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II

(Non-legislative acts)

DECISIONS

COMMISSION DECISION

of 3 September 2013

State aid SA.32554 (09/C)

Restructuring aid for Hypo Group Alpe Adria implemented by Austria*(notified under document C(2013) 5648)***(Only the German text is authentic)****(Text with EEA relevance)**

(2014/341/EU)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union, and in particular the first subparagraph of Article 108(2) thereof,

Having regard to the Agreement on the European Economic Area, and in particular Article 62(1)(a) thereof,

Having called on Member States and other interested parties to submit their comments pursuant to those provisions ⁽¹⁾,

Whereas:

1. PROCEDURE

- (1) In December 2008, Hypo Alpe Adria Group ('HGAA' or '*the bank*') received EUR 900 million in Tier-1 *Partizipationskapital* ⁽²⁾ from the Republic of Austria on the basis of the Austrian emergency bank support scheme ('*the bank support scheme*') ⁽³⁾.
- (2) On 29 April 2009 Austria provided the Commission with a viability plan for HGAA.
- (3) In its decision of 12 May 2009 in case N 254/2009 ('*the 2009 opening decision*') ⁽⁴⁾ the Commission instigated the formal investigation procedure pursuant to Article 16 of Council Regulation (EC) No 659/1999 of 22 March 1999 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union ⁽⁵⁾, raising doubts about the compatibility with the internal market of the restructuring aid which Germany had granted to HGAA's majority stakeholder, BayernLB, in December 2008. In the same decision, the Commission questioned whether HGAA was fundamentally sound.

⁽¹⁾ OJ C 116, 23.4.2013, p. 13.

⁽²⁾ *Partizipationskapital* has no voting rights.

⁽³⁾ That scheme had been approved by Commission Decision of 9 December 2008 in case N 557/2008, OJ C 3, 8.1.2009, p. 2, *Maßnahmen nach dem Finanzmarktstabilitäts- und dem Interbankmarktstärkungsgesetz für Kreditinstitute und Versicherungsunternehmen in Österreich*.

⁽⁴⁾ OJ C 134, 13.6.2009, p. 31.

⁽⁵⁾ OJ L 83, 27.3.1999, p. 1.

- (4) HGAA was nationalised on 23 December 2009. In that context several aid measures were temporarily authorised by the Commission in its decision of 23 December 2009 in Cases C 16/2009 and N 698/2009 ⁽⁶⁾ (*the December 2009 rescue decision*) on the basis of Article 107(3)(b) of the Treaty on the Functioning of the European Union (*the Treaty*) until the submission of a credible restructuring plan for HGAA to the Commission. In the same decision the Commission extended the formal investigation procedure in relation to additional aid measures granted by Austria in favour of HGAA.
- (5) On 22 June 2010, the Commission further extended the formal investigation procedure in particular due to the failure of the revised restructuring plan for HGAA, which had been submitted on 16 April 2010, to demonstrate the restoration of viability, proper burden-sharing and a sufficient degree of mitigation of competition distortions. The Commission also prolonged the authorisation of the aid it had temporarily found compatible with the internal market in the December 2009 rescue decision, until it had concluded its examination of the restructuring plan for HGAA (*the 2010 extension decision*) ⁽⁷⁾.
- (6) On 29 December 2010, Austria notified an additional measure in favour of HGAA in the form of an asset guarantee amounting to EUR 200 million. That aid measure was authorised by Commission Decision of 19 July 2011 in cases SA.32172 (2011/NN) and SA.32554 (2009/C) ⁽⁸⁾ (*the July 2011 rescue decision*).
- (7) On 7 February 2011, the Commission informed Austria and Germany that Case N 698/2009 ⁽⁹⁾ concerning HGAA would be split procedurally from Case C 16/2009 concerning BayernLB. Subsequently, the procedure relating to HGAA was registered under Case SA.32554 (2009/C). This Decision only concerns Case SA.32554 (2009/C).
- (8) On 21 April 2011, Austria submitted a new restructuring plan for HGAA.
- (9) On 3 December 2012, Austria notified an additional aid measure in favour of HGAA in the form of a capital injection via ordinary shares by the Republic of Austria and a State guarantee on subordinated debt instruments to be issued by HGAA. The notification contained a catalogue of commitments for HGAA. Those measures were temporarily authorised by Commission Decision of 5 December 2012 in case SA.32554 (2009/C) ⁽¹⁰⁾ (*the December 2012 rescue decision*). The authorisation took place in light of certain commitments provided by Austria. However, Austria only partially respected those commitments.
- (10) On 5 October 2012 Austria brought an action for the annulment of Commission Decision of 25 July 2012 in case SA.28487 (C 16/2009 ex N 254/2009) ⁽¹¹⁾ (subsequently withdrawn and replaced by Commission Decision of 5 February 2013 ⁽¹²⁾ concerning BayernLB (*the BayernLB decision*)).
- (11) For a detailed description of the procedure, reference is made to the 2009 opening decision, the December 2009 rescue decision, the 2010 extension decision, the July 2011 rescue decision and the December 2012 rescue decision.
- (12) The various restructuring plans for HGAA and their amendments were discussed between the Austrian authorities and the Commission services in a series of meetings, phone conferences and other information exchanges between July 2010 and August 2013.

⁽⁶⁾ OJ C 85, 31.3.2010, p. 21.

⁽⁷⁾ OJ C 266, 1.10.2010, p. 5.

⁽⁸⁾ OJ C 31, 4.2.2012, p. 13.

⁽⁹⁾ Thereafter referred to as SA.32554 (2009/C) 'Restructuring Aid for Hypo Group Alpe Adria'.

⁽¹⁰⁾ OJ C 59, 28.2.2013, p. 34.

⁽¹¹⁾ Not yet published.

⁽¹²⁾ Not yet published.

- (13) On 29 June 2013 Austria notified a restructuring plan providing for the liquidation of HGAA which was subsequently completed by submission of 27 August 2013.

2. DESCRIPTION

2.1. THE BENEFICIARY

- (14) HGAA is an internationally active finance group with headquarters in Klagenfurt, Carinthia, from where its banking and leasing activities including the wind-down part are controlled and steered via Hypo Alpe Adria Bank-International ('HBIInt'). HBIInt carries out central group functions including group controlling, group accounting, overall risk management, legal matters and compliance, liquidity management, security issuance and refinancing of HGAA's subsidiaries.
- (15) At the end of 2012, HGAA had an overall balance sheet total of EUR 33,8 billion and risk weighted assets ('RWA') of about EUR 21 billion.
- (16) HGAA is 100 % owned by the Republic of Austria ⁽¹³⁾.
- (17) As of 31 December 2008 HGAA was present via banking and/or leasing subsidiaries in twelve countries, namely in Austria, Slovenia, Italy, Germany, Hungary, Bulgaria, Croatia, Serbia, Bosnia and Herzegovina, Montenegro, Ukraine and in the former Yugoslav Republic of Macedonia ('FYROM').
- (18) Currently, HGAA is active in Austria with HBA. It is also active in Slovenia (with HBS and the leasing company HLS), Croatia (with HBC and the integrated leasing company HAALC), Bosnia and Herzegovina (with the two banking entities HBFBiH and — in the Republika Srpska — HBRS including the leasing company HLRS), Serbia (with HBSE) and Montenegro (with HBM) (collectively 'the South-Eastern European ('SEE') countries').
- (19) A wind-down process has been launched for many of the bank's industrial stakes and financial subsidiaries. The Italian HBI stopped new business by 1 July 2013. Other subsidiaries in wind-down are the Croatian leasing company (HLC) and a Croatian wind-down unit derived from transferred banking assets (H-ABDUCO), the Austrian leasing company (HLA), the German leasing company (HLG), in Montenegro the leasing company (HLM) and a wind-down unit derived from transferred banking assets (HDM), leasing in Hungary (HLHU), leasing in Bulgaria (HLBG), leasing in FYROM (HLMK), leasing in Ukraine (HLUA), in Bosnia and Herzegovina the leasing company HETA BiH as well as a wind-down unit derived from transferred banking assets (BORA), HLSE and HRSE leasing in Serbia, and in Slovenia TCK and TCV which are two entities derived from transferred banking and leasing activities and HLI leasing in Italy ⁽¹⁴⁾. The Alpe Adria Privatbank in Lichtenstein has already been liquidated.
- (20) The following recitals provide an overview of the entities which are still active.
- (21) The Austrian subsidiary HBA is present in the segment retail, corporate and institutional. It offers all classical services of a universal bank. HBA which has a regional focus on Carinthia with branches in Vienna and Salzburg has a national market share of below [...] (*) % when measured in assets and of [...] % in deposits.
- (22) In Slovenia the group is present with the bank HBS (market share of about [...] % in assets and [...] % in deposits). As for the leasing company, HLS, it focuses on mobile and selected immobile leasing activities.

⁽¹³⁾ See recital (4) and the December 2009 rescue decision.

⁽¹⁴⁾ The companies Norica and HBIInt Credit Management (CM), each of which has external investors holding 49 %, are also in wind-down mode.

(*) Confidential information.

- (23) The Croatian HBC is a universal bank (market share of around [...] % in assets, [...] % in deposits). HAALC is active in leasing and has a market share of around [...] % in new financing volume.
- (24) Two different banks are active in Bosnia and Herzegovina, HBRS in Republika Srpska (market share around [...] % in assets and [...] % in deposits) and HBFBiH in the Federation of Bosnia and Herzegovina (having a market share of [...] % in assets). The leasing company HLRS, owned by HBRS, has a market share of around [...] % on new finance volume.
- (25) HBM in Montenegro has a market share of [...] % in assets. The leasing business generated out of the bank has a market share of [...] %.
- (26) The Serbian HBSE focuses on the private and business segments (market share about [...] % in assets and [...] % in deposits).

2.2. THE AID MEASURES

December 2008 – Measures by BayernLB and State measures under the Austrian bank support package

- (27) In 2008 HGAA received support by its shareholders at the time, BayernLB and the Republic of Austria.
 - In December 2008, HGAA received EUR 700 million from its then majority shareholder, BayernLB, which itself had received State aid in the same month from the Free State of Bavaria.
 - On 29 December 2008, HGAA received EUR 900 million in Tier-1 *Partizipationskapital* from the Republic of Austria and liquidity guarantees of EUR 1,35 billion for bond issues, both on the basis of the bank support scheme.

December 2009 – State recapitalisation and guarantees

- (28) When HGAA was nationalised it received the following aid measures:
 - a temporary asset guarantee of EUR 100 million by Austria under the conditions for distressed banks under the bank support scheme,
 - a recapitalisation by Austria under the conditions for distressed banks under the bank support scheme in an amount of EUR 450 million,

January 2011 – Asset guarantee

- (29) Following an additional need for write-downs, Austria granted HGAA an asset guarantee amounting to EUR 200 million from 31 December 2010 until 30 June 2013.

December 2012 – State recapitalisation and guarantee

- (30) Following a decision by the Austrian supervisory authority, HGAA had to comply with an increased capital ratio of 12,04 % by 31 December 2012. To that end, HGAA received from the Austrian authorities
 - a capital increase of EUR 500 million in the form of shares and
 - a State guarantee on subordinated Tier-2 capital instruments with a nominal value of EUR 1 billion.

- (31) For a detailed description of the bank and the aid measures authorised so far, reference is made to recitals 17 to 19 of the opening decision, recitals 13 to 15 and 27 to 40 of the December 2009 rescue decision, recitals 15 to 19 of the July 2011 rescue decision and recitals 10 to 12 of the December 2012 rescue decision.

2.3. THE ADDITIONAL AID MEASURES NOT YET GRANTED

- (32) The restructuring plan projects for the period 2013-17 additional capital needs for the wind-down unit amounting to approximately EUR 2,6 billion in the base case, EUR 4,7 billion in the pessimistic case and EUR 5,4 billion in the stress case. Under the assumption that the capital is provided in a liquid form the required additional liquidity needs of HGAA until 2017 would amount to EUR 2,5 billion in a base case and are estimated to reach EUR 3,3 billion in a stressed pessimistic case. (Should the measures not be granted in a liquid form liquidity measures in a higher amount might be necessary).
- (33) Austria has sought, on a precautionary basis, the Commission's authorisation of State aid measures which may be necessary to satisfy any additional capital or liquidity needs so as to satisfy all regulatory requirements or cover losses. Any capital granted will be limited to the amount necessary to fulfil the regulatory minimum capital requirements which have to be confirmed by the competent supervisory authority.

2.4. THE CONTRIBUTION OF THE FORMER SHAREHOLDERS OF HGAA

- (34) Before its nationalisation HGAA had the following owners: BayernLB (67,08 %), Land Carinthia via Kärntner Landesholding (12,42 %), Grazer Wechselseitige Versicherung AG ('GRAWE') (20,48 %) and Mitarbeiterstiftung Hypo Alpe Adria (0,02 %).
- (35) All owners ceded their shareholders' rights by selling their shares to Austria for a symbolic price of one euro.
- (36) BayernLB renounced all its shareholder's rights including an existing EUR 300 million Ergänzungskapital (Tier-2) in HGAA and relieved HGAA from the obligation to repay EUR 525 million of existing credit lines it had previously been granted ⁽¹⁵⁾.
- (37) In order to ensure liquidity for HGAA, BayernLB re-issued a liquidity line that had terminated in December 2009, amounting to EUR [...]. Furthermore, it was agreed that the existing intra-group funding of EUR [...] from BayernLB to HGAA would remain with HGAA until 31 December 2013. For 2014, BayernLB would leave funding amounting to EUR [...] within HGAA, and for 2015 EUR [...]. Those amounts are guaranteed by Austria in case HGAA is split up or another economically comparable measure is taken which does not ensure the viability of HGAA ⁽¹⁶⁾.
- (38) In 2008 BayernLB had already injected capital amounting to EUR 700 million into HGAA, which has since been fully depleted as it was fully used to cover losses.
- (39) GRAWE subscribed to EUR 30 million of non-convertible Tier-1 capital (*Partizipationskapital*) with a dividend of 6 % p.a. starting in 2013 in case of profits. Based on a decision by the Republic of Austria on 30 May 2011, the nominal amount of that capital has been reduced to EUR 9 million following a loss allocation (*Kapitalschnitt*).
- (40) GRAWE also contributed EUR 100 million in terms of liquidity until 31 December 2013. The liquidity was fully collateralised (EUR 50 million by Austrian covered bonds, the remaining EUR 50 million by other assets eligible for issuing covered bonds).

⁽¹⁵⁾ The rescue of HGAA by Austria under those conditions implied that BayernLB had to write down the full book value of HGAA, amounting to EUR 2,3 billion and to renounce receivables from HGAA for funding already provided amounting to EUR 825 million.

⁽¹⁶⁾ In the meantime, HGAA has stopped interest and principal payments relating to certain loans by BayernLB in line with its interpretation of the Austrian own funds substitution law (*Eigenkapitalersatzgesetz*). BayernLB disputes that decision and has instigated a lawsuit with the aim of getting back the loans plus interest payments as originally agreed. [...].

- (41) Carinthia contributed to the rescue operation in December 2009 via
- a recapitalisation of EUR 200 million, which was made in two parts: (i) Carinthia converted EUR 50 million of Tier-2 capital into about EUR 31 million of Tier-1 *Partizipationskapital* and injected EUR 150 million in the form of *Partizipationskapital*. The *Partizipationskapital* has a profit-related dividend of 6 %, due for the first time for the business year 2013. The total amount of EUR 181 million of *Partizipationskapital* initially injected has in the meantime been reduced to about EUR 55 million via a capital cut (*Kapitalschnitt*);
 - liquidity measures amounting to approximately EUR 200 million provided by Land Carinthia in the context of existing business relationships.
- (42) The following table provides an overview of the original amounts of *Partizipationskapital* in HGAA (all in HBInt) and its current amount. It should be recalled that *Partizipationskapital* has no voting rights. All shares with voting rights are held by the Republic of Austria.

Table 1

Overview *Partizipationskapital*

Partizipationskapital by old shareholders		
	Original amount (in EUR)	After <i>Kapitalschnitt</i> and other measures (conversion etc.)
GRAWE	30 000 000	9 170 369
Land Carinthia	30 772 982	9 406 653
Land Carinthia	150 000 000	45 851 845
<i>Intermediate sum</i>	210 772 982	64 428 867
Republic of Austria	900 000 000	275 111 073
Total	1 110 772 982	339 539 940

- (43) HGAA repurchased several hybrid and other capital instruments significantly below par or cancelled them altogether and thus increased its capital base: In April 2012 HGAA made a transaction which resulted in a Tier-1 increase of EUR 153 million. In August 2012 HGAA cancelled some hybrid instruments thus generating a further EUR 23,5 million in capital. In December 2012, HGAA offered a buy-back of other capital instruments resulting in an extraordinary profit of EUR [...].
- (44) In addition, the holders of own fund instruments (*Partizipationskapital* and other hybrid capital instruments) did not receive any profit-dependent dividends or coupons due to the losses of HGAA. For 2009 and 2010, HGAA could therefore retain more than EUR [...].

2.5. THE CAUSES OF HGAA'S PROBLEMS

- (45) HGAA's problems were mainly caused by an aggressive growth strategy based on cheap State-guaranteed funding.
- (46) HGAA bet massively on a rapid growth and catch-up in the markets in the SEE countries. In particular in the period 2000 to 2007 HGAA entered a large number of new markets. As a result, the balance sheet size of HGAA increased to EUR 43,3 billion on 31 December 2008, up from EUR 9,8 billion on 31 December 2002.

Table 2

Expansion of HGAA, per country and business line



- (47) The expansion strategy was made possible by favourable financing costs of HGAA due to State guarantees by Land Carinthia (*Ausfallshaftung*) which increased from EUR 4,9 billion by 31 December 2002 to EUR 20,7 billion by 31 December 2009. The access to cheap financing caused HGAA to neglect the generation of local deposits.
- (48) The rapid balance sheet expansion in SEE markets, coupled with cheap State-guaranteed funding, generated short-term profits. From 2002 to 2006, HGAA made profits in every year except in 2004. However, the business model masked underlying risks of asset quality deterioration and refinancing, thus causing the bank to neglect the adequate overhaul and development of the procedures for internal control and risk management, which would have been required to cope with its changed needs following the expansion. With business volume considerations driving the bank's strategy, leading it to taking high risks in particular in projects in the real estate and tourism segments, economic and business risks were systemically misjudged. The lack of adequate control mechanisms also rendered the bank vulnerable to fraud, causing several criminal investigations. Over time its portfolio became, partly due to a lack of proper collateralisation, plagued with a significant portion of non-performing loans. In many cases underlying collateral proved difficult or impossible to sell, necessitating large write downs.
- (49) In addition, by granting a significant part of its retail and small and medium-sized enterprises ('SME') loans in SEE countries in Euros or Swiss Francs, the bank exposed itself to additional repayment risks. With the subsequent appreciation in particular of the Swiss Franc against the local currencies, those risks have partly materialized.
- (50) Although within the regulatory limits at the time, in view of its risk profile resulting from its target client base and asset portfolio, the bank was operating with insufficient capital. That factor became a problem almost as soon as fortunes reversed. A calculation contained in the submitted liquidation plan shows that without the aid measures the bank would have had as from 2013 a negative capital ratio, both for the Tier-1 ratio [...] and the overall own funds ratio [...]. That calculation is fictional in so far as there would have been the need for a drastic downsizing or a liquidation of the bank even before. According to Austria liquidation would have had systemic financial stability effects in Austria, in particular due to the liability guarantees assumed by Land Carinthia, which might have been triggered in such scenario, but also in those SEE countries where HGAA has a significant market share.
- (51) The bank realized too late that its business model was dysfunctional and reacted too slowly, partly due to the complex group structure and the difficulty of managing such a large and heterogeneous group.

- (52) Even in early [...], the asset quality relating to new business continued to be problematic and the margins inadequate, when taking appropriate risk and capital costs into account.
- (53) Previously submitted restructuring plans did not demonstrate HGAA's stand-alone viability.
- (54) In addition, in the submissions by Austria on which this Decision is based⁽¹⁷⁾ the base case scenarios of the restructuring plan show the group result being negative throughout the period 2013-17, whilst setting out an additional capital need of EUR [...]. Even the 'management case', which does not contain adequate measures to limit potential distortions of competition, shows a return to a modest profitability (of [...]) only in the year 2017, with losses before that. Moreover, potential costs for the prolongations of guarantees beyond 2013 are not included in that prognosis.

2.6. PARTIAL COMPLIANCE WITH COMMITMENTS

- (55) In the December 2012 rescue decision the Commission authorised the measures notified by Austria in light of certain commitments made by the Member State which were intended to ensure that competition distortions would be limited as much as possible. The commitments aimed at limiting the bank's business activities, e.g. in terms of return levels, risk categories of customers and maturities thus contributing to limiting risky behaviour and therefore the possibility to expand business to the detriment of competitors.
- (56) In January 2013 Austria informed the Commission that for economic reasons it had not been feasible for the bank to comply with all of those commitments for some of its subsidiaries. It referred in particular to the restriction as regards foreign currency loans, the restriction to limit public finance and corporate credit engagements to clients with a credit rating of [...] which Austria claimed could not be implemented in the SEE countries and, for HBA, the restriction to limit public finance engagements to [...].

3. THE LIQUIDATION PLAN

- (57) On 29 June 2013 Austria submitted a liquidation plan under which HGAA will be liquidated in an orderly manner with the necessary time available to sell potentially viable assets while the remaining parts will be wound down over time.
- (58) Under the liquidation plan, the balance sheet size of HGAA will decrease by 85 % from EUR 43,3 billion at the end of 2008 to EUR 6,56 billion in 2017. In the same period its RWA will decrease by 85 % to EUR 4,75 billion from EUR 32,8 billion at the end of 2008.
- (59) To implement that liquidation, the liquidation plan presents a strategy for the bank's three remaining pillars, i.e. (i) the Austrian bank (HBA), (ii) the SEE network and (iii) the wind-down part.
- (60) The liquidation process will be steered from the central group level, where meanwhile a number of improvements have taken place as regards – inter alia – risk management, reporting, collateral valuation and procedures relating to ratings⁽¹⁸⁾.
- (61) Overall, the liquidation plan puts the focus on completing the sale of HBA, which has already been instigated, and increasing the attractiveness of the SEE network with the aim of enabling a sale of all SEE entities by 30 June 2015 at the latest. To that end, Austria has given a number of commitments for any new business with the aim of ensuring an adequate balance of risk and profitability as long as the SEE entities have not been sold.

⁽¹⁷⁾ Kommunikation zur EU - Überarbeiteter Umstrukturierungsplan, Klagenfurt am Wörthersee, 29.6.2013.

⁽¹⁸⁾ The plan explains that a legally independent SEE holding may be created or that parts of HBInt may be split away (including refinancing lines) so as to allow the SEE entities to become independently operating entities.

- (62) In particular, HGAA will in principle only disburse new retail mortgages with a loan to value-ratio of [...] % or higher, the internal funding cost matrix will be commensurate with the funding situation of the relevant branch or subsidiary and [...] will, apart from certain exceptions, only be provided to clients if that client has a [...].

THE SALE OF HBA

- (63) On 31 May 2013 a contract for the sale of all HBA shares was signed with Anadi Financial Holdings Pte. Ltd, with the closure of that sale being currently expected to take place before 31 December 2013 ⁽¹⁹⁾.
- (64) Until the closure of the sale, HBA will continue to focus on its position as a regional bank in Carinthia with branches in Vienna and Salzburg. The size of the bank has already been reduced significantly and a problematic portfolio amounting to EUR 1,99 billion was hived off before 31 December 2011. The balance sheet of HBA as of 31 December 2012 amounted to EUR 4,15 billion (while the balance sheet by 31 December 2008 amounted to EUR 7,05 billion).

SEE NETWORK

- (65) The business activity of the SEE network has already been significantly reduced by focusing on core markets and core competences in Slovenia, Croatia, Bosnia and Herzegovina, Serbia and Montenegro. In addition, the operational entities in those countries were relieved by a portfolio of EUR 2,4 billion and a further portfolio hive-off in the amount of EUR [...] is planned in 2013, pending approval by local supervisory authorities. The balance sheet size of the total SEE network amounts to EUR 10,11 billion as of 31 December 2012 and will decrease further to less than EUR [...] after the envisaged additional portfolio transfer has been completed, amounting to about [...] % of the balance sheet size when compared to 31 December 2008 (EUR 14,8 billion).
- (66) Furthermore, there has been a change in the business strategy of those entities' operation in the SEE countries, aiming at improving their saleability, with a focus on small-scale business and on retail and SME. Their funding strategy is also changing, with local SEE entities focusing on becoming more locally funded instead of relying too strongly on the funding provided by the group. New business is already now fully locally funded.
- (67) In **Slovenia** the focus of the banking activities is on [...] and [...] clients [...] with the aim of [...]. [...] will be reduced significantly with a planned exit from [...] while the bank remains active in [...].
- (68) In **Croatia** the bank aims to [...] with the objective of [...]. For [...], the aim is to focus more on [...]. The focus of the [...] is on [...].
- (69) In **Bosnia and Herzegovina** the focus will be increasingly on [...] coupled with a stringent [...], better [...] and a [...]. [...] will be reduced with [...] remaining the focus.
- (70) In **Serbia** the focus is on [...] with the aim of [...]. As regards [...], the focus is on [...] as well as [...]. The bank aims at [...], even for performing portfolios [...].
- (71) In **Montenegro** the [...] focus on a [...], whereas focusses on [...].
- (72) The change in the focus and business strategy of the SEE banks aims at increasing the chances that the entities can be sold over time. The liquidation plan provides that the SEE network will be sold as a whole or in parts by 30 June 2015. Any sale will be done through open and transparent sale procedures where buyers will have the choice to acquire all or part of the network.

⁽¹⁹⁾ Should the closing not occur as currently expected, HGAA will continue to try selling HBA by 30 June 2014. Should such a sale not be possible by that date, HBA will be transferred to the wind-down unit.

- (73) Any part of the SEE network not sold by 30 June 2015 will immediately cease to undertake new business and be transferred to the wind-down unit ⁽²⁰⁾.

THE WIND-DOWN UNIT

- (74) The aim of the wind-down unit is to reduce all wind-down entities and portfolios as quickly as possible.
- (75) The activities in Italy are already in wind-down. The aim is to steer an orderly wind-down process while avoiding an abrupt withdrawal of deposits ⁽²¹⁾.
- (76) In addition, the wind-down part encompasses all other portfolios which have been identified to be wound down (including entities which have stopped new business including the subsidiaries in Macedonia, Ukraine, Bulgaria, Germany and Hungary), as well as stakes in industrial and touristic companies.
- (77) In summary, the wind-down part includes in particular:
- (i) HBI,
 - (ii) Non-strategic company stakes (industrial and touristic),
 - (iii) Wind-down financials, namely (a) the portfolio of HBInt as well as the existing wind-down portfolios and refinancing lines remaining in various entities (in particular in HBI and SEE countries); (b) the portfolios which have been removed from some subsidiaries such as HBI and SEE-network banks or leasing companies; (c) the wind-down leasing companies,
 - (iv) The vehicles Norica and HBInt Credit Management (CM) ⁽²²⁾.
- (78) Until 2017, the estimated cumulative capital needs (mainly due to write-downs of the book value of the entities to be sold, due to further losses on different portfolios and due to needed refinancing) amount to about EUR 2,6 billion in a base case and up to EUR 5,4 billion under an adverse stress pessimistic case. The liquidation plan also assumes additional liquidity needs depending on whether the capital would be provided in cash or via a guarantee. Under the assumption that the capital is provided in a liquid form the required additional liquidity needs of HGAA until 2017 would amount to EUR 2,5 billion in a base case and are estimated to reach EUR 3,3 billion in a stressed pessimistic case ⁽²³⁾.
- (79) However, as according to Austria different options are still being examined for the wind-down part, those estimates may still change. For instance, Austria has announced that it is exploring the option of installing an asset management company ('AMC'), which would enable HGAA to transfer wind-down assets to that entity, operating without a banking licence. Such a transfer would affect the point in time at which the capital needs would arise.

COMMITMENTS PROVIDED BY AUSTRIA

- (80) Austria has undertaken to ensure that the liquidation plan submitted on 29 June 2013, as last modified by Austria's communication of 27 August 2013, is implemented in full, including the commitments set out in the Annex, and in accordance with the timetable laid down in that Annex.

⁽²⁰⁾ See section IV of the Annex, point 3.2.2.

⁽²¹⁾ The [...] is to be implemented according to the [...] set out in the table contained in section V. point 3.4 of the commitment catalogue contained in the Annex. In order to ensure a [...] refinancing by own means HBI [...] should it be necessary to prevent the deposits from falling below the [...] or to compensate for any such drop.

⁽²²⁾ See footnote 14.

⁽²³⁾ As explained in FN 16 [...].

4. GROUNDS FOR INITIATING THE PROCEDURE

- (81) The Commission recalls that it opened the formal investigation procedure pursuant to Article 108(2) of the Treaty regarding the compatibility of the restructuring aid for HGAA with the internal market because it had, on the basis of the earlier submitted restructuring plans, serious doubts whether HGAA would be able to restore its long-term viability. The Commission had also expressed doubts whether adequate burden-sharing was ensured and the distortions of competition were sufficiently limited.
- (82) The Commission has repeatedly questioned the ability of HGAA to restore its viability⁽²⁴⁾, with serious doubts explicitly raised regarding the business model⁽²⁵⁾. The Commission has also raised doubts as to whether HGAA would be able to remunerate its capital sufficiently, which is a precondition for a bank to be considered viable⁽²⁶⁾. In its December 2009 rescue decision the Commission has already requested the Member State to consider the option of an orderly winding down of the bank⁽²⁷⁾.
- (83) In assessing viability, the Commission raised in particular doubts relating to the funding strategy⁽²⁸⁾, asset quality⁽²⁹⁾ and internal control structures⁽³⁰⁾. In recital 37 of its December 2012 rescue decision the Commission raised doubts about the quality of HGAA's new business.
- (84) As regards burden-sharing, the 2009 opening decision⁽³¹⁾ and the December 2009 rescue decision⁽³²⁾ mention a possible lack of burden-sharing from BayernLB and HGAA's previous owners (GRAWE and Land Carinthia). The 2009 opening decision mentions in recital 102 a lack of burden-sharing from HGAA's hybrid capital owners.
- (85) Recital 41 of the 2010 extension decision questions whether the injected capital into HGAA by Austria under the conditions of the Austrian scheme is sufficiently remunerated as the bank had been considered as fundamentally sound by Austria and thus benefitted from cheaper remuneration rates than would have been the case had it been considered as a distressed bank.
- (86) On competition distortions, the Commission, based on the previous plans submitted by Austria, questioned whether the extent of the balance size reductions would be sufficient⁽³³⁾ and repeatedly called for measures which would address competition distortions⁽³⁴⁾. Against the background of an ever increasing aid amount the Commission has repeatedly called for additional measures for addressing competition distortions⁽³⁵⁾.

5. COMMENTS FROM INTERESTED PARTIES

- (87) No comments from interested parties were received.

⁽²⁴⁾ See for example the 2009 opening decision, recital 92; the December 2009 rescue decision, recital 66; the 2010 extension decision, recitals 31 to 39; the July 2011 rescue decision, recitals 39 to 43; the December 2012 rescue decision, recital 37.

⁽²⁵⁾ See for example the 2010 extension decision, recital 31; the July 2011 rescue decision, recital 40.

⁽²⁶⁾ See for example the 2010 extension decision, recital 39.

⁽²⁷⁾ See recital 65 of the December 2009 rescue decision.

⁽²⁸⁾ See for example recitals 34 and 38 of the 2010 extension decision.

⁽²⁹⁾ See for example recital 66 of the December 2009 rescue decision, recitals 35 and 37 of the 2010 extension decision and recital 43 of the July 2011 rescue decision.

⁽³⁰⁾ See for example recital 36 of the 2010 extension decision.

⁽³¹⁾ See the 2009 opening decision, recital 102.

⁽³²⁾ See the December 2009 rescue decision, recital 67.

⁽³³⁾ See the 2009 opening decision, recital 98.

⁽³⁴⁾ See the 2009 opening decision, recital 98; the 2010 extension decision, recital 42.

⁽³⁵⁾ See the July 2011 rescue decision, recital 44; the December 2012 rescue decision, recital 38.

6. COMMENTS FROM AUSTRIA

- (88) Austria's comments deal mainly with the Commission's treatment of State aid to BayernLB. The Commission concluded in its Decision of 25 July 2012 in case SA. 28487 (C16/2009) ⁽³⁶⁾ regarding restructuring aid to BayernLB that the guarantee by the Republic of Austria on the liquidity amounting to EUR 2,638 billion which BayernLB, in the context of the 2009 rescue operation, has agreed to leave in HGAA, constituted State aid to the benefit of BayernLB and has subsequently authorised the aid measure as being compatible with the internal market. On 5 October 2012 Austria brought an action for annulment ⁽³⁷⁾ against that decision, arguing in particular that the Commission had failed to demonstrate why the measure should be considered compatible with the internal market and insisting that the measure does not constitute aid to the benefit of BayernLB.
- (89) Austria undertakes to ensure that the commitments laid down in the Annex are complied with in full.

7. ASSESSMENT

The assessment of the restructuring aid has to consider all aid granted to HGAA since 2008.

7.1. EXISTENCE OF AID

- (90) According to Article 107(1) of the Treaty, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market
- (91) The qualification of a measure as State aid requires the following conditions to be met: (i) the measure must be financed through State resources; (ii) it must grant an advantage liable to favour certain undertakings or the production of certain goods; (iii) that advantage must be selective; and (iv) the measure must distort or threaten to distort competition and have the potential to affect trade between Member States. Those conditions being cumulative, they must all be present before a measure is characterized as State aid.
- (92) Recitals 51 to 56 of the decision approving the bank support scheme confirm that any measure granted under that scheme constitutes State aid. The Commission furthermore recalls that it has already established in recitals 48 to 53 of the 2009 rescue decision, recital 25 of the July 2011 rescue decision and recital 16 of the December 2012 rescue decision that the conditions set out in Article 107(1) of the Treaty are met for the aid measures listed under a) and b) and that those measures therefore constitute aid. The Commission maintains its view as it will explain below.

a) The measures provided by Austria under the bank support scheme

- (93) All measures granted under the bank support scheme, namely the EUR 900 million recapitalisation and the guarantees of EUR 1,35 billion received in 2008, constitute aid as set out in recitals 51 to 56 of the decision approving that scheme.

b) The further measures granted by Austria

- (94) Outside the bank support scheme Austria has authorized a EUR 450 million recapitalisation, an asset guarantee of EUR 100 million (which has meanwhile been terminated), an asset guarantee of EUR 200 million, a capital increase of EUR 500 million in the form of shares and a guarantee on subordinated Tier-2 capital instruments with a nominal value of EUR 1 billion.

⁽³⁶⁾ Replaced by Commission Decision of 5 February 2013 under the same case number; not yet published.

⁽³⁷⁾ Registered as Case T-427/12.

- (95) Both the capital injection and the guarantees are granted from State resources within the meaning of Article 107(1) of the Treaty. They are granted to a single undertaking and are therefore selective. They are granted under conditions which would not be available to HGAA on the markets, which is not disputed by Austria. Given that HGAA is an undertaking active in the financial sector, which is open to intense international competition, any advantage from State resources to HGAA has the potential to affect intra-Union trade and to distort competition. Those findings were already set out in recital 16 of the December 2012 rescue decision and are confirmed in the present Decision.

c) The recapitalisation by BayernLB

- (96) BayernLB was itself recapitalised by the Free State of Bavaria in 2008 and used part of the funds to recapitalise its subsidiary HGAA. According to recital 124 of the BayernLB decision the full amount of the recapitalisation granted by the Free State of Bavaria constitutes aid to BayernLB. As the amount of aid in one measure cannot be double-counted, the Commission concludes that the recapitalisation of HGAA by BayernLB does not constitute State aid to the benefit of HGAA. Moreover, it seems that at the time of the recapitalisation of HGAA BayernLB was acting in order to safeguard its investment in its subsidiary, in line with market economy considerations, and that its decision to recapitalise HGAA cannot be imputed to a Member State.

d) The contingent aid measures

- (97) Austria seeks authorisation of aid measures to satisfy potentially arising capital and liquidity needs which in a stress scenario might amount up to EUR 5,4 billion for capital and up to EUR 3,3 billion for liquidity. Those potential future aid measures for the wind-down of HGAA will be granted from State resources within the meaning of Article 107(1) of the Treaty. They are granted to a single undertaking and are therefore selective. As they are granted under conditions which would not be available to HGAA on the markets they constitute an advantage. Given that HGAA is an undertaking active in the financial sector, which is open to intense international competition, any advantage from State resources to HGAA has the potential to affect intra-Union trade and to distort competition.

Conclusion as to the total aid amount

- (98) The total amount of aid granted to HGAA by Austria through the reinforcement of capital is EUR 3,15 billion (including the EUR 300 million of asset guarantees having the same effect as a capital injection). That amount represents around 9,6 % of HGAA's RWA in 2008. In addition, HGAA has received a total amount of EUR 1,35 billion in guarantees. Furthermore, Austria has requested the authorisation of potential aid measures which might become necessary to cover future capital needs within the wind-down of HGAA which in a stress case might go up to EUR 5,4 billion, leading to a total aid amount in terms of capital and asset guarantees of EUR 8,55 billion which equal 26 % of RWA. In addition, Austria requested the authorisation of liquidity measures amounting to EUR 3,3 billion.

7.2. COMPATIBILITY OF THE AID

7.2.1. Application of Article 107(3)(b) TFEU

- (99) Article 107(3)(b) of the Treaty sets out that State aid may be considered to be compatible with the internal market where it is granted '*to remedy a serious disturbance in the economy of a Member State*'.
- (100) On the basis of Article 107(3)(b) of the Treaty State aid can be found compatible with the internal market if it serves to '*remedy a serious disturbance in the economy of a Member State*'. Despite a slow economic recovery that has taken hold since the beginning of 2010, the Commission still considers that the requirements for State aid to be approved pursuant to Article 107(3)(b) of the Treaty continue to be fulfilled in view of the persisting stress in financial markets. In July 2013 the Commission confirmed that view by adopting the Communication from the Commission on the application, from 1 August 2013, of State aid rules to support measures in favour of banks in the context of the financial crisis ⁽³⁸⁾.

⁽³⁸⁾ OJ C 216, 30.7.2013, p. 1, see in particular point 6.

- (101) The Austrian Central Bank has already on an earlier occasion confirmed that HGAA was a bank with systemic importance for the financial market in Austria and in South-Eastern Europe and reiterated that view by letter of 3 December 2012. Without the aid measures the supervisory authorities might have closed HGAA due to the latter's breach of capital requirements.
- (102) The closure under such conditions of a bank considered by a Member State to be of systemic importance, such as HGAA, could directly affect the financial markets and thus the entire economy of a Member State. In the light of the current fragile situation of the financial markets, the Commission therefore continues to base its assessment of State aid measures in the banking sector on Article 107(3)(b) of the Treaty.

7.2.2. Compatibility of the aid measures

- (103) All measures identified as State aid have been provided in the context of the restructuring and liquidation of HGAA. The Communication on the return to viability and the assessment of restructuring measures in the financial sector in the current crisis under the State aid rules ⁽³⁹⁾ ('*Restructuring Communication*') sets out the rules applicable to the granting of restructuring and liquidation aid to financial institutions in the current crisis. According to the Restructuring Communication, in order to be compatible with the internal market under Article 107(3)(b) of the Treaty, the restructuring of a financial institution in the context of the current financial crisis has to (i) lead to the restoration of the viability of the bank, (ii) include sufficient own contribution by the beneficiary (burden-sharing) and ensure that the aid is limited to the minimum necessary and (iii) contain sufficient measures limiting the distortion of competition.

Restoration of viability

- (104) As the Commission has indicated in the Restructuring Communication, the Member State needs to provide a comprehensive restructuring plan which shows how the long-term viability of the entity will be restored without State aid within a reasonable period of time and within a maximum of five years. According to point 13 of the Restructuring Communication long-term viability is achieved when a bank is able to compete in the marketplace for capital on its own merits in compliance with the relevant regulatory requirements. For a bank to do so, it must be able to cover all its costs and provide an appropriate return on equity, taking into account the risk profile of the bank. Point 14 of the Restructuring Communication stipulates that long-term viability requires that any State aid received is either redeemed over time or is remunerated according to normal market conditions, thereby ensuring that any form of additional State aid is terminated.
- (105) Previously submitted restructuring plans for HGAA did not allow for the conclusion that a return to viability of the whole group is feasible.
- (106) The Commission furthermore notes that the cheap funding stemming from the guarantees offered by Carinthia will come to an end over time and that the rapid catch-up process of the SEE economies has stopped.
- (107) As a result, the bank is unable to adequately remunerate its capital or to repay the State capital and thus achieve a return to viability by the end of the restructuring period. Thus, it does not seem possible to restore viability for HGAA on a stand-alone basis. The Commission therefore concludes that its doubts as regards the restoration of viability have not been allayed.
- (108) As set out in point 9 of the Restructuring Communication any restructuring plan should include a comparison with alternative options, including a break-up or absorption by another bank. In case a bank cannot be restored to viability, the restructuring plan should indicate how it can be wound up in an orderly fashion. Point 21 stipulates that an orderly winding-up or the auctioning off of a failed bank should always be considered where a bank cannot credibly return to long-term viability.

⁽³⁹⁾ OJ C 195, 19.8.2009, p. 9.

- (109) The Austrian authorities have submitted a liquidation plan which provides for such an orderly wind-down strategy. The submitted plan sets out the sale of the operational entities, the Austrian HBA (for which a sales contract is already signed) and the SEE network, via an open procedure by end June 2015 at the latest. All the remaining parts are put into a controlled and orderly wind-down process. In that context Austria commits that as from 1 July 2013 the Italian entity HBI will not undertake new business. Should a sale of the operational SEE units not be feasible by 30 June 2015, they will also stop new business and be wound down. As a result, by 30 June 2015 at the latest HGAA will cease to be an active undertaking in the financial sector.
- (110) The sale of the operational entities will be done through unconditional, transparent and open procedures, which will allow all interested market participants to make an offer for the entities. Such competitive procedures ensure that the best bid constitutes the market price, thus excluding aid to the buyer ⁽⁴⁰⁾. Where the Commission finds that there is aid to a buyer, the Commission will assess the compatibility of that aid separately.
- (111) As regards the issue of whether the entities to be sold might constitute an economic continuity of HGAA and the aid measures might therefore constitute aid to those entities, the Commission first notes that it is not yet clear whether the SEE network will be sold as a whole to a single buyer or whether various buyers will acquire parts of the current network.
- (112) For a finding of economic continuity, inter alia, the following factors may be taken into consideration: the subject-matter of the transfer, the price of the transfer, the identity of the shareholders or the owners of the undertaking which takes over and of the initial undertaking or the economic logic of the operation ⁽⁴¹⁾.
- (113) The Commission observes firstly that the aid granted was not assigned to tackle the problems of the individual operational entities in Austria or SEE countries but of HGAA as a group. None of the subsidiaries in the SEE countries or HBA represents the core of HGAA's business and the entities to be sold only represent a part of HGAA's assets. Furthermore, the business model of the entities to be sold is different from the business model of HGAA, which was an international banking group reliant on cheap financing largely based on State guarantees from Carinthia and focussing on rapid expansion benefitting from the catch-up potential of emerging markets. In the future, the funding of the subsidiaries in the SEE countries will no longer be dependent on State guarantees but will be based on local (and thus more expensive) funding, which will require a more prudent approach as regards margins and risk management. Whilst HGAA focussed rather on large-scale business and key clients, the entities to be sold will focus on SME business. In practice the entities to be sold will be oriented towards a different client base.
- (114) The Commission furthermore notes that the sale of the operational entities is designed to maximise the value of HGAA's assets before its liquidation in the interest of its creditors.
- (115) On the basis of the subject-matter, of the fact that the shareholders of HGAA and the entities to be sold will not be identical, and of the economic logic of the sales operation, the Commission considers that once the operational entities are sold and HGAA has ceased to exist there will be no continuation of the economic activity of HGAA.
- (116) The liquidation plan sets out that some assets will be taken out of the operational entities to be sold. That removal will both improve the entities' funding ability and improve the average asset quality of the remaining balance sheet, thus contributing to the marketability of the respective entities.

⁽⁴⁰⁾ See point 20 of the Restructuring Communication and 49 of the Communication on the application of State aid rules to measures taken in relation to financial institutions in the context of the current global financial crisis (*the Banking Communication*), OJ C 270, 25.10.2008, p. 8.

⁽⁴¹⁾ See Joined Cases T-415/05, T-416/05 and T-423/05 *Greece and Others v Commission* [2010] ECR I-4749, paragraph 135.

- (117) Point 21 of the Restructuring Communication points out that the creation of an autonomous 'good bank' from a combination of the 'good' assets and liabilities of an existing bank may also be an acceptable path to viability, provided any such new entity is not in a position to unduly distort competition. In that regard, the creation of a SEE holding or the regrouping of certain assets away from HBLnt to the SEE holding with the aim of creating a viable and marketable SEE banking unit would be an acceptable solution ⁽⁴²⁾.
- (118) The problem of asset quality, stemming from both the legacy portfolio and more recent risky engagements, could not be solved on a going concern basis because of increasing risk costs and impairments. Therefore the Commission considers that the liquidation plan presented by Austria to increasingly transfer problematic assets into the wind-down unit as the appropriate strategy.
- (119) As regards the funding envisaged in the liquidation plan, the entities to be sold will increasingly concentrate on local funding and seek to reduce their dependency on wholesale funding provided by HGAA. The Commission welcomes that change in funding strategy. It notes that there will be an on-going funding commitment of HGAA to the entities to be sold.
- (120) Furthermore, the liquidation plan provides for a significant reduction in the leasing activities of HGAA, which have been a major source of HGAA's problems in the past as leasing activities have a relatively low profitability compared to their risks and funding requirements. That reduction will also positively contribute to the marketability of the operational entities.
- (121) The Commission concludes that the viability of HGAA cannot be restored and that the orderly wind-down strategy for HGAA as put forward by Austria is an appropriate means to deal with HGAA given that it is not possible to restore the viability of the bank as such.

Own contribution and burden-sharing

- (122) The Restructuring Communication indicates that an appropriate contribution by the beneficiary is necessary in order to limit the aid to a minimum and to address distortions of competition and moral hazard. To that end, it provides that (i) both the restructuring costs and the amount of aid should be limited and (ii) a significant own contribution is necessary.
- (123) The Restructuring Communication further provides that, in order to keep the aid limited to the minimum, the bank should first use its own resources to finance the restructuring. The costs associated with the restructuring should not only be borne by the State but also by those who invested in the bank. That objective is achieved in particular by absorbing losses with available capital.
- (124) First, all previous shareholders of HGAA have sold their shares to the Republic of Austria for a symbolic price of one euro which reduced the risk that the aid measures benefit the former shareholders. The former owners have also provided HGAA with capital or liquidity, which have been used to cover losses and to improve the liquidity situation.
- (125) The majority shareholder of HGAA at the time of that sale was BayernLB. In total, BayernLB has contributed about EUR 1,5 billion in capital whilst renouncing further ownership rights, not even any prospect of further remuneration. BayernLB also contributed about EUR 4,3 billion in liquidity to HGAA. Furthermore, BayernLB faced a significant write-down loss when selling its HGAA shares which contributes to addressing moral hazard in line with point 22 of the Restructuring Communication.

⁽⁴²⁾ The Commission notes positively that Austria commits to ensure that the loan-to-deposit ('LTD') ratio of the entities not earmarked for wind-down will be geared to a successful sale either by steering the credit process or by measures to synthetically or effectively reduce the LTD ratio, see commitments section III, point 4.1.8.

- (126) The Commission therefore considers that the amount of burden-sharing from the former owner BayernLB is significant and adequate.
- (127) That conclusion will not be affected by the final outcome of the on-going lawsuit on the repayment of the outstanding loans to BayernLB. If BayernLB were to lose the lawsuit, the amount of burden-sharing would be even higher. If BayernLB were to win the lawsuit, the amount of burden-sharing as assessed in this Decision would not change.
- (128) The contribution of GRAWE consists of both capital and liquidity measures. The originally capital injection of GRAWE into HGAA amounting to EUR 30 million has in the meantime been reduced to about EUR 9 million through a decision by the Republic of Austria as the bank's sole shareholder to allocate the capital for loss absorption (*Kapitalschnitt*). GRAWE also provided liquidity to HGAA.
- (129) Based on the above considerations, the Commission concludes that the burden-sharing of GRAWE is sufficient.
- (130) As regards the Land Carinthia, the Commission observes that the Land Carinthia has contributed to burden-sharing by injecting capital which has been significantly reduced in the meantime through the *Kapitalschnitt*.
- (131) Based on the above considerations, the Commission concludes that the burden-sharing of Land Carinthia is sufficient.
- (132) The fact that the remuneration on the Partizipationskapital for GRAWE and Land Carinthia is higher than the remuneration for the capital injected by BayernLB is justified because BayernLB provided a different kind of capital instrument. In contrast to GRAWE and Land Carinthia, they provided no Partizipationskapital, but simply renounced all rights deriving from capital instruments and some liquidity. Thus BayernLB provided a higher degree of burden-sharing which seems appropriate as BayernLB had been the dominant owner of HGAA before the acquisition of the bank by Austria.
- (133) Another open issue is whether the injected Partizipationskapital capital into HGAA by Austria under the conditions of the bank support scheme is sufficiently remunerated. It has to be recalled that under the bank support scheme there were two different interest rates to be paid depending on whether the aided bank had been a distressed or a fundamentally sound bank. HGAA was considered as fundamentally sound by Austria and thus paid lower remuneration rates than if it would have done had it been considered a distressed bank.
- (134) On that issue, the Commission observes that all the remaining Partizipationskapital remains with HBIInt, and thus with the wind-down part of HGAA. Given that the wind-down part is no longer active on the market and that the viability of HGAA cannot be restored (so that HGAA will be liquidated), the Commission finds that the low remuneration can be accepted in the present case.
- (135) The Mitarbeiterstiftung Alpe Adria was the smallest owner of HGAA with a 0,02 % stake. Its stake was also sold for one euro when the Republic of Austria acquired HGAA in December 2009. Given the complete loss of any shareholders' rights without any consideration, the Commission considers the degree of burden-sharing is sufficient, in particular given its relative small size compared with the other owners.
- (136) As regards the hybrid capital holders, HGAA has taken a number of steps to ensure their burden-sharing by buying back those instruments significantly below par or cancelling them altogether which has generated a significant capital effect.

- (137) Furthermore, the Commission notes that many of the hybrid capital instruments as well as the Partizipationskapital instruments only yield dividends or coupon payments in case of profits. Given the lack of profitability of the bank in recent years, the holders of those instruments have not received such payments. In addition, there will be restrictions on dividend and coupon pay-outs in the future. As a result, the Commission considers that there is sufficient burden-sharing from the holders of those instruments.
- (138) For those reasons, the Commission concludes that the liquidation plan of HGAA provides for an appropriate burden-sharing.

Limiting competition distortions

- (139) Finally, section 4 of the Restructuring Communication requires that the restructuring plan contains measures limiting distortions of competition. Such measures should be tailor-made to address the distortions on the markets where the beneficiary operates after restructuring. In the present case it needs to be ensured that the entities which will remain active on the market before they will be finally sold do not use the State resources received in a manner which is detrimental to competitors and do not act in a distortive manner.
- (140) To that end, Austria commits to the business restrictions set out in section 4 of the Annex which will ensure that until the sale competition distortions resulting from the existence and the activities of the operational entities are kept as much as possible to the minimum.
- (141) The nature and form of competition measures depend on two criteria: first, the amount of the aid and the conditions and circumstances under which it was granted and, second, the characteristics of the markets on which the beneficiary will operate.
- (142) The Commission recalls that HGAA has received State aid amounting to EUR 3,15 billion in capital and asset guarantees and EUR 1,35 billion in liquidity guarantees and, for purposes of the wind-down process, might receive additional State aid up to EUR 5,4 billion in capital and EUR 3,3 billion in liquidity in the future.
- (143) The total aid amount in capital and asset guarantees would amount to EUR 8,55 billion which is equivalent to approximately 26 % of HGAA's RWA of EUR 32,8 billion as of 31 December 2008. The amount of aid granted is therefore significant very large, requiring appropriate measures.
- (144) Point 35 of the Restructuring Communication stipulates that structural measures such as divestitures should favour the entry of competitors while allowing for the exit process to take place within an appropriate time frame that preserves financial stability.
- (145) The Commission observes that the liquidation plan provides for an orderly wind-down where by 30 June 2015 at the latest HGAA will cease to exist as an active economic actor on the markets and will just wind down the activities which have not been sold by that time.
- (146) As regards the continued activity of the SEE entities until their sale, Austria has submitted a number of commitments as regards the new business to be pursued by those entities, avoiding any possible distortion of competition in the period until the sale.

- (147) In that respect, the Commission in particular positively takes note of the restrictions on new business to which Austria and HGAA committed: After taking into account risk costs and funding costs a minimum return of [...] % p.a. should be realised on new business. That minimum return on new business will ensure that operational entities do not enter into anti-competitive pricing practices while at the same time contribute to their long-term profitability. In the same spirit, the bank commits to limitations on the maturities of new business so that maturity transformation only contributes in a limited way to profitability. [...] ⁽⁴³⁾ [...]. As regards [...], Austria provided an additional commitment to limit the [...] business to customers rated [...] or better and not to exceed a total volume of EUR [...]. That commitment mitigates the risks associated with currency devaluation and restricts the volume in which the bank can be active in that market segment. In summary, those restrictions both serve to ensure long-term viability and limit the competitive capacity of the respective entities.
- (148) The Commission further views positively the commitments regarding an improved risk management, in particular as regards the annual re-rating of all exposures exceeding EUR [...] and the commitment that in retail and public finance the bank will only do business with customers rated [...] ⁽⁴⁴⁾. Those commitments ensure that the business conduct will be prudent and the affected entities will abstain from a risky business strategy. Business will be conducted so that profitability needs are balanced with the necessary risk control considerations. At the same time, the commitments also preclude an aggressive market expansion strategy.
- (149) The Commission notes positively the two-fold purpose of the commitments set out in recitals 147 and 148. Firstly, they contribute to increasing the saleability of the business as no overly risky business is conducted, and secondly, they diminish competition distortions by restricting aggressive behaviour and thus limiting new business.
- (150) Under the liquidation plan all operational parts of HGAA will be either wound down or sold. Austria has provided a firm commitment as regards the sale of HBA and the SEE network (in parts or as a whole) in that the sale has to be done by 30 June 2014 respectively 30 June 2015 at the latest. After that date, all new business has to stop and HGAA will exit the market, either because all activities are in a wind-down process or because they have been sold to a third party in a transparent way. As such, the sales/wind-down process of HGAA contributes significantly to limiting the competition distortions of competition resulting from the aid, because HGAA as such will disappear from the markets.
- (151) The Commission considers that the still fragile situation on the financial markets in particular in the SEE countries justifies the prolonged deadline of 30 June 2015 for the sale of the entities in those countries. It notes that the Austrian activities have already been sold and that if the sale is not completed by 30 June 2014 those activities will also be wound down.
- (152) Overall, the Commission notes that by 2017 the remaining balance sheet size and the RWA of HGAA will decline by about 85 % (provided the sale succeeds as planned).
- (153) In addition to those far-reaching measures, the Commission notes a ban on advertising State support and a ban on aggressive commercial practices to which Austria committed. It also welcomes an acquisition ban, which ensures that the State aid will not be used to take over competitors, but to serve its intended purpose, namely to finance the liquidation process.
- (154) The Commission deplores Austria's partial compliance with the commitments it entered into within the framework of the 2012 December rescue decision. The Commission considers, however, that the breach of some of those commitments which lasted for a restricted period of time is counterbalanced by the complete break-up and liquidation of the bank.

⁽⁴³⁾ [...].

⁽⁴⁴⁾ This relates to a 1-year default probability of [...] % or less.

- (155) Taking into account the commitments and in light of the appropriateness of the own contribution and burden-sharing as set out in recitals 122 to 138, the Commission considers that there are sufficient safeguards to limit potential distortions of competition despite the high amount of aid granted to HGAA.

CONCLUSIONS

- (156) In view of the commitments made by Austria it is concluded that the wind-down strategy is in line with the Restructuring Communication, the liquidation aid is limited to the minimum necessary and competition distortions are sufficiently addressed. The liquidation aid is thus compatible with the internal market pursuant to Article 107(3)(b) of the Treaty,

HAS ADOPTED THIS DECISION:

Article 1

1. The following measures constitute State aid:

- (a) the recapitalisation in the amount of EUR 900 million under the bank support scheme;
- (b) the recapitalisation in the amount of EUR 450 million under the bank support scheme;
- (c) the guarantees of EUR 1,35 billion under the bank support scheme;
- (d) the asset guarantee of EUR 100 million;
- (e) the asset guarantee of EUR 200 million;
- (f) the recapitalisation in the amount of EUR 500 million;
- (g) the State guarantee on subordinated Tier-2 capital instruments with a nominal value of EUR 1 billion;
- (h) the contingent capital for the wind-up of HGAA up to a maximum amount of EUR 5,4 billion;
- (i) The contingent liquidity support up to a maximum amount of EUR 3,3 billion.

2. The State aid referred to in paragraph 1 is compatible with the internal market, in the light of the commitments set out in the Annex.

Article 2

Austria shall ensure that the liquidation plan submitted on 29 June 2013 and complemented by submission of 27 August 2013 is implemented in full, including the commitments set out in the Annex.

Article 3

This Decision is addressed to the Republic of Austria.

Done at Brussels, 3 September 2013.

For the Commission
Joaquín ALMUNIA
Vice-President

ANNEX

Preliminary remarks

The following commitments are provided by Austria exclusively to the European Commission (**hereinafter: ‘the Commission’**) as sole addressee and only for the purposes of case SA.32554 (ex C 16/2009). Third parties may not rely on these commitments to derive any claims to a certain conduct by Austria and/or the Hypo Alpe Adria group of credit institutions (hereinafter: ‘HGAA’).

The commitments provided to the Commission by Austria in the commitments letter dated 30 November 2012, which are set out in the Annex to the Commission’s approval decision dated 5 December 2012, C(2012) 9255 final, are replaced by the commitments set out under sections B.III.3 and B.III.4.

