

Amendment 1 (4/2019)
To
Amd. No. 1 to AIS-012 (Part 9)(Rev.1):2011
Performance Requirements for Side-Marker Lamps
for Motor Vehicle

1.0 Page III, Introduction, Point No. 0.3

Substitute the following text for the existing text:

“ECE R 91 (Rev. 3) Supplement 15 to the original version of the Regulation - Date of entry into force: 3 November 2013 & Revision 3 – Corrigendum 1 Corrigendum 1 to Revision 3 of the Regulation (Erratum by the secretariat): Date of entry into force: 13 March 2015

2.0 Page III, Introduction, Point No. 0.4

Insert the following words in the table:

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
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3.0 Page 1/26, Clause 2.3

Substitute the following words:

“filament lamp” with “light source”

4.0 Page 1/26, Clause 2.4

Insert the following text at the end:

“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.”

5.0 Page 2/26, Clause 3.2.2

Re-number Sub-Clause (b) as (c)

6.0 Page 2/26, Clause 3.2.2

Insert the following sub-clause (b):

“(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.”

7.0 Page 2/26, Clause 4.3 (a)

Substitute the following words:

“filament lamp” with “light source”

8.0 Page 3/26, Clause 6.3

Insert a new Sub Clause 6.3.3,

“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.”

9.0 Page 3/26, Clause 6.4

Substitute the following words:

“filament lamp” with “light source”

10.0 Page 3/26, Clause 6.4.1

Substitute the following text for the existing text:

Any category or categories of light source(s) approved according to AIS-034 (Part 1) (Rev. 1) and/or AIS 130 may be used, provided that no restriction on the use is made in AIS-034 (Part 1) (Rev. 1) 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.

11.0 Page 4/26, Clause 6.4.2 and 6.4.3

Substitute the following words:

“filament lamp” with “light source”

12.0 Page 5/26, Clause 8.0

Substitute the following text for the existing text:

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 coordinates 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.

13.0 Page 5/26, Clause 9.1 and 9.2

Substitute the following text for the existing text:

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.

14.0 Page 5/26, Clause 9.2

Insert new sub Clause 9.2 after 9.1

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.

15.0 Page 6/26, Clause 11.1

Substitute the following words:

“standard filament lamp with standard light source.”

16.0 Page 8/26, Clause 16.1.1

Substitute the following words:

“standard filament lamp with standard light source.”

17.0 Page 14/26, ANNEX D, Sub Clause D3.2

Substitute the following text for the existing text:

“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.”

18.0 Page 16/26, Annex F, Sub Clause F1.2, F1.2.2 & F1.3

Substitute the following words:

“Standard filament lamp” with “Standard light source”

19.0 Page 18/26, Annex G, Sub Clause G1.2, G1.2.2 & G1.3

Substitute the following words:

“Standard filament lamp” with “Standard light source”

PRINTED BY
THE AUTOMOTIVE RESEARCH ASSOCIATION OF INDIA
P.B. NO. 832, PUNE 411 004

ON BEHALF OF
AUTOMOTIVE INDUSTRY STANDARDS COMMITTEE

UNDER
CENTRAL MOTOR VEHICLE RULES – TECHNICAL STANDING COMMITTEE

SET-UP BY
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
(DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS)
GOVERNMENT OF INDIA

11th April 2019

AUTOMOTIVE INDUSTRY STANDARD

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

(Revision 1)

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October 2011

Status chart of the standard to be used by the purchaser for updating the record

Sr. No.	Corrigenda.	Amendment	Revision	Date	Remark	Misc.
General remarks :						

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.

ECE R 91 (Rev. 2, Amd. 1, Suppl. 11 to original version) Date of entry into force: 15 October 2008	Uniform provisions concerning the approval of side-marker lamps for motor vehicles and their trailers
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0.4 The following standards contain provisions, which through reference in this text constitute provisions of the standard.

AIS-053:2005	Automotive Vehicles - Types - Terminology
AIS-008 (Rev.1): 2010	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. 1):2010	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. 1):2010	Provisions concerning the Approval of Gas-discharge Light Sources for use in Approved Gas-discharge Lamp units of Power-driven Vehicles
AIS-037:2004	Procedure for Type Approval and Establishing Conformity of Production for Safety Critical Components
AIS-010 (Part 5) (Rev. 1):2010	Requirements of Chromaticity Co-ordinates of Colour of Light Emitted from Lighting and Light-signalling Devices

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**

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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.1) 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;
- (b) the characteristics of the optical system (level of intensity, light distribution angles, category of filament lamp, 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.

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.

^{1/} As defined in AIS-053: Automotive Vehicles - Types - Terminology

- 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 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.

