to allow for corrosion shall not be taken into consideration in calculating the thickness of the shell walls.

1.2.2 Shells and their service and structural equipment shall be designed to withstand without loss of contents (other than quantities of gas escaping through any degassing vents)

— the static and dynamic stresses in normal conditions of carriage,

— the prescribed minimum stresses as defined in 1.2.6 and 1.2.8.

1.2.3 The pressure on which the wall thickness of the shell is based shall not be less than the calculation pressure, but the stresses referred to in 1.2.2 shall also be taken into account.

1.2.4 Unless specially prescribed otherwise in the various classes, the followoing particulars shall be taken into account in the design of shells:

1.2.4.1 — gravity-discharge shells intended for the carriage of substances having a vapour pressure not exceeding 110 kPa (1,1 bar) (absolute pressure) at 50 °C shall be designed for a calculation pressure of twice the static pressure of the substance to be carried but not less than twice the static pressure of water;

1.2.4.2 — pressure-filled or pressure-discharge shells intended for the carriage of substances having a vapour pressure not exceeding 110 kPa (1,1 bar) (absolute pressure) at 50 °C shall be designed for a calculation pressure equal to 1,3 times the filling or discharge pressure;

1.2.4.3 — shells intended for the carriage of substances having a vapour pressure of more than 110 kPa (1,1 bar) but not more than 175 kPa (1,75 bar)(absolute pressure) at 50 °C shall, whatever their filling or discharge system, be designed for a calculation pressure of not less than 0,15 MPa (1,5 bar) (gauge pressure), or 1,3times the filling or discharge pressure, whichever is the higher;

1.2.4.4 — shells intended for the carriage of substances having a vapour pressure of more than 175 kPa (1,75 bar) (absolute pressure) at 50 °C shall, whatever their filling or discharge system. be designed for a calculation pressure equal to 1,3times the filling or discharge pressure but not less than 0,4 MPa (4 bar) (gauge pressure).

1.2.5 Tank-containers intended to contain certain dangerous substances shall be provided with additional protection. This may take the form of additinal thickness of the shell (such additional thickness being determined in the light of the dangers inherent in the substances concerned — see the various classes) or of a protective device.

1.2.6 At the test pressure, the stress σ (sigma) at the most severely stressed point of the shell shall not exceed the material-dependent limits prescribed below. Allowance shall be made for any weakening due to the welds.

1.2.6.1 For all metals and alloys, the stress σ at the test pressure shall be lower than the smaller of the values given by the following formulae:

$\sigma \leq 0{,}75\ Re$ or $\sigma \leq 0{,}5\ Rm$

Where:

Re = Apparent yield stress, or at 0,2 % or

in the case of austenitic steels: at 1 %

Rm = minimum tensile strength

Ratios of Re/Rm exceeding 0,85 are not allowed for steels used in the construction of welded tanks.

The values of Re and Rm to be used shall be specified minimum values according to material standards.

If no material standard exists for the metal or alloy in question, the values of Re and Rm used shall be approved by the competent authority or by a doby designated by that authority.

When austenitic steels are used, the specified minimum values according to the material standards may be exceeded by up to 15 % if these higher values are attested in the inspection certificate.

The values specified in the certificate shall be taken as a basis in determining the Re/Rm ratio in each case.

1.2.6.2 For steel, the elongation at fracture, in per cent, shall be not less than

$$\frac{10\,000}{\text{determined tensile strength in N/mm}^2}$$ but in any case it shall be not less than 16 % for fine-grained steels

and not less than 20 % for other steels

For aluminium alloys, the elongation at fracture shall be not less than 12 % (1).

(1) In the case of sheet metal the axis of the tensile test-piece shall be at right angles to the direction of rolling the permanent elongation at fracture (l = 5 d) shall be measured on test-pieces of circular cross-section in which the gauge length l is equal to five times the diameter d; if test-pieces of rectangular section are used, the gauge length shall be calculated by the formula $l = 5{,}65\sqrt{F_0}$, where F_0 is the initial cross-sectional area of the test piece.

1.2.7 All parts of a tank-container intended for the carriage of liquids having a flash-point of not more than 61 °C and for the carriage fo flammable gases shall be capable of being electrically earthed. Any metal contact which might encourage electrochemical corrosion shall be avoided.

1.2.8 Tank-containers shall be capable of absorbing the stresses specified in 1.2.8.1 and the wall thickness of the shells shall be at least as prescribed in 1.2.8.2 to 1.2.8.5 below.

1.2.8.1 Tank-containers and their fastenings shall, under the maximum permissible load mass, be capable of absorbing the stresses exerted by:

— in the direction of travel: twice the total mass;

— horizontally at right angles to the direction of travel: the total mass (where the direction of travel is not clearly determined, twice the total mass in each direction);

— vertically upwards: the total mass; and

— vertically downwards: twice the total mass;

Under each of these forces the safety factors to be observed shall be the following:

— for metals having a clearly-defined yield point: a safety factor of 1,5 in relation to the apparent yield stress; or

— for metals with no clearly-defined point: a safety factor of 1,5 in relation to the guaranteed 0,2 %-proof stress (1 %-maximum elongation for austenitic steels).

1.2.8.2 The thickness of the cylindrical wall of the shell and of the ends and cover plates shall be at least equal to the largest of the values obtained by the following formulae:

$$e = \frac{P_{ep} \times D}{2 \times \alpha \times \lambda} \text{ (mm)} \qquad e = \frac{P_{cal} \times D}{2 \times \alpha} \text{ (mm)}$$

where

P_{ep} = test presure in MPa;

P_{cal} = Calculation pressure in MPa as specified in 1.2.4;

D = internal diameter of shell in mm;

σ = permissible stress, as defined in 1.2.6.1 in N/mm^2;

λ = a coefficient not exceeding 1, allowing for any weakening due to welds.

The thickness shall in no case be less than the values prescribed in 1.2.8.3 und 1.2.8.4.

1.2.8.3 The walls, ends and cover plates of shells shall be not less than 5 mm thick if of mild steel (1) (in conformity with the provisions of 1.2.6) or of equivalent thickness if of another metal. Where the diameter is more than 1,80 m, this thickness shall be increased to 6mm, except in the case of shells intended for the carriage of powdery or granular substances, if the shell is of mild steel (1) (in conformity with the provisions of 1.2.6) or to an equivalent thickness if of another metal.

Whatever the metal used, the minimum thickness of the shell wall shall never be less than 3 mm.

'Equivalent thickness' means the thickness obtained by the following formula (2):

$$e_1 = \frac{21{,}4 \times e_0}{\sqrt[3]{Rm_1 \times A_1}}$$

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(1) 'Mild steel' means a steel having a breaking strength between 360 N/mm^2 and 440 N/mm^2.

(2) This formula is derived from the general formula

$$e_1 = e_0 \sqrt[3]{\frac{Rm_0 \times A_0}{Rm_1 \times A_1}}$$

Where

Rm_0 = 360,

A_0 = 27 for the mild steel of reference

Rm_1 = minimum tensile strength of the metal chosen, in N/mm^2

A_1 = minimum elongation of the metal chosen on fracture under tensile stress, in %

1.2.8.4 Where protection of the shell against damage is provided, the competent authority may allow the aforesaid minimum thickness to be reduced in proportion to the protection provided; however, the said thicknesses shall be not less than 3 mm in the case of mild steel [1] or than an equivalent thickness in the case of other materials, for shells not more than 1,80 m in diameter [2]. For shells of a diameter exceeding 1,80 m [2] this minimum thickness shall be increased to 4 mm in the case of mild steel [1] and to an equivalent thickness in the case of other metals. 'Equivalent thickness' means the thickness obtained by the formula [3]:

$$e_1 = \frac{21{,}4 \times e_0}{\sqrt[3]{Rm_1 \times A_1}} \text{ [3]}$$

1.2.8.5 The additional protection referred to under 1.2.8.4 may consist of

over-all external structural protection as 'sandwich' construction where the sheathing is secured to the shell, or

a structure in which the shell is supported by a complete skeleton including longitudinal and transverse structural members, or

double-wall construction.

Where the shells are made with double walls, the space between being evacuated of air, the aggregate thickness of the outer metal wall and the shell wall shall correspond to the minimum wall thickness prescribed in 1.2.8.3, the thickness of the wall of the shell itself being not less than the minimum thickness prescribed in 1.2.8.4.

Where shells are made with double walls with an intermediate layer of solid materials at least 50 mm thick, the outer wall shall have a thickness of not less than 0,5 mm if it is made of mild steel [1] or at least 2 mm if it is made of a plastics material reinforced with glass fibre. Solid foam with an impact absorption capacity such as that, for example,of polyurethane foam, may be used as the intermediate layer of solid material.

1.2.8.6 The manufacturer's qualification for performing welding operations shall be one recognized by the competent authority. Welding shall be performed by skilled welders using a welding process whose effectiveness (including any heat treatments required) has been demonstrated by test. Non-destructive tests shall be carried out by radiography or by ultrasound and shall confirm that the quality of the welding is appropriate to the stresses.

In determining the thickness of the shell walls in accordance with 1.2.8.2, the following values of the coefficient lambda (λ) shall be adopted for the welds:

0,8: where the weld beads are so far as possible inspected visually on both faces and are subjected to a non-destructive spot check with particular attention to connection;

0,9: where all longitudinal beads throughout their length, all connections, 25 % of circular beads, and welds for the assembly of large-diameter items of equipment are subjected to non-destructive checks. Beads shall be checked visually on both sides as far as possible;

1,0: where all beads are subjected to non-destructive checks and are as far as possible inspected visually on both sides. A weld test-piece shall be taken.

Where the competent authority has doubts regarding the quality of weld beads, it may require additional checks.

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[1] 'Mild steel' means a steel having a breaking strength between 360 N/mm² and 440 N/mm².

[2] For shells not of circular cross-section, for example box-shaped or elliptical shells, the indicated diameters shall correspond to those calculated on the basis of a circular cross-section of the same area. For such shapes of cross-section the radius of convexity of the shell wall shall not exceed 2 000 mm at the sides or 3 000 mm at the top and bottom.

[3] This formula is derived from the general formula

$$e_1 = e_0 \sqrt[3]{\frac{Rm_0 \times A_0}{Rm_1 \times A_1}}$$

Where

Rm_0 = 360,

A_0 = 27 for the mild steel of reference

Rm_1 = minimum tensile strength of the metal chosen, in N/mm²

A_1 = minimum elongation of the metal chosen on fracture under tensile stress, in %

1.2.8.7 Measures shall be taken to protect shells against the risk of deformation as a result of a negative internal pressure.

Unless otherwise prescribed in the special provisions for the individual classes, these shells may have valves to avoid an unacceptable negative internal pressure, without intervening bursting discs.

1.2.8.8 The thermal insulation shall be so designed as not to hinder access to, or the operation of, filling and discharge devices and safety valves.

1.3 ***Items of Equipment***

1.3.1 The items of equipment shall be so arrenged as to be protected against the risks of being wrenched off or damaged during carriage and handling. They shall exhibit a suitable degree of safety comparable to that of the shells themselves and shall in particular:

— be compatible with the substances carried;

— meet the requirements of 1.2.2.

The leakproofness of the service equipment shall be ensured even in the event of the overturning of the tank-container.

The gaskets shall be made of material compatible with the substance carried and shall be replaced as soon as their effectiveness is impaired, for example as a result of ageing.

Gaskets ensuring the leakproofness of fittings requiring manipulation during normal use of the tank-containers shall be so designed and arranged that manipulation of the fittings incorporating them does not damage them.

1.3.2 Every bottom-discharge shell, and in the case of compartmented bottom-discharge shells every compartment, shall be equipped with two mutually independent shut-off devices, the first being an internal stop-valve [1] fixed directly to the shell and the second being a sluice-valve or other equivalent device [2], mounted in series, one at each end of the discharge pipe. The bottom discharge of shells intended for the carriage of powdery or granular substances may be constituted by external piping with a stop-valve if it is made of a malleable metallic material. In addition, the opening shall be capable of being closed by means of screwthreaded plugs, blank flanges or other equally effective devices.

The internal stop-valve may be operated from above or from below. In both cases its setting — open or closed — shall be capable of being verified, from the ground if possible. The control devices shall be so designed as to prevent any unintended opening through impact or an inadvertent act.

The internal shut-off device shall continue to be effective in the event of damage to the external control device.

In order to avoid any loss of contents in the event of damage to the external discharge fittings (pipes,lateral shut-off devices), the internal stop-valve and its seating shall be protected against the danger of being wrenched off by external stresses or shall be so designed as to resist them. The filling and discharge devices (including flanges or threaded plugs) and any protective caps shall be secured against any inadvertent opening.

The position and/or direction of closure of the sluice valves shall be clearly apparent.

1.3.3 The shell or each of its compartments shall be provided with an opening large enough to permit its inspection.

1.3.4 Shells intended for the carriage of substances for which all openings are above the surface level of the liquid may be equipped, in the lower part of the body, with a cleaning aperture (fist-hole). This aperture shall be capable of being sealed by a flange so closed as to be leakproof, the design of which shall be approved by the competent authority or by a body designated by that authority.

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[1] However, in the case of shells intended for the carriage of certain crystallizable or highly viscous substances, deeply refrigerated liquefied gases and shells fitted with an ebonite or thermoplastic coating, the internal stop-valve may be replaced by an external stop-valve provided with additional protection.

[2] In the case of tank-containers of less than 1 m^3 capacity, the sluice-valve or other equivalent device may be replaced by a blank flange.

1.3.5 Shells intended for the carriage of liquids having a vapour pressure of not more than 110 kPa (1,1 bar) (absolute pressure) at 50 °C shall have a venting system and a safety device to prevent the contents from spilling out of the shell if the tank-container overturns, or shall conform to the requirements of 1.3.6 or 1.3.7 below.

1.3.6 Shells intended for the carriage of liquids having a vapour pressure of more than 110 kPa (1,1 bar) but not more than 175 kPa (1,75 bar) (absolute pressure) at 50 °C shall have a safety valve set at not less than 150 kPa (1,5 bar) (gauge pressure) and such that it is fully open at a pressure not exceeding the test pressure; or shall conform to the requirements of 1.3.7.

1.3.7 Shells intended for the carriage of liquids having a vapour pressure of more than 175 kPa (1,75 bar) but not more than 300 kPa (3 bar) (absolute pressure) at 50 °C shall be equipped with a safety valve set at a gauge pressure of not less than 300 kPa (3 bar) and such that it is fully open at a pressure not exceeding the test pressure; or shall be hermetically closed [1].

1.3.8 No movable parts such as covers, closure devices, etc., which are liable to come into frictional or percussive contact with aluminium shells intended for the carriage of flammable liquids having a flash-point of not more than 61 °C or for the carriage of flammable gases may be made of unprotected corrodible stell.

1.4 ***Type Approval***

The competent authority or a body designated by that authority shall issue in respect of each new type of tank-container a certificate attesting that the prototype tank-container, including fastenings, which it has surveyed is suitable for the purpose for which it is intended and meets the construction requirements of Section 1.2, the equipment requirements of Section 1.3 and the special conditions for the Classes of substance carried. If the tank-containers are serially manufactured without modification, this approval shall be valid for the entire series. The test results, the substances and/or the groups of substances for the carriage of which the tank-container is approved and a type approval number shall be entered in a test report.

The substances of a group of substances shall be of a similar kind and equally compatible with the characteristics of the shell. The substances or groups of substances permitted shall be specified in the test report, with their chemical names or the corresponding collective heading in the list of substances, and their Class and item number. The approval number shall consist of the distinguishing sign [2] of the State in whose territory the approval was granted, and a registration number.

1.5 ***Tests***

1.5.1 Shells and their equipment shall either together or separately undergo an initial inspection before being put into service. This inspection shall include:

a check of conformity to the approved prototype,

a check of the design characteristics [3],

an external and internal examination,

a hydraulic pressure test [4] at the test pressure indicated on the data plate, and

a check of satisfactory operation of the equipment.

The hydraulic pressure test shall be carried out before the installation of such thermal insulation as may be necessary. If the shells and their equipment have been tested separately, they shall be jointly subjected to a leakproofness test after assembly in accordance with 1.1.4.3.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special provisions applicable to the individual classes.

[2] The distinguishing signs in international traffic prescribed by the Vienna Convention on Road Traffic (Vienna1968).

[3] The check of the design characteristics shall also include, for shells requiring a test pressure of 1 Mpa (10 bar) or higher, the taking of weld test-pieces in accordance with the tests prescribed in Appendix II C.

[4] In special cases and with the agreement of the expert approved by the competent authority, the hydraulic pressure test may be replaced by a test using another liquid or a gas, where such an operation does not present any danger.

1.5.2 Shells and their equipment shall undergo periodic inspection at fixed intervals. The periodic inspections shall include an external and internal examination and, as a general rule, a hydraulic pressure test [1]. Sheathing for thermal or other insulation shall be removed only to the extent required for reliable appraisal of the shell's characteristics.

In the case of shells intended for the carriage of powdery or granular substances, and with the agreement of the expert approved by the competent authority, the periodic hydraulic pressure tests may be omitted and replaced by leakproofness tests in accordance with 1.1.4.3.

The maximum interval for periodic inspections shall be five years.

Empty tank-containers, uncleaned, may also be moved after expiry of the fixed period for the purpose of undergoing the test.

1.5.3 In addition, a leakproofness test of the shell with its equipment in accordance with 1.1.4.3 and a check of the satisfactory operation of all the equipment shall be carried out at least every two and a half years.

Empty, uncleaned tank-containers may be moved after expiry of this period, for undergoing inspection.

1.5.4 When the safety of the shell or of its equipment may have been impaired as a result of repairs, alterations or accident, an exceptional check shall be carried out.

1.5.5 The test, inspections and checks in accordance with 1.5.1 to 1.5.4. shall be carried out by the expert approved by the competent authority. Certificates shall be issued showing the results of these operations. These certificates shall refer to the list of the substances permitted for carriage in the shell in accordance with section 1.4.

1.6 ***Marking***

1.6.1 Each shell shall be fitted with a corrosion-resistant metal plate permanently attached to the shell in a place readily accessible for inspection. The following particulars at least shall be marked on the plate by stamping or by any other similar method. These particulars may be engraved directly on the walls of the shell itself if the walls are so reinforced that the strength of the shell is not impaired:

— approval number;

— manufacturer's name or mark;

— manufacturer's serial number;

— year of manufacture;

— test pressure [2] (gauge pressure);

— capacity [2] — in the case of multiple-element tank-containers: the capacity of each element;

— design temperature [2] (only if above + 50 °C or below – 20 °C);

— date (month and year) of initial test and of most recent periodic test in accordance with 1.5.1 and 1.5.2;

— stamp of the expert who carried out the tests, and

— material of the shell and, where appropriate, the protective lining.

On pressure-filled or pressure-discharge shells the maximum permissible working pressure [2] allowed shall be inscribed in addition.

1.6.2 The following particulars shall be inscribed either on the tank-container itself or on a panel:

— names of the owner and of the operator;

— capacity [2] of the shell;

— unladen (tare) mass [2];

— maximum permissible laden mass [2];

— name of the substance being carried [3].

In addition, tank-containers shall bear the prescribed danger labels.

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[1] In special cases and with the agreement of the expert approved by the competent authority, the hydraulic pressure test may be replaced by a test using another liquid or a gas, where such an operation does not present any danger.

[2] Add the units of measurement after the numerical values.

[3] A collective description covering a group of substances of a similar nature and equally compatible with the characteristics of the shell may be given instead of the name.

1.7 ***Operation***

1.7.1 During carriage, tank-containers shall be loaded on the wagon in such a way as to be adequately protected by the fittings of the wagon or of the tank-container itself against lateral and longitudinal impact and against overturning [1]. If the shells and the service equipment are so constructed as to withstand impact or overturning they need not be protected in this way. The thickness of the walls of the shell shall remain, throughout its period of use, not less than the minimum value prescribed in 1.2.8.

1.7.2 Shells shall not be loaded with any dangerous substances other than those for whose carriage they have been approved and which, in contact with the materials of the shell, gaskets, equipment and protective linings, are not liable to react dangerously with therm, to form dangerous products or appreciably to weaken the material. Foodstuffs shall not be carried in these shells unless the necessary steps have been taken to prevent any harm to public health.

1.7.3 The following degrees of filling shall not be exceeded in tank-containers intended for the carriage of liquids at ambient temperatures:

1.7.3.1 — for flammable substances without additional risks (e.g. toxicity or corrosivity) in shells with a venting system or with safety valves (even where preceded by a bursting disc):

$$\text{degree of filling} = \frac{100}{1 + \alpha\ (50 - t_F)}\ \%\ \text{of capacity;}$$

1.7.3.2 — for toxic or corrosive substances (whether flammable or not) in shells with a venting system or with safety valves (even where preceded by a bursting disc):

$$\text{degree of filling} = \frac{98}{1 + \alpha\ (50 - t_F)}\ \%\ \text{of capacity;}$$

1.7.3.3 — for flammable substances and for harmful or slightly corrosive substances (whether flammable or not) in hermetically closed shells without safety device:

$$\text{degree of filling} = \frac{97}{1 + \alpha\ (50 - t_F)}\ \%\ \text{of capacity;}$$

1.7.3.4 — for highly toxic, toxic, highly corrosive or corrosive substances (whether flammable or not) in hermetically closed shells without safety device:

$$\text{degree of filling} = \frac{95}{1 + \alpha\ (50 - t_F)}\ \%\ \text{of capacity.}$$

1.7.3.5 In these formulae α is the mean coefficient of cubic expansion of the liquid between 15 °C and 50 °C, i.e. for a maximum variation in temperature of 35 °C.

α is calculated by the formula: $\alpha = \dfrac{d_{15} - d_{50}}{35 \times d_{50}}$

In which d_{15} and d_{50} are the relative densities of the liquid at 15 °C and 50 °C respectively. t_F is the mean temperature of the liquid at the time fo filling.

1.7.3.6 The provisions of 1.7.3.1 to 1.7.3.4 above shall not apply to shells whose contents are maintained by means of a heating device at a temperature above 50 °C during carriage. In such a case the degree of filling at the outset shall be such and the temperature shall be so regulated that the shell is not full to more than 95 % of its capacity at any time during carriage and that the filling temperature is not exceeded.

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[1] Examples of protection of shells:
1. Protection against lateral impact may for example consist of longitudinal bars protecting the shell on both sides at the level of the median line.
2. Protection against overturning may for example consist of reinforcing rings or bars fixed transversally in relation to the frame.
3. Protection against rear impact may for example consist of a bumper or frame.

1.7.3.7 Where hot substances are loaded, the temperature on the outer surface of the shell or of the thermal insulation shall not exceed 70 °C during carriage.

1.7.4 Shells intended for the carriage of liquids [1] which are not divided by partitions or surge plates into sections of not more than 7 500 litres capacity shall be filled to not less than 80 % of their capacity unless they are empty.

1.7.5 During loading and unloading of tank-containers, appropriate measures shall be taken to prevent the release of dangerous quantities of gases and vapours. Tank-containers shall be closed so that the contents cannot spill out uncontrolled. The openings of bottom-discharge shells shall be closed by means of screw-threaded plugs, blank flanges or other equally effective devices. The leakproofness of the shell closures, particularly in the upper part of the dip tube, shall be verified by the consignor after the shell has been filled.

1.7.6 Where several closure systems are fitted in series, that nearest to the substance being carried shall be closed first.

1.7.7 No dangerous residue of the substance being carried shall adhere to the outside of shells during carriage, whether they are full or empty.

1.7.8 To be accepted for carriage, empty shells, uncleaned, shall be closed in the same manner and be leakproof to the same degree as if they were full.

1.7.9 Substances which may react dangerously with each other shall not be carried in adjoining compartments of shells.

The following are considered dangerous reactions:

a) combustion and/or giving off considerable heat;

b) emission of flammable and/or toxic gases;

c) formation of corrosive liquids;

d) formation of unstable substances;

e) dangerous rise in pressure.

Substances which may react dangerously with each other may be carried in adjoining compartments of shells, when these compartments are separated by a partition with a wall thickness equal to or greater than that of the shell itself. They may also be carried in compartments of the same shell separated by an empty space or an empty compartment between loaded compartments.

1.8 ***Transitional measures***

1.8.1 Tank-containers constructed before the entry into force of the requirements applicable from 1 January 1988 which do not conform to those requirements but were constructed according to the requirements of RID in force until that date may still be used.

1.8.2 Tank-containers constructed before the entry into force of the requirements applicable from 1 January 1993 which do not conform to those requirements but were constructed according to the requirements of RID in force until that date may still be used.

1.8.3 Tank-containers constructed in accordance with the requirements of Appendix II C in force before 1 January 1995 which do not however conform to the corresponding requirements in force as from 1 January 1995, may continue to be used.

1.8.4 Tank-containers intended for the carriage of flammable liquids with a flash-point from 55 °C to 61 °C, constructed before the entry into force of the requirements of 1.2.7, 1.3.8 and 3.3.3 applicable from 1 January 1997, which do not conform to those requirements, but were constructed according to the requirements of those paragraphs in force until that date may still be used.

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[1] Substances whose kinematic viscosity at 20 °C is less than 2 680 mm^2/s shall be deemed to be liquids for the purposes of this provision.

1.9 ***Use of tank-containers approved for maritime transport***

Tank-containers which do not fully meet the requirements of this Appendix but which have been approved in accordance with the requirements concerning maritime transport [1]shall be accepted for carriage on the following conditions.

(a) Only substances accepted for carriage in tank-containers in accordance with the requirements of this Appendix may be carried;

(b) The consignor shall enter in the consignment note, in addition to the particulars already prescribed: 'Carriage in accordance with Section 1.9 of Appendix X'.

2. Special requirements applicable to Class 2: Gases: compressed, liquefield or dissolved under pressure

2.1 ***Use***

The gases of marg. 201 listed in the table in 2.5.2.5 may be carried in tank-containers.

2.2 ***Construction***

2.2.1.1 Shells intended for the carriage of substances of items 1, 2 and 4 shall be made of steel.

For weldless shells, by derogation from 1.2.6.2 a minimum elongation at fracture of 14 % and a stress σ (sigma) lower than or equal to the limits given below according to the materials may be accepted:

(a) if the ratio Re/Rm (minimum guaranteed characteristics after heat treatment) is higher than 0,66 without exceeding 0,85: $\sigma \leq 0{,}75$ Re.

(b) if the ratio Re/Rm (minimum guaranteed characteristics after heat treatment) is higher than 0,85: $\sigma \leq 0{,}5$ Rm.

