

DRAFT

AUTOMOTIVE INDUSTRY STANDARD

**Performance Requirements for
Side-Marker Lamps
for Motor Vehicles**

(Revision 2)

Date of hosting on Website: 18th November 2021

Last Date for comments: 17th December 2021

INTRODUCTION

0.1 The Government of India felt the need for a permanent agency to expedite the publication of standards and development of test facilities in parallel when the work on the preparation of the standards is going on, as the development of improved safety critical parts can be undertaken only after the publication of the standard and commissioning of test facilities. To this end, the erstwhile Ministry of Surface Transport (MOST) has constituted a permanent Automotive Industry Standards Committee (AISC) vide order No. RT-11028/11/97-MVL dated September 15, 1997. The standards prepared by AISC will be approved by the permanent CMVR Technical Standing Committee (CTSC). After approval, the Automotive Research Association of India, (ARAI), Pune, being the Secretariat of the AIS Committee, has published this standard. For better dissemination of this information ARAI may publish this document on their Web site.

0.2 Accordingly AIS-012 covering performance requirements of lighting and light-signalling devices for motor vehicles having more than three wheels, trailers and semi-trailers has been published in 2004 and implemented thereafter in 2005.

With technological advancement in lighting and light-signalling devices and updation in ECE regulations, AIS-012 was taken up for revision and now is prepared in ten parts. This part covers performance requirements for side-marker lamps for motor vehicles.

0.3 While preparing this standard considerable assistance has been derived from following ECE regulation.

UN R 91 Supplement 17 to the original version of the Regulation – Date of entry into force: 10 February 2018	Uniform provisions concerning the approval of side-marker lamps for motor vehicles and their trailers
--	---

0.4 The following standards contain provisions, which through reference in this text constitute provisions of the standard.

IS 14272	Automotive Vehicles - Types - Terminology
AIS-008 (Rev.2): 2019	Installation Requirements of Lighting and Light-signalling Devices for Motor Vehicle having more than Three Wheels, Trailer and Semi-trailer excluding Agricultural Tractor and Special Purpose Vehicle
AIS-034 (Part 1) (Rev. 2)	Provisions concerning the Approval of Filament Lamps for use in Approved Lamp Units on Power Driven Vehicles and their Trailers
AIS-034 (Part 2) (Rev. 2)	Provisions concerning the Approval of Gas-discharge Light Sources for use in Approved Gas-discharge Lamp units of Power-driven Vehicles
AIS-037	Procedure for Type Approval and Establishing Conformity of Production for Safety Critical Components
AIS-010 (Part 5) (Rev. 2)	Requirements of Chromaticity Co-ordinates of Colour of Light Emitted from Lighting and Light-signalling Devices
IEC 60061,	Lamp Caps and Holders together with Gauges for the Control of Interchangeability and Safety.

AIS 130	Provisions concerning the approval of Light Emitting Diode (LED) light sources for use in approved lamp units on power-driven vehicles and their trailers
IEC 60809	Lamps and light sources for road vehicles - Dimensional, electrical and luminous requirements
UN R 91	Uniform provisions concerning the approval of side-marker lamps for motor vehicles and their trailers

- 0.5 The AISC panel and Automotive Industry Standards Committee (AISC) responsible for preparation of this standard are given in Annex H and Annex J respectively.

**Performance Requirements for Side-Marker Lamps
for Motor Vehicles**

Para. No.	Contents	Page No.
1.	Scope	
2.	Definitions	
3.	Application for approval	
4.	Markings	
5.	Approval	
6.	General specifications	
7.	Intensity of light emitted	
8.	Colour of light emitted	
9.	Test procedure	
10.	Modifications of the side-marker lamp type and extension of approval	
11.	Conformity of production	
12.	Penalties for non-conformity of production	
13.	Reserved Clause	
14.	Reserved Clause	
15.	Transitional provisions	
16.	Establishing Compliance of “E”/“e” approved side-marker lamp to this standard	
17.	Amendments to ECE regulations after the level described in 0.3 of introduction	
List of Annexes		
Annex A	Minimum angles required for light distribution in space	
Annex B	Reserved	
Annex C	Reserved	
Annex D	Photometric measurements	
Annex E	Colour of light emitted	
Annex F	Minimum requirements for conformity of production control procedures	
Annex G	Minimum requirements for sampling by a testing agency	

Performance Requirements for Side-Marker Lamps for Motor Vehicles

1.0 SCOPE

This standard applies to side-marker lamps for vehicles of category M, N, T and A^{1/}.

Note: The permission to use side-marker lamps covered by this standard is governed by requirements specified by the standard for installation of requirements of that category of vehicles.

2.0 DEFINITIONS

For the purpose of this standard,

2.1. The definitions given in AIS-008(Rev.2) and its amendments in force at the time of application for type approval shall apply to this standard.