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 filament lamp(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 rated voltage or the range of voltages, and the rated wattage.
- 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 (and rated wattage).
- 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. Approval marking shall be as per AIS-037
- 5.4.1. to 5.12 Reserved

6.0 GENERAL SPECIFICATIONS

- 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.
- 6.4. In the case of replaceable filament lamp(s):
 - 6.4.1. Any category or categories of filament lamp(s) approved according to AIS-034 (Part 1)(Rev. 1) may be used, provided that no restriction on the use is made in AIS-034(Parts 1) (Rev. 1) and its amendments in force at the time of application for type approval.

- 6.4.2. The design of the device shall be such that the filament lamp can be fixed in no other position but the correct one.
- 6.4.3. 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.

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 ± 20° 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:

the lamp shall comply with the minimum intensity required when any one light source has failed;

when all light sources are illuminated the maximum intensity specified may not be exceeded.

All light sources which are connected in series are considered to be one light source.
- 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

- 8.1. The side-marker lamp shall emit amber light; however it may emit 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.
- 8.2. The colour of the light emitted inside the field of the light distribution grid defined at paragraph D.2. of Annex D Shall be 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.

9.0 TEST PROCEDURE

- 9.1. Measurements shall be carried out with a colourless standard filament lamp of the type recommended for the side-marker lamp and so regulated as to produce the reference luminous flux prescribed for this type of lamp, taking into account the provisions of paragraph 9.2. below.
- 9.2. All measurements on lamps equipped with non-replaceable light sources (filament lamps and other) shall be made at 6.75 V, 13.5 V or 28.0 V respectively.

In the case of light sources supplied by a special power supply, the above test voltages shall be applied to the input terminals of that power supply. The test laboratory may require from the manufacturer the special power supply needed to supply the light sources.

- 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

- 11.1. Every device bearing an approval mark as prescribed under this standard shall conform to the type approved and shall comply with the requirements of this standard. However, in the case of a device picked at random from series production, the requirements as to the respectively, minimum and maximum intensities of the light emitted (measured with a standard filament lamp as referred to in 9. above) shall be at least 80 per cent of the minimum values specified and not exceed 120 per cent of the maximum values allowed.
- 11.2 The conformity of production procedures shall comply with those set out in the AIS-037 with the following requirements:
 - 11.2.1 During the verification as per 11.1, if tests are required, the following tests shall be carried out:
 - 11.2.1.1 Intensity of light emitted (See 7).
 - 11.2.1.2 Colour of light emitted (See 8).
 - 11.3 Devices with apparent defects are disregarded.
 - 11.4 The reference mark is disregarded.
 - 11.5 The normal frequency of these verifications shall be once every two years.

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.1):2011, shall be granted by test agencies from 22nd February 2011 (date of adoption of this standard in CMVR-TSC). Such type approvals shall be deemed to be compliance to Annex H1, H2, H3 of AIS-012:2004.

15.2 At the request of applicant, type approval to the compliance to AIS-012:2004 shall be granted up to the notified date of implementation of AIS-012 (Part 9) (Rev.1):2011.

15.3 Type approvals issued for compliance to Annex H1, H2, H3 of AIS-012:2004 shall be extended to approval of AIS-012 (Part 9) (Rev.1):2011 subject to satisfactory compliance of the following:

15.3.1 Marking as per 4.0 and sub-clauses of 5.0 applicable for marking.

15.3.2 In case of “E”/ “e” approved devices, requirements specified in 16.

15.3.3 In the case of side marker lamps the photometric requirements, in particular those prescribed in 7.1.1 of this standard.

Note: Additional verification for the above need not be carried out, if compliance to the above requirements has already been established during the type approval as per Annex H1, H2, H3 of AIS-012:2004.

15.4 Extension of approvals for engineering and administrative changes:

15.4.1 In the case of 15.1, extensions shall be granted subject to the conditions of AIS-012 (Part 9) (Rev.1):2011. Such extensions shall be deemed to be compliance to AIS-010:2004.

15.4.2 In the case of 15.2, extensions shall be granted subject to conditions of AIS-012:2004 till the notified date of implementation of AIS-012 (Part 9) (Rev.1):2011.

15.5 Type approvals for compliance to AIS-037, already been granted, shall continue to be valid for AIS-012 (Part 9) (Rev.1):2011.

Note : Necessary corrections to the reference of verification reports as per this standard shall be incorporated while issuing the next COP certificate. In the meantime for issuing of vehicle certificate, test/verification report as per this standard shall deemed to be the proof of compliance of AIS-037.