2.2.1.2 Receptacles as defined in marg. 211 (1), (2) and (3) and cylinders as part of bundles of cylinders as defined in marg. 211 (5) which are elements of a multiple-element tank-container, shall be constructed according to marg. 212.

2.2.2 The requirements of Appendix II, C shall apply to the materials and construction of welded shells.

2.2.3 Shells intended for the carriage of 1017 chlorine or 1076 phosgene of item 2TC shall be designed for a calculation pressure [2] of at least 2,2 MPa (22 bar) (gauge pressure).

2.3 ***Items of equipment***

2.3.1 The discharge pipes of shells shall be capable of being closed by blank flanges or some other equally reliable device. For shells intended for the carriage of deeply refrigerated gases of item 3, these blank flanges or other equally effective devices may be fitted with pressure-release openings of a maximum diameter of 1,5 mm.

2.3.2 Shells intended for the carriage of liquefied gases may, in addition to the openings prescribed in 1.3.2 and 1.3.3, be provided with openings for the fitting of gauges, thermometers, manometers and with bleed holes, as required for their operation and safety.

2.3.2.1 Filling and discharge openings of shells of a capacity exceeding 1 m^3 intended for the carriage of liquefied flammable and/or toxic gases shall be equipped with an instant-closing internal safety device which closes automatically in the event of an unintended movement of the tank-container or of fire. It shall also be possible to operate the closing device by remote control.

2.3.2.2 All openings, other than those for the accommodation of safety valves and closed bleed holes, of shells intended for the carriage of liquefied flammable and/or toxic gases shall, if their nominal diameter is more than 1,5 mm, be equipped with an internal shut-off device.

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[1] These requirements are published in the IMDG Code.
[2] See 1.2.8.2.

2.3.2.3 By derogation from the provisions of 2.3.2.1 and 2.3.2.2, shells intended for the carriage of deeply-refrigerated flammable and/or toxic liquefied gases may be equipped with external devices in place of internal devices if the external devices afford protection against external damage at least equivalent to that afforded by the wall of the shell.

2.3.2.4 If the shells are equipped with gauges, these shall not be of a transparent material in direct contact with the substance carried. If there are thermometers they shall not project directly into the gas or liquid through the shell wall.

2.3.2.5 Shells intended for the carriage of 1053 hydrogen sulphide and 1064 methyl mercaptan of item 2TF, 1017 chlorine, 1076 phosgene and 1079 sulphur dioxide of item 2TC, shall not have any opening below the surface level of the liquid. In addition, the cleaning apertures (fist holes) referred to in 1.3.4.2 shall not be permitted.

2.3.2.6 Filling and discharge orifices situated in the upper part of shells shall be equipped with, in addition to what is prescribed in 2.3.2.1, a second, external, closing device. This device shall be capable of being closed by a blank flange or some other equally reliable device.

2.3.2.7 By derogation from the requirements in 2.3.2.1, 2.3.2.2 and 2.3.2.6, for receptacles as defined in marg. 211 (1),(2),(3) and (5) which form a multiple element tank-container, the safety devices may also be mounted within the manifolding arrangement.

2.3.3 Safety valves shall meet the conditions prescribed in 2.3.3.1 to 2.3.3.3 below.

2.3.3.1 Shells intended for the carriage of gases of items 1,2 and 4 may be fitted with not more than two safety valves whose aggregate clear cross-sectional area of passage at the seating or seatings shall be not less than 20 cm^2 per 30 m^3 or part thereof of the receptacle's capacity. These safety valves shall be capable of opening automatically under a pressure of from 0,9 to 1,0 times the test pressure of the shell to which they are fitted. They shall be of such a type as to resist dynamic stresses, including liquid surge. The use of deadweight or counterweight valves is prohibited.

Shells intended for the carriage of gases of items 1 to 4 indicated by the letter T in marg. 201 shall not have safety valves unless the safety valves are proceded by a bursting disc. In the latter case, the arragement of the bursting disc and the safety valve shall be satisfactory to the competent authority.

Where tank containers are intended for carriage by sea, the provisions of this paragraph shall not prohibit the fitting of safety valves conforming to the regulations governing that mode of transport [1].

2.3.3.2 Shells intended for the carriage of gases of item 3 shall be fitted with two independent safety valves; each valve shall be so designed as to allow the gases formed by evaporation during normal operation to escape from the shell in such a way that the pressure does not at any time exceed by more than 10 % the working pressure indicated on the shell.

One of the two safety valves may be replaced by a bursting disc which shall be such as to burst at the test pressure.

In the event of loss of the vacuum in a double-walled shell, or of destruction of 20 % of the insulation of a single-walled shell, the safety valve and the bursting disc shall permit an outflow such that the pressure in the shell cannot exceed the test pressure.

2.3.3.3 The safety valves of shells intended for the carriage of gases of item 3 shall be capable of opening at the working pressure indicated on the shell. They shall be so designed as to function faultlessly even at the lowest working temperature. The reliability of their operation at that temperature shall be established and checked either by testing each valve or by testing a specimen valve of each design type.

2.3.4 Thermal insulation

2.3.4.1 If shells intended for the carriage of liquefied gases of item 2 are equipped with thermal insulation, this shall consist of either:

— a sun shield covering not less than the upper third but not more than the upper half of the shell surface and separated from the shell by an air space at least 4 cm across; or

— a complete cladding, of adequate thickness, of insulating materials.

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[1] These requirements are published in the IMDG Code.

2.3.4.2 Shells intended for the carriage of gases of item 3 shall be thermally insulated. The thermal insulation shall be protected by means of continuous sheathing. If the space between the shell and the sheathing is under vacuum (vacuum insulation), the protective sheathing shall be so designed as to withstand without deformation an external pressure of at least 100 kPa (1 bar) (gauge pressure). Notwithstanding 1.1.4.2, external and internal reinforcing devices may be taken into account in the calculations. If the sheathing is so closed as to be gas-tight, a device shall be provided to prevent any dangerous pressure from developing in the insulating layer in the event of inadequate gas-tightness of the shell or of its items of equipment. This device shall prevent the infiltration of moisture into the heat-insulating sheath.

2.3.4.3 Shells intended for the carriage of liquefied gases having a boiling point below –182 °C at atmospheric pressure shall not include any combustible material either in the thermal insulation or in the fastenings.

The means of attachment ofr shells of vacuum insulated tanks may, with the approval of the competent authority, contain plastics materials between the shell and the sheathing.

2.3.5 A multiple-element tank-container contains elements which are linked to each other by a manifold and permanently mounted on the frame of a multiple-element tank-container·

The following elements are considered to be elements of a multiple-element tank-container:

— cylinders as defined in marg. 211(1)

— tubes as defined in marg. 211 (2)

— pressure drums as defined in marg. 211 (3)

— bundles of cylinders (also known as frames) as defined in marg. 211 (5)

— shells as defined in Appendix X.

Note: Bundles of cylinders as defined in marg. 211 (5) which are not elements of a multiple-element tank-container are subject to the requirements of Class 2.

For multiple-element tank-containers, the following, conditions shall be complied with:

2.3.5.1 If one of the elements of a multiple-element tank-container is fitted with a safety valve and shut-off devices are provided between the elements, every element shall be so fitted.

2.3.5.2 The filling and discharge devices may be fitted to a manifold.

2.3.5.3 Each element of a multiple-element tank-container, including each individual cylinder of a bundle, as defined in marg. 211(5), intended for the carriage of gases designated by the letter T in marg. 201 shall be capable of being isolated by a shut-off valve.

2.3.5.4 The elements of a multiple-element tank-container intended for the carriage of gases designated by the letter F in marg. 201, when consisting of receptacles as defined in marg. 211(1),(2),(3) and (5), shall be combined in groups of not more than 5 000 litres which are capable of being isolated by a shut-off valve.

Each element of a multiple-element tank-container intended for the carriage of gases designated by the letter F in marg. 201 when consisting of shells as defined in Appendix X shall be capable of being isolated by a shut-off valve.

2.3.6 By derogation from the provisions of 1.3.3, shells intended for the carriage of deeply refrigerated liquefied gases need not have an inspection aperture.

2.4 ***Type approval***

No special requirements.

2.5 ***Tests***

2.5.1.1 Receptacles as defined in marg. 211 (1), (2) and (3) and cylinders as part of bundles of cylinders as defined in marg. 211 (5), which are elements of a multiple-element tank-container, shall be tested according to marg. 219.

2.5.1.2 The materials of every welded shell, except those mentioned in 2.5.1.1, shall be tested according to the method described in Appendix II C.

2.5.2.1 The test pressure for shells intended for the carriage of gases of item 1 having a critical temperature below – 50 °C shall be at least one and one-half times the filling pressure at 15 °C.

2.5.2.2 The test pressure for shells intended for the carriage of:

— gases of item having a critical temperature of – 50 °C or above;

— gases of item 2 having a critical temperature below 70 °C, and

— gases of item 4

shall be such that, when the shell is filled to the maximum mass of the contents per litre of capacity, the pressure reached in the shell by the substance at 55 °C for shells with thermal insulation or 65 °C for shells without thermal insulation does not exceed the test pressure.

2.5.2.3 The test pressure for shells intended for the carriage of gases of item 2 having a critical temperature of 70 °C or above shall be:

(a) If the shell is equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0,1 MPa(1 bar) of the liquid at 60 °C, but not less than 0,1 MPa (1 bar);

(b) If the shell is not equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0,1 MPa (1 bar), of the liquid at 65 °C, but not less than 1 MPa (10 bar).

The maximum values of kg/litre prescribed for the degree of filling are calculated as follows:

maximum mass of contents per litre of capacity = 0,95 × density of the liquid phase at 50 °C (in kg/l); moreover the vapour phase shall not disappear at 60 °C.

If the shells are not more than 1,5 metre in diameter the values of the test pressure and maximum permissible mass of contents per litre of capacity conforming to marg. 219 (d) shall be applicable.

2.5.2.4 The test pressure for shells intended for the carriage of gases of item 3 shall be not less than 1,3 times the maximum permitted working pressure indicated on the shell, but not less than 300 kPa (3 bar) (gauge pressure); for shells with vacuum insulation the test pressure shall be not less than 1,3 times the maximum permitted working pressure increased by 100 kPa (1 bar).

2.5.2.5 **Table of gases and gas mixtures which may be carried in tank-containers, minimum test pressure of the shells and as far as is applicable, maximum mass of contents per litre of capacity.**

In the case of gases and gas mixtures classified under n.o.s. entries, the values of the test pressure and maximum mass of contents per litre of capacity shall be prescribed by the expert approved by the competent authority.

When shells for gases fo items 1 and 2 having a critical temperature of – 50 °C or above and below 70 °C have been subjected to a test pressure lower than that shown in the table, and the shells are fitted with thermal insulation, a lower maximum load may be prescribed by the expert approved by the competent authority, provided that the pressure reached in the shell by the substance at 55 °C does not exceed the test pressure stamped on the shell.

Toxic gases and gas mixtures classified under n.o.s. entries with a LC_{50} < 200 ppm shall not be authorized for carriage in tank-containers.

Note: 1076 phosgene of item 2 TC, 1067 dinitrogen tetroxide (nitrogen dioxide) of item 2TOC and 1001 acetylene, dissolved, of item 4 shall only be authorized for carriage in multiple-element tank-containers.

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
1 A	1002 Air, compressed	see 2.5.2.1				
	1006 Argon, compressed	see 2.5.2.1				
	1046 Helium, compressed	see 2.5.2.1				
	1056 Krypton, compressed	see 2.5.2.1				
	1065 Neon, compressed	see 2.5.2.1				
	1066 Nitrogen, compressed	see 2.5.2.1				
	1979 Rare gases, mixture, compressed	see 2.5.2.1				
	1980 Rare gases and oxygen, mixture, compressed	see 2.5.2.1				
	1981 Rare gases and nitrogen, mixture, compressed	see 2.5.2.1				
	1982 Tetrafluoromethane, compressed (refrigerant gas R 14, compressed)	20 30	200 300	20 30	200 300	0,62 0,94
	2036 Xenon, compressed	12	120			1,30
				13	130	1,24
	2193 Hexafluoroethane, compressed (refrigerant gas R 116, compressed)			20	200	1,10
		16	160			1,28
		20	200			1,34
	1956 Compressed gas, n.o.s.	see 2.5.2.1 or 2.5.2.2				
1 O	1014 Carbon dioxide and oxygen, mixture, compressed	see 2.5.2.1				
	1072 Oxygen, compressed	see 2.5.2.1				
	3156 Compressed gas, oxidizing, n.o.s.	see 2.5.2.1 or 2.5.2.2				
1 F	1049 Hydrogen, compressed	see 2.5.2.1				
	1957 Deuterium, compressed	see 2.5.2.1				
	1962 Ethylene, compressed			22,5	225	0,34
				30	300	0,37
		12	120			0,25
		22,5	225			0,36
	1971 Methane, compressed, or natural gas, compressed with high methane content	see 2.5.2.1				
	2034 Hydrogen and Methane, mixture, compressed	see 2.5.2.1				
	2203 Silane, compressed [1]	22,5	225	22,5	225	0,32
		25	250	25	250	0,41
	1964 Hydrocarbon gas, mixture, compressed, n.o.s.	see 2.5.2.1 or 2.5.2.2				
	1954 Compressed gas, flammable, n.o.s.	see 2.5.2.1 or 2.5.2.2				
1 T	1612 Hexaethyl tetraphosphate and compressed gas, mixture	see 2.5.2.1				
	1955 Compressed gas, toxic, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				

[1] Considered as pyrophoric.

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
1 TF	1016 Carbon monoxide, compressed	see 2.5.2.1				
	1023 Coal gas, compressed	see 2.5.2.1				
	1071 Oil gas, compressed	see 2.5.2.1				
	1911 Diborane, compressed	not allowed				
	2600 Carbon monoxide and hydrogen, mixture, compressed	see 2.5.2.1				
	1953 Compressed gas, toxic, flammable, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
1 TC	1008 Boron trifluoride, compressed	22,5 30	225 300	22,5 30	225 300	0,715 0,86
	1859 Silicon tetrafluoride, compressed	20 30	200 300	20 30	200 300	0,74 1,10
	2198 Phosphorus pentafluoride, compressed	not allowed				
	2417 Carbonyl fluoride, compressed	20 30	200 300	20 30	200 300	0,47 0,70
	3304 Compressed gas, toxic, corrosive, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
1 TO	2451 Nitrogen trifluoride	20 30	200 300	20 30	200 300	0,50 0,75
	3303 Compressed gas, toxic, oxidizing, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
1 TFC	3305 Compressed gas, toxic, flammable, corrosive, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
1 TOC	1045 Fluorine, compressed	not allowed				
	1660 Nitric oxide, compressed	not allowed				
	2190 Oxygen difluoride,	not allowed				
	3306 Compressed gas, toxic, oxidizing, corrosive, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
2 A	1009 Bromotrifluoromethane (refrigerant gas R 13B1)			4,2 12 25	42 120 250	1,13 1,44 1,60
		12	120			1,50
	1013 Carbon dioxide			19 25	190 250	0,66 0,75
		19 22,5	190 225			0,73 0,78
	1015 Carbon dioxide and nitrous oxide, mixture	see 2.5.2.2 or 2.5.2.3				
	1018 Chlorodifluoromethane (refrigerant gas R 22)	2,4	24	2,6	26	1,03
	1020 Chloropentafluoroethane (refrigerant gas R 115)	2	20	2,3	23	1,08
	1021 1-Chloro-1,2,2,2-tetrafluoroethane (refrigerant gas R 124)	1	10	1,1	11	1,20

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 A *(cont'd)*	1022 Chlorotrifluoromethane (refrigerant gas R 13)			10	100	0,83
				12	120	0,90
				19	190	1,04
				25	250	1,10
		12	120			0,96
		22,5	225			1,12
	1028 Dichlorodifluoromethane (refrigerant gas R 12)	1,5	15	1,6	16	1,15
	1029 Dichloromonofluoromethane (refrigerant gas R 21)	1	10	1	10	1,23
	1058 Liquefied gases, non-flammable, charged with nitrogen, carbon dioxide or air	1,5 × filling pressure see 2.5.2.2 or 2.5.2.3				
	1080 Sulphur hexafluoride	12	120			1,34
				7	70	1,04
				14	140	1,33
				16	160	1,37
	1858 Hexafluoropropylene (refrigerant gas R 1216)	1,7	17	1,9	19	1,11
	1952 Ethylene oxide and carbon dioxide, mixture, with not more than 9 % ethylene oxide	19	190	19	190	0,66
		25	250	25	250	0,75
	1958 1,2-Dichloro-1,1,2,2-tetrafluoroethane (refrigerant gas R 114)	1	10	1	10	1,30
	1973 Chlorodifluoromethane and chloropentafluoroethane, mixture, with fixed boiling point, with approximately 49 % chlorodifluoromethane (refrigerant gas R 502)	2,5	25	2,8	28	1,05
	1974 Chlorodifluoromethane (refrigerant gas R 12B1)	1	10	1	10	1,61
	1976 Octafluorocyclobutane (refrigerant gas R C318)	1	10	1	10	1,34
	1983 1-Chloro-2,2,2-trifluoroethane (refrigerant gas R 133a)	1	10	1	10	1,18
	1984 Trifluoromethane (refrigerant gas R 23)	19	190			0,92
		25	250			0,99
				19	190	0,87
				25	250	0,95
	2422 Octafluorobut-2-ene (refrigerant gas R 1318)	1,2	12	1,2	12	1,34
	2424 Octafluoropropane (refrigerant gas R 218)	2,5	25	2,5	25	1,09
	2599 Chlorotrifluoromethane and Trifluoromethane, azeotropic mixture with approximately 60 % chlorotrifluoromethane (refrigerant gas R 503)	3,1	31	3,1	31	0,11
		4,2	42			0,21
		10	100			0,76
				4,2	42	0,20
				10	100	0,66
	2602 Dichlorodifluoromethane and 1,1-difluoroethane, azeotropic mixture with approximately 74 % dichlorodifluoromethane (refrigerant gas R 500)	1,8	18	2	20	1,01
	3070 Ethylene oxide and dichlorodifluoromethane, mixture with not more than 12,5 % ethylene oxide	1,5	15	1,6	16	1,09
	3159 1,1,1,2-Tetrafluoroethane (refrigerant gas R 134a)	1,6	16	1,8	18	1,04
	3220 Pentafluoroethane (refrigerant gas R 125)	3,1	31	3,4	34	0,95
	3296 Heptafluoropropane (refrigerant gas R 227)	1,5	15	1,5	15	1,20

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 A *(cont'd)*	3297 Ethylene oxide and chlorotetrafluoroethane, mixture with not more than 8,8 % ethylene oxide	1	10	1	10	1,16
	3298 Ethylene oxide and pentafluoroethane, mixture with not more than 7,9 % ethylene oxide	2,6	26	2,6	26	1,02
	3299 Ethylene oxide and tetrafluoroethane, mixture with not more than 5,6 % ethylene oxide	1,7	17	1,7	17	1,03
	1078 refrigerant gas, n.o.s., such as					
	mixture F1	1	10	1,1	11	1,23
	mixture F2	1,5	15	1,6	16	1,15
	mixture F3	2,4	24	2,7	27	1,03
	other mixtures	see 2.5.2.2 or 2.5.2.3				
	1968 Insecticide gas, n.o.s.	see 2.5.2.2 or 2.5.2.3				
	3163 Liquefied gas, n.o.s.	see 2.5.2.2 or 2.5.2.3				
2 O	1070 Nitrous oxide	22,5	225			0,78
				18	180	0,68
				22,5	225	0,74
				25	250	0,75
	3157 Liquefied gas, oxidizing, n.o.s.	see 2.5.2.2 or 2.5.2.3				
2 F	1010 1,2-butadiene, inhibited, or	1	10	1	10	0,59
	1010 1,3-butadiene, inhibited, or	1	10	1	10	0,55
	1010 mixture of 1,3-butadiene and hydrocarbons, inhibited	1	10	1	10	0,50
	1011 Butane	1	10	1	10	0,51
	1012 Butylenes, mixture or	1	10	1	10	0,50
	1012 1-butylene or	1	10	1	10	0,53
	1012 cis-2-butene or	1	10	1	10	0,55
	1012 trans-2-butylene	1	10	1	10	0,54
	1027 Cyclopropane	1,6	16	1,8	18	0,53
	1030 1,1-Difluoroethane (refrigerant gas R 152a)	1,4	14	1,6	16	0,79
	1032 Dimethylamine, anhydrous	1	10	1	10	0,59
	1033 Dimethyl ether	1,4	14	1,6	16	0,58
	1035 Ethane	12	120			0,32
				9,5	95	0,25
				12	120	0,29
				30	300	0,39
	1036 Ethylamine	1	10	1	10	0,61
	1037 Ethyl chloride	1	10	1	10	0,80
	1039 Ethyl methyl ether	1	10	1	10	0,64
	1041 Ethylene oxide and carbon dioxide, mixture with more than 9 % ethylene oxide but not more than 87 %	2,4	24	2,6	26	0,73
	1055 Isobutylene	1	10	1	10	0,52
	1060 Methyl, acetylene and propadiene mixture, stabilized	see 2.5.2.2 or 2.5.2.3				
	Propadiene with 1 % to 4 % methylacetylene	2,2	22	2,2	22	0,50
	mixture P1	2,5	25	2,8	28	0,49
	mixture P2	2,2	22	2,3	23	0,47
	1061 Methylamine, anhydrous	1	10	1,1	11	0,58

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 F *(cont'd)*	1063 Methyl chloride (refrigerant gas R 40)	1,3	13	1,5	15	0,81
	1077 Propylene	2,5	25	2,7	27	0,43
	1081 Tetrafluoroethylene, inhibited	not allowed				
	1083 Trimethylamine, anhydrous	1	10	1	10	0,56
	1085 Vinyl bromide, inhibited	1	10	1	10	1,37
	1086 Vinyl chloride, inhibited	1	10	1,1	11	0,81
	1087 Vinyl methyl ether, inhibited	1	10	1	10	0,67
	1860 Vinyl fluoride, inhibited	12	120			0,58
		22,5	225			0,65
				25	250	0,64
	1912 Methyl chloride and methylene chloride, mixture	1,3	13	1,5	15	0,81
	1959 1,1-Difluoroethylene (refrigerant gas R 1132a)	12	120			0,66
		22,5	225			0,78
				25	250	0,77
	1969 Isobutane	1	10	1	10	0,49
	1978 Propane	2,1	21	2,3	23	0,42
	2035 1,1,1-Trifluoroethane (refrigerant gas R 143a)	2,8	28	3,2	32	0,79
	2044 2,2-Dimethylpropane	1	10	1	10	0,53
	2200 Propadiene, inhibited	2,2	22	2,2	22	0,50
	2419 Bromotrifluoroethylene	1	10	1	10	1,19
	2452 Ethyl acetylene, inhibited	1	10	1	10	0,57
	2453 Ethyl fluoride (refrigerant gas R 161)	3	30	3	30	0,57
	2454 Methyl fluoride (refrigerant gas R 41)	30	300	30	300	0,36
	2517 1-Chloro-1,1-difluoroethane (refrigerant gas R 142b)	1	10	1	10	0,99
	2601 Cyclobutane	1	10	1	10	0,63
	3153 Perfluoro(methyl vinyl ether)	2	20	2	20	0,75
	3154 Perfluoro(ethyl vinyl ether)	1	10	1	10	0,98
	3252 Difluoromethane (refrigerant gas R 32)	4,8	48	4,8	48	0,78
	1965 Hydrocarbon gas, mixture, liquefied, n.o.s., such as					
	mixture A	1	10	1	10	0,50
	mixture A0	1,2	12	1,4	14	0,47
	mixture A1	1,6	16	1,8	18	0,46
	mixture B	2	20	2,3	23	0,43
	mixture C	2,5	25	2,7	27	0,42
	other mixtures	see 2.5.2.2 or 2.5.2.3				
	3161 Liquefied gas, flammable, n.o.s.	see 2.5.2.2 or 2.5.2.3				
2 T	1062 Methyl bromide	1	10	1	10	1,51
	1581 Chloropicrin and methyl bromide, mixture	1	10	1	10	1,51
	1582 Chloropicrin and methyl chloride, mixture	1,3	13	1,5	15	0,81
	1967 Insecticide gas toxic, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				
	2191 Sulfuryl fluoride	5	50	5	50	1,10
	3162 Liquefied gas, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 TF	1026 Cyanogen	10	100	10	100	0,70
	1040 Ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 °C	1,5	15	1,5	15	0,78
	1053 Hydrogen sulphide	4,5	45	5	50	0,67
	1064 Methyl mercaptan	1	10	1	10	0,78
	1082 Trifluorochloroethylene, inhibited	1,5	15	1,7	17	1,13
	2188 Arsine	not allowed				
	2192 Germane [1]	not allowed				
	2199 Phospine [1]	not allowed				
	2202 Hydrogen selenide, anhydrous	not allowed				
	2204 Carbonyl sulphide	2,6	26	2,6	26	0,84
	2676 Stibine	not allowed				
	3300 Ethylene oxide and carbon dioxide, mixture with more than 87 % ethylene oxide	2,8	28	2,8	28	0,73
	3160 Liquefied gas, toxic, flammable, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				
2 TC	1005 Ammonia, anhydrous	2,6	26	2,9	29	0,53
	1017 Chlorine	1,7	17	1,9	19	1,25
	1048 Hydrogen bromide, anhydrous	5	50	5,5	55	1,54
	1050 Hydrogen chloride, anhydrous	12	120			0,69
				10	100	0,30
				12	120	0,56
				15	150	0,67
				20	200	0,74
	1069 Nitrosyl chloride	not allowed				
	1076 Phosgene	only in a multiple-element tank-containers				
	1079 Sulphur dioxide	1	10	1,2	12	1,23
	1589 Cyanogen chloride, inhibited	not allowed				
	1741 Boron trichloride	not allowed				
	2194 Selenium hexafluoride	not allowed				
	2195 Tellurium hexafluoride	not allowed				
	2196 Tungsten hexafluoride	not allowed				
	2197 Hydrogen iodide, anhydrous	2,3	23	2,3	23	2,25
	2418 Sulphur tetrafluoride	not allowed				
	2420 Hexafluoroacetone	2,2	22	2,2	22	1,08
	3057 Trifluoroacetyl chloride	1,3	13	1,5	15	1,17
	3308 Liquefied gas, toxic, corrosive n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				
2 TO	3083 Perchloryl fluoride	3,3	33	3,3	33	1,21
	3307 Liquefied gas, toxic, oxidizing, n.o.s.	see 2.5.2.2 or 2.5.2.3				

[1] Considered as pyrophoric.