2.2. **"Side-marker lamp"** means a lamp used to indicate the presence of the vehicle when viewed from the side;

2.3. **"Side-marker lamps of different types"** means lamps which do not differ in such essential respects as:

- (a) the trade name or mark;
 - (i) Lamps bearing the same trade name or mark but produced by different manufacturers shall be considered as being of different types;
 - (ii) Lamps produced by the same manufacturer differing only by the trade name or mark shall be considered as being of the same type.
- (b) the characteristics of the optical system (level of intensity, light distribution angles, category of light source, light source module, etc.).

A change of the colour of the filament lamp or the colour of any filter does not constitute a change of type.

2.4. References made in this standard to standard (étalon) filament lamp(s) and to standard AIS-034(Part 1)(Rev. 1) shall refer to standard AIS-034 (Part1)(Rev. 1) and its amendments in force at the time of application for type approval.

Reference made in this Standard to standard (étalon) LED light source(s) and to AIS 130 shall refer to AIS 130 as amended from time to time in force at the time of application for type approval

^{1/} As defined in [IS 14272](#): Automotive Vehicles - Types - Terminology

3.0 APPLICATION FOR APPROVAL

3.1. The application for approval shall be submitted by the applicant.

At the choice of the applicant, it will specify that the device may be installed on the vehicle with different inclinations of the reference axis in respect to the vehicle reference planes and to the ground or rotate around its reference axis; these different conditions of installation shall be indicated in the communication form. It shall specify:

3.1.1. whether the side-marker lamp is intended to emit amber or red light.

3.2. For each type of side-marker lamp the application shall be accompanied by:

3.2.1. drawings, in triplicate, in sufficient detail to permit identification of the type of lamp and showing geometrically in what position(s) it may be mounted on the vehicle; the axis of observation to be taken as the axis of reference in the tests (horizontal angle $H = 0^\circ$, vertical angle $V = 0^\circ$); the point to be taken as the centre of reference in the said tests; the vertical and horizontal tangents to the illuminating surface and their distances from the centre of reference of the lamp. The drawings shall indicate the space reserved for the approval mark as per AIS-037.

3.2.2. A brief technical description stating, in particular, with the exception of lamps with non-replaceable light sources:

(a) The category or categories of filament lamp(s) prescribed; this filament lamp category shall be one of those listed in AIS-034 (Parts 1)(Rev. 1) and its amendments in force at the time of application for type approval and/or

(b) The category or categories of LED light source(s) prescribed; this LED light source category shall be one of those contained in AIS 130 and as amended from time to time at the time of application for type approval; and/or

(b) The light source module specific identification code.

3.2.3. Two samples; if the application is made for side-marker lamps which are not identical but are symmetrical and suitable for mounting one on the left and one on the right side of the vehicle and/or, alternatively, one towards the front and one towards the rear, the two samples submitted may be identical and be suitable for mounting only on the right or only on the left side of the vehicle and/or, alternatively, only towards the front or only towards the rear.

3.2.4. In the case of a type of lamp differing only by the trade name or mark from a type that has already been approved it shall be sufficient to submit:

- 3.2.4.1. A declaration by the lamp manufacturer that the type submitted is identical (except in the trade name or mark) with and has been produced by the same manufacturer as, the type already approved, the latter being identified by its approval code;
- 3.2.4.2. Two samples bearing the new trade name or mark or equivalent documentation
- 3.2.5. In the case of a non-replaceable filament lamp(s) or light source module(s) equipped with non-replaceable filament lamp(s), the documents according to paragraph 6.5. of this Standard.

4.0 MARKINGS

- 4.1. Side-marker lamps submitted for approval:
- 4.2. Side-marker Lamp Manufacturer's trade mark; this marking shall be clearly legible and indelible;
- 4.3. With the exception of lamps with non-replaceable light sources shall bear a clearly legible and indelible marking indicating:
 - (a) the category or categories of light source(s) prescribed; and/or
 - (b) the light source module specific identification code.
- 4.4. Reserved.
- 4.5. In the case of lamps with non-replaceable light sources or light source module(s), shall bear the marking of the rated voltage or range of voltage.
- 4.6. In the case of lamps with light source module(s), the light source module(s) shall bear:
 - 4.6.1. The trade name or mark of the applicant; this marking shall be clearly legible and indelible;
 - 4.6.2. Reserved
 - 4.6.3. The marking of the rated voltage or range of voltage.
- 4.7. On the prototype for type approval, the markings may be provided by suitable temporary methods and need not necessary be obtained from the tools used for series production.

5.0 APPROVAL

- 5.1. If the two side-marker lamps submitted for approval pursuant to paragraph 3.2.3. above satisfy the provisions of this standard, approval shall be granted.
- 5.2. Type approval number shall be assigned to each type approved.
- 5.3. Reserved.