Save as otherwise provided below, all commitments apply to each of the operational entities listed in section B.II.1 only until the relevant entity has been reprivatised in accordance with section B.IV.3.

Commitments**I. Implementation of the restructuring plan; Monitoring Trustee**

Austria will ensure that the restructuring plan is fully implemented within the relevant deadlines. Austria undertakes that the implementation of the restructuring plan and the fulfilment of the commitments will be monitored by a Monitoring Trustee. The appointment, duties, obligations and discharge of the Monitoring Trustee must follow the procedures set out in section C.

II. Definitions**1. Operational entities**

The **‘operational entities’** to be reprivatised in accordance with section B.IV.3 are the following companies (including, in each case, the companies solely controlled by them, either directly or indirectly):

1.1. HBA

Hypo Alpe-Adria-Bank AG, Klagenfurt, Austria (‘HBA’).

1.2. SEE/SEE network

— Hypo Alpe-Adria-Bank d.d., Ljubljana, Slovenia (‘HBS’).

— Hypo Leasing d.o.o., Ljubljana, Slovenia (‘HLS’) or its legal successor created under the internal HGAA restructuring, provided that it is put up for sale. This company’s activity is limited to [...] and [...] leasing.

— Hypo Alpe-Adria-Bank d.d., Zagreb, Croatia (‘HBC’) and its subsidiary Hypo Alpe-Adria-Leasing d.o.o., Croatia (‘HAALC’), whose business activity is limited to [...].

— Hypo Alpe-Adria-Bank d.d., Mostar, Bosnia and Herzegovina (‘HBFBiH’).

— Hypo Alpe-Adria-Bank a.d., Banja Luka, Republic of Serbia (‘HBRs’) and its subsidiary Hypo Alpe-Adria-Leasing d.o.o., Banja Luka, Republic of Serbia (‘HLRS’), whose business activity is limited to [...] leasing.

— Hypo Alpe-Adria-Bank a.d., Podgorica, Montenegro (‘HBM’).

— Hypo Alpe-Adria-Bank a.d., Belgrade, Serbia (‘HBSE’).

2. Wind-down part

In the wind-down part, the non-strategic business lines and portfolios of HGAA and Hypo-Alpe-Adria Bank S.p.A., whose head office is in Udine, Italy ('HBI'), are to be wound down in accordance with the restructuring plan, while preserving capital and minimising loss of value. All companies/entities not explicitly listed under the preceding section II.1 shall be included in the wind-down part. The wind-down part is to include inter alia:

2.1. Wind-down participations

Non-strategic shareholdings

2.2. Wind-down financials

- Portfolio of HBIInt. and refinancing lines to subsidiaries (in particular SEE, HBI) remaining in HGAA.
- Sub-portfolios belonging to individual subsidiary banks (HBA, HBI, SEE network banks) and to HLS transferred in the wind down.
- Wind-down leasing companies (HLHU, HLUA, HLBG, HLG, HLC, HLMK, HLA, HLM, HETA, HLI, HRSE and HLSE).
- Minority companies (Credit Management, Norica).

2.3. HBI

Hypo Alpe-Adria-Bank S.p.A., Udine, Italy ('HBI').

III. General commitments

1. Pursuit of a prudent, sound and sustainable business policy

Austria will ensure that, while the restructuring plan is being implemented, HGAA pursues a prudent, sound and sustainable business policy, reviews the appropriateness of its internal incentive schemes under statutory and regulatory rules, and makes sure that its incentive schemes do not result in incentivising to undertake unsuitable risks.

2. Profit transfer

Austria will ensure that each operational entity (i.e. HBA and the SEE network), until their respective reprivatization, transfers any annual profit to its respective owners only to the extent that this is allowed by law and does not result in failing to meet the regulatory own capital ratios of the operational entity concerned applicable at the time of the profit transfer, or in any economic disadvantage for the company. This commitment shall also apply mutatis mutandis to any intermediate (holding) companies, HBI until it is completely wound down, and HBIInt. as long as it is controlled by Austria.

3. Own contribution

The coupon ban set out in Austria's commitments letter dated 30 November 2012 and in No 11 in the Annex to the Commission's approval decision dated 5 December 2012, C(2012) 9255 final, is replaced by the following commitment:

3.1. No dividend or coupon payments that are not required by law

3.1.1. Austria will ensure that HGAA, during the implementation of the restructuring plan, does not make any dividend or coupon payments on its issued Tier 1 and Tier 2 capital instruments (including shares, shareholdings, hybrid capital and additional capital) issued before the final approval decision is adopted, unless HGAA is legally obliged to do so, even without releasing reserves, or with the prior agreement of the Commission services.

3.1.2. The capital instruments referred to above do not include those capital instruments, shares and/or shareholdings held by Austria, unless a dividend or coupon payment on the capital instruments held by Austria would also result in a payment obligation to third parties.

- 3.1.3. The dividend ban under point 3.1.1 does not apply to dividend payments by the temporary 'minority companies' that do not engage in advertising, [...] and [...], (i.e. two SPVs in which external investors hold a 49 % stake; the activity of the SPVs is limited to holding certain securities and paying out income from the securities to HBInt and the minority companies in the form of dividends, see section 5.3.4 of the restructuring plan) where failure to make these payments would result in the winding up of one of these companies, which would have an adverse impact on HGAA's total capitalisation.
- 3.2. No calling in or repurchase of capital instruments that are not required by law
- 3.2.1. Austria will ensure that HGAA, during the implementation of the restructuring plan, does not call in, repurchase or otherwise terminate before maturity capital instruments within the meaning of point 3.1.1 above, unless HGAA is legally obliged to do so, even without releasing reserves, or with the prior agreement of the Commission services.
- 3.2.2. With the prior agreement of the Commission services, this excludes the calling, repurchasing and other ways of early termination of capital instruments, if:
- they do not result in a permanent reduction in HGAA's regulatory capital ratios, and
 - payments by HGAA to creditors in connection with the early termination (e.g. repurchase price, indemnity) do not exceed the market value of the instruments at the time of termination, if necessary plus:
 - a premium of not more than 10 % of the market value, and/or
 - a payment no more than the discounted cash value of the interest due on the instrument until its original maturity date.
- 3.2.3. With the prior agreement of the Commission, the specific determination of the market value within the meaning of the above will correspond to:
- in the case of publicly traded instruments: the average price of the instrument or comparable instruments in the month before publication of the offer to repurchase the instruments in question;
 - in the case of other instruments: the value established in another, suitable way and verified by an independent third party using valuations of the instrument or comparable instruments.
4. Behavioural commitments/restrictions on new business
- 4.1. Replacement of the commitments dated 30 November 2013 (Annex to the Commission's approval decision dated 5 December 2012, C(2012) 9255 final)
- The commitments provided to the Commission by Austria in the commitments letter dated 30 November 2012, which are set out in the Annex to the Commission's approval decision dated 5 December 2012, C(2012) 9255 final, are replaced by the following commitments.
- 4.1.1. HGAA will limit new business in the public finance segment to [...] and corporate credit engagements to [...] or less, with a 1-year probability of default of [...] or less for both public and corporate finance. In addition, all engagements above [...] in the corporate segment must be [...] % collateralised in compliance with HGAA's internal credit policy parameters. Exceptions to the above restrictions are permissible if the local regulator requires certain financial instruments to be held. Furthermore, Treasury Bills issued by the Republic of Serbia and the Federation of Bosnia and Herzegovina with a maximum tenor of [...] will be exempt from the above restrictions, if the acquisition of these securities [...].

4.1.2. HGAA will disburse new retail mortgages only with a loan-to-value (LTV) ratio of [...] % or lower. New retail mortgages with a maximum LTV ratio of [...] % is permissible if the debt-to-income ratio of the respective client – defined as total monthly obligations with HGAA and other financial institutions (established through local credit bureaus) divided by monthly net income – is less than or equal to [...] %. In addition, any new mortgage granted must be eligible for inclusion in the cover pools under the local legislation on mortgage bonds/securitisation where such legislation exists.

4.1.3. The internal funding cost matrix for every new engagement (within the meaning of section 4.2) must be commensurate with the funding situation of the branch/subsidiary for the entire term structure. At the very minimum, this should be:

EURIBOR 3 m + [...] % for engagements up to [...] years,

EURIBOR 3 m + [...] % for engagements from [...] years ([...]),

EURIBOR 3 m + [...] % for engagements above [...] years ([...]),

to be increased for countries with a particularly weak credit stance [...]. In addition to the group-wide maturity restrictions in public finance and corporate finance (see point 4.1.1), no engagements exceeding [...] years may be undertaken in those countries. The funding add-ons may be lowered in cases where assets fulfil the legal and asset criteria for securitisation and are intended to be used directly for securitisation (e.g. mortgages, financial leases, SME loans, and public finance) based on usable collateral as verified by the Monitoring Trustee (between [...] and [...] bps depending on the amount of collateralisation, [...] bps for over-collateralisation).

4.1.4. After properly calculating the funding cost (in accordance with point 4.1.3) and risk cost (the total expected loss on the uncovered amount, after applying an additional haircut of [...] % on the collateral), an annual return on equity of at least [...] % for any new credit engagement must be ensured (fees may be taken into account in the calculation). The Commission may, by service letter, lift the requirement for an additional haircut of [...] % for the purpose of calculating the risk costs once the Monitoring Trustee provides a reasoned opinion that the bank's existing collateral valuation system as a whole is appropriate and already includes appropriate haircuts.

4.1.5. The return on equity within the meaning of the above paragraph must in principle be calculated on the basis of the regulatory capital requirements allocated to the specific loans. However, the methodology currently applied by HGAA for calculating the capital requirements for a specific loan is based on an economic approach, in line with risk-cost calculation. The European Commission may, by service letter, allow HGAA to continue to use the economic approach for the calculation of capital requirements for specific loans upon verification by the monitoring trustee that (i) the methodology is sound, and (ii) provided that HGAA has established that an equivalent return on regulatory capital requirement of [...] % would hold both at target portfolio and effective portfolio level.

4.1.6. [...] may be provided to clients only if the client [...]. The exceptions to this are:

— [...];

— [...] are restricted to a nominal volume of EUR [...] annual new business; every [...] granted in [...] must have a credit rating of at least [...] or better (in accordance with HGAA's internal credit rating master scale).

4.1.7. HGAA will ensure an annual re-rating and complete financial documentary follow-up of each client with an exposure of more than EUR [...] equivalent, to be verified by risk management at group head office.

4.1.8. The Republic of Austria commits to ensuring that the loan-to-deposit (LtD) ratio of the operational entities will be geared towards a successful sale, either by steering the credit process or by other measures to reduce the LtD ratio (artificially or effectively). The Republic of Austria is aware that LtD ratios in excess of 100 % can act as an impediment to the successful sale of an entity.

4.1.9. HGAA will replace or re-train credit officers and relationship managers where flaws in the credit process have been discovered or where credits have been disbursed at sub-standard profitability levels.

4.1.10. HGAA shall not acquire any shareholdings in companies or parts of companies (hereinafter: 'shareholdings'), save as otherwise provided below. With the prior agreement of the Commission, HGAA may acquire shareholdings where special circumstances require it to do so in order to maintain or secure financial stability or effective competition. HAA may acquire shareholdings without the prior agreement of the Commission where: (i) the respective acquisition price is less than [...] % of HGAA's balance-sheet total at the time of the Commission decision, and (ii) the sum of all the acquisition prices paid by HGAA over the whole restructuring period (i.e. until the sale of the SEE network is complete, see IV) is less than [...] % of HGAA's balance-sheet total at the time of the Commission decision. Excluded from the prohibition on acquisitions are shareholdings managed or acquired in the course of HGAA's normal business operations in connection with non-performing loans or similar banking operations.

4.1.11. HGAA shall not use the aid for promotion purposes.

4.1.12. The implementation of the above measures will be monitored on a quarterly basis by an external Monitoring Trustee (see section C below) who reports to the Commission.

4.2. Scope of the commitments ('Restrictions on new business') pursuant to 4.1.1-4.1.6

The restrictions set out in 4.1.1-4.1.6 shall apply only to new business as defined below:

4.2.1. Definition of the Corporate, Public Finance and Retail segments

The Corporate and Public Finance segments correspond in principle to HGAA's current business segment definitions, with the following changes:

4.2.1.1. The Corporate segment is defined as:

privately owned companies (with the exception of financial institutions) which meet the following size criteria in terms of turnover and/or exposure:

— Annual turnover of EUR [...] or above; or

— Gross exposure of at least EUR [...], except in Croatia, with a threshold of EUR [...]. HGAA is to provide the Monitoring Trustee with evidence that the current exposure threshold distinguishing the retail segment from the corporate segment in Croatia indeed lies at EUR [...] at present and that changing the threshold would entail excessive costs.

4.2.1.2. Public Finance segment:

The Public Finance segment is defined as:

— 'sovereigns', i.e. entities that are able to exercise sovereign powers by issuing generally binding laws or other binding regulations (States, ministries, state/government authorities, social security institutions, etc.);

— exposure explicitly guaranteed by sovereigns;

— 'sub-sovereigns', i.e. regional and local authorities (federal states, provinces, counties, towns, municipalities) and the political entities of the Republic of Bosnia and Herzegovina, namely the Republic of Serbia and the Federation of Bosnia and Herzegovina; and

- public-sector entities (PSEs ⁽¹⁾), provided that they enjoy a direct sovereign/sub-sovereign guarantee.

Any entity or agency that is not a sovereign/sub-sovereign as defined above and does not have a sovereign/sub-sovereign guarantee must be treated as a corporate (institutional) client in accordance with the rules on the Corporate (institutional) segment.

4.2.1.3. Retail segment:

The Retail segment is defined as:

- private individuals
- all forms of SME, i.e. privately held companies, freelancers and agricultural entities, regardless of their legal form, which meet all the following size criteria in terms of turnover and exposure:
 - annual turnover of less than EUR [...], and
 - gross exposure of less than EUR [...], except Croatia with a threshold of EUR [...] (subject to the provision of evidence as stipulated in the second indent under 4.2.1.1 above).

4.2.2. New business within the Corporate and Public Finance segments

4.2.2.1. General definitions

In principle 'new business' within the meaning of the restrictions on new business under points 4.1.1 to 4.1.6 is defined according to HGAA's existing risk reporting standards and therefore encompasses either:

- risk-relevant ⁽²⁾ credit/leasing transactions with a completely new client (or with a group of connected clients — GoB) - i.e. **'new client business' (NCB)**; or
- increases in credit/leasing exposure with existing clients (on a product basis) - i.e. **'exposure-increasing business' (ExIB)**; and
- credit/leasing exposure renewals (prolongations) with existing clients (on a product basis) going beyond a tenor of [...] - i.e. **'exposure-prolonging business' - (ExPB)** ⁽³⁾.

4.2.2.2. Additional criteria

- Within the context of ExIB, new business must be considered at the level of individual transactions. So if a client intends to increase its cash exposure and in turn reduce its guarantee exposure by the same amount, the increased cash exposure still counts as new business.
- **Finance leasing must be treated as credit financing.** New business (NCB and ExIB) must therefore be fully compliant with the new business requirements under points 4.1.1 to 4.1.6 above.
- **Operating leasing** must be treated as new business within the meaning of points 4.1.1-4.1.6, having regard to the following considerations:
 - **Minimum rating** of [...] and maximum tenor as per the restrictions on new business must be observed.

⁽¹⁾ Entities directly controlled by the sovereign/sub-sovereign or economically connected to the sovereign/sub-sovereign.

⁽²⁾ The term 'risk-relevant business' is defined as per the Group Credit Principles and therefore includes any credit/leasing business involving counterparty and/or del credere risks.

⁽³⁾ Even though prolongations with a maximum tenor of [...] are not subject to the restrictions on new business under points 4.1.1-4.1.6, such transactions must nevertheless adhere strictly to HGAA risk policies and other relevant regulations.

- **Full collateralisation is to be assumed as long as** the residual value is fully covered by the carrying value, provided that the residual value is sufficiently conservative; this will be the case where the residual value corresponds to a highly probable sales value (after deduction of sales costs) of the underlying item in the financial records of the booking entity.
- Any credit engagement involving uncommitted credit lines should adhere to the new lending standards under points 4.1.1-4.1.6.
- **Intragroup transactions** (e.g. refinancing of local banks, leasing and other participations) and business arising out of **HGAA's liquidity management requirements** shall be accounted for in the **Financial Institutions segment**.

4.2.2.3. Limitations

The following risk-relevant transactions **are not subject to** the restrictions on new business under points 4.1.1-4.1.6:

- **Transactions with financial institutions in the context of HGAA's liquidity book**, i.e.
 - FX spot transactions (i.e. intra-day settlement limits);
 - FX outright and swaps with a maximum tenor of [...], provided that a netting and collateral agreement (ISDA and CSA), stipulating a threshold (substantive unsecured exposure) of maximum EUR [...], is in place;
 - Money-market loans, deposits and (reverse) repo transactions, **each** with a maximum tenor of [...], where the maximum amount per counterparty is limited to a total of EUR [...] and the total amount granted at any time is limited to a maximum of EUR [...].
 - Financial derivatives (interest-rate swaps) with a maximum tenor of [...], provided that a netting and collateral agreement (ISDA and CSA), stipulating a threshold (substantive unsecured exposure) of maximum EUR [...], is in place.

HGAA must ensure that individual counterparty limits for financial institutions business are approved by the group head office risk management, with a maximum tenor of [...].

- **New financing and prolongations, roll-overs, restructurings and reprogrammings granted to non-performing clients** (and all customers within the remit of Group/Local Task Force Rehabilitation and/or Credit Rehabilitation) with the aim and the clearly documented prospect of bringing them back to performing status and/or enabling a final recovery of the exposure, as long as the maturity of the new financing in this context is limited to [...]. Any such transaction should be adequately documented, including quantitative evidence that it is the best way of preserving value for HGAA rather than merely a delay in the recognition of losses. The assumptions used for this quantitative assessment should be sufficiently conservative.
- **Prolongations, roll-overs, restructurings or reprogrammings** of existing performing exposures⁽¹⁾ or existing performing clients (GoBs), which are objectively justified, in the interest of HGAA, and not granted a tenor of more than [...]. Any such transaction should be adequately documented, including quantitative evidence that it is the best way of preserving value for HGAA rather than merely a delay in the recognition of losses. The assumptions used for this quantitative assessment should be sufficiently conservative.

⁽¹⁾ According to HGAA's exposure measurement methodology, this means that the unutilised part of existing committed framework loans will not be considered new business.

- **Additional financings provided to clients on the group/local watch-list** with the aim and the clear, documented prospect of stabilising their financial situation (including hedging of interest-rate and FX risks), thus preventing an event of default and enabling them to return to performing status as long as this kind of financing is not granted beyond a tenor of [...]. Any such transaction must be adequately documented, including quantitative evidence that it is the best way of preserving value for HGAA rather than merely a delay in the recognition of losses. The assumptions used for this quantitative assessment should be sufficiently conservative.
- Transactions
 - which are **fully** covered in **cash**, fully enforceable for collateral purposes for the entire duration of the loan contract, unencumbered by pledges in existing credits, provided the client's rating is not worse than [...], OR
 - which are fully covered by a guarantee from a financial institution (bank guarantee), provided the guarantor's rating is no worse than [...].
- **Exposure increases** due to **fluctuations in FX rates, market values** of derivatives and **pricing** of bonds.
- **Conversion of existing FX loans** to EUR loans, if the client's accounting currency is EUR, Kuna or Convertible Mark, the total exposure is converted at the prevailing FX-rate, and the collateral terms for HGAA are the same or better.
- Business for which an offer (term sheet) mutually agreed by the responsible local risk and sale unit was sent to and accepted by HGAA clients before 1 January 2013, provided that HGAA is legally bound to disburse and this can be properly documented.
- Business conducted using **funds from development banks and supranational financing institutions** (e.g. EIB, EBRD, HBOR, SID, etc.) as well as subsidised loan programmes offered by sovereign/sub-sovereign agencies, provided that, as far as collateralisation is concerned, the cut-off rating [...] and a maximum tenor of [...] must be observed. Such subsidised loan programmes must have credit-risk mitigating features [...], which is to be confirmed by the Monitoring Trustee prior to HGAA's participation.
- **Internal financings** (i.e. refinancing lines) provided to other HGAA entities for **repossession** of collaterals and assets in the process of court auctions or sales.
- **Reclassification of leases**, i.e. from operating leases to financial leases, if the asset risk of the operating lease can be fully converted into counterparty risk (in other words, all of the risks and rewards incidental to ownership of the leased asset are transferred from the lessor to the lessee).
- **Fulfilment of existing contracts and commitments** (e.g. real estate under construction, activation of leases to go), provided the contract or local legislation does not allow for the possibility of cancelling the commitment in part or in whole, for example under one of the covenant clauses.

4.2.3. New business in the Retail segment

In accordance with point 4.2.2.1 and in compliance with the principles of due and prudent risk reporting, 'new business' for the retail segment is defined as follows:

- (i) A risk-relevant credit or leasing transaction (e.g. a loan or a credit line) which is considered a retail lending or leasing product and which is **newly granted to an existing or new customer** (or GoB), **OR**

- (ii) For **limit-based retail products** already held by a retail client, such as overdrafts, credit cards and retail SME (working capital) credit lines, the difference between the newly granted (higher) limit and the old (lower) limit, **OR**
- (iii) For **amortising retail products** already held by a client, such as all forms of instalment loans, the difference between the newly/granted (higher) loan amount and the old (lower) loan amount.

4.2.3.1. Further definitions and considerations

- (i) Until HGAA is in a position to report on incremental exposure increases as outlined in 4.2.3(ii) and (iii), exposure increases with existing clients (on a product basis) are considered **new business**. For clarification: a decrease in the instalment frequency (e.g. from monthly to quarterly) is considered new business.
- (ii) **Marginal/insignificant** exposure increases (up to EUR [...]) caused by transaction fees, capitalised interest/fees, etc., in particular relating to the transactions listed under 4.2.3.2 (e.g. currency switches, restructurings, consolidations, prolongations, etc.) are **not considered new business at any time**.
- (iii) Within the context of exposure-increasing retail business, the existence or otherwise of new business must be determined at the level of individual transactions, so exposure increases on one product (held by the client) are not to be netted against exposure decreases on another product. Netting of client loans against client deposits is not permissible either.
- (iv) **Finance leasing** shall be treated as credit financing, and is therefore new business pursuant to 4.2.3, and subject to the restrictions on new business.
- (v) **Operating leasing** shall be treated as new business if it is caught by 4.2.3, and is therefore subject to the restrictions on new business.
- (vi) **Reclassification of leases** (e.g. from operating leases to finance leases) is not considered new business, unless it increases the risk exposure of the bank in regulatory or economic terms.

4.2.3.2. Limitations/Exclusions

The following risk-relevant transactions are to receive **specific treatment**:

- All offers on retail loans made to clients before 1 January 2013 **are not subject to the restrictions on new business**, provided that they are accepted by the client within the acceptance period as determined by the laws in the relevant country. Offers made after 1 January 2013 must comply with the commitments under point 4.1.
- Retail loans made **using funds from development banks and supranational financing institutions** (e.g. EIB, EBRD, HBOR, SID, etc.) and subsidised loan programmes supported by sovereign/sub-sovereign lending or insurance agencies or public funds are not subject to the restrictions on new business.
- **Restructuring of retail loan or lease contracts**, if they were provided to natural persons (private clients) with a maximum amount of EUR [...], **are not considered new business, as long as the exposure is not increased**. The following principles must be observed:
 - Restructuring should always be net-present-value neutral (NPV-neutral);
 - In the course of a restructuring, exposure to a client may NOT be increased;

- No new money may be disbursed to the customer during the restructuring process or under the restructured obligation;
- Restructuring of a retail client may take place only if the client demonstrates the ability and willingness to repay the restructured obligation;
- Clients being sued (by a third party), subject to legal enforcement measures, or otherwise having limited legal capacity because of a statutory procedure may not be restructured.

If the client is not a natural person (private client) but an SME (business client) and hence not subject to the above eligibility criterion, the restructuring rules (recovery maximisation) and maturity limitations for corporate clients will apply.

- **Cross-segment migration of existing exposure without any exposure increase is not considered new business.** This in particular affects exposure on project financing (e.g. construction of apartments) made by the corporate segment, which is ultimately covered/paid back by retail clients, for example when they take up loans for the purchase of the apartments. In this case, the exposure has effectively migrated from the corporate segment to the retail segment. However, the following limitations apply:
 - The maximum permissible LTV is [...] %, and
 - The maximum annual volume of new business is limited to [...] % of the annual volume of new retail mortgage business within each country.
- Increases in the total exposure of retail loans due to **interest, fees or other forms of debt capitalisation** (mostly in the context of non-performing loans or restructurings) **are not considered to be new business.**
- **Debt consolidation** for retail clients (within HGAA booking entities or groups of accounts) is considered to be part of restructuring if the related exposure is limited to EUR [...] (EUR [...] in Croatia, if accepted by the Monitoring Trustee, see 4.2.1.3). If the exposure is larger, the maturity limitations for corporate clients will apply.

However, if the new consolidated loan is granted in the form of a retail loan, and the exposure is (substantially) higher than the sum of exposures of the consolidated loans, the difference in exposure is deemed to be new business, in accordance with 4.2.3(ii) and (iii). Until the reporting capabilities are in place, however, 4.2.3.1(i) applies.

- 'Loan top-ups' on retail loans are **not to be considered new business**, if the option to top up was explicitly granted in the original loan agreement, could not be cancelled by HGAA and was subject only to the client meeting certain loan covenants, although without the client having to go through a standard loan appraisal. In the case of other forms of top-ups on retail loans, the difference between the old loan amount and the new loan amount is considered to be **new business** in accordance with 4.2.3(ii) and (iii). Until the reporting capabilities are in place, however, 4.2.3.1(i) applies.
- 'Currency switches', i.e. a retail client switching from a foreign-currency denominated loan (or foreign-currency indexed loan) to a local-currency denominated loan, without a substantial increase in exposure (up to EUR [...]), **are not considered new business.** In the event of a substantial increase in exposure, the difference between the old loan amount and the new loan amount is considered **new business** in accordance with 4.2.3(ii) and (iii). Until the reporting capabilities are in place, however, 4.2.3.1(i) applies.

— Retail loans granted for the re-marketing or re-leasing of repossessed assets/collaterals **are not considered new business**, although the following limitations apply:

— For the re-marketing of apartments and other real estate, the maximum permissible LTV is [...] % and the maximum annual volume of new business is limited to [...] % of the annual volume of new retail mortgage business within each country.

— For vehicles and equipment, the maximum annual volume of new business is limited to [...] % of the annual volume of new retail vehicle and equipment business within each country.

— Fulfilment of existing contracts and commitments (e.g. real estate under construction, activation of leases to go) **is not considered to be new business**.

IV. *Reprivatisation of the operational entities*

1. Reduction in balance sheet totals and market presence

1.1. On 31 December 2008 HGAA was active as an international financial group with 384 branches in twelve countries (Austria, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro, Bulgaria, Germany, the Former Yugoslav Republic of Macedonia, Ukraine, Hungary) in banking (retail, corporate, public), leasing (retail, corporate, real estate, motor vehicles, equipment) and shareholdings with a balance-sheet total of EUR 43,34 billion and risk-weighted assets (RWA) of EUR 32,83 billion.

1.2. Soon after HGAA was nationalised, it withdrew from all new business in Bulgaria, the Former Yugoslav Republic of Macedonia, Ukraine, Hungary and Germany and ceased all non-strategic activities. The subsidiaries in these countries were put into wind-down and are now being resolved in an orderly fashion. The strategic new positioning has resulted in the closure of twelve of the former total of eighteen branches in the 'wind-down countries' of Bulgaria, the Former Yugoslav Republic of Macedonia, Ukraine, Hungary and Germany.

1.3. HGAA's remaining market activities on 31 December 2012, i.e. the 'operational entities' within the meaning of section B.II.1, and the HBI, had a combined balance-sheet total of approximately EUR 17,54 billion and RWA of EUR 11,02 billion, which corresponded to merely some 40,5 % of HGAA's group balance-sheet total and 33,6 % of RWA on 31 December 2008. Of these amounts,

— HBA had a balance-sheet total on 31 December 2012 of some EUR 4,15 billion, representing approximately 59 % of its balance-sheet total on 31 December 2008 (EUR 7,05 billion) and only 10 % of HGAA's group balance-sheet total on 31 December 2008 and RWA of EUR 1,23 billion (HBA on 31 December 2008: EUR 3,392 billion);

— HBI had a balance-sheet total on 31 December 2012 of EUR 3,28 billion, corresponding to approximately 65 % of its balance-sheet total on 31 December 2008 (EUR 5,02 billion) and only 8 % of HGAA's group balance-sheet total on 31 December 2008, and RWA of EUR 2,54 billion (HBI on 31 December 2008: EUR 4,198 billion);

— the SEE network had a balance-sheet total on 31 December 2012 of EUR 10,11 billion, corresponding to 68,5 % of its balance-sheet total on 31 December 2008 (EUR 14,775 billion) and only 23 % of HGAA's group balance-sheet total on 31 December 2008, and RWA of EUR 7,2 billion (SEE at 31 December 2008: EUR 12,623 billion);

The classification of HBI as a wind-down entity in the second half of 2013 reduces the combined balance-sheet total of the operational entities (HBA and SEE network) by a further 19 % compared with the existing data, corresponding to only approximately 33 % of HGAA's group balance-sheet total and 26 % of RWA on 31 December 2008.

- 1.4. The remaining operational entities are to be privatised as quickly and efficiently as possible in accordance with section B.IV.3. After the operational entities have been completely privatised, HGAA's balance sheet will still contain business to be wound down.
2. Maintaining profitability until reprivatisation

Austria commits that HGAA will conduct the business of the operational entities with the objective of restoring and maintaining their long-term profitability in accordance with the provisions of the restructuring plan and its annexes (including this list of commitments). This commitment does not stand in the way of the restructuring of the operational entities and/or the transfer of individual assets or portfolios to the wind-down part, provided this is necessary to restore, maintain or optimise the prospects of reprivatisation.
3. Earliest possible reprivatisation

Austria undertakes that the operational entities will be reprivatised at the earliest possible opportunity in accordance with this section. References in this section B.IV.3. to the reprivatisation of the operational entities include the authorised reprivatisation of parts of the operational entities, if necessary.
- 3.1. Reprivatisation

The reprivatisation of an operational entity is deemed to have taken place if the Republic of Austria has sold 100 % of the shares or all the assets of the operational entity concerned to one or more purchasers not controlled by the Republic of Austria. Reprivatisation also includes the sale of all the shares held directly or indirectly by Austria in the operational entities as part of an IPO under normal market conditions.
- 3.2. Date of reprivatisation

Reprivatisation is deemed to have taken place on the day on which a binding purchase contract for the acquisition of the operational entity governed by the law of obligations ('purchase contract') is signed. Where parts of an operational entity are sold to several purchasers, the effective date of privatisation is the day on which the last purchase contract is concluded. In the event of an IPO, the effective date of a timely privatisation is the day on which the last share held directly or indirectly by Austria is placed on the market. However, the entities sold through an IPO are no longer bound by the commitments in section B.III with effect from the day on which [...] shares are placed on the market.
- 3.3. Reprivatisation deadline

HBA must be reprivatised by 31 December 2013 and the SEE network by 30 June 2015.
- 3.4. Execution deadline

The sale of HBA must take place by [...]. Execution of contracts for the sale of the SEE network must take place by [...].
- 3.5. Extension of the execution deadlines

In the event of delays due to the absence of the necessary sale authorisations by a supervisory or competition authority, the Commission may agree to extend an execution deadline for the sale of the SEE network in accordance with 3.4 by a further [...]. Austria will submit an application in good time, in any event at least two weeks before the original execution deadline expires, and provide the Commission with confirmation from the Monitoring Trustee that the delay is due entirely to the authorising authority(ies) and confirmation that HGAA has taken all reasonable steps in order to bring about execution of the sale contract within the original deadline.
- 3.6. Change of purchaser

If it transpires, after the timely reprivatisation but before the execution deadline has expired, that the purchaser of an entity is unable to fulfil the execution conditions or cannot fulfil them by the execution deadline, the sale may take place to a third party with the Commission's agreement, provided that sale can be executed within the execution deadline for the first sale.

3.7. Failure to meet the reprivatisation or execution deadlines

If a reprivatisation deadline under 3.3 or an execution deadline under 3.4 read in conjunction with 3.5 is not met, the entity concerned must cease new business from the day following the day on which the deadline expires. From that date, the provisions of this list of commitments that apply to the wind-down part shall apply to the entity concerned.

4. Sale procedure

4.1. Austria undertakes that HGAA will initiate the sale procedures needed to re-privatise the operational entities in a timely fashion and conduct them quickly in order to allow the earliest possible reprivatisation.

4.2. Reprivatisation of the operational entities will take place either as part of an IPO under normal market conditions or, where allowed by law and possible without infringing commercial secrets, as part of an open, transparent and unconditional sale procedure involving the usual representations and warranties. This does not preclude the holding of negotiations with specifically identified interested parties before or during such a procedure.

V. Wind-down part

1. Wind-down of existing business that preserves capital and value

1.1. Austria commits that HGAA, with effect from the date of adoption of the final approval, will wind down exclusively the business in its wind-down part on that date in a way that preserves capital and value.

1.2. The assets in the wind-down part will be actively and effectively sold, liquidated or wound down.

1.3. In principle the assets must be sold as quickly as possible. HGAA undertakes to sell these assets as soon as it is possible to achieve at least the asset book value as sale proceeds, unless the sale price is considered clearly inappropriate on the basis of an incontestable, objective valuation.

1.4. All assets that cannot be sold under 1.3 will expire at term.

2. No new business in the wind-down part

2.1. Austria commits that, with effect from the date of adoption of the final approval, no new business will be concluded in the wind-down part. Save as otherwise provided for below under 2.2 and 2.3, from that date all HGAA companies, with the exception of the operational entities, will wind down only their existing business on that date.

2.2. Prolongations with existing customers remain allowed in the wind-down part too if there is a realistic and plausible prospect, supported by evidence, that a prolongation will improve the future serviceability or future utilisation of the financing. Prolongations will not be granted for longer than [...]; justified exceptions with longer extension periods are to be disclosed to the Monitoring Trustee and adequately justified in each individual case. Even at the end of the restructuring period all wind-up activities must be resolved as quickly as possible.

The following continue to be admissible:

— transactions which are necessary in the context of liquidity management in the wind-down part, i.e. central bank transactions;

— management of the cover pools in the wind-down part, where no new asset business is transacted, save as provided by the rule in indent 4;

- derivative transactions which are necessary in order to manage interest-rate, currency and credit risks in the existing portfolio, e.g. asset swaps, provided that they reduce HGAA's overall market risk position;
- transactions that are necessary for regulatory or other legal reasons, including the acquisition, holding and sale of securities authorised for the management of HGAA's cover pools and liquidity;
- business concluded by the wind-down entity for its own refinancing, including new issues and buying back of debt;
- the purchase of moveable and immovable assets in the context of court-supervised and extra-judicial auctions and private transfer to take possession of securities;
- fulfilment of existing contracts and commitments (e.g. real estate under construction, activation of leases to go, reclassification of finance leases as operating leases and vice versa);
- re-leasing of assets (short to medium-term), where it is not possible to sell the assets in the short term and preserve value, in order to reduce or avoid costs (maintenance, etc.).

In addition, transactions with HGAA group companies remain authorised (provided that their purpose is the prolongation of refinancing lines) and transactions with buyers of HGAA assets (shareholdings, portfolios, etc.), which are carried out in connection with the reprivatisation and are necessary for the successful sale of the entities/assets concerned (e.g. seller financing, extension by HGAA of collateral granted — such as guarantees — in favour of the buyer, etc.).

- 2.3. In the case of engagements whose performance is affected, the wind-down entity may, as part of the recovery and resolution, make adjustments to the transaction with the respective debtor of the reference commitment concerned, provided that these measures can be regarded as preserving value or reducing risk without causing distortions of competition, which must be substantiated in writing to the Monitoring Trustee in every case. Adjustments to the transaction are changes to the engagement, for example interest-rate adjustments, deferrals, rescheduling of maturity, assumption of an obligation, prolongations and debt conversion, e.g. through the conclusion of new credit agreements for the same amount, changes to collateral or changes to financial ratios or waiving the legal effects of financial ratios. The adjustments referred to in this paragraph may have a maturity extension of [...]; adjustments exceeding this may be undertaken only with the approval of the Monitoring Trustee.
 - 2.4. Furthermore, (financing of) expenditure on direct enhancements of assets to be sold is authorised, if by so doing it is possible to significantly increase the chances of marketing. This concerns in particular legal fees and administrative charges (e.g. for corrections to the local land register) and, in individual cases, structural/technical changes to individual assets, for which agreement by the Monitoring Trustee is required.
3. Wind-down of HBI

In order to prevent market distortion during the resolution of Retail-Bank HBI and deposit outflows, and to cushion against HBI's resulting additional liquidity requirements, the following provisions will apply to HBI:

 - 3.1. HBI will not transact any new business, save as otherwise provided below.
 - 3.2. HBI's assets will be gradually reduced through sales of portfolios or individual assets, further restructuring transactions (i.e. transfers of portfolios and/or assets to the wind-down entity) and also by the amortisation of existing assets.

3.3. The wind-down of the liabilities on HBI's balance sheet will follow the wind-down of the assets on its balance sheet and will be determined by the latter. HBI's liabilities will therefore be reduced proportionally to the reduction on the asset side.

3.4. At present, the following key steps are planned for the wind-down of HBI:

— reduction in the current balance-sheet total of approximately EUR 3 billion by around [...] % by the end of 2013 through further portfolio transfers to the local wind-down entity (HLI);

— reduction in the balance-sheet total of the remaining amounts receivable by contractual maturity of around EUR [...] to some EUR [...] by the end of 2018;

— [...]

[...]	[...]	[...]	[...]	[...]	[...]	[...]
[...]	[...]	[...]	[...]	[...]	[...]	[...]
[...]	[...]	[...]	[...]	[...]	[...]	[...]

3.5. In order to secure [...] own refinancing by HBI in the wind-down stage and avoid the need for additional liquidity, HBI may [...], provided this is necessary in order to prevent or offset an undershoot of the existing [...].

3.6. HBI will offer/take deposits only at nominal interest rates below the average of the best reference rates offered in the same period by HBI's five leading unassisted competitors [...] for comparable products.

3.7. [...].

3.8. Save as otherwise provided above, the provisions concerning the wind-down part in V.1 and V.2 shall apply mutatis mutandis to the wind-down of HBI.

2. Monitoring Trustee

I. Appointment

1. Austria will ensure that HGAA appoints, in accordance with the following provisions, a Monitoring Trustee (hereinafter: 'Trustee') who must carry out the tasks and duties referred to in section C.II.

2. The Trustee must be independent of HGAA, at no time become exposed to a conflict of interest, and possess the specialist knowledge required to carry out his mandate. The Trustee is to be remunerated by HGAA in a way that does not impede the independent and effective fulfilment of his mandate. The cost of the Trustee will, as far as is legally permissible, be borne by HGAA, otherwise it will be borne by Austria.

3. With the agreement of the Commission, the Trustee already appointed in fulfilment of the commitments in point 12 of the Annex to the Commission's approval decision of 5 December 2012, C(2012) 9255 final, [...], will continue to act as Trustee. In the event that the Commission instead requires another Trustee to be appointed, the following will apply:

3.1. Austria undertakes that HGAA will submit the names of one or more persons as Trustee within an appropriate time frame. The proposals must contain sufficient information about those persons with regard to their suitability (section C.I.2). The appointment of a proposed Trustee by HGAA is subject to the approval of the Commission, which may withhold its approval only if the proposed Trustee is manifestly unsuitable.

- 3.2. If the Commission rejects all the trustees proposed by HGAA, Austria undertakes to ensure that HGAA submits the names of one or more further persons within four weeks of being informed of the rejection, in accordance with the requirements and procedure set out in sections C.I.2 und C.I.3. If all further proposed trustees are also rejected by the Commission, the Commission will nominate a trustee whom HGAA will then appoint.

II. *Duties and obligations of the Trustee*

1. The duty of the Trustee is to monitor the full and timely implementation of HGAA's restructuring plan and compliance with the commitments, and to perform the Trustee's specific duties set out in the list of commitments (for example in section D.I.). The Commission may request explanations or clarifications from the Trustee.
2. The Trustee will report quarterly to the Commission on the implementation of the restructuring plan and compliance with the commitments. To this end, the Trustee will submit a draft written report on the implementation of the restructuring plan and compliance with the commitments to the Commission, Austria and HGAA after the end of each quarter. If necessary, the Commission may specify the scope of the report in more detail.
3. The Commission, Austria and HGAA may submit comments on the draft within two weeks of receiving it ('deadline for comments'). Within four weeks of the deadline for comments, the Trustee will submit the final report to the Commission, incorporating any comments. The Trustee is also to send a copy of the final report to Austria and HGAA.

III. *Duties and obligations of Austria and HGAA*

Austria will ensure that, during the implementation of the final approval, the Commission and the Trustee are to have unrestricted access to all information required to monitor the implementation of the final approval. HGAA will support the Trustee by preparing and making information available quickly. The Commission and the Trustee may ask HGAA and Austria for explanations and clarification. Austria and HGAA will cooperate fully with the Commission and the Trustee with regard to monitoring of the implementation of the final approval.

IV. *Replacement and discharge of the Trustee*

1. If the Trustee does not fulfil his duties and obligations or does not (any longer) fulfil the suitability criteria (section C.I.2.), the Trustee may be removed by HGAA with the agreement of the Commission or, in the event of a corresponding justified request by the Commission, after hearing the Trustee, the Trustee must be removed by HGAA. If the Trustee is removed, he must be replaced by a new Trustee. The new Trustee is to be appointed in accordance with the procedure referred to in section C.I..
2. If the Trustee is removed, he may be required to continue in his function until a new Trustee is in place. The removed Trustee must hand over all relevant information to the new Trustee. The activity of the removed Trustee will end only once he has been discharged from his duties by HGAA with the agreement of the Commission.

2. **Final provisions**

I. *Reporting on further aid*

1. The Republic of Austria undertakes not to grant further aid to companies in the HGAA Group that are not included in the wind-down part unless the aid serves regulatory requirements and this is confirmed by the regulator. The Republic of Austria further undertakes to notify the Commission immediately of all further aid measures in favour of HGAA until the restructuring plan has been fully implemented.

II. *Settlement of legal disputes*

1. In the event of a conflict between Austria's commitments and HGAA's legal obligations, Austria undertakes that HGAA will notify the Trustee without delay and propose an alternative to resolve the conflict.

2. After receiving a sufficiently documented alternative proposal from HGAA, the Trustee will examine as rapidly as possible, in consultation with the Commission, whether the alternative proposal is appropriate, having regard to the final approval and the specific HGAA legal obligation in question. If the proposal is suitable, the Commission services will take the further necessary steps in accordance with the relevant procedures.

III. *Consultation clause*

In response to a sufficiently documented application by Austria, the Commission may, in consultation with the Trustee, grant an extension to the deadlines laid down in the commitments, provided that a certain result is promised within that deadline, or lift, change or replace one of more of the duties and conditions in these commitments.

COMMISSION DECISION**of 16 October 2013****on State aid No SA.18211 (C 25/2005) (ex NN 21/2005) granted by the Slovak Republic for Frucona Košice a.s.***(notified under document C(2013) 6261)***(Only the Slovak text is authentic)****(Text with EEA relevance)**

(2014/342/EU)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union, and in particular the first subparagraph of Article 108(2) thereof ⁽¹⁾,

Having called on interested parties to submit their comments pursuant to the provision referred to above and having regard to their comments ⁽²⁾,

Whereas:

I. PROCEDURE**1. PROCEDURE BEFORE THE COMMISSION**

- (1) By letter of 15 October 2004 registered on 25 October 2004, the Commission received a complaint concerning alleged unlawful state aid granted to Frucona Košice, a. s.. The complainant sent additional information on 3 February 2005. A meeting with the complainant took place on 24 May 2005.
- (2) On the basis of the information provided by the complainant, by letter of 6 December 2004 the Commission asked Slovakia to provide information on the disputed measure. Slovakia responded by letter of 4 January 2005, registered on 17 January 2005, informing the Commission about the potentially unlawful aid granted to Frucona Košice a. s. in the context of an arrangement with creditors and asking the Commission to approve the aid as rescue aid to a company in financial difficulties. Slovakia submitted additional information by letter of 24 January 2005, registered on 28 January 2005. The Commission asked for additional information by letter of 9 February 2005, to which it received answers by letter of 4 March 2005, registered on 10 March 2005. A meeting with the Slovak authorities took place on 12 May 2005.
- (3) By letter of 5 July 2005, the Commission informed Slovakia that it had decided to initiate the procedure laid down in Article 108(2) TFEU in respect of the aid.
- (4) The Commission decision to initiate the procedure was published in the *Official Journal of the European Union* ⁽³⁾. The Commission invited interested parties to submit their comments on the measure.
- (5) The Slovak authorities submitted their observations by letter of 10 October 2005, registered on 17 October 2005. The Commission received comments from one interested party (the beneficiary) by letter of 24 October 2005, registered on 25 October 2005. It forwarded them to Slovakia, which was given the opportunity to react; Slovakia's comments were received by letter dated 16 December 2005, registered on 20 December. A meeting at which the beneficiary was given the opportunity to explain its submission took place on 28 March 2006. Slovakia submitted additional information by letter of 5 May 2006, registered on 8 May 2006.

⁽¹⁾ With effect from 1 December 2009, Articles 87 and 88 of the EC Treaty have become Articles 107 and 108, respectively, of the TFEU. The two sets of provisions are, in substance, identical. For the purposes of this Decision, references to Articles 107 and 108 of the TFEU should be understood as references to Articles 87 and 88, respectively, of the EC Treaty where appropriate. The TFEU also introduced certain changes in terminology, such as the replacement of 'Community' by 'Union' and 'common market' by 'internal market'. The terminology of the TFEU will be used throughout this Decision.

⁽²⁾ OJ C 233, 22.9.2005, p. 47.

⁽³⁾ See footnote 2.

- (6) The Commission adopted a decision ordering recovery of the aid on 7 June 2006 ⁽⁴⁾. Since that date, in the course of its contacts with the Slovak authorities concerning execution of that decision, the Commission was notified of the outcome of the national judicial proceedings relating to the amount of debt to be entered into the arrangement with the creditors. That information should be taken into account in this decision.

2. THE PROCEEDINGS BEFORE THE GENERAL COURT

- (7) On 12 January 2007 Frucona Košice a.s. appealed against the decision to the General Court of the European Union, contesting, inter alia, the classification of the debt write-off as state aid by claiming that it was in line with the market economy creditor principle. By judgment of 7 December 2010 (Case T-11/07) the General Court dismissed the arguments of the applicant and confirmed the Commission decision on the grounds that bankruptcy would have been more advantageous for the State than the arrangement with the creditors.

3. PROCEEDINGS BEFORE THE COURT OF JUSTICE

- (8) Frucona Košice a.s. appealed against the judgment of the General Court to the Court of Justice, claiming in particular that the General Court had failed to assess correctly the Commission's application of the private creditor test and had inadmissibly sought to substitute its own reasoning for that of the Commission as regards the private creditor test (Case C-73/11 P).
- (9) On 24 January 2013 the Court of Justice set the judgment of the General Court aside. The Court of Justice concluded that the Commission had committed a manifest error of assessment by failing to take into account the duration of bankruptcy proceedings in its assessment of the private creditor test or, if it had taken that factor into account, by failing to set out sufficient grounds for its decision. The case was referred back to the General Court for judgment on the company's pleas concerning the tax execution procedure which it had not yet ruled on.

4. REVOCATION

- (10) In view of the judgment of the Court of Justice, the Commission therefore considers it appropriate to revoke the original decision of 7 June 2006 and replace it with this decision in order to remedy the shortcomings identified by the Court of Justice.

II. DETAILED DESCRIPTION OF THE AID

1. THE COMPANY

- (11) The beneficiary of the financial support is Frucona Košice a. s., a company which was active in the production of spirit and spirit-based beverages, non-alcoholic beverages, canned fruit and vegetables, and vinegar. After losing its licence the beneficiary stopped producing spirit and spirit-based beverages. Nevertheless, it continued to be active on the wholesale market for spirit and spirit-based beverages. The company is situated in a region eligible for regional aid under Article 107(3)(a) TFEU.
- (12) At the time of the relevant events, the beneficiary employed about 200 people. In its comments on the decision to open the formal investigation, the company provided the Commission with data on turnover (including excise duties and VAT), shown in the following table.

Table 1

Turnover in different segments of production, including excise duties and VAT [SKK]

	2002	2003	2004
Vinegar	28 029 500	27 605 100	11 513 600
Fruit and vegetable production	37 112 500	32 584 500	22 696 400
Cabbage	2 878 340	503 030	201 310

⁽⁴⁾ Commission Decision 2007/254/EC of 7 April 2006 on State aid C 25/2005 (ex NN 21/2005) implemented by the Slovak Republic for FRUCONA Košice, a.s. (OJ L 112, 30.4.2007, p. 14).

	2002	2003	2004
Carbonated non-alcoholic beverages	9 373 800	17 601 600	17 560 100
Non-carbonated non-alcoholic beverages	2 877 700	6 420 420	7 920 010
Juices – 100 %	51 654 900	43 421 600	22 706 600
Spirits	696 193 500	743 962 700	728 837 400
Cider	1 495 640	106 360	0
Syrup	5 928 100	6 502 920	5 199 540
Other products/services	59 476 000	99 635 000	63 680 000
TOTAL	895 019 980	978 343 230	880 314 960 (*)

(*) In EUR, the turnover is said to have been EUR 23,6 million in 2002, EUR 25,7 million in 2003 and EUR 23 million in 2004. The exchange rate used for information purposes in this Decision is EUR 1 = SKK 38.

- (13) These data differ considerably from the data obtained by the Commission from the Slovak authorities and stated in the decision to open the formal investigation⁽⁵⁾. In their reaction to the comments of the beneficiary after the opening of the formal investigation, the Slovak authorities did not dispute the accuracy of the above figures. According to the Slovak authorities, the beneficiary qualifies as a medium-sized enterprise.

2. APPLICABLE NATIONAL LEGISLATION

- (14) The disputed measure is a write-off of a tax debt by the Košice IV Tax Office under an arrangement with creditors. This process is governed by Bankruptcy and Arrangement Act No 328/91 (the 'Bankruptcy Act').
- (15) An arrangement with creditors is a court-supervised process, which, like bankruptcy, is designed to settle the financial situation of indebted companies⁽⁶⁾. Under bankruptcy proceedings, the company ceases to exist and either its assets are sold to a new owner or the company is liquidated. In contrast, under arrangement proceedings, the indebted company continues to trade with no change of ownership.
- (16) Arrangement proceedings are initiated by the indebted company. The purpose is to reach an agreement with its creditors whereby the indebted company pays off part of its debt and the remainder is written off. The agreement has to be approved by the supervising court.
- (17) Creditors whose receivables are secured, for example by means of a mortgage, act as separate creditors. For the arrangement proposal to be accepted, all the separate creditors have to vote in its favour, whereas for other creditors a qualified majority suffices. In other words, separate creditors vote separately and have a right to veto the proposal.
- (18) Separate creditors have a privileged position also in bankruptcy proceedings. The claims of the separate creditors may be satisfied at any time during the bankruptcy proceedings and any proceeds from sale of secured assets under the bankruptcy proceedings are meant to be used exclusively to satisfy the claims of the separate creditors. If the claims of the separate creditors cannot be covered from this sale, the remaining parts are put into the second group with the claims of the remaining creditors. In the second group, the creditors are satisfied on a *pro rata* basis.

⁽⁵⁾ The total turnover was said to have been SKK 334 million (EUR 8,8 million) in 2002, SKK 360 million (EUR 9,5 million) in 2003 and SKK 720 million (EUR 19 million) in 2004.

⁽⁶⁾ A company is considered indebted when it has a number of creditors and is not able to settle its obligations within 30 days from their due date.

- (19) Under the Bankruptcy Act, the company applying for an arrangement with creditors has to submit to the supervising court a list of measures for its reorganisation and for continued financing of its activity after the arrangement.
- (20) Under Act 511/92 on Administration of Taxes and Fees and Changes to the System of Local Financial Authorities (the 'Tax Administration Act'), a company may ask the tax authorities to defer payment of taxes. Interest is charged on the deferred amount and the deferred debt has to be secured.
- (21) The Tax Administration Act also governs tax execution, the aim of which is to recover the tax receivables of the State through sale of real estate, movable assets or of the firm as a whole.

3. THE FACTS

- (22) Between November 2002 and November 2003 the beneficiary availed itself of the possibility offered by the Tax Administration Act to have its obligation to pay excise duty on spirit deferred ⁽⁷⁾. The deferred debt totalled SKK 477 015 759 (EUR 12,6 million). Before agreeing to defer these payments, as prescribed by law the Tax Office secured each of its receivables against the beneficiary's assets. The Slovak authorities submit that the value of these securities based on the beneficiary's accounts was SKK 397 476 726 (EUR 10,5 million). The beneficiary, however, claims that the value of these securities, as estimated by experts at the end of 2003, was SKK 193 940 000 (EUR 5 million). This is, according to the beneficiary, the value of the secured assets (movable property, real estate and receivables) expressed in what are known as 'expert prices'.
- (23) As of 1 January 2004, the amended Tax Administration Act limited the possibility of requesting a tax deferral to only once a year. The beneficiary availed itself of this for the December 2003 excise tax payable in January 2004. However, it was not able to pay or have deferred the January 2004 excise duty payable on 25 February 2004. As a result, the beneficiary became an indebted company within the meaning of the Bankruptcy Act. As a result, the beneficiary lost its licence for production and processing of spirit.
- (24) On 8 March 2004 the beneficiary applied to the competent regional court for arrangement. After establishing that all the necessary legal requirements were met, the regional court decided to initiate arrangement by a decision of 29 April 2004. The creditors voted in favour of the arrangement proposed by the beneficiary at a meeting on 9 July 2004. The arrangement was confirmed on 14 July 2004 by a decision of the supervising regional court.
- (25) In August 2004 the Tax Office appealed against this confirmatory decision of the court. By a decision of 25 October 2004 the Supreme Court decided that the appeal was not admissible and declared the decision of the regional court approving the creditors' agreement to be valid and enforceable as of 23 July 2004. The public prosecutor subsequently appealed against the decision of the regional court under the extraordinary further appeal procedure.
- (26) The creditors, including the Tax Office, agreed with the beneficiary on the following arrangement: 35 % of the debt would be repaid by the beneficiary within one month from the validity of the creditors' agreement and the remaining 65 % of the debt would be foregone by the creditors. All the creditors were therefore treated equally. The specific amounts for each creditor are shown in the following table.

Table 2

The beneficiary's debt situation before and after the arrangement [SKK]

Creditor		Debt before the arrangement	Debt after the arrangement (*)	Amount written off
Public	Tax Office	640 793 831	224 277 841	416 515 990

⁽⁷⁾ The excise duty is payable on a monthly basis.

	Creditor	Debt before the arrangement	Debt after the arrangement (*)	Amount written off
Private	Tetra Pak a.s.	1 004 208	351 498	652 710
	MTM-obaly, s. r. o.	317 934	111 277	206 657
	Merkant družstvo	332 808	116 483	216 325
	Vetropack, s. r. o.	2 142 658	749 930	1 392 728
TOTAL		644 591 439 (**)	225 607 029	418 984 410

(*) The amount that the beneficiary is obliged to pay back to its creditors.

(**) In EUR, the total debt before the arrangement was EUR 16,96 million and the total debt remaining after the arrangement EUR 5,93 million.

- (27) The claims of the Tax Office entered in the arrangement proceedings totalled SKK 640 793 831 (EUR 16,86 million) and comprised mainly unpaid excise taxes for the period May 2003 – March 2004, VAT for the period January-April 2004, plus penalties and interest. The claims foregone by the Tax Office totalled SKK 416 515 990 (EUR 11 million). The arrangement provided the Tax Office with SKK 244 277 841 (EUR 5,86 million).
- (28) The Tax Office acted in the arrangement proceedings as a separate creditor and as such voted separately. Thus, in order for the arrangement to take place, the Tax Office had to vote in favour of it. The privileged position of the Tax Office was due to the fact that some of its receivables were secured in relation to the deferral of the beneficiary's tax debt in 2002-2003 (see paragraph 17). All the other creditors voted in favour of the proposed arrangement. Their receivables were ordinary trade receivables not secured in any manner.
- (29) In its proposal for arrangement, in accordance with the requirements of the Bankruptcy Act the beneficiary described reorganisation measures concerning the production, distribution and workforce (including redundancies).
- (30) On the organisational and workforce fronts, the beneficiary planned the following measures: creation of a universal production group for all the production activities, reorganisation of its transport facilities by exclusion of vehicles with the lowest residual value and reorganisation of commercial activities. These measures were to be accompanied by laying off 50 employees from March to May 2004. Over the same period, a further 50 employees were to work on 60 % remuneration.
- (31) In the production and technical area, the beneficiary stated that, since the company had lost the licence for production of spirit, the production facilities concerned would be rented out as of April 2004. The beneficiary planned to reduce or cease production of some unprofitable non-alcoholic beverages and stated that any introduction of a new product in this category would be preceded by an analysis of profitability of such a production.
- (32) The beneficiary also mentions the following measures: the cost restructuring that should result from lower production costs following the abandonment of the production of spirit and from the abolition of part of the company's own transport and the sale of old equipment for scrap.
- (33) The beneficiary also planned to sell an administrative building, a shop and a recreation building and mentioned the possibility of selling or renting out the vinegar production facility. In their comments on the decision to open the formal investigation procedure the Slovak authorities confirmed that the sale of the administrative building, the shop and the recreation building had not taken place.
- (34) The beneficiary planned an intensive sale of its stocks of ready products ⁽⁸⁾.

⁽⁸⁾ In view of the loss of the licence for production of spirit and derived beverages, and according to the information provided by the complainant, this sale probably concerned mainly the spirit.