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 TFC	2189 Dichlorosilane	1	10	1	10	0,90
	2534 Methylchlorosilane	not allowed				
	3309 Liquefied gas, toxic, flammable, corrosive, n.o.s.	see 2.5.2.2 or 2.5.2.3				
2 TOC	1067 Dintrogen tetroxide (introgen dioxide)	only in multiple-element tank-containers				
	1749 Chlorine trifluoride	3	30	3	30	1,40
	1975 Nitric oxide and dinitrogen tetroxide mixture (nitric oxide and nitrogen dioxide mixture)	not allowed				
	2548 Chlorine pentafluoride	not allowed				
	2901 Bromine chloride	1	10	1	10	1,50
	3310 Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				
3 A	1913 Neon, refrigerated liquid	see 2.5.2.4				
	1951 Argon, refrigerated liquid	see 2.5.2.4				
	1963 Helium, refrigerated liquid	see 2.5.2.4				
	1970 Krypton, refrigerated liquid	see 2.5.2.4				
	1977 Nitrogen, refrigerated liquid	see 2.5.2.4				
	2187 Carbon dioxide, refrigerated liquid	see 2.5.2.4				
	2591 Xenon, refrigerated liquid	see 2.5.2.4				
	3136 Trifluoromethane, refrigerated liquid	see 2.5.2.4				
	3158 Gas, refrigerated liquid, n.o.s.	see 2.5.2.4				
3 O	1003 Air, refrigerated liquid	see 2.5.2.4				
	1073 Oxygen, refrigerated liquid	see 2.5.2.4				
	2201 Nitrous oxide, refrigerated liquid	see 2.5.2.4				
	3311 Gas, refrigerated liquefied, oxidizing, n.o.s.	see 2.5.2.4				
3 F	1038 Ethylene, refrigerated liquid	see 2.5.2.4				
	1961 Ethane, refrigerated liquid	see 2.5.2.4				
	1966 Hydrogen, refrigerated liquid	see 2.5.2.4				
	1972 Methane, refrigerated liquid, or 1972 Natural gas, refrigerated liquid, with high methane content	see 2.5.2.4				
	3138 Ethylene, acetylene and propylene in mixture refrigerated liquid, containing at least 71,5 % ethylene with not more than 22,5 % acetylene and not more than 6 % propylene	see 2.5.2.4				
	3312 Gas, refrigerated liquid, flammable, n.o.s.	see 2.5.2.4				
4 A	2073 Ammonia solutions, relative density less than 0,880 kg/l at 15 °C					
	with more than 35 % and not more than 40 % ammonia	1	10	1	10	0,80
	with more than 40 % and not more than 50 % ammonia	1,2	12	1,2	12	0,77
4 F	1001 Acetylene, dissolved	only in multiple-element tank-containers				
4 TC	3318 Ammonia solutions, relative density less than 0,880 kg/l at 15 °C in water, with more than 50 % ammonia	see 2.5.2.2				

2.5.3 The first hydraulic pressure test shall be carried out before thermal insulation is applied.

2.5.4 The capacity of each shell intended for the carriage of gases of item 1 filled by mass, and gases of items 2 and 4 shall be determined, under the supervision of an expert approved by the competent authority, by weighing of by volumetric measurement of the quantity of water required to fill the shell. The measurement of shell capacity shall be accurate to within 1 %. Determination by a calculation based on the dimensions of the shell is not permitted. The maximum permissible load mass according to marg. 219,2.5.2.2 and 2.5.2.3 shall be prescribed by an approved expert.

2.5.5 Checking of the welds shall be carried out in accordance with the lambda-coefficient 1,0 requirements of 1.2.8.6.

2.5.6 Outwithstanding the requirements of 1, 5, the periodic tests, including the hydraulic pressure test, shall take place:

2.5.6.1 — Every 2 ½ and a half years in the case of shells intended for the carriage of 1008 boron trifuluoride of item ITC, 1053 hydrogen sulphide of item 2 TF, 1017 chlorine, 1048 hydrogen bromide, anhydrous, 1050 hydrogen, anhydrous, 1076 phosgene and 1079 sulphur dioxide of item 2 TC and 1067 dinitrogen tetroxid (nitrogen dioxide) of item 2 TOC.

2.5.6.2 — After 8 years and thereafter every 12 years in the case of shells intended for the carriage of gases of item 3. A leakproofness test shall be performed by an approved expert, at the request of the competent authority, between any two successive tests.

2.5.6.3 Receptacles as defined in marg. 211(1), (2) and 3 and cylinder as part of bundles of cylinders as defined in marg. 211(5), which are elements of a multiple-element tankcontainer, shall have periode inspection according to marg. 217.

2.5.7 In the case of vacuum-insulated shells the hydraulic-pressure test and the check of the internal condition may, with the approved expert, be replaced by a leakproofness test and measurement of the vacuum.

2.5.8 If apertures have been made, on the occasion of periodic inspections, in shells intended for the carriage of gases of item 3, the method by which they are hermetically closed before the shells are replaced in service shall be approved by the approved expert and shall ensure the integrity of the shell.

2.5.9 The leakproofness test of shells intended for the carriage of gases of items 1, 2 and 4 shall be carried out at a pressure of not less than 0,4 MPa (8bar)(gauge pressure).

2.6 ***Marking***

2.6.1 In addition, the following particulars shall be marked by stamping or by any other similar method on the plate prescribed in 1.6.1, or directly on the walls of the shell itself if the walls are so reinforced that the strength of the shell is not impaired:

2.6.1.1 On shells intended for the carriage of only one substance:

— the name of the gas in full in accordance with marg. 201, in addition for gases classified under an n.o.s. entry, the technical name [1].

This indication shall be supplemented, in the case of shalls intended for the carriage of compressed gases of item 1 filled by volume pressure), by an indication of the maximum filling pressure at 15 °C allowed for the shell and, in the case of shells intended for the carriage of gases of item 1 filled by mass, and of gases of items 2,3 and 4, by the maximum permissible load mass in kg and the filling temperature if below – 20 °C.

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[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. Instead of the technical name, the use of one of the following names permitted:
— For 1078 refrigerant gas, n.o.s., of item 2A: mixture F1, mixture F2, mixture F3;
— For 1060 methyl acetylene and propadiene mixtures, stabilized, of item 2F: mixture P1, mixture P2;
— For 1965 hydrocarbon gas mixture, liquefied, n.o.s. of item 2F: mixture A, mixture AO, mixture A1, mixture B, mixture C. The names customary in the trade and mentioned in marg. 201, Note 1 to item 2F nº 1965, may be used only as a complement.

2.6.1.2 On multi-purpose shells:

— the names, in full in accordance with marg. 201 for gases classified under an n.o.s. entry, the technical name (1), of the gases for whose carriage the shell is approved.

This shall be supplemented by particulars of the permissible maximum load mass, in kg for each of them.

2.6.1.3 On shells intended for the carriage of gases of item 3:

— the maximum permissible working pressure.

2.6.1.4 On shells equipped with the thermal insulation:

— the inscription 'thermally insulated' of 'thermally insulated by vacuum'.

2.6.2.1 The frame of a multiple-element tank-container shall bear near the filling point a plate specifying:

— the test pressure of the elements; (2),

— the maximum filling pressure (2) at 15 °C allowed for the elements intended for compressed gases,

— the number of elements;

— the total capacity (2) of the elements;

— the name of the gas in full accordance with marg. 201 and in addition for gases classified under an n.o.s. entry, the technical name (1),

and , in addition, in the case of liquified gases:

— the maximum permissible load mass (2)per element.

2.6.2.2 Receptacles as defined in marg. 211(1),(2),(3)and (5), which are elements of a multiple-element tank container, shall be marked according to marg. 223. These receptacles need not be labelled individually with the danger labels as required in marg. 224.

Multiple-element tank-containers shall be marked in accordance with Appendix VIII and labelled in accordance with marg. 224.

2.6.3 In addition to the particulars prescribed in 1,6,2, the following shall be inscribed either on the shell itself or on a plate:

a) the inscription 'minimum filling temperature allowed: ...';

b) where the shell is intended for the carriage of one substance only:

the name of the gas in full in accordance with marg. 201 and, in addition for gases classified under an n.o.s. entry, the technical name (1).

for gases of item 1 filled by mass and for gases of items 2, 3 and 4, the maximum permissible load mass in kg;

c) where the shell is a multi-purpose shell:

the names in full (1) of all the gases to whose carriage the shell is assigned, with an indication of the maximum permissible load mass in kg for each of them;

d) where the shell is equipped with thermal insulation:

the inscription 'thermally insulated' or 'thermally insulated by vacuum', in an official language of the country of registration, and if this language is not French, German, Italian or English, also in French, German, Italian of English, unless the international tariffs or agreements concluded between the railway administrations provide otherwise.

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(1) The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. Instead of the technical name, the use of one of the following names permitted:
— For 1078 refrigerant gas, n.o.s., of item 2A: mixture F1, mixture F2, mixture F3;
— For 1060 methyl acetylene and propadiene mixtures, stabilized, of item 2F: mixture P1, mixture P2;
— For 1965 hydrocarbon gas mixture, liquefied, n.o.s. of item 2F: mixture A, mixture AO, mixture A1, mixture B, mixture C. The names customary in the trade and mentioned in marg. 201, Note 1 to item 2F nº 1965, may be used only as a complement.

(2) Add the units of measurement after the numerical values.

2.7 ***Operation***

2.7.1 When shells are approved for different gases, a change of use shall include emptying, purging and evacuation operations to the extent necessary for safe operation.

2.7.2 When loaded tank-containers or empty but uncleaned tank-containers are handed over for carriage, only the particulars applicable under 2.6.3 to the gas loaded or just discharged shall be visible; all particulars concerning other gases shall be covered up.

2.7.3 The elements of a multiple-element tank-container shall contain only one and the same gas.

2.7.4 The degree of filling of shells intended for the carriage of gases of item 3F shall remain below the level at which, if the contents were raised to a temperature at which the vapour pressure equalled the opening pressure of the safety valve, the volume of the liquid would reach 95 % or the capacity of the shell at that temperature. Shells for the carriage of gases of items 3 A and 3 O may be filled to 98 % at the loading temperature and the loading pressure.

2.7.5 In the case of shells intended for the carriage of gases of item 3 O, the materials used to ensure leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents.

2.7.6 The requirement in 1.7.6 shall not apply to gases of item 3.

2.8 ***Transitional measures***

Tank-containers intended for the carriage of substances of Class 2, built before 1 January 1997, may bear the marking in accordance with the requirements of this Appendix in force before 1 January 1997, until the next periodic test.

3. Special requirements applicable to Class 3: Flammable liquids

3.1 ***Use***

The following substances of marg. 301 may be carried in tank-containers:

3.1.1 Propyleneimine, inhibited, of item 12.

3.1.2 Substances classified under (a) of items 11, 14 to 22, 26, 27 and 41.

3.1.3 Substances classified under (b) of items 11, 14 to 27 and 41 and substances classified under items 32 and 33.

3.1.4 Substances classified under items 1 to 5, 31, 34 and 61 with the exception of isopropylnitrate, n-propyl nitrate and nitromethane of item 3 (b).

3.2 ***Construction***

3.2.1 Shells intended for the carriage of propyleneimine, inhibited, of item 12, shall be designed for a calculation pressure [1] of not less than 1,5 (15 bar) (gauge pressure).

3.2.2 Shells intended for the carriage of the substances referred to in 3.1.2 shall be designed for a calculation pressure [1] of not less than 1 MPa (10bar)(gauge pressure).

3.2.3 Shells intended for the carriage of the substances referred to 3.1.3 shall be designed for a calculation pressure [1] of not less than 0,4 MPa (4bar)(gauge pressure) .

3.2.4 Shells intended for the carriage of the substance referred to in 3.1.4 shall be designed in accordance with the requirements of the general part of this Appendix.

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[1] See 1.2.8.2.

3.3 ***Items of equipment***

3.3.1 All openings of shells intended for carriage of the substances referred to in 3.1.1 and 3.1.2 shall be above the surface level of the liquid. No pipes or pipe connections shall pass through the walls of the shell below the surface level of the liquid. Shells shall be capable of being hermetically closed [1] and the closures shall be capable of being protected by a lockable cap.

3.3.2 Shells intended for the carriage of the substances referred to in 3.1.3 and 3.1.4 may also be of the bottom discharge type. Shells intended for the carriage of the substances referred to in 3.1.3. except those of item 33 shall be capable of being hermetically closed [1].

3.3.3 If shells intended for the carriage of the substances referred to in 3.1.1, 3.1.2 or 3.1.3, except those of item 33, are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority. If shells intended for the carriage of the substances referred to in 3.1.4 are equipped with safety valves or a venting system, these shall satisfy the requirements of 1.3.5 to 1.3.7. If shells intended for the carriage of substances of item 33 are fitted with safety valves, these shall satisfy the requirements of 1.3.6 and 1.3.7. Shells intended for the carriage of the substances referred to in 3.1.4 having a flash-point not exceeding 61 °C and equipped with a venting system which cannot be closed shall have a flame-trap in the venting system or be resistant to the pressure generated by an explosion.

3.3.4 If the shells are fitted with non-metallic protective linings (inner layers) these shall be so designed that no danger of ignition from electrostatic charges can occur.

The bottom discharge system of shells intended for the carriage of substances of marg. 301, item 61(c) may consist of an external pipe with a stop-valve, if it is constructed of a metallic material to deformation.

3.4 ***Type approval***

No special requirements.

3.5 ***Tests***

3.5.1 hells intended for the carriage of substances referred to in 3.1.1, 3.1.2 and 3.1.3 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 0,4 MPa (4bar) (gauge pressure).

3.5.2 Shells intended for the carriage of substances referred to in 3.1.4 shall be subjected to the initial and periodic hydrualic pressure tests as their calculation pressure as defined in 1.2.4.

3.6 ***Marking***

No special requirements.

3.7 ***Operation***

3.7.1 Shells intended for the carriage of the substances referred to in 3.1.1, 3.1.2 and 3.1.3 except those of item 33 shall be hermetically closed [1] during carriage. The closures of shells intended for the carriage of substances referred to in 3.1.1 and 3.1.2 shall be protected by a locked cap.

3.7.2 Tank-containers approved for the carriage of substances of items 11, 12, 14 to 19, 27, 32 and 41 shall not be used for the carriage of foodstuffs, other articles of consumption or animal feedstuffs.

3.7.3 An aluminium alloy shall not be used for the carriage of acetaldehyde of item 1 (a) unless the shell is reserved solely for such carriage and the acetaldehyde is free from acid.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special provisions applicable to the individual classes.

3.7.4 The petrol (gasoline) referred to in the Note to item 3 (b) of marg. 301 may also be carried in shells designed according to 1.2.4.1 and having equipment conforming 1.3.5.

3.8 ***Transitional requirements***

3.8.1 Tank-containers intended for the carriage of substances of marg. 301, items 32 and 33 constructed in accordance with the requirements of this Appendix in force before 1 January 1995 which do not however conform to the corresponding requirements in force as from 1 January 1995, may continue to be used until 31 December 1999.

Tank-containers intended for the carriage of substances of marg. 301, item 61, which do not however conform to the requirements in force as from 1 January 1995, may continue to be used until 31 December 2002.

3.8.2 Tank-containers built in accordance with the requirements in force before 1 January 1997, but which do not conform of 3.3.3 and 3.3.4 in force from 1 January 1997 may continue to be used.

4. Special requirements applicable to
Class 4.1: Flammable solids
Class 4.2: Substances liable to spontaneous combustion
Class 4.3: Substances which, in contact with water, emit flammable gases

4.1 ***Use***

The following substances of marg. 401, 431 and 471 may be carried in tank-containers.

4.1.1 Substances listed under (a) of items 6,17,19 and 31 to 33 of marg. 431.

4.1.2 Substances of items 11 (a) and 22 of marg. 431.

4.1.3 Substances listed under a) of items 1, 2, 3, 21, 23 and 25 of marg. 471.

4.1.4 Substances of item 11 (a) of marg. 471.

4.1.5 Substances listed under (b) and (c)

— of items 6,8,10,17,19 and 21 of marg. 431;

— of items 3, 21, 23 and 25 of marg. 471 and 3241 2-bromo-2-nitropropane-1,3 diol of marg. 401, item 26(c)

4.1.6 Substances of items 5 and 15 of marg. 401

4.1.7 Powdery and granular substances listed under letter (b) or (c)

— of items 1, 6, 7, 8, 11, 12, 13, 14, 16 and 17 of marg. 401

— of items 1,5,7,9,12,13,14,15,16,18 and 20 of marg. 431

— of items 11, 12, 13, 14, 15, 16, 17, 19, 20, 22 and 24 of marg. 471

Note: For the carriage in bulk of substances of marg. 401, 431 or 471, see marg. 416, 446 and 486.

4.2 ***Construction***

4.2.1 Shells intended for the carriage of the substances referred to in 4.1.1 shall be designed for a calculation pressure [1] of not less than 2,1 MPa (21 bar)(gauge pressure). The requirements of Appendix II C shall be applicable to the materials and construction of these shells.

[1] See 1.2.8.2.

4.2.2 Shells intended for the carriage of the substances referred to in 4.1.2, 4.1.3 and 4.1.4 shall be designed for a calculation pressure(1) of not less than 1 Mpa (10 bar) (gauge pressure).

4.2.3 Shell intended for the carriage of the substances referred to in 4.1.5 shall be designed for a calculation pressure (1) of not less than 0,4 MPa (4bar)(gauge pressure).

4.2.4 Shells intended for the carriage of solids referred to in 4.1.6 and 4.1.7 shall be designed in accordance with the requirements of the general part of this Appendix.

4.2.5 All parts of tank-containers for the carriage of substances of marg. 431, item 1 (b) shall be capable of being electrically earthed.

4.3 ***Items of Equipment***

4.3.1 All openings of shells intended for the carriage of the substances referred to in 4.1.1, 4.1.2,4.1.3 and 4.1.5 shall be above the surface level of the liquid. No pipes or pipe connections shall pass through the walls of the shell below the surface level of the liquid. Shells shall be capable of being hermetically closed (2) and the closures shall be capable of being protected with lockable caps. The cleaning apertures (fist-holes) referred to in 1.3.4 shall not be permitted.

4.3.2 With the exception of shells intended for the carriage of caesium and rubidium of marg. 471, item 11 (a), shells intended for the carriage of the substances referred to in 4.1.4, 4.1.6 and 4.1.7 may also be the bottom-discharge type. The openings of shells intended for the carriage of caesium and rubidium of marg. 471, item 11 (a) shall be equipped with hermetically closing and lockable caps.

4.3.3 Shells intended for the carriage of the substances referred to in 4.1.2 shall also meet the following requirements:

4.3.3.1 The heating device shall not penetrate into, but shall be exterior to, the body of the shell. However, a pipe used for extracting the phosphorus may be equiped with a heating jacket. The heating device of the jacket shall be so regulated as to prevent the temperature of the phosphorus from exceeding the filing temperature of the shell. Other piping shall enter the shell in its upper part; openings shall be above the highest permissible level of the phosphorus and be capable of being completely enclosed under lockable caps. In addition, the cleaning apertures (fist holes) referred to 1.3.4 shall not be permitted.

4.3.3.2 The shell shall be equipped with a gauging system for verifying the level of the phosphurus and, if water is used as the protective agent, with a fixed gauge mark showing the highest permissible level of water.

4.3.4 If shells intended for the carriage of the substances referred to in 4.1.1, 4.1.3 and 4.1.5 are fitted with safety valves, a bursing disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority.

4.3.5 Shells intended for the carriage of the substances referred to in 4.1.6 shall be equipped with thermal insulation made of materials which are not readily flammable.

4.3.6 If shells intended for the carriage of the substances referred to in 4.1.4 are equipped with thermal insulation, such insulation shall be made of materials which are not readily flammable.

4.3.7 Shells intended for the carriage of the substances referred to in 4.1.6 may be equipped with valves opening automatically inwards under the effect of a difference of pressure of between 20 kPa and 30 kPa (0,2 bar and 0,3 bar).

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(1) See 1.2.8.2.

(2) Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special provisions applicable to the individual classes.

4.4 ***Type approval***

No special requirements.

4.5 ***Tests***

4.5.1 Shells intended for the carriage of the substances referred to in 4.1.1 shall be subjected to the initial and periodic hydraulic pressure tests at a gauge pressure of not less than 1 MPa (10 bar). The materials of each of these shells shall be tested by the method described in Appendix II C.

4.5.2 Shells intended for the carriage of the substances referred to in 4.1.2, 4.1.3 and 4.1.5 shall be subjected to the initial and periodic hydraulic pressure tests at a gauge pressure of not less than 0,4 MPa (4 bar).

By derogation from the requirements of 1.5.2, shells intended for the carriage of substances referred to in 4.1.4 shall undergo periodic inspections at least every eight years which shall include a thickness check using suitable instruments. For such shells, the leakproofness test and check, for which provision is made in marg. 1.5.3, shall be carried out at least every four years.

4.5.3 Shells intended for the carriage of the substances referred to 4.1.6 and 4.1.7 shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 1.2.4.

4.6 ***Marking***

4.6.1 Shells intended for the carriage of the substances referred to in 4.1.1. shall bear in addition to the particulars prescribed in 1.6.2, the words: 'Do not open during carriage. Liable to spontaneous combustion'. Shells intended for the carriage of substances of marg. 471 referred to in 4.1.3 to 4.1.5 shall bear in addition to the particulars prescribed in 1.6.2, the words: 'Do not open during carriage. Gives off flammable gases on contact with water'. These particulars shall be in an official language of the country of approval, and if this language is not French, German, Italian or English, also in French, German, Italian or English unless international tariffs or agreements concluded between the railway administrations provide otherwise.

4.6.2 Shells intended for the carriage of the substances of marg. 471, item 1 (a) shall also bear, on the plate prescribed in 1.6.1, the names of approved substances and the maximum permissible load of the shell in kg.

4.7 ***Operation***

4.7.1.1 Substances of marg. 431. items 11 and 22, shall, if water is used as protective agent, be covered with a depth of not less than 12 cm of water at the time of filling; the degree of filling at a temperature of 60 °C shall not exceed 98 %. If nitrogen is used as a protective agent, the degree of filling at a temperature of 60 °C shall not exceed 96 %. The remaining space shall be filled with nitrogen in such a way that, even after cooling, the pressure at no time falls below atmospheric pressure. The shell shall be hermetically closed [1] so that no leakage of gas occurs.

4.7.1.2 Uncleaned empty shells which have contained substances of marg. 431 items 11 and 22, shall when handed over for carriage, either:

— be filled with nitrogen: or

— be filled with water to not less than 96 % and not more than 98 % of their capacity; between 1 October and 31 March, this water shall contain sufficient anti-freeze agent to make it impossible for the water to freeze during carriage; the anti-freeze agent shall be free from corrosive action and not liable to react with phosphorus.

4.7.2 Shells containing substances of marg. 431, items 31 to 33, and marg. 471, items 2(a), 3(a) and 3(b) shall be filled to not more than 90 % of their capacity; a space of 5 % shall remain empty for safety when the liquid is at an average temperature of 50 °C. During carriage, the substances shall be under a layer of inert gas, the gauge of which shall not be less than 50 kPa (0,5 bar). The shells shall be hermetically closed [1] and the protective caps conforming to 4.3.1 shall be locked. Uncleaned empty shells shall, when handed over for carriage, be filled with an inert gas at a gauge pressure of at least 50 kPa (0,5 bar).

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special provisions applicable to the individual classes.

4.7.3 For ethyldichlorosilane, methyldichlorosilane, trichlorosilane of marg. 471, item 1, the degree of filling shall not exceed 0,93 or 0,95 or 1,14 kg per litre of capacity respectively, if filling is by mass. If filling is by volume, and for chlorosilanes not mentioned by name (n.o.s.) of marg. 471, item 1, the rate of filling shall not exceed 85 %. The shells shall be hermetically closed [1] and the protective caps conforming to 4.3.1 shall be locked.

4.7.4 Shells containing substances of marg. 401, items 5 and 15, shall not be filled to more than 98 % of their capacity.

4.7.5 For the carriage of caesium and rubidium of marg. 471, item 11 (a), the substance shall be covered by an inert gas and the caps conforming to 4.3.2 shall be locked. Shells containing other substances of marg. 471, item 11(a), shall not be handed over for carriage until the substance has solidified completely and been covered by an inert gas.

Uncleaned empty shells which have contained substances of marg. 471, item 11(a) shall be filled with an inert gas. The shells shall be hermetically closed.

4.7.6.1 When substances of marg. 431, item 1(b) are being loaded, the temperature of the goods being loaded shall not exceed 60 °C.

4.7.6.2 A maximum loading temperature of 80 °C is permitted provided that smoulder spots are prevented during loading and the tank is hermetically closed [1].

After loading, the tanks are to be pressurized (e.g. with compressed air) to check tightness. It shall be ensured that no depressurization takes place during carriage. Before unloading, checks shall be carried out to find out if pressure is still above atmospheric. If this is not the case, an inert gas shall be introduced into the tanks prior to unloading.

5. Special requirements applicable to Class 5.1: Oxidizing substances Class 5.2: Organic peroxides

5.1 *Use*

5.1.1 The following substances of marg. 501 may be carried in tank-containers:

5.1.1.1 Substances of item 5.

5.1.1.2 Substances listed under (a) or (b) of items 1 to 4, 11, 13, 16, 17, 22 and 23, carried in the liquid state or in the molten state.

5.1.1.3 Ammonium nitrate liquid of item 20.

5.1.1.4 Substances listed under (c) of items 1, 11, 13, 16, 18, 22 and 23 carried in the liquid state or in the molten state.

5.1.1.5 Substances in powdery or granular form listed under letter (b) or (c) of items 11, 13 to 18, 21 to 27, 29 and 31.

Note: For the carriage in bulk of substances of marg. 501, see marg. 516.

5.1.2 Substances of marg. 551, items 9 (b) and 10 (b) may be carried in tank-containers under conditions laid down by the competent authority of the country of origin, if, on the basis of tests (see 5.4.2), the competent authority is satisfied that such a transport operation can be carried out safely.

If the country is not a Member State, these conditions laid down shall be recongized by the competent authority of the first COTIF Contracting State reached by the consignment.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special provisions applicable to the individual classes.

5.2 ***Construction***

5.2.1 Shells intended for the carriage of substances referred to in 5.1.1.1. shall be designed for a calculation pressure (1) of not less than 1 MPa (10 bar) (gauge pressure).