- 5.4. Every side-marker lamp conforming to a type approved under this Regulation shall bear, in the space referred to in paragraph 4.4. above, and in addition to the markings prescribed in paragraphs 4.2. and 4.3. or 4.4. respectively:
 - 5.4.1. An approval mark consisting of:
 - 5.4.1.1. Reserved.
 - 5.4.1.2. The approval mark as per AIS 037.
 - 5.4.2. The additional symbol "SM1" or "SM2."
 - 5.4.3. Reserved.
 - 5.4.4. On devices with reduced light distribution in conformity to paragraph 2.5. of Annex 4 to this Regulation a vertical arrow starting from a horizontal segment and directed downwards.
- 5.5. The marks and symbols mentioned in paragraphs 5.4.1. to 5.4.2. above shall be indelible and clearly legible even when the device is mounted on the vehicle.
- 5.6. Where grouped, combined or reciprocally incorporated lamps have been found to comply with the requirements of several Standards, a single approval mark may be applied provided that such lamps are not grouped, combined or reciprocally incorporated with a lamp or lamps not satisfying any one of those Standards.
 - 5.6.1. An approval mark may be located anywhere on the grouped, combined or reciprocally incorporated lamps provided that:
 - 5.6.1.1. It is visible after their installation;
 - 5.6.1.2. 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.
- 5.7. The identification symbol for each lamp appropriate to each Standard 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 approval shall be marked:
 - 5.7.1. Either on the appropriate light-emitting surface, or
 - 5.7.2. In a group, in such a way that each lamp may be clearly identified (see three possible models in example 2 shown in Annex 3 of UN R 91).
- 5.8. 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 under which the approval was granted.
- 5.9. An approval number shall be assigned to each type approved.
- 5.10. Annex 3 of UN R 91 gives examples of arrangements of approval marks for a single lamp (example 1) and for an assembly (example 2).

- 5.11. Lamps grouped with a type of headlamp of which the lens is also used for another type of headlamp. The provisions laid down in paragraphs 5.6. to 5.9. above are applicable.
- 5.11.1. However, if different types of headlamps or units of lamps including a headlamp comprise the same lens, the latter may bear the different approval marks relating to these types of headlamp or units of lamps, provided that the main body of the headlamp, even if it cannot be separated from the lens, 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.
- 5.11.2. Annex 3 of UN R 91 gives examples of approval marks relating to lamps which are grouped with a headlamp (example 3).
- 5.12. The approval marking shall be clearly legible and indelible. It may be placed on an inner or outer part (transparent or not) of the device which cannot be separated from the transparent part of the device emitting the light. In any case the marking shall be visible when the device is fitted on the vehicle or when a movable part such as the hood or boot lid or a door is opened.

6.0 GENERAL SPECIFICATIONS

The requirements contained in sections 6. "General specifications" and 7. "Individual specifications" and in the Annexes referenced in the said sections of AIS 008 (Rev.2) or AIS 030, and their series of amendments in force at the time of application for the lamp type approval shall apply to this Standard.

The requirements pertinent to each lamp and to the category/ies of vehicle on which the lamp is intended to be installed shall be applied, where its verification at the moment of lamp type approval is feasible.

- 6.1. Each side-marker lamp submitted for approval shall conform to the specifications set out in paragraphs 7.0 and 8.0 of this standard.
- 6.2. Side-marker lamps shall be so designed and made that, in normal use, despite the vibrations to which they may then be subjected, their satisfactory operation continues to be ensured and they retain the characteristics prescribed by this standard.
- 6.3. In the case of light source modules, it shall be checked that:
 - 6.3.1. The design of the light source module(s) shall be such as:
 - (a) that each light source module can only be fitted in no other position than the designated and correct one and can only be removed with the use of tool(s);
 - (b) If there are more than one light source module used in the housing for a device, light source modules having different

characteristics cannot be interchanged within the same lamp housing.

- 6.3.2. The light source module(s) shall be tamperproof.
- 6.3.3. A light source module shall be so designed that regardless of the use of tool(s), it shall not be mechanically interchangeable with any replaceable approved light source
- 6.4. In the case of replaceable light source(s):
 - 6.4.1. The side-marker lamp shall only be equipped with light source(s) approved according to AIS 034 (Part 1)(Rev.2) and/or AIS 130, provided that no restriction on the use is made in AIS 034 (Part 1)(Rev.2) and its series of amendments in force at the time of application for type approval or in AIS 130 and its series of amendments in force at the time of application for type approval.
 - 6.4.2. The design of the device shall be such that the light source can be fixed in no other position but the correct one.
 - 6.4.3. The light source holder shall conform to the characteristics given in IEC Publication 60061. The holder data sheet relevant to the category of filament lamp used, applies.
- 6.5 In the case of non-replaceable filament lamp(s) or light source module(s) equipped with non-replaceable filament lamp(s), the applicant shall annex to the type approval documentation a report (by the light source manufacturer indicated in the type approval documentation), acceptable to the Type Approval Authority, that demonstrates compliance of these non-replaceable filament lamp(s) with the requirements as specified in paragraph 4.11. of IEC 60809, Edition 3

7.0 INTENSITY OF LIGHT EMITTED

7.1. The intensity of the light emitted by each of the two samples submitted shall be:

Side-marker lamp category		SM1	SM2
7.1.1 Minimum intensity	In the axis of reference	4.0 cd	0.6 cd
	Within the specified angular field, other than above	0.6 cd	0.6 cd
7.1.2 Maximum intensity	Within the specified angular field ^{1/}	25.0 cd	25.0 cd
7.1.3 Angular field	Horizontal	± 45 deg.	± 30 deg.
	Vertical	± 10 deg.	± 10 deg.