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

17.1 Supplements

Note: In case of changes in ECE regulation, which are issued as supplements (Supplements do not affect the earlier type approvals) at the request of applicant, approval of compliance to this standard shall be issued taking into account the changes arising out of such supplement(s) to ECE regulation with approval from Chairman AISC.

This shall be incorporated in the test report.

Such changes will be considered for inclusion in this standard at the time of its next amendment /revision.

17.2 Series of amendments

Changes in ECE regulation, which are issued as series of amendments (series of amendments may affect the earlier type approvals) will not be considered for issuing approval to this standard.

However, Chairman, AISC may, on a case to case basis, permit to accept latest series of amendments.

This shall be incorporated in the test report.

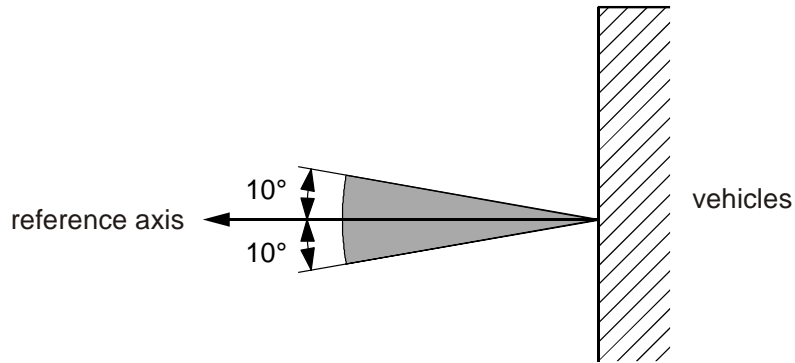
Note : Such changes will be considered for inclusion in this standard at the time of its next revision.

ANNEX A

(See 7.2)

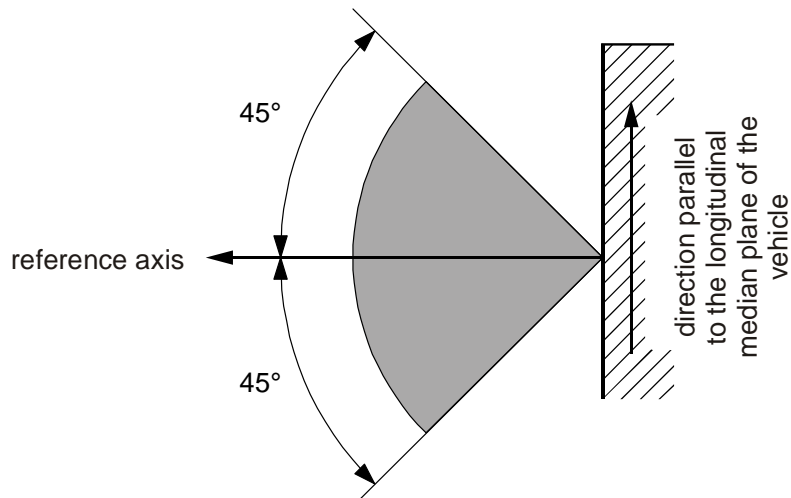
MINIMUM ANGLES REQUIRED FOR LIGHT DISTRIBUTION IN SPACE

Minimum vertical angles, SM1 and SM2:

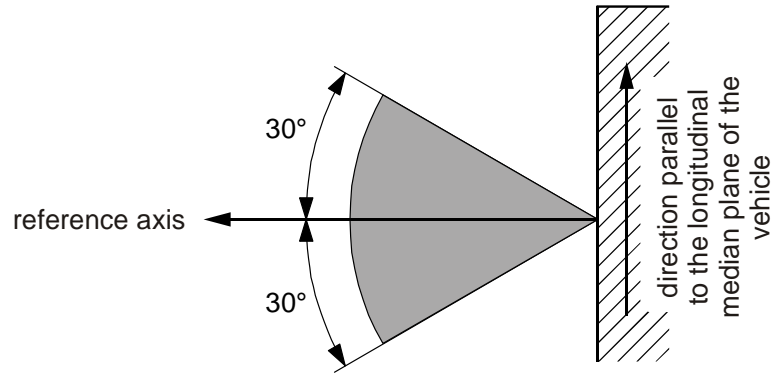


The angle of 10° below the horizontal may be reduced to 5° in case of lamps with a mounting height of equal to or less than 750 mm above the ground.