5.2.2 Shells intended for the carriage of substances referred to in 5.1.1.2 shall be designed for a calculation pressure (1) of not less than 0,4 PMa (4 bar) (gauge pressure). Shells, and their items of equipment, intended for the carriage of substances of item 1 of marg. 501 shall be made of aluminium not less than 99,5 % pure or of suitable steel not liable to cause hydrogen peroxide to decompose. Where shells are made of aluminium not less than 99,5 % pure, the wall thickness need not be greater than 15 mm, even where calculation in accordance with 1.2.8.2 gives a higher value.

5.2.3 Shells intended for the carriage of substances referred to in 5.1.1.3 shall be designed for a calculation pressure (1) of not less than 0,4 MPa (4 bar) (gauge pressure). The shells shall be made of austenitic steel.

5.2.4 Shells intended for the carriage of liquids of 5.1.1.4 and powdery or granular substances of 5.1.1.5 shall be designed in accordance with the requirement of the general part of this Appendix.

5.2.5 Shells intended for the carriage of 5.1.2 shall be designed for a calculation pressure (1) of not less than 0,4 MPa (4 bar) (gauge pressure).

5.3 ***Items of equipment***

5.3.1 Shells intended for the carriage of substances of items 1 (a), 3 (a) and 5 marg. 501 shall have their openings above the surface level of the liquid. In addition the cleaning apertures (fist-holes) referred to in 1.3.4 shall not be permitted. In the case of solutions containing more than 60 % but not more than 70 % hydrogen peroxide, openings below the surface level of the liquid shall be permissible. In this case the shell-discharge system shall be equipped with two mutually independent shut-off devices, mounted in series, the first being a quick-closing internal stop-valve of an approved type and the second a sluice-valve, placed at each end of the discharge pipe. A blank flange or some other equally reliable device shall also be fitted to the outlet of each external sluice-valve. The internal stop-valve shall be such that it will remain integral with the shell and in the closed position if the pipe is wrenched off.

5.3.2 The connections to the external pipe-sockets of shells shall be made of materials not liable to cause decomposition of hydrogen peroxide.

5.3.3 Shells intended for the carriage of substances of item 1, or of liquid ammonium nitrate of item 20 of marg. 501 shall be fitted in their upper part with a shut-off device preventing any buildup of excess pressure inside the shell, any leakage of liquid, an any entry of foreign matter into the shell.

The shutt-off devices of shalls intended for the carriage of liquid ammonium nitrate of item 20 shall be so designed as to preclude obstruction of the devices of solified ammonium nitrate during carriage.

5.3.4 Where shells intended for the carriage of liquid ammonium nitrate of item 20 of marg. 501 are sheathed in thermally-insulating material, the material shall be of an inorganic nature and entirely free from combustible matter.

5.3.5 Shells intended for the carriage of substances referred to in 5.1.2 shall be equiped with thermal insulation complying with the requirements of 2.3.4.1. The sun shield and any part of the shell not covered by it, of the outer sheating of a complete lagging, shall be painted white or finished in bright metal. The paint shall be cleaned before each transport journey and revewed in case of yellowing or deterioration. The thermal insulation shall be free from combustible matter.

5.3.6 Shells intended for the carriage of substances referred to in 5.1.2 shall be fitted with temperature sensing devices.

5.3.6.1 Shells intended for the carriage of substances referred to in 5.1.2 shall be fitted with safety valves and pressure-relief devices. Vacuum-relief devices may also be used. Pressure-relief devices shall operate at pressures determined according to both the properties of the organic peroxide and the construction characteristics of the shell. Fusible elements shall not be permitted in the body of the shell.

(1) See 1.2.8.2.

5.3.6.2 Shells intended for the carriage of substances referred to in 5.1.2 shall be fitted with springloaded safety valves to prevent significant pressure build-up within the shell of the decomposition products and vapours released at a temperature of 50 °C. The capacity and start-to-discharge pressure of the safety valve shall be based on the results of the tests specified in 5.4.2. The start-to-discharge pressure shall however in no case be such that liquid could escape from the valve(s) if the shell were overturned.

5.3.6.3 The pressure relief devices of shells for the carriage of substances to in 5.1.2 may be of the spring-loaded or bursting-disc types,designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of fire engulfment (heat load 110kW/m^2) of self accelerating decomposition. The start-to-dicharge pressure of the pressure relief device(s) shall be higher than that specified in 5.3.6.2 and based on the results referred to in 54.2. The dimensions of the pressure relief devices shall be such that the maximum pressure in the shell never exceeds the test pressure of the shell.

5.3.6.4 For shells with an insulation of a complete cladding intended for the carriage of substances referred to in 5.1.2, the capacity and stting of the pressure relief device(s) shall be determined assuming a loss of insulation from 1 % of the surface area.

5.3.6.5 Vacuum-relief devices and spring-loaded safety valves of shells for the carriage of substances referred to in 5.1.2 shall be provided with flame arresters unless the substances to be carried and their decomposition products are non-combustible. Due attention shall be paid to the reduction of the relief capacity caused by the flame arrester.

5.4 ***Type approval***

5.4.1 Tank-containers approved for the carriage of liquid ammonium nitrate of item 20 of marg. 501 shall not be approved for the carriage of organic substances.

5.4.2 For the type approval of shells intended for the carriage of substances referred to in 5.1.2, tests shall be undertaken:

— To prove the compatibility of all materials normally in contact with substance during carriage;

— To provide data to facilitate the design of the pressure-relief devices and safety valves, taking into account the design characteristics of the tank-container; and

— To establish any special requirements necessary for the safe carriage of the substance.

The test results shall be included in the report for the type approval of the shell.

5.5 ***Tests***

5.5.1 Shells intended for the carriage of the substances referred in to 5.1.1.1., 5.1.1.2 and 5.1.1.3 shall be subjected to the initial and periodic hydraulic pressure tests at a gauge pressure of not less than 0,4 MPa (4 bar). Shells of pure aluminium intended for the carriage of substances of item 1 of marg. 501 may be subjected to the initial and periodic hydraulic pressure tests at a pressure of only 250 KPa (2,5 bar) (gauge pressure).

Shells intended for the carrriage of the substances referred to in 5.1.1.4 and 5.1.1.5 shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 1.2.4.

5.5.2 Shells intended for the carriage of the substances referred to in 5.1.2 shall be subjected to the initial and periodic hydraulic pressure tests at the calculation pressure as defined in 5.2.5.

5.6 ***Marking (5.1)***

5.6.1 No special requirements (Class 5.1)

5.6.2 For shells intended for the carriage of the substances referred to in 5.1.2, the following additional particulars shall be marked by stamping or by any other similar method on the plate prescribed in 1.6.2 or directly on the walls of the shell itself if the walls are so reinforced that the strenght of the shell is not impaired:

— The chemical name with the approved concentration of the substance concerned.

5.7 *Operation*

5.7.1 The inside of the shell, and all parts liable into contact with substances referred to in 5.1.1 and 5.1.2 shall be kept clean. No lubricant capable of combining dangerously with the substance carried shall be used for pumps, valves or other devices.

5.7.2 Shells intended for the carriage of items 1 (a), 2 (a) and 3 (a) of marg. 501 shall be filled to not more than 95 % of their capacity at a reference temperature of 15 °C. Shells intended for the carriage of substances of item 20 of marg. 501 shall be filled to not more than 97 % of their capacity, and the maximum temperature after filling shall not exceed 140 °C. In the event of change of use, shells and their equipment shall be thoroughly cleaned of all residues before and after the carriage of substances of item 20.

5.7.3 Shells intended for the carriage of substances referred to in 5.1.2 shall be filled as set out in the test report for the type approval of the shell, but shall be filled to not more than 90 % of their capacity. Shells shall be free from impurities at the time of filling.

5.7.4 Service equipment such as valves and external piping of shells for the carriage of substances referred to in 5.1.2 shall be emptied after filling or discharging of the tank.

6. Special requirements applicable to classes 6.1 and 6.2: Toxic substances, infectious substances.

6.1 *Use*

The following substances of marg. 601 and 651 may be carried in tank-containers:

6.1.1 — the substances listed by name in items 2 to 4 of marg. 601.

6.1.2 — the substances listed under (a) of items 6 to 13 with the exception of isopropyl chloroformate of item 10 and substances of items 15 to 18, 20, 22, 23, 25 to 28, 31 to 36, 41, 44, 51, 52, 55, 61, 65 to 68, 71 to 73 and 90 of marg. 601 carried in the liquid state or in the molten state.

6.1.3 — the substances listed under b) or c) of items 11 to 28, 32 to 36, 41, 44, 51 to 55, 57 to 62, 64 to 68, 71 to 73 and 90 marg. 601 carried in the liquid state or in the molten state.

6.1.4 — the powdery or granular substances listed under (b) or (c) items 12, 14, 17, 19, 21, 23, 25 to 27, 32 to 35, 41, 44, 51 to 55, 57 to 68 and 73 and 90 of marg. 601.

Note: For the carriage in bulk of substances of marg. 601, see marg. 616.

6.1.5 Substances of marg. 651, item 3.

Note: For the carriage in bulk of substances of marg. 651 item 4 (b), see marg. 666.

6.2 *Construction*

6.2.1 Shells intended for the carriage of the substances referred to in 6.1.1 shall be designed for a calculation pressure [1] of not less than 1,5 MPa (15 bar) (gauge pressure).

6.2.2 Shells intended for the carriage of the substances referred to in 6.1.2 shall be designed for a calculation pressure [1] of not less than 1 MPa (10 bar) (gauge pressure).

6.2.3 Shells intended for the carriage of the substances referred to in 6.1.3 and 6.1.5 shall be designed for a calculation pressure [1] of not less than 0,4 MPa (4 bar) (gauge pressure).

Shells intended for the carriage of chloroacetic acid of item 24 (b) of marg. 601 shall be provided with a enamel of equivalent protective lining if the material of the shell is attacked by chloroacetic acid.

[1] See 1.2.8.2.

6.2.4 Shells intended for the carriage for the powdery or granular substances referred to in 6.1.4 shall be designed in accordance with the requirements of the part of this Appendix.

6.3 ***Items of equipment***

6.3.1 All openings of shells intended for the carriage of the substances referred to in 6.1.1 and 6.1.2 shall be above the surface level of the liquid. No pipe or pipe connections shall pass through the walls of the shell below level of the liquid. Shells shall be capable of being hermetically closed [1] and the closures shall be capable of being protected with a lockable cap. The cleaning openings (fist holes) provided of hydrocyanic acid of marg. 601, item 2.

6.3.2 Shells intended for the carriage of the substances referred to in 6.1.3 to 6.1.5 may also be of the bottom-discharge type. The shells shall be capable of being hermetically closed [1]

6.3.3 If shells are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority.

6.4 ***Type approval***

No special requirements.

6.5 ***Tests***

6.5.1 Shells intended for the carriage of the substances referred to in 6.1.1 to 6.1.3 and 6.1.5 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 0,4 MPa (4 bar)(gauge pressure).

6.5.2 Shells intended for the carriage of substances referred to in 6.1.4 shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 1.2.4.

6.6 ***Marking***

No special requirements.

6.7 ***Operation***

6.7.1 Shells intended for the carriage of the substances of marg. 601, item 3 shall not be filled to more than 1 kg per liter of capacity.

6.7.2 Shells shall be hermetically closed [1] during carrriage. The closures of shells intended for the carriage of the substances referred to in 6.1.1 and 6.1.2 shall be protected with a locked cap.

6.7.3 Tank-containers approved for the carriage of the substances referred to in 6.1 shall not be used for the carriage of foodstuffs, other articles of consumption or animal feedstuffs.

6.8.1 Tank-containers intended for the carriage of substances of items 6,8,9,10,13,15,16,18,20,25 and 27 of marg. 601 and 1809 phosphorus trichloride of item 67(a), built in accordance with the requirements of this Appendix in force before 1 January 1995, but which do not conform to the requirements in force from 1 January 1995 may continue to be used until 31 December 1999.

6.8.2 Tank-containers intended for the carriage of items 8(a),10(a),13(b),15(a),16(a),18(a),20(a) and 67(a) of marg. 601 built in accordance with the requirements of this Appendix in force before 1 January 1997, but which do not conform to the requirements in force from 1 January 1997 may continue to be used until 31 December 2001.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special provisions applicable to the individual classes.

7. Special requirements applicable to Class 7: Radioactive material

7.1 ***Use***

Material of marg. 704, Schedules 1,5,6,9,10 and 11, except uranium hexafluoride, may be carried in tank-containers. The provisions of the appropriate schedule in marg. 704 are applicable.

Note: There may be additional requirements for tank-containers which are designed as a Type A or Type B packaging.

7.2 ***Construction***

See marg. 1736

7.3 ***Items of equipment***

Shells intended for the carriage of liquid radioactive material (1) shall have their openings above the level of the liquid. No piping or pipe connection shall pass through the walls of the shell below the surface level of the liquid.

7.4 ***Type approval***

Tank-containers approved for the carriage of radioactive material shall not be approved for the carriage of other substances.

7.5 ***Tests***

7.5.1 Shells shall undergo the initial and periodic hydraulic pressure tests at a pressure of at least 0,265 MPa (2.65 bar)(gauge pressure).

7.5.2 Notwithstanding the requirements of 1.5.2, the periodic internal inspection may be replaced by a programme approved by the competent authority.

7.6 ***Marking***

In addition, the trefoil symbol, as shown in marg. 705 (5), shall be marked by stamping of by any other equivalent method on the plate described in 1.6.1. This trefoil symbol may be applied directly on the walls of the shell itself, if the walls are so reinforced that the strength of the shell is not impaired.

7.7 ***Operation***

7.7.1 The degree of filling according to 7.1.3 at the reference temperature of 15 °C shall not exceed 93 % of the capacity of the shell.

7.7.2 Tank-containers which have been used for the carriage of radioactive marterial shall not be used for the carriage of other substances.

8. Special requirements applicable to Class 8: Corrosive substances

8.1 ***Use***

The following substances of marg. 801 may be carried in tank-containers:

8.1.1 — the substances listed by name in items 6 and 14.

8.1.2 — the substances listed under (a) of items 1, 2, 3, 7, 8, 12, 17, 32, 33, 39, 40, 46, 47, 52 to 56, 64 to 68, 70 and 72 to 76 carried in the liquid or in the molten states.

(1) Substances whose kinematic viscosity at 20 °C is less than 2 680 mm^2/s shall be deemed to be liquids for the purposes of this provision.

8.1.3 — phosphorus oxybromide of item 15 and substances classified under (b) or (c) of items 1 to 5, 7, 8, 10, 12, 17, 31 to 40, 42 to 47, 51 to 56 and 61 to 76, carried in the liquid state or in the molten state.

8.1.4 — powdery or granular substances classified under (b) or (c) of times 9, 11, 13, 16, 31, 34, 35, 39, 41, 45, 46, 52, 55, 62, 65, 67, 69, 71, 73 and 75.

Note: For the carriage in bulk of substances of marg. 801 see marg. 816.

8.2 ***Construction***

8.2.1 Shells intended for the carriage of substances listed by name in items 6 and 14 shall be designed for a calculation pressure (1) of not less than 2,1 MPa (21 bar) (gauge pressure). Shells intended for the carriage of substances of item 14 shall be provided with a lead lining not less than 5 mm thick or an equivalent lining. The requirements of Appendix II C shall apply to the matrials and construction of welded shells intended for the carriage of substances of item 6.

8.2.2 Shells intended for the carriage of the substances referred to in 8.1.2 shall be designed for a calculation pressure (1) of not less than 1 MPa (10 bar) (gauge pressure).

Where the use of aluminium is necessary for shells intended for the carriage of nitric acid of item (2), such shells shall be made of aluminium not less than 99,5 % pure; the wall thickness need not exceed 15 mm, even when the calculation according to 1.2.8.2 gives a higher figure.

8.2.3 Shells intended for the carriage of the substances referred to in 8.1.3 shall be designed for a calculation pressure (1) of not less than 0,4 MPa (4 bar) (gauge pressure).

8.2.4 Shells intended for the carriage of powdery or granular substances referred to in 8.1.4 shall be designed in acccordance with the requirements of the general part of this Appendix.

8.3 ***Items of equipment***

8.3.1 All openings of shells for the carriage of substances of items 6,7 and 14 shall be above the surface of the liquid. No pipes or pipe connections shall pass through the walls of the shell below the surface level of the liquid. In addition, the cleaning openings (fist holes) referred to in 1.3.4 shall not be permitted. Shells shall be capable of being hermetically closed (2) and the closures shall be capable of being protected by a lockable cap.

8.3.2 Shells intended for the carriage of the substances referred to in 8.1.2,8.1.3 and 8.1.4, with the exception of substances of items 7, may also be of the bottom-discharge type.

8.3.3 If shells intended for the carriage of the substances referred to in 8.1.2 are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority.

8.3.4 Shells intended for the carriage of suphur trioxide, inhibited of item 1 (a) shall be thermally insulated and fitted with a heating device on the outside.

8.3.5 Shells and their service equipment intended for the carriage of hypochlorite solutions of item 61 shall be so designed as to prevent the entry of foreign matter, leakage of liquid or any building up of dangerous excess pressure inside the shell.

8.4 ***Type approval***

No special requirements.

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(1) See 1.2.8.2.

(2) Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special provisions applicable to the individual classes.

8.5 ***Tests***

8.5.1 Shells intended for the carriage of substances of item 6 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of at least 1 MPa (10 bar) (gauge pressure).

Shells intended for the carriage of substances of items 6 and 7 shall be inspected every two and a half years for resistence to corrosion, by means of suitable instruments (e.g. by ultrasound).

8.5.2 Shells intended for the carriage of substances of item 14 or of the substances referred to in 8.1.2 and 8.1.3 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 0,4 MPa (4 bar) (gauge pressure). The hydraulic pressure test for shells intended for the carriage of sulphur trioxide, inhibited of item 1 (a) shall be repeated every two and a half years.

Shells made of pure aluminium and intended for the carriage of nitric of item 2 (a) need be subjected to the initial and periodic hydraulic pressure tests at a pressure of only 250 kPa (2,5 bar) (gauge pressure).

The condition of the lining of shells intended for the carriage of substances of item 14 shall be inspected every year by an expert by the competent authority, who shall inspect the inside of the shell.

8.5.3 Shells intended for the carriage of the substances referred to 8.1.4 shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 1.2.4.

8.6 ***Marking***

8.6.1 Shells intended for the carriage of substances of item 6 and 14 shall bear, in addition to the particulars prescribed in 1.6.2 the date (month, year) of the most recent inspection of the internal condition of shell.

8.6.2 Shells intended for the carriage of inhibited sulphur trioxide of item 1 (a) and substances of items 6 and 14 shall bear in addition, on the plate prescribed in 1.6.1, the maximum permitted load mass of the shell in kg.

8.7 ***Operation***

8.7.1 Shells intended for the carriage of sulphur trioxide, inhibited of item 1 (a) shall not be filled to more than 88 % of their capacity; those intended for the carriage of substances of item 14 shall be filled to not less than 88 % and not more than 92 % of their capacity or to 2,86 kg per litre of capacity.

Shells intended for the carriage of substances of item 6 shall not be filled to more than 0,84 kg per litre of capacity.

8.7.2 Shells intended for the carriage of substances of items 6, 7 and 14 shall be hermetically closed [1] during carriage and the closures shall be protected by a locked cap.

8.8.1. Tank-containers intended for the carriage of substances of items 3, 12, 33, 40 and 54 of marg. 801, built in accordance with the requirements of this Appendix in force before 1 January 1995, but which do not conform to the requirements in force from 1 January 1995 may continue to be used until 31 December 1999.

8.8.2. Tank-containers intended for the carriage of 2686 2-diethylaminoethanol of item 54 (b), built in accordance with the requirements of this Appendix in force before 1 January 1997, but which do not conform to the requirements in force from 1 January 1997 may continue to be used until 31 December 2001.

9. Special requirements applicable to Class 9: Miscellaneous dangerous substances and articles

9.1 ***Use***

Substances of items 1, 2, 11, 12, 20 and 31 to 35 and 2211 polymeric beads, expandable of item 4 of mag. 901 may be carried in tank-containers.

Note: For the carriage in bulk of substances of marg. 901, see marg. 916

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special provisions applicable to the individual classes.

9.2 ***Construction***

9.2.1 Shells intended for the carriage of substances of items 1, 11, 12, 20 and 31 and for 2211 polymeric beads, expandable, of item 4 shall be designed in accordance with the requirements of the general part of this Appendix.

9.2.2 Shells intended for the carriage of substances of item 2 shall be designed for a calculation pressure [1] of not less than 0,4 MPa (4bar) (gauge pressure).

9.3 ***Items of equipment***

9.3.1 Shells intended for the carriage of substances of items 1 and 2 shall be capable of being hermetically closed [2]. Shells intended for the carriage of polymeric beads, expandable, of item 4 shall be fitted with a safety valve.

9.3.2 If shells intended for the carrriage of substances of items 1 and 2 are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority.

9.3.3 Shells intended for the carriage of substances of item 20 shall be equipped with thermal insulation. They may also be equipped with pressure release devices opening automatically inwards or outwards under the effect of a difference of pressure of between 20 kPa and 30 kPa (0,2 bar and 0,3 bar).

The thermal insulation directly in contact with the shell intended for the carriage of substances of item 20 shall have an ignition temperature at least 50 °C higher than the maximum temperature for which the shell was designed.

9.3.4 The bottom discharge system of shells intended for the carriage of substances of item 20 may consist of an external pipe with a stop-valve if it is constructed of a metallic material liable to deformation.

9.4 ***Type approval***

No special requirements.

9.5 ***Tests***

9.5.1 Shells intended for the carriage of substances of item 2 shall be subjected to the initial and periodic hydraulic tests at a pressure of not less than 0,4 PMa (4bar) (gauge pressure).

9.5.2 Shells intended for the carriage of substances of items 1, 11, 12, 20 and 31 to 35 and for 2211 polymeric beads, expandable of item 4 shall be subjected to the initial and periodic hydraulic pressure tests at the calculation pressure [1] used in their design as defined in 1.2.4.

9.6 ***Marking***

Shells intended for the carriage of substances of item 20 shall bear, in addition to the markings in accordance with 1.6.2, the mark reproduced in Appendix IX, marg. 1910.

9.7 ***Operation***

9.7.1 Shells intended for the carriage of substances of items 1 and 2 shall be hermetically closed [2] during carriage.

9.7.2 Tank-containers approved for the carriage of substances of items 1 and 2 shall not be used for the carriage of foodstuffs, other articles of consumption or animal feedstuffs.

Tank-containers intended for the carriage of substances of item 20 of marg. 901 which do not however conform to the requirements in force as from 1 January 1997, may continue to be used until 31 December 2004.

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[1] See 1.2.8.2.

[2] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special provisions applicable to the individual classes.

APPENDIX XI

REQUIREMENTS CONCERNING THE USE, CONSTRUCTION AND TESTING OF TANK WAGONS

Note. For the purposes of these requirements, battery wagons defined in marg. 2.3.5 and wagons with demountable tanks defined in footnote (1) to marg. 2.1 are also considered to be tank wagons.

1. Requirements applicable to all classes

1.1 *GENERAL; SCOPE; DEFINITIONS*

1.1.1 These requirements shall apply to tank wagons used for carriage of liquid, gaseous, powdery or granular substances.

Note: For the purposes of the requirements of this Appendix, the following shall be considered to be substances carried in the liquid state:

— substances which are liquid at normal temperatures and pressures

— solids handed over for carriage at elevated temperatures or hot, in the molten state.

1.1.2 Part 1 sets out the requirements applicable to tank wagons intended for the carriage of substances of all classes. Parts 2 to 9 contain special requirements supplementing or modifying the requirements of Part 1.

1.1.3 A tank wagon comprises a superstructure, consisting of one or more shells and their items of equipment, and an underframe fitted with its own items of equipment (running gear, suspension, buffing, traction, braking gear and inscriptions).

1.1.4 In the following requirements:

1.1.4.1 — 'shell' means the sheathing containing the substance (including the openings and their closures);

— 'service equipment' of the shell means the filling, emptying, venting, safety, heating, and heat-insulating devices, and measuring instruments;

— 'structural equipment' means the reinforcing, fastening and protective members external or internal to the shell.

1.1.4.2 — 'calculation pressure' means a theoretical pressure at least equal to the test pressure which, according to the degree of danger exhibited by the substance being carried, may to a greater or lesser degree exceed the working pressure. It is used solely to determine the thickness of the walls of the shell, independently of any external or internal reinforcing device;

— 'test pressure' means the highest effective pressure which arises in the shell during the pressure test;

— 'filling pressure' means the maximum pressure actually built up in the shell when it is being filled under pressure;

— 'discharge pressure' means the maximum pressure actually built up in the shell when it is being discharged under pressure;

— 'maximum wording pressure (gauge pressure)' means the highest of the following three pressures:

(a) the highest effective pressure allowed in the shell during filling ('maximum filling pressure allowed');

(b) the highest effective pressure allowed in the shell during discharge ('maximum discharge pressure allowed'); and

(c) the effective gauge pressure to which the shell is subjected by its contents (including such extraneous gases as it may contain) at the maximum working temperature.

Unless specially prescribed otherwise in the various classes, the numerical value of this working pressure (gauge pressure) shall not be lower than the vapour pressure (absolute pressure) of the filling substance at 50 °C.

For shells equipped with safety valves (with or without bursting disc), the maximum working pressure (gauge pressure) shall however be equal to the prescribed opening pressure of such safety valves.

1.1.4.3 — 'leakproofness test' means a test which consists of subjecting the shell to an effective internal pressure equal to the maximum working pressure, but not less than 20 kPa (0,2 bar) (gauge pressure), by a method recognized by the competent authority.

For shells equipped with venting systems and a safety device to prevent the contents spilling out if the shell overturns, the pressure for the leakproofness test shall be equal to the static pressure of the filling substance.

1.2 *CONSTRUCTION*

1.2.1 Shells shall be designed and constructed in accordance with the provisions of a technical code recognized by the competent authority, in which the material is chosen and the wall thickness determined taking into account maximum and minimum filling and working temperatures, but the following minimum requirements shall be met:

1.2.1.1 Shells shall be made of suitable metallic materials which, unless other temperature ranges are prescribed in the various classes, shall be resistant to brittle fracture and to stress corrosion cracking at a temperature between −20 °C and +50 °C. However, suitable non-metallic materials may be used to manufacture equipment and accessories.

1.2.1.2 For welded shells, only material of faultless weldability and whose adequate impact strength at an ambient temperature of −20 °C can be guaranteed, particularly in the weld seams and the zones adjacent thereto, shall be used.