Note :- ^{1/} In addition, for red side-marker lamp, in the angular field from 60° to 90° in horizontal direction and $\pm 20^\circ$ in vertical direction towards the front of the vehicle, the maximum intensity is limited to 0.25 cd."

7.1.4. In the case of a lamp containing more than one light source:

7.1.5 Failure of a single lamp containing more than one light source:

7.1.5.1. In a single lamp containing more than one light source, a group of light sources, wired so that the failure of any one of them causes all of them to stop emitting light, shall be considered to be one light source.

7.1.5.2. In case of failure of any one light source in a single lamp containing more than one light source, at least one of the following provisions shall apply:

(a) The light intensity complies with the minimum intensity required in the table of standard light distribution in space as shown in Annex 4; or

(b) A signal for activation of a tell-tale indicating failure, as indicated in paragraph 6.18.8. of AIS 008 (Rev.2), is produced, provided that the luminous intensity in the axis of reference is at least 50 per cent of the minimum intensity required. In this case a note in the communication form states that the lamp is only for use on a vehicle fitted with a tell-tale indicating failure

7.2. Outside the reference axis and within the angular fields defined in the diagrams in Annex A to this standard, the intensity of the light emitted by each of the two side-marker lamps supplied shall:

7.2.1. In each direction corresponding to the points in the light distribution table reproduced in Annex D to this standard, be not less than the product of the minimum specified in paragraph 7.1. above by the percentage specified in the said table for the direction in question;

7.2.2. In no direction within the space from which the side-marker lamp is visible, exceed the maximum specified in paragraph 7.1. above;

- 7.2.3. The provisions of paragraph D.2.2. of Annex D to this standard on local variations of intensity shall be observed.
- 7.3. Annex D, to which reference is made in paragraph 7.2.1. above, gives particulars of the measurement methods to be used.

8.0 COLOUR OF LIGHT EMITTED

The colour of the light emitted inside the field of the light distribution grid defined at paragraph D.2.0 of Annex D shall be amber within the limits of the chromaticity co-ordinates prescribed for the colour in question when measured in accordance with Annex E. Outside this field no sharp variation of colour shall be observed. However it can be red, if the rearmost side-marker lamp is grouped or combined or reciprocally incorporated with the rear position lamp, the rear end-outline marker lamp, the rear fog lamp, the stop lamp, or is grouped with or has part of the light emitting surface in common with the rear retro-reflector. To check these colorimetric characteristics, the test procedure described in paragraph 9.0 of this standard shall be applied. Outside this field no sharp variation of colour shall be observed.

However, for lamps equipped with non-replaceable light sources (filament lamps and other), the colorimetric characteristics should be verified with the light sources present in the lamp, in accordance with relevant subparagraphs of paragraph 9.1. of this standard

9.0 TEST PROCEDURE

- 9.1. All measurements, photometric and colorimetric shall be carried out with an uncoloured or coloured standard light source of the category prescribed for the device, supplied with the voltage:
- (a) In the case of filament lamps, that is necessary to produce the reference luminous flux required for that category of filament lamp;
 - (b) In the case of LED light sources of 6.75 V, 13.5 V, 28 V; the luminous flux value produced shall be corrected. The correction factor is the ratio between the objective luminous flux and the mean value of the luminous flux found at the voltage applied;
 - (c) In the case of lamps with non-replaceable light sources: 6.75 V, 13.5 V or 28 V respectively;
 - (d) In the case of a system that uses an electronic light source control gear being part of the lamp³ applying at the input terminals of the lamp the voltage declared by the manufacturer or, if not indicated, 6.75 V, 13.5 V or 28.0 V, respectively; In the case of a system that uses an electronic light source control gear not being part of the lamp, the voltage declared by the manufacturer shall be applied to the input terminals of the lamp.
 - (e) In the case of a system that uses an electronic light source control gear not being part of the lamp, the voltage declared by the

manufacturer shall be applied to the input terminals of the lamp.

- 9.2. The test laboratory shall require from the manufacturer the light source control gear needed to supply the light source and the applicable functions
- 9.3. The limits of the apparent surface in the direction of the reference axis of a light-signalling device shall be determined.

10.0 MODIFICATIONS OF THE TYPE OF SIDE MARKER LAMP AND EXTENSION OF APPROVAL

- 10.1 Every modification pertaining to the information, even if the changes are not technical in nature declared in accordance with paragraph 3 of this standard shall be intimated by the applicant to the testing agency.

If the changes are in parameters not related to the provisions, no further action need be taken.

If the changes are in parameters related to the provisions, the testing agency, which has issued the certificate of compliance, shall then consider, whether,

- 10.1.1 The device with the changed specifications still complies with provisions, or
- 10.1.2 Any further verification is required to establish compliance.
- 10.2 For considering whether testing is required or not, guidelines given in 10.5 (criteria for extension of approval) shall be used.
- 10.3 In case of 10.2, tests for only those parameters which are affected by the modifications need be carried out
- 10.4 In case of fulfilment of criterion of 10.1.1 or after results of further verification as per 10.1.2 are satisfactory, the approval of compliance shall be extended for the changes carried out.