- (35) According to this proposal, the beneficiary was to finance the arrangement through own resources (sale of stock) of SKK 110 million and through external financing in the form of a loan from a commercial bank of SKK 100 million. From the information submitted by the beneficiary in response to the opening of the formal investigation, the outstanding debt was eventually covered by the revenue from the issue of new shares (SKK 21 million; EUR 0,56 million), revenue from the sale of stock (SKK 110 million; EUR 2,9 million) and a supplier loan from Old Herold s.r.o. (SKK 100 million; EUR 2,6 million). The maturity of the invoices of Old Herold s.r.o. was 40 days, which, according to the beneficiary, was a long period considering the precarious financial situation of the beneficiary. This longer maturity enabled the beneficiary to accumulate the necessary cash.
- (36) After the opening of the formal investigation the Slovak authorities informed the Commission that, under the creditors' agreement, SKK 224 277 841 had been paid to the Tax Office on 17 December 2004. The Slovak authorities confirmed that they had suspended the write-off of the debt agreed in the arrangement proceedings pending resolution of the procedure before the European Commission.
- (37) In the context of their contacts concerning the execution of the Commission decision ordering recovery of the aid, the Slovak authorities informed the Commission of the outcome of the extraordinary appeal procedure referred to in paragraph 25: by decision of 27 April 2006, the Supreme Court of the Slovak Republic partially overturned the decision of the competent regional court of 14 July 2004 confirming the creditors' agreement on the grounds that road tax arrears of SKK 424 490 had wrongly been included in the arrangement. The Supreme Court dismissed the appeal as to the remainder. By decision of 18 August 2006, the competent regional court implemented the decision of the Supreme Court of 27 April 2006, stating that the corrected amount due to the Tax Office was SKK 640 369 341,4 (35 % of which is SKK 224 129 269,1).

III. DECISION TO INITIATE PROCEEDINGS UNDER ARTICLE 108(2) TFEU

- (38) In its decision to initiate the formal investigation the Commission raised doubts that the disputed write-off was free of state aid. The Commission concluded that the behaviour of the Tax Office in the arrangement proceedings did not meet the market economy creditor test. Specifically, the Commission found that the Tax Office was in a situation legally different from the other creditors, as it possessed secured claims and could initiate tax execution. The Commission doubted that the arrangement proceedings led to the best possible outcome for the State, when compared with bankruptcy proceedings or tax execution.
- (39) The Commission then raised doubts on the compatibility of the disputed aid with the internal market. It first raised doubts that the aid could be found compatible as rescue aid, as the Slovak authorities had claimed. Rescue aid can only be liquidity support in the form of loan guarantees or loans. The disputed measure, however, is a debt write-off, which corresponds to a non-repayable grant. In addition, the measure was not granted with the prospect that, no later than six months after the rescue measure had been authorised, the beneficiary would present a restructuring plan or a liquidation plan or reimburse the aid in full.
- (40) The Commission then considered the compatibility of the disputed measure as restructuring aid and raised doubts as to whether two of the main conditions were fulfilled: the existence of a restructuring plan ensuring the return to long-term viability within a reasonable time-frame and the limitation of the aid to the minimum necessary.

IV. COMMENTS FROM INTERESTED PARTIES

- (41) In addition to the information on the facts set out in Part II, the beneficiary submitted the following comments.
- (42) The beneficiary argues that the reason for its financial difficulties at the beginning of 2004 was the change in the Tax Administration Act, which restricted the possibility of requesting deferral of taxes to only once a year. This was an important change for the beneficiary, which had been, in its own words, relying on this mechanism in previous years.

- (43) On the merits of the case, the beneficiary first submitted that the Commission did not have jurisdiction to review the contested measure because the measure had been put into effect before the date of accession and was not applicable after accession. The measure is said to have been put into effect before accession because the arrangement procedure was initiated on 8 March 2004 and, as the beneficiary submits, approved by the court on 29 April 2004, i.e. before Slovakia joined the European Union. Furthermore, the tax authorities are said to have signalled their agreement to the proposed arrangement in the framework of negotiations preceding the initiation of the arrangement procedure. A meeting with the Tax Directorate of the Slovak Republic had taken place in December 2003 and on 3 February 2004 the local Tax Office sent the beneficiary a letter in which it, allegedly, confirmed the possibility of going ahead with an arrangement.
- (44) The beneficiary then submitted that, even if the Commission continued to maintain that it was competent to act, the contested measure did not constitute state aid because the market economy creditor principle was met.
- (45) First, the beneficiary claims that comparing arrangement with tax execution is misleading because the initiation of the former excludes or suspends the latter. Tax execution was not, therefore, an option for the Tax Office. In addition, according to the beneficiary, had it not voluntarily initiated the arrangement, after some weeks or months it would have had a legal obligation under the law governing insolvency to launch the procedure for bankruptcy or an arrangement.
- (46) Second, the beneficiary submits that the decision of the State to avoid bankruptcy but instead to seek a solution through an arrangement met the market economy creditor test. As evidence the beneficiary submits certificates from two auditors and one bankruptcy receiver stating that the Tax Office would receive more – and receive it more quickly – from the arrangement than from bankruptcy proceedings. The beneficiary also submits further material and statistics suggesting that bankruptcy proceedings in Slovakia last on average 3-7 years and bring only a very limited return from the sale of the assets ⁽⁹⁾.
- (47) The beneficiary bases its analysis mainly on a report of 7 July 2004 by the auditing company EKORDA, which the Tax Office allegedly had at its disposal before the creditors' vote on 9 July 2004. No evidence, however, was submitted showing that this was indeed the case.
- (48) According to the EKORDA report, the revenue from the sale of assets in the case of bankruptcy would be at best SKK 204 million (EUR 5,3 million), which, after deduction of various fees of SKK 45 million, would be only SKK 159 million (EUR 4,2 million). The beneficiary itself corrected the amount of the fees to be deducted (SKK 36 million) and arrived at the figure of SKK 168 million (EUR 4,4 million). Even though the Tax Office as the only separate creditor and by far the largest creditor would receive most of this revenue, it would still be less than what it received after the arrangement.
- (49) To arrive at this result EKORDA used as a basis the book value as at 31 March 2004 of fixed assets, stock, cash and short-term receivables after adjustments, taking account of their unrecoverability and low value. EKORDA adjusted the nominal value of the beneficiary's assets by a 'liquidation factor' for each component of the assets in the event of sale in bankruptcy (45 % for fixed assets, 20 % for stock and short-term receivables and 100 % for cash).
- (50) EKORDA mentions the future tax revenue from the operation of the beneficiary ⁽¹⁰⁾, as well as the development of employment in the region and of the food-processing industry in Slovakia as very important factors pleading in favour of the continuation of the beneficiary.

⁽⁹⁾ The beneficiary gives an example of a company owning similar assets and operating in the same sector and some more general statistical averages on the use of bankruptcy proceedings in Slovakia.

⁽¹⁰⁾ The 2004 figures used by EKORDA in its report show that 98 % is VAT and excise duties.

- (51) The beneficiary also mentions two other reports. The auditor Ms Marta Kochová concluded that the maximum revenue from the sale of the assets, which, however, were not evaluated, would be SKK 100 million (EUR 2,6 million), which, after deduction of fees of SKK 22 million, would be only SKK 78 million (EUR 2 million). The bankruptcy receiver Ms Holovačová is said to state that, in her opinion, in general arrangement is more advantageous for creditors than bankruptcy. One consideration is that the creditor has an interest in the debtor staying in business (future revenue from trade or from taxes).
- (52) Third, the beneficiary submits that long-term considerations should be taken into account, such as future tax revenue. It is asserted that the case-law excluding socio-political considerations from the market economy creditor test does not apply when the calculation of future tax revenue is considered by a public authority ⁽¹¹⁾. According to the beneficiary, the situation of the public authority here is analogous to the situation of a market economy creditor, who is a supplier interested in the survival of a client. The beneficiary then refers to the case-law on the market economy investor principle.
- (53) The beneficiary concludes that the market economy creditor test was met and the disputed measure does not constitute state aid.
- (54) Should the Commission nevertheless conclude otherwise, the beneficiary argues that the disputed measure is compatible as restructuring aid. The beneficiary submits that the Tax Office had verified the capacity of the business plan of the beneficiary to restore long-term viability before agreeing with the arrangement. The absence of a formal restructuring plan is, according to the beneficiary, irrelevant in the case of an *ex post* assessment by the Commission, because the Commission is now able to see whether the beneficiary did in fact become viable. However, the beneficiary considers that, in the case of an *ex ante* assessment, a detailed restructuring plan is necessary. It then briefly describes the restructuring measures undertaken: increase of own capital, lay-offs, and sale of stock. The beneficiary considers that the halting of the production of spirit and spirit-based beverages and the renting out of the production assets to the company Old Herold s. r. o. was indeed a restructuring measure. Even though originally the halting of production was the result of the loss of the licence, the beneficiary did not ask for a new licence after the arrangement.
- (55) According to the beneficiary, the requirement that its contribution to the restructuring be significant was also met.
- (56) Finally, the beneficiary submits that the fact that it is active in an assisted region and is one of the largest regional employers should be taken into account when applying the guidelines applicable to restructuring aid.

V. COMMENTS FROM THE SLOVAK REPUBLIC

- (57) In their reply to the opening of the formal investigation, the Slovak authorities made some comments on the facts already referred to in Part II.
- (58) The Slovak authorities confirmed that at the time of the vote on the arrangement the Tax Office did not take the state aid aspect into account. The Tax Office did not consider the arrangement as a form of state aid and therefore the beneficiary was not requested to provide a restructuring plan, which differs from the business plan submitted to the court in accordance with the insolvency legislation.
- (59) In their reaction to the comments submitted by the beneficiary, the Slovak authorities submitted the following comments of its own.

⁽¹¹⁾ The beneficiary refers to joined cases C-278/92, C-279/92 and C-280/92 *Spain v Commission* [1994] ECR I-4103.

- (60) The Slovak authorities would not apply the beneficiary's comments on the average length of bankruptcy proceedings and the average return from the sale of assets in bankruptcy proceedings to this case. According to them, considering the low number of creditors and the existence of assets with a positive liquidation value, which exceeded the amount paid to the State after the arrangement, bankruptcy proceedings would have been completed in a shorter period than the average and the yield of the Tax Office would have been higher than in case of the arrangement. The local Tax Office undertook an inspection at the company on 21 June 2004 and found that, as at 17 June 2004, the beneficiary had cash of SKK 161,3 million, receivables of SKK 62,8 million, stocks of spirit and spirit-based beverages with a value of SKK 84 million and fixed assets with a book value of SKK 200 million.
- (61) The Slovak authorities consider that tax execution was a real alternative for the Tax Office. They confirm that the Tax Office could have initiated this procedure prior to the arrangement, as it also could have done if the court had refused to confirm the arrangement (because the Tax Office as a separate creditor would not have voted for it).
- (62) The Slovak authorities do not agree with the beneficiary's assertion that its financial difficulties were due to the change in the Tax Administration Act. According to the Slovak authorities, the financial difficulties of the beneficiary were due to its financial strategy of using indirect taxes for the running of its own business, whereas what the beneficiary was supposed to do was simply collect the taxes from its clients and transfer them to the state budget.
- (63) The Slovak authorities do not agree that the meeting with the Tax Directorate in December 2003 is evidence of the Tax Office's preliminary agreement with the arrangement. They submitted a letter of 6 July 2004 from the Tax Directorate to the Tax Office, indicating that the Tax Office should not agree to the arrangement proposed by the beneficiary, because it was unfavourable for the State. This letter then referred to another, more general, letter of 15 January 2004 from the Minister of Finance to the Tax Directorate, asking it to ensure that no agreement would be given to proposals for arrangements with creditors that would involve write-offs of tax receivables by tax offices. Moreover the Slovak authorities interpret the letter of 3 February 2004 referred to by the beneficiary (see paragraph 43) as explicitly disagreeing with the arrangement at the level of 35 %.
- (64) The Slovak authorities submit that the beneficiary had not paid excise taxes on time from January 2001 to March 2004 and had regularly had its tax obligations deferred.
- (65) According to the Slovak authorities, considerable differences in the estimates of the two auditors' reports (see paragraphs 48 and 51) raise doubts as to the credibility of both reports. The authorities have, in particular, doubts on the liquidation factor assigned to current assets by EKORDA. This factor should be higher than 20 %.
- (66) Finally, according to the Slovak authorities, the beneficiary had not drawn up a viable restructuring plan and the arrangement measures proposed could not be considered restructuring measures.

VI. ASSESSMENT

1. COMPETENCE OF THE COMMISSION

- (67) As some of the relevant events took place before Slovakia joined the European Union on 1 May 2004, the Commission first has to determine whether it is competent to act with regard to the disputed measure.
- (68) Measures that were put into effect before accession and are not applicable after accession cannot be examined by the Commission either under the interim mechanism procedure, governed by Annex IV, point 3 of the Accession Treaty, or under the procedures laid down in Article 108 TFEU. Neither the Accession Treaty nor the Treaty on the Functioning of the European Union requires or empowers the Commission to review these measures.

- (69) However, measures put into effect after accession clearly fall within the competence of the Commission. In order to assess the moment when a certain measure was put into effect, the relevant criterion is the legally binding act by which the competent national authority undertakes to grant aid ⁽¹²⁾.
- (70) The beneficiary claimed that the disputed measure was put into effect before accession and is not applicable thereafter (see paragraph 43).
- (71) The Commission cannot accept the arguments put forward by the beneficiary. The proposal to initiate the arrangement proceedings is not an act of the granting authority, but an act of the beneficiary. The decision of the court to commence the arrangement proceedings is likewise not an act of the granting authority. This decision only permitted the beneficiary and its creditors to proceed with negotiations on the arrangement but clearly did not constitute the granting event. There is no evidence that the Tax Directorate would have expressed its agreement with the disputed measure at the meeting in December 2003. On the contrary, the Slovak authorities denied any such preliminary agreement. The letter of 3 February 2004 is explicit in refusing to accept the proposal to settle at the level of 35 %.
- (72) The decision of the competent authority to write off part of its claims was taken on 9 July 2004, when the Tax Office agreed with the arrangement proposed by the beneficiary.
- (73) Accordingly, the question of whether the measure is applicable after accession no longer arises.
- (74) The Commission therefore concludes that it is competent to assess the disputed measure pursuant to Article 108 TFEU.

2. EXISTENCE OF STATE AID WITHIN THE MEANING OF ARTICLE 107(1) TFEU

- (75) Article 107(1) TFEU declares any aid granted by a Member State or through state resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods and affects trade between Member States incompatible with the internal market.
- (76) Writing off a debt towards a public authority, such as a Tax Office, is a form of using state resources. Since it benefits an individual undertaking, the measure is selective.
- (77) Until the events that triggered the insolvency procedure, the beneficiary was operating in the market of the production of spirit and spirit-based beverages, non-alcoholic beverages and canned fruit and vegetables. In 2003 the beneficiary was the third producer of spirit and spirit-based beverages in Slovakia. After the loss of the licence for the production of spirit and spirit-based beverages in March 2004, the beneficiary was active in the wholesale of spirit and spirit-based beverages, produced by another company, Old Herold s. r. o., using the beneficiary's production assets that Old Herold s. r. o. rents. In all segments in which the beneficiary was active prior to the arrangement and in which it is active at present there is trade between Member States.
- (78) In the decision to open the formal investigation procedure, the Commission raised doubts as to whether the measure distorted or threatened to distort competition by conferring on the beneficiary an advantage that it would normally not be able to obtain on the market. In other words, the Commission had doubts as to whether the State behaved in relation to the beneficiary as a market economy creditor.
- (79) It was established that the creditors' agreement contained the same conditions of debt arrangement for both the private creditors and the Tax Office (public creditor). 35 % of the debt was to be paid to the creditors by a prescribed date, which is what the beneficiary did in fact do. The remaining 65 % was to be written off.

⁽¹²⁾ Case T-109/01 *Fleuren Compost v Commission* [2004] ECR II-132, paragraph 74.

- (80) However, the position of the Tax Office as a creditor in this case was unusually strong and cannot be equated to that of a typical creditor in bankruptcy proceedings. The legal and economic situation of the Tax Office before the creditors' agreement was more advantageous than that of the private creditors. Not only was the Tax Office, with more than 99 % of all claims registered in the bankruptcy proceedings, clearly the dominant and decisive creditor, it was also, and more importantly, a separate creditor. Its claims could therefore be satisfied at any time during the bankruptcy proceedings from the proceeds from the sale of the secured assets: as described in paragraph 18 above, those proceeds would be used exclusively to satisfy the claims of the separate creditor. It therefore needs to be examined in detail whether the Tax Office used all the means available to it to obtain the highest possible repayment of its receivables, as a market economy creditor would do.
- (81) The conditions which a measure must meet in order to be treated as aid for the purposes of Article 107 TFEU are not met if the recipient undertaking could, in circumstances which correspond to normal market conditions, have obtained the same advantage as that which has been made available to it through state resources⁽¹³⁾. That assessment is made by applying, in principle, the private market creditor test. When a public creditor grants payment facilities in respect of a debt payable to it by an undertaking, such payment facilities constitute state aid for the purposes of Article 107(1) TFEU where, taking account of the significance of the economic advantage thereby granted, the recipient undertaking would manifestly not have obtained comparable facilities from a private creditor in a situation as close as possible to that of the public creditor and seeking to recover sums due to it by a debtor in financial difficulty⁽¹⁴⁾.
- (82) The applicability of the private market operator test ultimately depends on the Member State concerned having conferred, otherwise than in its capacity as public authority, an economic advantage on an undertaking. It follows that, if a Member State relies on that test during the administrative procedure, it must, where there is doubt, establish unequivocally and on the basis of objective and verifiable evidence that the measure implemented is ascribable to the State acting as a private market operator. That evidence must show clearly that the Member State concerned took the decision to act as it did before or at the same time as conferring the economic advantage. In that regard, it may be necessary to produce evidence showing that the decision was based on economic evaluations comparable to those which would have been carried out in the circumstances by a rational private market operator in a situation as close as possible to that of the Member State. However, it is not enough to rely on economic evaluations made after the advantage was conferred, or on a retrospective finding that the course of action chosen by the Member State concerned was actually beneficial, or on subsequent justifications of the course of action actually chosen⁽¹⁵⁾.
- (83) In brief, the Slovak Republic submits that, in its view, the measure constitutes state aid. It acknowledged that, at the time of the arrangement, the question of state aid was simply not considered and requested that the disputed measure be treated as rescue aid. It therefore appears that the requirements of the case-law referred to above have not been complied with in this case and the disputed measure constitutes state aid within the meaning of Article 107(1) TFEU.
- (84) It is the beneficiary who argued that the measure is free of aid and submits the documents described above, in particular reports from two auditors.
- (85) On the basis of the information submitted both by the beneficiary and the Slovak authorities, the Commission determined the following facts on the financial situation of the beneficiary in the year in question, in as far as relevant for the application of the market economy creditor test. The figures as at 31 March 2004 provided by the beneficiary and the figures as at 17 June 2004 provided by the Slovak authorities cannot be verified by the Commission against the beneficiary's accounts. The Commission, however, has no reason to doubt these figures.

⁽¹³⁾ C-73/11 P *Frucona Košice*, judgment of 24 January 2013, not yet reported, paragraph 70.

⁽¹⁴⁾ See Case C-342/96, *Spain v Commission*, [1999] ECR I-2459, paragraph 46; Case C-256/97 *DM Transport* [1999] ECR I-3913, paragraph 30; Case C-124/10 P *Commission v EDF*, judgment of 5 June 2012, not yet reported, paragraph 79 and Case C-73/11 P *Frucona Košice*, judgment referred to above, paragraph 73.

⁽¹⁵⁾ See Case C-124/10 P *Commission v EDF*, referred to above, paragraphs 81 to 85.

Table 3

Financial situation of the beneficiary 2003–2004 [million SKK]

	31.12.2003 ⁽¹⁾	31.3.2004 ⁽²⁾	28.4.2004 ⁽³⁾	17.6.2004 ⁽⁴⁾	31.12.2004 ⁽⁵⁾
Non-current assets ⁽⁶⁾	208	205	204	200	200
Stocks	119	209	176	84	52
Cash	3	50	94	161	27
Short-term commercial receivables	128	98 ⁽⁷⁾	80	63 ⁽⁸⁾	97

⁽¹⁾ Source: Balance sheet 1 January 31 December 2003, provided by the beneficiary. All the values are book values.

⁽²⁾ Source: EKORDA report of 7 July 2004, taking into account the book value, except for the receivables, which are adjusted to their liquidation value.

⁽³⁾ Source: Balance sheet 1 January 28 April 2004, provided by the beneficiary. All the values are book values.

⁽⁴⁾ Information provided by the Slovak authorities and obtained during the on-the-spot check by the Tax Office at the beneficiary's premises on 17 June 2004 (see paragraph 60 above).

⁽⁵⁾ Source: Annual report 2004, provided by the beneficiary. All the values are book values.

⁽⁶⁾ Land, buildings, machinery, intangible assets, financial assets.

⁽⁷⁾ According to EKORDA, the book value of short-term receivables of SKK 166 million has to be adjusted to the liquidation value of SKK 98 million (see paragraph 97 below).

⁽⁸⁾ It is not clear whether this figure represents the book value or the liquidation value of the short-term receivables. As a precaution, the Commission assumed it is the book value.

- (86) The Commission will first examine the evidence submitted by the beneficiary in support of the statement that bankruptcy proceedings would have left the Tax Office worse off than arrangement proceedings (section 2.1). The Commission will then examine the position in relation to tax execution (section 2.2). Finally the Commission will examine other evidence submitted by the Slovak authorities and the beneficiary (section 2.3).
- (87) As described in paragraph 37, the amount of debt to be included in the arrangement was reduced as a result of the extraordinary appeal procedure. However, it should be noted that this judgment came several years after the decision to enter into the arrangement. For the purposes of the market economy creditor test, the information available at the time when a hypothetical creditor would have assessed which course of action was most appropriate remains the standard against which to measure the behaviour of the public creditor. The analysis below therefore uses the figures in the agreement as entered into on 23 July 2004.

2.1. Arrangement with creditors versus bankruptcy

- (88) In order to assess whether an advantage was actually conferred on the beneficiary, the Commission must carry out an overall assessment, taking into account all relevant evidence in the case enabling it to determine whether the beneficiary company would manifestly not have obtained comparable facilities from a private creditor ⁽¹⁶⁾. In other words, it must examine whether the Tax Office was better off accepting the conditions proposed under the arrangement or whether it would have been more advantageous to initiate bankruptcy proceedings.
- (89) The Commission considers that the EKORDA report is not a credible basis for comparing the arrangement proposed with hypothetical bankruptcy proceedings. The Slovak authorities agree with the Commission in this respect.
- (90) At the outset, the Commission notes that, when issuing its report on 7 July 2004 (just two days before the creditors' meeting), for its calculations EKORDA used the status of the beneficiary's assets as at 31 March 2004. It is clear from Table 3 that the level of various assets changed considerably after 31 March 2004. In particular a considerable portion of the stock was sold, which led to an increase in cash. These changes are of great importance

⁽¹⁶⁾ See Case C-124/10 P *Commission v EDF*, referred to above, paragraph 86.

when applying liquidation factors ranging from 20 % for stock and short-term receivables to 100 % for cash. Indeed, even if the liquidation factors estimated by EKORDA had been correct (which the Commission contests for the reasons set out below) and using the methodology used by EKORDA, the following table shows how the outcome of EKORDA's calculation would have been different if based on figures from 28 April 2004 and 17 June 2004, i.e. still before the creditors' meeting on 9 July 2004.

Table 4

**Comparison of the likely yield from the sale of the beneficiary's assets in bankruptcy proceedings
[million SKK]**

		Situation on:					
		31.3.2004		28.4.2004		17.6.2004	
	Liquidation factor [%]	Book value	Yield	Book value	Yield	Book value	Yield
Non-current assets	45	205	92	204	92	200	90
Stocks	20	209	42	176	35	84	17
Short-term receivables	20	98 ⁽¹⁾	20	86 ⁽²⁾	17	37 ⁽³⁾	7
Cash	100	50	50	94	94	161	161
Total			204		238		275

⁽¹⁾ This is the book value (SKK 166 million) adjusted by EKORDA to reflect the liquidation value of the receivables.

⁽²⁾ This is a proxy of the liquidation value that the Commission obtained by adjusting the book value of the short-term receivables (SKK 147 million) by the same ratio as EKORDA used in its analysis (see footnote 6, table 3).

⁽³⁾ This is a proxy of the liquidation value that the Commission obtained by adjusting the book value of the short-term receivables (SKK 63 million; see also footnote 21) by the same ratio as EKORDA used in its analysis (see footnote 16). The Commission, however, notes that, judging from the information provided by the Slovak authorities, the receivables of SKK 63 million were enforceable receivables. It is therefore very doubtful whether any adjusting of their book value is actually necessary. If the liquidation value of these receivables is actually SKK 63 million, the total yield in a bankruptcy procedure as at 17 June 2004 would have been SKK 331 million (EUR 8,7 million).

- (91) It should be noted that the business plan submitted by the beneficiary to the court the sale of stock for SKK 110 million was planned for the period March–May 2004. EKORDA must therefore have been aware that the assets of the beneficiary would be subject to considerable changes after 31 March 2004, but did not take this into account.
- (92) Had the book value of the beneficiary's assets from 28 April 2004 been taken into account, it would have led to the conclusion that the likely yield from the sale of the beneficiary's assets in a bankruptcy procedure would have been higher than estimated in the report (SKK 238 million, or EUR 6,3 million, instead of SKK 204 million, or EUR 5,3 million). An analysis using the figures from June 2004 would have allowed a clear conclusion to be drawn that the likely yield from the sale of the beneficiary's assets in bankruptcy proceedings (SKK 275 million; EUR 7,2 million) would have been higher than what was proposed under the arrangement, and that the Tax Office should use its veto right and reject the proposal with the effect of terminating the arrangement. Again, the Commission would point out that the above results were obtained using the assumptions and the methodology of EKORDA.
- (93) The Commission, however, cannot accept the methodology used by EKORDA and does not find the assumptions of the beneficiary credible. This conclusion is reinforced by the doubts of the Slovak authorities as described in paragraphs 60 and 65.
- (94) To start with, EKORDA does not explain in its report how it determined the three liquidation factors. The purpose of liquidation factors is to calculate the remaining value of assets sold in the liquidation proceedings, taking into account the nature of the sale e.g. assets sold separately, under time constraints, etc. Therefore, it is assumed that the value of the assets obtained through a liquidation sale is usually lower than the book value, depending on the type of the assets. The percentage share of the value of the assets obtained through the liquidation compared to the book value is the liquidation factor.

- (95) Furthermore, the liquidation factor of 45 % for non-current assets seems to be too low. According to the beneficiary itself, the value of its assets pledged in favour of the Tax Office was SKK 194 million⁽¹⁷⁾. This value is, according to the beneficiary, expressed in prices estimated by independent experts at the turn of the year 2003/2004. In the Commission's view, this kind of 'expert price' should normally reflect the general value of the asset, a proxy expressing for what price the asset can be sold at a given moment. It should be recalled that the expert value of these assets was established in order to ascertain their value as security for the Slovak authorities against the deferred tax debt of the beneficiary, as required by the Tax Administration Act. EKORDA does not provide any clarification as to why the sale of the non-current assets in bankruptcy proceedings would yield only 45 % of their book value of SKK 205 million, whereas the beneficiary itself placed a much higher value on these assets.
- (96) In response to the beneficiary's argument that it would be hard to find a buyer because most of the pledged machinery was confined only to the production of spirit and spirit-based beverages, non-alcoholic beverages or canned products, the Commission has the following two comments. First, the 'expert price' of the pledged real estate was SKK 105 million, which is on its own higher than the total yield forecast by EKORDA (SKK 92 million). Second, the actual developments in the company show that some of these production assets quickly found a new user Old Herold s.r.o. Indeed, once the beneficiary lost the licence to produce spirit and spirit-based beverages its production assets were rented to Old Herold. It seems therefore that there was an imminent interest from a competitor for these production assets.
- (97) As for stock, the Slovak authorities themselves consider that the liquidation factor should be higher than 20 %.
- (98) The beneficiary was able to generate SKK 110 million from the sale of its stock in 2004 (see paragraph 35), i.e. more than 50 % of the book value of the stock on which EKORDA based its assessment. This is a strong indication that the liquidation factor of 20 % was too low. The changes in the balance sheet in 2004 with regard to stock supports this conclusion. In addition, in its business plan the beneficiary itself estimated the yield from the sale of stock over the period March–May 2004 to be SKK 110 million (see paragraph 35). EKORDA ignored this estimate. Finally, from the nature of the beneficiary's activities it can be assumed that the stock comprised final or semi-finished products which could have been sold directly to distributors or consumers, further supporting the use of a higher liquidation factor.
- (99) The Commission considers that the liquidation factor for the stock should be 52 %. This figure is based on the beneficiary's estimate of the yield it would receive from the sale of stock for the purpose of financing the agreement (i.e. SKK 110 million). Taking into account the book value at that time (SKK 209 million) the only possible liquidation factor for stock was therefore at least 52 % (52 % of 209 million being 110 million).
- (100) Concerning the short-term receivables, EKORDA used double adjusting. First, it adjusted their book value by a factor of 59 % (the book value being SKK 166 million and the value that EKORDA used in its calculations SKK 98 million) and then in addition used the low liquidation factor of 20 %. This methodology is questionable. It can be acceptable to adjust the book value of receivables to reflect their actual value at a given time. EKORDA, however, does not provide any explanation as to why the yield in bankruptcy/liquidation would be only one fifth (SKK 20 million) of what the beneficiary itself believed to be able to obtain from its debtors (SKK 98 million).
- (101) The book value of short-term receivables based on March 2004 figures (SKK 166 million) was adjusted to SKK 98 million by EKORDA in order to correct for uncollectible or low-quality receivables. In addition, however, EKORDA applied a liquidation factor of only 20 % to the adjusted book value. If EKORDA's 59 % factor for adjusting the book value of the short-term receivables is applied to the book value based on the June 2004 figures (SKK 63 million), the result is SKK 37 million. However, according to the information provided by the Slovak authorities, there were receivables of SKK 63 million that were enforceable. It is therefore doubtful whether any adjusting of their book value is actually necessary.

⁽¹⁷⁾ This figure is disputed by the Slovak authorities, as explained below.

- (102) In any event, there is no obvious reason why the liquidation value should be even lower than the adjusted figure. The Commission therefore considers that the expected yield from the short-term receivables is certainly not lower than the adjusted figure of SKK 37 million.
- (103) Given the above, the Commission adjusted EKORDA's estimates and made a new assessment using the figures from June 2004. This assessment clearly shows that the likely yield from the sale of the beneficiary's assets in bankruptcy proceedings would have been much higher than the yield forecast in EKORDA's report. The figures are summarised in the table below.

Table 5

**Comparison of the likely yield from the sale of the beneficiary's assets in bankruptcy proceedings
EKORDA figures compared with the Commission's corrected figures (in SKK million)**

	EKORDA (31.3.2004)		Correction (17.6.2004)	
	Book value	Yield	Book value	Yield
Non-current assets	205	92	200	194 ⁽¹⁾
Stock	209	42	84	43 ⁽²⁾
Short-term receivables	98 ⁽³⁾	20	63	37 ⁽⁴⁾
Cash	50	50	161	161
Total	562	204	508	435

⁽¹⁾ Throughout the investigation procedure the beneficiary submitted that the value of its non-current assets pledged in favour of the Tax Office was SKK 194 million. This is the evaluation of an independent valuer, expressed as an 'expert price'. That price should be a proxy for what price the asset could have been sold at the time. It should be noted that this is a minimum price; the Slovak authorities estimated the price of the pledged assets to be SKK 397 million.

⁽²⁾ The liquidation factor used is 52 %. This liquidation factor can be derived from the fact that the beneficiary had indicated that it intended to raise at least SKK 110 million from the sale of stock for the purpose of financing the arrangement. However, based on a book value of SKK 209 million, this was possible only if the liquidation factor for stock was at least 52 % (SKK 110 million/SKK 209 million).

⁽³⁾ This is the book value (SKK 166 million) adjusted by EKORDA to reflect the liquidation value of the receivables.

⁽⁴⁾ This is the value of the short-term receivables after the adjustment of their book value (SKK 63 million) by a factor of 59 % used by EKORDA. There is no obvious reason why the liquidation value should be lower after such adjustment.

- (104) The costs of bankruptcy proceedings, according to the beneficiary's comments on the opening decision, should constitute 18 % of the estimated value of the proceeds from the sale of the beneficiary's assets in those proceedings. This is according to the beneficiary an appropriate rate in the light of the World Bank Report of 2004 ⁽¹⁸⁾. Therefore, by applying this percentage to the corrected value of the likely yield from the sale of the beneficiary's assets, as established by the Commission, the costs of the bankruptcy proceedings would come to SKK 78,3 million. When this amount is deducted from the corrected yield from the sale of the beneficiary's assets, the result is higher than the sum received by the Tax Office under the arrangement (435 million – 78,3 million = 356,7 million; the sum agreed under arrangement was SKK 224,3 million).
- (105) As indicated in Table 5, the likely yield from sale of the beneficiary's assets was SKK 435 million. Taking into account that the Tax Office would have received close to 100 % of the proceeds of the sale ⁽¹⁹⁾, and even allowing for bankruptcy costs of up to 18 % of these proceeds as claimed by the beneficiary, the Tax Office would still have received SKK 132,4 million more than under the arrangement.

⁽¹⁸⁾ It is noted that the other reports submitted by the beneficiary (namely the reports by EKORDA and Ms Kochová) reckon on a slightly higher percentage of costs around 22 %. However, since proceedings in this case would be likely to be shorter than average bankruptcy proceedings, there appears to be no reason why the costs should be even higher than those for average proceedings as recorded in the World Bank Report. If anything, it might be expected that the low number of creditors and simple structure of the debt (over 99 % in the hands of one creditor) would lead to lower than average costs.

⁽¹⁹⁾ It would have received 100 % of the pledged assets (SKK 194 million), plus over 99 % of the proceeds generated by the sale of the remaining assets.

- (106) Moreover, even applying the very low liquidation factors provided by EKORDA to the value of the beneficiary's assets as at June 2004, the likely yield from the sale of these assets (after deducting the costs of the bankruptcy proceedings – 18 %) would be SKK 225,5 million, which is still higher than the sum agreed to by the Tax Office under the arrangement ⁽²⁰⁾.
- (107) Finally, it should be noted that the Slovak authorities have not supported the beneficiary's claim that the Tax Office had the EKORDA report at its disposal prior to the creditors' meeting on 9 July 2004 and thus could have used it as a basis for its decision. However, the Tax Office did have the results of its own June 2004 inspection, which showed that Frucona had significant assets as indicated in Table 3. On the basis of these data, the Tax Directorate by letter of 6 July 2004 to the local Tax Office, indicated that the local Tax Office should not agree to the arrangement proposed by the beneficiary, because it was unfavourable for the State.
- (108) The other experts' reports provided by the beneficiary failed to meet the standard required to demonstrate that the market creditor test was met. In particular, none of the reports states on what basis the, sometimes exceptionally low, liquidation factors were established. Furthermore, it can be observed that as regards the report of Ms Kochová, whose conclusions were significantly different from the conclusions of EKORDA, that it is not clear for what purpose this report was made and on what period and assumptions it was based. The report by the receiver Ms Holovačová only states that, in general, arrangement proceedings are more advantageous for creditors than bankruptcy proceedings. Therefore, none of the information in either of these two reports can be used either to support or to refute the beneficiary's assertion that the market economy creditor test was met.
- (109) In addition, as regards the arguments regarding the duration of bankruptcy proceedings, the circumstances of this case need to be taken into account when considering what impact the possible length of bankruptcy proceedings might have on the decision-making process of a hypothetical private creditor.
- (110) The fact that the State was in a privileged position in comparison to the other creditors, due to the fact that its debt was secured against the beneficiary's non-current assets, is a further important aspect in this case. In HAMSA, the Court confirmed that the status as a secured creditor is a relevant factor to be taken into account in applying the private creditor test ⁽²¹⁾. In accordance with Section 31(1)(e) of the Bankruptcy Act, the claims of a separate creditor may be satisfied at any time during the bankruptcy proceedings from the sale of the assets which provide the security. Therefore, as regards the assets pledged to the Tax Office, the length of the bankruptcy proceedings overall was, in the Commission's view, irrelevant, since these claims could have been satisfied independently of the progress of those proceedings.
- (111) In particular, even taking the value placed on the secured assets by the beneficiary, the Tax Office could have obtained early satisfaction through the sale of the securities of at least SKK 194 million, or 86 % of the sum proposed in the creditors' agreement. Only if there had been some prospect of it not receiving the full amount agreed under the arrangement would the Tax Office have had to consider whether it was worth waiting for the end of the bankruptcy proceedings. What is more, upon final distribution to the creditors, the Tax Office would then have received around 99 % of the yield from the sale of the remaining assets (SKK 185 million in the worst case scenario, that is applying EKORDA's liquidation factors; see Table 4). It should have been clear to the Tax Office that the resulting debt recovery would have been well in excess of the sum on offer under the arrangement and that only a small part of that total would have entailed a wait as compared to under the arrangement.
- (112) Therefore, it can be concluded that the information concerning the duration of bankruptcy proceedings in Slovakia would not have influenced the decision of a hypothetical private creditor in any significant way.
- (113) Furthermore, in any event, at the time of the arrangement the beneficiary had: (i) a very low number of creditors and (ii) assets with a liquidation value higher than the amount agreed by the State under the arrangement (as shown in Table 5, the likely yield from the sale of the unsecured assets alone was SKK 241 million).

⁽²⁰⁾ The yield from the sale of the beneficiary's assets would amount to SKK 275 million (see Table 4). After deducting the costs of the bankruptcy proceedings, which according to the beneficiary constituted 18 % of the yield from the assets' sale, i.e. SKK 49,5 million, the Tax Office would have received SKK 225,5 million.

⁽²¹⁾ Case T-152/99 HAMSA [2002] ECR II-3058, paragraph 168.

- (114) The number of creditors involved in the arrangement was low, there being only five of them. Of these five creditors, four were private and their share of the total debt was only 0,6 % (SKK 3 797 608 out of SKK 644 166 949) as shown in Table 2. The State therefore represented by far the largest creditor with 99,4 % of the total claims. Such circumstances would significantly reduce the risk of any disagreements between creditors and consequent litigation and would, therefore, tend to shorten the length of the bankruptcy proceedings.
- (115) With regard to the argument presented by the beneficiary, based on a report by the World Bank called 'Doing business in 2004' claiming that bankruptcy proceedings in Slovakia last on average 4,8 years, it should be noted that the report refers to a general 'closing a business indicator', which measures the overall time to go through bankruptcy proceedings as well as court powers in bankruptcy proceedings. This duration is not strictly the same as the average length of bankruptcy proceedings. The Slovak authorities themselves expressed the view that given the circumstances of this case, the duration of the bankruptcy proceedings would be shorter than the average (see paragraph 60). This assessment by the Slovak authorities is particularly relevant given the fact that the proceedings in question would be conducted in accordance with Slovak bankruptcy law and practice. Moreover, the Slovak government was itself the creditor of the beneficiary.
- (116) In addition, the length of the bankruptcy proceedings in the reports provided by the beneficiary varies significantly from two years to more than six years⁽²²⁾. Therefore the assessments of the duration of bankruptcy proceedings in Slovakia that the beneficiary submitted to the Commission were generalisations and did not take account of the specifics of the case at hand. Some of those assessments were of an approximate nature and, to a certain extent, were inconsistent with each another.
- (117) As regards the specific example of a Slovak company in the same sector as the beneficiary whose bankruptcy proceedings lasted for more than five years, it should be noted that the beneficiary failed to demonstrate how that example relates to this case and in particular whether that company was in the same or a very similar legal and material situation as the beneficiary⁽²³⁾. Given the fact that the beneficiary had one large creditor with privileged status the State and a number of assets with a significant appraisal value, the bankruptcy proceedings in the case of the beneficiary could have been concluded in a relatively swift manner and would thus present a preferred course of action for the largest creditor the State.
- (118) Lastly, even assuming that the bankruptcy proceedings would have lasted four to five years, as claimed by the beneficiary, the difference between the likely amounts to be recovered and the amounts agreed under the arrangement was so big, that the length of those proceedings would not have played a significant role in the decision of a private creditor as to whether to accept the arrangement. Considering a discount rate of 5,14 %⁽²⁴⁾, the present value of the future cash flow of SKK 356,7 million even after five years is SKK 277,6 million, i.e. well above the amount agreed under the arrangement. Under such conditions, the bankruptcy proceedings would have had to take more than 9 years in order for the present value to be lower than the amount agreed under the arrangement. Such a long liquidation procedure would not have been considered likely in this case by any private market operator. In addition, the present value of the total amounts to be recovered would be further increased if it is taken into account that a significant part of the debt would likely have been repaid earlier through the sale of the secured assets (see paragraph 1111111)).
- (119) On the basis of the evidence available, it can be concluded that a private creditor would not have entered into the arrangement on the terms agreed by the Tax Office in this case; given that the Tax Office could be satisfied as a separate creditor at any time during the bankruptcy proceedings and, in addition, obtain over 99 % of the yield distributed to the remaining creditors (due to the size of its claims when compared to the other creditors), it can be concluded that almost the entire yield obtained in the bankruptcy proceedings would go to the Tax Office and, as demonstrated above, would be higher than the amount agreed in the arrangement between the creditors.

⁽²²⁾ Ms Kochová's report – 2 years, Ms Holovačová's report more than 6 years, World Bank 2004 report – 4,8 years, Slovak Ministry of Justice report and World Bank 2002 report – 3 to 7 years.

⁽²³⁾ The example provided by the beneficiary in its comments of 25 October 2005 refers to the declared bankruptcy of Liehofruct White Lady Distillery, s.r.o. Levoča.

⁽²⁴⁾ In 2004, the interest rate for government bonds with maturity between 3 and 5 years ranged between 4,06 % and 5,14 %. To keep on the conservative side, the calculation takes into account the highest amount of 5,14 %.

2.2. Arrangement with creditors versus tax execution

- (120) The Tax Office, unlike the private creditors, was entitled on its own initiative to proceed with tax execution through the sale of real estate, machinery or the firm as a whole. No evidence, within the meaning of the case-law referred to above in paragraph 82, was provided to indicate that the Tax Office had considered this course of action and concluded that it would be less advantageous than agreeing to the arrangement.
- (121) In any event, the Commission finds irrelevant the beneficiary's argument that the arrangement proceedings shelter the company from tax execution. As confirmed by the Slovak authorities, tax execution was an option for the Tax Office, either prior to the launch of the arrangement proceedings or after the Tax Office's veto on the proposed arrangement. This option therefore needs to be considered when applying the market economy creditor test. The beneficiary does not compare the proposed arrangement with the potential outcome of tax execution.
- (122) The Commission bases its analysis on data provided by both the beneficiary and the Slovak authorities. In this context it is noted that the Slovak authorities confirmed that the pledge in favour of the Tax Office was SKK 397 million as mentioned in the decision to open the formal investigation procedure. This value is said to be obtained from the beneficiary's accounts. The beneficiary, for its part, submits that the value of the pledged assets expressed in 'expert prices' is SKK 194 million (see paragraph 22). While the Commission does not need to determine which figure is correct, the following conclusions can nevertheless be made.
- (123) First, the pledge was a counterpart against the deferred tax debt of the beneficiary, as required by the Tax Administration Act. If the value of the beneficiary's assets was in reality only half of the pledge, as suggested by the expert opinion submitted by the beneficiary, it means that the securities required by the State for those deferrals were insufficient. In these circumstances, the tax deferrals permitted by the Tax Office between November 2002 and November 2003 totalling SKK 477 million therefore in all probability failed to meet the market economy creditor test. For the purpose of this case it is not necessary for the Commission to determine whether those measures were free of state aid. However, if the earlier deferrals already constituted state aid, the market economy creditor principle can no longer be referred to when the deferred amounts are later (partly) written off.
- (124) Second, even if the lower figures submitted by the beneficiary are used in the calculation of the proceeds from tax execution, the market economy creditor, had he had the possibility, would have favoured this procedure over arrangement.
- (125) In the case of tax execution a tax office can directly sell the debtor's assets (receivables and other current assets, movable assets, real estate). At the time when the Tax Office voted in favour of the arrangement, the beneficiary had stock worth SKK 43 million, enforceable receivables of at least SKK 37 million and SKK 161 million in cash (see Table 5). It is noted that the value of those current assets alone (SKK 241 million; EUR 6,3 million) ⁽²⁵⁾ would exceed the yield proposed in the arrangement (SKK 224,3 million; EUR 5,93 million). In addition, the beneficiary had other assets, the value of which was at least SKK 194 million.
- (126) Furthermore, tax execution would not involve administrative fees as in the case of bankruptcy proceedings. It is a procedure that is initiated and controlled by the tax office, so it can also be assumed that it would be conducted in a speedy manner.
- (127) The Commission therefore concluded that tax execution against the beneficiary's assets would have led to a higher return than the arrangement.

⁽²⁵⁾ Value of the current assets = stocks (SKK 43 million) + short-term receivables (SKK 37 million) + cash (SKK 161 million) = SKK 241 million.

2.3. Further evidence

- (128) The Commission takes note of the letter submitted by the Slovak authorities from the director of the Tax Directorate to his subordinate, the director of the tax office in question (see paragraph 63). The letter clearly shows that the Tax Directorate (which had prior direct contacts with the beneficiary) opposed the proposed arrangement and gave a clear indication that the local Tax Office should not vote in favour of the arrangement. The reason mentioned in the letter was that the proposed arrangement was 'not advantageous' for the State.
- (129) It was also demonstrated by the Slovak authorities that there was a clear policy instruction given by the Ministry of Finance at the beginning of 2004 to the tax authorities to the effect that they should not accept arrangements proposing write-offs of tax authorities' receivables ⁽²⁶⁾. This policy choice was communicated in connection with the amendment of the Tax Administration Act as of 1 January 2004, in an effort to strengthen discipline in tax collection.
- (130) In addition, it should be noted that the Tax Office itself appealed against this arrangement as early as 2 August 2004, i.e. not even one month after the arrangement was agreed upon.
- (131) The beneficiary submitted that the Tax Office had signalled its agreement to the arrangement even prior to the beneficiary launching the procedure. The Commission considers that the evidence submitted by the beneficiary indicates quite the opposite. In his letter of 3 February 2004 to the beneficiary, the director of the Tax Office writes that, although in principle he is not against the use of the arrangement procedure, he does not agree with the beneficiary's proposal for arrangement with 35 % repayment of the debt.
- (132) On the basis of this evidence, the Commission cannot but conclude that the Slovak authorities were opposed to the arrangement proposed by the beneficiary, and were opposed to it already prior to the launching of the arrangement proceedings on 8 March 2004, before the creditors' vote on 9 July 2004 and also after the court approved the arrangement.
- (133) The beneficiary submitted that long-term effects, such as the continuity of the tax revenue for the State, should be taken into account (see paragraph 52).
- (134) First, it needs to be stressed that the market economy creditor test differs from the market economy investor test. Whereas a market economy investor is in a position to decide whether to enter into a relationship with the company in question and will be driven by the long-term, strategic prospect of obtaining an appropriate return from his investment ⁽²⁷⁾, a 'market economy creditor', who already is in a commercial or public law relationship with the insolvent company, will aim at obtaining the repayment of sums already due to him ⁽²⁸⁾ on conditions that are as advantageous as possible in terms of the degree of repayment and the timeframe. The motivations of the hypothetical market economy creditor and the market economy investor will therefore be different. Accordingly, the case-law has defined separate tests for the two situations.
- (135) Second, as to the analogy to the creditor-supplier, it is important to note that the nature of his receivables and those of the State is fundamentally different. Because the relations of the supplier to the insolvent firm have an exclusively contractual basis, he may actually suffer from the loss of a business partner. If the insolvent company is liquidated or sold off, the supplier would need to find a new client or contract with the new owner. The risk is higher when his dependency on the insolvent firm is considerable. Such a creditor will indeed consider the future. In contrast, the relations of the State with the insolvent firm are based on public law and are therefore not dependent on the will of the parties. Any new owner taking over the assets of the liquidated firm would automatically be obliged to pay taxes. Moreover, the State is never dependent on a single taxpayer. Finally and most importantly, the State is not profit-driven when levying taxes and does not act in a commercial way and with commercial considerations when doing so. The above analogy is therefore not well-founded.

⁽²⁶⁾ It can be deduced from the letter that the Ministry agreed with arrangements consisting of a deferral of payment of not more than two months for VAT and excise duties and six months for other taxes.

⁽²⁷⁾ Case T-152/99 *HAMSA*, referred to above, paragraph 126;

⁽²⁸⁾ See, for example, Case C-342/96 *Spain v Commission*, referred to above, paragraph 46.

- (136) The Commission concludes that the situation of the State in this case is not comparable to the situation of a hypothetical market economy investor or to the situation of a hypothetical dependent market economy creditor. In any event, the loss of future taxes cannot be taken into account when applying the market economy creditor principle ⁽²⁹⁾.
- (137) Lastly, it is noted from the overview of taxes submitted by the beneficiary that most of the taxes paid by the beneficiary since 1995 were indirect taxes (excise duties and VAT). As these taxes are paid by final consumers, the liquidation of the beneficiary would have no impact on their collection, as consumers would continue to purchase the taxed products (in this case mainly spirit and spirit-based beverages) from other producers. The beneficiary's argument regarding considerable future tax loss is therefore not credible.
- (138) The Commission concludes that none of the other evidence submitted by the beneficiary demonstrates that the behaviour of the hypothetical private creditor would have been influenced. Therefore nothing in this section alters the Commission's assessment of that behaviour in sections 2.1 or 2.2.

2.4. Conclusion

- (139) On the basis of the above evidence, the Commission concludes that in this case the market economy creditor test was not met and the State conferred on the beneficiary an advantage that it would not have been able to obtain from the market.
- (140) The Commission therefore concludes that the debt write-off agreed to by the local Tax Office under the arrangement constitutes state aid within the meaning of Article 107(1) TFEU.

3. COMPATIBILITY OF THE AID: DEROGATION UNDER ARTICLE 107(3) TFEU

- (141) The primary objective of the measure is to assist a company in difficulty. In such cases, the exemption under Article 107(3)(c) TFEU, which allows state aid to be authorised to facilitate the development of certain economic activities where it does not adversely affect trading conditions to an extent contrary to the common interest, can be applied, if the relevant conditions are complied with.
- (142) In view of the production portfolio of the beneficiary, the Commission assessed whether special rules applicable to the agriculture sector apply in this case. Basing itself on the information on the beneficiary's turnover submitted by the Slovak authorities, the Commission concluded in its decision to open the formal investigation that most of beneficiary's products were not products falling under Annex I to the TFEU and therefore the general state aid rules apply.
- (143) In its comments on the decision to open the formal investigation the beneficiary disputed the data on the turnover provided by the Slovak authorities beforehand (see Table 1), but did not dispute the decision of the Commission to base its assessment on the general state aid rules. Without wishing to determine whether the figures provided by the beneficiary were accurate ⁽³⁰⁾, the Commission verified whether its above conclusion would stand up against the new data. The Commission concluded that the majority of the beneficiary's turnover is generated by products not falling under Annex I to the TFEU. The general, and not the sector-specific, state aid rules therefore apply.
- (144) Rescue and restructuring aid to ailing companies is currently governed by the Community Guidelines on state aid for rescuing and restructuring firms in difficulty ⁽³¹⁾ (the 'New Guidelines'), which replaced the previous text adopted in 1999 ⁽³²⁾ (the '1999 Guidelines').

⁽²⁹⁾ See, by analogy, Case C-124/10 P *Commission v EDF*, referred to above, paragraphs 79 and 80.

⁽³⁰⁾ These figures do not seem to be supported by the annual accounts submitted by the beneficiary.

⁽³¹⁾ OJ C 244, 1.10.2004, p. 2.

⁽³²⁾ OJ C 288, 9.10.1999, p. 2.

- (145) The transitional provisions of the New Guidelines stipulate that the New Guidelines will apply to the assessment of any rescue or restructuring aid granted without the authorisation of the Commission (unlawful aid) if some of or all the aid is granted after 1 October 2004, the day of publication of the New Guidelines in the *Official Journal of the European Union* (point 104, first subparagraph). However, for aid unlawfully granted before 1 October 2004, the examination will be conducted on the basis of the guidelines applicable at the time when the aid was granted (point 104, second subparagraph).
- (146) The approval by the Tax Office of the arrangement was issued on 9 July 2004 and took effect on 23 July 2004. Accordingly, the aid was unlawfully granted before 1 October 2004. The 1999 Guidelines, which were applicable at the time when the aid was granted, therefore apply.
- (147) The beneficiary is a medium-sized company within the meaning of Commission Regulation (EC) No 70/2001 on the application of Articles 87 and 88 of the EC Treaty to state aid to small and medium-sized enterprises ⁽³³⁾.

3.1. Eligibility of the company

- (148) According to point 5(c) of the 1999 Guidelines, a company is regarded as being in difficulty where it fulfils the criteria under domestic law for being the subject of collective insolvency proceedings.
- (149) The beneficiary was the subject of the arrangement proceedings, which, under the definition in the Bankruptcy Act, is only accessible to insolvent companies. It is therefore eligible for rescue and restructuring aid.

3.2. Rescue aid

- (150) The disputed measure was initially described by the Slovak authorities as rescue aid. In accordance with the 1999 Guidelines, the Commission raised doubts as to the compatibility of the aid as rescue aid on the grounds described in part III.
- (151) Neither the Slovak authorities nor the beneficiary commented on these doubts. No new facts have been presented to the Commission in this respect.
- (152) Since the above doubts have not been allayed, the Commission concludes that the aid is not compatible as rescue aid within the meaning of the 1999 Guidelines.

3.3. Restructuring aid

- (153) The Commission raised doubts as to whether the aid was compatible as restructuring aid within the meaning of the 1999 Guidelines on the grounds described in part III.
- (154) The Commission notes that the Slovak authorities, who bear the burden of proving that the state aid is compatible with the internal market, have not submitted any new facts in support of this conclusion. The Commission took due note of the comments submitted by the beneficiary.

3.3.1. Return to long-term viability

- (155) According to the 1999 Guidelines, the granting of restructuring aid must be linked to and conditional on implementation of a feasible and coherent restructuring plan to restore the firm's long-term viability. The Member State commits itself to this plan, which must be endorsed by the Commission. Failure by the company to implement the plan is regarded as misuse of aid.

⁽³³⁾ OJ L 10, 13.1.2001, p. 33.

- (156) In substance, the restructuring plan must be such as to enable the beneficiary to restore its long-term viability within a reasonable timescale and on the basis of realistic assumptions as to future operating conditions. The plan should describe the circumstances that led to the beneficiary's difficulties and identify appropriate measures to address these difficulties. Restructuring operations cannot be limited to financial aid designed to make good debts and past losses without tackling the reasons for the difficulties.
- (157) For companies situated in assisted areas and small and medium-sized companies, the 1999 Guidelines stipulate that the conditions for authorising aid may be less stringent as regards the implementation of compensatory measures and the content of monitoring reports. Nonetheless, these factors do not exempt such companies from the requirement to draw up a restructuring plan nor the Member States from the obligation to make the granting of restructuring aid conditional upon implementation of a restructuring plan.
- (158) After the opening of the formal investigation, the Slovak authorities confirmed that the business plan that the beneficiary was obliged to draw up as a condition for the launching of the arrangement procedure was only considered by the competent court, i.e. not the granting authority, and that neither the court nor the Tax Office monitored the implementation of the plan.
- (159) Contrary to this confirmation, the beneficiary stated that the Tax Office had studied the ability of the business plan to restore long-term viability prior to its approval of the arrangement, but did not submit any evidence of this.
- (160) The beneficiary further argued that the absence of a formal restructuring plan is irrelevant in a situation of an *ex post* assessment of the aid by the Commission, when the Commission can assess whether the beneficiary did actually become viable. According to the beneficiary, the formal restructuring plan can only be required in the case of an *ex ante* assessment, to which only the 1999 Guidelines can apply.
- (161) This line of argument is not correct. The 1999 Guidelines apply to the compatibility assessment of both notified and unlawful aid. Whenever the assessment takes place, the condition that the restructuring aid be subject to the establishment of a viable restructuring plan is valid. The Commission has to conduct its assessment on the basis of the information available at the time when the aid was granted.
- (162) It may be concluded that the Tax Office as the granting authority did not have any opportunity to evaluate a restructuring plan and to make the write-off of its receivables conditional on duly monitored implementation of such a plan. Therefore, the first, formal, condition, which is fully applicable also to *ex post* assessment, was not met.
- (163) As to the substance of the business plan, the Slovak authorities did not submit any information allaying the Commission's doubt that the plan represented a genuine restructuring plan as required by the 1999 Guidelines.
- (164) The Commission cannot but maintain the conclusion it reached in the decision to open the formal investigation. The business plan submitted is merely a plan dealing with the beneficiary's acute problem of mounting debt to the State. The plan does not analyse in any way the circumstances that led to the beneficiary's difficulties nor the financial situation of the company at that time and its financial prospects. Since this analysis was missing, the beneficiary did not propose specific steps addressing the individual reasons that led to the difficulties. The only measure described in detail is the proposed financial restructuring through the arrangement with creditors.
- (165) The plan does not mention at all the increase of the beneficiary's own capital, mentioned by the beneficiary as one of the restructuring measures. Nothing in the file demonstrates that the capital increase by Hydree Slovakia should be considered as a measure ensuring that, in the long-term, the beneficiary would not repeat its strategy of financing its production through debt on VAT and excise duties, which is what eventually led to its difficulties. The Slovak authorities themselves confirmed that the capital increase did not in any way decrease the risk of repetition of the financial problems. These doubts are all the stronger, given that the capital increase totalled SKK 21 million while the restructured debt was SKK 644 million.