Water-quenched steel may not be used for welded steel shells. If fine-gained steel is used, the guaranteed value of the yield stress Re shall not exceed 460 N/mm^2 and the value of the upper limit of guaranteed tensile strength Rm shall not exceed 725 N/mm^2, in accordance with the specifications relating to the material.

1.2.1.3 Welds shall be skilfully made and shall afford the fullest safety. With regard to the execution and checking of weld beats, see also 1.2.8.4. Shells whose minimum wall thicknesses have been determined in accordance with 1.2.8.3 and 1.2.8.4 shall be checked by the methods described in the definition of the weld coefficient 0,8.

1.2.1.4 The materials of shells or their protective linings in contact with the contents shall not contain substances liable to react dangerously with the contents, to form dangerous compounds, or substantially to weaken the material.

1.2.1.5 The protective lining shall be so designed that its leakproofness remains intact whatever the deformation liable to occur in normal conditions of carriage (1.2.8.1).

1.2.1.6 If contact between the substances carried and the material used for the construction of the shell entails a progressive decrease in the thickness of the walls, this thickness shall be increased at manufacture by an appropriate amount. This additional thickness to allow for corrosion shall not be taken into consideration in calculating the thickness of the shell walls.

1.2.2 Shells and their service and structural equipment shall be designed to withstand without loss of contents (other than quantities of gas escaping through any degassing vents):

— static and dynamic stresses in normal conditions of carriage;

— prescribed minimum stresses as defined in 1.2.6 and 1.2.8.

In the case of wagons in which the shell constitutes a stressed self-supporting member, the shell shall be designed to withstand the stresses thus imposed in addition to stresses from other sources.

1.2.3 The pressure on which the thickness of the shell walls is based shall be not less than the calculation pressure, but the stresses referred to in 1.2.2 shall also be taken into account.

1.2.4 Unless specially prescribed otherwise in the various classes, the following particulars shall be taken into account in the design of shells:

1.2.4.1 — gravity-discharge shells intended for the carriage of substances having a vapour pressure not exceeding 110 kPa (1,1 bar) (absolute pressure) at 50 °C shall be designed for a calculation pressure of twice the static pressure of the substance to be carried but not less than twice the static pressure of water;

1.2.4.2 — pressure-filled or pressure-discharge shells intended for the carriage of substances having a vapour pressure not exceeding 110 kPa (1,1 bar) (absolute pressure) at 50 °C shall be designed for a calculation pressure equal 1,3 times the filling or discharge pressure;

1.2.4.3 — shells intended for the carriage of substances having a vapour pressure of more than 110 kPa (1,1 bar) but not more than 175 kPa (1,75 bar) (absolute pressure) at 50 °C shall, whatever their filling or discharge system, be designed for a calculation pressure of not less than 150 kPa (1,5 bar) (gauge pressure), or 1,3 times the filling or discharge pressure, whichever is the higher;

1.2.4.4 — shells intended for the carriage of substances having a vapour pressure of more than 175 kPa (1,75 bar) (absolute pressure) at 50 °C shall, whatever their filling or discharge system, be designed for a calculation pressure equal to 1,3 times the filling or discharge pressure but not less than 0,4 MPa (4 bar) (gauge pressure).

1.2.5 Tank wagons intended to contain certain dangerous substances shall be provided with special protection, which shall be determined for the various classes.

1.2.6 At the test pressure, the stress σ (sigma) at the most severely stressed point of the shell shall not exceed the material-dependent limits prescribed below. Allowance shall be made for any weakening due to the welds.

1.2.6.1 For all metals and alloys, the stress σ at the test pressure shall be lower than the smaller of the values given by the following formula:

$\sigma \leq 0{,}75\ Re$ or $\sigma \leq 0{,}5\ Rm$

where

Re = apparent yield stress, or at 0,2 % or, in the case of austenitic steels, at 1 %

Rm = minimum tensile strength

Ratios of Re/Rm exceeding 0,85 are not allowed for steels used in the construction of welded tanks.

The value of Re and Rm to be used shall be specified minimum values according to material standards. If no material standard exists for the metal or alloy in question, the values of Re and Rm used shall be approved by the competent authority or by a body designated by that authority.

When austenitic steels are used, the specified minimum values according to the material standards may be exceeded by up to 15 % if these higher values are attested in the inspection certificate.

The values specified in the certificate shall be taken as a basis in determining the Re/Rm ratio in each case.

1.2.6.2 For steel, the elongation at fracture, in per cent, shall be not less than

$$\frac{10\,000}{\text{determined tensile strength in N/mm}^2}$$

but in any case it shall be not less than 16 % for fine-grained steels and not less than 20 % for other steels.

For aluminium alloys the elongation at fracture shall be not less than 12 % [1].

[1] In the case of sheet metal the axis of the tensile test-piece shall be at right angles to the direction of rolling the permanent elongation at fracture ($l = 5\ d$) shall be measured on test-pieces of circular cross-section in which the gauge length l is equal to five times the diameter d; if test-pieces of rectangular section are used, the gauge length shall be calculated by the formula $l = 5{,}65\sqrt{F_0}$, where F_0 is the initial cross-sectional area of the test piece.

1.2.7 All parts of tank wagons intended for the carriage of liquids having a flash-point of not more than 61 °C and for the carriage of flammable gases shall be linked by equipotential connections and shall be capable of being electrically earthed. Any metal contact capable of causing electrochemical corrosion shall be avoided.

1.2.8 Shells and their fastenings shall withstand the stresses specified in 1.2.8.1 and the wall thickness of the shells shall be at least as determined in 1.2.8.2 and 1.2.8.3 below.

1.2.8.1 Tank wagons shall be so constructed as to be capable of withstanding, under the maximum permissible load, the stresses which occur during carriage by rail. As regards these stresses, reference should be made to the tests prescribed by the competent railway authorities.

1.2.8.2 The tickness of the cylindrical wall of the shell and of the ends cover plates shall be at least equal to the largest of the values obtained by the following formulae:

$$e = \frac{P_{ep} \times D}{2 \times \sigma \times \lambda} \text{ mm} \qquad e = \frac{P_{cal} \times D}{2 \times \sigma} \text{ mm}$$

where

P_{ep} = test pressure in MPa;

P_{cal} = calculation pressure in MPa as specified in 1.2.4;

D = internal diameter of shell in mm;

σ = permissible stress, as defined in 1.2.6.1. in N/mm^2;

λ = a coefficient not exceeding 1, allowing for any weakening due to welds

The thickness shall in no case be less than the values prescribed in 1.2.8.3 and 1.2.8.4.

1.2.8.3 The walls, ends and cover plates of shells be not less than 6 mm thick or for powdery or granular substances not less than 5 mm thick if of mild steel [1] or of equivalent thickness if of another metal. 'Equivalent thickness' means the thickness obtained by the following formula [2]:

$$e_1 = \frac{21{,}4 \times e_0}{\sqrt[3]{Rm_1 \times A_1}}$$

1.2.8.4 The manufacturer's qualification for performing welding operations shall be one recognised by the competent authority. Welding shall be performed by skilled welders using a welding process whose effectiveness (including any heat treatments required) has been demonstrated by test. Non-destructive tests shall be carried out by radiography or ultrasound and shall confirm that the quality of the welding is appropriate to the stresses.

In determining the thickness of the shell walls in accordance with 1.2.8.2, the following values of the coefficient lambda shall be adopted for the welds:

0,8: where the weld beads are inspected visually on both sides so far as possible and are subjected to a non-destructive spot check with particular attention to connections;

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[1] 'Mild steel' means a steel having a breaking strength between 360 N/mm^2 and 440 N/mm^2.

[2] This formula is derived from the general formula

$$e_1 = e_0 \sqrt[3]{\frac{Rm_0 \times A_0}{Rm_1 \times A_1}}$$

Where

Rm_0 = 360,

A_0 = 27 for the mild steel of reference

Rm_1 = minimum tensile strength of the metal chosen, in N/mm^2

A_1 = minimum elongation of the metal chosen on fracture under tensile stress, in %

1.2.8.4 *(cont'd)* 0,9: where all longitudinal beads throughout their length, all connections, 25 % of circular beads, and welds for the assembly of large-diameter items of equipment are subjected to non-destructive checks. Beads shall be checked visually on both sides so far as possible;

1,0: where all beads are subjected to non-destructive checks and are checked visually on both sides so far as possible. A weld test piece shall be taken.

Where the competent authority has doubts regarding the quality or weld beads, it may require additional checks.

1.2.8.5 Measures shall be taken to protect shells against the risk of deformation as a result of a negative internal pressure. Unless otherwise prescribed in the special provisions for the individual classes, these shells may have valves to avoid an unacceptable negative internal pressure, without intervening bursting discs.

1.2.8.6 The thermal insulation shall be so designed as not to hinder access to, or the operation of, the filling and discharge devices and the safety valves.

1.3 *ITEMS OF EQUIPMENT*

1.3.1 The items of equipment shall be so arranged as to be protected against the risk of being wrenched off or damaged during carriage and handling. They shall exhibit a suitable degree of safety comparable to that of the shell itself, and shall in particular:

— be compatible with the goods carried,

— meet the requirements of 1.2.2.

The leakproofness of the service equipment shall be ensured even in the event of the tank wagon overturning. Gaskets shall be made of a material compatible with the substance carried and shall be replaced as soon as their effectiveness is impaired, for example as a result of ageing.

Gaskets ensuring the leakproofness of fittings needing to be manipulated during normal use of the tank wagon shall be so designed and arranged that manipulation of the fitting in which they are incorporated does not damage them.

1.3.2 Every bottom-discharge shell, or in the case of compartmented bottom-discharge shells every compartment, shall be equipped with two mutually independent shut off devices, the first being an internal stop-valve [1] placed, with its seating, inside the shell and the second being a sluice-valve or other equivalent device, mounted in series, one at each end of the discharge pipe. The bottom discharge of shells intended for the carriage of powdery or granular substances may be constituted by external piping with a stop-valve, if it is made of a malleable metallic material. In addition, the openings shall be capable of being closed by means of screw-threaded plugs, blank flanges or other equally effective devices. The internal stop-valve may be operated from above or from below. In both cases, its setting — open or closed — shall be capable of being verified, from the ground if possible. Its control devices shall be so designed as to prevent any unintended opening through impact or an inadvertent act. The internal shut-off device shall continue to be effective in the event of damage to the external control device.

In order to avoid any loss of contents in the event of damage to the external filling and discharge fittings (pipes, lateral shut-off devices), the internal stop-valve and its seating shall be protected against the danger of being wrenched off by external stresses or shall be so designed as to resist them. The filling and discharge devices (including flanges or threaded plugs) and any protective caps shall be capable of being secured against any inadvertent opening.

The position and/or the direction of closure of the sluice-valves shall be clearly apparent.

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[1] However, in the case of shells intended for the carriage of certain crystallizable or highly viscous substances, deeply refrigerated liquefied gases and shells fitted with an ebonite or thermoplastic coating, the internal stop-valve may be replaced by an external stop-valve provided with additional protection.

1.3.3 The shell or each of its compartments shall be provided with an opening large enough to permit its inspection.

1.3.4 Shells intended for the carriage of substances for which all openings are above the surface level of the liquid may be equipped, in the lower part of the body, with a cleaning aperture (fist hole). This aperture shall be capable of being sealed by a flange so closed as to be leakproof, the design of which shall be approved by the competent authority or by a body designated by that authority.

1.3.5 Shells intended for the carriage of liquids having a vapour pressure of not more than 110 kPa (1,1 bar) (absolute pressure) at 50 °C shall have a venting system and a device to prevent the contents from spilling out if the shell overturns; otherwise they shall conform to the requirements of 1.3.6 or 1.3.7.

1.3.6 Shells intended for the carriage of liquids having a vapour pressure of more than 110 kPa (1,1 bar) but not exceeding 175 kPa (1,75 bar) (absolute pressure) at 50 °C shall have a safety valve set at a gauge pressure of not less than 150 kPa (1,5 bar) and such that it is fully open at a pressure not exceeding the test pressure; otherwise they shall conform to the requirements of 1.3.7.

1.3.7 Shells intended for the carriage of liquids having a vapour pressure of more than 175 kPa (1,75 bar) but not exceeding 300 kPa (3 bar) (absolute pressure) at 50 °C shall be equipped with a safety valve set at a gauge pressure of not less than 300 kPa (3 bar) and such that it is fully open at a pressure not exceeding the test pressure; otherwise they shall be hermetically closed [1].

1.3.8 No movable parts such as covers, closure devices, etc, which are liable to come into frictional or percussive contact with aluminium shells intended for the carriage of flammable liquids having a flash-point of not more than 61 °C or for the carriage of flammable gases, may be made of unprotected corrodible steel.

1.4 *TYPE APPROVAL*

1.4.1 The competent authority or a body designated by that authority shall issue in respect of each new type of tank wagon a certificate attesting that the prototype tank wagon, including the fastenings of the shell, which it has surveyed is suitable for the purpose for which it is intended and meets the construction requirements of Section 1.2, the equipment requirements of Section 1.3 and the special conditions depending on the classes of substances carried. The test results, the substances and/or the groups of substances for the carriage of which the tank wagon is approved and its type approval number shall be entered in a test report.

The substances of a group of substances shall be of a similar kind and equally compatible with the characteristics of the shell. The substances or groups of substances permitted shall be specified in the test report, with their chemical names or the corresponding collective heading in the list of substances, and their class and item number.

1.4.2 If tank wagons are manufactured according to this prototype without modification, this approval shall be valid for tank wagons so manufactured.

1.5 *ACCEPTANCE AND PERIODIC TESTS OF TANK WAGONS*

1.5.1 Shells and their equipment shall either together or separately undergo an initial inspection before being put into service. This inspection shall include:

— a check of conformity to the approved prototype;

— a check of the design characteristics [2];

— an external and internal examination;

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.

[2] The check of the design characteristics shall also include, for tank wagons a minimum test pressure of 1 MPa (10 bar), sampling of weld test-pieces — work samples — in accordance with 1.2.8.4 and in accordance with the tests in Appendix II C.

1.5.1 *(cont'd)*

— a hydraulic pressure test [1] at the test pressure indicated on the data plate;

— a check of satisfactory operation of the equipment.

The hydraulic pressure test shall be carried out before the installation of such thermal insulation as may be necessary. If the shells and their equipment have been tested separately, they shall be jointly subjected to a leakproofness test after assembly in accordance with 1.1.4.3.

1.5.2 Shells and their equipment shall undergo periodic inspections at fixed intervals. The periodic inspections shall include an external and internal examination and, as a general rule, a hydraulic pressure test [1]. Sheathing for thermal or other insulation shall be removed only to the extent required for reliable appraisal of the shell's characteristics.

In the case of shells intended for the carriage of powdery of granular substances, and with the agreement of the expert approved by the competent authority, the periodic hydraulic pressure tests may be omitted and replaced by leakproofness tests in accordance with 1.1.4.3.

The maximum interval for periodic inspections shall be eight years.

Empty tank wagons, uncleaned, may also be carried after the expiry of the set time limit, for the purpose of undergoing the test.

1.5.3 In addition, a leakproofness test of the shell with its equipment in accordance with 1.1.4.3 and a check of the satisfactory operation of all the equipment shall be carried out at least every four years. Empty, uncleaned tank wagons, battery wagons and wagons with demountable tanks may be moved after expiry of this period for undergoing inspection.

1.5.4 When the safety of the shell or of its equipment may have been impaired as a result of repairs, alterations or accident, an exceptional check shall be carried out.

1.5.5 The tests, inspections and checks in accordance with 1.5.1 to 1.5.4 shall be carried out by the expert approved by the competent authority. Certificates shall be issued showing the results of these operations. These certificates shall refer to the list of substances permitted for carriage in the shell in accordance with section 1.4.

1.6 *MARKING*

1.6.1 Each shell shall be fitted with a corrosion-resistant metal plate permanently attached tot the shell in a place readily accessible for inspection. The following particulars at least shall be marked on the plate by stamping or by any other similar method. These particulars may be engraved directly on the walls of the shell itself if the walls are so reinforced that the strength of the shell is not impaired:

— approval number;

— manufacturer's name of mark;

— manufacturer's serial number;

— year of manufacture;

— test pressure [2] (gauge pressure);

— capacity [2]; in the case of multiple-element shells: the capacity of each element;

— design temperature [2] (only if above + 50 °C or below – 20 °C);

— date (month and year) of initial test and of most recent periodic test in accordance with 1.5.1 and 1.5.2;

— stamp of the expert who carried out the tests; and

— material of the shell and, where appropriate, the protective lining.

On pressure-filled or pressure-discharged shells the maximum permissible working pressure [2] allowed shall be inscribed in addition.

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[1] In special cases and with the agreement of the expert approved by the competent authority, the hydraulic pressure test may be replaced by a test using another liquid or a gas, where such an operation does not present any danger.

[2] Add the units of measurement after the numerical values.

1.6.2 The following particulars shall be inscribed on each side of the tank wagon (on the shell itself or on a panel):

— name of the owner;

— capacity;

— unladen (tare) mass of tank wagon;

— load limits according to the characteristics of the wagon and the nature of the lines used; and

— name of the substance(s) accepted for carriage [1];

— for every test after 1. January 1993: the date (month, year) of the next test in accordance with 1.5.2, 1.5.3 or with the corresponding special requirements for substances accepted for carriage.

In addition, tank wagons shall bear the prescribed danger labels.

1.7 ***OPERATION***

1.7.1 The thickness of the walls of the shell shall not, throughout its use, fall below the minimum figure prescribed in 1.2.8.

1.7.2 Shells shall not be loaded with any dangerous substances other than those for whose carriage they have been approved and which, in contact with the material of the shell, gaskets, equipment and protective linings, are not liable to react dangerously with them, to form dangerous products or appreciably to weaken the material. Foodstuffs may not be carried in these shells unless the necessary measures have been taken to prevent any harm to public health.

1.7.3 The following degrees of filling shall not be exceeded in shells intended for the carriage of liquids at ambient temperatures:

1.7.3.1 — for flammable substances without additional risks (e.g. toxicity or corrosivity) in shells with a venting system, or with safety valves (even where preceded by a bursting disc):

$$\text{degree of filling} = \frac{100}{1 + \alpha\ (50 - t_F)}\ \%\ \text{of capacity;}$$

1.7.3.2 — for toxic or corrosive substances, (whether flammable or not), in shells with a venting system or with safety valves (even where preceded by a bursting disc):

$$\text{degree of filling} = \frac{98}{1 + \alpha\ (50 - t_F)}\ \%\ \text{of capacity;}$$

1.7.3.3 — for flammable substances and for hamful or slightly corrosive substances (whether flammable or not) in hermetically closed shells without safety device:

$$\text{degree of filling} = \frac{97}{1 + \alpha\ (50 - t_F)}\ \%\ \text{of capacity;}$$

1.7.3.4 — for highly toxic, toxic, highly corrosive or corrosive substances (whether flammable or not) in hermetically closed shells without safety device:

$$\text{degree of filling} = \frac{95}{1 + \alpha\ (50 - t_F)}\ \%\ \text{of capacity.}$$

1.7.3.5 In these formula α is the mean coefficient of cubic expansion of the liquid between 15 °C and 50 °C, i.e. for a maximum variation in temperature of 35 °C.

α is calculated by the formula: $\alpha = \dfrac{d_{15} - d_{50}}{35 \times d_{50}}$

in which d_{15} and d_{50} are the density of the liquid at 15 °C and 50 °C respectively. t_F is the mean temperature of the liquid at the time of filling.

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[1] A collective description covering a group of substances of a similar nature and equally compatible with the characteristics of the shell may be given instead of the name.

1.7.3.6 The provisions of 1.7.3.1 to 1.7.3.4 above shall not apply to shells whose contents are maintained by means of a heating device at a temperature above 50 °C during carriage. In such a case the degree of filling at the outset shall be such and the temperature shall be so regulated that the shell is not full to more than 95 % of its capacity at any time during carriage and that the filling temperature is not exceeded.

1.7.3.7 Where hot substances are loaded, the temperature of the outer surface of the shell or of the thermal insulation shall not exceed 70 °C during carriage.

1.7.4 During loading and unloading of tank wagons, appropriate measures shall be taken to prevent the release of dangerous quantities of gases and vapours. Shells shall be closed so that the contents cannot run out uncontrolled. The openings of bottom-discharge shells shall be closed by means of screw-threaded plugs, blank flanges or other equally effective devices. The leakproofness of the shell closures, particularly in the upper part of the dip tube, shall be verified by the consignor after the shell has been filled.

1.7.5 Where several closure systems are fitted in series, that nearest to the substance being carried shall be closed first.

1.7.6 No dangerous residue of the substance carried shall adhere to the outside of shells during carriage, whether they are full or empty.

1.7.7 To be accepted for carriage, empty shells, uncleaned, shall be closed in the same manner and be leakproof to the same degree as if they were full.

1.7.8 The connecting pipes between the shells of several independent but interconnected tank wagons (complete train, for example) shall be empty during carriage.

1.7.9 Substances which may react dangerously with each other shall not be carried in adjoining compartments of shells:

The following are considered dangerous reactions:

a) combustion and/or giving off considerable heat;

b) emission of flammable and/or toxic gases;

c) formation of corrosive liquids;

d) formation of unstable substances;

e) dangerous rise in pressure.

Substances which may react dangerously with each other may be carried in adjoining compartments of shells, when these compartments are separated by a partition with a wall thickness equal to or greater than that of the shell itself. They may also be carried in compartments of the same shell separated by an empty space or an empty compartment between loaded compartments.

1.8 *TRANSITIONAL MEASURES*

1.8.1 Tank wagons constructed before the entry into force of the requirements of this Appendix and which do not comply with them, but which were built in accordance with the requirements of RID, may be used until 30 September 1986. Tank wagons intended for the carriage of gases of Class 2 may, however, be used until 30 September 1994, if the periodic tests are carried out.

1.8.2 After these dates, their retention in service is permitted if the items of equipment of the shell satisfy the requirements of this Appendix. The wall thickness of the shells, except for shells intended for the carriage of gases of item 3 of Class 2, shall meet a calculation pressure of at least 0,4 MPa (4 bar) (gauge pressure) for mild steel or 200 kPa (2 bar) (gauge pressure) for aluminium and aluminim alloys.

This requirement applies equally to tank wagons which do not bear an indication of the material of the shell in accordance with 1.6.1 from 1 January 1998.

1.8.3 Periodic tests for tank wagons retained in service in conformity with the transitional provisions shall be carried out in accordance with the provisions of 1.5 and the special provisions pertaining to the various classes. Unless the earlier provisions prescribed a higher test pressure, a test pressure of 200 kPa (2 bar) (gauge pressure) is sufficient for aluminium and aluminium alloy shells.

1.8.4 Tank wagons which meet these transitional provisions may be used until 30 September 1998 for the carriage of dangerous goods for which they were approved.

This transitional period does not apply to tank wagons intended for the carriage of substances of Class 2, or to tank wagons whose wall thickness and items of equipment meet the requirements of this Appendix.

1.8.5 Tank wagons constructed before the entry into force of the requirements applicable from 1 January 1988 and which do not conform to those provisions but were constructed according to the requirements of RID in force until that date may still be used.

1.8.6 Tank wagons constructed before the entry in force of the requirements applicable from 1 January 1993 and which do not conform to those provisions but were constructed according to the requirements of RID in force until that date may still be used.

1.8.7 Tank wagons constructed in accordance with the requirements of Appendix II, C in force before 1 January 1995 which do not however conform to the corresponding requirements in force as from 1 January 1995, may continue to be used.

1.8.8 Tank wagons intended for the carriage of flammable liquids with a flash-point from 55 °C to 61 °C constructed before the entry into in force of the requirements of 1.2.7, 1.3.8 and 3.3.3 applicable from 1 January 1997, which do not conform to the requirements of those paragraphs in force until that date may continue to be used.

2. Special requirements applicable to Class 2: Gases: compressed, liquefied or dissolved under pressure

2.1 *USE*

The gases of marg. 201 in the table in 2.5.2.5 may be carried in tank wagons, battery wagons and wagons with demountable tanks [1]:

2.2 *CONSTRUCTION*

2.2.1.1 Shells intended for the carriage of subtances of itmes 1, 2 and 4 shall be made of steel.

For weldless shells, by derogation from 1.2.6.2 a minimum elongation at fracture of 14 % and a stress σ (sigma) lower than or equal to the limits given below according to the materials may be accepted:

a) if the ratio Re/Rm (minimum guaranteed characteristics after heat treatment) is higher than 0,66 without exceeding 0,85: $\sigma \leq 0{,}75$ Re;

b) if the ratio Re/Rm (minimum guaranteed characteristics after heat treatment) is higher than 0,85: $\sigma \leq 0{,}5$ Rm.

2.2.1.2 Receptables as defined in marg. 211 (1), (2) and (3) cylinders as part of bundles of cylinders as defined in marg. 211 (5) which are elements of a multiple-element battery wagon, shall be constructed according to marg. 212.

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[1] A collective designation, covering substances of a similar kind and equally compatible with the characteristics of the shell, may be given instead of the name.

2.2.2 The requirements of Appendix II C shall apply to the materials and construction of welded shells.

2.2.3 Shells intended for the carriage of 1017 chlorine or 1076 phosgene of item 2TC shall be designed for a calculation pressure [1] of at least 2,2 MPa (22 bar) (gauge pressure).

2.2.4 For double-walled shells, the wall thickness of the inner receptacle may, notwithstanding the requirements of 1.2.8.3, be 3 mm if a metal is used which has good low-temperature performance corresponding to a minimum tensile strength Rm = 490 N/mm^2 and a minimum coefficient of elongation A = 30 %.

If other metals are used, an equivalent minimum wall thickness shall be maintained; this thickness is to be calculated according to the formula in footnote 3 to 1.2.8.3, where R_{m0} = 490 N/mm^2 und für A_0 = 30 %.

The outer shell must in this case have a minimum wall thickness of 6 mm where mild steel is concerned. If other materials are used, an equivalent minimum wall thickness shall be maintained, which must be calculated according to the formula given in 1.2.8.3.

2.3 *ITEMS OF EQUIPMENT*

2.3.1 The discharge pipes of shells shall be capable of being closed by blank flanges or some other equally reliable device. For shells intended for the carriage of deeply refrigerated gases of item 3, these blank flanges or other equally effective devices may be fitted with pressure-release openings of a maximum diameter of 1,5 mm.

2.3.2 Shells intended for the carriage of liquefied gases may, in addition to being provided with the openings prescribed in 1.3.2 and 1.3.3, be provided with openings for the fitting of gauges, thermometers, manometers and with bleed holes, as required for their operation and safety.