10.5 Criteria for extension of approval

The Criteria shall be as agreed between the testing agency and applicant.

11.0 Conformity of Production

The conformity of production procedures shall comply with those set out in the AIS-037 with the following requirements:

- 11.1. Any side-marker lamp shall be so manufactured as to conform to the type approved under this Standard.

The compliance with the requirements set forth in paragraphs 7. and 8. above shall be verified as follows:

- 11.1.1 The minimum requirements for conformity of production control procedures set forth in Annex F to this Standard shall be complied with.
- 11.1.2 The minimum requirements for sampling by an inspector set forth in Annex F to this Standard shall be complied with.
- 11.2 The Test Agency 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.
- 11.3 In the case of non-replaceable filament lamp(s) or light source module(s) equipped with non-replaceable filament lamps, a report (by the light source manufacturer indicated in the type approval documentation) shall demonstrate compliance of these non-replaceable filament lamp(s) with lifetime requirements and, in the case of colour coated filament lamps, also with colour endurance requirements, as specified in paragraph 4.11. of IEC 60809, Edition 3

12.0 PENALTIES FOR NON-CONFORMITY OF PRODUCTION

Penalties for non-conformity of production shall be as prescribed in AIS-037.

13.0 Reserved

14.0 Reserved

15.0 TRANSITIONAL PROVISIONS

- 15.1 At the request of the applicant, type approvals for compliance to AIS-012 (Part 9) (Rev.2):20XX shall be granted by testing agencies from (date of adoption of this standard in CMVR-TSC). Such type approvals shall be deemed to be compliant to AIS-012 (Part 9) (Rev.1):2011 as amended from time to time
- 15.2 Type approvals issued for compliance to AIS-012 (Part 9) (Rev.1):2011 as amended from time to time shall be extended to approval of AIS-012 (Part 9) (Rev.2):20XX, subject to satisfactory compliance to the requirements of this standard
- 15.3 At the request of applicant, type approval to the compliance to AIS-012 (Part 9) (Rev.1):2011 as amended from time to time shall be granted up to the notified date of implementation of AIS-012 (Part 9) (Rev.2):20XX

16.0 ESTABLISHING COMPLIANCE OF “E”/“e” APPROVED SIDE-MARKER LAMP TO THIS STANDARD

16.1 As an exception to 7.4 of AIS-037 (or related administrative decisions) for certifying compliance of “E”/ “e” approved front position lamps, rear position lamps, stop lamps, direction indicators rear-registration-plate illuminating devices and Reversing Lamp to this standard, the following test shall be carried out by testing agency

16.1.1 Photometric requirements measured with a standard filament lamp as referred to in 8 above shall be at least 80 per cent of the minimum values specified and shall not exceed 120 per cent of the maximum values specified in 7.0.

16.1.2 Colorimetric requirements shall be as specified in 8.0.

17.0 AMENDMENTS TO ECE REGULATIONS AFTER THE LEVEL DESCRIBED IN 0.3 OF INTRODUCTION

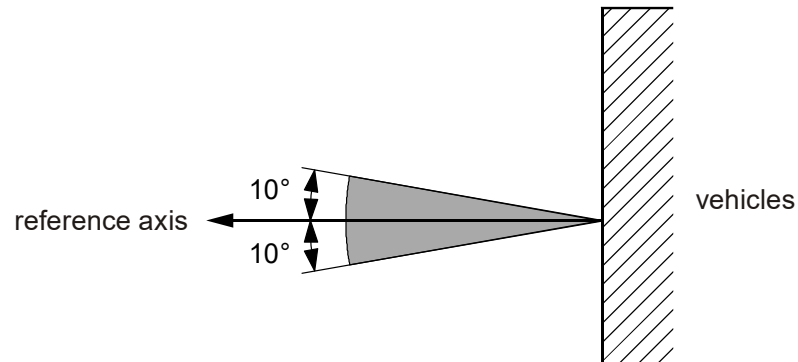
Acceptance of changes in UN regulations after the level described in 0.3 of introduction shall be as per AIS-000, as amended from time to time, as applicable, unless otherwise stated.

ANNEX A

(See 7.2)

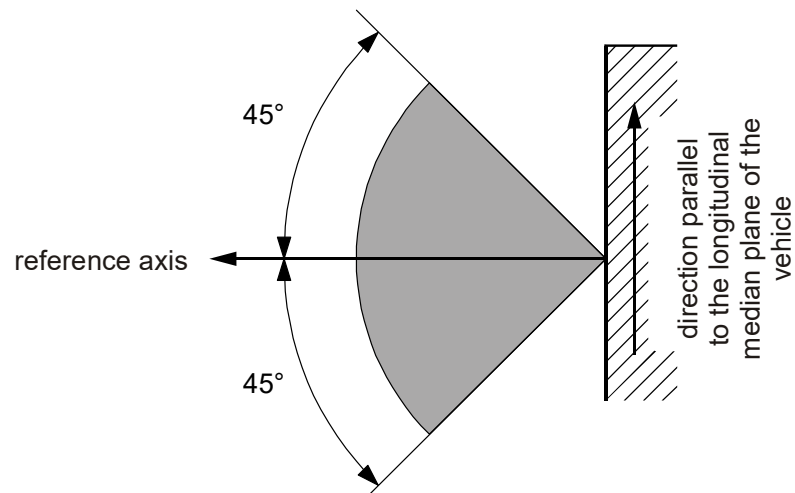
**MINIMUM ANGLES REQUIRED FOR
LIGHT DISTRIBUTION IN SPACE**

Minimum vertical angles, SM1 and SM2:

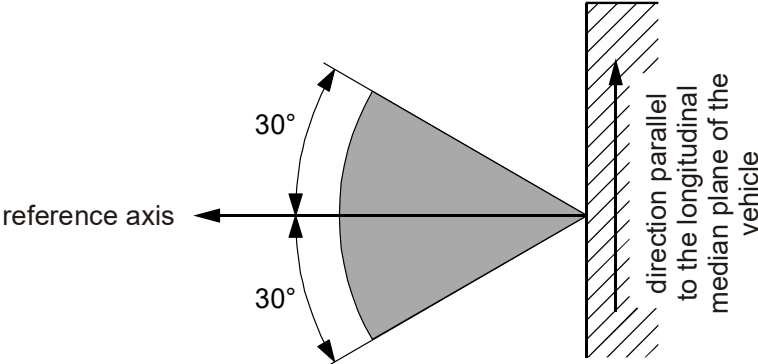


The angle of 10° below the horizontal may be reduced to 5° in case of lamps with a mounting height of equal to or less than 750 mm above the ground.

Minimum horizontal angles, SM1:



Minimum horizontal angles, SM2:



ANNEX B
Reserved

ANNEX C
Reserved

ANNEX D

(See 7.2.1)

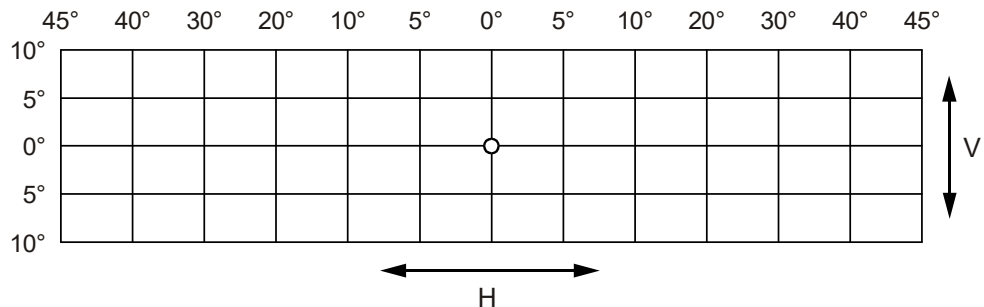
PHOTOMETRIC MEASUREMENTS

D1.0 MEASUREMENT METHODS

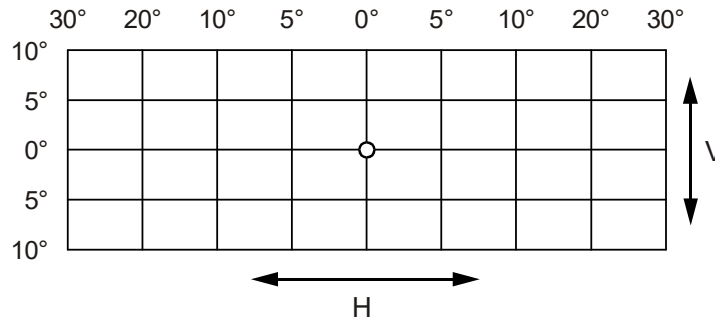
- D1.1. During photometric measurement stray reflections shall be avoided by appropriate marking.
- D1.2. In case the results of measurements should be challenged, measurements shall be carried out in such a way as to meet the following requirements:
 - D1.2.1. The distance of measurement shall be such that the law of the inverse of the square of the distance is applicable;
 - D1.2.2. The measuring equipment shall be such that the angular aperture of the receiver viewed from the reference centre of the lamp is comprised between 10 minutes and 1 degree;
 - D1.2.3. The intensity requirement for a particular direction of observation shall be deemed to be satisfied if that requirement is met in a direction deviating by not more than one-quarter of a degree from the direction of observation.
- D1.3. In the case where the device may be installed on the vehicle in more than one or in a field of different positions the photometric measurements shall be repeated for each position or for the extreme positions of the field of the reference axis specified by the manufacturer.
- D1.4. The direction $H = 0^\circ$ and $V = 0^\circ$ corresponds to the reference axis. (On the vehicle it is horizontal, perpendicular to the median longitudinal plane of the vehicle and oriented in the required direction of visibility.) It passes through the centre of reference.