- (166) The capital increase in itself is not proof of market confidence in the beneficiary's return to long-term viability. The Commission notes that the beneficiary did not manage to obtain any loan from a private bank, despite its active efforts.
- (167) Furthermore, letting the production assets to the beneficiary's competitor Old Herold s. r. o. was clearly necessitated by the fact that the beneficiary had lost its licence to produce spirit and spirit-based products and not by the fact that this production would have been loss-making and therefore in need of restructuring. It is true that the beneficiary itself could have requested a new licence after the arrangement was finalised and did not do so. The Commission, however, observes that the beneficiary continues to sell the products produced by Old Herold using the beneficiary's assets and brand name and even plans to increase these sales, as is stated in the annual report for the period 29 April 2004 - 30 December 2004. The letting of these production assets therefore cannot be considered as a restructuring measure because, on the basis of all the evidence available, there was no need for restructuring of this part of production.
- (168) As to the remaining measures proposed in the business plan, the Commission's doubts have not been allayed. These measures are simply activities in the normal course of business rather than rationalisation measures (sale of old equipment or vehicles). The two proposed structural measures (abandonment of the production of non-profitable non-alcoholic products and the sale of some real estate) were described very vaguely without any indication of the precise products or a timetable. The Slovak authorities confirmed that the real estate intended for sale (an administrative building, a shop and a recreation building) had not been sold as at 10 October 2005, i.e. that this planned measure had not been implemented as announced.
- (169) The combination of the absence of a formal restructuring plan and the absence of genuine analysis of the difficulties, of the measures necessary to address these difficulties and of the market conditions and prospects leads the Commission to the conclusion that the business plan submitted by the beneficiary is not a genuine restructuring plan as required by the 1999 Guidelines⁽³⁴⁾. The Commission's doubts that the beneficiary would restore long-term viability have therefore not been allayed.
- 3.3.2. *Aid limited to the strict minimum*
- (170) Although the Commission's conclusion that in the absence of a genuine restructuring plan its doubts on the long-term viability persist is in itself sufficient to conclude that the aid is not compatible with the internal market, the Commission will also analyse the other central criterion of the 1999 Guidelines, i.e. that the aid must be limited to the strict minimum necessary.
- (171) In accordance with point 40 of the 1999 Guidelines, the amount and intensity of the aid must be limited to the strict minimum needed to enable restructuring to be undertaken in light of the existing financial resources of the beneficiary. The beneficiary is expected to make a significant contribution to the restructuring from its own resources.
- (172) The costs of restructuring came to the total amount of debt restructured through the arrangement. The beneficiary paid 35 % of this amount.
- (173) The Slovak authorities did not provide any further explanation in response to the doubts expressed by the Commission in this respect. The beneficiary explained how it financed payment of the debt remaining after the arrangement (see paragraphs 30-35). According to the beneficiary, its own contribution totalled to SKK 231 million (EUR 6,1 million).
- (174) First, the resources available to the beneficiary exceeded the amount of debt remaining after the arrangement. This suggests that the aid was not limited to the minimum necessary.

⁽³⁴⁾ See also Case C-17/99 *France v Commission* [2001] ECR I-2481.

- (175) More importantly, however, the Commission considers that the credit provided by Old Herold does not qualify as an own contribution by the beneficiary within the meaning of the 1999 Guidelines. Payables constitute an ongoing source of financing of the operation of the firm. They are short-term loans, which, however, have to be paid back. It is only if suppliers commit to allow payment maturity longer than normal practice that additional resources are available to the company for the restructuring and that this delay constitutes a sign that the market believes in the feasibility of the return to viability.
- (176) The beneficiary did not in any way demonstrate that the deferral of payment by Old Herold went considerably beyond what is normal commercial practice between the beneficiary and its suppliers. The maturity of 40 days seems to be standard practice, especially considering the fact that it was given to the beneficiary after the arrangement. The beneficiary was thereby no longer in financial difficulties. The very purpose of the arrangement was to help the beneficiary out of its financial problems.
- (177) The Commission therefore concludes that this prolonged maturity cannot be considered as a contribution to restructuring from external resources.
- (178) Without this deferral, the own contribution of the beneficiary within the meaning of the 1999 Guidelines is SKK 131 million (EUR 3,4 million) and thus corresponds to 20 % of the restructuring costs.
- (179) The 1999 Guidelines did not contain any thresholds indicating when the own contribution of the beneficiary is considered to be significant.
- (180) Considering the practice of the Commission in applying the 1999 Guidelines and the change in Commission policy in this respect towards the introduction of thresholds under the 2004 Guidelines ⁽³⁵⁾, the Commission considers that the contribution of 20 % is rather low. Such a contribution might be accepted under the 1999 Guidelines only if all the other conditions for approving the aid were fulfilled. The Commission would then have to take into account such criteria as whether the company is active in an assisted area, to what extent the sources of financing reflect market confidence, beyond the beneficiary itself and its shareholders, in the long-term viability of the company or other specifics of the case.
- (181) In light of the above, the Commission cannot accept in this case that the contribution of the beneficiary is significant. The Commission concludes that its doubts as to whether the own contribution of the beneficiary was significant and whether the aid is limited to the minimum necessary have not been allayed.

3.4. Compatibility of the aid: conclusion

- (182) The Commission concludes that the aid is not compatible with the internal market as rescue or restructuring aid. In addition, no other derogation laid down in the TFEU is applicable to this case.

VII. CONCLUSION

- (183) The Commission finds that the Slovak Republic unlawfully granted the write-off of tax debt in favour of Frucona Košice a.s. in breach of Article 108(3) TFEU. This aid is not compatible with the internal market under any derogation laid down in the TFEU.
- (184) Even though the implementation of the write-off by the Tax Office has been suspended pending resolution of this procedure, the Commission finds that the advantage for the beneficiary was created the moment that the Tax Office decided to forego part of its claims and thus put the aid at the disposal of the beneficiary. This moment was the entry into force of the creditors' agreement on 23 July 2004. The advantage over the beneficiary's competitors lay in the fact that the Tax Office has not enforced its tax claims.

⁽³⁵⁾ The threshold for medium-size enterprises under the 2004 Guidelines is at least 40 %.

- (185) To restore the status *ex ante*, the state aid has to be recovered. Given that the advantage was conferred at the moment of the entry into force of the creditors' agreement on 23 July 2004, the amount of aid to be recovered is the full amount of the write-off as set out in that agreement.
- (186) However, it was decided by the Supreme Court of the Slovak Republic that road tax arrears amounting to SKK 424 490 had been wrongly included in the arrangement. As a result, the headline debt in the agreement was reduced by that amount and the amount of debt owing to the Tax Office and entered into the agreement as corrected was SKK 640 369 341.
- (187) The road tax arrears, which had in the meantime been treated as having been written off, were paid in full on 2 August 2006. This payment should be taken into account when calculating the amount of aid and the interest on it still to be recovered,

HAS ADOPTED THIS DECISION:

Article 1

Decision 2007/254/EC is repealed.

Article 2

The state aid which the Slovak Republic implemented in favour of Frucona Košice a.s., totalling SKK 416 515 990, is incompatible with the internal market.

Article 3

1. The Slovak Republic shall take all necessary measures to recover from the beneficiary the aid unlawfully made available to it referred to in Article 2, taking into account that SKK 424 490 corresponding to road tax arrears was paid into the account of the local Tax Office on 2 August 2006.
2. Recovery shall be effected without delay and in accordance with the procedures of national law provided that they allow the immediate and effective execution of the decision.
3. The sum recovered shall include interest for the whole period running from the date on which it was put at the disposal of Frucona Košice, a.s. until its actual recovery.
4. The interest shall be calculated in accordance with Chapter V of Commission Regulation (EC) No 794/2004 of 21 April 2004 implementing Council Regulation (EC) No 659/1999 laying down detailed rules for the application of Article 93 of the EC Treaty ⁽³⁶⁾. The interest rate shall be applied on a compound basis throughout the entire period referred to in paragraph 3.

Article 4

The Slovak Republic shall inform the Commission, within two months of notification of this Decision, of the measures taken to comply with it. It shall provide this information using the questionnaire attached in the Annex to this Decision.

Article 5

This Decision is addressed to the Slovak Republic.

Done at Brussels, 16 October 2013.

For the Commission
Joaquín ALMUNIA
Vice-President

⁽³⁶⁾ OJ L 140, 30.4.2004, p. 1.

ANNEX

INFORMATION REGARDING THE IMPLEMENTATION OF THE COMMISSION DECISION ...

1. Calculation of the amount to be recovered

- 1.1. Please provide the following details on the amount of unlawful state aid that has been put at the disposal of the beneficiary:

Date(s) ^(o)	Amount of aid (*)	Currency

^(o) Date or dates on which aid or individual instalments of aid were put at the disposal of the beneficiary.

^(*) Amount of aid put at the disposal of the beneficiary (in gross aid equivalents).

Comments:

- 1.2. Please explain in detail how the interests to be paid on the amount of aid to be recovered will be calculated.

2. Measures planned and already taken to recover the aid

- 2.1. Please describe in detail what measures are planned and what measures have already been taken to effect an immediate and effective recovery of the aid. Please also indicate, where relevant, the legal basis for the measures taken/planned.
- 2.2. What is the timetable for the recovery process? When will the recovery of the aid be completed?

3. Recovery already effected

- 3.1. Please provide the following details on the amounts of aid that have been recovered from the beneficiary:

Date(s) ^(o)	Amount of aid repaid	Currency

^(o) Date(s) on which the aid was repaid

- 3.2. Please attach proof of the repayment of the aid amounts specified in the table under point 3.1 above.

ACTS ADOPTED BY BODIES CREATED BY INTERNATIONAL AGREEMENTS

Only the original UN/ECE texts have legal effect under international public law. The status and date of entry into force of this Regulation should be checked in the latest version of the UN/ECE status document TRANS/WP.29/343, available at: <http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29docstts.html>

Regulation No 98 of the Economic Commission for Europe of the United Nations (UN/ECE) — Uniform provisions concerning the approval of motor vehicle headlamps equipped with gas-discharge light sources

Incorporating all valid text up to:

Supplement 4 to the 01 series of amendments — Date of entry into force: 15 July 2013

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A. ADMINISTRATIVE PROVISIONS

Scope ⁽¹⁾

This Regulation applies to:

(a) Headlamps, and

(b) Distributed lighting systems,

utilizing gas-discharge light sources, for vehicles of categories, M and N and L₃.

1. DEFINITIONS

For the purpose of this Regulation,

- 1.1. The definitions given in Regulation No 48 and its series of amendments in force at the time of application for type approval shall apply to this Regulation.
- 1.2. 'Lens' means the outermost component of the headlamp (unit) which transmits light through the illuminating surface;
- 1.3. 'Coating' means any product or products applied in one or more layers to the outer face of a lens;
- 1.4. 'Matched pair' means the set of lamps of the same function on the left- and right-hand side of the vehicle;
- 1.5. Headlamps of different 'types' are headlamps which differ in such essential respects as:
 - 1.5.1. The trade name or mark;
 - 1.5.2. The characteristics of the optical system;
 - 1.5.3. The inclusion or elimination of components capable of altering the optical effects by reflection, refraction, absorption and/or deformation during operation;
 - 1.5.4. Suitability for right-hand or left-hand or for both traffic systems;
 - 1.5.5. The kind of beam produced (passing beam or driving beam or both);
 - 1.5.6. However, a device intended for the installation on the left side of the vehicle and the corresponding device intended for the installation on the right side of the vehicle shall be considered to be of the same type.
- 1.6. References made in this Regulation to standard (étalon) filament lamp(s) and gas-discharge light source(s) shall refer to Regulations Nos 37 and 99 respectively, and to their series of amendments in force at the time of application for type approval.

⁽¹⁾ Nothing in this Regulation shall prevent a Contracting Party to the Agreement applying this Regulation from prohibiting the combination of a headlamp approved 'PL' (Plastic Lens) under this Regulation with a mechanical headlamp-cleaning device (i.e. with wipers) on vehicles which it registers.

2. APPLICATION FOR APPROVAL OF A HEADLAMP ⁽¹⁾
- 2.1. The application for approval shall be submitted by the owner of the trade name or mark of the headlamp or by his duly accredited representative. It shall specify:
 - 2.1.1. Whether the headlamp is intended to provide a passing beam, a driving beam or both;
 - 2.1.2. Whether, if the headlamp is intended to provide a passing beam, it is designed for both left-hand and right-hand traffic or for either left-hand or right-hand traffic only;
 - 2.1.3. If the headlamp is equipped with an adjustable reflector, the mounting position(s) of the headlamp in relation to the ground and the longitudinal median plane of the vehicle;
 - 2.1.4. The maximum vertical angles above and below the nominal position(s) which the aiming device can achieve;
 - 2.1.5. Which light sources are energized when the various beam combinations are used;
 - 2.1.6. Whether a distributed lighting system is used and which type(s) of beam(s) is (are) intended to be provided by this system;
 - 2.1.7. The category of light source as listed in Regulations Nos 37 or 99 and their series of amendments in force at the time of application for type approval.

For a distributed lighting system using a non-replaceable gas-discharge light source not approved under Regulation No 99, the part number assigned by the light-generator manufacturer to the light-generator.

- 2.2. Every application shall be accompanied by:
 - 2.2.1. Drawings in triplicate in sufficient detail to permit identification of the type (see paragraphs 3.2 and 4.2 below). The drawings must show the position intended for the approval number and the additional symbols in relation to the circle of the approval mark, in case of LED module(s) also the space reserved for the specific identification code(s) of the module(s), and must show the headlamp in vertical (axial) section and in front elevation, with main details of the optical design including the flutings, if applicable.
 - 2.2.2. A brief technical specification including, where it applies, the make and type of the ballast(s) and, in the case where the headlamp is used to produce bend lighting, the extreme positions according to paragraph 6.2.7 below. In the case of LED module(s) this shall include:
 - (a) A brief technical specification of the LED module(s);
 - (b) A drawing with dimensions and the basic electrical and photometric values and the objective luminous flux.

In addition, for a distributed lighting system, a brief technical specification including the list of the light-guide(s) and related optical components and information describing the light-generator(s) sufficient to permit identification. This information shall include the part number assigned by the light-generator manufacturer, a drawing with dimensions and the basic electrical and photometric values and an official test report related to paragraph 5.8 of this Regulation.

⁽¹⁾ For gas-discharge light sources see Regulation No 99.

2.2.3. Samples, as follows:

- 2.2.3.1. For approval of a headlamp, two samples of each type of headlamp, one sample intended for the installation on the left side of the vehicle and one sample intended for the installation of the right side of the vehicle, with standard gas-discharge light source and one ballast of each type to be used, where applicable;

For approval of a distributed lighting system using a non-replaceable gas-discharge light source not approved under Regulation No 99, two samples of the system including the light-generator and one ballast of each type to be used, where applicable.

2.2.4. For the test of plastic material of which the lenses are made:

2.2.4.1. Fourteen lenses;

- 2.2.4.1.1. Ten of these lenses may be replaced by 10 samples of material, at least 60 × 80 mm in size, having a flat or convex outer surface and a substantially flat area (radius of curvature not less than 300 mm) in the middle measuring at least 15 × 15 mm.

- 2.2.4.1.2. Every such lens or sample of material shall be produced by the method to be used in mass production;

- 2.2.4.2. A reflector to which the lenses can be fitted in accordance with the manufacturer's instructions.

2.2.5. For testing the UV-resistance of light transmitting components made of plastic material against UV radiation of gas-discharge light sources inside the headlamp:

- 2.2.5.1. One sample each of the relevant material as being used in the headlamp or one headlamp sample containing these. Each material sample shall have the same appearance and surface treatment — if any — as intended for use in the headlamp to be approved.

- 2.2.5.2. The UV-resistance testing of internal materials to light source radiation is not necessary:

- 2.2.5.2.1. If low-UV-type gas-discharge light sources are being applied as specified in Regulation No 99, or;

- 2.2.5.2.2. If provisions are taken to shield the relevant headlamp components from UV radiation, e.g. by glass filters, or;

- 2.2.5.2.3. If low-UV-type LED modules are being applied as specified in Annex 11 to this Regulation.

- 2.3. For a distributed lighting system 10 samples of the material(s) and related protective coating/shield, if any, of which the light-guide and other optical parts of the system are made.

- 2.4. The materials making up the lens and, in the case of a distributed lighting system, the materials making up the optical parts of the system, and related coatings/shields, if any, shall be accompanied by the test report of the characteristics of these materials and coatings if they have already been tested.

3. MARKINGS

- 3.1. Headlamps or distributed lighting systems submitted for approval shall bear legibly and indelibly the trade name or mark of the applicant.

- 3.2. They shall comprise, on the lens and on the main body ⁽¹⁾, spaces of sufficient size for the approval mark and the additional symbols referred to in paragraph 4; these spaces shall be indicated on the drawings referred to in paragraph 2.2.1 above.
- 3.3. Headlamps designed to satisfy the requirements of both right-hand and left-hand traffic shall bear markings indicating the two settings of the optical unit on the vehicle or of the gas-discharge light source on the reflector; these markings shall consist of the letters 'R/D' for the position for right-hand traffic and the letters 'L/G' for the position for left-hand traffic.
- 3.4. All beams may bear on their light-emitting surface a centre of reference as shown in Annex 6.
- 3.5. In the case of a light-generator of a distributed lighting system using a non-replaceable gas-discharge light source not approved under Regulation No 99, the light-generator shall bear the trade name or mark of its manufacturer and the part number referred to in paragraph 2.2.2 above.
- 3.6. In the case of lamps with LED module(s), the lamp shall bear the marking of the rated voltage and rated wattage and the light source module specific identification code.
- 3.7. LED module(s) submitted along with the approval of lamp:
- 3.7.1. Shall bear the trade name or mark of the applicant. This marking shall be clearly legible and indelible;
- 3.7.2. Shall bear the specific identification code of the module. This marking shall be clearly legible and indelible.
- This specific identification code shall comprise the starting letters 'MD' for 'MODULE' followed by the approval marking without the circle as prescribed in paragraph 4.2.1 below and in the case several non-identical light source modules are used, followed by additional symbols or characters. This specific identification code shall be shown in the drawings mentioned in paragraph 2.2.1 above. The approval marking does not have to be the same as the one on the lamp in which the module is used, but both markings shall be from the same applicant.
- 3.8. If an electronic light source control gear which is not part of a LED module is used to operate a LED module(s), it shall be marked with its specific identification code(s), the rated input voltage and wattage.
4. APPROVAL
- 4.1. General
- 4.1.1. If all the samples of a type of headlamp submitted pursuant to paragraph 2 above satisfy the provisions of this Regulation, approval shall be granted.
- 4.1.2. Headlamps conforming to this Regulation may be grouped, combined or reciprocally incorporated with any other lighting or light-signalling function(s) provided that their respective lighting functions are not impaired.
- 4.1.3. Where grouped, combined or reciprocally incorporated lamps satisfy the requirements of more than one Regulation, a single international approval mark may be affixed provided that each of the grouped, combined or reciprocally incorporated lamps satisfies the provisions applicable to it.

⁽¹⁾ If the lens cannot be detached from the main body of the headlamp, a unique marking as per paragraph 4.2.5 shall be sufficient.

- 4.1.4. An approval number shall be assigned to each type approved. Its first two digits shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval (at present 01). The same Contracting Party may not assign the same number to another type of headlamp covered by this Regulation. However, the matched pair is considered to be one type.
- 4.1.5. Notice of approval or of extension or refusal or withdrawal of approval or production definitively discontinued of a type of headlamp pursuant to this Regulation shall be communicated to the Parties to the 1958 Agreement applying this Regulation, by means of a communication form conforming to the model in Annex 1 to this Regulation.
- 4.1.6. In addition to the mark prescribed in paragraph 3.1, an approval mark as described in paragraphs 4.2 and 4.3 below shall be affixed in the spaces referred to in paragraph 3.2 above to every headlamp conforming to a type approved under this Regulation.
- 4.2. Composition of the approval mark
- The approval mark shall consist of:
- 4.2.1. An international approval marking, comprising:
- 4.2.1.1. A circle surrounding the letter 'E' followed by the distinguishing number of the country which has granted approval⁽¹⁾;
- 4.2.1.2. The approval number prescribed in paragraph 4.1.4 above;
- 4.2.2. The following additional symbol or symbols:
- 4.2.2.1. On headlamps meeting left-hand traffic requirements only, a horizontal arrow pointing to the right of an observer facing the headlamp, i.e. to the side of the road on which the traffic moves;
- 4.2.2.2. On headlamps designed to meet the requirements of both traffic systems by means of an appropriate adjustment of the setting of the optical unit or the light source, a horizontal arrow with a head at each end, the heads pointing respectively to the left and to the right;
- 4.2.2.3. On headlamps meeting the requirements of this Regulation in respect of the passing beam only, the letter 'DC';
- 4.2.2.4. On headlamps meeting the requirements of this Regulation in respect of the driving beam only, the letter 'DR';
- 4.2.2.5. On headlamps meeting the requirements of this Regulation in respect of both the passing beam and the driving beam, the letters 'DCR';
- 4.2.2.6. On headlamps incorporating a lens of plastic material, the letters 'PL' to be affixed near the symbols prescribed in paragraphs 4.2.2.3 to 4.2.2.5 above;
- 4.2.2.7. On headlamps meeting the requirements of this Regulation in respect of the driving beam, an indication of the maximum luminous intensity expressed by a reference mark as defined in paragraph 6.3.2.2 below, placed near the circle surrounding the letter 'E';

⁽¹⁾ The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.2/Amend.1.

In the case of reciprocally incorporated headlamps, indication of the maximum luminous intensity of the driving beam as a whole shall be expressed as above.

- 4.2.2.8. On distributed lighting systems, the letters 'DLS' shall replace the letter 'D' required in paragraphs 4.2.2.3, 4.2.2.4 and 4.2.2.5 applying the same criteria.
- 4.2.3. In every case the relevant operating mode used during the test procedure according to paragraph 1.1.1.1 of Annex 4 and the allowed voltage(s) according to paragraph 1.1.1.2 of Annex 4 shall be stipulated on the approval forms and on the communication forms transmitted to the countries which are Contracting Parties to the Agreement and which apply this Regulation.

In the corresponding cases the device shall be marked as follows:

- 4.2.3.1. On headlamps meeting the requirements of this Regulation which are so designed that the passing beam shall not be lit simultaneously with that of any other lighting function with which it may be reciprocally incorporated: an oblique stroke (/) shall be placed behind symbol indicating the headlamp producing the passing beam in the approval mark.
- 4.2.3.2. The requirement in paragraph 4.2.3.1 above shall not apply to headlamps meeting the requirements of this Regulation which are so designed that the passing beam and the driving beam are provided by the same gas-discharge light source.
- 4.2.4. The two digits of the approval number which indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval and, if necessary, the required arrow may be marked close to the above additional symbols.
- 4.2.5. The marks and symbols referred to in paragraphs 4.2.1 to 4.2.3 above shall be clearly legible and be indelible. They may be placed on an inner or outer part (transparent or not) of the headlamp, which cannot be separated from the transparent part of the headlamp emitting the light. In the case of a distributed lighting system with outer lens built in the light-guide, this condition is deemed satisfied if the approval marking is placed at least on the light-generator and on the light-guide, or on its protective shield. In any case the marking shall be visible when the headlamp or the system is fitted on the vehicle or when a movable part such as the hood is opened.
- 4.3. Arrangement of the approval mark
- 4.3.1. Independent lamps
- Figures 1 to 9, Annex 2 to this Regulation give examples of arrangements of the approval marks with the above-mentioned additional symbols.
- 4.3.2. Grouped, combined or reciprocally incorporated lamps
- 4.3.2.1. Where grouped, combined or reciprocally incorporated lamps have been found to comply with the requirements of several Regulations, a single international approval mark may be affixed, consisting of a circle surrounding the letter 'E' followed by the distinguishing number of the country which has granted the approval, and an approval number. This approval mark may be located anywhere on the grouped, combined or reciprocally incorporated lamps, provided that:

- 4.3.2.1.1. It is visible as per paragraph 4.2.5.

- 4.3.2.1.2. No part of the grouped, combined or reciprocally incorporated lamps that transmits light can be removed without at the same time removing the approval mark.
- 4.3.2.2. The identification symbol for each lamp appropriate to each Regulation under which approval has been granted, together with the corresponding series of amendments incorporating the most recent major technical amendments to the Regulations at the time of issue of the approval and, if necessary, the required arrow shall be marked:
- 4.3.2.2.1. Either on the appropriate light-emitting surface;
- 4.3.2.2.2. Or in a group, in such a way that each of the grouped, combined or reciprocally incorporated lamps may be clearly identified (see four possible examples in Annex 2, Fig. 10).
- 4.3.2.3. The size of the components of a single approval mark shall not be less than the minimum size required by the Regulation under which approval has been granted for the smallest of the individual marks.
- 4.3.2.4. An approval number shall be assigned to each type approved. The same Contracting Party may not assign the same number to another type of grouped, combined or reciprocally incorporated lamps covered by this Regulation.
- 4.3.2.5. Figure 10, Annex 2 to this Regulation, gives examples of arrangements of approval marks for grouped, combined or reciprocally incorporated lamps with all the above-mentioned additional symbols.
- 4.3.3. Lamps, the lens of which are used for different types of headlamps and which may be reciprocally incorporated or grouped with other lamps
- The provisions laid down in paragraph 4.3.2 above are applicable.
- 4.3.3.1. In addition, where the same lens is used, the latter may bear the different approval marks relating to the different types of headlamps or units of lamps, provided that the main body or distributed lighting system of the headlamp, even if they cannot be separated from the lens, also comprises the space described in paragraph 3.2 above, and bears the approval mark of the actual functions.
- 4.3.3.2. Figure 11, Annex 2 to this Regulation, gives examples of arrangements of approval marks relating to the above case.
- 4.3.4. Distributed lighting systems
- For distributed lighting systems the applicable provisions of paragraphs 4.3.1 to 4.3.3.2 shall be complied with, in conjunction with the requirements of paragraph 3.4.
- B. TECHNICAL REQUIREMENTS FOR HEADLAMPS ⁽¹⁾
5. GENERAL SPECIFICATIONS
- 5.1. Each sample shall comply with the specifications set forth in paragraphs 6 to 8 below.
- 5.2. Headlamps shall be so made as to retain their prescribed photometric characteristics and to remain in good working order when in normal use, in spite of the vibrations to which they may be subjected.

⁽¹⁾ Technical requirements for gas-discharge light sources: see Regulation No 99.

- 5.2.1. Headlamps shall be fitted with a device enabling them to be so adjusted on the vehicle as to comply with the rules applicable to them. Such a device need not be fitted on units in which the reflector and the diffusing lens cannot be separated, provided the use of such units is confined to vehicles on which the headlamps setting can be adjusted by other means.

Where a headlamp providing a principal passing beam and a headlamp providing a driving beam, each equipped with its own light source(s), are assembled to form a composite unit, the adjusting device shall enable each optical system individually to be duly adjusted. The same provision applies to headlamps providing a front fog lamp beam and a driving beam, and to headlamps providing a principal passing beam and a front fog lamp beam, and to headlamps providing these three beams.

- 5.2.2. However, these provisions shall not apply to headlamp assemblies whose reflectors are indivisible. For this type of assembly, the requirements of paragraph 6.3 of this Regulation shall apply.

- 5.3. Headlamps designed to satisfy the requirements of both right-hand and of left-hand traffic may be adapted for traffic on a given side of the road either by an appropriate initial setting when fitted on the vehicle or by selective setting by the user. Such initial or selective setting may consist, for example, of fixing either the optical unit at a given angle on the vehicle or the light source(s) at a given angle in relation to the optical unit. In all cases, only two different and clearly distinct settings, one for right-hand and one for left-hand traffic, shall be possible, and the design shall preclude inadvertent shifting from one setting to the other or setting in an intermediate position. Where two different setting positions are provided for the light source, the components for attaching the light source to the reflector must be so designed and made that, in each of its two settings, the light source will be held in position with the precision required for headlamps designed for traffic on only one side of the road. Conformity with the requirements of this paragraph shall be verified by visual inspection and, where necessary, by a test fitting.

- 5.4. Illumination configuration for different traffic conditions

- 5.4.1. In the case of headlamps designed to meet the requirements of traffic moving on one side of the road (either right or left) only, appropriate measures shall be taken to prevent discomfort to road-users in a country where traffic moves on the side of the road opposite to that of the country for which the headlamp was designed ⁽¹⁾. Such measures may be:

- (a) Occulting a part of the outer headlamp lens area;
- (b) Downward movement of the beam. Horizontal movement is allowed;
- (c) Any other measure to remove or reduce the asymmetrical part of the beam.

- 5.4.2. Following the application of this (these) measure(s) the following requirements regarding the luminous intensity of the headlamp shall be met with the adjustment left unchanged compared to that for the original traffic direction:

- 5.4.2.1. Passing beam designed for right-hand traffic and adapted to left-hand traffic:

At 0,86D-1,72L at least 2 500 cd;

At 0,57U-3,43R not more than 880 cd.

⁽¹⁾ Instructions on the installation of lamps fitted with these measures are given in Regulation No 48.

5.4.2.2. Passing beam designed for left-hand traffic and adapted to right-hand traffic:

At 0,86D-1,72R at least 2 500 cd;

At 0,57U-3,43L not more than 880 cd.

5.5. On headlamps designed to provide alternately a driving beam and a passing beam or a passing beam and/or a driving beam designed to become a bend lighting, any mechanical, electro-mechanical or other device incorporated in the headlamp for these purposes ⁽¹⁾ must be so constructed that:

5.5.1. The device is robust enough to withstand 50 000 operations under normal conditions of use. In order to verify compliance with this requirement, the Technical Service responsible for approval tests may:

(a) Require the applicant to supply the equipment necessary to perform the test;

(b) Forego the test if the headlamp presented by the applicant is accompanied by a test report, issued by a Technical Service responsible for approval tests for headlamps of the same construction (assembly), confirming compliance with this requirement.

5.5.2. In the case of failure the luminous intensity of the headlamp above the line H-H shall not exceed the values of a passing beam according to paragraph 6.2.6; in addition, on headlamps designed to provide a passing and/or a driving beam to become a bend lighting, a luminous intensity of at least 2 500 cd shall be fulfilled in test point 25 V (VV line, 1,72 D).

5.5.3. Either the principal passing beam or the driving beam can always be obtained without any possibility of the mechanism stopping in between the two positions;

5.5.4. The user cannot, with ordinary tools, change the shape or position of the moving parts.

5.6. Complementary tests shall be done according to the requirements of Annex 4 to ensure that in use there is no excessive change in photometric performance.

5.7. Light transmitting components made of plastic material shall be tested according to the requirements of Annex 5.

5.8. Replaceability of light sources

5.8.1. The gas-discharge light source(s) used in gas-discharge headlamps or in distributed lighting systems shall be replaceable and approved according to Regulation No 99 and its series of amendments in force at the time of application for type approval. However, gas-discharge light source(s) not approved according to Regulation No 99 can be used only in the case where they are a non-replaceable part of a light-generator. However, in the case of distributed lighting systems the light-generator can be replaceable without using special tools also in the case where the light-source used in it is not approved.

5.8.2. In the case that one or more (additional) filament light sources are used in the gas-discharge headlamp, these filament light sources shall be approved according to Regulation No 37 and its series of amendments in force at the time of application for type approval, provided that no restriction on the use is made in Regulation No 37 and its series of amendments in force at the time of application for type approval.

⁽¹⁾ These provisions shall not apply to the control switch.

- 5.8.3. The design of the device shall be such that the filament lamp, if any, can be fixed in no other position but the correct one.
- 5.8.4. In the case of replaceable gas-discharge light sources and in the case of additional filament light sources the lamp holder shall conform to the dimensional characteristics as given on the data sheet of IEC Publication 60061, relevant to the category of light source(s) used. The light source(s) shall fit easily into the headlamp.
- 5.9. Non-replaceable gas-discharge light sources not approved under Regulation No 99 used in distributed lighting systems shall moreover comply with the following requirements (corresponding to those specified in Regulation No 99 for approval of gas-discharge light sources):
- 5.9.1. Starting, run-up and hot-restrike as prescribed in paragraph 3.6 of Regulation No 99;
- 5.9.2. Colour as prescribed in paragraph 3.9 of Regulation No 99. The colour shall be white;
- 5.9.3. UV-radiation as prescribed in paragraph 3.10 of Regulation No 99, if so indicated in the application for approval (paragraph 2.2.2 above).
- 5.10. The headlamp and ballast system shall not generate radiated or power line disturbances to cause a malfunction of other electric/electronic systems of the vehicle ⁽¹⁾.
- 5.11. If it is necessary for the test procedure, the test house may require from the manufacturer additional test samples, test benches (holders) or special power supplies.
- 5.12. The test procedure shall be carried out under the mounting specifications of the manufacturer.
- 5.13. The headlamp (if equipped with LED modules) and the LED module(s) themselves shall comply with the relevant requirements specified in Annex 11 to this Regulation. The compliance with the requirements shall be tested.
6. ILLUMINATION
- 6.1. General provisions
- 6.1.1. Headlamps or distributed lighting systems shall be so made that with suitable gas-discharge light source they give adequate illuminance without dazzle when emitting the passing-beam, and good illumination when emitting the driving-beam.
- 6.1.2. The luminous intensity produced by the headlamp shall be measured at 25 m distance by means of a photoelectric cell having a useful area comprised within a square of 65 mm side. The point HV is the centre-point of the coordinate system with a vertical polar axis. Line h is the horizontal through HV (see Annex 3 to this Regulation).
- 6.1.3. The headlamp or distributed lighting systems shall be deemed satisfactory if the photometric requirements set in the present paragraph 6 are met with one light source, which has been aged during at least 15 cycles, in accordance with Annex 4, paragraph 4 of Regulation No 99.

⁽¹⁾ Compliance with the requirements for electromagnetic compatibility is relevant to the individual vehicle type.

Where the gas-discharge light source is approved according to Regulation No 99 it shall be a standard (étalon) light-source and its luminous flux may differ from the objective luminous flux specified in Regulation No 99. In this case, the luminous intensities shall be corrected accordingly.

The above correction does not apply to distributed lighting systems using a non-replaceable gas-discharge light source or to headlamps with the ballast(s) totally or partially integrated.

Where the gas-discharge light source is not approved according to Regulation No 99 it shall be a production non-replaceable light source.

- 6.1.4. The dimensions determining the position of the arc inside the standard gas-discharge light source are shown in the relevant data sheet of Regulation No 99.
- 6.1.5. Photometric compliance must be checked in accordance with paragraph 6.2.6 or 6.3 of this Regulation. This is also valid for the cut-off zone between 3°R and 3°L (measurement method for the cut-off colour being under consideration).
- 6.1.6. The colour of the light of the beams emitted by headlamps using gas-discharge light sources shall be white.
- 6.1.7. Four seconds after ignition of a headlamp, equipped with a gas discharge light source with the ballast not integrated with the light source, and that has not been operated for 30 minutes or more:
 - 6.1.7.1. At least 37 500 cd shall be attained at point HV, for a headlamp producing driving beam only.
 - 6.1.7.2. At least 6 250 cd shall be attained at point 50V for headlamps producing passing beam only or alternately passing and driving beam functions as described in paragraph 5.4 of this Regulation.
 - 6.1.7.3. In either case the power supply shall be sufficient to secure the required rise of the high current pulse.
- 6.2. Provisions concerning passing beams
 - 6.2.1. The luminous intensity distribution of the passing beam headlamp shall incorporate a 'cut-off' (see Figure 1 below), which enables the headlamp to be adjusted correctly for the photometric measurements and for the aiming on the vehicle.

The 'cut-off' shall provide:

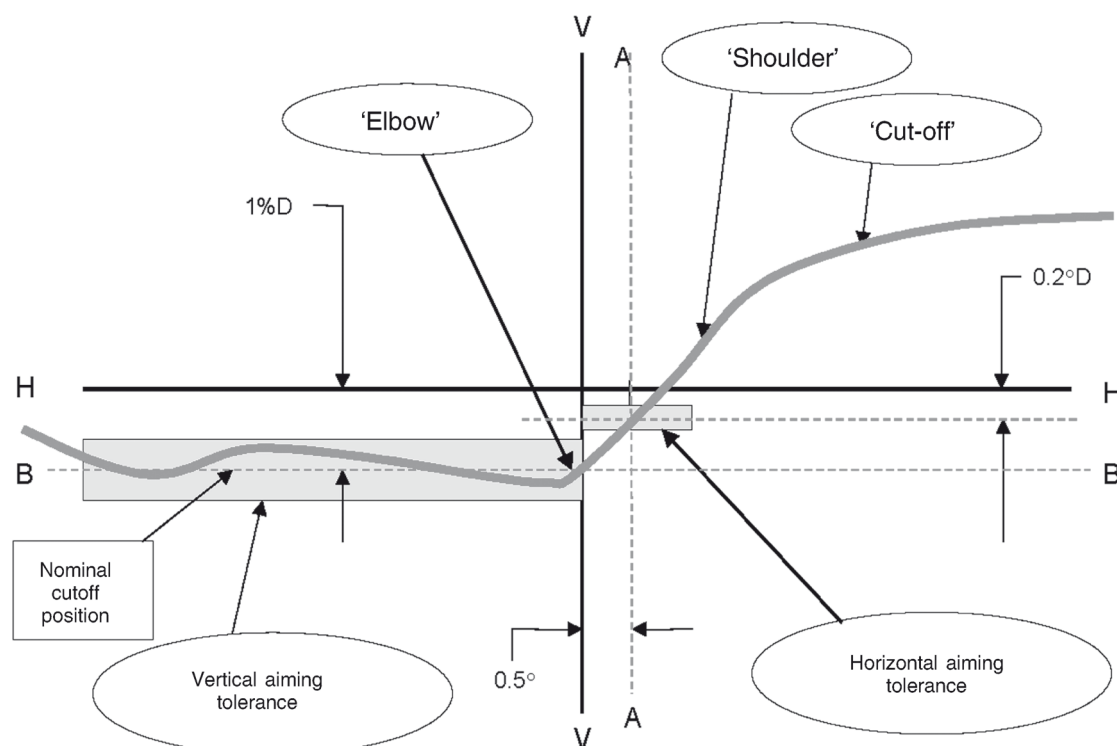
- (a) For right hand traffic beams:
 - (i) A straight 'horizontal part' towards the left;
 - (ii) A raised 'elbow — shoulder' part towards the right.
- (b) For left hand traffic beams:
 - (i) A straight 'horizontal part' towards the right;
 - (ii) A raised 'elbow — shoulder' part towards the left.

In each case the 'elbow — shoulder' part shall have a sharp edge.

6.2.2. The headlamp shall be visually aimed by means of the 'cut-off' (see Figure 1) as follows. The aiming shall be carried out using a flat vertical screen set up at a distance of 10 m or 25 m (as indicated in section 9 of Annex 1) forward of the headlamp and at right angles to the H-V axis as shown in Annex 3 to this Regulation. The screen shall be sufficiently wide to allow examination and adjustment of the 'cut-off' of the passing beam over at least 5° on either side of the V-V line.

6.2.2.1. For vertical adjustment: the horizontal part of the 'cut-off' is moved upward from below line B and adjusted to its nominal position one per cent (0,57 degrees) below the H-H line;

Figure 1



Note: The scales are different for vertical and horizontal lines.

6.2.2.2. For horizontal adjustment: the 'elbow — shoulder' part of the 'cut-off' shall be moved:

For right hand traffic from right to left and shall be horizontally positioned after its movement so that:

- (a) Above the line $0,2^\circ D$ its 'shoulder' shall not exceed the line A to the left and
- (b) On the line $0,2^\circ D$ or below its 'shoulder' should cross the line A and
- (c) The kink of the 'elbow' is basically located within $\pm 0,5$ degrees to the left or right of the V-V line;

Or

For left hand traffic from left to right and shall be horizontally positioned after its movement so that:

- (a) Above the line $0,2^\circ D$ its 'shoulder' shall not exceed the line A to the right and

(b) On the line 0,2° D or below its 'shoulder' should cross the line A and

(c) The kink of 'elbow' should be primarily on the V-V line.

- 6.2.2.3. Where a headlamp so aimed does not meet the requirements set out in paragraphs 6.2.5, 6.2.6 and 6.3, its alignment may be changed, provided that the axis of the beam is not displaced:

Horizontally from line A by more than:

(a) 0,5° to the left or 0,75° to the right, for right hand traffic or

(b) 0,5° to the right or 0,75° to the left, for left hand traffic and

Vertically not more than 0,25° up or down from line B.

- 6.2.2.4. If, however, vertical adjustment cannot be performed repeatedly to the required position within the tolerances described in paragraph 6.2.2.3 above, the instrumental method of Annex 10, paragraphs 2 and 3 shall be applied to test compliance with the required minimum quality of the 'cut-off' and to perform the vertical and horizontal adjustment of the beam.

- 6.2.3. When so aimed, the headlamp needs, if its approval is sought solely for a passing beam, to comply only with the requirements referred to in paragraphs 6.2.4 and 6.2.5 below; if it is intended to provide both a passing beam and a driving beam, it shall comply with the requirements set out in paragraphs 6.2.4 to 6.2.6.

- 6.2.4. Only one gas-discharge light source is permitted for each passing beam headlamp. A maximum of two additional light sources are permitted as follows:

- 6.2.4.1. One additional light source according to Regulation No 37 or one or more additional LED module(s) may be used inside the passing beam headlamp to contribute to bend lighting.

- 6.2.4.2. One additional light source according to Regulation No 37, and/or one or more LED module(s) inside the passing beam headlamp, may be used for the purposes of generating infrared radiation. It/they shall only be activated at the same time as the gas discharge light source. In the event that the gas-discharge light source fails, this additional light source and/or LED module(s) shall be automatically switched off.

- 6.2.4.3. In the event of failure of an additional light source or LED module, the headlamp shall continue to fulfil the requirements of the passing beam.

- 6.2.4.4. Measurement conditions with respect to light sources

- 6.2.4.4.1. In the case of a gas-discharge light source:

The voltage applied to the terminals of the ballast(s) is either 13,2 V $\pm$ 0,1 for 12 V systems or otherwise specified (see Annex 7).

- 6.2.4.4.2. In the case of a filament light source according to Regulation No 37:

The lamp shall be measured by means of an uncoloured standard (étalon) filament lamp designed for a rated voltage of 12 V. During the checking, the voltage at the terminals of the filament lamp shall be regulated so as to obtain the reference luminous flux at 13,2 V as indicated at the relevant data sheet of Regulation No 37.

6.2.4.4.3. In the case of LED module(s):

The lamp shall be measured at 6,3 V, 13,2 V or 28,0 V respectively, if not otherwise specified within this Regulation. LED module(s) operated by an electronic light source control gear, shall be measured as specified by the applicant.

6.2.5. After more than 10 minutes after ignition the luminous intensities at the test points referred to in the table below and in Annex 3, Figure B (or mirrored about the VV line for left-hand traffic) shall meet the following requirements:

Points or segments								Luminous intensity (cd)		Horizontal angle (degrees)	Vertical angle (degrees)
								Max	Min		
Any point in zone A (bounded by the following coordinates in degrees)											
8L	8L	8R	8R	6R	1,5R	V-V	4L				
1U	4U	4U	2U	1,5U	1,5U	H-H	H-H	625			
2		B 50 L						350		3,43 L	0,57 U
3		75 R							12 500	1,15 R	0,57 D
4		50 L						18 480		3,43 L	0,86 D
5		25 L1						18 800		3,43 L	1,72 D
6		50 V							7 500	0	0,86 D
7		50 R							12 500	1,72 R	0,86 D
8		25 L2							2 500	9 L	1,72 D
9		25 R1							2 500	9 R	1,72 D
10		25 L3							1 250	15 L	1,72 D
11		25 R2							1 250	15 R	1,72 D
12		15 L							625	20 L	2,86 D
13		15 R							625	20 R	2,86 D
14									(*)	8 L	4 U
15									(*)	0	4 U
16									(*)	8 R	4 U
17									(*)	4 L	2 U
18									(*)	0	2 U

Points or segments	Designation (**)	Luminous intensity (cd)		Horizontal angle (degrees)	Vertical angle (degrees)
		Max	Min		
19			(*)	4 R	2 U
20			65	8 R	0
21			125	4 L	0
A to B	Segment I		3 750	5,15 L to 5,15 R	0,86 D
C - D		1 750		2,5 R	1 U
E to F	Segment III and under	12 500		9,37 L to 8,53 R	4,29 D
	E max R	43 800		Right of VV line	Above 1,72 D
	E max L	31 300		Left of VV line	

Note: In the table:

Letter L means that the point or segment is located on the left of VV line.

Letter R means that the point or segment is located on the right of VV line.

Letter U means the point or segment is located above HH line.

Letter D means the point or segment is located below HH line.

(*) The luminous intensities at points 14 through 19 shall be such that:

14 + 15 + 16 $\geq$ 190 cd and

17 + 18 + 19 $\geq$ 375 cd.

(**) For left-hand traffic, the letter R shall be replaced by letter L and vice versa.

6.2.6. The requirements in paragraph 6.2.5 above shall also apply to headlamps designed to provide bend lighting and/or that include the additional light source or LED module(s) referred to in paragraph 6.2.4.2. In the case of a headlamp designed to provide bend lighting its alignment may be changed, provided that the axis of the beam is not displaced vertically by more than 0,2°.

6.2.6.1. If bend lighting is obtained by:

6.2.6.1.1. Swivelling the passing beam or moving horizontally the kink of the elbow of the cut-off, the measurements shall be carried out after the complete headlamp assembly has been reaimed horizontally, e. g. by means of a goniometer;

6.2.6.1.2. Moving one or more optical parts of the headlamp without moving horizontally the kink of the elbow of the cut-off, measurements shall be carried out with these parts being in their extreme operating position;

6.2.6.1.3. Means of one additional light source or one or more LED module(s) without moving horizontally the kink of the elbow of the cut-off, measurements shall be carried out with this light source or LED module(s) activated.

6.3. Provisions concerning driving beams

6.3.1. In the case of a headlamp designed to provide a driving beam and a passing beam, measurements of the luminous intensity of the driving beam shall be taken with the same headlamp alignment as for measurements under paragraph 6.2.5 above; in the case of a headlamp providing a driving beam only, it shall be so adjusted that the area of maximum luminous intensity is centred on the point of intersection of lines H-H and V-V; such a headlamp needs meet only the requirements referred to in paragraph 6.3. Test voltages are the same as in paragraph 6.2.4.4.

- 6.3.2. It is possible to use several light sources for the driving beam, these light sources being listed in Regulation No 37 (in this case the filament lamps shall be operated at their reference luminous flux), in Regulation No 99 and/or they can be LED module(s). Where more than one light source is used to provide the driving beam, these light sources shall be operated simultaneously whilst determining the maximum value of luminous intensity (I_M).

It is also possible that a part of the driving beam produced by one of these light sources will be used exclusively for short time signals (flash to pass) as declared by the applicant. This shall be indicated in the relevant drawing and a remark shall be made in the communication form.

- 6.3.3. Referring to Annex 3, Figure C, and the table below, the luminous intensity distribution of the driving beam shall meet the following requirements.

Test point	Angular coordinates Degrees	Required luminous intensity Cd
		Min
H-5L	0,0, 5,0 L	6 250
H-2,5L	0,0, 2,5 L	25 000
H-2,5R	0,0, 2,5 R	25 000
H-5R	0,0, 5,0 R	6 250

- 6.3.3.1. The point of intersection (HV) of lines HH and VV shall be situated within the isolux representing 80 per cent of maximum luminous intensity. This maximum value (I_M) shall not be less than 43 800 cd.

- 6.3.3.2. The maximum value (I_M) shall in no circumstances exceed 215 000 cd.

- 6.3.4. The reference mark (I'_M) of the maximum luminous intensity, referred to in paragraph 6.3.3.2 above, shall be obtained by the ratio:

$$I'_M = I_M / 4\,300.$$

This value shall be rounded off to the value 7,5 — 10 — 12,5 — 17,5 — 20 — 25 — 27,5 — 30 — 37,5 — 40 — 45 — 50.

- 6.4. Provisions concerning movable reflectors

- 6.4.1. With the lamp fixed according to all the positions described in paragraph 2.1.4, the headlamp must meet the photometric requirements of paragraph 6.2 or 6.3, or both.

- 6.4.2. Additional tests are made after the reflector has been tilted vertically upwards by the angle quoted in paragraph 2.1.4 or 2 degrees, whichever is smaller, by means of the headlamp aiming devices. The headlamp is then re-aimed downwards (by means of the goniometer), and the photometric specifications must be met at the following points:

Principal passing beam: HV and 75 R (75 L respectively);

Driving beam: I_M and point HV (percentage of I_M).

If the aiming devices do not allow a continuous movement, the position nearest to 2 degrees is chosen.

- 6.4.3. The reflector is brought back to its nominal angular position as defined in paragraph 6.2.2, and the goniometer is set back to its position of origin. The reflector is tilted vertically downwards by the angle quoted in paragraph 2.1.4, or 2 degrees, whichever is smaller, by means of the headlamp aiming device. The headlamp is then re-aimed upwards (by means of the goniometer for example) and points as in paragraph 6.5.2 are checked.

7. GAUGING OF DISCOMFORT AND/OR DISABILITY

The discomfort and/or disability caused by the passing beam of headlamps shall be gauged ⁽¹⁾.

C. FURTHER ADMINISTRATIVE PROVISIONS

8. MODIFICATION OF THE HEADLAMP TYPE AND EXTENSION OF APPROVAL

- 8.1. Every modification of the headlamp type including the ballast shall be notified to the Type Approval Authority which approved the headlamp type. The said department may then either:

8.1.1. Consider that the modifications made are unlikely to have appreciable adverse effects and that in any event the headlamp still complies with the requirements; or

8.1.2. Require a further test report from the technical service responsible for conducting the tests.

8.2. Confirmation or refusal or approval, specifying the alterations, shall be communicated by the procedure specified in paragraph 4.1.5 above to the Contracting Parties to the Agreement which apply this Regulation.

8.3. The competent authority issuing the extension of approval shall assign a series number to each communication form drawn up for such an extension and inform thereof the other Contracting Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

9. CONFORMITY OF PRODUCTION

9.1. Headlamps approved under this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set forth in paragraph 6.

9.2. In order to verify that the requirements of paragraph 9.1 are met, suitable controls of the production shall be carried out.

9.3. The holder of the approval shall in particular:

9.3.1. Ensure the existence of procedures for the effective control of the quality of products:

9.3.2. Have access to the control equipment necessary for checking the conformity to each approved type;

9.3.3. Ensure that data of test results are recorded and that related documents shall remain available for a period to be determined in accordance with the administrative service;

9.3.4. Analyse the results of each type of test in order to verify and ensure the stability of the product characteristics making allowance for variation of an industrial production;

9.3.5. Ensure that for each type of product at least the tests prescribed in Annex 8 to this Regulation are carried out;

⁽¹⁾ This requirement will be the subject of a recommendation for the benefit of the administrations.

- 9.3.6. Ensure that any collecting of samples giving evidence of non-conformity with the type of test considered shall give rise to another sampling and another test. All the necessary steps shall be taken to re-establish the conformity of the corresponding production.
- 9.4. The competent authority which has granted type approval may at any time verify the conformity control methods applicable to each production unit.
- 9.4.1. In every inspection, the test books and production survey records shall be presented to the visiting inspector.
- 9.4.2. The inspector may take samples at random to be tested in the manufacturer's laboratory. The minimum number of samples may be determined in the light of results of the manufacturer's own checks.
- 9.4.3. When the quality level appears unsatisfactory or when it seems necessary to verify the validity of the tests carried out in the application of paragraph above, the inspector shall select samples, to be sent to the technical service which has conducted the type approval tests, using the criteria of Annex 9.
- 9.4.4. The competent authority may carry out any test prescribed in this Regulation. These tests will be on samples selected at random without causing distortion of the manufacturer's delivery commitments and in accordance with the criteria of Annex 9.
- 9.4.5. The competent authority shall strive to obtain a frequency of inspection of once every two years. However, this is at the discretion of the competent authority and their confidence in the arrangements for ensuring effective control of the conformity of production. In the case where negative results are recorded, the competent authority shall ensure that all necessary steps are taken to re-establish the conformity of production as rapidly as possible.
- 9.5. Headlamps with apparent defects are disregarded.
- 9.6. The reference mark is disregarded.
- 9.7. The measuring points 14 to 21 from paragraph 6.2.6 of this Regulation are disregarded.
10. PENALTIES FOR NON-CONFORMITY OF PRODUCTION
- 10.1. The approval granted in respect of a type of headlamp pursuant to this Regulation may be withdrawn if the requirements are not complied with or if a headlamp bearing the approval mark does not conform to the type approved.
- 10.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.
11. PRODUCTION DEFINITELY DISCONTINUED
- If the holder of the approval completely ceases to manufacture a type of headlamp approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication, that authority shall inform thereof the other Contracting Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

12. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS, AND OF TYPE APPROVAL AUTHORITIES

The Contracting Parties to the 1958 Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, or production definitively discontinued, issued in other countries, are to be sent.

13. TRANSITIONAL PROVISIONS

13.1. From the date of entry into force of the 01 series of amendments to this Regulation no Contracting Party applying it shall refuse to grant approvals under this Regulation as amended by the 01 series of amendments.

13.2. Until 60 months after the date of entry into force of the 01 series of amendments to this Regulation with regard to the changes introduced by the 01 series of amendments concerning the photometric testing procedures involving the use of the spherical coordinate system and the specification of luminous intensity values, and in order to allow the Technical Services (test laboratories) to update their testing equipment, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 01 series of amendments where existing testing equipment is used with suitable conversion of the values, to the satisfaction of the type approval authority.

13.3. As from 60 months after the date of entry into force of the 01 series of amendments, Contracting Parties applying this Regulation shall grant approvals only if the headlamp meets the requirements of this Regulation as amended by the 01 series of amendments.

13.4. Existing approvals for headlamps already granted under this Regulation before the date of entry into force of the 01 series of amendments shall remain valid indefinitely.

13.5. Contracting Parties applying this Regulation shall not refuse to grant extensions of approvals to the preceding series to this Regulation.

ANNEX 1

COMMUNICATION

(Maximum format: A4 (210 × 297 mm))



issued by: Name of administration

.....

.....

.....

Concerning ⁽²⁾: Approval granted

Approval extended

Approval refused

Approval withdrawn

Production definitively discontinued

of a type of headlamp or of a distributed lighting system pursuant to Regulation No 98.

Approval No:

Extension No:

1. Trade name or mark of the headlamp or distributed lighting system:
2. Manufacturer's name for the type of device or system:
3. Manufacturer's name and address:
4. If applicable, name and address of the manufacturer's representative:
5. Submitted for approval on:
6. Technical Service responsible for conducting approval tests:
7. Date of test report:
8. Number of test report:
9. Brief description:
 - 9.1. Headlamp/system submitted for approval as type ⁽³⁾:
 - 9.2. The passing beam light source may/may not ⁽²⁾ be lit simultaneously with the driving beam light source and/or another reciprocally incorporated headlamp.
 - 9.3. The rated voltage of the device is:
 - 9.4. Category (or categories) of light source(s) ⁽⁴⁾:
 - 9.5. Trade name and identification number of separate ballast(s) or part(s) of ballast(s):
 - 9.6. The adjustment of the 'cut-off' has been determined at 10 m/25 m ⁽²⁾.
The determination of the minimum sharpness of the 'cut-off' has been carried out at 10 m/25 m ⁽²⁾.
 - 9.7. Number and specific identification code(s) of LED module(s):
 - 9.8. Distributed lighting system with one common gas-discharge light source: Yes/No ⁽²⁾
 - 9.9. Remarks (if any):
 - 9.10. Measures according to paragraph 5.4 of this Regulation:
10. Approval mark position:
11. Reason(s) for extension of approval:
12. Approval granted/extended/refused/withdrawn ⁽²⁾:
13. Place:
14. Date:

15. Signature:
16. The list of documents deposited with the Administration Service which has granted approval is annexed to this communication and may be obtained on request.

⁽¹⁾ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).

⁽²⁾ Strike out what does not apply.

⁽³⁾ Indicate the appropriate marking selected from the list below:

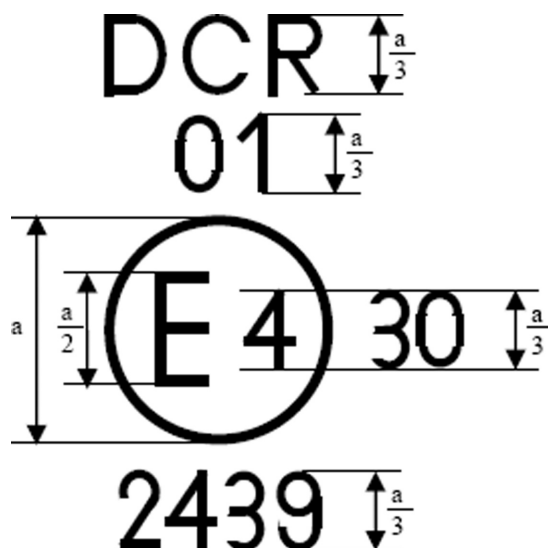
DC,	DC/,	DC/PL,	DR,	DCR,	DC/R,	DC PL,	DR PL,	DCR PL,	DC/R PL,
DC,	DCR,	DC/R,	DC/,	DC PL,	DCR PL,	DC/R PL,	DC/PL,		
→	→	→	→	→	→	→	→		
DC,	DCR,	DC/R,	DC/,	DC PL,	DCR PL,	DC/R PL,	DC/PL,		
←	←	←	←	←	←	←	←		
DLSC,	DLSC/,	DLSC/PL,	DLSR,	DLSCR,	DLSC/R,	DLSC PL,	DLSR PL,	DLSCR PL,	DLSC/R
PL,									
DLSC,	DLSCR,	DLSC/R,	DLSC/,	DLSC PL,	DLSCR PL,	DLSC/R PL,	DLSC/PL,		
→	→	→	→	→	→	→	→		
DLSC,	DLSCR,	DLSC/R,	DLSC/,	DLSC PL,	DLSCR PL,	DLSC/R PL,	DLSC/PL,		
←	←	←	←	←	←	←	←		

⁽⁴⁾ In the case of a DLS using a non-replaceable gas-discharge light source not approved under Regulation No 99 shall be indicated the part number assigned by the light-generator manufacturer to the light-generator.

ANNEX 2

EXAMPLES OF ARRANGEMENTS OF APPROVAL MARKS

Figure 1



$a \geq 8 \text{ mm}$ (on glass)

$a \geq 5 \text{ mm}$ (on plastic material)

The headlamp bearing the approval mark shown above is a headlamp approved in the Netherlands (E4), under approval number 2439, meeting the requirements of this Regulation, as amended by the 01 series of amendments. The passing beam is designed for right-hand traffic only.

Figure 30 indicates that the maximum luminous intensity of the driving beam is between 123 625 and 145 125 candelas.

Note: The approval number and additional symbols shall be placed close to the circle and either above or below the letter 'E', or to the right or left of that letter. The digits of the approval number shall be on the same side of the letter 'E' and face in the same direction.

The use of Roman numerals as approval numbers should be avoided so as to prevent any confusion with other symbols.