2.3.2.1 Filling and discharge openings of shells intended for the carriage of liquefied flammable and/or toxic gases shall be equipped with an instant-closing internal safety device which closes automatically in the event of an unintended movement of the tank wagon or a fire. It shall also be possible to operate the closing device from a distance. The device which keeps the internal closure open, e.g. a rail hook, is not a component of the wagon.

2.3.2.2 All openings, other than those for the accommodation of safety valves and closed bleed holes, of shells intended for the carriage of liquefied flammable and/or toxic gases shall, if their normal diameter is more than 1,5 mm, be equipped with an internal shut-off device.

2.3.2.3 Notwithstanding the provisions of 2.3.2.1 and 2.3.2.2, shells intended for the carriage of deeply-refrigerated flammable and/or toxic liquefied gases may be equipped with external devices in place of internal devices if the external devices have a protection against external damage at least equivalent to that of the wall of the shell.

2.3.2.4 If the shells are equipped with gauges in direct contact with the substance carried they shall not be of a transparent material. If there are thermometers they shall not project directly into the gas or liquid through the shell wall.

2.3.2.5 Shells intended for the carriage of 1053 hydrogen sulphide and 1064 methyl mercaptan of item 2TF, 1017 chlorine, 1076 phosgene, 1079 sulphur dioxide of item 2TC, shall not have any opening below the surface level of the liquid. In addition, the cleaning apertures (fist holes) referred to in 1.3.4.2 shall not be permitted.

2.3.2.6 Filling and discharge openings situated in the upper part of shells shall, in addition to what is prescribed in 2.3.2.1, be equipped with a second, external closing device. This shall be capable of being closed by a blank flange or some other equally reliable device.

2.3.2.7 By derogation from the requirements in paragraphs 2.3.2.1, 2.3.2.2 and 2.3.2.6, for receptacles as defined in marg. 211 (1), (2), (3) and (5) which form a multiple-element battery wagon, the safety devices may also be mounted within the manifolding arrangement.

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[1] See 1.2.8.2.

2.3.3 Safety valves shall meet the conditions prescribed in 2.3.3.1 to 2.3.3.3 below.

2.3.3.1 Shells intended for the carriage of gases of items 1, 2 and 4 may be fitted with not more than two safety valves, whose aggregate clear cross-sectional area of passage of the seating or seatings shall be not less than 20 cm^2 per 30 m^3 or part thereof of the receptacle's capacity. These valves shall be capable of opening automatically under a pressure of from 0,9 to 1,0 times the test pressure of the shell to which they are fitted. They shall be of a type able to resist dynamic stresses, including liquid surge. The use of deadweight or counterweight valves is prohibited.

Shells intended for the carraige of gases of items 1 to 4 indicated by the letter T in marg. 201 shall not have safety valves unless the safety valves are preceded by a bursting disc. In the latter case the arrangement of the bursting disc and the safety valve shall be to the satisfaction of the competent authority.

Where tank wagons are intended for carriage by sea, the provisions of this paragraph shall not prohibit the fitting of safety valves conforming to the regulations governing that mode of transport [1].

2.3.3.2 Shells intended for the carriage of gases of item 3 shall be fitted with two independant safety valves each so designed as to permit the gases formed by evaporation during normal operation to escape from the shell in such a way that the pressure does not at any time exceed the working pressure indicated on the shell by more than 10 %.

One of the two safety valves may be replaced by a bursting disc which shall be such as to burst at the test pressure.

In the event of loss of the vacuum in a double-walled shell, or of destruction of 20 % of the insulation of a single-walled shell, the safety valve and the bursting disc shall permit an outflow such that the pressure in the shell cannot exceed the test pressure.

2.3.3.3 The safety valves of shells intended for the carriage of gases of item 3 shall be capable of opening at the working pressure indicated on the shell. They shall be so designed as to function faultlessly even at their lowest working temperature. The reliability of their operation at that temperature shall be established and checked either by testing each valve or by testing a specimen valve of each design type.

2.3.4 Thermal insulation.

2.3.4.1 If shells intended for the carriage or liquefied gases of item 2 are equipped with thermal insulation, such insulation shall consist of either:

— a sun shield covering not less than the upper third but not more than the upper half of the shell and separated from the shell by an air space not less than 4 cm accross; or

— a complete cladding, of adequate thickness, of insulating materials.

2.3.4.2 Shells intended for the carriage of gases of item 3 shall be thermally insulated. The thermal insulation shall be ensured by means of continuous sheathing. If the space between the shell and the sheating is under vacuum (vacuum insulation), the protective sheathing shall be so designed as to withstand without deformation an external pressure of at least 100 kPa (1 bar) (gauge pressure). By derogation from 1.1.4.2, external and internal reinforcing devices may be taken into account in the calculation. If the sheathing is so closed as to be gas-tight, a device shall be provided to prevent any dangerous pressure from developing in the insulating layer in the event of inadequate gas-tightness of the shell or of its items of equipment. The device shall prevent the infiltration of moisture into the heat-insulating sheath.

2.3.4.3 Shells intended for the carriage of liquefied gases having a boiling point below –182 °C at atmospheric pressure shall not include any combustible material either in the thermal insulation or in the means of attachment to the frame.

The means of attachment for shells of vacuum insulated thanks may, with the approval of the competent authority, contain plastics materials between the shell and sheathing.

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[1] These requirements are published in the IMDG Code.

2.3.5 A multiple-element battery-wagon contains elements which are linked to each other by a manifold and permanently mounted on the frame of a multiple-element battery wagon. The following elements are considered to be elements of a multiple-element battery-wagon.

— cylinders as defined in marg. 211 (1)

— tubes as defined in marg. 211 (2)

— pressure drums as defined in marg. 211 (3)

— bundles of cylinders (also known as frames) as defined in marg. 211 (5)

— shells as defined in Appendix XI.

Note. Bundles of cylinders as defined in marg. 211 (5) which are not elements of multiple-element battery-wagon are subject to the requirements of Class 2.

The following conditions shall be complied with for battery-wagons:

2.3.5.1 If one of the elements of a multiple-element shell is fitted with a safety valve and shut-off devices are provided between the elements, every element shall be so fitted.

2.3.5.2 The filling and discharge devices may be fitted to a manifold.

2.3.5.3 Each element of a multiple-element battery-wagon, including each individual cylinder of a bundle as defined in marg. 211 (5) intended for the carriage of gases designated by the letter T in marg. 201, shall be capable of being isolated by a shut-off valve.

2.3.5.4 The elements of a multiple-element battery-wagon intended for the carriage of gases designated by the letter F in marg. 201, when consisting of receptacles as defined in marg. 211 (1), (2), (3) and (5), shall be combined in groups of not more than 5 000 litres which are capable of being isolated by a shut-off valve.

Each element of a multiple-element battery-wagon intended for the carriage of gases designated by the letter F in marg. 201 when consisting of shells as defined in Appendix XI shall be capable of being isolated by a shut-off valve.

2.3.5.5 If the elements are demountable [1], the following requirements apply:

a) they shall be so fixed on the underframe of the wagon that they cannot move;

b) they shall not be interconnected by a manifold;

c) if the elements can be rolled, the valves shall be provided with protective caps.

2.3.6 Notwithstanding the provisions of 1.3.3, shells intended for the carriage of deeply refrigerated liquefied gases need not have an inspection aperture.

2.4 *TYPE APPROVAL*

No special requirements.

2.5 *TESTS*

2.5.1.1 Receptacles as defined in marg. 211 (1), (2) and (3) cylinders as part of bundles of cylinders as defined in marg. 211 (5), which are elements of a multiple-element battery-wagon, shall be tested according to marg. 219.

2.5.1.2 The materials of every welded shell, except those mentioned in 2.5.1.1, shall be tested according to the method described in Appendix II C.

2.5.2 The test pressure shall be:

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[1] A collective designation, covering substances of a similar kind and equally compatible with the characteristics of the shell, may be given instead of the name.

2.5.2.1 The test pressure for shells intended for the carriage of gases of item 1 having a critical temperature below – 50 °C shall be at least one and one-half times the filling pressure at 15 °C.

2.5.2.2 The test pressure for shells intended for the carriage of:

— gases of item 1 having a criticial temperature of – 50 °C or above;

— gases of item 2 having a critical temperature below 70 °C, and

— gases of item 4

shall be such that, when the shell is filled to the maximum mass of the contents per litre of capacity, the pressure reached in the shell by the substance at 55 °C for shells with thermal insulation or 65 °C for shells without thermal insulation does not exceed the test pressure.

2.5.2.3 The test pressure for shells intended for the carriage of gases of item 2 having a critical temperature of 70 °C or above shall be:

a) If the shell is equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0,1 MPa (1 bar) of the liquid at 60 °C, but not less than 1 MPa (10 bar);

b) If the shell is not equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0,1 MPa (10 bar), of the liquid at 65 °C, but not less than 1 MPa (10 bar).

The maximum values of kg/litre prescribed for the degree of filling are calculated as follows: maximum mass of contents per litre of capacity = 0,95 × density of the liquid phase at 50 °C (in kg/l); moreover the vapour phase shall not disappear at 60 °C.

If the shells are not more than 1,5 metres in diameter the values of the test pressure and maximum permissible mass of contents per litre of capacity conforming to marg. 219 d) shall be applicable.

2.5.2.4 The test pressure for shells intended for the carriage of gases of item 3 shall be not less than 1,3 times the maximum permitted working pressure indicated on the shell, but not less than 300 kPa (3 bar) (gauge pressure); for shells with vacuum insulation the test pressure shall be not less than 1,3 times the maximum permitted working pressure increased by 100 kPa (1 bar).

2.5.2.5 **Table of gases and gas mixtures which may be carried in tank wagons, battery-wagons and wagons with demountable tanks; minimum test pressure of the shells and, as far as applicable, maximum mass of contents per litre of capacity**

In the case of gases and gas mixtures classified under n.o.s. entries, the values of the test pressure and maximum mass of contents per litre of capacity shall be prescribed by the expert approved by the competent authority.

When shells for gases of items 1 and 2 having a criticial temperature of – 50 °C or above and below 70 °C have been subjected to a test pressure lower than shown in the table, and the shells are fitted with thermal insulation, a lower maximum load may be prescribed by the expert approved by the competent authority, provided that the pressure reached in the shell by the substance at 55 °C does not exceed the test pressure stamped on the shell.

Toxic gases and gas mixtures classified under n.o.s. entries with a LC_{50} value < 200 ppm shall not be authorized for carriage in tank wagons, battery-wagons and wagons with demountable tanks.

Note: 1076 phosgene of item 2TC, 1067 dinitrogen tetroxide (nitrogen dioxide) of item 2TOC and 1001 acetylene, dissolved, of item 4F shall only be authorized for carriage in multiple-element battery-wagons.

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
1 A	1002 Air, compressed	see 2.5.2.1				
	1006 Argon, compressed	see 2.5.2.1				
	1046 Helium, compressed	see 2.5.2.1				
	1056 Krypton, compressed	see 2.5.2.1				
	1065 Neon, compressed	see 2.5.2.1				
	1066 Nitrogen, compressed	see 2.5.2.1				
	1979 Rare gases, mixture, compressed	see 2.5.2.1				
	1980 Rare gases and oxygen, mixture, compressed	see 2.5.2.1				
	1981 Rare gases and nitrogen, mixture, compressed	see 2.5.2.1				
	1982 Tetrafluoromethane, compressed (refrigerant gas R 14, compressed)	20 30	200 300	20 30	200 300	0,62 0,94
	2036 Xenon, compressed	12	120			1,30
				13	130	1,24
	2193 Hexafluoroethane, compressed (refrigerant gas R 116, compressed)			20	200	1,10
		16	160			1,28
		20	200			1,34
	1956 Compressed gas, n.o.s.	see 2.5.2.1 or 2.5.2.2				
1 O	1014 Carbon dioxide and oxygen, mixture, compressed	see 2.5.2.1				
	1072 Oxygen, compressed	see 2.5.2.1				
	3156 Compressed gas, oxidizing, n.o.s.	see 2.5.2.1 or 2.5.2.2				
1 F	1049 Hydrogen, compressed	see 2.5.2.1				
	1957 Deuterium, compressed	see 2.5.2.1				
	1962 Ethylene, compressed			22,5	225	0,34
				30	300	0,37
		12	120			0,25
		22,5	225			0,36
	1971 Methane, compressed, or natural gas, compressed with high methane content	see 2.5.2.1				
	2034 Hydrogen and Methane, mixture, compressed	see 2.5.2.1				
	2203 Silane, compressed [1]	22,5	225	22,5	225	0,32
		25	250	25	250	0,41
	1964 Hydrocarbon gas, mixture, compressed, n.o.s.	see 2.5.2.1 or 2.5.2.2				
	1954 Compressed gas, flammable, n.o.s.	see 2.5.2.1 or 2.5.2.2				
1 T	1612 Hexaethyl tetraphosphate and compressed gas, mixture	see 2.5.2.1				
	1955 Compressed gas, toxic, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				

[1] Considered as pyrophoric.

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
1 TF	1016 Carbon monoxide, compressed	see 2.5.2.1				
	1023 Coal gas, compressed	see 2.5.2.1				
	1071 Oil gas, compressed	see 2.5.2.1				
	1911 Diborane, compressed	not allowed				
	2600 Carbon monoxide and hydrogen, mixture, compressed	see 2.5.2.1				
	1953 Compressed gas, toxic, flammable, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
1 TC	1008 Boron trifluoride, compressed	22,5 30	225 300	22,5 30	225 300	0,715 0,86
	1859 Silicon tetrafluoride, compressed	20 30	200 300	20 30	200 300	0,74 1,10
	2198 Phosphorus pentafluoride, compressed	not allowed				
	2417 Carbonyl fluoride, compressed	20 30	200 300	20 30	200 300	0,47 0,70
	3304 Compressed gas, toxic, corrosive, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
1 TO	2451 Nitrogen trifluoride	20 30	200 300	20 30	200 300	0,50 0,75
	3303 Compressed gas, toxic, oxidizing, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
1 TFC	3305 Compressed gas, toxic, flammable, corrosive, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
1 TOC	1045 Fluorine, compressed	not allowed				
	1660 Nitric oxide, compressed	not allowed				
	2190 Oxygen difluoride,	not allowed				
	3306 Compressed gas, toxic, oxidizing, corrosive, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.1 or 2.5.2.2				
2 A	1009 Bromotrifluoromethane (refrigerant gas R 13B1)			4,2 12 25	42 120 250	1,13 1,44 1,60
		12	120			1,50
	1013 Carbon dioxide			19 25	190 250	0,66 0,75
		19 22,5	190 225			0,73 0,78
	1015 Carbon dioxide and nitrous oxide, mixture	see 2.5.2.2 or 2.5.2.3				
	1018 Chlorodifluoromethane (refrigerant gas R 22)	2,4	24	2,6	26	1,03
	1020 Chloropentafluoroethane (refrigerant gas R 115)	2	20	2,3	23	1,08
	1021 1-Chloro-1,2,2,2-tetrafluoroethane (refrigerant gas R 124)	1	10	1,1	11	1,20

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 A *(cont'd)*	1022 Chlorotrifluoromethane (refrigerant gas R 13)			10	100	0,83
				12	120	0,90
				19	190	1,04
				25	250	1,10
		12	120			0,96
		22,5	225			1,12
	1028 Dichlorodifluoromethane (refrigerant gas R 12)	1,5	15	1,6	16	1,15
	1029 Dichloromonofluoromethane (refrigerant gas R 21)	1	10	1	10	1,23
	1058 Liquefied gases, non-flammable, charged with nitrogen, carbon dioxide or air	1,5 × filling pressure see 2.5.2.2 or 2.5.2.3				
	1080 Sulphur hexafluoride	12	120			1,34
				7	70	1,04
				14	140	1,33
				16	160	1,37
	1858 Hexafluoropropylene (refrigerant gas R 1216)	1,7	17	1,9	19	1,11
	1952 Ethylene oxide and carbon dioxide, mixture, with not more than 9 % ethylene oxide	19	190	19	190	0,66
		25	250	25	250	0,75
	1958 1,2-Dichloro-1,1,2,2-tetrafluoroethane (refrigerant gas R 114)	1	10	1	10	1,30
	1973 Chlorodifluoromethane and chloropentafluoroethane, mixture, with fixed boiling point, with approximately 49 % chlorodifluoromethane (refrigerant gas R 502)	2,5	25	2,8	28	1,05
	1974 Chlorodifluoromethane (refrigerant gas R 12B1)	1	10	1	10	1,61
	1976 Octafluorocyclobutane (refrigerant gas RC318)	1	10	1	10	1,34
	1983 1-Chloro-2,2,2-trifluoroethane (refrigerant gas R 133a)	1	10	1	10	1,18
	1984 Trifluoromethane (refrigerant gas R 23)	19	190			0,92
		25	250			0,99
				19	190	0,87
				25	250	0,95
	2422 Octafluorobut-2-ene (refrigerant gas R 1318)	1,2	12	1,2	12	1,34
	2424 Octafluoropropane (refrigerant gas R 218)	2,5	25	2,5	25	1,09
	2599 Chlorotrifluoromethane and Trifluoromethane, azeotropic mixture with approximately 60 % chlorotrifluoromethane (refrigerant gas R 503)	3,1	31	3,1	31	0,11
		4,2	42			0,21
		10	100			0,76
				4,2	42	0,20
				10	100	0,66
	2602 Dichlorodifluoromethane and 1,1-difluoroethane, azeotropic mixture with approximately 74 % dichlorodifluoromethane (refrigerant gas R 500)	1,8	18	2	20	1,01
	3070 Ethylene oxide and dichlorodifluoromethane, mixture with not more than 12,5 % ethylene oxide	1,5	15	1,6	16	1,09
	3159 1,1,1,2-Tetrafluoroethane (refrigerant gas R 134a)	1,6	16	1,8	18	1,04
	3220 Pentafluoroethane (refrigerant gas R 125)	3,1	31	3,4	34	0,95
	3296 Heptafluoropropane (refrigerant gas R 227)	1,5	15	1,5	15	1,20

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 A *(cont'd)*	3297 Ethylene oxide and chlorotetrafluoroethane, mixture with not more than 8,8 % ethylene oxide	1	10	1	10	1,16
	3298 Ethylene oxide and pentafluoroethane, mixture with not more than 7,9 % ethylene oxide	2,6	26	2,6	26	1,02
	3299 Ethylene oxide and tetrafluoroethane, mixture with not more than 5,6 % ethylene oxide	1,7	17	1,7	17	1,03
	1078 refrigerant gas, n.o.s., such as					
	mixture F1	1	10	1,1	11	1,23
	mixture F2	1,5	15	1,6	16	1,15
	mixture F3	2,4	24	2,7	27	1,03
	other mixtures	see 2.5.2.2 or 2.5.2.3				
	1968 Insecticide gas, n.o.s.	see 2.5.2.2 or 2.5.2.3				
	3163 Liquefied gas, n.o.s.	see 2.5.2.2 or 2.5.2.3				
2 O	1070 Nitrous oxide	22,5	225			0,78
				18	180	0,68
				22,5	225	0,74
				25	250	0,75
	3157 Liquefied gas, oxidizing, n.o.s.	see 2.5.2.2 or 2.5.2.3				
2 F	1010 1,2-butadiene, inhibited, or	1	10	1	10	0,59
	1010 1,3-butadiene, inhibited, or	1	10	1	10	0,55
	1010 mixture of 1,3-butadiene and hydrocarbons, inhibited	1	10	1	10	0,50
	1011 Butane	1	10	1	10	0,51
	1012 Butylenes, mixture or	1	10	1	10	0,50
	1012 1-butylene or	1	10	1	10	0,53
	1012 cis-2-butene or	1	10	1	10	0,55
	1012 trans-2-butylene	1	10	1	10	0,54
	1027 Cyclopropane	1,6	16	1,8	18	0,53
	1030 1,1-Difluoroethane (refrigerant gas R 152a)	1,4	14	1,6	16	0,79
	1032 Dimethylamine, anhydrous	1	10	1	10	0,59
	1033 Dimethyl ether	1,4	14	1,6	16	0,58
	1035 Ethane	12	120			0,32
				9,5	95	0,25
				12	120	0,29
				30	300	0,39
	1036 Ethylamine	1	10	1	10	0,61
	1037 Ethyl chloride	1	10	1	10	0,80
	1039 Ethyl methyl ether	1	10	1	10	0,64
	1041 Ethylene oxide and carbon dioxide, mixture with more than 9 % ethylene oxide but not more than 87 %	2,4	24	2,6	26	0,73
	1055 Isobutylene	1	10	1	10	0,52
	1060 Methyl, acetylene and propadiene mixture, stabilized	see 2.5.2.2 or 2.5.2.3				
	Propadiene with 1 % to 4 % methylacetylene	2,2	22	2,2	22	0,50
	mixture P1	2,5	25	2,8	28	0,49
	mixture P2	2,2	22	2,3	23	0,47
	1061 Methylamine, anhydrous	1	10	1,1	11	0,58

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 F *(cont'd)*	1063 Methyl chloride (refrigerant gas R 40)	1,3	13	1,5	15	0,81
	1077 Propylene	2,5	25	2,7	27	0,43
	1081 Tetrafluoroethylene, inhibited	not allowed				
	1083 Trimethylamine, anhydrous	1	10	1	10	0,56
	1085 Vinyl bromide, inhibited	1	10	1	10	1,37
	1086 Vinyl chloride, inhibited	1	10	1,1	11	0,81
	1087 Vinyl methyl ether, inhibited	1	10	1	10	0,67
	1860 Vinyl fluoride, inhibited	12	120			0,58
		22,5	225			0,65
				25	250	0,64
	1912 Methyl chloride and methylene chloride, mixture	1,3	13	1,5	15	0,81
	1959 1,1-Difluoroethylene (refrigerant gas R 1132a)	12	120			0,66
		22,5	225			0,78
				25	250	0,77
	1969 Isobutane	1	10	1	10	0,49
	1978 Propane	2,1	21	2,3	23	0,42
	2035 1,1,1-Trifluoroethane (refrigerant gas R 143a)	2,8	28	3,2	32	0,79
	2044 2,2-Dimethylpropane	1	10	1	10	0,53
	2200 Propadiene, inhibited	2,2	22	2,2	22	0,50
	2419 Bromotrifluoroethylene	1	10	1	10	1,19
	2452 Ethyl acetylene, inhibited	1	10	1	10	0,57
	2453 Ethyl fluoride (refrigerant gas R 161)	3	30	3	30	0,57
	2454 Methyl fluoride (refrigerant gas R 41)	30	300	30	300	0,36
	2517 1-Chloro-1,1-difluoroethane (refrigerant gas R 142b)	1	10	1	10	0,99
	2601 Cyclobutane	1	10	1	10	0,63
	3153 Perfluoro(methyl vinyl ether)	2	20	2	20	0,75
	3154 Perfluoro(ethyl vinyl ether)	1	10	1	10	0,98
	3252 Difluoromethane (refrigerant gas R 32)	4,8	48	4,8	48	0,78
	1965 Hydrocarbon gas, mixture, liquefied, n.o.s., such as					
	mixture A	1	10	1	10	0,50
	mixture A0	1,2	12	1,4	14	0,47
	mixture A1	1,6	16	1,8	18	0,46
	mixture B	2	20	2,3	23	0,43
	mixture C	2,5	25	2,7	27	0,42
	other mixtures	see 2.5.2.2 or 2.5.2.3				
	3161 Liquefied gas, flammable, n.o.s.	see 2.5.2.2 or 2.5.2.3				
2 T	1062 Methyl bromide	1	10	1	10	1,51
	1581 Chloropicrin and methyl bromide, mixture	1	10	1	10	1,51
	1582 Chloropicrin and methyl chloride, mixture	1,3	13	1,5	15	0,81
	1967 Insecticide gas toxic, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				
	2191 Sulfuryl fluoride	5	50	5	50	1,10
	3162 Liquefied gas, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 TF	1026 Cyanogen	10	100	10	100	0,70
	1040 Ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 °C	1,5	15	1,5	15	0,78
	1053 Hydrogen sulphide	4,5	45	5	50	0,67
	1064 Methyl mercaptan	1	10	1	10	0,78
	1082 Trifluorochloroethylene, inhibited	1,5	15	1,7	17	1,13
	2188 Arsine	not allowed				
	2192 Germane [1]	not allowed				
	2199 Phospine [1]	not allowed				
	2202 Hydrogen selenide, anhydrous	not allowed				
	2204 Carbonyl sulphide	2,6	26	2,6	26	0,84
	2676 Stibine	not allowed				
	3300 Ethylene oxide and carbon dioxide, mixture with more than 87 % ethylene oxide	2,8	28	2,8	28	0,73
	3160 Liquefied gas, toxic, flammable, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				
2 TC	1005 Ammonia, anhydrous	2,6	26	2,9	29	0,53
	1017 Chlorine	1,7	17	1,9	19	1,25
	1048 Hydrogen bromide, anhydrous	5	50	5,5	55	1,54
	1050 Hydrogen chloride, anhydrous	12	120			0,69
				10	100	0,30
				12	120	0,56
				15	150	0,67
				20	200	0,74
	1069 Nitrosyl chloride	not allowed				
	1076 Phosgene	only in a multiple-element battery wagons				
	1079 Sulphur dioxide	1	10	1,2	12	1,23
	1589 Cyanogen chloride, inhibited	not allowed				
	1741 Boron trichloride	not allowed				
	2194 Selenium hexafluoride	not allowed				
	2195 Tellurium hexafluoride	not allowed				
	2196 Tungsten hexafluoride	not allowed				
	2197 Hydrogen iodide, anhydrous	2,3	23	2,3	23	2,25
	2418 Sulphur tetrafluoride	not allowed				
	2420 Hexafluoroacetone	2,2	22	2,2	22	1,08
	3057 Trifluoroacetyl chloride	1,3	13	1,5	15	1,17
	3308 Liquefied gas, toxic, corrosive n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				
2 TO	3083 Perchloryl fluoride	3,3	33	3,3	33	1,21
	3307 Liquefied gas, toxic, oxidizing, n.o.s.	see 2.5.2.2 or 2.5.2.3				

[1] Considered as pyrophoric.