D2.0 TABLES OF LIGHT DISTRIBUTION

- D2.1. SM1 category of side-marker lamps



- D2.1.1. Minimum values:
0.6 cd at any point other than the reference axis, at which it shall be 4.0 cd.
- D2.1.2. Maximum values:
25.0 cd at any point
- D2.2. SM2 category of side-marker lamps



- D2.2.1. Minimum values:
0.6 cd, at any point
- D2.2.2. Maximum values:
25.0 cd, at any point
- D2.3. For SM1 and SM2 category of side-marker lamps it may be sufficient to check only five points selected by the test authority.
- D2.4. Within the field of light distribution shown above as a grid the light pattern should be substantially uniform, i.e. the light intensity in every direction within a part of the field formed by the grid lines shall meet at least the lowest minimum value applicable to the respective grid lines.
- D2.5. However, in the case where the device is intended to be installed at a mounting height of equal to or less than 750 mm above the ground, the photometric intensity is verified only up to an angle of 5° downwards.

D3.0 PHOTOMETRIC MEASUREMENT OF LAMPS

The photometric performance shall be checked:

- D3.1. For non-replaceable light sources (filament lamps and other):
with the light sources present in the lamp, in accordance with paragraph 9.2. of this standard.

D3.2. For replaceable light sources:

When equipped with light sources at 6.75 V, 13.5 V or 28.0 V, the luminous intensity values produced shall be corrected. For filament lamps the correction factor is the ratio between the reference luminous flux and the mean value of the luminous flux found at the voltage applied (6.75 V, 13.5 V or 28.0 V).

For LED light sources the correction factor is the ratio between the objective luminous flux and the mean value of the luminous flux found at the voltage applied (6.75 V, 13.5 V or 28.0 V).

The actual luminous fluxes of each light source used shall not deviate more than 5 per cent from the mean value. Alternatively and in case of filament lamps only, a standard filament lamp may be used in turn, in each of the individual positions, operated at its reference flux, the individual measurements in each position being added together

D3.3. For any signalling lamp except those equipped with filament lamp(s), the luminous intensities, measured after one minute and after 30 minutes of operation, shall comply with the minimum and maximum requirements. The luminous intensity distribution after one minute of operation can be calculated from the luminous intensity distribution after 30 minutes of operation by applying at each test point the ratio of luminous intensities measured at HV after one minute and after 30 minutes of operation.

ANNEX E

(See 8)

COLOUR OF LIGHT EMITTED

The chromaticity co-ordinates of colour emitted shall be in accordance with para. 4 of AIS-010(Part 5) (Rev. 2).

For checking the colorimetric characteristics, a source of light at a colour temperature of 2,856 K, corresponding to illuminant A of the International Commission on Illumination (CIE), shall be used. However, for lamps equipped with non-replaceable light sources (filament lamps and other), the colorimetric characteristics should be verified with the light sources present in the lamp, in accordance with paragraph 9.2. of this standard.

ANNEX F

(See 11.)

**MINIMUM REQUIREMENTS FOR CONFORMITY OF
PRODUCTION CONTROL PROCEDURES**

F1.0 GENERAL

- F1.1. 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 standard.
- F1.2. With respect to photometric performances, the conformity of mass-produced side-marker lamps shall not be contested if, when testing photometric performances of any side-marker lamp chosen at random and equipped with a standard light source, or when the side-marker lamps are equipped with non-replaceable light sources (filament lamps or other), and when all measurements are made at 6.75 V, 13.5 V or 28.0 V respectively:
- F1.2.1. no measured value deviates unfavourably by more than 20 per cent from the values prescribed in this standard.
- F1.2.2. If, in the case of a side-marker lamp equipped with a replaceable light source and if results of the test described above do not meet the requirements, tests on side-marker lamps shall be repeated using another standard light source.
- F1.3. The chromaticity coordinates shall be complied with when the side-marker lamp is equipped with a standard light source, or for side-marker lamps equipped with non-replaceable light sources (filament lamps or other), when the colorimetric characteristics are verified with the light source present in the side-marker lamp.
- F 1.4. In the case of non-replaceable filament lamp(s) or light source module(s) equipped with non-replaceable filament lamps, at any conformity of production check:
- F 1.4.1. The holder of the approval mark shall demonstrate the use in normal production and show the identification of the non-replaceable filament lamp(s) as indicated in the type approval documentation;
- F 1.4.2. In the case where doubt exists in respect to compliance of the non-replaceable filament lamp(s) with lifetime requirements and/or, in the case of colour coated filament lamps, with colour endurance requirements, as specified in paragraph 4.11. of IEC 60809, Edition 3, conformity shall be checked (by the light source manufacturer indicated in the type approval documentation) as specified in paragraph 4.11. of IEC 60809, Edition 3

F2.0 MINIMUM REQUIREMENTS FOR VERIFICATION OF CONFORMITY BY THE MANUFACTURER

For each type of side-marker lamp 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 standard.

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.

F2.1. Nature of tests

Tests of conformity in this standard shall cover the photometric and colorimetric characteristics.

F2.2. Methods used in tests

F2.2.1. Tests shall generally be carried out in accordance with the methods set out in this standard.

F2.2.2. In any test of conformity carried out by the manufacturer, equivalent methods may be used with the consent of the testing agency responsible for approval tests. The manufacturer is responsible for proving that the applied methods are equivalent to those laid down in this standard.