Figure 2

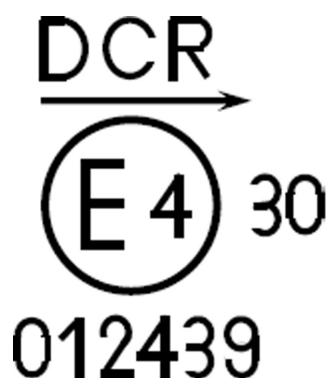
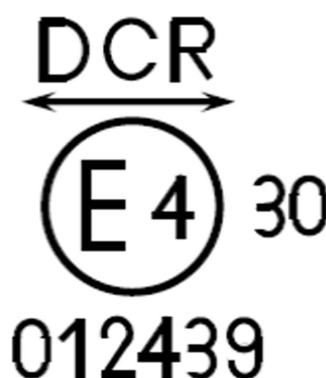


Figure 3a



The headlamp bearing the approval marking shown above is a headlamp meeting the requirements of this Regulation, as amended by the 01 series of amendments, with respect to both the passing beam and the driving beam and designed:

For left-hand traffic only

For both traffic systems, by means of an adjustment as desired of the setting of the optical unit or the light source on the vehicle

Figure 3b

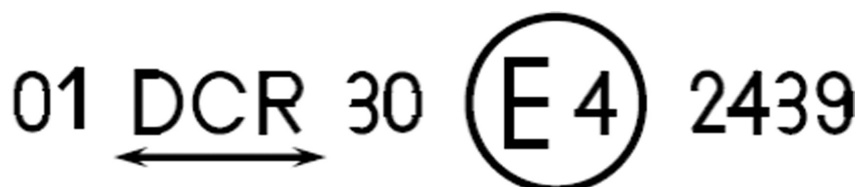


Figure 4



Figure 5

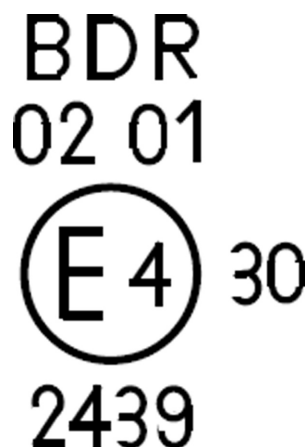


The headlamp bearing the approval marking shown above is a headlamp meeting the requirements of this Regulation, as amended by the 01 series of amendments, with a gas discharge light source for the passing beam only and is equipped with a lens of plastic material, and designed:

For both traffic systems

For right-hand traffic only

Figure 6



The headlamp bearing the approval marking shown above is a headlamp meeting the requirements of this Regulation, as amended by the 01 series of amendments, with gas discharge light sources for the driving beam, and is combined or grouped or reciprocally incorporated with a front fog lamp.

Figure 7a

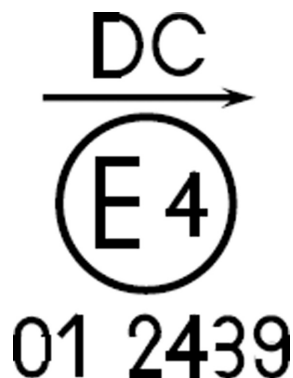
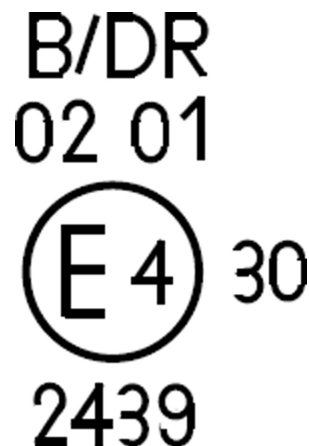


Figure 7b



The headlamp bearing the above approval marking shown above is a headlamp meeting the requirements of this Regulation, as amended by the 01 series of amendments:

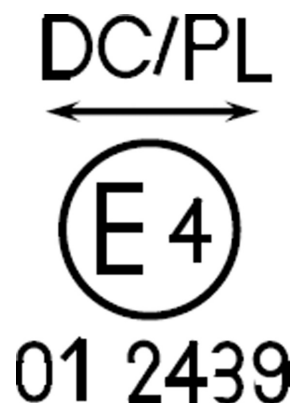
With a gas discharge light source in respect of the passing beam only and is designed for left-hand traffic only.

Same arrangement as Figure 6, but the front fog lamp cannot be lit simultaneously with the driving beam.

Figure 8



Figure 9



Identification of a passing beam headlamp meeting the requirements of this Regulation, as amended by the 01 series of amendments, and incorporating a lens of plastic material,

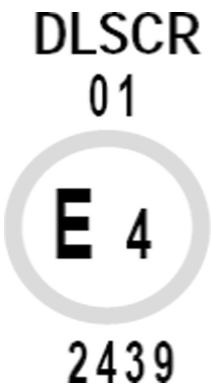
and combined or grouped or reciprocally incorporated with R 8 halogen driving beam.

The passing beam shall not be lit simultaneously with the halogen driving beam. The passing beam is designed for right-hand traffic only.

designed for both traffic systems.

The passing beam shall not be lit simultaneously with another reciprocally incorporated headlamp.

Figure 10



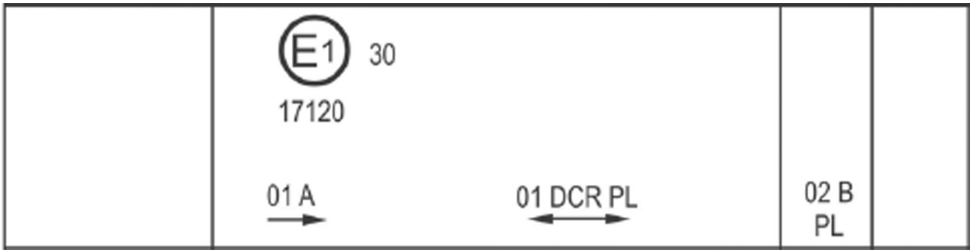
The approval marking shown above identifies a distributed lighting system using a gas-discharge light source and meeting the requirements of this Regulation, as amended by the 01 series of amendments, with respect to both the passing beam and the driving beam for both traffic systems.

Examples of possible simplified marking for grouped, combined or reciprocally incorporated lamps fitted to the front of the vehicle

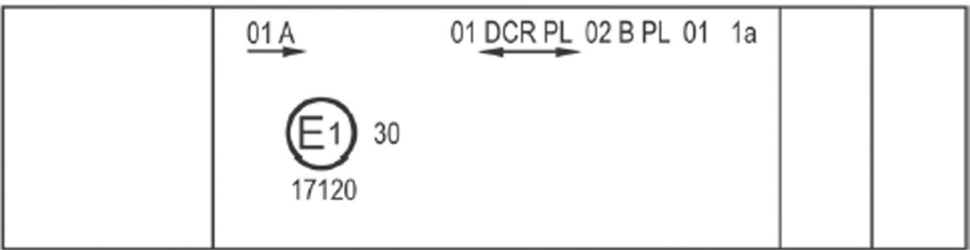
Figure 11

(The vertical and horizontal lines schematize the shape and overall arrangement of the light-signalling device. They are not part of the approval mark.)

Model A



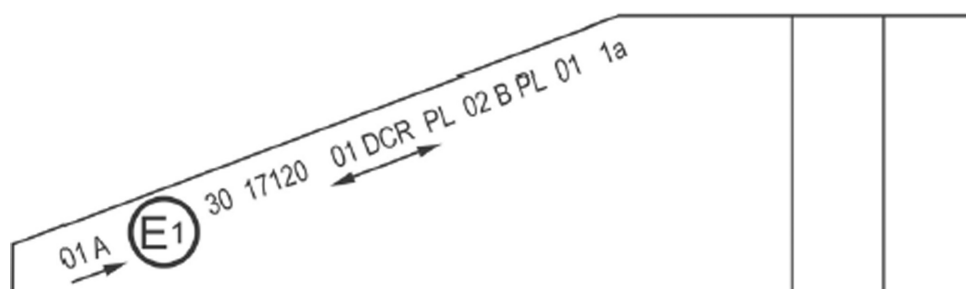
Model B



Model C



Model D



Note: The four examples shown above correspond to a lighting device bearing an approval mark relating to:

A front position lamp approved in accordance with the 01 series of amendments to Regulation No 7, for left-hand installation;

A headlamp with a gas discharge passing beam designed for right-hand and left-hand traffic and a gas discharge driving beam with a maximum intensity comprised between 123 625 and 145 125 (as indicated by the number 30), approved in accordance with this Regulation in its original form and incorporating a lens of plastic material;

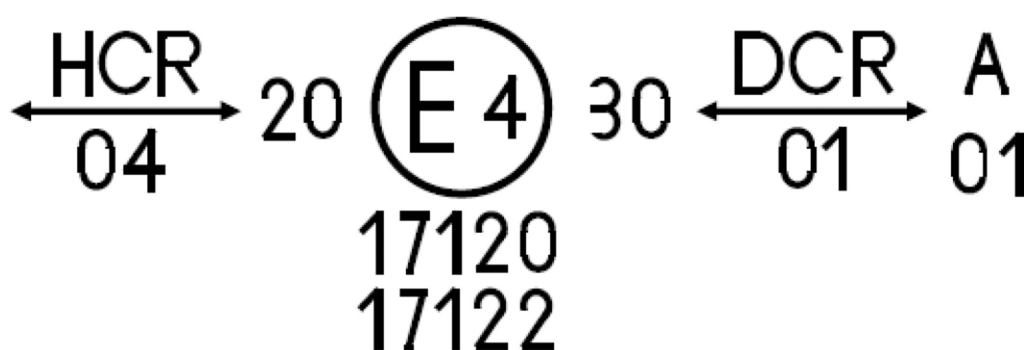
A front fog lamp approved in accordance with the 02 series of amendments to Regulation No 19 and incorporating a lens of plastic material;

A front direction indicator lamp of category 1a approved in accordance with the 01 series of amendments to Regulation No 6.

Figure 12

Lamp reciprocally incorporated or grouped with a headlamp

Example 1



The above example corresponds to the marking of a lens intended to be used in different types of headlamps namely:

Either:

A headlamp with a passing beam designed for both traffic systems and a driving beam with a maximum luminous intensity comprised between 80 625 and 96 750 candelas (as indicated by the number 20) approved in the Netherlands (E 4) in accordance with the requirements of Regulation No 8 as amended by the 04 series of amendments, and

A front position lamp approved in accordance with the 01 series of amendments to Regulation No 7,

Or

A headlamp with a gas discharge passing beam and a driving beam with a maximum luminous intensity comprised between 123 625 and 145 125 candelas (as indicated by the number 30), designed for both traffic systems and approved in the Netherlands in accordance with the requirements of this Regulation, as amended by the 01 series of amendments, which is reciprocally incorporated with the same front position lamp as above,

Or

Even either of the above-mentioned headlamps approved as a single lamp.

The main body of the headlamp shall bear the only valid approval number, for instance:

A $\overleftrightarrow{\text{HCR}}$
01 04
 $\textcircled{\text{E 4}}$ 20
17120

or

$\overleftrightarrow{\text{HCR}}$
04
 $\textcircled{\text{E 4}}$ 20
17120

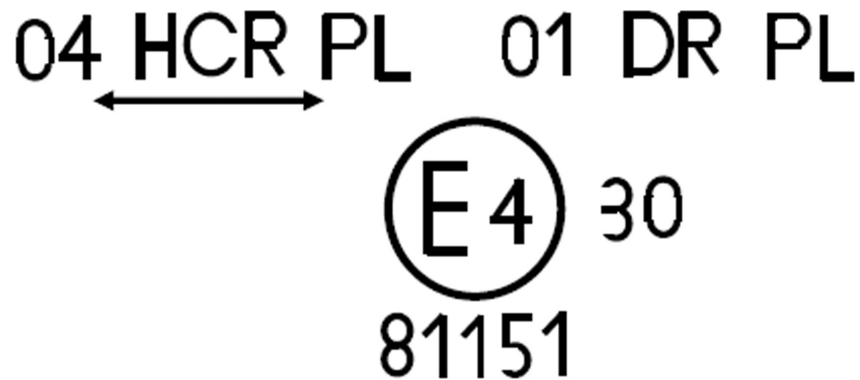
or

$\overleftrightarrow{\text{DCR}}$
01
 $\textcircled{\text{E 4}}$ 30
17122

or

A $\overleftrightarrow{\text{DCR}}$
01 01
 $\textcircled{\text{E 4}}$ 30
17122

Example 2



The above example corresponds to the marking of a lens of plastic material and used in an assembly of two headlamps approved in the Netherlands (E4) under approval number 81151, consisting of:

A headlamp emitting a halogen passing beam designed for both traffic systems and a halogen driving beam with a maximum luminous intensity between x and y candelas, meeting the requirements of Regulation No 8 and,

A headlamp emitting a gas discharge driving beam with a maximum luminous intensity comprised between w and z candelas, meeting the requirements of this Regulation, as amended by the 01 series of amendments, the maximum luminous intensities of the driving beam contributors as a whole being comprised between 123 625 and 145 125 candelas as shown by the number 30.

Figure 13

LED modules

MD E3 17325

The LED module bearing the light source module identification code shown above has been approved together with a lamp approved in Italy (E3) under approval number 17325.

—

ANNEX 3

SPHERICAL COORDINATE MEASURING SYSTEM AND TEST POINT LOCATIONS

Figure A

Spherical coordinate measuring system

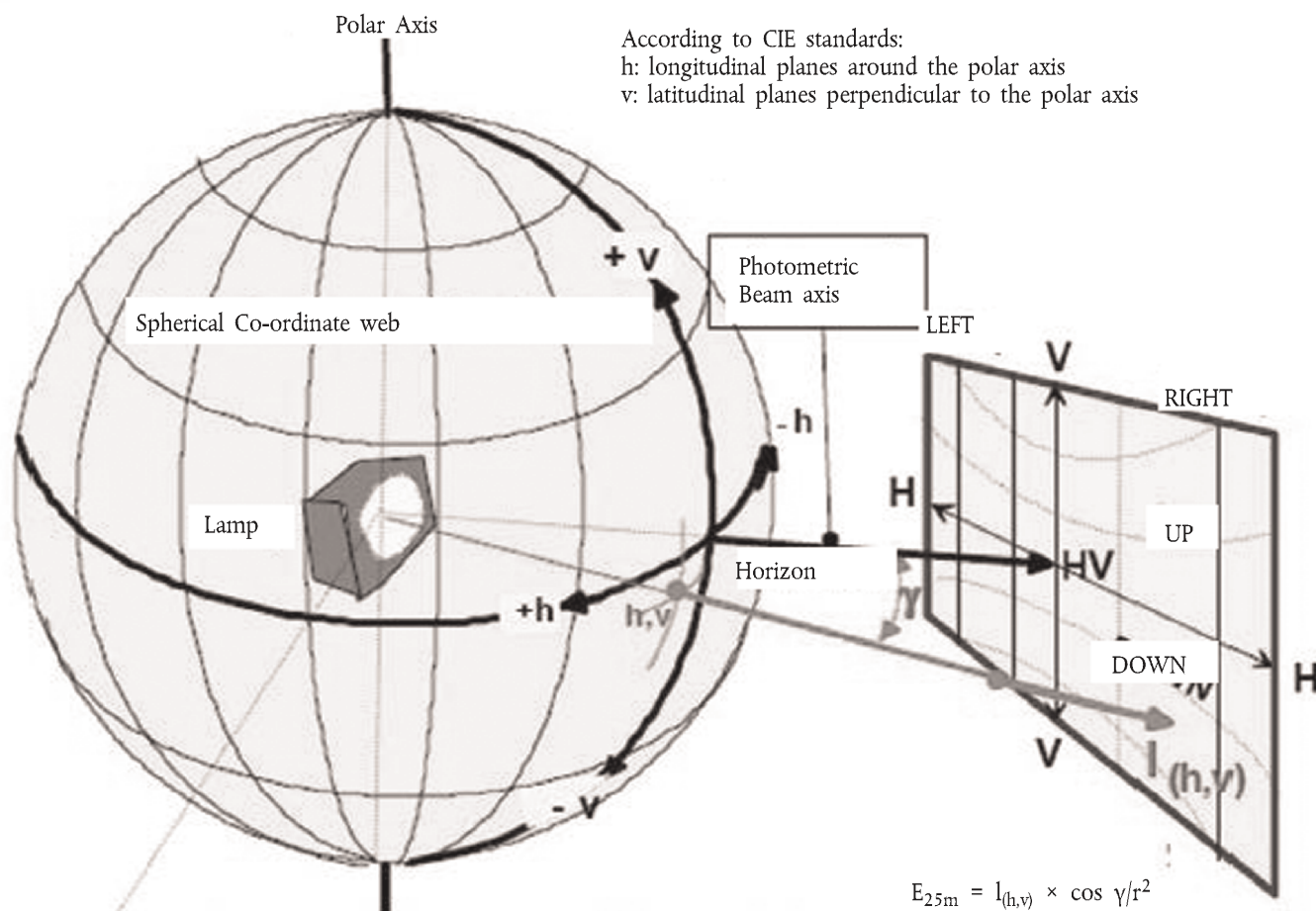
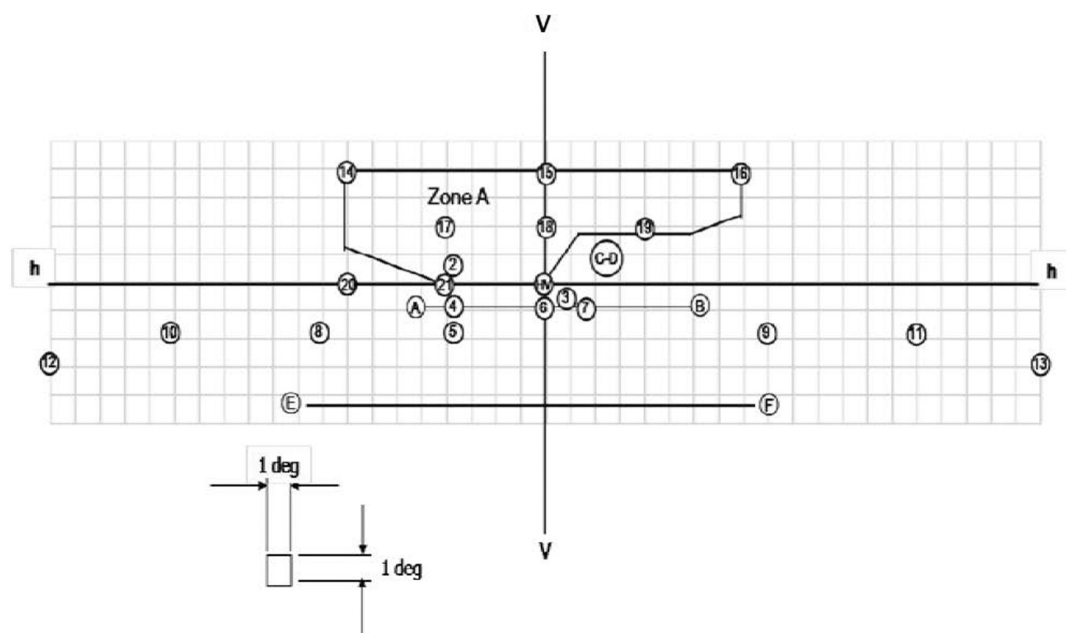


Figure B

Passing beam for right-hand traffic

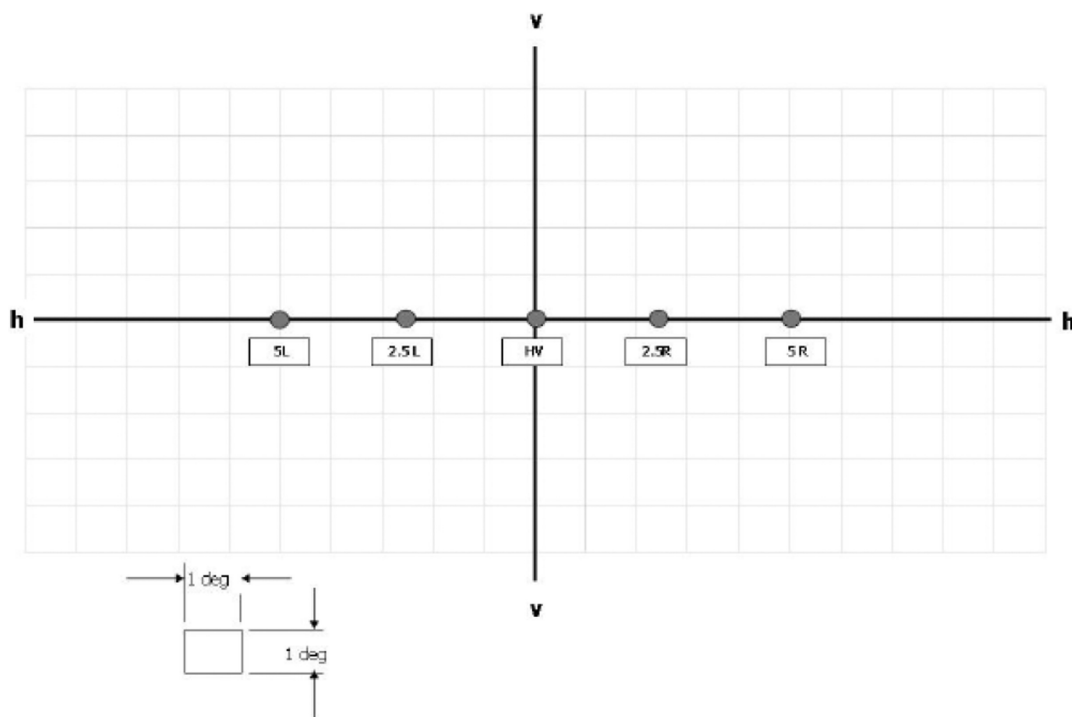


h-h = horizontal plane, v-v = vertical plane passing through the optical axis of the headlamp

The test point locations for left-hand traffic are mirrored about the VV line

Figure C

Driving beam test points



h-h = horizontal plane, v-v = vertical plane passing through the optical axis of the headlamp.

ANNEX 4

TESTS FOR STABILITY OF PHOTOMETRIC PERFORMANCE OF HEADLAMPS IN OPERATION

Test on complete headlamps

Once the photometric values have been measured according to the prescriptions of this Regulation, in the point for $I_{\max}$ for driving beam and in points HV, 50 R and B 50 L for passing beam (or HV, 50 L, B 50 R for headlamps designed for left-hand traffic) a complete headlamp sample shall be tested for stability of photometric performance in operation. 'Complete headlamp' shall be understood to mean the complete lamp itself including ballast(s) and those surrounding body parts and lamps which could influence its thermal dissipation.

The tests shall be carried out:

- (a) In a dry and still atmosphere at an ambient temperature of $23\text{ °C} \pm 5\text{ °C}$, the test sample being mounted on a base representing the correct installation on the vehicle;
- (b) In case of replaceable light sources: using mass production filament light sources, which have been aged for at least one hour, or mass production gas-discharge light sources, which have been aged for at least 15 hours or mass production LED modules which have been aged for at least 48 hours and cooled down to ambient temperature before starting the tests as specified in this Regulation. The LED modules supplied by the applicant shall be used.

The measuring equipment shall be equivalent to that used during headlamp type approval tests.

The test sample shall be operated without being dismounted from or readjusted in relation to its test fixture. The light source used shall be a light source of the category specified for that headlamp.

1. TEST FOR STABILITY OF PHOTOMETRIC PERFORMANCE

The tests shall be carried out in a dry and still atmosphere at an ambient temperature of $23 \pm 5\text{ °C}$, the complete headlamp being mounted on a base representing the correct installation on the vehicle.

1.1. Clean headlamp

The headlamp shall be operated for 12 hours as described in subparagraph 1.1.1 and checked as prescribed in subparagraph 1.1.2.

1.1.1. Test procedure

The headlamp shall be operated for a period according to the specified time, so that:

- 1.1.1.1. (a) In the case where only one lighting function (driving or passing beam) is to be approved, the corresponding light source is lit for the prescribed time ⁽¹⁾;
- (b) In the case of a reciprocally incorporated passing beam lamp and driving beam lamp or in the case of a reciprocally incorporated front fog lamp and driving beam headlamp:

⁽¹⁾ When the tested headlamp is grouped and/or reciprocally incorporated with signalling lamps, the latter shall be lit for the duration of the test. In the case of a direction indicator lamp, it shall be lit in flashing operation mode with an on/off time ratio of approximately one to one.

If the applicant declares that the headlamp is to be used with a single light source lit ⁽²⁾ at a time, the test shall be carried out in accordance with this condition, activating ⁽¹⁾ each specified function successively for half the time specified in paragraph 1.1,

In all other cases ⁽¹⁾, ⁽²⁾, the headlamp shall be subjected to the following cycle until the time specified is reached:

15 minutes, passing beam lit;

5 minutes, all functions lit;

In the case of a passing beam and a driving beam provided by the same gas-discharge light source, the cycle will be:

15 minutes, passing beam lit;

5 minutes, all driving beam contributors lit.

- (c) In the case of grouped lighting functions, all the individual functions shall be lit simultaneously for the time specified for individual lighting functions (a), also taking into account the use of reciprocally incorporated lighting functions (b), according to the manufacturer's specifications.
- (d) In the case of a passing beam designed to provide bend lighting with the addition of a light source, this light source shall be switched on for 1 minute, and switched off for 9 minutes during the activation of the passing beam only (see the Appendix of this Annex).
- (e) In the case that the driving beam uses several light sources in accordance with paragraph 6.3.2 and if the applicant declares that a part of the driving beam (one of these additional light sources) will be used exclusively for short time signals (flash to pass), the test shall be carried out without this part of the driving beam.

1.1.1.2. Test voltage

The voltage shall be applied to the terminals of the test sample as follows:

- (a) In case of replaceable filament light source(s) operated directly under vehicle voltage system conditions: the test shall be performed at 6,3 V, 13,2 V or 28,0 V as applicable except if the applicant specifies that the test sample may be used at a different voltage. In this case, the test shall be carried out with the filament light source operated at the highest voltage that can be used.
- (b) In case of replaceable gas discharge light source(s): The test voltage for the electronic light source control-gear is $13,2 \pm 0,1$ volts for 12 V vehicle voltage system, or otherwise specified in the application for approval.
- (c) In the case of non-replaceable light source operated directly under vehicle voltage system conditions: All measurements on lighting units equipped with non-replaceable light sources (filament light sources and/or others) shall be made at 6,3 V, 13,2 V or 28,0 V or at other voltages according to the vehicle voltage system as specified by the applicant respectively.

⁽²⁾ Should two or more light sources be simultaneously lit when headlamp flashing is used, this shall not be considered as being normal use of the light sources simultaneously.

- (d) In the case of light sources, replaceable or non-replaceable, being operated independently from vehicle supply voltage and fully controlled by the system, or, in the case of light sources supplied by a supply and operating device, the test voltages as specified above shall be applied to the input terminals of that device. The test laboratory may require from the manufacturer the supply and operating device or a special power supply needed to supply the light source(s).
- (e) LED module(s) shall be measured at 6,75 V, 13,2 V or 28,0 V respectively, if not otherwise specified within this Regulation. LED module(s) operated by an electronic light source control gear shall be measured as specified by the applicant.
- (f) Where signalling lamps are grouped, combined or reciprocally incorporated into the test sample and operating at voltages other than the nominal rated voltages of 6 V, 12 V or 24 V respectively, the voltage shall be adjusted as declared by the manufacturer for the correct photometric functioning of that lamp.

1.1.2. Test results

1.1.2.1. Visual inspection:

Once the headlamp has been stabilized to the ambient temperature, the headlamp lens and the external lens, if any, shall be cleaned with a clean, damp cotton cloth. It shall then be inspected visually; no distortion, deformation, cracking or change in colour of either the headlamp lens or the external lens, if any, shall be noticeable.

1.1.2.2. Photometric test:

To comply with the requirements of this Regulation, the photometric values shall be verified in the following points:

Passing beam:

50 R — B 50 L — 25 L for headlamps designed for right-hand traffic

50 L — B 50 R — 25 R for headlamps designed for left-hand traffic

Driving beam: Point $I_{\max}$.

Another aiming may be carried out to allow for any deformation of the headlamp base due to heat (the change of the position of the cut-off line is covered in paragraph 2 of this Annex).

Except for point B50L, a 10 per cent discrepancy between the photometric characteristics and the values measured prior to the test is permissible including the tolerances of the photometric procedure. The value measured at point B50L shall not exceed the photometric value measured prior to the test by more than 170 cd.

1.2. Dirty headlamp

After being tested as specified in subparagraph 1.1 above, the headlamp shall be operated for one hour as described in subparagraph 1.1.1, after being prepared as prescribed in subparagraph 1.2.1, and checked as prescribed in subparagraph 1.1.2.

1.2.1. Preparation of the headlamp

1.2.1.1. Test mixture

1.2.1.1.1. For headlamp with the outside lens in glass:

The mixture of water and a polluting agent to be applied to the headlamp shall be composed of:

9 parts by weight of silica sand with a particle size of 0-100 µm,

1 part by weight of vegetal carbon dust (beechwood) with a particle size of 0-100 µm,

0,2 parts by weight of NaCMC ⁽³⁾, and

an appropriate quantity of distilled water, with a conductivity of ≤ 1 mS/m.

The mixture must not be more than 14 days old.

1.2.1.1.2. For headlamp with outside lens in plastic material:

The mixture of water and polluting agent to be applied to the headlamp shall be composed of:

9 parts by weight of silica sand with a particle size of 0-100 µm,

1 part by weight of vegetal carbon dust (beechwood) with a particle size of 0-100 µm,

0,2 part by weight of NaCMC ⁽³⁾,

13 parts by weight of distilled water with a conductivity of ≤ 1 mS/m, and

2 ± 1 parts by weight of surface-actant ⁽⁴⁾.

The mixture must not be more than 14 days old.

1.2.1.2. Application of the test mixture to the headlamp:

The test mixture shall be uniformly applied to the entire light-emitting surface of the headlamp and then left to dry. This procedure shall be repeated until the illuminating value has dropped to 15-20 per cent of the values measured for each following point under the conditions described in this Annex:

Point of $E_{\max}$ in passing beam/driving beam and in driving beam only,

50 R and 50 V ⁽⁵⁾ for a headlamp producing only a passing beam, designed for right-hand traffic,

50 L and 50 V ⁽⁵⁾ for a headlamp producing only a passing beam, designed for left-hand traffic.

⁽³⁾ NaCMC represents the sodium salt of carboxymethylcellulose, customarily referred to as CMC. The NaCMC used in the dirt mixture shall have a degree of substitution (DS) of 0,6-0,7 and a viscosity of 200-300 cP for a 2 per cent solution at 20 °C.

⁽⁴⁾ The tolerance on quantity is due to the necessity of obtaining a dirt that correctly spreads out on all the plastic lens.

⁽⁵⁾ 50 V is situated 375 mm below HV on the vertical line VV on the screen at 25 m distance.

2. TEST FOR CHANGE IN VERTICAL POSITION OF THE CUT-OFF LINE UNDER THE INFLUENCE OF HEAT

This test consists of verifying that the vertical drift of the cut-off line under the influence of heat does not exceed a specified value for an operating headlamp producing a passing beam.

The headlamp tested in accordance with paragraph 1 shall be subjected to the test described in paragraph 2.1, without being removed from or readjusted in relation to its test fixture.

If the headlamp has a moving reflector, only the position closest to the average vertical angular stroke is chosen for this test.

2.1. Test for passing beam headlamps

The test shall be carried out in a dry and still atmosphere at an ambient temperature of $23 \pm 5^\circ\text{C}$.

Using a mass production gas-discharge light source which has been aged for at least 15 hours, the headlamp shall be operated on passing beam function without being dismounted from or readjusted in relation to its test fixture. (For the purpose of this test, the voltage shall be adjusted as specified in paragraph 1.1.1.2). The position of the cut-off line in its horizontal part (between VV and the vertical line passing through point B 50 L for right-hand traffic or B 50 R for left-hand traffic) shall be verified 3 minutes (r_3) and 60 minutes (r_{60}) respectively after operation.

The measurement of the variation in the cut-off line position as described above shall be carried out by any method giving acceptable accuracy and reproducible results.

2.2. Test results

2.2.1. The result expressed in milliradians (mrad) shall be considered as acceptable for a passing beam headlamp when the absolute value $\Delta r_1 = |r_3 - r_{60}|$ recorded on the headlamp is not more than 1,0 mrad ($\Delta r_1 \leq 1,0$ mrad) upward and not more than 2,0 mrad ($\Delta r_1 \leq 2,0$ mrad) downwards.

2.2.2. However, if this value is:

Movement	
Upward	more than 1,0 mrad but not more than 1,5 mrad ($1,0 \text{ mrad} < \Delta r_1 \leq 1,5 \text{ mrad}$)
Downward	more than 2,0 mrad but not more than 3,0 mrad ($2,0 \text{ mrad} < \Delta r_1 \leq 3,0 \text{ mrad}$)

A further sample of a headlamp shall be tested as described in paragraph 2.1 after being subjected three consecutive times to the cycle as described below, in order to stabilize the position of mechanical parts of the headlamp on a base representative of the correct installation on the vehicle:

Operation of the passing beam for one hour, (the voltage shall be adjusted as specified in paragraph 1.1.1.2),

After this period of one hour, the headlamp type shall be considered as acceptable if the absolute value Δr measured on this sample meets the requirements in paragraph 2.2.1 above.

Appendix

Overview of operational periods concerning test for stability of photometric performance

Abbreviations: P: Passing beam lamp

D: Driving beam lamp ($D_1 + D_2$ means two driving beams)

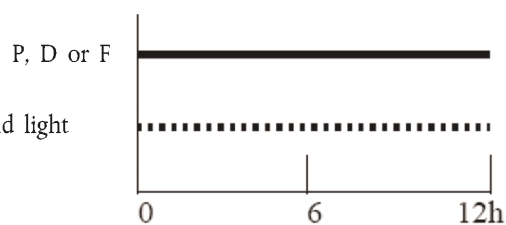
F: Front fog lamp

-  Means a cycle of 15 minutes off and 5 minutes lit
 Means a cycle of 9 minutes off and 1 minutes lit
 Means a cycle of 15 minutes lit and 5 minutes off

All the following grouped headlamps and front fog lamps together with the added marking symbols are given as examples and are not exhaustive.

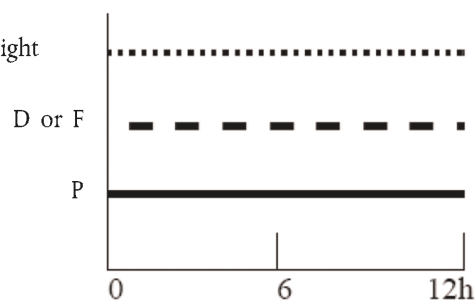
1. P or D or F (DC or DR or B)

Additional light source or LED module(s) of bend light



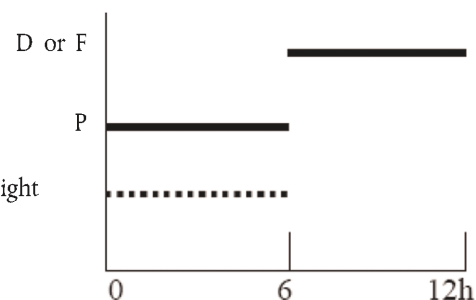
2. P+F (DC B) or P+D (DCR)

Additional light source or LED module(s) of bend light



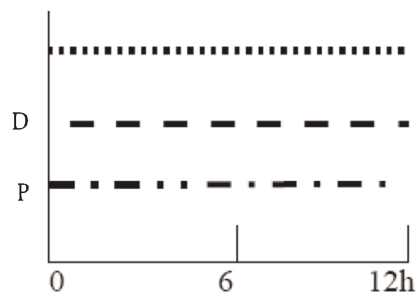
3. P+F (DC B/) or DC/B or P+D (DC/R)

Additional light source or LED module(s) of bend light



4. P+D (DCR) with the same light source

Additional light source or LED module(s) of bend light



ANNEX 5

Requirements for lamps incorporating lenses of plastic material — testing of lens or material samples and of complete lamps

1. GENERAL SPECIFICATIONS

- 1.1. The samples supplied pursuant to paragraphs 2.2.5 and 2.3 of this Regulation shall satisfy the specifications indicated in paragraphs 2.1 to 2.5 below.
- 1.2. The two samples of complete lamps/systems supplied pursuant to paragraph 2.2.4 of this Regulation and incorporating lenses of plastic material shall, with regard to the lens material, satisfy the specifications below.
- 1.3. The samples of lenses of plastic material or samples of material shall be subjected, with the reflector to which they are intended to be fitted (where applicable), to approval tests in the chronological order indicated in table A reproduced in Appendix 1 to this Annex.
- 1.4. However, if the lamp manufacturer can prove that the product has already passed the tests prescribed in paragraphs 2.1 to 2.5 below, or the equivalent tests pursuant to another Regulation, those tests need not be repeated; only the tests prescribed in Appendix 1, table B, shall be mandatory.
- 1.5. If the headlamps are designed for right-hand installation only, or for left-hand installation only, tests pursuant to this Annex may be done on one sample only, at the choice of the applicant.

2. TESTS

2.1. Resistance to temperature changes

2.1.1. Tests

Three new samples (lenses) shall be subjected to five cycles of temperature and humidity (RH = relative humidity) change in accordance with the following programme:

- (a) 3 hours at 40 ± 2 °C and 85-95 per cent RH;
- (b) 1 hour at 23 ± 5 °C and 60-75 per cent RH;
- (c) 15 hours at -30 ± 2 °C;
- (d) 1 hour at 23 ± 5 °C and 60-75 per cent RH;
- (e) 3 hours at 80 ± 2 °C;
- (f) 1 hour at 23 ± 5 °C and 60-75 per cent RH.

Before this test, the samples shall be kept at 23 ± 5 °C and 60-75 per cent RH for at least four hours.

Note: The periods of one hour at 23 ± 5 °C shall include the periods of transition from one temperature to another which are needed in order to avoid thermal shock effects.

2.1.2. Photometric measurements

2.1.2.1. Method

Photometric measurements shall be carried out on the samples before and after the test.

These measurements shall be made using a standard lamp, at the following points:

B 50 L and 50 R for the passing beam of a passing lamp or a passing/driving lamp (B 50 R and 50 L in the case of headlamps intended for left-hand traffic);

$I_{\max}$ for the driving beam.

2.1.2.2. Results

The variation between the photometric values measured on each sample before and after the test shall not exceed 10 per cent including the tolerances of the photometric procedure.

2.2. Resistance to atmospheric and chemical agents

2.2.1. Resistance to atmospheric agents

Three new samples (lenses or samples of material) shall be exposed to radiation from a source having a spectral energy distribution similar to that of a black body at a temperature between 5 500 K and 6 000 K. Appropriate filters shall be placed between the source and the samples so as to reduce as far as possible radiations with wave lengths smaller than 295 nm and greater than 2 500 nm. The samples shall be exposed to an energetic illumination of $1\,200\text{ W/m}^2 \pm 200\text{ W/m}^2$ for a period such that the luminous energy that they receive is equal to $4\,500\text{ MJ/m}^2 \pm 200\text{ MJ/m}^2$. Within the enclosure, the temperature measured on the black panel placed on a level with the samples shall be $50 \pm 5\text{ }^\circ\text{C}$. In order to ensure a regular exposure, the samples shall revolve around the source of radiation at a speed between 1 and 5 min^{-1} .

The samples shall be sprayed with distilled water of conductivity lower than 1 mS/m at a temperature of $23 \pm 5\text{ }^\circ\text{C}$, in accordance with the following cycle:

Spraying: 5 minutes;

Drying: 25 minutes.

2.2.2. Resistance to chemical agents

After the test described in paragraph 2.2.1 above and the measurement described in paragraph 2.2.3.1 below have been carried out, the outer face of the said three samples shall be treated as described in paragraph 2.2.2.2 with the mixture defined in paragraph 2.2.2.1 below.

2.2.2.1. Test mixture

The test mixture shall be composed of 61,5 per cent n-heptane, 12,5 per cent toluene, 7,5 per cent ethyl tetrachloride, 12,5 per cent trichloroethylene and 6 per cent xylene (volume per cent).

2.2.2.2. Application of the test mixture

Soak a piece of cotton cloth (as per ISO 105) until saturation with the mixture defined in paragraph 2.2.2.1 above and, within 10 seconds, apply it for 10 minutes to the outer face of the sample at a pressure of 50 N/cm^2 , corresponding to an effort of 100 N applied on a test surface of $14 \times 14\text{ mm}$.

During this 10-minute period, the cloth pad shall be soaked again with the mixture so that the composition of the liquid applied is continuously identical with that of the test mixture prescribed.

During the period of application, it is permissible to compensate the pressure applied to the sample in order to prevent it from causing cracks.

2.2.2.3. Cleaning

At the end of the application of the test mixture, the samples shall be dried in the open air and then washed with the solution described in paragraph 2.3 (Resistance to detergents) at $23 \pm 5\text{ }^\circ\text{C}$.

Afterwards the samples shall be carefully rinsed with distilled water containing not more than 0,2 per cent impurities at $23 \pm 5\text{ }^\circ\text{C}$ and then wiped off with a soft cloth.

2.2.3. Results

2.2.3.1. After the test of resistance to atmospheric agents, the outer face of the samples shall be free from cracks, scratches, chipping and deformation, and the mean variation in transmission $\Delta t = \frac{T_2 - T_3}{T_2}$, measured on the three samples according to the procedure described in Appendix 2 to this Annex shall not exceed 0,020 ($\Delta t_m < 0,020$).

2.2.3.2. After the test of resistance to chemical agents, the samples shall not bear any traces of chemical staining likely to cause a variation of flux diffusion, whose mean variation $\Delta d = \frac{T_5 - T_4}{T_2}$, measured on the three samples according to the procedure described in Appendix 2 to this Annex shall not exceed 0,020 ($\Delta d_m < 0,020$).

2.2.4. Resistance to light source radiations

The following test shall be done:

Flat samples of each light transmitting plastic component of the headlamp are exposed to the light of the gas-discharge light source. The parameters such as angles and distances of these samples shall be the same as in the headlamp. These samples shall have the same colour and surface treatment, if any, as the parts of the headlamp.

After 1 500 hours of continuous exposure, the colorimetric specifications of the transmitted light must be met with a new standard gas-discharge light source, and the surfaces of the samples shall be free of cracks, scratches, scalings or deformation.

2.3. Resistance to detergents and hydrocarbons

2.3.1. Resistance to detergents

The outer face of three samples (lenses or samples of material) shall be heated to $50 \pm 5^\circ\text{C}$ and then immersed for five minutes in a mixture maintained at $23 \pm 5^\circ\text{C}$ and composed of 99 parts distilled water containing not more than 0,02 per cent impurities and one part alkylaryl sulphonate.

At the end of the test, the samples shall be dried at $50 \pm 5^\circ\text{C}$. The surface of the samples shall be cleaned with a moist cloth.

2.3.2. Resistance to hydrocarbons

The outer face of these three samples shall then be lightly rubbed for one minute with a cotton cloth soaked in a mixture composed of 70 per cent n-heptane and 30 per cent toluene (volume per cent), and shall then be dried in the open air.

2.3.3. Results

After the above two tests have been performed successively, the mean value of the variation in transmission $\Delta t = \frac{T_2 - T_3}{T_2}$, measured on the three samples according to the procedure described in Appendix 2 to this Annex shall not exceed 0,010 ($\Delta t_m < 0,010$).

2.4. Resistance to mechanical deterioration

2.4.1. Mechanical deterioration method

The outer face of the three new samples (lenses) shall be subjected to the uniform mechanical deterioration test by the method described in Appendix 3 to this Annex.

2.4.2. Results

After this test, the variations:

In transmission: $\Delta t = \frac{T_2 - T_3}{T_2}$

And in diffusion: $\Delta d = \frac{T5 - T4}{T2}$

Shall be measured according to the procedure described in Appendix 2 in the area specified in paragraph 2.2.4 above. The mean value of the three samples shall be such that:

$\Delta t_m \leq 0,100$;

$\Delta d_m \leq 0,050$.

2.5. Test of adherence of coatings, if any

2.5.1. Preparation of the sample

A surface of 20 mm × 20 mm in area of the coating of a lens shall be cut with a razor blade or a needle into a grid of squares approximately 2 mm × 2 mm. The pressure on the blade or needle shall be sufficient to cut at least the coating.

2.5.2. Description of the test

Use an adhesive tape with a force of adhesion of 2 N/(cm of width) ± 20 per cent measured under the standardized conditions specified in Appendix 4 to this Annex. This adhesive tape, which shall be at least 25 mm wide, shall be pressed for at least five minutes to the surface prepared as prescribed in paragraph 2.5.1.

Then the end of the adhesive tape shall be loaded in such a way that the force of adhesion to the surface considered is balanced by a force perpendicular to that surface. At this stage, the tape shall be torn off at a constant speed of 1,5 m/s ± 0,2 m/s.

2.5.3. Results

There shall be no appreciable impairment of the gridded area. Impairments at the intersections between squares or at the edges of the cuts shall be permitted, provided that the impaired area does not exceed 15 per cent of the gridded surface.

2.6. Tests of the complete headlamp incorporating a lens of plastic material

2.6.1. Resistance to mechanical deterioration of the lens surface

2.6.1.1. Tests

The lens of lamp sample No 1 shall be subjected to the test described in paragraph 2.4.1 above.

2.6.1.2. Results

After the test, the results of photometric measurements carried out on the headlamp in accordance with this Regulation shall not exceed:

(a) By more than 30 per cent the maximum values prescribed at points B50 L and HV and by more than 10 per cent below the minimum values prescribed at point 75 R (in the case of headlamps intended for left-hand traffic, the points to be considered are B50 R, HV and 75 L)

or

(b) By more than 10 per cent below the minimum values prescribed for HV in the case of a headlamp producing driving beam only.

2.6.2. Test of adherence of coatings, if any

The lens of lamp sample No 2 shall be subjected to the test described in paragraph 2.5 above.

Appendix 1

CHRONOLOGICAL ORDER OF APPROVAL TESTS

A. Tests on plastic materials (lenses or samples of material supplied pursuant to paragraph 2.2.4 of this Regulation)

Samples Tests	Lenses or samples of material										Lenses			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.1. Limited photometry (para. 2.1.2)											x	x	x	
1.1.1. Temperature change (para. 2.1.1)											x	x	x	
1.2. Limited photometry (para. 2.1.2)											x	x	x	
1.2.1. Transmission measurement	x	x	x	x	x	x	x	x	x					
1.2.2. Diffusion measurement	x	x	x				x	x	x					
1.3. Atmospheric agents (para. 2.2.1)	x	x	x											
1.3.1. Transmission measurement	x	x	x											
1.4. Chemical agents (para. 2.2.2)	x	x	x											
1.4.1. Diffusion measurements	x	x	x											
1.5. Detergents (para. 2.3.1)				x	x	x								
1.6. Hydrocarbons (para. 2.3.2)				x	x	x								
1.6.1. Transmission measurement				x	x	x								
1.7. Deterioration (para. 2.4.1)							x	x	x					
1.7.1. Transmission measurement							x	x	x					
1.7.2. Diffusion measurement							x	x	x					
1.8. Adherence (para. 2.5)														x
1.9. Resistance to light source radiations (para. 2.2.4)										x				

B. Tests on complete headlamps (supplied pursuant to paragraph 2.2.3 of this Regulation)

Tests	Complete headlamp	
	Sample No	
	1	2
2.1. Deterioration (para. 2.6.1.1.1)	x	
2.2. Photometry (para. 2.6.1.2)	x	
2.3. Adherence (para. 2.6.2)		x

Appendix 2

Method of measurement of the diffusion and transmission of light**1. EQUIPMENT (SEE FIGURE)**

The beam of a collimator K with a half divergence $\beta/2 = 17,4 \times 10^{-4}$ rd is limited by a diaphragm D_T with an opening of 6 mm against which the sample stand is placed.

A convergent achromatic lens L_2 , corrected for spherical aberrations, links the diaphragm D_T with the receiver R; the diameter of the lens L_2 shall be such that it does not diaphragm the light diffused by the sample in a cone with a half top angle of $\beta/2 = 14^\circ$.

An annular diaphragm D_D with angles $\alpha/2 = 1^\circ$ and $\alpha_{\max}/2 = 12^\circ$ is placed in an image focal plane of the lens L_2 .

The non-transparent central part of the diaphragm is necessary in order to eliminate the light arriving directly from the light source. It shall be possible to remove the central part of the diaphragm from the light beam in such a manner that it returns exactly to its original position.

The distance $L_2 D_T$ and the focal length F_2 ⁽¹⁾ of the lens L_2 shall be so chosen that the image of D_T completely covers the receiver R.

When the initial incident flux is referred to 1 000 units, the absolute precision of each reading shall be better than 1 unit.

2. MEASUREMENTS

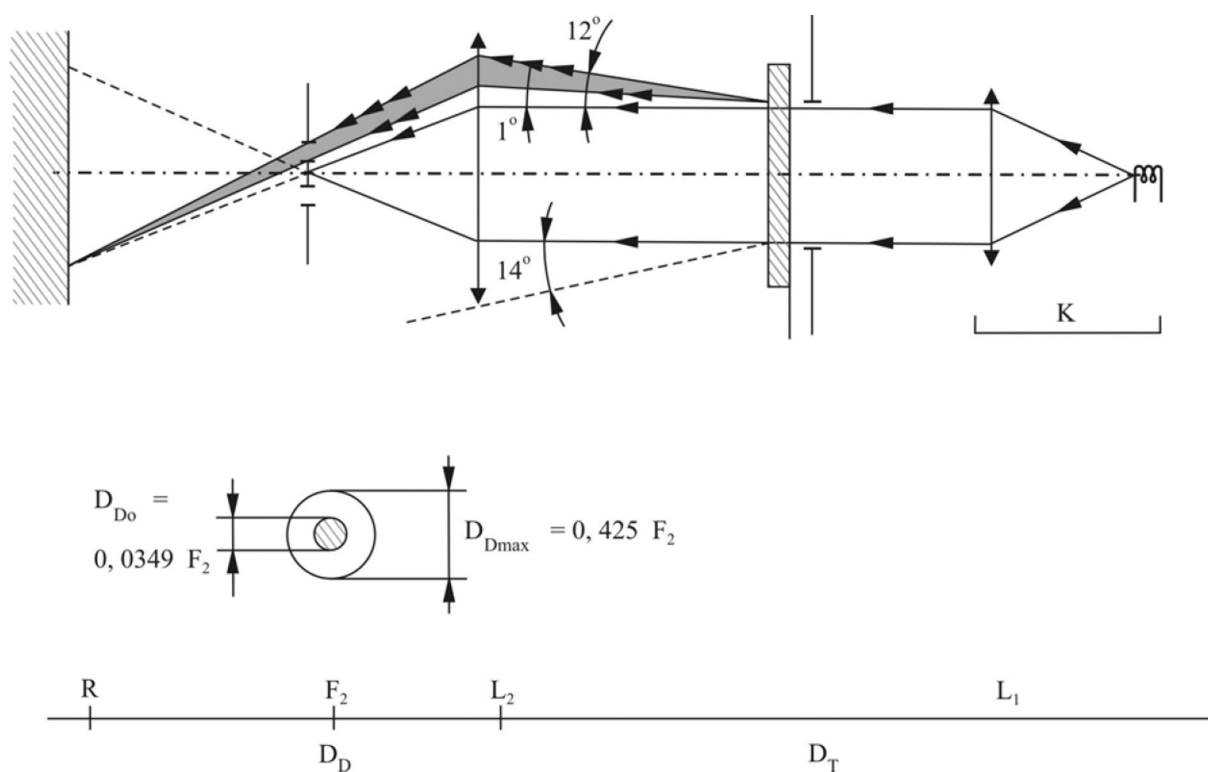
The following readings shall be taken:

Reading	With sample	With central part of D_D	Quantity represented
T_1	no	no	Incident flux in initial reading
T_2	yes (before test)	no	Flux transmitted by the new material in a field of 24°
T_3	yes (after test)	no	Flux transmitted by the tested material in a field of 24°
T_4	yes (before test)	yes	Flux diffused by the new material
T_5	yes (after test)	yes	Flux diffused by the tested material

⁽¹⁾ For L_2 it is recommended to use a focal distance of about 80 mm.

Figure 1

Optical setup for measurement of variations in diffusion and transmission



*Appendix 3***SPRAY TESTING METHOD****1. TEST EQUIPMENT****1.1. Spray gun**

The spray gun used shall be equipped with a nozzle 1,3 mm in diameter allowing a liquid flow rate of $0,24 \pm 0,02$ l/minute at an operating pressure of 6,0 bars – 0, + 0,5 bar.

Under these operation conditions the fan pattern obtained shall be $170 \text{ mm} \pm 50 \text{ mm}$ in diameter on the surface exposed to deterioration, at a distance of $380 \text{ mm} \pm 10 \text{ mm}$ from the nozzle.

1.2. Test mixture

The test mixture shall be composed of:

- (a) Silica sand of hardness 7 on the Mohr scale, with a grain size between 0 and 0,2 mm and an almost normal distribution, with an angular factor of 1,8 to 2;
- (b) Water of hardness not exceeding 205 g/m^3 for a mixture comprising 25 g of sand per litre of water.

2. TEST

The outer surface of the lamp lenses shall be subjected once or more than once to the action of the sand jet produced as described above. The jet shall be sprayed almost perpendicular to the surface to be tested.

The deterioration shall be checked by means of one or more samples of glass placed as a reference near the lenses to be tested. The mixture shall be sprayed until the variation in the diffusion of light on the sample or samples measured by the method described in Appendix 2, is such that:

$$\Delta d = \frac{T_5 - T_4}{T_2} = 0,0250 \pm 0,0025$$

Several reference samples may be used to check that the whole surface to be tested has deteriorated homogeneously.

*Appendix 4***ADHESIVE TAPE ADHERENCE TEST****1. PURPOSE**

This method allows to determine under standard conditions the linear force of adhesion of an adhesive tape to a glass plate.

2. PRINCIPLE

Measurement of the force necessary to unstick an adhesive tape from a glass plate at an angle of 90°.

3. SPECIFIED ATMOSPHERIC CONDITIONS

The ambient conditions shall be at 23 ± 5 °C and 65 ± 15 per cent relative humidity (RH).

4. TEST PIECES

Before the test, the sample roll of adhesive tape shall be conditioned for 24 hours in the specified atmosphere (see para. 3 above).

Five test pieces each 400 mm long shall be tested from each roll. These test pieces shall be taken from the roll after the first three turns were discarded.

5. PROCEDURE

The test shall be under the ambient conditions specified in paragraph 3.

Take the five test pieces while unrolling the tape radially at a speed of approximately 300 mm/s, then apply them within 15 seconds in the following manner:

Apply the tape to the glass plate progressively with a slight lengthwise rubbing movement of the finger, without excessive pressure, in such a manner as to leave no air bubble between the tape and the glass plate.

Leave the assembly in the specified atmospheric conditions for 10 minutes.

Unstick about 25 mm of the test piece from the plate in a plane perpendicular to the axis of the test piece.

Fix the plate and fold back the free end of the tape at 90°. Apply force in such a manner that the separation line between the tape and the plate is perpendicular to this force and perpendicular to the plate.

Pull to unstick at a speed of $300 \text{ mm/s} \pm 30 \text{ mm/s}$ and record the force required.

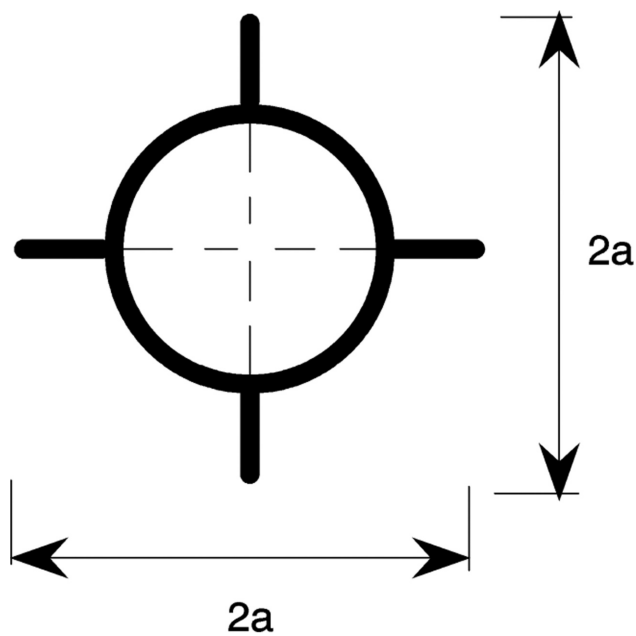
6. RESULTS

The five values obtained shall be arranged in order and the median value taken as the result of the measurement. This value shall be expressed in Newtons per centimetre of width of the tape.

ANNEX 6

CENTRE OF REFERENCE

Diameter = a



$a = 2 \text{ mm min.}$

This optional mark of the centre of reference shall be positioned on the lens at its intersection with the reference axis of the passing beam, and also on the lenses of the driving beams when they are neither grouped nor combined nor reciprocally incorporated with a passing beam.

The above drawing represents the mark of the centre of reference as projected on a plane substantially tangent to the lens about the centre of the circle. The lines constituting this mark may either be solid or dotted.

—

ANNEX 7

VOLTAGE MARKINGS



This marking must be placed on the main body of each headlamp containing only gas discharge light sources and ballast, and on each external part of the ballast.

The ballast(s) is(are) designed for a ** volts network system.

This marking must be placed on the main body of each headlamp containing at least one gas discharge light source and ballast.

The ballast(s) is(are) designed for a ** volts network system.

None of the filament lamps and/or LED module(s) which the headlamp contains is designed for a 24 volts network system.

ANNEX 8

MINIMUM REQUIREMENTS FOR CONFORMITY OF PRODUCTION CONTROL PROCEDURES

1. GENERAL

- 1.1. The conformity requirements shall be considered satisfied from a mechanical and geometric standpoint, if the differences do not exceed inevitable manufacturing deviations within the requirements of this Regulation.
- 1.2. With respect to photometric performance, the conformity of mass-produced headlamps shall not be contested if, when testing photometric performance of any headlamp chosen at random and measured at $13,2 \text{ V} \pm 0,1 \text{ V}$ or as otherwise specified and:

either

Equipped with a replaceable standard gas-discharge light source according to paragraph 6.1.3. The luminous flux of this gas-discharge light source may differ from the objective luminous flux value specified in Regulation No 99. In this case, the illuminances shall be corrected accordingly.

or

Equipped with the serial production gas-discharge light source and the serial ballast, if any. The luminous flux of this light source may deviate from the objective luminous flux due to light source and ballast tolerances as specified in Regulation No 99; accordingly the measured illuminances may be corrected by 20 per cent in the favourable direction.