2.5.2.5 *(cont'd)*

Item No and Group	UN No and name of the substance	Minimum test pressure for shells				Maximum permissible mass of contents per liter of capacity (kg)
		with thermal insulation		without thermal insulation		
		MPa	bar	MPa	bar	
2 TFC	2189 Dichlorosilane	1	10	1	10	0,90
	2534 Methylchlorosilane	not allowed				
	3309 Liquefied gas, toxic, flammable, corrosive, n.o.s.	see 2.5.2.2 or 2.5.2.3				
2 TOC	1067 Dintrogen tetroxide (introgen dioxide)	only in multiple-element battery wagons				
	1749 Chlorine trifluoride	3	30	3	30	1,40
	1975 Nitric oxide and dinitrogen tetroxide mixture (nitric oxide and nitrogen dioxide mixture)	not allowed				
	2548 Chlorine pentafluoride	not allowed				
	2901 Bromine chloride	1	10	1	10	1,50
	3310 Liquefied gas, toxic, oxidizing, corrosive, n.o.s. (allowed if LC_{50} equal to or greater than 200 ppm)	see 2.5.2.2 or 2.5.2.3				
3 A	1913 Neon, refrigerated liquid	see 2.5.2.4				
	1951 Argon, refrigerated liquid	see 2.5.2.4				
	1963 Helium, refrigerated liquid	see 2.5.2.4				
	1970 Krypton, refrigerated liquid	see 2.5.2.4				
	1977 Nitrogen, refrigerated liquid	see 2.5.2.4				
	2187 Carbon dioxide, refrigerated liquid	see 2.5.2.4				
	2591 Xenon, refrigerated liquid	see 2.5.2.4				
	3136 Trifluoromethane, refrigerated liquid	see 2.5.2.4				
	3158 Gas, refrigerated liquid, n.o.s.	see 2.5.2.4				
3 O	1003 Air, refrigerated liquid	see 2.5.2.4				
	1073 Oxygen, refrigerated liquid	see 2.5.2.4				
	2201 Nitrous oxide, refrigerated liquid	see 2.5.2.4				
	3311 Gas, refrigerated liquefied, oxidizing, n.o.s.	see 2.5.2.4				
3 F	1038 Ethylene, refrigerated liquid	see 2.5.2.4				
	1961 Ethane, refrigerated liquid	see 2.5.2.4				
	1966 Hydrogen, refrigerated liquid	see 2.5.2.4				
	1972 Methane, refrigerated liquid, or 1972 Natural gas, refrigerated liquid, with high methane content	see 2.5.2.4				
	3138 Ethylene, acetylene and propylene in mixture refrigerated liquid, containing at least 71,5 % ethylene with not more than 22,5 % acetylene and not more than 6 % propylene	see 2.5.2.4				
	3312 Gas, refrigerated liquid, flammable, n.o.s.	see 2.5.2.4				
4 A	2073 Ammonia solutions, relative density less than 0,880 kg/l at 15 °C					
	with more than 35 % and not more than 40 % ammonia	1	10	1	10	0,80
	with more than 40 % and not more than 50 % ammonia	1,2	12	1,2	12	0,77
4 F	1001 Acetylene, dissolved	only in multiple-element battery wagons				
4 TC	3318 Ammonia solutions, relative density less than 0,880 kg/l at 15 °C in water, with more than 50 % ammonia	see 2.5.2.2				

2.5.3 The first hydraulic pressure test shall be carried out before thermal insulation is applied.

2.5.4 The capacity of each shell intended for the carriage of gases of item 1 which are filled by mass, and gases of items 2 and 4 shall be determined, under the supervision of an expert approved by the competent authority, by weighing or by volumetric measurement of the quantity of water required to fill the shell. The measurement of shell capacity shall be accurate to within 1 %. Determination by a calculation based on the dimensions of the shell is not permitted. The maximum permissible load according to marg. 219 and 2.5.2.2 and 2.5.2.3 shall be prescribed by an approved expert.

2.5.5 Checking of the welds shall be carried out in accordance with the lambda-coefficient 1,0 requirements of 1.2.8.4.

2.5.6 Notwithstanding the requirements of 1,5, the periodic tests, including the hydraulic pressure test, shall take place:

2.5.6.1 — Every four years in the case of shells intended for the carriage of 1008 boron trifluoride of item 1TC, 1053 hydrogen sulphide of item 2TF, 1017 chlorine, 1048 hydrogen bromide, anhydrous, 1050 hydrogen chloride, anhydrous, 1076 phosgene and 1079 sulphur dioxide of item 2TC and 1067 dinitrogen tetroxide (nitrogen dioxide) of item 2 TOC;

2.5.6.2 — After eight years service and thereafter every twelve years in the case of shells intended for the carriage of gases of item 3. A leakproofness test shall be performed by an approved expert, six years after each periodic test.

2.5.6.3 Receptacles as defined in marg. 211(1), (2) and (3) and cylinders as part of bundles of cylinders as defined in marg. 211(5), which are elements of a multiple-element battery-wagon, shall have periodic inspections according to marg. 217.

2.5.7 For shells equipped with vacuum insulation, the hydraulic test and the check of the internal condition may, with the consent of the approved expert, be replaced by a leakproofness test and measurement of the vacuum.

2.5.8 If, at the time of periodic inspections, openings are made in shells intended for the carriage of gases of item 3, the method by which they are hermetically closed before being returned to service shall be approved by the approved expert and shall ensure the integrity of the shell.

2.5.9 The leakproofness test for shells intended for the carriage of gases of items 1, 2 and 4 shall be carried out at a pressure of not less than 0,4 MPa (4 bar) and not more than 0,8 MPa (8 bar) (gauge pressure).

2.6 ***Marking***

2.6.1 In addition, the following particulars shall be marked by stamping or by any other similar method on the plate prescribed in 1.6.1 or directly on the walls of the shell itself if the walls are so reinforced that the strength of the shell is not impaired.

2.6.1.1 On shells intended for the carriage of only one substance:

— the name of the gas in full in accordance with marg. 201 and, in addition for gases classified under an n.o.s entry, the technical name [1].

This shall be supplemented, in the case of shells intended for the carriage of gases of item 1 filled by volume by the maximum filling pressure at 15 °C allowed for the shell and, in the case of shells for the carriage of gases of item 1 filled by mass, and for gases of items 2, 3 and 4 by the maximum permissible load mass in kg and the filling temperature, if below – 20 °C.

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[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. Instead of the technical name, the use of one of the following names permitted:
— For 1078 refrigerant gas, n.o.s., of item 2A: mixture F1, mixture F2, mixture F3;
— For 1060 methyl acetylene and propadiene mixtures, stabilized, of item 2F: mixture P1, mixture P2;
— For 1965 hydrocarbon gas mixture, liquefied, n.o.s. of item 2F: mixture A, mixture AO, mixture A1, mixture B, mixture C. The names customary in the trade and mentioned in marg. 201, Note 1 to item 2F nº 1965, may be used only as a complement.

2.6.1.2 On multi-purpose shells:

— the names, in full in accordance with marg. 201 and in addition for gases classified under an n.o.s. entry, the technical name [1] of the gases for whose carriage the shell is approved.

This shall be supplemented by particulars of the maximum permissible load mass, in kg, for each of them.

2.6.1.3 On shells intended for the carriage of gases of item 3:

— the maximum permissible working pressure.

2.6.1.4 On shells equipped with thermal insulation:

— the expression 'thermally insulated' or 'thermally insulated by vacuum'.

2.6.2.1 The frame of a battery-wagon, with the exception of demountable tanks, shall be fitted near the filling point with a plate specifying:

— the test pressure [2] of the elements;

— the maximum filling pressure [2] at 15 °C allowed for elements intended for compressed gases;

— the number of elements;

— the aggregate capacity [2] of the elements;

— the name of the gas in full in accordance with marg. 201 and in addition for gases classified under an n.o.s. entry, the technical name [1];

and, in addition, in the case of liquefied gases:

— the maximum permissible load mass [2] per element.

2.6.2.2 Receptacles as defined in marg. 211(1), (2), (3) and (5), which are elements of a multiple-element battery-wagon, shall be marked according to marg. 223. These receptacles need not be labelled individually with the danger labels as required in marg. 224.

Multiple-element battery-wagons shall be marked in accordance with Appendix VIII and labelled in accordance with marg. 224.

2.6.3 In addition to the inscriptions prescribed in 1.6.2, the following shall be inscribed on each side of the tank wagon or on panels:

(a) the inscription 'minimum filling tempertaure allowed'.

(b) for shells intended for the carriage of one substance only:

— the name of the gas in full in accordance with marg. 201 and, in addition for gases classified under an n.o.s. entry, the technical name [1];

— for gases of item 1 filled by mass and for gases of items 2, 3 and 4, the maximum permissible load mass in kg.

(c) for multi-purpose shells:

— the name in full [1] of all the gases to whose carriage the shell is assigned, with an indication of the maximum permissible load mass in kg for each of them.

(d) for shell equipped with thermal insulation:

— the inscription 'thermally insulated' or 'thermally insulated by vacuum', in an official language of the country of registration and, if this language is not French, German, Italian or English, also in French, German, Italian or English, unless international tariffs or agreements concluded between the railway administrations provide otherwise.

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[1] The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. Instead of the technical name, the use of one of the following names permitted:
— For 1078 refrigerant gas, n.o.s., of item 2A: mixture F1, mixture F2, mixture F3;
— For 1060 methyl acetylene and propadiene mixtures, stabilized, of item 2F: mixture P1, mixture P2;
— For 1965 hydrocarbon gas mixture, liquefied, n.o.s. of item 2F: mixture A, mixture AO, mixture A1, mixture B, mixture C. The names customary in the trade and mentioned in marg. 201, Note 1 to item 2F n° 1965, may be used only as a complement.

[2] Add the units of measurement after the numerical values.

2.6.3.1 The load limits in accordance with 1.6.2

— for compressed gases of item 1 filled by mass;

— for liquefied gases of items 2 and 3, and

— for gases dissolved under pressure of item 4,

shall be determined in the light of the maximum permissible load mass of the shell, depending on the substance carried; in the case of multi-purpose shells, the name in full of the particular gas being carried shall be stated together with the load limit.

2.6.4 The panels on wagons carrying demountable tanks as referred to in 2.3.5.5 need not bear the particulars prescribed in 1.6.2 and 2.6.3.

2.6.5 Shells intended for the carriage of gases of items 2 and 3 shall be marked with an unbroken orange [1] band, about 30 cm wide, encircling the shell at mid-height.

2.7 ***Operation***

2.7.1 When shells are approved for different gases, a change of use shall include emptying, purging and evacuation operations to the extent necessary for safe operation.

2.7.2 When loaded tank wagons or empty but uncleaned tank wagons are handed over for carriage, only the particulars applicable under 2.6.3 to the gas loaded or just discharged shall be visible; all particulars concerning other gases shall be covered up.

2.7.3 The element of a multiple-element battery-wagon shall contain only one and the same gas.

2.7.4 The degree of filling of shells intended for the carriage of gases of item 3F shall remain below the level at which, if the contents were raised to the temperature at which the vapour pressure equalled the opening pressure of the safety valve, the volume of the liquid would reach 95 % of the shell's capacity at that temperature.

Shells intended for the carriage of gases of items 3A and 3O may be filled to 98 % at the loading temperature and the loading pressure.

2.7.5 On shells intended for the carriage of gases of item 3O, the materials used to ensure leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents.

2.7.6 The requirement in 1.7.5 does not apply to gases of item 3.

2.7.7 *Control provisions for the loading of liquid-gas tank wagons*

2.7.7.1 Control measures before loading

(a) For each gas to be carried, the details on the tank plate (see 1.6.1 and 2.6.1) shall be checked to agree with those on the wagon panel (see 1.6.2 and 2.6.3).

Tank wagons for multiple use shall especially be checked to ensure that the correct folding panels are visible on both sides of the wagon.

The load limits on the wagon panel shall not exceed the maximum permissible filling mass on the tank plate.

(b) The last load shall be determined, either from particulars in the consignment note or by analysis. If necessary the tank shall be cleaned.

(c) The mass of the residue shall be determined (e.g. by weighing) and taken into account in determining the filling quantity, so that the tank wagon is not overfilled or overloaded.

(d) The leakproofness of the shell and its items of equipment, and their ability to function, shall be checked.

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[1] See Appendix VIII, marginal 1800 (1), Note.

2.7.7.2 Loading procedure

For loading, the provisions of the operating instructions of the tank wagon shall be complied with.

2.7.7.3 Control measures after loading

(a) After filling, wether the wagon is overfilled or overloaded shall be checked by calibrated checking devices (e.g. by weighing on a calibrated weighbridge).

Overfilled of overloaded tank wagons shall be immediately discharged in a safe manner until the permitted filling quantity is reached.

(b) The partial pressure of inert gases in the gas phase shall not exceed 0,2 MPa (2 bar), or the gauge pressure in the gas phase shall not exceed by more than 0,1 MPa (1 bar) the vapour pressure (absolute) of the liquid gas at the temperature of the liquid phase (for 1040 ethylene oxide with nitrogen, however, see the requirements of marg. 201, item 2TF).

(c) After loading, bottom-discharge wagons shall be checked to ensure that the internal shut-off devices are adequately closed.

(d) Before blank flanges or other equally effective devices are fitted, the vents shall be checked for leakproofness.

(e) Blank flanges or other equally effective devices shall be fitted on vents. These closures shall be equipped with suitable seals. They shall be closed when using all elements provided for in their design types.

(f) Lastly, a final visual check of the wagon, its equipment and marking shall be made to ensure that no filling substance is escaping.

2.8 ***Transitional measures***

Tank wagons, battery-wagons and wagons with demountable tanks intended for the carriage of substances of Class 2, built before 1 January 1997, may bear the marking in accordance with the requirements of this Appendix in force before 1 January 1997, until the next periodic test.

3. Special requirements applicable to Class 3: Flammable liquids

3.1 ***Use***

The following substances of marg. 301 may be carried in tank wagons:

3.1.1 Propyleneimine, inhibited, of item 12.

3.1.2 Substances classified under (a) of items 11, 14 to 22, 26, 27 and 41.

3.1.3 Substances classified under (b) of items 11, 14 to 27, 41 and substances classified under items 32 and 33.

3.1.4 Substances classified under items 1 to 5, 31, 34 and 61 with the exception of isopropyl-nitrate, n-propyl nitrate and nitromethane of item 3(b).

3.2 ***Construction***

3.2.1 Shells intended for the carriage of propyleneimine, inhibited, of item 12 shall be designed for a calculation pressure [1] of not less than 1,5 MPa (15 bar) (gauge pressure).

3.2.2 Shells intended for the carriage of the substances referred to in 3.1.2 shall be designed or a calculation pressure [1] of not less than 1 MPa (10 bar) (gauge pressure).

3.2.3 Shells intended for the carriage of the substances referred to in 3.1.3 shall be designed for a calculation pressure [1] of not less than 0,4 MPa (4 bar) (gauge pressure).

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[1] See 1.2.8.2.

3.2.4 Shells intended for the carriage of the substances referred to in 3.1.4 shall be designed in accordance with the requirements of the general part of this Appendix.

3.3 ***Items of equipment***

3.3.1 All openings of shells intended for the carriage of the substances referred to in 3.1.1 and 3.1.2 shall be above the surface level of the liquid. No pipes or pipe connections shall pass through the walls of the shell below the surface level of the liquid. Shells shall be capable of being hermetically closed [1] and the closures shall be capable of being protected by a lockable cap.

3.3.2 Shells intended for the carriage of the substances referred to in 3.1.3 and 3.1.4 may also be of the bottom discharge type. Shells intended for the carriage of the substances referred to in 3.1.3, except those of item 33, shall be capable of being hermetically closed [1].

3.3.3 If shells intended for the carriage of the substances referred to in 3.1.1, 3.1.2 or 3.1.3 except those of item 33 are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority. If shells intended for the carriage of the substances referred to in 3.1.4 are equipped with safety valves or a venting system, these shall satisfy the requirements of 1.3.5 to 1.3.7. If shells intended for the carriage of substances of item 33 are fitted with safety valves, these shall satisfy the requirements of 1.3.6 and 1.3.7. Shells intended for the carriage of the substances referred to in 3.1.4 having a flash-point not exceeding 61 °C and equipped with a venting system or be resistant to the pressure generated by an explosion.

3.3.4 If the shells are fitted with non-metallic protective linings (inner layers), these shall be so designed that no danger of ignition from electrostatic charges can occur.

The bottom discharge system of shells intended for the carriage of substances of marg. 301, item 61(c) may consist of an external pipe with a stop-valve, if it is constructed of a metallic material liable to deformation.

3.4 ***Type approval***

No special requirements.

3.5 ***Tests***

3.5.1 Shells intended for the carriage of substances referred to in 3.1.1, 3.1.2 and 3.1.3 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 0,4 MPa (4 bar) (gauge pressure).

3.5.2 Shells intended for the carriage of substances referred to in 3.1.4 shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 1.2.4.

3.6 ***Marking***

No special requirements.

3.7 ***Operation***

3.7.1 Shells intended for the carriage of the substances referred to in 3.1.1, 3.1.2 and 3.1.3, except those of item 33, shall be hermetically [1] closed during carriage. The closures of shells intended for the carriage of substances referred to in 3.1.1 and 3.1.2 shall be protected by a locked cap.

3.7.2 Tank wagons approved for the carriage of substances of items 11, 12, 14 to 19, 27, 32 and 41 shall not be used for the carriage of foodstuffs, articles of consumption or animal feedstuffs.

3.7.3 An aluminium alloy shell shall not be used for the carriage of acetaldehyde of item 1(a) unless the shell is reserved solely for such carriage and the acetaldehyde is free from acid.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.

3.7.4 The petrol (gasoline) referred to in the Note to item 3(b) of marg. 301 may also be carried in tanks designed according to 1.2.4.1 and having equipment conforming to 1.3.5.

3.8 ***Transitional requirements***

3.8.1 Tank wagons intended for the carriage of substances of marg. 301, items 32 and 33 constructed in accordance with the requirements of this Appendix in force before 1 January 1995 which do not however conform to the corresponding requirements in force as from 1 January 1995, may continue to be used until 31 December 2002.

Tank wagons intended for the carriage of substances of marg. 301, item 61, which do not however conform to the requirements in force as from 1 January 1995, may continue to be used from 31 December 2004.

3.8.2 Tank wagons built in accordance with the requirements in force before 1 January 1997, but which do not conform to the requirements of 3.3.3 and 3.3.4 in force from 1 January 1997 may continue to be used.

4. Special requirements applicable to Calls 4.1: Flammable solids; Class 4.2: Substances liable to spontaneous combustion; Class 4.3: Substances which, in contact with water, emit flammable gases

4.1 ***Use***

The following substances of marg. 401, 431 and 471 may be carried in tank wagons:

4.1.1 Substances listed under (a) of items 6, 17, 19 and 31 to 33 of marg. 431;

4.1.2 Substances of items 11(a) and 22 of marg. 431;

4.1.3 Substances listed under (a) of items 1, 2, 3, 21, 23 and 25 of marg. 471;

4.1.4 Substances of item 11(a) of marg. 471;

4.1.5 Substances listed under (b) or (c)

— of items 6, 8, 10, 17, 19 and 21 of marg. 431,

— of items 3, 21, 23 and 25, of marg. 471 and 3241 2-bromo-2-nitropropane-1,3-diol of marg. 401, item 26(c).

4.1.6 Substances of items 5 and 15 of marg. 401.

4.1.7 Powdery and granular substances listed under (b) or (c):

— of items 1, 6, 7, 8, 11, 12, 13, 14, 16 and 17 of marg. 401;

— of items 1, 5, 7, 9, 12, 13, 14, 15, 16, 18 and 20 of marg. 431;

— of items 11, 12, 13, 14, 15, 16, 17, 19, 20, 22 and 24 of marg. 471.

4.2 ***Construction***

4.2.1 Shells intended for the carriage of the substances referred to in 4.1.1 shall be designed for a calculation pressure [1] of not less than 2,1 MPa (21 bar) (gauge pressure). The requirements of Appendix II C are applicable to the materials and construction of these shells.

[1] See 1.2.8.2.

4.2.2 Shells intended for the carriage of the substances referred to in 4.1.2, 4.1.3 and 4.1.4 shall be designed for a calculation pressure [1] of not less than 1 MPa (10 bar) (gauge pressure).

4.2.3 Shells intended for the carriage of the substances referred to in 4.1.5 shall be designed for a calculation pressure [1] of not less than 0,4 MPa (4 bar) (gauge pressure).

4.2.4 Shells intended for the carriage of solids referred to in 4.1.6 and 4.1.7 shall be designed in accordance with the requirements of the general part of this Appendix.

4.2.5 All parts of tank wagons intended for the carriage of substances of marg. 431, item 1(b) shall be linked by equipotential connections and shall be capable of being electrically earthed.

4.3 ***Items of equipment***

4.3.1 All openings of shells intended for the carriage of the substances referred to in 4.1., 4.1.2, 4.1.3 and 4.1.5 shall be above the surface level of the liquid. No pipes or pipe connections shall pass through the walls of the shell below the surface level of the liquid. Shells shall be capable of being hermetically closed [2] and the closures shall be capable of being protected with lockable caps. The cleaning apertures (fist-holes) referred to in 1.3.4 shall not be permitted.

4.3.2 With the exception of shells intended for the carriage of caesium and rubidium of marg. 471, item 11(a), shells intended for the carriage of substances referred to in 4.1.4, 4.1.6 and 4.1.7 may also be of the bottom-discharge type. The openings of shells intended for the carriage of caesium and rubidium of marg. 471, item 11(a) shall be equipped with hermetically closing and lockable caps.

4.3.3 Shells intended for the carriage of the substances referred to in 4.1.2 shall in addition meet the following requirements:

4.3.3.1 The heating device shall not penetrate into the body of the shell but shall be exterior to it. However, a pipe used for extracting the phosphorus may be equipped with a heating jacket. The device for heating this jacket shall be so regulated as to prevent the temperature of the phosphorus from exceeding the filling temperature of the shell. Other piping shall enter the shell in its upper part; openings shall be above the highest permissible level of the phosphorus and be capable of being completely enclosed under lockable caps. In addition, the cleaning aperture (fist-holes) referred to in 1.3.4 shall not be permitted.

4.3.3.2 The shell shall be equipped with a gauging system for verifying the level of the phosphorus and, if water is used as the protective agent, with a fixed gauge mark showing the highest permissible level of water.

4.3.4 If shells intended for the carriage of substances referred to in 4.1.1, 4.1.3 and 4.1.5 are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority.

4.3.5 Shells intended for the carriage of the substances referred to in 4.1.6 shall be equipped with thermal insulation made of materials which are not readily flammable.

4.3.6 If shells intended for the carriage of substances referred to in 4.1.4 are equipped with thermal insulation, such insulation shall be made of materials which are not readily flammable.

4.3.7 Shells intended for the carriage of the substances referred to in 4.1.6 may be equipped with valves opening automatically inwards or outwards under the effect of a difference of pressure of between 20 kPa and 30 kPa (0,2 bar and 0,3 bar).

4.4 ***Type approval***

No special requirements.

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[1] See 1.2.8.2.

[2] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.

4.5 ***Tests***

4.5.1 Shells intended for the carriage of the substances referred to in 4.1.1 shall be subjected to the initial and periodic hydraulic pressure tests at a gauge pressure of not less than 1 MPa (10 bar). The materials of each of the shells shall be tested by the method described in Appendix II C.

4.5.2 Shells intended for the carriage of the substances referred to in 4.1.2, 4.1.3, 4.1.4 and 4.1.5 shall be subjected to the initial and periodic hydraulic pressure tests at a gauge pressure of not less than 0,4 MPa (4 bar).

4.5.3 Shells intended for the carriage of the substances referred to in 4.1.6 and 4.1.7 shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 1.2.4.

4.6 ***Marking***

4.6.1 Shells intended for the carriage of the substances referred to in 4.1.1, shall bear in addition to the particulars prescribed in 1.6.2, the words: 'Do not open during carriage. Liable to spontaneous combustion'. Shells intended for the carriage of substances of marg. 471 referred to in 4.1.3 to 4.1.5 shall bear in addition to the particulars prescribed in 1.6.2, the words: 'Do not opening during carriage. Gives off flammable gases on contact with water'. These particulars shall be in an official language of the country of approval, and if that language is not French, German, Italian or English, also in French, German, Italian or English unless the international tariffs or agreements concluded between the railway administrations provide otherwise.

4.6.2 Shells intended for the carriage of substances of marg. 471, item 1(a) shall also bear, on the plate prescribed in 1.6.1, the names of the approved substances and the maximum permissible load of the shell in kg.

Loading limits by mass according to 1.6.2 for the substances listed shall be determined taking into account the maximum permissible load of the shells.

4.7 ***Operation***

4.7.1.1 Substances of items 11 and 22 of marg. 431, shall, if water is used as a protective agent, be covered with a depth of not less than 12 cm of water at the time of filling; the degree of filling at a temperature of 60 °C shall not exceed 98 %. If nitrogen is used as a protective agent, the degree of filling at a temperature of 60 °C shall not exceed 96 %. The remaining space shall be filled with nitrogen in such a way that, even after cooling, the pressure at no time falls below atmospheric pressure. The shell shall be hermitically closed [1] so that no leakage of gas occurs.

4.7.1.2 Uncleaned empty shells which have contained substances of marg. 431, items 11 and 22, shall, when handed over for carriage, either:

— be filled with nitrogen; or

— be filled with water to not less than 96 % and not more than 98 % of their capacity. Between 1 October and 31 March, this water shall contain sufficient anti-freeze agent to make it impossible for the water to freeze during carriage; the anti-freeze agent shall be free from corrosive action and not liable to react with phosphorus.

4.7.2 Shells containing substances of marg. 431, items 31 to 33, and marg. 471, items 2(a), 3(a) and 3(b), shall be filled to not more than 90 % of their capacity; a space of 5 % shall remain empty for safety when the liquid is at an average temperature of 50 °C. During carriage, the substances shall be under a layer of inert gas, the gauge pressure of which shall not be less than 50 kPa (0,5 bar). The shells shall be hermetically closed [1] and the protective caps conforming to 4.3.1 shall be locked. Uncleaned empty shells shall when handed over for carriage be filled with an inert gas at a gauge pressure of at least 50 kPa (0,5 bar).

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.

4.7.3 For ethyldichlorosilane, methyldichlorosilane and trichlorosilane (silicochloroform) of marg. 471, item 1, the degree of filling shall not exceed 0,93 or 0,95 or 1,14 kg per litre of capacity respectively, if filling is by mass. If filling is by volume, and for chlorosilanes not mentioned by name (n.o.s.) of marg. 471, item 1, the rate of filling shall not exceed 85 %. The shells shall be hermetically closed [1] and the protective caps conforming to 4.3.1 shall be locked.

4.7.4 Shells containing substances of marg. 401, items 5 and 15, shall not be filled to more than 98 % of their capacity.