F2.2.3. The application of paragraphs F.2.2.1. and F.2.2.2. requires regular calibration of test apparatus and its correlation with measurements made by a testing agency.

F2.2.4. In all cases the reference methods shall be those of this standard, particularly for the purpose of administrative verification and sampling.

F2.3. Nature of sampling

Samples of side-marker lamps shall be selected at random from the production of a uniform batch. A uniform batch means a set of side-marker lamps 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.

F2.4. Measured and recorded photometric characteristics

The sampled side-marker lamp shall be subjected to photometric measurements for the minimum values at the points listed in Annex D

and the required chromaticity coordinates listed in Annex E, provided for in the standard.

F2.5. **Criteria governing acceptability**

The manufacturer is responsible for carrying out a statistical study of the test results and for defining, in agreement with the testing agency, criteria governing the acceptability of his products in order to meet the specifications laid down for verification of conformity of products in paragraph 11.1. of this standard.

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 G (first sampling) would be 0.95.

ANNEX G

(See F 2.5)

MINIMUM REQUIREMENTS FOR SAMPLING BY A TESTING AGENCY

G1.0 GENERAL

- G1.1. The conformity requirements shall be considered satisfied from a mechanical and a geometric standpoint, in accordance with the requirements of this standard, if any, if the differences do not exceed inevitable manufacturing deviations.
- G1.2. With respect to photometric performance, the conformity of mass-produced side-marker lamps shall not be contested if, when testing photometric performances of any side-marker lamp chosen at random and equipped with a standard light source, or when the side-marker lamps are equipped with non-replaceable light sources (filament lamps or other), and when all measurements are made at 6.75 V, 13.5 V or 28.0 V respectively:
- G1.2.1. no measured value deviates unfavourably by more than 20 per cent from the values prescribed in this standard.
 - G1.2.2. If, in the case of a side-marker lamp equipped with a replaceable light source and if results of the test described above do not meet the requirements, tests on side-marker lamps shall be repeated using another standard light source.
 - G1.2.3. Side-marker lamps with apparent defects are disregarded.
- G1.3. The chromaticity coordinates shall be complied with when the side-marker lamp is equipped with a standard light source, or for the side-marker lamps equipped with non-replaceable light sources (filament lamps or other), when the colorimetric characteristics are verified with the light source present in the side-marker lamp.

G2.0 FIRST SAMPLING

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

- G 2.1. The conformity of mass-produced lamps shall not be contested if the deviation of any specimen of samples A and B (all four lamps) is not more than 20 per cent.

In the case, that the deviation of both lamps of sample A is not more than 0 per cent the measurement can be closed.

- 2.2. The conformity of mass-produced lamps shall be contested if the deviation of at least one specimen of samples A or B is more than 20 per cent.

The manufacturer shall be requested to bring his production in line with the requirements (alignment) and a repeated sampling according to paragraph 3. below shall be carried out within two months' time after the notification. The samples A and B shall be retained by the Technical Service until the entire Conformity of Production process is finished.

G 3. First repeated sampling

A sample of four lamps is selected at random from stock manufactured after alignment.

The first sample of two is marked C, the second sample of two is marked D.

- G 3.1. The conformity of mass-produced lamps shall not be contested if the deviation of any specimen of samples C and D (all four lamps) is not more than 20 per cent.

In the case, that the deviation of both lamps of sample C is not more than 0 per cent the measurement can be closed.

- G 3.2. The conformity of mass-produced lamps shall be contested if the deviation of at least:

- G 3.2.1. One specimen of samples C or D is more than 20 per cent but the deviation of all specimen of these samples is not more than 30 per cent.

The manufacturer shall be requested again to bring his production in line with the requirements (alignment).

A second repeated sampling according to paragraph 4. below shall be carried out within two months' time after the notification. The samples C and D shall be retained by the Technical Service until the entire Conformity of Production process is finished.

- G 3.2.2. One specimen of samples C and D is more than 30 per cent.

In this case the approval shall be withdrawn and paragraph 5. below shall be applied.

G 4. Second repeated sampling

A sample of four lamps is selected at random from stock manufactured after alignment.

The first sample of two is marked E, the second sample of two is marked F.

- G 4.1. The conformity of mass-produced lamps shall not be contested if the deviation of any specimen of samples E and F (all four lamps) is not more than 20 per cent.

In the case, that the deviation of both lamps of sample E is not more than 0 per cent, the measurement can be closed.

G 4.2. The conformity of mass-produced lamps shall be contested if the deviation of at least one specimen of samples E or F is more than 20 per cent.

In this case the approval shall be withdrawn and paragraph 5. below shall be applied.

G 5. Approval withdrawn

Approval shall be withdrawn according to paragraph 12. of this Regulation

ANNEX H
(See introduction)

**COMPOSITION OF AISC PANEL ON
LIGHTING AND LIGHT SIGNALLING DEVICES**

(To be included)

ANNEX J
(See introduction)

COMMITTEE COMPOSITION
Automotive Industry Standards Committee

(To be included)