- 1.2.1. No illuminance value, if measured and corrected according to paragraph 1.2 above, deviates unfavourably by more than 20 per cent from the values prescribed in this Regulation. For values B 50 L (or R) and in Zone A, the maximum unfavourable deviation may be respectively:

B 50 L (or R) ⁽¹⁾: 170 cd equivalent 20 per cent

255 cd equivalent 30 per cent

Zone A 255 cd equivalent 20 per cent

380 cd equivalent 30 per cent.

1.2.2. Or if

- 1.2.2.1. For the passing beam, the values prescribed in this Regulation are met at HV (with a tolerance of +170 cd) and related to that aiming at one point within a circle of 0,35 degrees around points B 50 L (or R) ⁽¹⁾ (with a tolerance of 85 cd), 75 R (or L), 50 V, 25 R1, 25 L2, and on segment I;

- 1.2.2.2. And if, for the driving beam, HV being situated within the isolux line $0,75 I_{\text{max}}$, a tolerance of + 20 per cent for maximum values and – 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraph 6.3 of this Regulation.

- 1.2.3. If the results of the tests described above do not meet the requirements, the alignment of the headlamp may be changed, provided that the axis of the beam is not displaced laterally by more than $0,5^\circ$ to the right or left and not by more than $0,2^\circ$ up or down.

⁽¹⁾ Letters in brackets refer to headlamps intended for left-hand traffic.

- 1.2.4. If the results of the tests described above do not meet the requirements, tests on the headlamp shall be repeated using another standard gas-discharge light source or gas-discharge light source and ballast, whatever is applicable according to paragraph 1.2 above.

- 1.3. With respect to the verification of the change in vertical position of the cut-off line under the influence of heat, the following procedure shall be applied:

One of the sampled headlamps shall be tested according to the procedure described in paragraph 2.1 of Annex 4 after being subjected three consecutive times to the cycle described in paragraph 2.2.2 of Annex 4.

The headlamp shall be considered as acceptable if Δr (as defined in paragraphs 2.1 and 2.2 of Annex 4 to this Regulation) does not exceed 1,5 mrad.

If this value exceeds 1,5 mrad but is not more than 2,0 mrad, a second headlamp shall be subjected to the test after which the mean of the absolute values recorded on both samples shall not exceed 1,5 mrad.

- 1.4. The chromaticity coordinates shall be complied with.

- 1.5. If, however, vertical adjustment cannot be performed repeatedly to the required position within the tolerances described in paragraph 6.2.2.3 of this Regulation, one sample shall be tested according to the procedure described in paragraphs 2 and 3 of Annex 10.

2. MINIMUM REQUIREMENTS FOR VERIFICATION OF CONFORMITY BY THE MANUFACTURER

For each type of headlamp the holder of the approval mark shall carry out at least the following tests, at appropriate intervals. The tests shall be carried out in accordance with the provisions of this Regulation.

If any sampling shows non-conformity with respect to the type of test concerned, further samples shall be taken and tested. The manufacturer shall take steps to ensure the conformity of the production concerned.

2.1. Nature of tests

Tests of conformity in this Regulation shall cover the photometric characteristics and the verification of the change in vertical position of the cut-off line under the influence of heat.

2.2. Methods used in tests

- 2.2.1. Tests shall generally be carried out in accordance with the methods set out in this Regulation.

- 2.2.2. In any test of conformity carried out by the manufacturer, equivalent methods may be used with the consent of the competent authority responsible for approval tests. The manufacturer is responsible for proving that the applied methods are equivalent to those laid down in this Regulation.

- 2.2.3. The application of paragraphs 2.2.1 and 2.2.2 requires regular calibrations of test apparatus and its correlation with measurements made by a competent authority.

- 2.2.4. In all cases the reference methods shall be those of this Regulation, particularly for the purpose of administrative verification and sampling.

2.3. Nature of sampling

Samples of headlamps shall be selected at random from the production of a uniform batch. A uniform batch means a set of headlamps of the same type, defined according to the production methods of the manufacturer.

The assessment shall in general cover series production from individual factories. However, a manufacturer may group together records concerning the same type from several factories, provided these operate under the same quality system and quality management.

2.4. Measured and recorded photometric characteristics

The sampled headlamps shall be subjected to photometric measurements at the points provided for in the Regulation, the reading being limited to points $I_{\max}$, HV ⁽²⁾, HL, HR ⁽³⁾ in the case of the driving beam, and to points B 50 L (or R) ⁽¹⁾, HV, 50 V, 75 R (or L) and 25 L2 (or R2) in the case of the passing beam (see figure in Annex 3).

2.5. Criteria governing acceptability

The manufacturer is responsible for carrying out a statistical study of the test results and for defining, in agreement with the competent authority, criteria governing the acceptability of his products in order to meet the specifications laid down for verification of conformity of products in paragraph 9.1 of this Regulation.

The criteria governing the acceptability shall be such that, with a confidence level of 95 per cent, the minimum probability of passing a spot check in accordance with Annex 9 (first sampling) would be 0,95.

⁽²⁾ When the driving beam is reciprocally incorporated with the passing beam, HV in the case of the driving beam shall be the same measuring point as in the case of the passing beam.

⁽³⁾ HL and HR: points on 'hh' located at 2,5 degrees to the left and to the right of point HV respectively.

ANNEX 9

MINIMUM REQUIREMENTS FOR SAMPLING BY AN INSPECTOR

1. GENERAL

1.1. The conformity requirements shall be considered satisfied from a mechanical and a geometric standpoint, in accordance with the requirements of this Regulation, if any, if the differences do not exceed inevitable manufacturing deviations.

1.2. With respect to photometric performance, the conformity of mass-produced headlamps shall not be contested if, when testing photometric performance of any headlamp chosen at random and measured at $13.2 \text{ V} \pm 0.1 \text{ V}$ or as otherwise specified and:

Either

Equipped with a removable standard gas-discharge light source according to paragraph 6.1.3. The luminous flux of this gas-discharge light source may differ from the reference luminous flux specified in Regulation No 99. In this case, the illuminances shall be corrected accordingly.

Or

Equipped with the serial production gas-discharge light source and the serial ballast. The luminous flux of this light source may deviate from the nominal luminous flux due to light source and ballast tolerances as specified in Regulation No 99, accordingly the measured illuminances may be corrected by 20 per cent in the favourable direction.

1.2.1. No measured value deviates unfavourably by more than 20 per cent from the values prescribed in this Regulation.

In the glare zone the maximum deviation may be respectively:

B 50 L (or R) ⁽¹⁾: 170 cd equivalent 20 per cent

255 cd equivalent 30 per cent

Zone A 255 cd equivalent 20 per cent

380 cd equivalent 30 per cent.

1.2.2. Or if

1.2.2.1. For the passing beam, the values prescribed in this Regulation are met at HV (with a tolerance of +170 cd) and related to that aiming at one point within a circle of 0,35 degrees around points B 50 L (or R) ⁽¹⁾ (with a tolerance of 85 cd), 75 R (or L), 50 V, 25 R1, 25 L2, and on segment I;

1.2.2.2. And if, for the driving beam, HV being situated within the isolux line $0,75 I_{\max}$, a tolerance of + 20 per cent for maximum values and – 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraph 6.3 of this Regulation. The reference mark is disregarded.

1.2.3. If the results of the tests described above do not meet the requirements, the alignment of the headlamp may be changed, provided that the axis of the beam is not displaced laterally by more than 0,5° to the right or left and not by more than 0,2° up or down.

⁽¹⁾ Letters in brackets refer to headlamps intended for left-hand traffic.

- 1.2.4. If the results of the tests described above do not meet the requirements, tests on the headlamp shall be repeated using another standard gas-discharge light source or gas-discharge light source and ballast, whatever is applicable according to paragraph 1.2 above.

- 1.3. With respect to the verification of the change in vertical position of the cut-off line under the influence of heat, the following procedure shall be applied:

One of the sampled headlamps shall be tested according to the procedure described in paragraph 2.1 of Annex 4 after being subjected three consecutive times to the cycle described in paragraph 2.2.2 of Annex 4.

The headlamp shall be considered acceptable if Δr (as defined in paragraphs 2.1 and 2.2 of Annex 4 to this Regulation) does not exceed 1,5 mrad.

If this value exceeds 1,5 mrad but is not more than 2,0 mrad, a second headlamp shall be subjected to the test after which the mean of the absolute values recorded on both samples shall not exceed 1,5 mrad.

- 1.4. The chromaticity coordinates shall be complied with.

- 1.5. If, however, vertical adjustment cannot be performed repeatedly to the required position within the tolerances described in paragraph 6.2.2.3 of this Regulation, one sample shall be tested according to the procedure described in paragraphs 2 and 3 of Annex 10.

2. FIRST SAMPLING

In the first sampling four headlamps are selected at random. The first sample of two is marked A, the second sample of two is marked B.

- 2.1. The conformity is not contested:

- 2.1.1. Following the sampling procedure shown in Figure 1 of this Annex the conformity of mass-produced headlamps shall not be contested if the deviation of the measured values of the headlamps in the unfavourable directions are:

2.1.1.1. Sample A

A1: One headlamp	0 per cent
One headlamp not more than	20 per cent
A2: Both headlamps more than	0 per cent
But not more than	20 per cent
Go to sample B	

2.1.1.2. Sample B

B1: Both headlamps	0 per cent
--------------------	------------

- 2.1.2. Or if the conditions of paragraph 1.2.2 for sample A are fulfilled.

2.2. The conformity is contested:

2.2.1. Following the sampling procedure shown in Figure 1 of this Annex the conformity of mass-produced headlamps shall be contested and the manufacturer requested to make his production meet the requirements (alignment) if the deviations of the measured values of the headlamps are:

2.2.1.1. Sample A

A3: One headlamp not more than	20 per cent
One headlamp more than	20 per cent
But not more than	30 per cent

2.2.1.2. Sample B

B2: In the case of A2	
One headlamp more than	0 per cent
But not more than	20 per cent
One headlamp not more than	20 per cent

B3: In the case of A2	
One headlamp	0 per cent
One headlamp more than	20 per cent
But not more than	30 per cent

2.2.2. Or if the conditions of paragraph 1.2.2 for sample A are not fulfilled.

2.3. Approval withdrawn

Conformity shall be contested and paragraph 10 applied if, following the sampling procedure in Figure 1 of this Annex, the deviations of the measured values of the headlamps are:

2.3.1. Sample A

A4: One headlamp not more than	20 per cent
One headlamp more than	30 per cent
A5: Both headlamps more than	20 per cent

2.3.2. Sample B

B4: In the case of A2	
One headlamp more than	0 per cent
But not more than	20 per cent
One headlamp more than	20 per cent

B5: In the case of A2	
Both headlamps more than	20 per cent

B6: In the case of A2	
One headlamp	0 per cent
One headlamp more than	30 per cent

2.3.3. Or if the conditions of paragraph 1.2.2 for samples A and B are not fulfilled.

3. REPEATED SAMPLING

In the cases of A3, B2, B3 a repeated sampling, third sample C of two headlamps and fourth sample D of two headlamps, selected from stock manufactured after alignment, is necessary within two months time after the notification.

3.1. The conformity is not contested

3.1.1. Following the sampling procedure shown in Figure 1 of this Annex the conformity of mass-produced headlamps shall not be contested if the deviations of the measured values of the headlamps are:

3.1.1.1. Sample C

C1: One headlamp	0 per cent
One headlamp not more than	20 per cent
C2: Both headlamps more than	0 per cent
But not more than	20 per cent
Go to sample D	

3.1.1.2. Sample D

D1: In the case of C2	
Both headlamps	0 per cent

3.1.2. Or if the conditions of paragraph 1.2.2 for sample C are fulfilled.

3.2. The conformity is contested:

3.2.1. Following the sampling procedure shown in Figure 1 of this Annex the conformity of mass-produced headlamps shall be contested and the manufacturer requested to make his production meet the requirements (alignment) if the deviations of the measured values of the headlamps are:

3.2.1.1. Sample D

D2: In the case of C2	
One headlamp more than	0 per cent
But not more than	20 per cent
One headlamp not more than	20 per cent

3.2.1.2. Or if the conditions of paragraph 1.2.2 for sample C are not fulfilled.

3.3. Approval withdrawn

Conformity shall be contested and paragraph 11 applied if, following the sampling procedure in Figure 1 of this Annex, the deviations of the measured values of the headlamps are:

3.3.1. Sample C

C3: One headlamp not more than	20 per cent
One headlamp more than	20 per cent
C4: Both headlamps more than	20 per cent

3.3.2. Sample D

D3: In the case of C2

One headlamp 0 or more than	0 per cent
One headlamp more than	20 per cent

3.3.3. Or if the conditions of paragraph 1.2.2 for samples C and D are not fulfilled.

4. CHANGE OF THE VERTICAL POSITION OF THE CUT-OFF LINE

With respect to the verification of the change in vertical positions of the cut-off line under the influence of heat, the following procedure shall be applied:

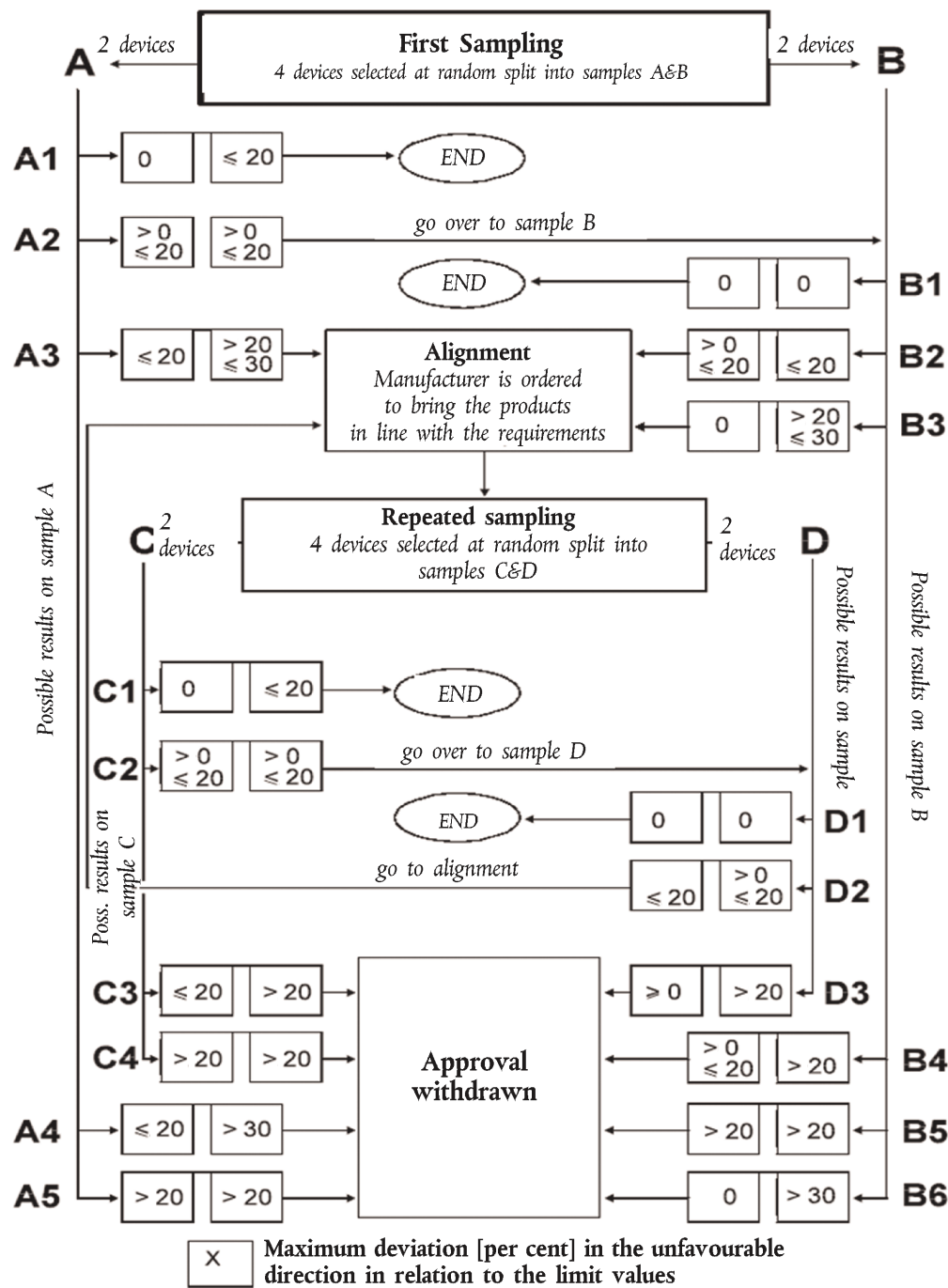
One of the headlamps of sample A after sampling procedure in Figure 1 of this Annex shall be tested according to the procedure described in paragraph 2.1 of Annex 4 after being subjected three consecutive times to the cycle described in paragraph 2.2.2 of Annex 4.

The headlamp shall be considered as acceptable if Δr does not exceed 1,5 mrad.

If this value exceeds 1,5 mrad but is not more than 2,0 mrad, the second headlamp of sample A shall be subjected to the test after which the mean of the absolute values recorded in both samples shall not exceed 1,5 mrad.

However, if this value of 1,5 mrad on sample A is not complied with, the two headlamps of sample B shall be subjected to the same procedure and the value of Δr for each of them shall not exceed 1,5 mrad.

Figure 1



ANNEX 10

INSTRUMENTAL VERIFICATION OF THE 'CUT-OFF' FOR PASSING BEAM HEADLAMPS**1. GENERAL**

In the case where paragraph 6.2.2.4 of this Regulation applies, the quality of the 'cut-off' shall be tested according to the requirements set out in paragraph 2 below and the instrumental vertical and horizontal adjustment of the beam shall be performed according to the requirements set out in paragraph 3 below.

Before carrying out the measurement of the quality of 'cut-off' and the instrumental aiming procedure, a visual pre-aim in accordance with paragraphs 6.2.2.1 and 6.2.2.2 of this Regulation is required.

2. MEASUREMENT OF THE QUALITY OF THE 'CUT-OFF'

To determine the minimum sharpness, measurements shall be performed by vertically scanning through the horizontal part of the 'cut-off' in angular steps of $0,05^\circ$ at either a measurement distance of:

(a) 10 m with a detector having a diameter of approximately 10 mm or

(b) 25 m with a detector having a diameter of approximately 30 mm.

The measuring distance at which the test was carried out shall be recorded in item 9 of the communication form (see Annex 1 to this Regulation).

To determine the maximum sharpness, measurements shall be performed by vertically scanning through the horizontal part of the 'cut-off' in angular steps of $0,05^\circ$ exclusively at a measurement distance of 25 m and with a detector having a diameter of approximately 30 mm.

The 'cut-off' quality shall be considered acceptable if the requirements of paragraph 2.1 to 2.3 below comply with at least one set of measurements.

2.1. Not more than one 'cut-off' shall be visible ⁽¹⁾**2.2. Sharpness of 'cut-off'**

The sharpness factor G is determined by scanning vertically through the horizontal part of the 'cut-off' at $2,5^\circ$ from the V-V where:

$$G = (\log E\beta - \log E(\beta + 0,1^\circ)) \text{ where } \beta = \text{the vertical position in degrees.}$$

The value of G shall not be less than 0,13 (minimum sharpness) and not greater than 0,40 (maximum sharpness).

2.3. Linearity

The part of the horizontal 'cut-off' that serves for vertical adjustment shall be horizontal between $1,5^\circ$ and $3,5^\circ$ from the V-V line (see figure 1 below).

⁽¹⁾ This paragraph should be amended when an objective test method is available.

- (a) The inflection points of the 'cut-off' gradient at the vertical lines at 1,5°, 2,5° and 3,5° shall be determined by the equation:

$$(d^2(\log E)/d\beta^2 = 0).$$

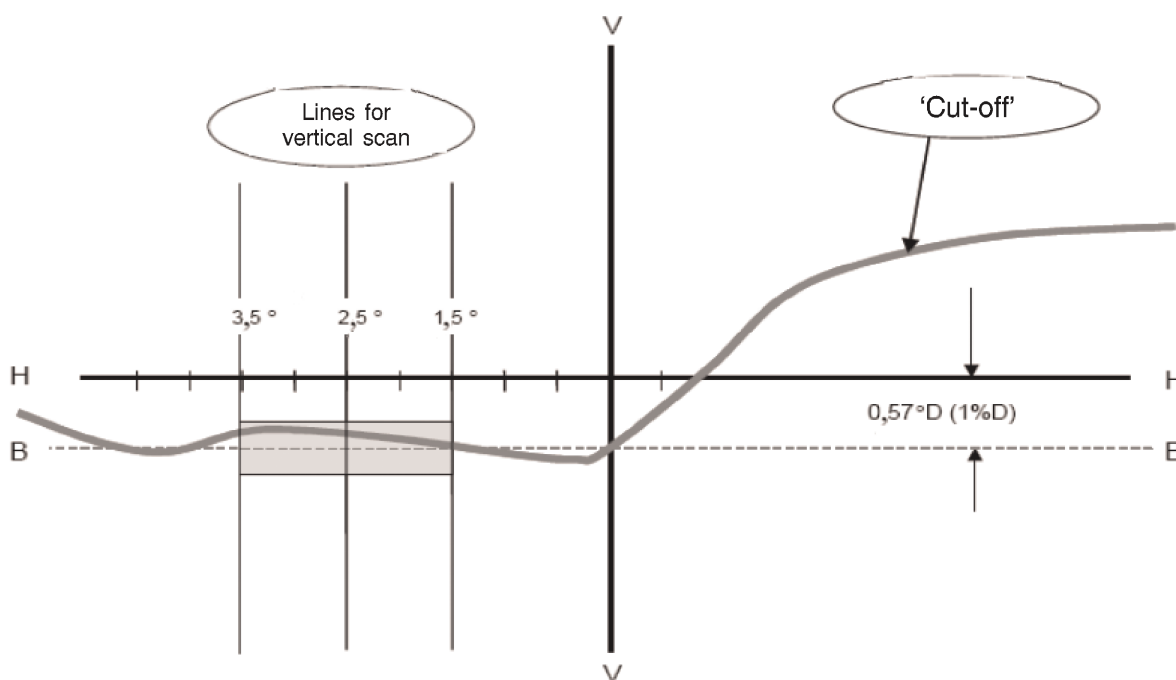
- (b) The maximum vertical distance between the inflection points determined shall not exceed 0,2°.

3. VERTICAL AND HORIZONTAL ADJUSTMENT

If the 'cut-off' complies with the quality requirements of paragraph 2 of this Annex, the beam adjustment may be performed instrumentally.

Figure 1

Measurement of 'cut-off' quality



Note: The scales are different for vertical and horizontal lines.

3.1. Vertical adjustment

Moving upward from below the line B (see figure 2 below), a vertical scan is carried out through the horizontal part of the 'cut-off' at 2,5° from V-V. The inflection point (where $d^2(\log E)/dv^2 = 0$) is determined and positioned on the line B situated one per cent below H-H.

3.2. Horizontal adjustment

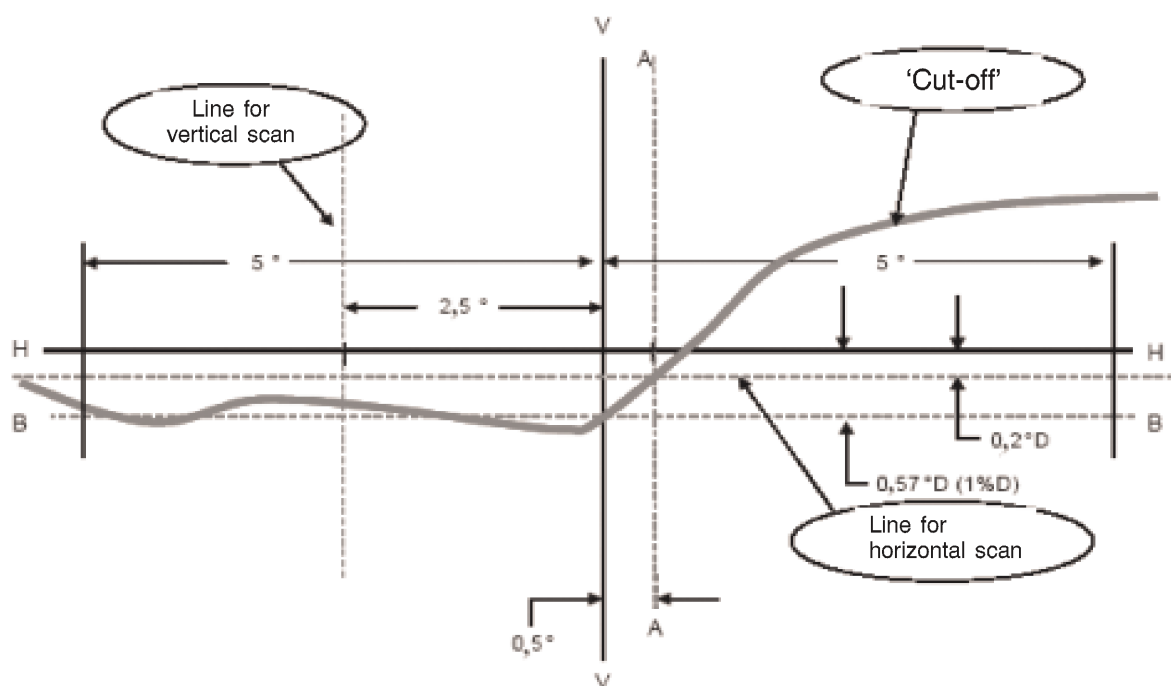
The applicant shall specify one of the following horizontal aim methods:

- (a) The '0,2 D line' method (see figure 2 below).

A single horizontal line at 0,2° D shall be scanned from 5° left to 5° right after the lamp has been aimed vertically. The maximum gradient 'G' determined using the formula $G = (\log E\beta - \log E(\beta + 0,1^\circ))$ where β is the horizontal position in degrees, shall not be less than 0,08.

The inflection point found on the 0,2 D line shall be positioned on the line A.

Figure 2

Instrumental vertical and horizontal adjustment — Horizontal line scan method

Note: The scales are different for vertical and horizontal lines.

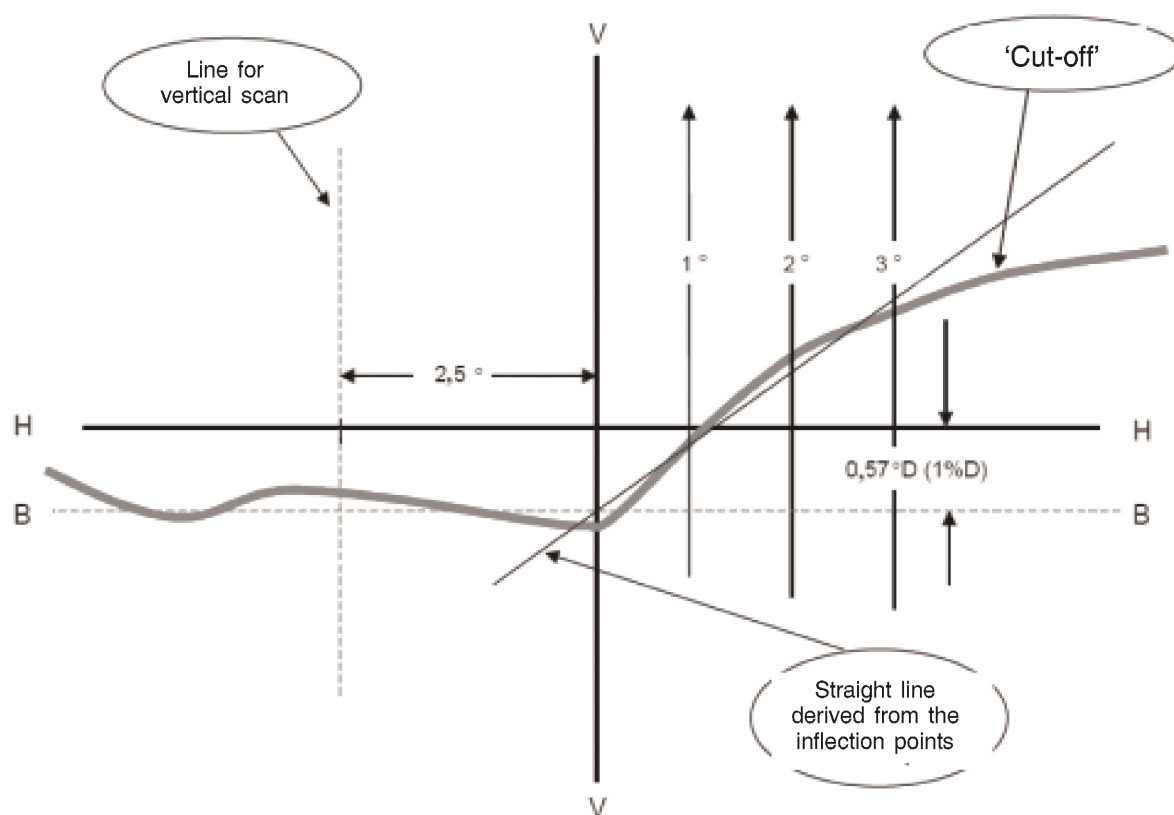
(b) The '3 line' method (see figure 3 below)

Three vertical lines shall be scanned from 2° D to 2° U at 1°R, 2°R, and 3°R after the lamp has been aimed vertically. The respective maximum gradients 'G' determined using the formula:

$$G = (\log E_{\beta} - \log E_{(\beta+0,1^{\circ})})$$

Where β is the vertical position in degrees, shall not be less than 0,08. The inflection points found on the three lines shall be used to derive a straight line. The intersection of this line and the line B found while performing vertical aim shall be placed on the V line.

Figure 3

Instrumental vertical and horizontal adjustment — Three line scan method

Note: The scales are different for vertical and horizontal lines.

ANNEX 11

REQUIREMENTS FOR LED MODULES AND HEADLAMPS INCLUDING LED MODULES**1. GENERAL SPECIFICATIONS**

- 1.1. Each LED module sample submitted shall conform to the relevant specifications of this Regulation when tested with the supplied electronic light source control-gear(s), if any.
- 1.2. LED module(s) shall be so designed as to be and to remain in good working order when in normal use. They shall moreover exhibit no fault in design or manufacture.
- 1.3. LED module(s) shall be tamperproof.
- 1.4. The design of removable LED module(s) shall be such that:
 - 1.4.1. When the LED module is removed and replaced with another module provided by the applicant and bearing the same light source module identification code, the photometric specifications of the headlamp shall be met;
 - 1.4.2. LED modules with different light source module identification codes within the same lamp housing, shall not be interchangeable.
- 1.5. Electronic light source control gear(s) may be part of the LED module(s).

2. MANUFACTURE

- 2.1. The LED(s) on the LED module shall be equipped with suitable fixation elements.
- 2.2. The fixation elements shall be strong and firmly secured to the LED(s) and the LED module.

3. TEST CONDITIONS**3.1. Application**

- 3.1.1. All samples shall be tested as specified in paragraph 4 below;
- 3.1.2. The kind of light sources on a LED MODULE shall be light emitting diodes (LED) as defined in Regulation No 48 paragraph 2.7.1 in particular with regard to the element of visible radiation. Other kinds of light sources are not permitted.

3.2. Operating conditions**3.2.1. LED module operating conditions**

All samples shall be tested under the conditions as specified in paragraphs 6.2.4.4 of this Regulation. If not specified differently in this Annex LED modules shall be tested inside the headlamp as submitted by the manufacturer.

3.2.2. Ambient temperature

For the measurement of electrical and photometric characteristics, the headlamp shall be operated in dry and still atmosphere at an ambient temperature of $23\text{ °C} \pm 5\text{ °C}$.

3.3. Ageing

Upon the request of the applicant the LED module shall be operated for 15 h and cooled down to ambient temperature before starting the tests as specified in this Regulation.

4. SPECIFIC REQUIREMENTS AND TESTS

4.1. UV-radiation

The UV-radiation of a low-UV-type LED module shall be such that:

$$k_{UV} = \frac{\int_{\lambda=250 \text{ nm}}^{400 \text{ nm}} E_e(\lambda) S(\lambda) d\lambda}{k_m \int_{\lambda=380 \text{ nm}}^{780 \text{ nm}} E_e(\lambda) V(\lambda) d\lambda} \leq 10^{-5} \text{ W/lm}$$

Where:

$S(\lambda)$ (unit: 1) is the spectral weighting function;

$k_m = 683 \text{ lm/W}$ is the maximum value of the luminous efficacy of radiation.

(For definitions of the other symbols see paragraph 4.1.1 of Annex 9 to Regulation No 112).

This value shall be calculated using intervals of one nanometre. The UV radiation shall be weighted according to the values as indicated in the Table UV below:

Table UV

Values according to 'IRPA/INIRC Guidelines on limits of exposure to ultraviolet radiation'. Wavelengths (in nanometres) chosen are representative; other values should be interpolated.

λ	$S(\lambda)$	λ	$S(\lambda)$	λ	$S(\lambda)$
250	0,430	305	0,060	355	0,00016
255	0,520	310	0,015	360	0,00013
260	0,650	315	0,003	365	0,00011
265	0,810	320	0,001	370	0,00009
270	1,000	325	0,00050	375	0,000077
275	0,960	330	0,00041	380	0,000064
280	0,880	335	0,00034	385	0,000053
285	0,770	340	0,00028	390	0,000044
290	0,640	345	0,00024	395	0,000036
295	0,540	350	0,00020	400	0,000030
300	0,300				

Only the original UN/ECE texts have legal effect under international public law. The status and date of entry into force of this Regulation should be checked in the latest version of the UN/ECE status document TRANS/WP.29/343, available at:
<http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29fdocsts.html>

Regulation No 113 of the Economic Commission for Europe of the United Nations (UN/ECE) — Uniform provisions concerning the approval of motor vehicle headlamps emitting a symmetrical passing beam or a driving beam or both and equipped with filament, gas-discharge light sources or LED modules

Incorporating all valid text up to:

Supplement 3 to the 01 series of amendments to the Regulation — Date of entry into force: 9 October 2014

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SCOPE ⁽¹⁾ ⁽²⁾

This Regulation applies to headlamps for vehicles of categories L and T ⁽³⁾.

1. DEFINITIONS

For the purpose of this Regulation,

- 1.1. 'Lens' means the outermost component of the headlamp (unit) which transmits light through the illuminating surface;
- 1.2. 'Coating' means any product or products applied in one or more layers to the outer face of a lens;
- 1.3. 'Headlamps of different types' mean headlamps which differ in such essential respects as:
 - 1.3.1. The trade name or mark;
 - 1.3.2. The characteristics of the optical system;
 - 1.3.3. The inclusion or elimination of components capable of altering the optical effects by reflection, refraction, absorption and/or deformation during operation;
 - 1.3.4. The kind of beam produced (passing beam, driving beam or both);
 - 1.3.5. The category of filament lamp(s), the gas-discharge light source or the light source module specific identification code(s);
- 1.4. 'Headlamps of different "Classes" (A or B or C or D or E)' mean headlamps identified by particular photometric provisions.
- 1.5. 'Colour of the light emitted from the device'. The definitions of the colour of the light emitted given in Regulation No 48 and its series of amendments in force at the time of application for type approval shall apply to this Regulation.
- 1.6. However, in the case of a system consisting of two headlamps a device intended for the installation on the left side of the vehicle and the corresponding device intended for the installation on the right side of the vehicle shall be considered to be of the same type.
- 1.7. References made in this Regulation to standard (étalon) filament lamp(s) and to Regulation No 37 shall refer to Regulation No 37 and its series of amendments in force at the time of application for type approval.
- 1.8. References made in this Regulation to standard (étalon) gas discharge light sources(s) and to Regulation No 99 shall refer to Regulation No 99 and its series of amendments in force at the time of application for type approval.

⁽¹⁾ Application of headlamps is given in the relevant Regulations on the installation of lighting and light-signalling devices.

⁽²⁾ Nothing in this Regulation shall prevent a Party to the Agreement applying this Regulation from prohibiting the combination of a headlamp incorporating a lens of plastic material approved under this Regulation with a mechanical headlamp-cleaning device (with wipers).

⁽³⁾ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3), document TRANS/WP.29/78/Rev.2, para. 2.

- 1.9. 'Additional lighting unit' means the part of a headlamp system that provides the bend lighting. It is independent from the device that provides the principal passing beam, may consist of optical, mechanical and electrical components, and it may be grouped and/or reciprocally incorporated with other lighting or light-signalling devices.
- 1.10. Other relevant definitions given in Regulations No 48, 53 and 74 and their series of amendments in force at the time of application for type approval shall apply to this Regulation.
2. APPLICATION FOR APPROVAL OF A HEADLAMP ⁽¹⁾
- 2.1. The application for approval shall be submitted by the owner of the trade name or mark or by his duly accredited representative. It shall specify:
- 2.1.1. Whether the headlamp is intended to provide both a passing beam and a driving beam or only one of these beams;
- 2.1.2. Whether it concerns a Class A or B or C or D or E headlamp;
- 2.1.3. The category of the filament lamp(s) used, as listed in Regulation No 37 and its series of amendments in force at the time of application for type approval, if any.
- 2.1.4. The category of gas-discharge light source as listed in Regulation No 99, if any.
- 2.1.5. For LED modules, the light source module specific identification code(s), if any.
- 2.1.6. For additional lighting unit(s), the additional lighting unit identification code(s), if any.
- 2.2. Every application for approval shall be accompanied by:
- 2.2.1. Drawings in triplicate in sufficient detail to permit identification of the type and representing a frontal view of the headlamp, with details of lens ribbing if any, and the cross-section; the drawings shall indicate the space reserved for the approval mark and, if applicable:
- (a) In the case of LED module(s), the drawings shall indicate also the space(s) reserved for the specific identification code(s) of the module(s)
 - (b) In the case of additional lighting unit(s), the space(s) reserved for the specific identification code(s) on the additional lighting unit(s) and the headlamp(s) producing the principal passing beam;
 - (c) In the case of additional lighting unit(s), the geometrical conditions of installation of the device(s) that meet the requirements of paragraph 6.2.8.
- 2.2.2. A brief technical description including:
- 2.2.2.1. For gas discharge lamps, the make and type of the ballast(s) in the case that the ballast(s) is (are) not integrated with the light source(s);

⁽¹⁾ For gas-discharge light sources see Regulation No 99.

- 2.2.2.2. In the case of LED module(s),
 - (a) A brief technical specification of the LED module(s);
 - (b) A drawing with dimensions and the basic electrical and photometric values and the objective luminous flux and for each LED module a statement whether it is replaceable or not;
 - (c) In case of electronic light source control gear, information on the electrical interface necessary for approval testing;
- 2.2.2.3. In the case of a headlamp designed to provide bend lighting, the minimum bank angle(s) to satisfy the requirement of paragraph 6.2.8.1.
- 2.2.3. Two samples of the type of headlamp. In the case of a system consisting of two headlamps one sample intended for the installation on the left side of the vehicle and one sample intended for the installation on the right side of the vehicle;
- 2.2.4. For Class B, or C, or D or E headlamps only, for the test of plastic material of which the lenses are made:
 - 2.2.4.1. For Class B or C or D or E, fourteen lenses;
 - 2.2.4.1.1. For Class B, C, D or E ten of these lenses may be replaced by ten samples of material at least 60 × 80 mm in size, having a flat or convex outer surface and a substantially flat area (radius of curvature not less than 300 mm) in the middle measuring at least 15 × 15 mm;
 - 2.2.4.1.2. Every such lens or sample of material shall be produced by the method to be used in mass production;
 - 2.2.4.2. A reflector to which the lenses can be fitted in accordance with the manufacturer's instructions.
- 2.2.5. For headlamps equipped with light sources according to Regulation No 99 or equipped with LED modules only, for testing the UV-resistance of light transmitting components made of plastic material against UV radiation of the light sources inside the headlamp:
 - 2.2.5.1. One sample each of the relevant material as being used in the headlamp or one headlamp sample containing these. Each material sample shall have the same appearance and surface treatment, if any, as intended for use in the headlamp to be approved.
 - 2.2.5.2. The UV-resistance testing of internal materials to light source radiation is not necessary:
 - 2.2.5.2.1. If low-UV-type gas-discharge light sources are being applied as specified in Regulation No 99, or;
 - 2.2.5.2.2. If only low-UV-type LED modules, as specified in Annex 12 to this Regulation, are being applied, or;
 - 2.2.5.2.3. If provisions are taken to shield the relevant headlamp components from UV radiation, e.g. by glass filters.
- 2.2.6. One ballast or electronic light source control gear, as applicable.
- 2.3. The materials making up the lenses and coatings, if any, shall be accompanied by the test report of the characteristics of these materials and coatings if they have already been tested.

3. MARKINGS

- 3.1. Headlamps submitted for approval shall bear the trade name or mark of the applicant.
- 3.2. They shall comprise, on the lens and on the main body ⁽¹⁾, spaces of sufficient size for the approval mark and the additional symbols referred to in paragraph 4; these spaces shall be indicated on the drawings referred to in paragraph 2.2.1 above.
- 3.3. On the back of the headlamp the indication of the category of filament lamp(s) or gas-discharge light source used.
- 3.4. Class E headlamps may bear on their light-emitting surface a centre of reference as shown in Annex 10.
- 3.5. Class E headlamps shall bear the voltage markings as shown in Annex 11.
- 3.6. In the case of lamps with LED module(s), the lamp shall bear the marking of the rated voltage and rated wattage and the light source module specific identification code.
- 3.7. LED module(s) submitted along with the approval of the lamp shall bear:
- 3.7.1. The trade name or mark of the applicant. This marking shall be clearly legible and indelible;
- 3.7.2. The specific identification code of the module. This marking shall be clearly legible and indelible.
- This specific identification code shall comprise the starting letters 'MD' for 'MODULE' followed by the approval marking without the circle as prescribed in paragraph 4.2.1 below and in the case several non-identical light source modules are used, followed by additional symbols or characters. This specific identification code shall be shown in the drawings mentioned in paragraph 2.2.1 above. The approval marking does not have to be the same as the one on the lamp in which the module is used, but both markings shall be from the same applicant.
- 3.7.3. If the LED module(s) are non-replaceable, the markings for LED module(s) are not required.
- 3.8. If an electronic light source control gear which is not part of a LED module is used to operate a LED module(s), it shall be marked with its specific identification code(s), the rated input voltage and wattage.
- 3.9. In the case of additional lighting unit(s), the headlamps producing the principal passing beam shall bear specific identification code of the additional lighting unit(s) mentioned in paragraph 3.10.2 below.
- 3.10. Additional lighting unit(s) shall bear the following markings:
- 3.10.1. The trade name or mark of the applicant. This marking shall be clearly legible and indelible.
- 3.10.2. In the case of filament light source, the category(s) of filament lamp(s), and/or

⁽¹⁾ If the lens cannot be detached from the main body of the headlamp, a unique marking as specified in paragraph 4.2.5 shall be sufficient.

In the case of LED module(s), the rated voltage and rated wattage and the specific identification code(s) of the LED module(s).

- 3.10.3. The specific identification code(s) of the additional lighting unit(s). This marking shall be clearly legible and indelible.

This specific identification code shall be comprised of starting letters 'ALU' for 'Additional Lighting Unit' followed by approval marking without the circle as prescribed in paragraph 4.2.1 below (ex. ALU E43 1234) and in the case where several non-identical additional lighting units are used, additional symbols or characters shall follow (ex. ALU E43 1234-A, ALU E43 1234-B). This specific identification code shall be shown in the drawings mentioned in paragraph 2.2.1 above. The approval marking does not have to be the same as the one on the lamp in which the additional lighting unit(s) is used, but both markings shall be from the same applicant.

4. APPROVAL

4.1. General

- 4.1.1. If all the samples of a type of headlamp submitted pursuant to paragraph 2 above satisfy the provisions of this Regulation, approval shall be granted.

- 4.1.2. Where grouped, combined or reciprocally incorporated lamps satisfy the requirements of more than one Regulation, a single international approval mark may be affixed provided that each of the grouped, combined or reciprocally incorporated lamps satisfies the provisions applicable to it.

- 4.1.3. An approval number shall be assigned to each type approved. Its first two digits shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party may not assign the same number to another type of headlamp covered by this Regulation.

- 4.1.4. Notice of approval or of extension or refusal or withdrawal of approval or production definitively discontinued of a type of headlamp pursuant to this Regulation shall be communicated to the Parties to the 1958 Agreement applying this Regulation, by means of a form conforming to the model in Annex 1 to this Regulation.

- 4.1.5. In addition to the mark prescribed in paragraph 3.1, an approval mark as described in paragraphs 4.2 and 4.3 below shall be affixed in the spaces referred to in paragraph 3.2 above to every headlamp conforming to a type approved under this Regulation.

4.2. Composition of the approval mark

The approval mark shall consist of:

- 4.2.1. An international approval marking, comprising:

- 4.2.1.1. A circle surrounding the letter 'E' followed by the distinguishing number of the country which has granted approval ⁽¹⁾;

- 4.2.1.2. The approval number prescribed in paragraph 4.1.3 above;

- 4.2.2. The following additional symbol:

- 4.2.2.1. A horizontal arrow with a head on each end, pointing to the left and to the right;

⁽¹⁾ The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to Consolidated Resolution on the Construction of Vehicles (R.E.3), document TRANS/WP.29/78/Rev.2/Amend.1.

- 4.2.2.2. On headlamps meeting the requirements of this Regulation in respect of the passing beam only, the letters 'C-AS' for Class A headlamps or 'C-BS' for Class B headlamps or 'WC-CS' for Class C headlamp or 'WC-DS' for Class D headlamp or 'WC-ES' for Class E headlamps;
- 4.2.2.3. On headlamps meeting the requirements of this Regulation in respect of the driving beam only, 'R-BS' for Class B headlamps or 'WR-CS' for Class C headlamp or 'WR-DS' for Class D headlamp or 'WR-ES' for Class E headlamps;
- 4.2.2.4. On headlamps meeting the requirements of this Regulation in respect of both the passing beam and the driving beam, the letters 'CR-BS' for Class B headlamps or 'WCR-CS' for Class C headlamp or 'WCR-DS' for Class D headlamp or 'WCR-ES' for Class E headlamps;
- 4.2.2.5. On headlamps incorporating a lens of plastic material, the group of letters 'PL' to be affixed near the symbols prescribed in paragraphs 4.2.1 and 4.2.2 above.
- 4.2.2.6. On headlamps, other than Class A, meeting the requirements of this Regulation in respect of the driving beam, an indication of the maximum luminous intensity expressed by a reference mark, as defined in paragraph 6.3.4 below, placed near the circle surrounding the letter 'E';
- 4.2.3. In every case the relevant operating mode used during the test procedure according to paragraph 1.1.1.1 of Annex 4 and the permitted voltage(s) according to paragraph 1.1.1.2 of Annex 4 shall be stipulated on the approval forms and on the communication forms transmitted to the countries which are Contracting Parties to the Agreement and which apply this Regulation.

In the corresponding cases the device shall be marked as follows:

- 4.2.3.1. on headlamps meeting the requirements of this Regulation which are so designed that the filament lamp, gas-discharge light source or LED module(s) producing the passing beam shall not be lit simultaneously with that of any other lighting function with which it may be reciprocally incorporated: an oblique stroke (/) shall be placed behind the passing lamp symbol in the approval mark.
- 4.2.4. The two digits of the approval number which indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval and the arrow defined in paragraph 4.2.2.1 may be marked close to the above additional symbols.
- 4.2.5. The marks and symbols referred to in paragraphs 4.2.1 to 4.2.3 above shall be clearly legible and be indelible. They may be placed on an inner or outer part (transparent or not) of the headlamp, which cannot be separated from the transparent part of the headlamp emitting the light. In any case they shall be visible when the headlamp is fitted on the vehicle or when a movable part is opened.
- 4.3. Arrangement of the approval mark
 - 4.3.1. Annex 2, Figures 1 to 15, to this Regulation gives examples of arrangements of the approval mark with the above-mentioned additional symbols.
 - 4.3.2. Grouped, combined or reciprocally incorporated lamps:
 - 4.3.2.1. Where grouped, combined or reciprocally incorporated lamps have been found to comply with the requirements of several Regulations, a single international approval mark may be affixed, consisting of a circle surrounding the letter 'E' followed by the distinguishing number of the country which has granted the approval, and an approval number. This approval mark may be located anywhere on the grouped, combined or reciprocally incorporated lamps, provided that:

- 4.3.2.1.1. It is visible as specified in paragraph 4.2.5;
- 4.3.2.1.2. No part of the grouped, combined or reciprocally incorporated lamps that transmits light can be removed without at the same time removing the approval mark.
- 4.3.2.2. The identification symbol for each lamp appropriate to each Regulation under which approval has been granted, together with the corresponding series of amendments incorporating the most recent major technical amendments to the Regulation at the time of issue of the approval, and if necessary, the required arrow shall be marked:
- 4.3.2.2.1. Either on the appropriate light-emitting surface,
- 4.3.2.2.2. Or in a group, in such a way that each of the grouped, combined or reciprocally incorporated lamps may be clearly identified.
- 4.3.2.3. The size of the components of a single approval mark shall not be less than the minimum size required for the smallest of the individual marks by the Regulation under which approval has been granted.
- 4.3.2.4. An approval number shall be assigned to each type approved. The same Contracting Party may not assign the same number to another type of grouped, combined or reciprocally incorporated lamps covered by this Regulation.
- 4.3.2.5. Annex 2, Figure 13, to this Regulation gives examples of arrangements of approval marks for grouped, combined or reciprocally incorporated lamps with all the above mentioned additional symbols.
- 4.3.3. Lamps, the lens of which are used for different types of headlamps and which may be reciprocally incorporated or grouped with other lamps:

The provisions laid down in paragraph 4.3.2 above are applicable.

- 4.3.3.1. In addition, where the same lens is used, the latter may bear the different approval marks relating to the different types of headlamps or units of lamps, provided that the main body of the headlamp, even if it cannot be separated from the lens, also comprises the space described in paragraph 3.2 above and bears the approval marks of the actual functions. If different types of headlamps comprise the same main body, the latter may bear the different approval marks.
- 4.3.3.2. Annex 2, Figure 14, to this Regulation gives examples of arrangements of approval marks relating to the above case.
5. GENERAL SPECIFICATIONS ⁽¹⁾
- 5.1. Each sample shall conform to the specifications set forth in paragraphs 6 to 8 below.
- 5.2. Headlamps shall be so made as to retain their prescribed photometric characteristics and to remain in good working order when in normal use, in spite of the vibrations to which they may be subjected.

⁽¹⁾ Technical requirements for filament lamp: see Regulation No 37. Technical requirements for gas-discharge light sources: see Regulation No 99.

- 5.2.1. Headlamps shall be fitted with a device enabling them to be so adjusted on the vehicles as to comply with the rules applicable to them. Such a device may or may not provide horizontal adjustment, provided that the headlamps are so designed that they can maintain a proper horizontal aiming even after the vertical aiming adjustment. Such a device need not be fitted on units in which the reflector and the diffusing lens cannot be separated, provided the use of such units is confined to vehicles on which the headlamp setting can be adjusted by other means.

Where a headlamp providing a passing beam and a headlamp providing a driving beam, each equipped with its own filament lamp(s), gas-discharge light source or LED module(s), are assembled to form a composite unit the adjusting device shall enable each optical system individually to be duly adjusted.

- 5.2.2. However, these provisions shall not apply to headlamp assemblies whose reflectors are indivisible. For this type of assembly the requirements of paragraph 6.3 of this Regulation apply.

- 5.3. Class A, B, C or D

- 5.3.1. Headlamps shall be equipped with filament lamp(s) approved according to Regulation No 37 and/or, for headlamps of class C or D, with (an) LED module(s).

In the case of the use of additional light source(s) and/or additional lighting unit(s) to provide bend lighting, only categories of filament lamps covered by Regulation No 37, provided that no restriction on the use for bending light is made in Regulation No 37 and its series of amendments in force at the time of application for type approval, and/or LED modules(s) shall be used.

- 5.3.2. It is possible to use two filament light sources for the principal passing beam and several filament light sources for the driving beam.

Any Regulation No 37 filament lamp may be used, provided that:

- (a) No restriction on the use is made in Regulation No 37 and its series of amendments in force at the time of application for type approval;
- (b) For Class A and B, its reference luminous flux at 13,2 V for principal dipped-beam does not exceed 900 lm;
- (c) For Class C and D, its reference luminous flux at 13,2 V for principal dipped-beam does not exceed 2 000 lm.

The design of the device shall be such that the filament lamp can be fixed in no other position but the correct one ⁽¹⁾.

The filament lamp holder shall conform to the characteristics given in IEC Publication 60061. The holder data sheet relevant to the category of filament lamp used, applies.

- 5.3.3. For lamps equipped with (an) LED module(s):

- 5.3.3.1. The electronic light source control gear(s), if applicable, shall be considered as being part of the headlamp; they may also be part of the LED module(s);

⁽¹⁾ A headlamp is regarded as satisfying the requirements of this paragraph if the filament lamp can be easily fitted into the headlamp and the positioning lugs can be correctly fitted into their slots even in darkness.

5.3.3.2. The headlamp and the LED module(s) themselves shall comply with the relevant requirements specified in Annex 12 to this Regulation. The compliance with the requirements shall be tested.

5.3.3.3. The total objective luminous flux of all LED modules producing the principal passing beam shall be measured as described in paragraph 5 of Annex 12. The following minimum and maximum limits shall apply:

	Headlamps Class A	Headlamps Class B	Headlamps Class C	Headlamps Class D
Principal passing beam minimum	150 lumen	350 lumen	500 lumen	1 000 lumen
Principal passing beam maximum	900 lumen	1 000 lumen	2 000 lumen	2 000 lumen

5.3.3.4. In the case of a replaceable LED module, the removal and replacement of this LED module, as described in Annex 12, paragraph 1.4.1, shall be demonstrated to the satisfaction of the Technical Service.

5.4. Class E headlamps

5.4.1. The headlamp shall be equipped with (a) gas-discharge light source(s) approved according to Regulation No 99 and/or (an) LED module(s).

In the case of the use of additional light source(s) and/or additional lighting unit(s) to provide bend lighting, only categories of filament lamps covered by Regulation No 37, provided that no restriction on the use for bending light is made in Regulation No 37 and its series of amendments in force at the time of application for type, and/or LED modules(s) shall be used.

5.4.2. In the case of replaceable gas-discharge light sources the lamp holder shall conform to the dimensional characteristics as given on the data sheet of IEC Publication 60061-2, relevant to the category of gas-discharge light source used. The gas-discharge light source shall fit easily into the headlamp.

5.4.3. In the case of (an) LED module(s) the following requirements apply:

5.4.3.1. The electronic light source control gear(s), if applicable, shall be considered as being part of the headlamp; they may also be part of the LED module(s);

5.4.3.2. The headlamp and the LED module(s) themselves shall comply with the relevant requirements specified in Annex 12 to this Regulation. The compliance with the requirements shall be tested.

5.4.3.3. The total objective luminous flux of all LED modules producing the principal passing beam shall be measured as described in paragraph 5 of Annex 12. The following minimum limit shall apply:

	Headlamps Class E
Principal passing beam minimum	2 000 lumen

5.5. In addition, Class B or C or D or E headlamps shall be complementary tested according to the requirements of Annex 4 to ensure that in use there is no excessive change in photometric performance.

5.6. If the lens of a Class B, C, D or E headlamp is of plastic material, tests shall be done according to the requirements of Annex 6.

- 5.7. On headlamps designed to provide alternately a driving beam and a passing beam, or headlamp systems including additional light source(s) and/or additional lighting unit(s) used to produce bend lighting, any mechanical, electromechanical or other device incorporated in the headlamp for these purposes shall be so constructed that:
- 5.7.1. The device is robust enough to withstand 50 000 operations under normal conditions of use. In order to verify compliance with this requirement, the Technical Service responsible for approval tests may:
- (a) Require the applicant to supply the equipment necessary to perform the test;
 - (b) Forego the test if the headlamp presented by the applicant is accompanied by a test report, issued by a Technical Service responsible for approval tests for headlamps of the same construction (assembly), confirming compliance with this requirement.
- 5.7.2. except for additional light source(s) and additional lighting unit(s) used to produce bend lighting, in the case of failure it must be possible to obtain automatically a passing beam or a state with respect to the photometric conditions which yields values not exceeding 1 200 cd in Zone 1 and at least 2 400 cd at 0,86 D-V by such means as e.g. switching off, dimming, aiming downwards, and/or functional substitution;
- 5.7.3. except for additional light source(s) and additional lighting unit(s) used to produce bend lighting, either the passing beam or the driving beam shall always be obtained without any possibility of the mechanism stopping in between the two positions;
- 5.7.4. The user cannot, with ordinary tools, change the shape or position of the moving parts.
- 5.8. For Class E, the headlamp and ballast system shall not generate radiated or power line disturbances to cause a malfunction of other electric/electronic systems of the vehicle ⁽¹⁾.
- 5.9. The definitions in paragraphs 2.7.1.1.3 and 2.7.1.1.7, in Regulation No 48 allow the use of LED module, which may contain holders for other light sources. Notwithstanding this provision a mixture of LED'(s) and other light sources for the passing beam or each driving beam, as specified by this Regulation is not allowed.
- 5.10. A LED module shall be:
- (a) Only removable from its device with the use of tools, unless it is stated in the communication sheet that the LED module is non replaceable and;
 - (b) So designed that regardless of the use of tool(s), it is not mechanically interchangeable with any replaceable approved light source.
6. ILLUMINATION
- 6.1. General provisions
- 6.1.1. Headlamps shall be so made that they give adequate illumination without dazzle when emitting the passing beam, and good illumination when emitting a driving beam.
- 6.1.2. The luminous intensity produced by the headlamp shall be measured at 25 m distance by means of a photoelectric cell having a useful area comprised within a square of 65 mm side. The point HV is the centre-point of the coordinate system with a vertical polar axis. Line H is the horizontal through HV (see Annex 3 to this Regulation).