4.7.5 For the carriage of caesium and rubidium of marg. 471, item 11(a), the substance shall be covered by an inert gas and the caps conforming to 4.3.2 shall be locked. Shells containing other substances of marg. 471, item 11(a) shall not be handed over for carriage until the substance has solidified completely and been covered by an inert gas.

Uncleaned empty shells which have contained substances of marg. 471, item 11(a) shall be filled with an inert gas. The shell shall be [1] hermetically closed.

4.7.6.1 When substances of marg. 431, item 1(b) are being loaded, the temperature of the goods being loaded shall not exceed 60 °C.

4.7.6.2 A maximum loading temperature of 80 °C is permitted provided that smoulder spots are prevented during loading and the tank is hermetically closed [1].

After loading, the tanks are to be pressurized (e.g. with compressed air) to check tightness. It shall be ensured that no depressurization takes place during carriage. Before unloading, checks shall be carried out to find out if pressure is still above atmospheric. If this is not the case, an inert gas shall be introduced into the tanks prior to unloading.

5. Special requirements applicable to Class 5.1: Oxidizing substances; Class 5.2: Organic peroxides

5.1 ***Use***

5.1.1 The following substances of marg. 501 may be carried in tank wagons:

5.1.1.1 Substances of item 5.

5.1.1.2 Substances listed under (a) or (b) of items 1 to 4, 11, 13, 16, 17, 22 and 23, carried in the liquid state or in the molten state.

5.1.1.3 Ammonium nitrate liquid of item 20.

5.1.1.4 Substances listed under (c) of items 1, 11, 13, 16, 18, 22 and 23, carried in the liquid state or in the molten state.

5.1.1.5 Substances in powdery or granular form listed under (b) or (c) of items 11, 13 to 18, 21 to 27, 29 and 31.

Note: For the carriage in bulk of substances of marg. 501, see marg. 516.

5.1.2 Substances of marg. 551, items 9(b) and 10(b), may be carried in tank wagons under conditions laid down by the competent authority of the country of origin, if on the basis of tests (see 5.4.2), the competent authority is satisfied that such a transport operation can be carried out safely.

If the country of origin is not a COTIF Contracting State, these conditions shall be recognized by the competent authority of the first COTIF Contracting State reached by the consignment.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.

5.2 *Construction*

5.2.1 Shells intended for the carriage of the substances referred to in 5.1.1.1 shall be designed for a calculation pressure (1) of not less than 1 MPa (10 bar) (gauge pressure).

5.2.2 Shells intended for the carriage of the substances referred to in 5.1.1.2 shall be designed for a calculation pressure (1) of not less than 0,4 MPa (4 bar) (gauge pressure). Shells, and their items of equipment, intended for the carriage of substances of item 1 of marg. 501 shall be made of aluminium not less than 99,5 % pure of suitable steel not liable to cause hydrogen peroxide to decompose. Where shells are made of aluminium not less than 99,5 % pure, the wall thickness need not be greater than 15 mm, even where calculation in accordance with 1.2.8.2 gives a higher value.

5.2.3 Shells intended for the carriage of the substances referred to in 5.1.1.3 shall be designed for a calculation pressure (1) of not less than 0,4 MPa (4 bar) (gauge pressure). The shells shall be made of austenitic steel.

5.2.4 Shells intended for the carriage of the liquids referred to in 5.1.1.4 and the powdery or granular substances referred to in 5.1.1.5 shall be designed in accordance with the requirements of the general part of this Appendix.

5.2.5 Shells intended for the carriage of the substances of 5.1.2 shall be designed for a calculation pressure (1) of not less than 0,4 MPa (4 bar) (gauge pressure).

5.3 *Items of equipment*

5.3.1 Shells intended for the carriage of the substances of items 1(a), 3(a) and 5 of marg. 501 shall have their openings above the surface level of the liquid, the cleaning openings (fist-holes) referred to in 1.3.4 shall not be permitted. In the case of solutions containing more than 60 % but not more than 70 % hydrogen peroxide, openings below the surface level of the liquid shall be permissible. In this case the shell-discharge system shall be equipped with two mutually independent shut-off devices mounted in series, the first being a quick-closing internal stop-valve of an approved type and the second a sluice-valve, at each end of the discharge pipe. A blank flange or some other reliable device shall also be fitted to the outlet of each external sluice-valve. The internal stop-valve shall be such that it remains integral with the shell and in the closed position if the pipe is wrenched off.

No part of the tank wagon may be of wood, unless this protection by a suitable coating.

5.3.2 The connections to the external pipe-outlets of shells shall be made of materials not liable to cause decomposition of hydrogen peroxide.

5.3.3 Shells intended for the carriage of substances of item 1 or ammonium nitrate liquid of item 20 of marg. 501, shall be fitted in their upper part with a shut-off device preventing any build-up of excess pressure inside the receptacle, any leakage of the liquid, and any entry of foreign matter into the receptacle.

The shut-off devices of shells intended for the carriage of ammonium nitrate liquid of item 20 of marg. 501 shall be so designed as to preclude obstruction of the devices by solidified ammonium nitrate during carriage.

5.3.4 Where shells intended for the carriage of ammonium nitrate liquid of item 20 of marg. 501 are sheated in thermal insulating material, the material shall be of an inorganic nature and entirely free from combustible matter.

5.3.5 Shells intended for the carriage of substances referred to in 5.1.2 shall be equipped with thermal insulation complying with the requirements of 2.3.4.1. The sun shield and any part of the shell not covered by it, or the outer sheating of a complete lagging, shall be painted white or finished in bright metal. The paint shall be cleaned before each transport journey and renewed in case of yellowing or deterioration. The thermal insulation shall be free from combustible matter.

(1) See 1.2.8.2.

5.3.6 Shells intended for the carriage of the substances referred to in 5.1.2 shall be fitted with temperature sensing devices.

5.3.6.1 Shells intended for the carriage of the substances referred to in 5.1.2 shall be fitted with safety valves and pressure-relief devices. Vacuum-relief devices may also be used. Pressure-relief devices shall operate at pressures determined according to both the properties of the organic peroxide and the construction characteristics of the tank. Fusible elements shall not be permitted in the body of the shell.

5.3.6.2 Shells intended for the carriage of the substances referred to in 5.1.2 shall be fitted with spring-loaded safety valves to prevent significant pressure build-up within the shell of the decomposition products and vapours released at a temperature of 50 °C. The capacity and start-to-discharge pressure of the safety valves shall be based on the results of the tests specified in 5.4.2. The start-to-discharge pressure shall however in no case be such that liquid could escape from the valve(s) if the shell were overturned.

5.3.6.3 The pressure-relief devices of shells for the carriage of substances referred to in 5.1.2 may be of the spring-loaded or bursting disc type designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of fire engulfment (heat load 110 kW/m^2) or self-accelerating decomposition. The start-to-discharge pressure of the pressure-relief devices shall be higher than that specified in 5.3.6.2 and based on the results of the tests referred to in 5.4.2. The dimensions of the pressure-relief devices shall be such that the maximum pressure in the tank never exceeds the test pressure of the shell.

5.3.6.4 For shells with an insulation consisting of a complete cladding intended for the carriage of substances referred to in 5.1.2, the capacity and setting of the pressure-relief device(s) shall be determined assuming a loss of insulation from 1 % of the surface area.

5.3.6.5 Vacuum-relief devices and spring-loaded safety valves of shells for the carriage of substances referred to in 5.1.2 shall be provided with flame arresters unless the substances to be carried and their decomposition products are non-combustible. Due attention shall be paid to the reduction of the relief capacity of organic substances.

5.4 ***Type approval***

5.4.1 Tank wagons approved for the carriage of liquid ammonium nitrate of item 20 of marg. 501 shall not be approved for the carriage of organic substances.

5.4.2 For the type approval of shells intended for the carriage of substances referred to in 5.1.2, tests shall be undertaken:

— to prove the compatibility of all materials normally in contact with the substance during carriage;

— to provide data to facilitate the design of the pressure-relief devices and safety valves taking into account the design characteristics of the tank wagon; and

— to establish any special requirements necessary for the safe carriage of the substance.

The test results shall be included in the report for the type approval of the shell.

5.5 ***Tests***

5.5.1 Shells intended for the carriage of the substances referred to in 5.1.1.1, 5.1.1.2 and 5.1.1.3 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 0,4 MPa (4 bar) (gauge pressure). Shells of pure aluminium intended for the carriage of substances of item 1 of marg. 501 may be subjected to the initial and periodic hydraulic pressure tests at a pressure of only 250 kPa (2,5 bar).

Shells intended for the carriage of the substances referred to in 5.1.1.4 and 5.1.1.5 shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 1.2.4.

5.5.2 Shells intended for the carriage of substances referred to in 5.1.2 shall be subjected to the initial and periodic hydraulic pressure tests at the calculation pressure as defined in 5.2.5.

5.6 ***Marking***

5.6.1 No special requirements (Class 5.1).

5.6.2 For shells intended for the carriage of substances referred to in 5.1.2, the following additional particulars shall be marked by stamping or by any other similar method on the plate prescribed in 1.6.2 or directly on the walls of the shell itself, if the walls are so reinforced that the strength of the shell is not impaired:

— The chemical name with the approved concentration of the substance concerned.

5.7 ***Operation***

5.7.1 The inside of the shell, and all parts liable to come into contact with substances referred to in 5.1.1 and 5.1.2 shall be kept clean. No lubricant capable of combining dangerously with the substances carried shall be used for pumps, valves or other devices.

5.7.2 Shells intended for the carriage of substances of items 1(a), 2(a) and 3(a) of marg. 501 shall be filled to not more than 95 % of their capacity at a reference temperature of 15 °C. Shells intended for the carriage of substances of item 20 of marg. 501 shall be filled to not more than 97 % of their capacity, and the maximum temperature after filling shall not exceed 140 °C. In the event of change of use, shells and equipment shall be thoroughly cleansed of all residues before and after the carriage of substances of item 20.

5.7.3 Shells intended for the carriage of substances referred to in 5.1.2 shall be filled as set out in the test report for the type approval of the shell, but shall be filled to not more than 90 % of their capacity. Shells shall be free from impurities at the time of filling.

5.7.4 Service equipment such as valves and external piping of shells intended for the carriage of substances referred to in 5.1.2 shall be emptied after filling or discharging of the tank.

6. Special requirements applicable to Class 6.1 and 6.2: Toxic substances, Infections substances

6.1 ***Use***

The following substances of marg. 601 and 651 may be carried in tank wagons:

6.1.1 substances listed by name in items 2 to 4 of marg. 601.

6.1.2 substances classified under (a) of items 6 to 13, with the exception of isopropyl chloroformate of item 10, 15 to 18, 20, 22, 23, 25 to 28, 31, to 36, 41, 44, 51, 52, 55, 61, 65 to 68, 71 to 73 and 90 of marg. 601, carried in the liquid state or in the molten state.

6.1.3 substances classified under (b) or (c) of items 11 to 28, 32 to 36, 41, 44, 51 to 55, 57 to 62, 64 to 68, 71 to 73 and 90 of marg. 601, carried in the liquid state or in the molten state.

6.1.4 powdery or granular substances classified under (b) or (c) of items 12, 14, 17, 19, 21, 23, 25 to 27, 32 to 35, 41, 44, 51 to 55, 57 to 68, 73 and 90 of marg. 601.

Note: For the carriage in bulk of substances of marg. 601, see marg. 616.

6.1.5 Substances of marg. 651, item 3.

Note: For the carriage in bulk of substances of marg. 651, item 4(b), see marg. 666.

6.2 ***Construction***

6.2.1 Shells intended for the carriage of substances referred to in 6.1.1 shall be designed for a calculation pressure [1] of not less than 1,5 MPa (15 bar) (gauge pressure).

[1] See 1.2.8.2.

6.2.2 Shells intended for the carriage of the substances referred to in 6.1.2 shall be designed for a calculation pressure (1) of not less than 1 MPa (10 bar) (gauge pressure).

6.2.3 Shells intended for the carriage of the substances referred to in 6.1.3 and 6.1.5 shall be designed for a calculation pressure (1) of not less than 0,4 MPa (4 bar) (gauge pressure).

Shells intended for the carriage of chloroacetic acid of item 24 (b) of marg. 601 shall be provided with an enamel or equivalent protective lining if the material of the shell is attacked by chloroacetic acid.

6.2.4 Shells intended for the carriage of the powdery or granular substances referred to in 6.1.4 shall be designed in accordance with the requirements of the general part of this Appendix.

6.3 ***Items of equipment***

6.3.1 All openings of shells intended for the carriage of the substances referred to in 6.1.1 and 6.1.2 shall be above the surface level of the liquid. No pipe or pipe connections shall pass through the walls of the shell below the surface level of the liquid. Shells shal be capable of being hermetically closed (2) and the closures shall be capable of being protected with a lockable cap. The cleaning apertures (fist-holes) provided for in 1.3.4 shall not however be permitted for shells intended for the carriage of solutions of hydrocyanic acid of marg. 601 item 2.

6.3.2 Shells intended for the carriage of the substances referred to in 6.1.3 to 6.1.5 may also be of the bottom-discharge type. The shells shall be capable of being hermetically closed (2).

6.3.3 If shells are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority.

6.4 ***Type approval***

No special requirements.

6.5 ***Tests***

6.5.1 Shells intended for the carriage of the substances referred to in 6.1.1 to 6.1.3 and 6.1.5 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 0,4 MPa (4 bar) (gauge pressure).

For shells intended for the carriage of substances of marg. 601, item 31(a), the periodic tests shall be carried out at intervals of not more than four years, and shall include the hydraulic pressure test.

6.5.2 Shells intended for the carriage of the substances reffered to in 6.1.4 shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 1.2.4.

6.6 ***Marking***

On shells intended for the carriage of substances of marg 601, item 3 the plate prescribed under 1.6.1 shall additionally be marked with the maximum permissible load mass of the shell in kg. The load limits in accordance with 1.6.2 for the substances in question shall be determined in the light of the maximum permitted load of the shell, depending on the substance carried.

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(1) See 1.2.8.2.

(2) Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.

6.7 ***Operation***

6.7.1 Shells intended for the carriage of substances of marg. 601, item 3 shall not be filled to more than 1 kg per litre of capacity.

6.7.2 Shells shall be hermetically closed [1] during carriage. The closures of shells intended for the carriage of the substances referred to in 6.1.1 and 6.1.2 shall be protected with a locked cap.

6.7.3 Tank wagons approved for the carriage of substances referred to in 6.1 shall not be used for the carriage of foodstuffs, other articles of consumption or animal feedstuffs.

6.8.1 Tank wagons approved for the carriage of substances of items 6, 8, 9, 10, 13, 15, 16, 18, 20, 25 and 27 of marg. 601 and 1809 phosphorus trichloride of item 67(a), built in accordance with the requirements of this Appendix in force before 1 January 1995, but which do not conform to the requirements in force from 1 January 1995 may continue to be used until 31 December 2002.

6.8.2 Tank wagons intended for the carriage of items 8(a), 10(a), 13(b), 15(a), 16(a), 18(a), 20(a) and 67(a) of marg. 601, built in accordance with the requirements of this Appendix in force before 1 Januari 1997, but which do not conform to the requirements in force from 1 January 1997 may continue to be used until 31 December 2004.

7. Special requirements applicable to Class 7: Radioactive material

7.1 ***Use***

Material of marg. 704, Schedules 1, 5, 6, 9, 10 and 11, except uranium hexafluoride, may be carried in tank wagons. The provisions of the appropriate schedule in marg. 704 are applicable.

Note: There may be additional requirements for tank wagons which are designed as a Type A or Type B packaging.

7.2 ***Construction***

See marg. 1736.

7.3 ***Items of equipment***

Shells intended for the carriage of liquid radioactive material [2] shall have their openings above the surface level of the liquid. No pipes or pipe connections shall pass through the walls of the shell below the surface level of the liquid.

7.4 ***Type approval***

Tank wagons approved for the carriage of radioactive material shall not be approved for the carriage of other substances.

7.5 ***Tests***

7.5.1 Shells shall be tested initially and periodically at a pressure of at least 0,265 MPa (2,65 bar) (gauge pressure).

7.5.2 Notwithstanding the requirements of 1.5.2, the periodic internal inspection may be replaced by a programme approved by the competent authority.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.

[2] Substances whose kinematic viscosity at 20 °C is less than 2 680 mm^2/s shall be deemed to be liquids for the purposes of this provision.

7.6 ***Marking***

In addition, the trefoil symbol, as shown in marg. 705(5), shall be marked by stamping or by any other equivalent method on the plate described in 1.6.1. This trefoil symbol may be applied directly on the walls of the shell itself, if the walls are so reinforced that the strength of the shell is not impaired.

7.7 ***Operation***

7.7.1 The degree of filling according to 1.7.3 at the reference temperature of 15 °C shall not exceed 93 % of the capacity of the shell.

7.7.2 Tank wagons which have been used for the carriage of radioactive material shall not be used for the carriage of other substances.

8. Special requirements applicable to Class 8: Corrosive substances

8.1 ***Use***

The following substances of marg. 801 may be carried in tank wagons:

8.1.1 substances listed by name in items 6 and 14.

8.1.2 substances classified under (a) of items 1, 2, 3, 7, 8, 12, 17, 32, 33, 39, 40, 46, 47, 52 to 56, 64 to 68, 70 and 72, 76, carried in the liquid state or in the molten state.

8.1.3 phosphorus oxybromide of item 15 or substances classified under (b) or (c) of items 1 to 5, 7, 8, 10, 12, 17, 31 to 40, 42 to 47, 51 to 56 and 61 to 76 carried in the liquid state or in the molten state.

8.1.4 powdery or granular corrosive or slightly corrosive substances classified under (b) or (c) of items 9, 11, 13, 16, 31, 34, 35, 39, 41, 45, 46, 52, 55, 62, 65, 67, 69, 71, 73 and 75.

Note: For the carriage in bulk of substances of marg. 801, see marg. 816.

8.2 ***Construction***

8.2.1 Shells intended for the carriage of substances listed by name in items 6 and 14 shall be designed for a calculation pressure [1] of not less than 2,1 MPa (21 bar) (gauge pressure). Shells intended for the carriage of substances of item 14 shall be provided with a lead lining not less than 5 mm thick or an equivalent lining. The requirements of Appendix II C shall apply to the materials and construction of welded shells intended for the carriage of substances of item 6.

8.2.2 Shells intended for the carriage of the substances referred to in 8.1.2 shall be designed for a calculation pressure [1] of not less than 1 MPa (10 bar) (gauge pressure).

Where the use of aluminium is necessary for shells intended for the carriage of nitric acid of item 2(a), such shells shall be made of aluminium not less than 99,5 % pure; the wall thickness need not exceed 15 mm, even when the calculation according to 1.2.8.2 gives a higher figure.

8.2.3 Shells intended for the carriage of the substances referred to in 8.1.3 shall be designed for a calculation pressure [1] of not less than 0,4 MPa (4 bar) (gauge pressure).

8.2.4 Shells intended for the carriage of powdery or granular substances referred to in 8.1.4 shall be designed in accordance with the requirements of the general part of this Appendix.

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[1] See 1.2.8.2.

8.3 ***Items of equipment***

8.3.1 All openings of shells intended for the carriage of substances of items 6, 7 and 14 shall be above the surface level of the liquid. No pipes or pipe connections shall pass through the walls of the shell below the surface level of the liquid. In addition, the cleaning apertures (fist holes) referred to in 1.3.4 shall not be permitted. Shells shall be capable of being hermetically closed [1] and the closures shall be capable of being protected by a lockable cap.

The following requirements are applicable to demountable tanks [2] intended for the carriage of substances of item 6:

(a) they shall be so fixed on the underframe of the wagon that they cannot move;

(b) they shall not be interconnected by a manifold;

(c) if the receptacles can be rolled, the valves shall be provided with protective caps.

8.3.2 Shells intended for the carriage of the substances referred to in 8.1.2, 8.1.3 and 8.1.4, with the exception of substances of item 7, may also be of the bottom-discharge type.

8.3.3 If shells intended for the carriage of the substances referred to in 8.1.2 are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such to satisfy the competent authority.

8.3.4 Shells intended for the carriage of sulphur trioxide, inhibited of item 1(a) shall be thermally insulated and fitted with a heating device on the outside.

8.3.5 Shells and their service equipment intended for the carriage of hypochlorite solutions of item 61 shall be so designed as to prevent the entry of foreign matter, leakage of liquid or any building up of dangerous excess pressure inside the shell.

8.4 ***Type approval***

No special requirements.

8.5 ***Tests***

8.5.1 Shells intended for the carriage of substances of item 6 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of at least 1 MPa (10 bar) (gauge pressure). The materials of each of these welded shells shall be tested by the method described in Appendix II C.

Shells intended for the carriage of substances of items 6 and 7 shall be inspected every four years for resistance to corrosion, by means of suitable instruments (e.g. by ultrasound).

8.5.2 Shells intended for the carriage of substances of item 14 or of the substances referred to in 8.1.2 and 8.1.3 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 0,4 MPa (4 bar) (gauge pressure). The hydraulic pressure test for shells intended for the carriage of sulphur trioxide, inhibited of item 1(a) shall be repeated every four years.

Shells made of pure aluminium and intended for the carriage of nitric acid of item 2(a) need be subjected to the initial and periodic hydraulic pressure tests at a pressure of only 250 kPa (2,5 bar) (gauge pressure).

The condition of the lining of shells intended for the carriage of substances of item 14 shall be inspected every year by an expert approved by the competent authority, who shall inspect the inside of the shell.

8.5.3 Shells intended for the carriage of the substances referred to in 8.1.4 shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 1.2.4.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.

[2] A collective designation, covering substances of a similar kind and equally compatible with the characteristics of the shell, may be given instead of the name.

8.6 ***Marking***

8.6.1 Shells intended for the carriage of substances of items 6 or 14 shall bear, in addition to the particulars prescribed in 1.6.2, the date (month, year) of the most recent inspection of the internal condition of the shell.

8.6.2 Shells intended for the carriage of sulphur trioxide, inhibited of item 1(a) and substances of item 6 and 14 shall bear in addition, on the plate prescribed under 1.6.1 the maximum permitted load mass of the shell in kg.

The load limits in accordance with 1.6.2 for the substances in question shall be determined in the light of the maximum permitted load mass of the shell, depending on the substance carried.

8.7 ***Operation***

8.7.1 Shells intended for the carriage of sulphur trioxide, inhibited of item 1(a) shall not be filled to more than 88 % of their capacity; those intended for the carriage of substances of item 14 shall be filled to not less than 88 % and not more than 92 % of their capacity or to 2,86 kg per litre of capacity.

Shells intended for the carriage of substances of items 6 shall not be filled to more than 0,84 kg per litre of capacity.

8.7.2 Shells intended for the carriage of substances of items 6, 7 and 14 shall be hermetically closed [1] during carriage and the closures shall be protected by a locked cap.

8.8.1 Tank wagons intended for the carriage of substances of items 3, 12, 33, 40 and 54 of marg. 801, built in accordance with the requirements of this Appendix in force before 1 January 1995, but which do not conform to the requirements in force from 1 January 1995 may continue to be used until 31 Decembre 2002.

Tank wagons intended for the carriage of 2686-2-diethylaminoethanol of item 54(b), built in accordance with the requirements of this Appendix in force before 1 January 1997, but which do not conform to the requirements in force from 1 January 1997 may continue to be used until 31 December 2004.

9. **Special requirements applicable to Class 9: Miscellaneous dangerous substances and articles**

9.1 ***Use***

Substances of items 1, 2, 11, 12, 20 and 31 to 35 and 2211 polymeric beads, expandable of item 4 of marg. 901 may be carried in tank wagons.

Note: For the carriage in bulk of substances of marg. 901, see marg. 916.

9.2 ***Construction***

9.2.1 Shells intended for the carriage of substances of items 1, 11, 12, 20 and 31 to 35 and for 2211 polymeric beads, expandable of item 4, shall be designed in accordance with the requirements of the general part of this Appendix.

9.2.2 Shells intended for the carriage of substances of item 2 shall be designed for a calculation pressure [2] of not less than 0,4 MPa (4 bar) (gauge pressure).

9.3 ***Items of equipment***

9.3.1 Shells intended for the carriage of substances of items 1 and 2 shall be capable of being hermetically closed [1]. Shells intended for the carriage of polymeric beads, expandable of item 4 shall be equipped with a safety valve.

9.3.2 If shells intended for the carriage of substances of items 1 and 2 are fitted with safety valves, a bursting disc shall be placed before the valves. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.

[2] See 1.2.8.2.

9.3.3 Shells intended for the carriage of substances of item 20 shall be equipped with thermal insulation. They may also be equipped with pressure release devices opening automatically inwards or outwards under the effect of a difference of pressure of between 20 kPa and 30 kPa (0,2 bar and 0,3 bar).

The thermal insulation directly in contact with the shell intend for the carriage of substances of item 20 shall have an ignition temperature at least 50 °C higher than the maximum temperature for which the shell was designed.

9.3.4 The bottom discharge system of shells intended for the carriage of substances of item 20 may be consist of an external pipe with a stop-valve if it is constructed in a metallic material liable to deformation.

9.4 ***Type approval***

No special requirements.

9.5 ***Tests***

9.5.1 Shells intended for the carriage of substances of items 2 shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 0,4 MPa (4 bar) (gauge pressure).

9.5.2 Shells intended for the carriage of substances of items 1, 11, 12, 20 and 31 to 35 and for 2211 polymeric beads, expandable of item 4 shall be subjected to the initial and periodic hydraulic pressure tests at the calculation pressure used in their design as defined in 1.2.4.

9.6 ***Marking***

Shells intended for the carriage of substances of item 20 shall bear on both sides, in addition to the markings in accordance with 1.6.2, the mark reproduced in Appendix IX, marg. 1910.

9.7 ***Operation***

9.7.1 Shells intended for the carriage of substances of items 1 and 2 shall be hermetically closed [1] during carriage.

9.7.2 Tank wagons approved for the carriage of substances of items 1 and 2 shall not be used for the carriage of foodstuffs, other articles of consumption or animal feedstuffs.

9.8 Tank wagons intended for the carriage of substances of item 20 of marg. 901 which do not however conform to the requirements in force as from 1 January 1997, may continue to be used until 31 December 2006.

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[1] Hermetically closed shells means shells whose openings are hermetically closed and which are not equipped with safety valves, bursting discs or other similar safety devices. Shells having safety valves preceded by a bursting disc shall be deemed to be hermetically closed. Valves to avoid an unacceptable negative pressure within the shell, without intervening bursting discs, shall however be permitted in shells not required to be hermetically closed during carriage under the special requirements applicable to the individual classes.