⁽¹⁾ Compliance with the requirements for electromagnetic compatibility is relevant to the individual vehicle type.

6.1.3. For Class A or B or C or D

6.1.3.1. Apart from (an) LED module(s), the headlamps shall be checked by means of an uncoloured standard (étalon) filament lamp designed for a rated voltage of 12 V. During the checking of the headlamp, the voltage at the terminals of the filament lamp shall be regulated so as to obtain the reference luminous flux at 13,2 V as indicated at the relevant data sheet of Regulation No 37.

In order to protect the standard (étalon) filament lamp during the process of photometric measurement it is permissible to carry out the measurements at a luminous flux that differs from the reference luminous flux at 13,2 V. If the test laboratory chooses to carry out measurements in such a manner the luminous intensity shall be corrected by multiplying the measured value by the individual factor F_{lamp} of the standard (étalon) filament lamp in order to verify the compliance with the photometric requirements where:

$$F_{\text{lamp}} = \Phi_{\text{reference}} / \Phi_{\text{test}}$$

$\Phi_{\text{reference}}$ is the reference luminous flux at 13,2 V as specified in the relevant data sheet of Regulation No 37

Φ_{test} is the actual luminous flux used for the measurement.

6.1.3.2. Depending on the number of filament lamps for which the headlamp is designed, it shall be considered acceptable if it meets the requirements of paragraph 6 with the same number of standard (étalon) filament lamp(s), which may be submitted with the headlamp.

6.1.3.3. LED module(s) shall be measured at 6,3 V or 13,2 V respectively, if not otherwise specified within this Regulation. LED module(s) operated by an electronic light source control gear, shall be measured as specified by the applicant.

6.1.4. For Class E with (a) gas-discharge light source(s) according to Regulation No 99

6.1.4.1. The headlamp shall be deemed satisfactory if the photometric requirements set in the present paragraph 6 are met with one light source, which has been aged during at least 15 cycles, in accordance with Annex 4, paragraph 4 of Regulation No 99.

Where the gas-discharge light source is approved according to Regulation No 99 it shall be a standard (étalon) light-source and its luminous flux may differ from the objective luminous flux specified in Regulation No 99. In this case, the illuminances shall be corrected accordingly.

The above correction does not apply to distributed lighting systems using a non-replaceable gas-discharge light source or to headlamps with the ballast(s) totally or partially integrated.

Where the gas-discharge light source is not approved according to Regulation No 99 it shall be a production non-replaceable light source.

The voltage applied to the terminals of the ballast(s) is: either: 13,2 V $\pm$ 0,1 V for 12 V systems or: as otherwise specified (see Annex 11).

6.1.4.2. The dimensions determining the position of the arc inside the standard gas-discharge light source are shown in the relevant data sheet of Regulation No 99.

6.1.4.3. Four seconds after ignition of a headlamp which has not been operated for 30 minutes or more, at least 37 500 cd must be reached at point HV of a driving beam and 3 750 cd at point 2 (0,86 D-V) of a passing beam for headlamps incorporating driving beam and passing beam functions, or 3 750 cd at point 2 (0,86 D-V) for headlamps having only a passing beam function. The power supply shall be sufficient to secure the quick rise of the high current pulse.

- 6.1.5. For Class E with (an) LED module(s)
- 6.1.5.1. LED module(s) shall be measured at 6,3 V or 13,2 V respectively, if not otherwise specified within this Regulation. LED module(s) operated by an electronic light source control gear, shall be measured as specified by the applicant.
- 6.1.6. In the case of headlamp systems having additional light source(s) and/or additional lighting unit(s) used to produce bend lighting, the additional light source(s) shall be measured according to the paragraphs 6.1.3, 6.1.4 and 6.1.5.
- 6.2. Provisions concerning passing beams
- 6.2.1. For a correct aiming the principal passing beam shall produce a sufficiently sharp 'cut-off' to permit a satisfactory visual adjustment with its aid as indicated in paragraph 6.2.2 below. The aiming shall be carried out using a flat vertical screen set up at a distance of 10 or 25 m forward of the headlamp and at right angles to the H-V. The screen shall be sufficiently wide to allow examination and adjustment of the 'cut-off' of the passing beam over at least 3° on either side of the V-V line. The 'cut-off' shall be substantially horizontal and shall be as straight as possible from at least 3° L to 3° R. In case the visual aim leads to problems or ambiguous positions, the instrumental method as specified in Annex 9, paragraphs 2 and 4, shall be applied and the quality or rather the sharpness of the 'cut-off' and the linearity shall be checked on performance.
- 6.2.2. The principal passing beam shall be aimed so that:
- 6.2.2.1. For horizontal adjustment: The beam is as symmetrical as possible with reference to line V-V;
- 6.2.2.2. For vertical adjustment: the horizontal part of the 'cut-off' line is adjusted to its nominal position (0,57 degree) below the H-H line.
- If, however, vertical adjustment cannot be performed repeatedly to the required position within the allowed tolerances, the instrumental method of Annex 9, paragraphs 4 and 5 shall be applied to test compliance with the required minimum quality of the 'cut-off' line and to perform the beam vertical adjustment.
- 6.2.3. When so aimed, the headlamp must, if its approval is sought solely for provision of a passing beam⁽¹⁾, comply with the requirements set out in paragraphs 6.2.5 and 6.2.6 below; if it is intended to provide both a passing beam and a driving beam, it shall comply with the requirements set out in paragraphs 6.2.5, 6.2.6 and 6.3.
- 6.2.4. Where a headlamp so aimed does not meet the requirements set out in paragraphs 6.2.5, 6.2.6 and 6.3, its alignment may be changed, except for headlamps that have no mechanism to adjust horizontal aim, on condition that the axis of the beam is not displaced laterally by more than 0,5 degree to the right or left and vertically by not more than 0,25 degree up or down. To facilitate alignment by means of the 'cut-off', the headlamp may be partially occulted in order to sharpen the 'cut-off'. However, the 'cut-off' should not extend beyond the line H-H.
- 6.2.5. The passing beam shall meet the requirements as shown in the applicable table below and the applicable figure as shown in Annex 3.

Notes:

For Class E headlamps the voltage applied to the terminals of the ballast(s) is either 13,2 V $\pm$ 0,1 V for 12 V systems or as otherwise specified (see Annex 11).

⁽¹⁾ Such a special 'passing beam' headlamp may incorporate a driving beam not subject to requirements.

'D' means under the H-H line.

'U' means above the H-H line.

'R' means right of the V-V line.

'L' means left of the V-V line.

6.2.5.1. For Class A headlamps (Figure B in Annex 3):

Test point/line/zone	Angular coordinates — degrees (*)		Required luminous intensity in cd
Any point in Zone 1	0° to 15°U	5°L to 5°R	≤ 320 cd
Any point on line 25 L to 25 R	1,72°D	5°L to 5°R	≥ 1 100 cd
Any point on line 12,5 L to 12,5 R	3,43°D	5°L to 5°R	≥ 550 cd

(*) 0,25° tolerance allowed independently at each test point for photometry unless indicated otherwise.

6.2.5.2. For Class B headlamps (Figure C in Annex 3):

Test point/line/zone	Angular coordinates — degrees (*)		Required luminous intensity in cd
Any point in Zone 1	0° to 15°U	5°L to 5°R	≤ 700 cd
Any point on line 50 L to 50 R except 50 V	0,86°D	2,5°L to 2,5°R	≥ 1 100 cd
Point 50 V	0,86°D	0	≥ 2 200 cd
Any point on line 25 L to 25 R	1,72°D	5°L to 5°R	≥ 2 200 cd
Any point in Zone 2	0,86°D to 1,72°D	5°L to 5°R	≥ 1 100 cd

(*) 0,25° tolerance allowed independently at each test point for photometry unless indicated otherwise.

6.2.5.3. For Class C, D or E headlamp (Figure D in Annex 3):

Test point/ line/zone	Test point angular coordinates degrees (*)		Required luminous intensity in cd			
			Minimum			Maximum
			Class C	Class D	Class E	Classes C, D, E
1	0,86°D	3,5°R	2 000	2 000	2 500	13 750
2	0,86°D	0	2 450	4 900	4 900	—
3	0,86°D	3,5°L	2 000	2 000	2 500	13 750
4	0,50°U	1,50°L and 1,50°R	—	—	—	900
5	2,00°D	15°L and 15°R	550	1 100	1 100	—
6	4,00°D	20°L and 20°R	150	300	600	—

Test point/ line/zone	Test point angular coordinates degrees (*)		Required luminous intensity in cd			
			Minimum			Maximum
			Class C	Class D	Class E	Classes C, D, E
7	0	0	—	—	—	1 700
Line 1	2,00°D	9°L to 9°R	1 350	1 350	1 900	—
8 (**)	4,00°U	8,0°L	$\sum 8 + 9 + 10 \geq 150 \text{ cd (**)}$			700
9 (**)	4,00°U	0				700
10 (**)	4,00°U	8,0°R				700
11 (**)	2,00°U	4,0°L	$\sum 11 + 12 + 13 \geq 300 \text{ cd (**)}$			900
12 (**)	2,00°U	0				900
13 (**)	2,00°U	4,0°R				900
14 (**)	0	8,0°L and 8,0°R	50 cd (**)	50 cd (**)	50 cd (**)	—
15 (**)	0	4,0°L and 4,0°R	100 cd (**)	100 cd (**)	100 cd (**)	900
Zone 1	1°U/8°L-4°U/8°L-4°U/8°R-1°U/8°R-0/4°R-0/1°R-0,6°U/0-0/1°L-0/4°L-1°U/8°L		—	—	—	900
Zone 2	> 4 U to < 15 U	8°L to 8°R	—	—	—	700

(*) 0,25° tolerance allowed independently at each test point for photometry unless indicated otherwise.

(**) On request of the applicant during measurement of these points, the front position lamp approved to Regulation No 50 or Regulation No 7, if combined, grouped, or reciprocally incorporated, shall be switched ON.

Other general text:

UN ECE type approval at reference luminous flux according to Regulation No 37.

Nominal aim for photometry:

Vertical: 1 per cent D (0,57°D) Horizontal: 0°

Allowed tolerances for photometry:

Vertical: 0,3°D to 0,8°D Horizontal: ± 0,5°D L-R

6.2.6. The light shall be as evenly distributed as possible within zones 1 and 2 for Class C, D or E headlamps.

6.2.6.1. However, the additional light source(s) or additional lighting unit(s) shall not be activated when the bank angle is less than 3 degrees.

6.2.7. Either one or two filament light sources (class A, B, C, D) or one gas discharge light source (class E) or one or more LED module(s) (class C, D, E) are permitted for the principal passing beam.

6.2.8. Additional light source(s) and/or additional lighting unit(s) used to produce bend lighting is (are) permitted, provided that:

6.2.8.1. The following requirement regarding illumination shall be met, when the principal passing beam(s) and corresponding additional light source(s) used to produce bend lighting are activated simultaneously:

(a) Left bank (when the motorcycle is rotated to the left about its longitudinal axis) the luminous intensity values shall not exceed 900 cd in the zone extending from HH to 15 deg above HH and from VV to 10 deg left.

(b) Right bank (when the motorcycle is rotated to the right about its longitudinal axis) the luminous intensity values shall not exceed 900 cd in the zone extending from HH to 15 deg above HH and from VV to 10 deg right.

6.2.8.2. This test shall be carried out with the minimum bank angle specified by the applicant simulating the condition by means of the test fixture etc.

6.2.8.3. For this measurement, at the request of the applicant, principal passing beam and additional light source(s) used to produce bend lighting, may be measured individually and the photometric values obtained combined to determine compliance with the specified luminous intensity values.

6.3. Provisions concerning driving beams

6.3.1. In the case of a headlamp designed to provide a driving beam and a passing beam, measurements of the luminous intensity of the driving beam shall be taken with the same headlamp alignment as applied to the condition of paragraph 6.2 above; in the case of a headlamp providing a driving beam only, it shall be so adjusted that the area of maximum luminous intensity (I_M) is centred on the point of intersection of lines H-H and V-V; such a headlamp need only meet the requirements referred to in paragraph 6.3.

6.3.2. Irrespective of the type of light source (LED module(s) or filament light source(s) or gas discharge light source) used to produce the passing beam, several light sources either:

(a) One or more filament light sources listed in Regulation No 37 (Classes A, B, C, D);

or

(b) Gas discharge light sources listed in Regulation No 99 (Class E); or

(c) LED module(s) (Classes C, D, E) may be used for each individual driving beam.

6.3.3. Except for Class A headlamps the luminous intensity produced by the driving beam shall either conform to the requirements of paragraph 6.3.3.1 (primary driving beam) or paragraph 6.3.3.2 (secondary driving beam).

A primary driving beam according to the requirements of paragraph 6.3.3.1 can be approved in any case.

A secondary driving beam according to the requirements of paragraph 6.3.3.2 can only be approved in the case where the driving beam is operated together with a passing beam or a primary driving beam. This shall be clearly indicated in the communication form of Annex 1, under item 9.1.

6.3.3.1. The luminous intensity of a primary driving beam shall conform to the following table (Figure E in Annex 3):

Test point number	Test point angular coordinates — degrees (*)	Required luminous intensity [cd]					
		Class B		Class C		Class D, E	
		MIN	MAX	MIN	MAX	MIN	MAX
1	H-V	16 000	—	20 000	—	30 000	—
2	H-2,5°R and 2,5°L	9 000	—	10 000	—	20 000	—
3	H-5°R and 5°L	2 500	—	3 500	—	5 000	—
4	H-9°R and 9°L	—	—	2 000	—	3 400	—
5	H-12°R and 12°L	—	—	600	—	1 000	—
6	2°U-V	—	—	1 000	—	1 700	—
	MIN luminous intensity of the maximum (I_M)	20 000	—	25 000	—	40 000	—
	MAX luminous intensity of the maximum (I_M)	—	215 000	—	215 000	—	215 000

(*) 0,25° tolerance allowed independently at each test point for photometry unless indicated otherwise.

6.3.3.2. The luminous intensity of a secondary driving beam shall conform to the following table (Figure F in Annex 3):

Test point number	Test point angular coordinates — degrees (*)	Required luminous intensity [cd]					
		Class B		Class C		Classes D, E	
		MIN	MAX	MIN	MAX	MIN	MAX
1	H-V	16 000	—	20 000	—	30 000	—
2	H-2,5°R and 2,5°L	9 000	—	10 000	—	20 000	—
3	H-5°R and 5°L	2 500	—	3 500	—	5 000	—
6	2°U-V	—	—	1 000	—	1 700	—
	MIN luminous intensity of the maximum (I_M)	20 000	—	25 000	—	40 000	—
	MAX luminous intensity of the maximum (I_M)	—	215 000	—	215 000	—	215 000

(*) 0,25° tolerance allowed independently at each test point for photometry unless indicated otherwise.

6.3.4. The reference mark (I'_M) of the maximum luminous intensity (I_M), referred to in paragraphs 4.2.2.6 and 6.3.3.1 or 6.3.3.2 shall be obtained by the ratio:

$$I'_M = I_M / 4\,300$$

This value shall be rounded off to the value 7,5 — 10 — 12,5 — 17,5 — 20 — 25 — 27,5 — 30 — 37,5 — 40 — 45 — 50.

- 6.4. In the case of headlamps with an adjustable reflector, additional tests shall be made after the reflector has been moved vertically $\pm 2^\circ$ or at least into the maximum position, if less than 2° , from its initial position by means of the headlamp adjusting device. The whole headlamp shall then be re-positioned (for example by means of the goniometer) by moving it through the same number of degrees in the opposite direction to the movement of the reflector. The following measurements shall be made and the points shall be within the required limits:

Passing beam: points HV and 0,86 D-V

Driving beam: I_M and point HV (percentage of I_M).

- 6.5. The screen illumination values mentioned in paragraphs 6.2 and 6.3 above shall be measured by means of a photoreceptor, the effective area of which shall be contained within a square of 65 mm side.

7. COLOUR

- 7.1. The colour of the light emitted shall be white.

8. MODIFICATION OF THE HEADLAMP TYPE AND EXTENSION OF APPROVAL

- 8.1. Every modification of the headlamp type shall be notified to the Type Approval Authority which approved the headlamp type. The said department may then either:

- 8.1.1. Consider that the modifications made are unlikely to have appreciable adverse effects and that in any event the headlamp still complies with the requirements; or

- 8.1.2. Require a further test report from the technical service responsible for conducting the tests.

- 8.2. Confirmation or refusal of approval, specifying the alterations, shall be communicated by the procedure specified in paragraph 4.1.4 above to the Parties to the Agreement which apply this Regulation.

- 8.3. The competent authority issuing the extension of approval shall assign a series number to each communication form drawn up for such an extension and inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

9. CONFORMITY OF PRODUCTION

The conformity of production procedures shall comply with those set out in the Agreement, Appendix 2 (E/ECE/324-E/ECE/TRANS/505/Rev.2) with the following requirements:

- 9.1. Headlamps approved under this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set forth in paragraphs 6 and 7.

- 9.2. The minimum requirements for conformity of production control procedures set forth in Annex 5 to this Regulation shall be complied with.

- 9.3. The minimum requirements for sampling by an inspector set forth in Annex 7 to this Regulation shall be complied with.

- 9.4. The authority which has granted type approval may at any time verify the conformity control methods applied in each production facility. The normal frequency of these verifications shall be once every two years.

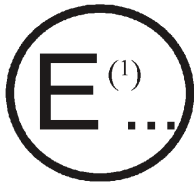
- 9.5. Headlamps with apparent defects are disregarded.

- 9.6. The measuring points 8 to 15 from paragraph 6.2.5.3 of this Regulation are disregarded.
10. PENALTIES FOR NON-CONFORMITY OF PRODUCTION
- 10.1. The approval granted in respect of a type of headlamp pursuant to this Regulation may be withdrawn if the requirements are not complied with or if a headlamp bearing the approval mark does not conform to the type approved.
- 10.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.
11. PRODUCTION DEFINITELY DISCONTINUED
- If the holder of the approval completely ceases to manufacture a type of headlamp approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication, that authority shall inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.
12. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS, AND OF TYPE APPROVAL AUTHORITIES
- The Parties to the 1958 Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, or production definitively discontinued, issued in other countries, are to be sent.
13. TRANSITIONAL PROVISIONS
- 13.1. From the date of entry into force of the 01 series of amendments to this Regulation, no Contracting Party applying it shall refuse to grant approvals under this Regulation as amended by the 01 series of amendments.
- 13.2. Until 60 months after the date of entry into force of the 01 series of amendments to this Regulation with regard to the changes introduced by the 01 series of amendments concerning the photometric testing procedures involving the use of the spherical coordinate system and the specification of luminous intensity values, and in order to allow the Technical Services (test laboratories) to update their testing equipment, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 01 series of amendments where existing testing equipment is used with suitable conversion of the values, to the satisfaction of the authority responsible for type approval.
- 13.3. As from 60 months after the date of entry into force of the 01 series of amendments, Contracting Parties applying this Regulation shall grant approvals only if the headlamp meets the requirements of this Regulation as amended by the 01 series of amendments.
- 13.4. Existing approvals for headlamps already granted under this Regulation before the date of entry into force of the 01 series of amendments shall remain valid indefinitely.
- 13.5. Contracting Parties applying this Regulation shall not refuse to grant extensions of approvals to the preceding series to this Regulation.
-

ANNEX 1

COMMUNICATION

(Maximum format: A4 (210 × 297 mm))



issued by: Name of administration

.....

.....

.....

Concerning ⁽²⁾: Approval granted
 Approval extended
 Approval refused
 Approval withdrawn
 Production definitively discontinued

of a type of headlamp pursuant to Regulation No 113

Approval No:

Extension No:

1. Trade name or mark of the vehicle:
2. Manufacturer's name for the type of vehicle:
3. Manufacturer's name and address:
4. If applicable, name and address of manufacturer's representative:
5. Submitted for approval on:
6. Technical Service responsible for conducting approval tests:
7. Date of report issued by that service:
8. Number of report issued by that service:
9. Brief description:

Category as described by the relevant marking ⁽³⁾:

Number and specific identification code(s) of electronic light source control gear(s), if any:

Number and specific identification code(s) of additional lighting unit(s) and for each LED module a statement whether it is replaceable or not, if any:

The determination of 'cut-off' sharpness yes/no ⁽²⁾

If yes, it was carried out at 10 m/25 m ⁽²⁾

Trade name and identification number of separate ballast(s) or part(s) of ballast(s):

The passing beam light source may/may not ⁽²⁾ be lit simultaneously with the driving beam light source and/or another reciprocally incorporated headlamp.

The minimum bank angle(s) to satisfy the requirement of paragraph 6.2.8.1, if any
- 9.1. Primary driving beam: yes/no ⁽²⁾
 Secondary driving beam: yes/no ⁽²⁾
 The secondary driving beam shall only be operated together with a passing beam or a primary driving beam.
10. Approval mark position:
11. Reason(s) for extension of approval:
12. Approval granted/extended/refused/withdrawn ⁽²⁾:
13. Place:
14. Date:

15. Signature:

16. The list of documents deposited with the Type Approval Authority which has granted approval is annexed to this communication and may be obtained on request.

⁽¹⁾ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see the provisions of the Regulation concerning approval).

⁽²⁾ Strike out which does not apply.

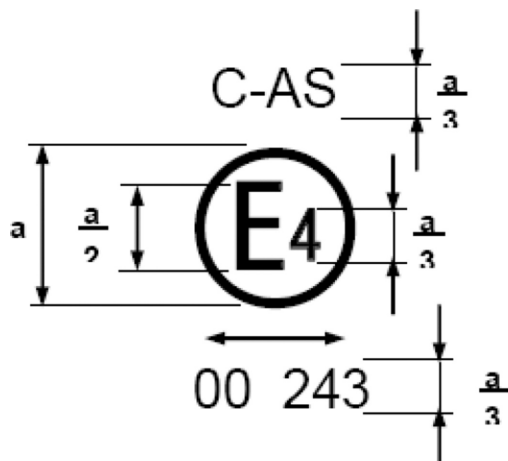
⁽³⁾ Indicate the appropriate marking selected from the list below:

C-AS,	C-BS,	R-BS,	CR-BS,	C/ -BS,	C/R-BS,
WC-CS,	C-BS PL,	R-BS PL,	CR-BS PL,	C/-BS PL,	C/R-BS PL,
WC/-CS,	WC-DS,	WR-CS	WR-DS,	WCR-CS,	WCR-DS,
WC/-DS PL,	WC/-DS,	WC/R-CS,	WC/R-DS,	WC-CS PL	
WC/CS PL,	WR-CS PL,	WR-DS PL,	WCR-CS PL,	WCR-DS PL,	
WC+CS,	WC/-DS PL,	WC/R-CS PL,	WC/R-DS PL,		
WC+CS PL,	WC+DS,	WC+R-CS,	WC+R-DS,	C+-BS,	C+R-BS,
WC-ES,	WC+R-CS PL,	WC+R-DS PL,	WC+R-DS PL,	C+-BS PL,	C+R-BS PL
WR-ES PL,	WR-ES,	WCR-ES,	WC/-ES,	WC/R-ES,	WC-ES PL,
WC+ES,	WCR-ES PL,	WC/-ES PL,	WC/R-ES PL		
	WC+R-ES,	WC+R-ES PL,	WC+R-ES PL		

ANNEX 2

EXAMPLES OF ARRANGEMENT OF APPROVAL MARKS

Figure 1



$a \geq 5$ mm for Class A headlamp

Figure 2



$a \geq 8$ mm (on glass) $a \geq 5$ mm (on plastic material)

The headlamp bearing one of the above approval marks has been approved in the Netherlands (E 4) pursuant to Regulation No 113 under approval number 243, meeting the requirements of this Regulation as amended by the 01 series of amendments. The letters C-AS (Figure 1) indicate that it concerns a Class A passing beam headlamp and the letters CR-BS (Figure 2) indicate that it concerns a Class B passing and driving beam headlamp.

Note: The approval number and additional symbols shall be placed close to the circle and either above or below the letter 'E', or to the right or left of that letter. The digits of the approval number shall be on the same side of the letter 'E' and face in the same direction. The use of Roman numerals as approval numbers should be avoided so as to prevent any confusion with other symbols.

Figure 3



Figure 4



The headlamp bearing the above approval mark is a headlamp incorporating a lens of plastic material meeting the requirements of this Regulation and is designed:

Figure 3: Class B in respect of the passing beam only.

Figure 4: Class B in respect of the passing beam and driving beam.



The headlamp bearing the above approval mark is a headlamp meeting the requirements of this Regulation:

Figure 5: Class B in respect of the passing beam and driving beam.

Figure 6: Class B in respect of the passing beam only.

The passing beam shall not be operated simultaneously with the driving beam and/or another reciprocally incorporated headlamp.



The headlamp bearing the above approval mark is a headlamp incorporating a lens of plastic material meeting the requirements of this Regulation and is designed:

Figure 7: Class C in respect of the passing beam only.

Figure 8: Class C in respect of the passing beam and driving beam.



The headlamp bearing the above approval mark is a headlamp meeting the requirements of this Regulation:

Figure 9: Class D in respect of the passing beam only.

Figure 10: Class D in respect of the passing beam and driving beam.

The passing beam shall not be operated simultaneously with the driving beam and/or another reciprocally incorporated headlamp.

Figure 11

WC-ES PL



Figure 12

WCR-ES PL



The headlamp bearing the above approval mark is a headlamp meeting the requirements of this Regulation:

Figure 11: Class E in respect of the passing beam only.

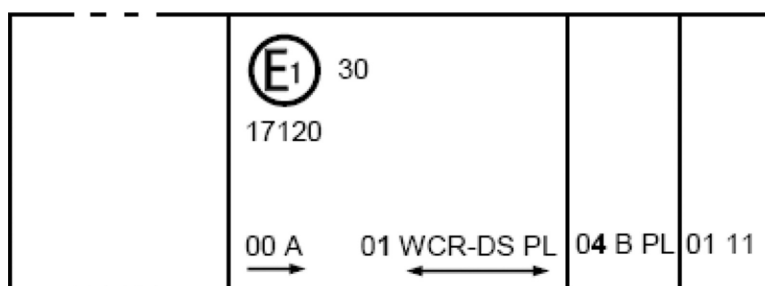
Figure 12: Class E in respect of the passing beam and driving beam.

Figure 13

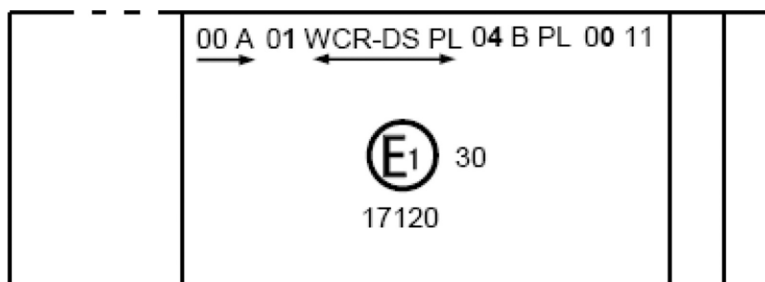
Simplified marking for grouped, combined or reciprocally incorporated lamps

(The vertical and horizontal lines schematize the shape of the light-signalling device. They are not part of the approval mark).

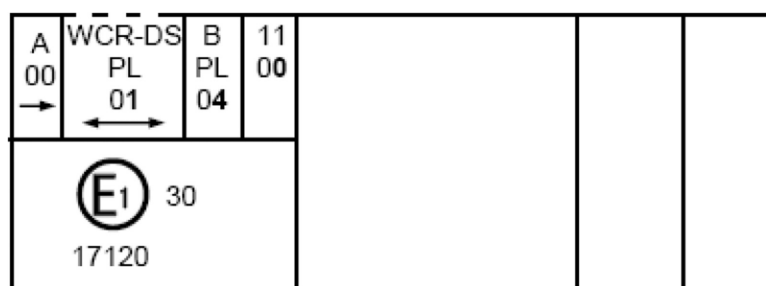
Model A



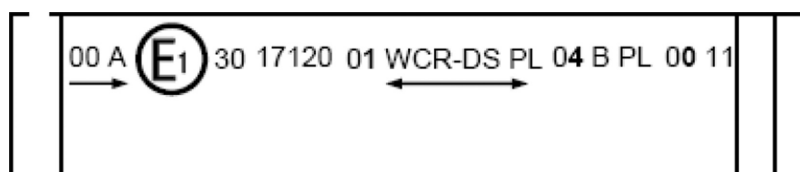
Model B



Model C



Model D



Note: The four examples above correspond to a lighting device bearing an approval mark comprising:

A front position lamp approved in accordance with Regulation No 50 in its original form (00),

A headlamp, Class D, with a passing beam and a driving beam with a maximum intensity comprised between 123 625 and 145 125 candelas (as indicated by the number 30), approved in accordance with the requirements of this Regulation as amended by the 01 series of amendments and incorporating a lens of plastic material,

A Class B front fog lamp approved in accordance with the 03 series of amendments to Regulation No 19 and incorporating a lens of plastic material,

A front direction indicator lamp of Category 11 approved in accordance with the 00 series of amendments to Regulation No 50.

Figure 14

Lamp reciprocally incorporated with a headlamp

Example 1



The above example corresponds to the marking of a lens of plastic material intended to be used in different types of headlamps, namely:

Either a headlamp, Class D, with a passing and a driving beam with a maximum luminous intensity comprised between 123 625 and 145 125 (as indicated by the number 30), approved in Germany (E1) in accordance with the requirements of this Regulation as amended by the 01 series of amendments, which is reciprocally incorporated with a front position lamp approved in accordance with Regulation No 50 in its original form (00);

or

A headlamp, Class C, with a passing beam and a driving beam with a maximum luminous intensity comprised between 48 375 and 64 500 candelas (as indicated by the number 12.5), approved in Germany (E1) in accordance with the requirements of this Regulation as amended by the 01 series of amendments, which is reciprocally incorporated with the same front position lamp as above.

Figure 15

LED modules

MD E3 17325

The LED module bearing the light source module identification code shown above has been approved together with a headlamp initially approved in Italy (E3) under approval number 17325.

Figure 16

Additional lighting units designed to provide bend lighting

ALU E43 1234

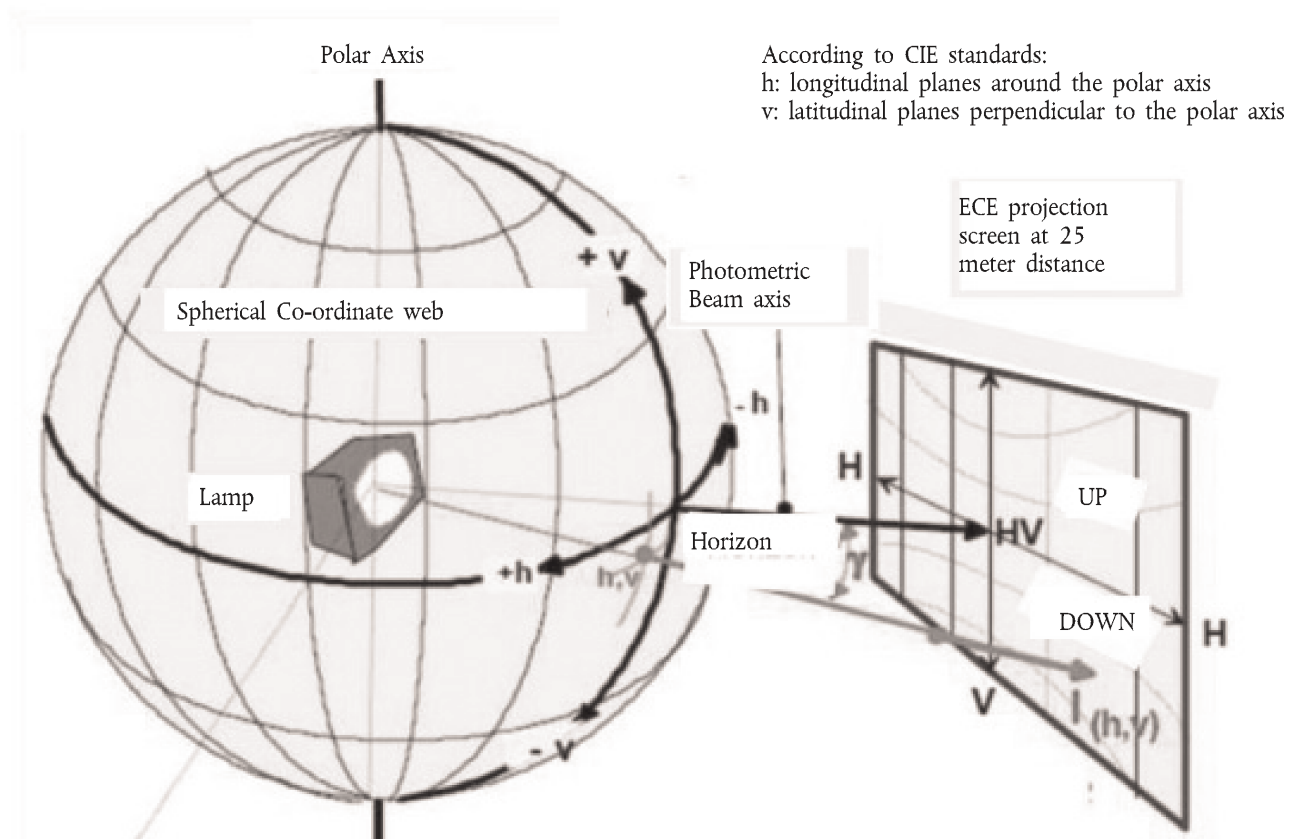
The additional lighting unit bearing the identification code shown above has been approved together with a headlamp initially approved in Japan (E43) under approval number 1234.

ANNEX 3

SPHERICAL COORDINATE MEASURING SYSTEM AND TEST POINT LOCATIONS

Figure A

Spherical Coordinate Measuring System

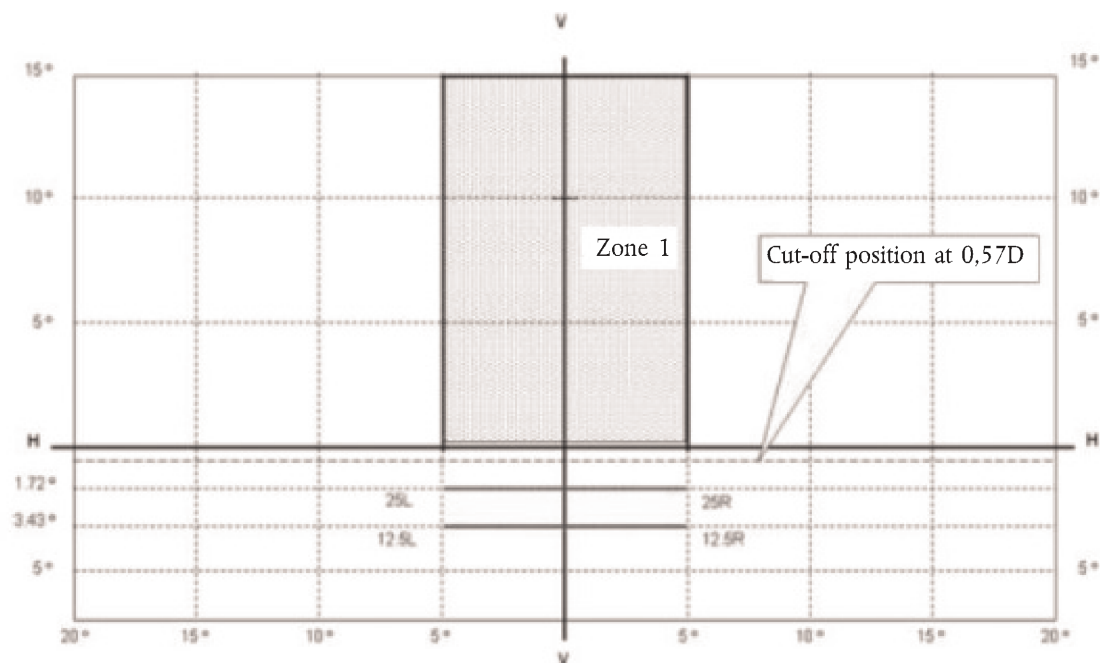


$$E_{25m} = I_{(h,v)} \times \cos \gamma / r^2$$

The angular co-ordinates are specified in degrees on a sphere with a vertical polar axis according to CIE publication No 70-1987 'The measurement of absolute luminous intensity distributions', i.e. corresponding to a goniometer with a horizontal ('elevation') axis fixed to the ground and a second, moveable ('rotation') axis perpendicular to the fixed horizontal axis.

Figure B

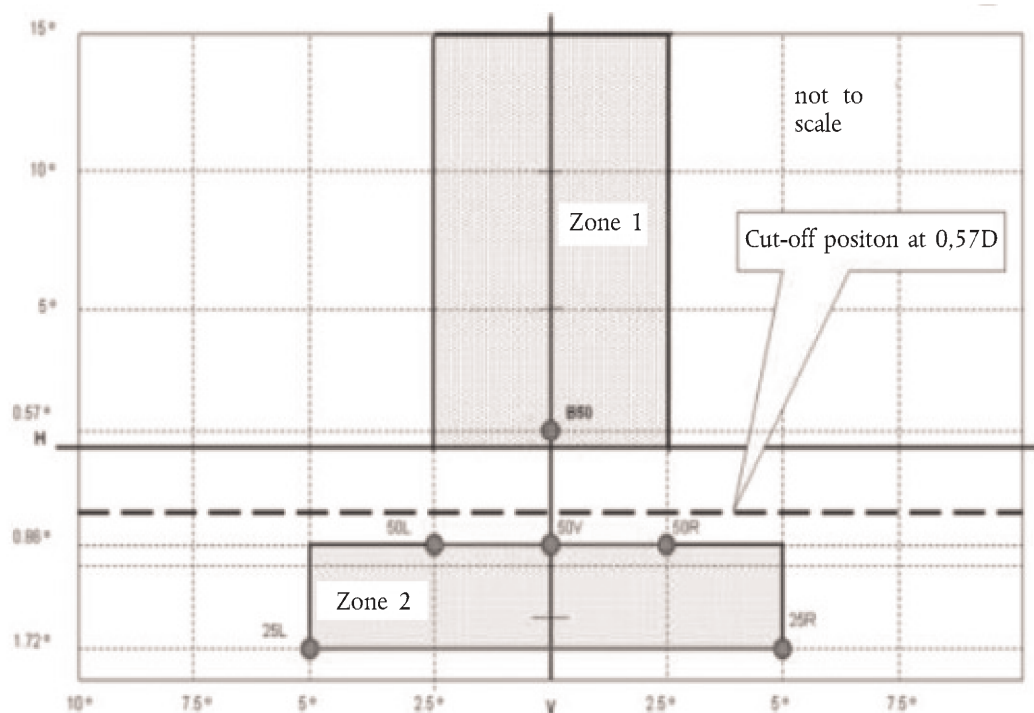
Passing beam test points and zones for Class A headlamp(s)



H-H: horizontal plane V-V: vertical plane passing through focus of headlamp

Figure C

Passing beam test points and zones for Class B headlamp(s)



H-H: horizontal plane V-V: vertical plane passing through focus of headlamp

Figure D

Passing beam — position of test points and zones for Classes C, D and E headlamp(s)

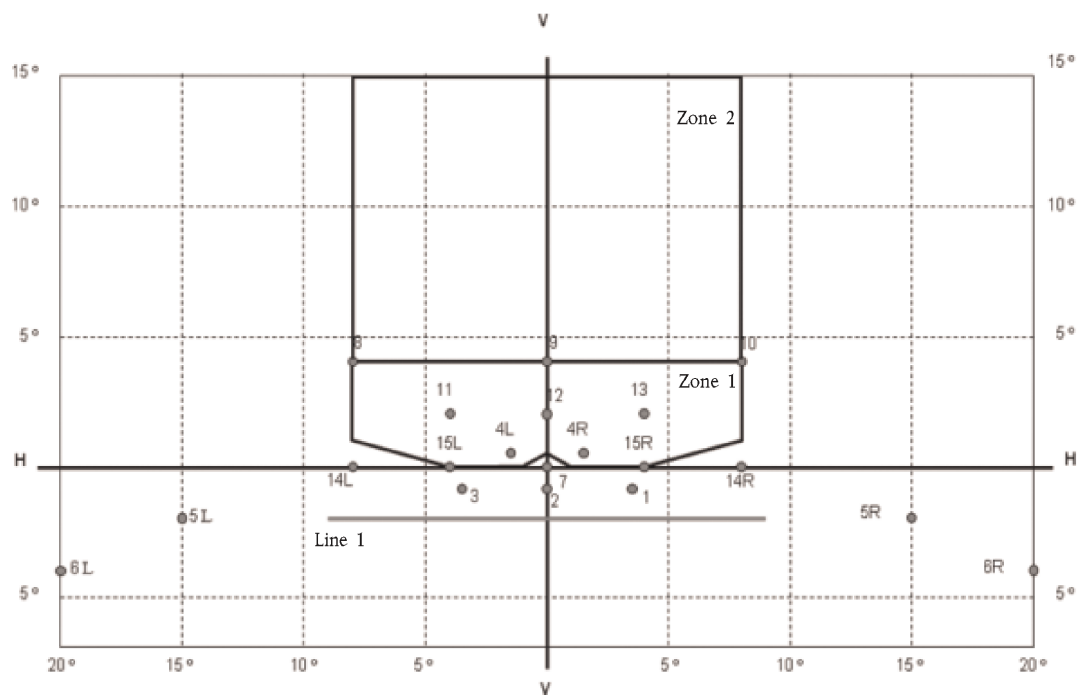


Figure E

Primary driving beam — position of test points

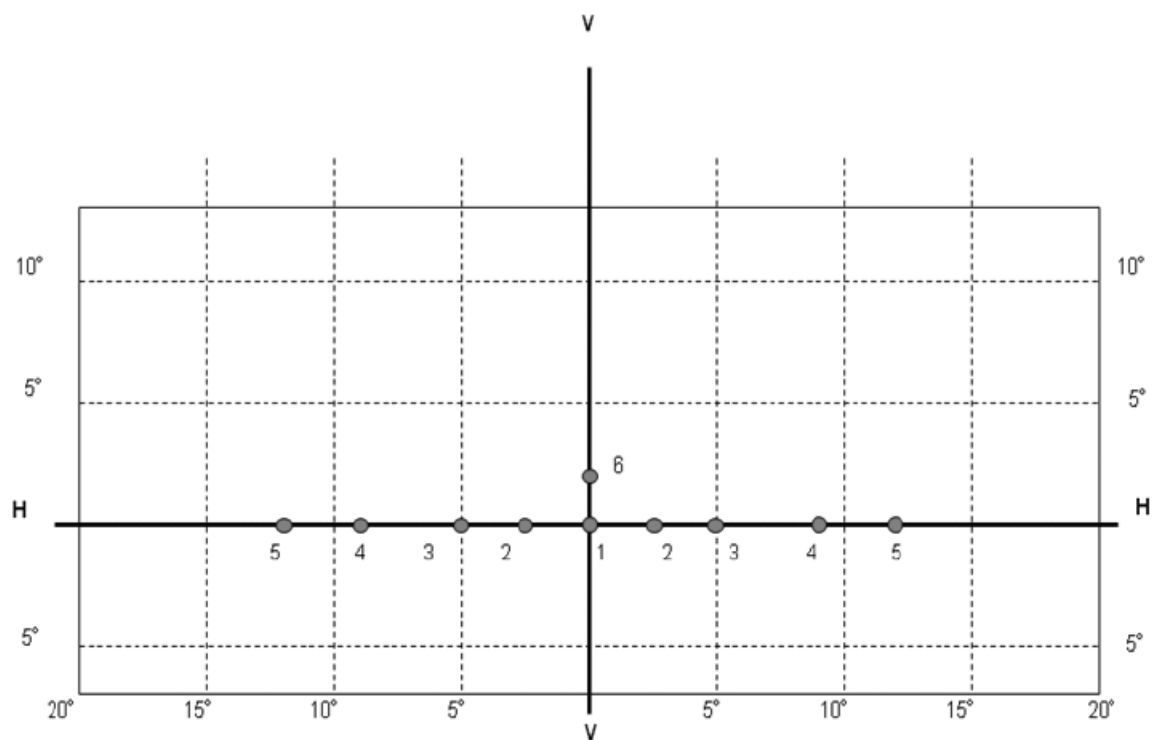
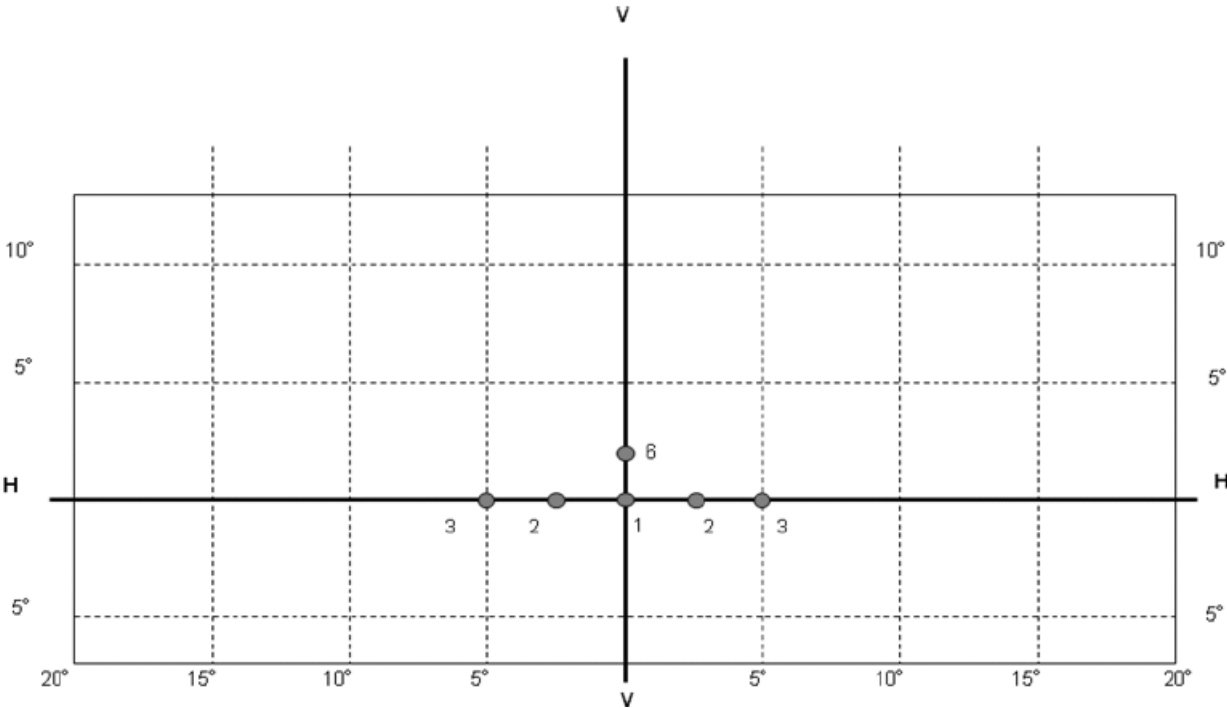


Figure F
Secondary driving beam — position of test points



ANNEX 4

TESTS FOR STABILITY OF PHOTOMETRIC PERFORMANCE OF HEADLAMPS IN OPERATION — TESTS ON COMPLETE CLASSES B, C, D AND E HEADLAMPS

Once the photometric values have been measured according to the prescriptions of this Regulation, in the point for I_{max} for driving beam and in points 0,50 U/1,5 L and 0,50 U/1,5 R, 50 R, 50 L for Class B passing beam and in points 0,86 D-3,5 R, 0,86 D-3,5 L, 0,50 U-1,5 L and 0,50 U-1,5 R for Classes C, D and E passing beam a complete headlamp sample shall be tested for stability of photometric performance in operation. 'Complete headlamp' shall be understood to mean the complete lamp itself, including those surrounding body parts, filament lamps, gas discharge light sources or LED module(s) which could influence its thermal dissipation.

The tests shall be carried out:

- (a) In a dry and still atmosphere at an ambient temperature of $23\text{ °C} \pm 5\text{ °C}$, the test sample being mounted on a base representing the correct installation on the vehicle;
- (b) In case of replaceable light sources: using mass production filament light sources, which have been aged for at least one hour, or mass production gas-discharge light sources, which have been aged for at least 15 hours or mass production LED modules which have been aged for at least 48 hours and cooled down to ambient temperature before starting the tests as specified in this Regulation. The LED modules supplied by the applicant shall be used.

The measuring equipment shall be equivalent to that used during headlamp type approval tests.

The test sample shall be operated without being dismounted from or readjusted in relation to its test fixture. The light source used shall be a light source of the category specified for that headlamp.

1. TEST FOR STABILITY OF PHOTOMETRIC PERFORMANCE

1.1. Clean headlamp

The headlamp shall be operated for 12 hours as described in paragraph 1.1.1 and checked as prescribed in paragraph 1.1.2.

1.1.1. Test procedure ⁽¹⁾

The headlamp shall be operated for a period according to the specified time, so that:

- 1.1.1.1. (a) In the case where only one lighting function (driving or passing beam or front fog lamp) is to be approved, the corresponding light source is lit for the prescribed time ⁽²⁾,
- (b) In the case of a headlamp with a passing beam and one or more driving beams or in case of a headlamp with a passing beam and a front fog lamp:
 - (i) The headlamp shall be subjected to the following cycle until the time specified is reached:
 - (a) 15 minutes, passing-beam lit;
 - (b) 5 minutes, all functions lit.

⁽¹⁾ For the test schedule see Annex 8 to this Regulation.

⁽²⁾ When the tested headlamp includes signalling lamps, the latter shall be lit for the duration of the test. In the case of a direction indicator lamp, it shall be lit in flashing mode with an on/off time of approximately one to one.

- (ii) If the applicant declares that the headlamp is to be used with only the passing beam lit or only the driving beam(s) lit ⁽³⁾ at a time, the test shall be carried out in accordance with this condition, activating ⁽²⁾ successively the passing beam half of the time and the driving beam(s) (simultaneously) for half of the time specified in paragraph 1.1 above.
- (c) In the case of a headlamp with a front fog lamp and one or more driving beams:
 - (i) The headlamp shall be subjected to the following cycle until the time specified is reached:
 - (a) 15 minutes, front fog lamp lit;
 - (b) 5 minutes, all functions lit.
 - (ii) If the applicant declares that the headlamp is to be used with only the front fog lamp lit or only the driving beam(s) lit ⁽³⁾ at a time, the test shall be carried out in accordance with this condition, activating ⁽²⁾ successively the front fog lamp half of the time and the driving beam(s) (simultaneously) for half the time specified in paragraph 1.1 above.
- (d) In the case of headlamp with a passing beam, one or more driving beams and a front fog lamp:
 - (i) The headlamp shall be subjected to the following cycle until the time specified is reached:
 - (a) 15 minutes, passing-beam lit;
 - (b) 5 minutes, all functions lit.
 - (ii) If the applicant declares that the headlamp is to be used with only the passing beam lit or only the driving beam(s) ⁽³⁾ lit at a time, the test shall be carried out in accordance with this condition, activating ⁽²⁾ successively the passing beam half of the time and the driving beam(s) for half the time specified in paragraph 1.1 above, while the front fog lamp is subjected to a cycle of 15 minutes off and 5 minutes lit for half of the time and during the operation of the driving beam;
 - (iii) If the applicant declares that the headlamp is to be used with only the passing beam lit or only the front fog lamp ⁽³⁾ lit at a time, the test shall be carried out in accordance with this condition, activating ⁽²⁾ successively the passing beam half of the time and the front fog lamp for half of the time specified in paragraph 1.1 above, while the driving beam(s) is(are) subjected to a cycle of 15 minutes off and 5 minutes lit for half of the time and during the operation of the passing beam;
 - (iv) If the applicant declares that the headlamp is to be used with only the passing beam lit or only the driving beam(s) ⁽³⁾ lit or only the front fog lamp ⁽³⁾ lit at a time, the test shall be carried out in accordance with this condition, activating ⁽²⁾ successively the passing beam one third of the time, the driving beam(s) one third of the time and the front fog lamp for one third of the time specified in paragraph 1.1 above.
- (e) In the case of a headlamp having additional light source(s) used to produce bend lighting, except for additional lighting unit(s), it (they) shall be switched on for one minute, and switched off for nine minutes during the activation of the principal passing beam.

⁽³⁾ Should two or more lamp light source be simultaneously lit when headlamp flashing is used, this shall not be considered as being normal use of the light source simultaneously.

If the headlamp has several additional light sources used to produce bend lighting, the test shall be carried out with the combination of light source(s) that represents the most severe operating condition.

1.1.1.2. Test voltage

The voltage shall be applied to the terminals of the test sample as follows:

- (a) In case of replaceable filament light source(s) operated directly under vehicle voltage system conditions: the test shall be performed at 6,3 V, 13,2 V or 28,0 V as applicable except if the applicant specifies that the test sample may be used at a different voltage. In this case, the test shall be carried out with the filament light source operated at the highest voltage that can be used.
- (b) In case of replaceable gas discharge light source(s): The test voltage for the electronic light source control-gear or the light source in case the ballast is integrated with the light source, is $13,2 \pm 0,1$ V for 12 V vehicle voltage systems, or otherwise specified in the application for approval.
- (c) In the case of non-replaceable light sources operated directly under vehicle voltage system conditions: all measurements on lighting units equipped with non-replaceable light sources (filament light sources and/or others) shall be made at 6,3 V, 13,2 V or 28,0 V or at other voltages according to the vehicle voltage system as specified by the applicant respectively.
- (d) In the case of light sources, replaceable or non-replaceable, being operated independently from vehicle supply voltage and fully controlled by the system, or, in the case of light sources supplied by a supply and operating device, the test voltages as specified above shall be applied to the input terminals of that device. The test laboratory may require from the manufacturer the supply and operating device or a special power supply needed to supply the light source(s).
- (e) LED module(s) shall be measured at 6,75 V, 13,2 V or 28,0 V respectively, if not otherwise specified within this Regulation. LED module(s) operated by an electronic light source control gear, shall be measured as specified by the applicant.
- (f) Where signalling lamps are grouped, combined or reciprocally incorporated into the test sample and operating at voltages other than the nominal rated voltages of 6 V, 12 V or 24 V respectively, the voltage shall be adjusted as declared by the manufacturer for the correct photometric functioning of that lamp.

1.1.2. Test results

1.1.2.1. Visual inspection

Once the headlamp has been stabilized to the ambient temperature, the headlamp lens and the external lens, if any, shall be cleaned with a clean, damp cotton cloth. It shall then be inspected visually; no distortion, deformation, cracking or change in colour of either the headlamp lens or the external lens, if any, shall be noticeable.

1.1.2.2. Photometric test

To comply with the requirements of this Regulation, the photometric values shall be verified in the following points:

For Class B headlamp:

Passing beam: 50 R — 50 L — 0,50 U/1,5 L and 0,50 U/1,5 R.

Driving beam: Point of $I_{\max}$

For Classes C, D and E headlamp:

Passing beam: 0,86 D/3,5 R — 0,86 D/3,5 L — 0,50 U/1,5 L and 1,5 R.

Driving beam: Point of $I_{\max}$

Another aiming may be carried out to allow for any deformation of the headlamp base due to heat (the change of the position of the 'cut-off' line is covered in paragraph 2 of this Annex).

Except for points 0,50 U/1,5 L and 0,50 U/1,5 R, a 10 per cent discrepancy between the photometric characteristics and the values measured prior to the test is permissible including the tolerances of the photometric procedure. The value measured at points 0,50 U/1,5 L and 0,50 U/1,5 R shall not exceed the photometric value measured prior to the test by more than 255 cd.

1.2. Dirty headlamp

After being tested as specified in paragraph 1.1 above, the headlamp shall be operated for one hour as described in paragraph 1.1.1, after being prepared as prescribed in paragraph 1.2.1, and checked as prescribed in paragraph 1.1.2.

1.2.1. Preparations of the headlamp

1.2.1.1. Test mixture

1.2.1.1.1. For headlamp with the outside lens in glass:

The mixture of water and a polluting agent to be applied to the headlamp shall be composed of:

- (a) 9 parts by weight of silica sand with a particle size of 0-100 μm ,
- (b) 1 part by weight of vegetal carbon dust (beechwood) with a particle size of 0-100 μm ,
- (c) 0,2 parts by weight of NaCMC ⁽⁴⁾, and
- (d) An appropriate quantity of distilled water, with a conductivity of ≤ 1 mS/m.

The mixture must not be more than 14 days old.

1.2.1.1.2. For headlamp with outside lens in plastic material:

The mixture of water and polluting agent to be applied to the headlamp shall be composed of:

- (a) 9 parts by weight of silica sand with a particle size of 0-100 μm ,
- (b) 1 part by weight of vegetal carbon dust (beechwood) with a particle size of 0-100 μm ,
- (c) 0,2 part by weight of NaCMC ⁽⁴⁾,
- (d) 13 parts by weight of distilled water with a conductivity of ≤ 1 mS/m, and

⁽⁴⁾ NaCMC represents the sodium salt of carboxymethylcellulose, customarily referred to as CMC. The NaCMC used in the dirt mixture shall have a degree of substitution (DS) of 0,6-0,7 and a viscosity of 0,2-0,3 Pa · s for a 2 per cent solution at 20 °C.

(e) 2 ± 1 parts by weight of surface-actant ⁽⁵⁾.

The mixture must not be more than 14 days old.

1.2.1.2. Application of the test mixture to the headlamp

The test mixture shall be uniformly applied to the entire light-emitting surface of the headlamp and then left to dry.

This procedure shall be repeated until the illumination value has dropped to 15-20 per cent of the values measured for each of the following points under the conditions described in this Annex:

For Class B headlamp:

Passing beam/driving beam and driving beam only: Point of $E_{\max}$

Passing beam only: B 50 and 50 V

For Classes C, D and E headlamp:

Passing beam/driving beam and driving beam only: Point of $E_{\max}$

Passing beam only: 0,50 U/1,5 L and 1,5 R and 0,86 D/V

2. TEST FOR CHANGE IN VERTICAL POSITION OF THE 'CUT-OFF' LINE UNDER THE INFLUENCE OF HEAT

This test consists of verifying that the vertical drift of the 'cut-off' line under the influence of heat does not exceed a specified value for an operating headlamp producing a passing beam.

The headlamp tested in accordance with paragraph 1, shall be subjected to the test described in paragraph 2.1, without being removed from or readjusted in relation to its test fixture.

2.1. Test

The test shall be carried out in a dry and still atmosphere at an ambient temperature of $23\text{ °C} \pm 5\text{ °C}$.

Using a mass production filament lamp(s) which has been aged for at least one hour or a mass production gas-discharge light source which has been aged for at least 15 hours or the LED module(s) as submitted with the headlamps, which has (have) been aged for at least 48 hours, the headlamp shall be operated on passing beam without being dismounted from or readjusted in relation to its test fixture. (For the purpose of this test, the voltage shall be adjusted as specified in paragraph 1.1.1.2). The position of the 'cut-off' line in its horizontal part (between the vertical lines passing through point 50 L and 50 R for Class B headlamp, 3,5 L and 3,5 R for Classes C, D and E headlamp) shall be verified 3 minutes (r_3) and 60 minutes (r_{60}) respectively after operation.

The measurement of the variation in the 'cut-off' line position as described above shall be carried out by any method giving acceptable accuracy and reproducible results.

2.2. Test results

- 2.2.1. The result in milliradians (mrad) shall be considered as acceptable for a headlamp producing a passing beam, only when the absolute value $\Delta r_1 = |r_3 - r_{60}|$ recorded on the headlamp is not more than 1,0 mrad ($\Delta r_1 \leq 1,0$ mrad).

⁽⁵⁾ The tolerance on quantity is due to the necessity of obtaining a dirt that correctly spreads out on all the plastic lens.

- 2.2.2. However, if this value is more than 1,0 mrad but not more than 1,5 mrad ($1,0 \text{ mrad} < \Delta r_I \leq 1,5 \text{ mrad}$) a second headlamp shall be tested as described in paragraph 2.1 after being subjected three consecutive times to the cycle as described below, in order to stabilize the position of mechanical parts of the headlamp on a base representative of the correct installation on the vehicle:

Operation of the passing beam for one hour, (the voltage shall be adjusted as specified in paragraph 1.1.1.2),

Period of rest for one hour.

The headlamp type shall be considered as acceptable if the mean value of the absolute values Δr_I measured on the first sample and Δr_{II} measured on the second sample is not more than 1,0 mrad.

ANNEX 5

MINIMUM REQUIREMENTS FOR CONFORMITY OF PRODUCTION CONTROL PROCEDURES**1. GENERAL**

1.1. The conformity requirements shall be considered satisfied from a mechanical and a geometrical standpoint, if the differences do not exceed inevitable manufacturing deviations within the requirements of this Regulation. This condition also applies to colour.

1.2. For Classes A, B, C and D headlamps:

1.2.1. With respect to photometric performances, the conformity of mass-produced headlamps shall not be contested if, when testing photometric performances of any headlamp chosen at random and equipped with standard filament lamp(s) and/or LED module(s), as present in the lamp:

1.2.2. For Class A headlamps, no measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation.

1.2.3. For Classes B, C and D headlamps:

1.2.3.1. No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation. For values in zone 1 for Classes B, C and D headlamps, the maximum unfavourable deviation may be respectively:

255 cd equivalent 20 per cent

380 cd equivalent 30 per cent

1.2.3.2. And if, for the driving beam, a tolerance of + 20 per cent for maximum values and – 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraphs 6.3.3.1 or 6.3.3.2 of this Regulation.

1.2.4. If, in the case of a lamp equipped with a replaceable filament light source according to Regulation No 37, the results of the tests described above do not meet the requirements, tests shall be repeated using another standard filament lamp(s).

1.2.5. If the results of the tests described above do not meet the requirements, the alignment of the headlamp may be changed, provided that the axis of the beam is not displaced laterally by more than 0,5 degree to the right or left and not by more than 0,2 degree up or down.

1.3. For Class E headlamps:

1.3.1. For Class E headlamps measured at 13,2 V $\pm$ 0,1 V, or as otherwise specified, and equipped with:

(a) A removable standard gas-discharge light source according to Regulation No 99. In this case the luminous flux of this gas-discharge light source may differ from the reference luminous flux specified in Regulation No 99 and the illuminances shall be corrected accordingly;

or

(b) A serial production gas-discharge light source and a serial ballast. In this case the luminous flux of this light source may deviate from the nominal luminous flux due to light source and ballast tolerances as specified in Regulation No 99 and accordingly the measured illuminances may be corrected by 20 per cent in the favourable direction;

or

(c) LED modules as present in the lamp.

The conformity of mass-produced headlamps, chosen at random and equipped with a gas discharge lamp and/or LED module(s) present in the headlamp, with respect to photometric performance shall not be contested provided that:

- 1.3.2. No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation. For values in zone 1, the maximum unfavourable deviation may be respectively:

255 cd equivalent 20 per cent

380 cd equivalent 30 per cent.

- 1.3.3. And if, for the driving beam a tolerance of + 20 per cent for maximum values and – 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraphs 6.3.3.1 or 6.3.3.2 of this Regulation.

- 1.3.4. If the results of the tests described above do not meet the requirements, the alignment of the headlamp may be changed, provided that the axis of the beam is not displaced laterally by more than 0,5 degree to the right or left and not by more than 0,2 degree up or down.

- 1.3.5. If the results of the tests described above do not meet the requirements, tests on the headlamp shall be repeated using another standard gas-discharge light source and/or ballast, or LED module and electronic light source control gear, whichever is applicable according to paragraph 1.3.1 above.

- 1.4. With respect to the verification of the change in vertical position of the 'cut-off' line under the influence of heat, the following procedure shall be applied (Classes B, C, D and E headlamps only):

One of the sampled headlamps shall be tested according to the procedure described in paragraph 2.1 of Annex 4 after being subjected three consecutive times to the cycle described in paragraph 2.2.2 of Annex 4.

The headlamp shall be considered as acceptable if Δr does not exceed 1,5 mrad.

If this value exceeds 1,5 mrad but is not more than 2,0 mrad, a second sample shall be subjected to the test after which the mean of the absolute values recorded on both samples shall not exceed 1,5 mrad.

- 1.5. Headlamps with apparent defects are disregarded.

- 1.6. If, however, for a series of samples vertical adjustment cannot be performed repeatedly to the required position within the allowed tolerances, the quality of 'cut-off' shall be tested on one of the headlamps from the series of samples, according to the procedure described in Annex 9, paragraphs 2 and 4.

2. MINIMUM REQUIREMENTS FOR VERIFICATION OF CONFORMITY BY THE MANUFACTURER

For each type of headlamp the holder of the approval mark shall carry out at least the following tests, at appropriate intervals. The tests shall be carried out in accordance with the provision of this Regulation.

If any sampling shows non-conformity with regard to the type of test concerned, further samples shall be taken and tested. The manufacturer shall take steps to ensure the conformity of the production concerned.

2.1. Nature of tests

Tests of conformity in this Regulation shall cover the photometric characteristics and for Classes B, C, D and E headlamps the verification of the change in vertical position of the 'cut-off' line under influence of heat.

2.2. Methods used in tests

2.2.1. Tests shall generally be carried out in accordance with the methods set out in this Regulation.

2.2.2. In any test of conformity carried out by the manufacturer, equivalent methods may be used with the consent of the competent authority responsible for approval tests. The manufacturer is responsible for proving that the applied methods are equivalent to those laid down in this Regulation.

2.2.3. The application of paragraphs 2.2.1 and 2.2.2 requires regular calibration of test apparatus and its correlation with measurement made by a competent authority.

2.2.4. In all cases the reference methods shall be those of this Regulation, particular for the purpose of administrative verification and sampling.

2.3. Nature of sampling

Samples of headlamps shall be selected at random from the production of a uniform batch. A uniform batch means a set of headlamps of the same type, defined according to the production methods of the manufacturer.

The assessment shall in general cover series production from individual factories. However, a manufacturer may group together records concerning the same type from several factories provided these operate under the same quality system and quality management.

2.4. Measured and recorded photometric characteristics

The sampled headlamps shall be subjected to photometric measurements at the points provided for in the Regulation, the reading being limited at the points:

2.4.1. For Class A headlamps: HV, LH, RH, 12,5 L and 12,5 R

2.4.2. For Class B headlamps: $I_{\max}$, HV ⁽¹⁾, in the case of the driving beam, and to the points HV, 0,86 D/3,5 R, 0,86 D/3,5 L, in the case of the passing beam.

2.4.3. For Classes C, D and E headlamps: $I_{\max}$, HV ⁽¹⁾, in the case of the driving beam, and to the points HV, 0,86 D/3,5 R, 0,86 D/3,5 L, in the case of the passing beam.

2.5. Criteria governing acceptability

The manufacturer is responsible for carrying out a statistical study of the test results and for defining, in agreement with the competent authority, criteria governing acceptability of his products in order to meet the specification laid down for verification of conformity of products in paragraph 9.1 of this Regulation.

The criteria governing acceptability shall be such that, with a confidence level of 95 per cent, the minimum probability of passing a spot check in accordance with Annex 7 (first sampling) would be 0,95.

⁽¹⁾ When the driving beam is reciprocally incorporated with the passing beam, HV in the case of the driving beam shall be the same measuring point as in the case of the passing beam.

ANNEX 6

REQUIREMENTS FOR LAMPS INCORPORATING LENSES OF PLASTIC MATERIAL — TESTING OF LENS OR MATERIAL SAMPLES AND OF COMPLETE LAMPS**1. GENERAL SPECIFICATIONS**

- 1.1. The samples supplied pursuant to paragraph 2.2.4 of this Regulation shall satisfy the specifications indicated in paragraphs 2.1 to 2.5 below.
- 1.2. The two samples of complete lamps supplied pursuant to paragraph 2.2.3 of this Regulation and incorporating lenses of plastic material shall, with regard to the lens material, satisfy the specifications indicated in paragraph 2.6 below.
- 1.3. The samples of lenses of plastic material or samples of material shall be subjected, with the reflector to which they are intended to be fitted (where applicable), to approval tests in the chronological order indicated in table A reproduced in Appendix 1 to this Annex.
- 1.4. However, if the lamp manufacturer can prove that the product has already passed the tests prescribed in paragraphs 2.1 to 2.5 below, or the equivalent tests pursuant to another Regulation, those tests need not be repeated; only the tests prescribed in Appendix 1, table B, shall be mandatory.

2. TESTS**2.1. Resistance to temperature changes****2.1.1. Tests**

Three new samples (lenses) shall be subjected to five cycles of temperature and humidity (RH = relative humidity) change in accordance with the following programme:

- (a) 3 hours at $40\text{ °C} \pm 2\text{ °C}$ and 85-95 per cent RH;
- (b) 1 hour at $23\text{ °C} \pm 5\text{ °C}$ and 60-75 per cent RH;
- (c) 15 hours at $-30\text{ °C} \pm 2\text{ °C}$;
- (d) 1 hour at $23\text{ °C} \pm 5\text{ °C}$ and 60-75 per cent RH;
- (e) 3 hours at $80\text{ °C} \pm 2\text{ °C}$;
- (f) 1 hour at $23\text{ °C} \pm 5\text{ °C}$ and 60-75 per cent RH;

Before this test, the samples shall be kept at $23\text{ °C} \pm 5\text{ °C}$ and 60-75 per cent RH for at least four hours.

Note: The periods of one hour at $23\text{ °C} \pm 5\text{ °C}$ shall include the periods of transition from one temperature to another which are needed in order to avoid thermal shock effects.

2.1.2. Photometric measurements**2.1.2.1. Method**

Photometric measurements shall be carried out on the samples before and after the test.

These measurements shall be made using a standard (étalon) lamp, a standard gas-discharge light source or (an) LED module(s) as present in the headlamp, at the following points:

B 50, 50 L and 50 R for Class B headlamp, 0,86 D/3,5 R, 0,86 D/3,5 L, 0,50 U/1,5 L and 1,5 R for Classes C, D and E headlamp for the passing beam or a passing/driving lamp;

$I_{\max}$, for the driving beam of a driving lamp or a passing/driving lamp;

2.1.2.2. Results

The variation between the photometric values measured on each sample before and after the test shall not exceed 10 per cent including the tolerances of the photometric procedure.

2.2. Resistance to atmospheric and chemical agents

2.2.1. Resistance to atmospheric agents

Three new samples (lenses or samples of material) shall be exposed to radiation from a source having a spectral energy distribution similar to that of a black body at a temperature between 5 500 K and 6 000 K. Appropriate filters shall be placed between the source and the samples so as to reduce as far as possible radiations with wave lengths smaller than 295 nm and greater than 2 500 nm. The samples shall be exposed to an energetic illumination of $1\,200\text{ W/m}^2 \pm 200\text{ W/m}^2$ for a period such that the luminous energy that they receive is equal to $4\,500\text{ MJ/m}^2 \pm 200\text{ MJ/m}^2$. Within the enclosure, the temperature measured on the black panel placed on a level with the samples shall be $50\text{ }^\circ\text{C} \pm 5\text{ }^\circ\text{C}$. In order to ensure a regular exposure, the samples shall revolve around the source of radiation at a speed between 1 and 5 min^{-1} .

The samples shall be sprayed with distilled water of conductivity lower than 1 mS/m at a temperature of $23\text{ }^\circ\text{C} \pm 5\text{ }^\circ\text{C}$, in accordance with the following cycle:

Spraying: 5 minutes; drying: 25 minutes.

2.2.2. Resistance to chemical agents

After the test described in paragraph 2.2.1 above and the measurement described in paragraph 2.2.3.1 below have been carried out, the outer face of the said three samples shall be treated as described in paragraph 2.2.2.2 with the mixture defined in paragraph 2.2.2.1 below.

2.2.2.1 Test mixture

The test mixture shall be composed of 61,5 per cent n-heptane, 12,5 per cent toluene, 7,5 per cent ethyl tetrachloride, 12,5 per cent trichloroethylene and 6 per cent xylene (volume per cent).

2.2.2.2. Application of the test mixture

Soak a piece of cotton cloth (as specified in ISO 105) until saturation with the mixture defined in paragraph 2.2.2.1 above and, within 10 seconds, apply it for 10 minutes to the outer face of the sample at a pressure of 50 N/cm^2 , corresponding to an effort of 100 N applied on a test surface of $14 \times 14\text{ mm}$.

During this 10-minute period, the cloth pad shall be soaked again with the mixture so that the composition of the liquid applied is continuously identical with that of the test mixture prescribed.

During the period of application, it is permissible to compensate the pressure applied to the sample in order to prevent it from causing cracks.

2.2.2.3. Cleaning

At the end of the application of the test mixture, the samples shall be dried in the open air and then washed with the solution described in paragraph 2.3 (resistance to detergents) $23\text{ }^\circ\text{C} \pm 5\text{ }^\circ\text{C}$.

Afterwards the samples shall be carefully rinsed with distilled water containing not more than 0,2 per cent impurities at $23\text{ }^\circ\text{C} \pm 5\text{ }^\circ\text{C}$ and then wiped off with a soft cloth.

2.2.3. Results

2.2.3.1. After the test of resistance to atmospheric agents, the outer face of the samples shall be free from cracks, scratches, chipping and deformation, and the mean variation in transmission $\Delta t = \frac{T_2 - T_3}{T_2}$, measured on the three samples according to the procedure described in Appendix 2 to this Annex shall not exceed 0,020 ($\Delta t_m < 0,020$).

2.2.3.2. After the test of resistance to chemical agents, the samples shall not bear any traces of chemical staining likely to cause a variation of flux diffusion, whose mean variation $\Delta t = \frac{T_5 - T_4}{T_2}$, measured on the three samples according to the procedure described in Appendix 2 to this Annex shall not exceed 0,020 ($\Delta d_m \leq 0,020$).

2.3. Resistance to detergents and hydrocarbons

2.3.1. Resistance to detergents

The outer face of three samples (lenses or samples of material) shall be heated to $50\text{ °C} \pm 5\text{ °C}$ and then immersed for five minutes in a mixture maintained at $23\text{ °C} \pm 5\text{ °C}$ and composed of 99 parts distilled water containing not more than 0,02 per cent impurities and one part alkylaryl sulphionate.

At the end of the test, the samples shall be dried at $50\text{ °C} \pm 5\text{ °C}$.

The surface of the samples shall be cleaned with a moist cloth.

2.3.2. Resistance to hydrocarbons

The outer face of these three samples shall then be lightly rubbed for one minute with a cotton cloth soaked in a mixture composed of 70 per cent n-heptane and 30 per cent toluene (volume per cent), and shall then be dried in the open air.

2.3.3. Results

After the above two tests have been performed successively, the mean value of the variation in transmission $\Delta t = \frac{T_2 - T_3}{T_2}$, measured on the three samples according to the procedure described in Appendix 2 to this Annex shall not exceed 0,010 ($\Delta t_m \leq 0,010$).

2.4. Resistance to mechanical deterioration

2.4.1. Mechanical deterioration method

The outer face of the three new samples (lenses) shall be subjected to the uniform mechanical deterioration test by the method described in Appendix 3 to this Annex.

2.4.2. Results

After this test, the variations:

in transmission: $\Delta t = \frac{T_2 - T_3}{T_2}$,

and in diffusion: $\Delta t = \frac{T_5 - T_4}{T_2}$,

shall be measured according to the procedure described in Appendix 2 in the area specified in paragraph 2.2.4.1.1 of this Regulation. The mean value of the three samples shall be such that:

$$\Delta t_m \leq 0,100;$$

$$\Delta d_m \leq 0,050$$

2.5. Test of adherence of coatings, if any

2.5.1. Preparation of the sample

A surface of 20 mm × 20 mm in area of the coating of a lens shall be cut with a razor blade or a needle into a grid of squares approximately 2 mm × 2 mm. The pressure on the blade or needle shall be sufficient to cut at least the coating.

2.5.2. Description of the test

Use an adhesive tape with a force adhesion of 2 N/(cm of width) ± 20 per cent measured under the standardized conditions specified in Appendix 4 to this Annex. This adhesive tape, which shall be at least 25 mm wide, shall be pressed for at least five minutes to the surface prepared as prescribed in paragraph 2.5.1.

Then the end of the adhesive tape shall be loaded in such a way that the force of adhesion to the surface considered is balanced by a force perpendicular to that surface. At this stage, the tape shall be torn off at a constant speed of 1,5 m/s ± 0,2 m/s.

2.5.3. Results

There shall be no appreciable impairment of the gridded area. Impairments at the intersections between squares or at the edges of the cuts shall be permitted, provided that the impaired area does not exceed 15 per cent of the gridded surface.

2.6. Tests of the complete headlamp incorporating a lens of plastic material

2.6.1. Resistance to mechanical deterioration of the lens surface

2.6.1.1. Tests

The lens of lamp sample No 1 shall be subjected to the test described in paragraph 2.4.1 above.

2.6.1.2. Results

After the test, the results of photometric measurements carried out on the headlamp in accordance with this Regulation shall not exceed:

(a) By more than 30 per cent the maximum values prescribed at point HV and shall not be more than 10 per cent below the minimum values prescribed at point 50 L and 50 R for Class B headlamp, 0,86 D/3,5 R, 0,86 D/3,5 L for Class C, D and E headlamp.

(b) By more than 10 per cent below the minimum values prescribed for HV in the case of a headlamp producing driving beam only.

2.6.2. Test of adherence of coatings, if any

The lens of lamp sample No 2 shall be subjected to the test described in paragraph 2.5 above.

2.7. Resistance to light source radiations

The following test shall be done:

Flat samples of each light transmitting plastic component of the headlamp are exposed to the light of the LED module(s) or the gas-discharge light source. The parameters such as angles and distances of these samples shall be the same as in the headlamp. These samples shall have the same colour and surface treatment, if any, as the parts of the headlamp.

After 1 500 hours of continuous operation, the colorimetric specifications of the transmitted light must be met, and the surfaces of the samples shall be free of cracks, scratches, scalings or deformation.

3. VERIFICATION OF THE CONFORMITY OF PRODUCTION
 - 3.1. With regard to the materials used for the manufacture of lenses, the lamps of a series shall be recognized as complying with this Regulation if:
 - 3.1.1. After the test for resistance to chemical agents and the test for resistance to detergents and hydrocarbons, the outer face of the samples exhibits no cracks, chipping or deformation visible to the naked eye (see paragraphs 2.2.2, 2.3.1 and 2.3.2);
 - 3.1.2. After the test described in paragraph 2.6.1.1, the photometric values at the points of measurement considered in paragraph 2.6.1.2 are within the limits prescribed for conformity of production by this Regulation.
 - 3.2. If the test results fail to satisfy the requirements, the tests shall be repeated on another sample of headlamps selected at random.
-

Appendix 1

CHRONOLOGICAL ORDER OF APPROVAL TESTS

A. Tests on plastic materials (lenses or samples of material supplied pursuant to paragraph 2.2.4 of this Regulation).

Samples Tests	Lenses or samples of material										Lenses			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.1. Limited photometry (para. 2.1.2)											x	x	x	
1.1.1. Temperature change (para. 2.1.1)											x	x	x	
1.1.2. Limited photometry (para. 2.1.2)											x	x	x	
1.2.1. Transmission measurement	x	x	x	x	x	x		x	x	x				
1.2.2. Diffusion measurement	x	x	x					x	x	x				
1.3. Atmospheric agents (para. 2.2.1)	x	x	x											
1.3.1. Transmission measurement	x	x	x											
1.4. Chemical agents (para. 2.2.2)	x	x	x											
1.4.1. Diffusion measurement	x	x	x											
1.5. Detergents (para. 2.3.1)				x	x	x								
1.6. Hydrocarbons (para. 2.3.2)				x	x	x								
1.6.1. Transmission measurement				x	x	x								
1.7. Deterioration (para. 2.4.1)								x	x	x				
1.7.1. Transmission measurement								x	x	x				
1.7.2. Diffusion measurement								x	x	x				
1.8. Adherence (para. 2.5)														x
1.9. Resistance to light source radiations (para. 2.7)							x							

B. Tests on complete headlamps (supplied pursuant to paragraph 2.2.3 of this Regulation).

Tests	Complete headlamp	
	Sample No	
	1	2
2.1. Deterioration (para. 2.6.1.1)	x	
2.2. Photometry (para. 2.6.1.2)	x	
2.3. Adherence (para. 2.6.2)		x

Appendix 2

METHOD OF MEASUREMENT OF THE DIFFUSION AND TRANSMISSION OF LIGHT

1. Equipment (see figure)

The beam of a collimator K with a half divergence $\beta/2 = 17,4 \times 10^4$ rd is limited by a diaphragm D τ with an opening of 6 mm against which the sample stand is placed.

A convergent achromatic lens L₂, corrected for spherical aberrations links the diaphragm D τ with the receiver R; the diameter of the lens L₂ shall be such that it does not diaphragm the light diffused by the sample in a cone with a half top angle of $\beta/2 = 14^\circ$.

An annular diaphragm D_D, with angles $\alpha^\circ/2 = 1^\circ$ and $\alpha_{\max}/2 = 12^\circ$ is placed in an image focal plane of the lens L₂.

The non-transparent central part of the diaphragm is necessary in order to eliminate the light arriving directly from the light source. It shall be possible to remove the central part of the diaphragm from the light beam in such a manner that it returns exactly to its original position.

The distance L₂ D τ and the focal length F₂ ⁽¹⁾ of the lens L₂ shall be so chosen that the image of D τ completely covers the receiver R.

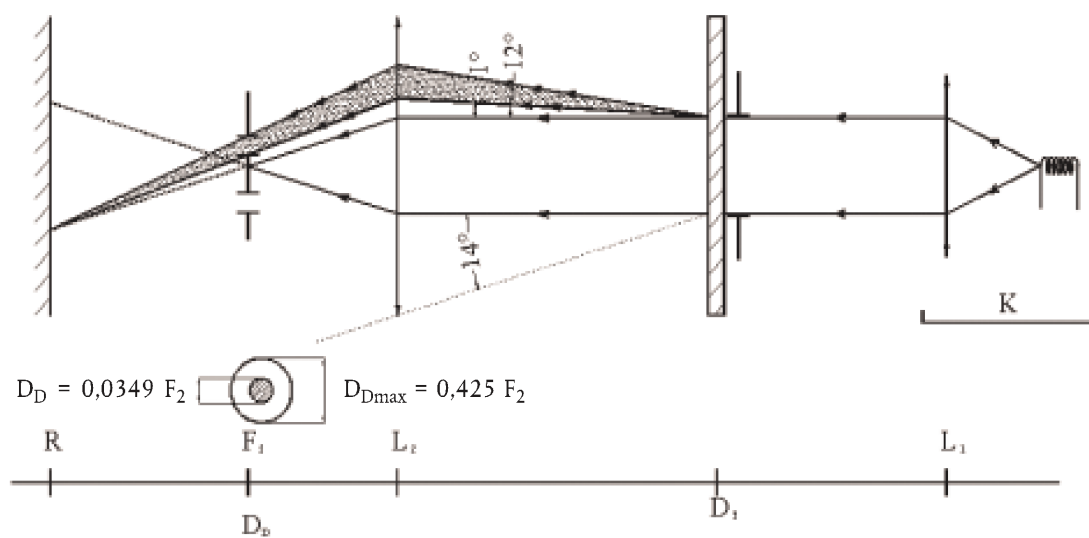
When the initial incident flux is referred to 1 000 units, the absolute precision of each reading shall be better than 1 unit.

2. Measurements

The following readings shall be taken:

Reading	With sample	With central part of DD	Quantity represented
T ₁	no	no	Incident flux in initial reading
T ₂	yes (before test)	no	Flux transmitted by the new material in a field of 24°
T ₃	yes (after test)	no	Flux transmitted by the tested material in a field of 24°
T ₄	yes (before test)	yes	Flux diffused by the new material
T ₅	yes (after test)	yes	Flux diffused by the tested material

⁽¹⁾ For L₂ it is recommended to use a focal distance of about 80 mm.



*Appendix 3***SPRAY TESTING METHOD****1. Test equipment****1.1. Spray gun**

The spray gun used shall be equipped with a nozzle 1,3 mm in diameter allowing a liquid flow rate of $0,24 \pm 0,02$ l/minute at an operating pressure of 6,0 bars – 0/+ 0,5 bar.

Under these operation conditions the fan pattern obtained shall be $170 \text{ mm} \pm 50 \text{ mm}$ in diameter on the surface exposed to deterioration, at a distance of $380 \text{ mm} \pm 10 \text{ mm}$ from the nozzle.

1.2. Test mixture

The test mixture shall be composed of:

Silica sand of hardness 7 on the Mohr scale, with a grain size between 0 and 0,2 mm and an almost normal distribution, with an angular factor of 1,8 to 2;

Water of hardness not exceeding 205 g/m^3 for a mixture comprising 25 g of sand per litre of water.

2. Test

The outer surface of the lamp lenses shall be subjected once or more than once to the action of the sand jet produced as described above. The jet shall be sprayed almost perpendicular to the surface to be tested.

The deterioration shall be checked by means of one or more samples of glass placed as a reference near the lenses to be tested. The mixture shall be sprayed until the variation in the diffusion of light on the sample or samples measured by the method described in Appendix 2, is such that:

$$\Delta d = \frac{T_5 - T_4}{T_2} = 0,0250 \pm 0,0025$$

Several reference samples may be used to check that the whole surface to be tested has deteriorated homogeneously.

*Appendix 4***ADHESIVE TAPE ADHERENCE TEST****1. PURPOSE**

This method allows to determine under standard conditions the linear force of adhesion of an adhesive tape to a glass plate.

2. PRINCIPLE

Measurement of the force necessary to unstick an adhesive tape from a glass plate at an angle of 90°.

3. SPECIFIED ATMOSPHERIC CONDITIONS

The ambient conditions shall be at 23 °C ± 5 °C and 65 ± 15 per cent RH.

4. TEST PIECES

Before the test, the sample roll of adhesive tape shall be conditioned for 24 hours in the specified atmosphere (see paragraph 3 above).

Five test pieces each 400 mm long shall be tested from each roll. These test pieces shall be taken from the roll after the first three turns were discarded.

5. PROCEDURE

The test shall be under the ambient conditions specified in paragraph 3.

Take the five test pieces while unrolling the tape radially at a speed of approximately 300 mm/s, then apply them within 15 seconds in the following manner:

Apply the tape to the glass plate progressively with a slight length-wise rubbing movement of the finger, without excessive pressure, in such a manner as to leave no air bubble between the tape and the glass plate.

Leave the assembly in the specified atmospheric conditions for 10 minutes.

Unstick about 25 mm of the test piece from the plate in a plane perpendicular to the axis of the test piece. Fix the plate and fold back the free end of the tape at 90°. Apply force in such a manner that the separation line between the tape and the plate is perpendicular to this force and perpendicular to the plate.

Pull to unstick at a speed of 300 mm/s ± 30 mm/s and record the force required.

6. RESULTS

The five values obtained shall be arranged in order and the median value taken as a result of the measurement. This value shall be expressed in Newtons per centimetre of width of the tape.

ANNEX 7

MINIMUM REQUIREMENTS FOR SAMPLING BY AN INSPECTOR

1. GENERAL

1.1. The conformity requirements shall be considered satisfied from a mechanical and a geometrical standpoint in accordance with the requirements of this Regulation, if any, if the differences do not exceed inevitable manufacturing deviations. This condition also applies to colour.

1.2. For Classes A, B, C and D headlamps:

1.2.1. With respect to photometric performances, the conformity of mass-produced headlamps shall not be contested if, when testing photometric performances of any headlamp chosen at random and equipped with standard filament lamp(s) and/or LED module(s) as present in the headlamp:

1.2.2. Class A headlamps: no measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation.

1.2.3. Classes B, C and D headlamps:

1.2.3.1. No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation. For values in zone 1 for Classes B, C and D headlamps, the maximum unfavourable deviation may be respectively:

255 cd equivalent 20 per cent

380 cd equivalent 30 per cent

1.2.3.2. And if for the driving beam a tolerance of + 20 per cent for maximum values and – 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraph 6.3.3.1 or 6.3.3.2 of this Regulation.

1.2.4. If the results of the tests described above do not meet the requirements, tests shall be repeated using other standard filament lamp(s).

1.2.5. If the results of the tests described above do not meet the requirements, the alignment of the headlamp may be changed, provided that the axis of the beam is not displaced laterally by more than 0,5 degree to the right or left and not by more than 0,2 degree up or down.

1.3. For Class E headlamps

1.3.1. For Class E headlamps measured at 13,2 V $\pm$ 0,1 V, or as otherwise specified, and equipped with:

(a) A removable standard gas-discharge light source according to Regulation No 99. In this case the luminous flux of this gas-discharge light source may differ from the reference luminous flux specified in Regulation No 99 and the illuminances shall be corrected accordingly;

or

(b) A serial production gas-discharge light source and a serial ballast. In this case the luminous flux of this light source may deviate from the nominal luminous flux due to light source and ballast tolerances as specified in Regulation No 99 and accordingly the measured illuminances may be corrected by 20 per cent in the favourable direction;

or

(c) LED modules as present in the lamp;

The conformity of mass-produced headlamps, chosen at random and equipped with a Gas Discharge lamp and/or LED module(s) present in the headlamp, with respect to photometric performance shall not be contested provided that;

- 1.3.2. No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation. For values in zone 1, the maximum unfavourable deviation may be respectively:

255 cd equivalent 20 per cent

380 cd equivalent 30 per cent.

- 1.3.3. And if, for the driving beam a tolerance of + 20 per cent for maximum values and – 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraph 6.3.3.1 or 6.3.3.2 of this Regulation.

- 1.3.4. If the results of the tests described above do not meet the requirements, the alignment of the headlamp may be changed, provided that the axis of the beam is not displaced laterally by more than 0,5 degrees to the right or left and not by more than 0,2 degrees up or down.

- 1.3.5. If the results of the tests described above do not meet the requirements, tests on the headlamp shall be repeated using another standard gas-discharge light source, a gas-discharge light source and/or ballast, or (an) LED module(s) and electronic light source control gear(s), whatever is applicable according to paragraph 1.3.1 above.

- 1.4. Headlamps with apparent defects are disregarded.

- 1.5. If, however, for a series of samples vertical adjustment cannot be performed repeatedly to the required position within the allowed tolerances, the quality of 'cut-off' shall be tested on one of the headlamps from the series of samples, according to the procedure described in Annex 9, paragraphs 2 and 4.

2. FIRST SAMPLING

In the first sampling four headlamps are selected at random. The first sample of two is marked A, the second sample of two is marked B.

- 2.1. The conformity is not contested

- 2.1.1. Following the sampling procedure shown in Figure 1 of this Annex the conformity of mass-produced headlamps shall not be contested if the deviations of the measured values of the headlamps in the unfavourable directions are:

2.1.1.1. Sample A

A1:	one headlamp		0 per cent
	one headlamp	not more than	20 per cent
A2:	both headlamps	more than	0 per cent
	but	not more than	20 per cent
	Go to sample B		

2.1.1.2. Sample B

B1:	both headlamps	0 per cent
-----	----------------	------------

2.2. The conformity is contested

2.2.1. Following the sampling procedure shown in Figure 1 of this Annex the conformity of mass-produced headlamps shall be contested and the manufacturer requested to make his production meet the requirements (alignment) if the deviations of the measured values of the headlamps are:

2.2.1.1. Sample A

A3:	one headlamp	not more than	20 per cent
	one headlamp	more than	20 per cent
	but	not more than	30 per cent

2.2.1.2. Sample B

B2:	in the case of A2		
	one headlamp	more than	0 per cent
	but	not more than	20 per cent
	one headlamp	not more than	20 per cent
B3:	in the case of A2		
	one headlamp		0 per cent
	one headlamp	more than	20 per cent
	but	not more than	30 per cent

2.3. Approval withdrawn

Conformity shall be contested and paragraph 11 applied if, following the sampling procedure shown in Figure 1 of this Annex, the deviations of the measured values of the headlamps are:

2.3.1. Sample A

A4:	one headlamp	not more than	20 per cent
	one headlamp	more than	30 per cent
A5:	both headlamps	more than	20 per cent

2.3.2. Sample B

B4:	in the case of A2		
	one headlamp	more than	0 per cent
	but	not more than	20 per cent
	one headlamp	more than	20 per cent
B5:	in the case of A2		
	both headlamps	more than	20 per cent
B6:	in the case of A2		
	one headlamp		0 per cent
	one headlamp	more than	30 per cent

3. REPEATED SAMPLING

In the case of A3, B2, B3 a repeated sampling, third sample C of two headlamps, selected from stock manufactured after alignment, is necessary within two months' time after the notification.

3.1. The conformity is not contested

3.1.1. Following the sampling procedure shown in Figure 1 of this Annex the conformity of mass-produced headlamps shall not be contested if the deviations of the measured values of the headlamps are:

3.1.1.1. Sample C

C1:	one headlamp		0 per cent
	one headlamp	not more than	20 per cent
C2:	both headlamps	more than	0 per cent
	but	not more than	20 per cent
	Go to sample D		

3.1.1.2. Sample D

D1:	in the case of C2		
	both headlamps		0 per cent

3.2. The conformity is contested

3.2.1. Following the sampling procedure shown in Figure 1 of this Annex the conformity of mass-produced headlamps shall be contested and the manufacturer requested to make his production meet the requirements (alignment) if the deviations of the measured values of the headlamps are:

3.2.1.1. Sample D

D2:	in the case of C2		
	one headlamp	more than	0 per cent
	but	not more than	20 per cent
	one headlamp	not more than	20 per cent

3.3. Approval withdrawn

Conformity shall be contested and paragraph 11 applied if, following the sampling procedure shown in Figure 1 of this Annex, the deviations of the measured values of the headlamps are:

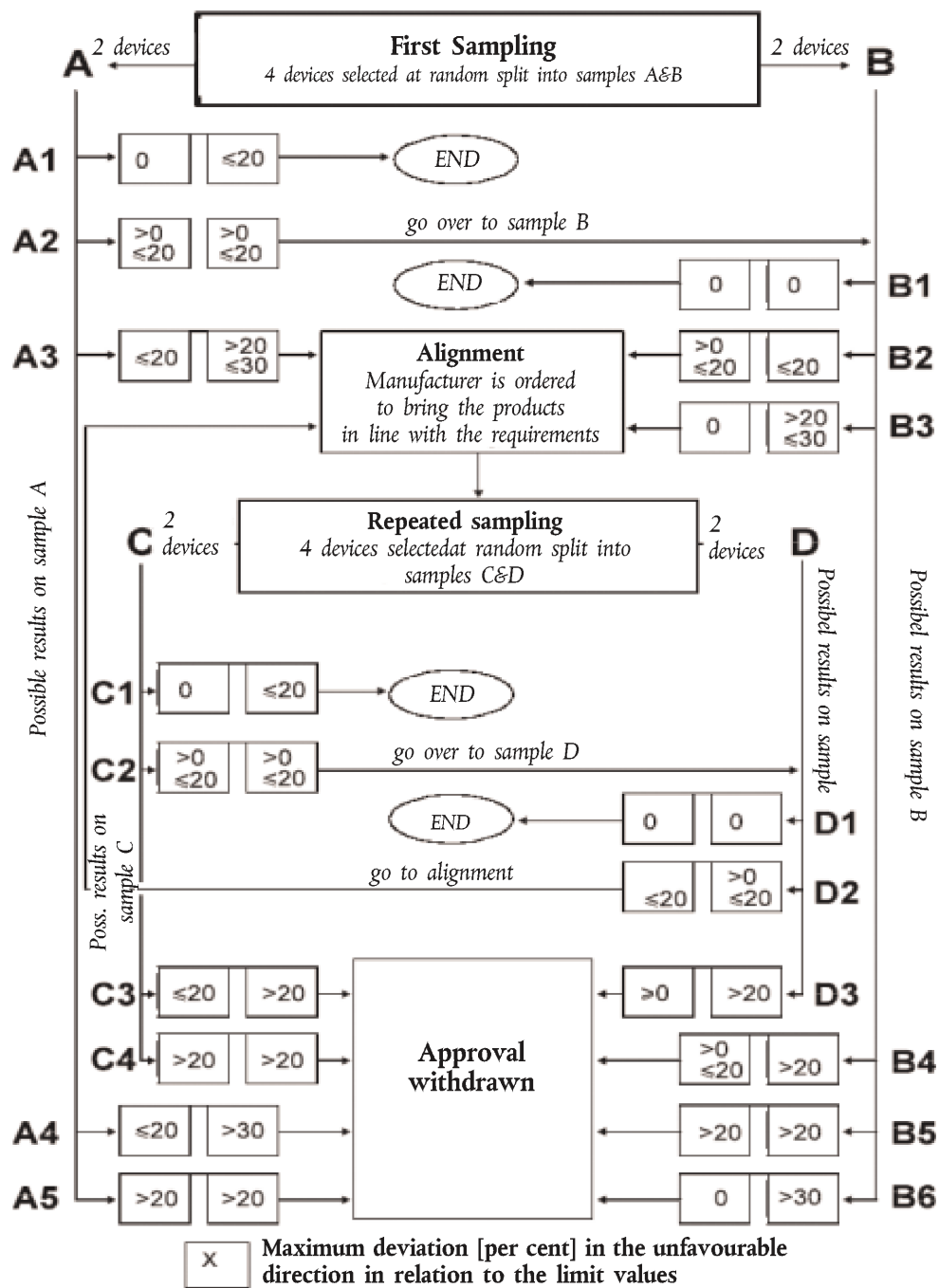
3.3.1. Sample C

C3:	one headlamp	not more than	20 per cent
	one headlamp	more than	20 per cent
C4:	both headlamps	more than	20 per cent

3.3.2. Sample D

D3:	in the case of C2		
	one headlamp	0 or more than	0 per cent
	one headlamp	more than	20 per cent

Figure 1



ANNEX 8

OVERVIEW OF OPERATIONAL PERIODS CONCERNING TEST FOR STABILITY OF PHOTOMETRIC PERFORMANCE

Abbreviations:

P: passing beam lamp

D: driving beam lamp ($D_1 + D_2$ means two driving beams)

F: front fog lamp

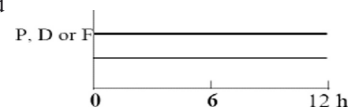
————— : means a cycle of 15 minutes off and 5 minutes lit.

————— : means a cycle of 9 minutes off and 1 minutes lit.

All following grouped headlamps and front fog lamps together with the added class B marking symbols are given as examples and are not exhaustive.

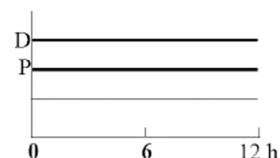
1. P or D or F (C-BS or R-BS or B)

Additional light source(s) used to produce bend lighting



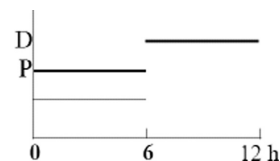
2. P+D (CR-BS) or P+D
- ₁
- +D
- ₂
- (CR-BS R-BS)

Additional light source(s) used to produce bend lighting



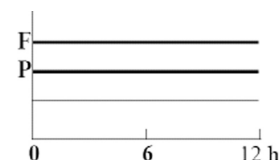
3. P+D (C/R-BS) or P+D
- ₁
- +D
- ₂
- (C/R-BS R-BS)

Additional light source(s) used to produce bend lighting



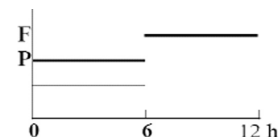
4. P+F (C-BS B)

Additional light source(s) used to produce bend lighting



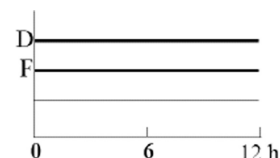
5. P+F (C-BS B/) or C-BS/B

Additional light source(s) used to produce bend lighting



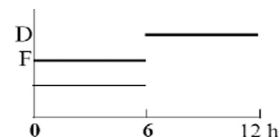
6. D+F (R-BS B) or D
- ₁
- +D
- ₂
- +F (R-BS R-BS B)

Additional light source(s) used to produce bend lighting



7. D+F (R-BS B/) or D
- ₁
- +D
- ₂
- +F (R-BS R-BS B/)

Additional light source(s) used to produce bend lighting



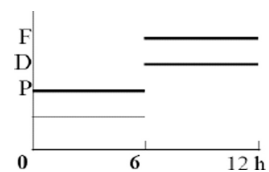
8. P+D+F (CR-BS B) or P+D₁+D₂+F
(CR-BS R-BS B)

Additional light source(s) used
to produce bend lighting



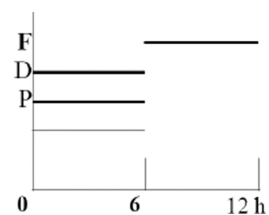
9. P+D+F (C/R-BS B) or P+D₁+D₂+F
(C/R-BS R-BS B)

Additional light source(s) used
to produce bend lighting



10. P+D+F (CR-BS B/) or P+D₁+D₂+F
(CR-BS R-BS B/)

Additional light source(s) used
to produce bend lighting



11. P+D+F (C/R-BS B/) or P+D₁+D₂+F
(C/R-BS R-BS/B)

Additional light source(s) used
to produce bend lighting



ANNEX 9

**DEFINITION AND SHARPNESS OF THE 'CUT-OFF' LINE FOR SYMMETRICAL PASSING BEAM HEADLAMPS AND AIMING
PROCEDURE BY MEANS OF THIS 'CUT-OFF' LINE**

1. GENERAL

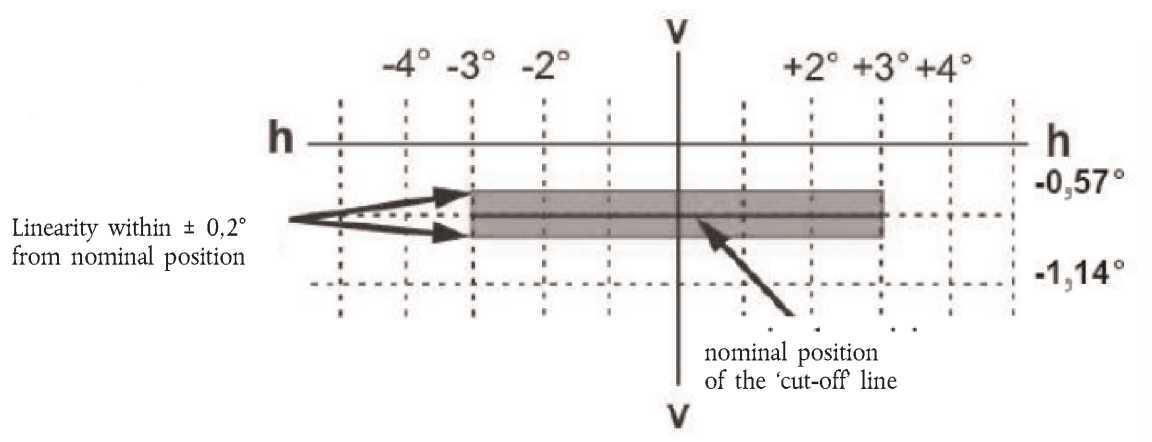
- 1.1. The luminous intensity distribution of the symmetrical passing-beam headlamps shall incorporate a 'cut-off' line which enables the symmetrical passing-beam headlamp to be adjusted correctly for the photometric measurements and for the aiming on the vehicle. The characteristics of the 'cut-off' line shall comply with the requirements set out in paragraphs 2 to 4 below:

2. SHAPE OF THE 'CUT-OFF' LINE

- 2.1. For visual adjustment of the symmetrical passing-beam headlamp the 'cut-off' line shall provide a horizontal line for vertical adjustment of the symmetrical passing-beam headlamp extending to either side of the V-V line (see Figure 1) as specified in paragraph 6.2.1 of this Regulation.

Figure 1

Shape and position of the 'cut-off' line



3. ADJUSTMENT OF THE SYMMETRICAL PASSING-BEAM HEADLAMP

- 3.1. Horizontal adjustment: the beam with the 'cut-off' line shall be so positioned that the projected beam pattern appears approximately symmetrical to the V-V line.
- 3.2. Vertical adjustment: after horizontal adjustment of the symmetrical passing-beam headlamp according to paragraph 3.1 above, the vertical adjustment shall be performed in such a way that the beam with its 'cut-off' line is moved upwards from the lower position until the 'cut-off' line is situated at nominal vertical position. For nominal vertical adjustment the 'cut-off' line is positioned on the V-V line at 1 per cent below the h-h line.

If the horizontal part is not straight but slightly curved or inclined, the 'cut-off' line shall not exceed the vertical range formed by two horizontal lines which are situated from 3° left to 3° right of the V-V line at $0,2^\circ$ for Class B and $0,3^\circ$ for Classes A, C, D and E headlamps above and below the nominal position of the 'cut-off' (see Figure 1).

- 3.3. When the vertical adjustments of three different individuals differs by more than $0,2^\circ$ for Class B and $0,3^\circ$ for Classes A, C, D and E head lamps, the horizontal part of the 'cut-off' line is assumed not to provide sufficient linearity or sharpness for performing visual adjustment. In this case the quality of 'cut-off' shall be tested instrumentally for compliance with requirements as follows.

4. MEASUREMENT OF THE QUALITY OF 'CUT-OFF'

- 4.1. Measurements shall be performed by vertically scanning through the horizontal part of the 'cut-off' line in angular steps not exceeding $0,05^\circ$:

(a) At either a measurement distance of 10 m and a detector with a diameter of approximately 10 mm;

(b) Or at a measurement distance of 25 m and a detector with a diameter of approximately 30 mm.

The measurement of the 'cut-off' quality shall be considered acceptable if the requirements of the paragraph 4.1.2 of this Annex shall comply with at least one measurement at 10 m or 25 m.

The measuring distance at which the test was determined shall be noted down in paragraph 9, Annex 1 'Communication form' of this Regulation.

The scanning is performed from its lower position upwards through the 'cut-off' line along the vertical lines at -3° to $-1,5^\circ$ and $+1,5^\circ$ to $+3^\circ$ from the V-V line. When so measured, the quality of the 'cut-off' line shall meet the following requirements:

4.1.1. Not more than one 'cut-off' line shall be visible ⁽¹⁾.

4.1.2. Sharpness of 'cut-off': if scanned vertically through the horizontal part of the 'cut-off' line along the $\pm 2,5$ lines, the maximum value measured for:

$$G = (\log E_V - \log E_{(V + 0,1^\circ)})$$

is called the sharpness factor G of the 'cut-off' line. The value of G shall not be less than 0,13 for Class B and 0,08 for Classes A, C, D and E.

4.1.3. Linearity: the part of the 'cut-off' line which serves for vertical adjustment shall be horizontal from 3°L to 3°R of the V-V line. This requirement is deemed to be met if the vertical positions of the inflection points according to paragraph 3.2 above at 3° left and right of the V-V line do not differ by more than $0,2^\circ$ for Class B and $0,3^\circ$ for Classes A, C, D and E headlamps from the nominal position at the V-V line.

5. INSTRUMENTAL VERTICAL ADJUSTMENT

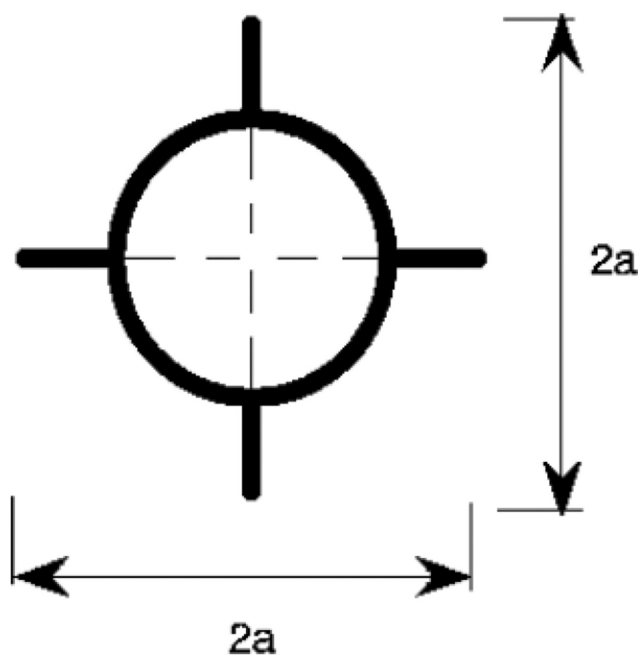
If the 'cut-off' line complies with the above quality requirements, the vertical beam adjustment can be performed instrumentally. For this purpose the inflection point where $d^2 (\log E)/dv^2 = 0$ is positioned on the V-V line in its nominal position below the h-h-line. The movement for measuring and adjusting the 'cut-off' line shall be upwards from below the nominal position.

⁽¹⁾ This paragraph will be amended, if an objective test method is available.

ANNEX 10

CENTRE OF REFERENCE

Diameter = a



$a = 2 \text{ mm min.}$

This optional mark of the centre of reference shall be positioned on the lens at its intersection with the reference axis of the passing beam, and also on the lenses of the driving beams when they are neither grouped nor combined nor reciprocally incorporated with a passing beam.

The above drawing represents the mark of the centre of reference as projected on a plane substantially tangent to the lens about the centre of the circle. The lines constituting this mark may either be solid or dotted.

—

ANNEX 11

VOLTAGE MARKINGS



This marking must be placed on the main body of each headlamp containing only gas discharge light sources and ballast, and on each external part of the ballast.

The ballast(s) is(are) designed for a ** Volts network system.

This marking must be placed on the main body of each headlamp containing at least one gas discharge light source and ballast.

The ballast(s) is(are) designed for a ** Volts network system.

None of the filament lamps which the headlamp contains is designed for a 24 Volts network system.

ANNEX 12

REQUIREMENTS FOR LED MODULES AND HEADLAMPS INCLUDING LED MODULES**1. GENERAL SPECIFICATIONS**

- 1.1. Each LED module sample submitted shall conform to the relevant specifications of this Regulation when tested with the supplied electronic light source control-gear(s), if any.
- 1.2. LED module(s) shall be so designed as to be and to remain in good working order when in normal use. They shall moreover exhibit no fault in design or manufacture. A LED module shall be considered to have failed if any one of its LEDs has failed.
- 1.3. LED module(s) shall be tamperproof.
- 1.4. The design of removable LED module(s) shall be such that:
 - 1.4.1. When the LED module is removed and replaced by another module provided by the applicant and bearing the same light source module identification code, the photometric specifications of the headlamp shall be met;
 - 1.4.2. LED modules with different light source module identification codes within the same lamp housing, shall not be interchangeable.

2. MANUFACTURE

- 2.1. The LED(s) on the LED module shall be equipped with suitable fixation elements.
- 2.2. The fixation elements shall be strong and firmly secured to the LED(s) and the LED module.

3. TEST CONDITIONS**3.1. Application**

- 3.1.1. All samples shall be tested as specified in paragraph 4 below.
- 3.1.2. The kind of light sources on a LED MODULE shall be light-emitting diodes (LED) as defined in Regulation No 48 paragraph 2.7.1 in particular with regard to the element of visible radiation. Other kinds of light sources are not permitted.

3.2. Operating conditions**3.2.1. LED module operating conditions**

All samples shall be tested under the conditions as specified in paragraph 6.1.3 of this Regulation. If not specified differently in this Annex LED modules shall be tested inside the headlamp as submitted by the manufacturer.

3.2.2. Ambient temperature

For the measurement of electrical and photometric characteristics, the headlamp shall be operated in dry and still atmosphere at an ambient temperature of $23\text{ °C} \pm 5\text{ °C}$.

3.3. Ageing

Upon the request of the applicant the LED module shall be operated for 48 h and cooled down to ambient temperature before starting the tests as specified in this Regulation.

4. SPECIFIC SPECIFICATIONS AND TESTS

4.1. Colour rendering

4.1.1. Red content

In addition to measurements as described in paragraph 7 of this Regulation, the minimum red content of the light of a LED module or headlamp incorporating LED module(s) tested at 50 V shall be such that:

$$k_{\text{red}} = \frac{\int_{\lambda=610 \text{ nm}}^{780 \text{ nm}} E_e(\lambda) V(\lambda) d\lambda}{\int_{\lambda=380 \text{ nm}}^{780 \text{ nm}} E_e(\lambda) V(\lambda) d\lambda} \Rightarrow 0,05$$

where:

$E_e(\lambda)$ (unit: W) is the spectral distribution of the irradiance;

$V(\lambda)$ (unit: 1) is the spectral luminous efficiency;

λ (unit: nm) is the wavelength.

This value shall be calculated using intervals of one nanometre.

4.2. UV-radiation

The UV-radiation of a low-UV-type LED module shall be such that:

$$k_{\text{UV}} = \frac{\int_{\lambda=250 \text{ nm}}^{400 \text{ nm}} E_e(\lambda) S(\lambda) d\lambda}{k_m \int_{\lambda=380 \text{ nm}}^{780 \text{ nm}} E_e(\lambda) V(\lambda) d\lambda} \leq 10^{-5} \text{ W/lm}$$

where:

$S(\lambda)$ (unit: 1) is the spectral weighting function;

$k_m = 683 \text{ lm/W}$ is the maximum value of the luminous efficacy of radiation.

(For definitions of the other symbols see paragraph 4.1.1 above).

This value shall be calculated using intervals of one nanometre. The UV-radiation shall be weighted according to the values as indicated in the Table UV below:

Table UV

Values according to 'IRPA/INIRC Guidelines on limits of exposure to ultraviolet radiation'. Wavelengths (in nanometres) chosen are representative; other values should be interpolated.

λ	$S(\lambda)$	λ	$S(\lambda)$	λ	$S(\lambda)$
250	0,430	305	0,060	355	0,00016
255	0,520	310	0,015	360	0,00013
260	0,650	315	0,003	365	0,00011
265	0,810	320	0,001	370	0,00009
270	1,000	325	0,00050	375	0,000077
275	0,960	330	0,00041	380	0,000064
280	0,880	335	0,00034	385	0,000530
285	0,770	340	0,00028	390	0,000044
290	0,640	345	0,00024	395	0,000036
295	0,540	350	0,00020	400	0,000030
300	0,300				

4.3. Temperature stability

4.3.1. Illuminance

- 4.3.1.1. A photometric measurement of the headlamp shall be made after 1 minute of operation for the specific function at the test point specified below. For these measurements, the aim can be approximate but must be maintained for before and after ratio measurements.

Test points to be measured:

Principal passing beam 50 V

(For the measurement of bend lighting, the test point shall be specified by the manufacturer.)

Driving beam H — V

- 4.3.1.2. The lamp shall continue operation until photometric stability has occurred. The moment at which the photometry is stable is defined as the point in time at which the variation of the photometric value is less than 3 per cent within any 15 minute period. After stability has occurred, aim for complete photometry shall be performed in accordance with requirements of specific device. Photometer the lamp at all test points required for the specific device.

- 4.3.1.3. Calculate the ratio between the photometric test point value determined in paragraph 4.3.1.1 and the point value determined in paragraph 4.3.1.2.

- 4.3.1.4. Once stability of photometry has been achieved, apply the ratio calculated above to each of the remainder of the test points to create a new photometric table that describes the complete photometry based on one minute of operation.

- 4.3.1.5. The luminous intensity values measured after one minute and after photometric stability has occurred shall comply with the minimum and maximum requirements.

4.3.2. Colour

The colour of the light emitted measured after one minute and measured after photometric stability has been obtained, as described in paragraph 4.3.1.2 of this Annex, shall both be within the required colour boundaries.

5. The measurement of the objective luminous flux of LED module(s) producing the principal passing beam shall be carried out as follows:

- 5.1. The LED module(s) shall be in the configuration as described in the technical specification as defined in paragraph 2.2.2 of this Regulation. Optical elements (secondary optics) shall be removed by the Technical Service at the request of the applicant by the use of tools. This procedure and the conditions during the measurements as described below shall be described in the test report.

- 5.2. Three LED modules of each type shall be submitted by the applicant with the light source control gear, if applicable, and sufficient instructions.

Suitable thermal management (e.g. heat sink) may be provided, to simulate similar thermal conditions as in the corresponding headlamp application.

Before the test each LED module shall be aged at least for 48 hours under the same conditions as in the corresponding headlamp application.

In the case of use of an integrating sphere, the sphere shall have a minimum diameter of one meter, and at least ten times the maximum dimension of the LED module, whichever is the largest. The flux measurements can also be performed by integration using a goniophotometer. The prescriptions in the CIE — Publication 84 — 1989, regarding the room temperature, positioning, etc., shall be taken into consideration.

The LED module shall be burned in for approximately one hour in the closed sphere or goniophotometer.

The flux shall be measured after stability has occurred, as explained in paragraph 4.3.1.2 of this Annex.

The average of the measurements of the three samples of each type of LED module shall be deemed to be its objective luminous flux.

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