Minimum horizontal angles, SM1:



Minimum horizontal angles, SM2:



ANNEX B

Reserved

ANNEX C

Reserved

ANNEX D

(See 7.2.1)

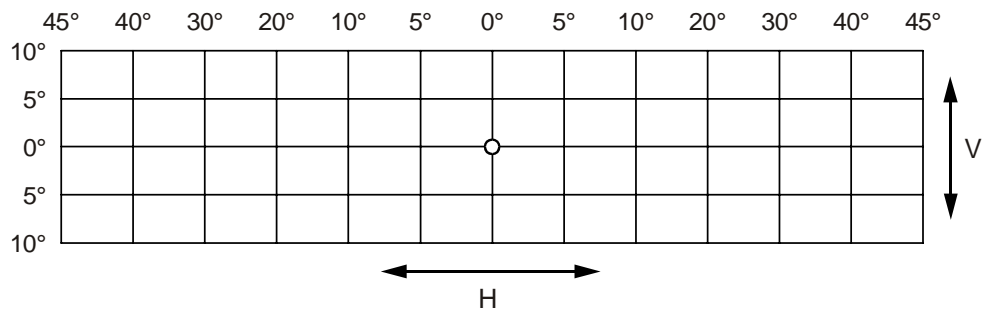
PHOTOMETRIC MEASUREMENTS

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



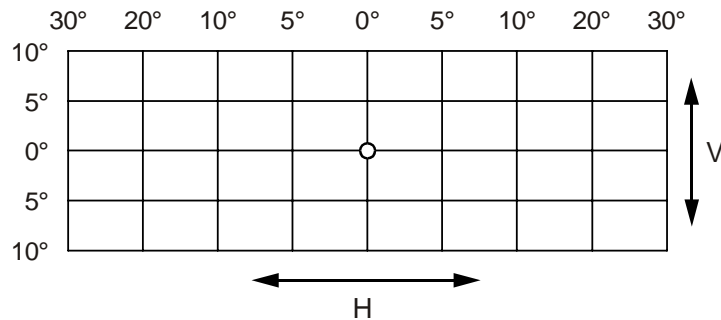
D2.1.1. Minimum values:

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 filament lamps:
- when equipped with filament lamps at 6.75 V, 13.5 V or 28.0 V the luminous intensity values produced shall be corrected. 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). The actual luminous fluxes of each filament lamp used shall not deviate more than ± 5 per cent from the mean value. Alternatively 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. 1) .

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 filament lamp, 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 filament lamp.
- F1.3. The chromaticity coordinates shall be complied with when the side-marker lamp is equipped with a standard filament lamp, 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.

**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 filament lamp, 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 filament lamp.

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 filament lamp, 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.

G2.1 The conformity is not contested

G2.1.1. Following the sampling procedure shown in Figure 1 of this annex the conformity of mass-produced side-marker lamps shall not be contested if the deviation of the measured values of the side-marker lamps in the unfavourable directions are:

G2.1.1.1. sample A

A1: one side-marker lamp	0 per cent
one side-marker lamp not more than	20 per cent
A2: both side-marker lamps more than	0 per cent
but not more than	20 per cent
go to sample B	

G2.1.1.2. sample B

B1: both side-marker lamps	0 per cent
----------------------------	------------

G2.1.2. or, if the conditions of paragraph G.1.2.2. for sample A are fulfilled.

G2.2. The conformity is contested

G2.2.1. Following the sampling procedure shown in Figure 1 of this annex the conformity of mass-produced side-marker lamps shall be contested and the manufacturer requested to make his production meet the requirements (alignment) if the deviations of the measured values of the side-marker lamps are:

G2.2.1.1. sample A

A3: one side-marker lamp not more than	20 per cent
one side-marker lamp more than	20 per cent
but not more than	30 per cent

G2.2.1.2. sample B

B2: in the case of A2	
one side-marker lamp more than	0 per cent
but not more than	20 per cent
one side-marker lamp not more than	20 per cent
B3: in the case of A2	
one side-marker lamp	0 per cent
one side-marker lamp more than	20 per cent
but not more than	30 per cent

G2.2.2. or, if the conditions of paragraph G.1.2.2. for sample A are not fulfilled.

G2.3. Non conformity established

Conformity shall be contested and paragraph 12. applied if, following the sampling procedure in Figure 1 of this annex, the deviations of the measured values of the side-marker lamps are:

G2.3.1. sample A

- | | | |
|-----|------------------------------------|-------------|
| A4: | one side-marker lamp not more than | 20 per cent |
| | one side-marker lamp more than | 30 per cent |
| A5: | both side-marker lamps more than | 20 per cent |

G2.3.2. sample B

- | | | |
|-----|----------------------------------|-------------|
| B4: | in the case of A2 | |
| | one side-marker lamp more than | 0 per cent |
| | but not more than | 20 per cent |
| | one side-marker lamp more than | 20 per cent |
| B5: | in the case of A2 | |
| | both side-marker lamps more than | 20 per cent |
| B6: | in the case of A2 | |
| | one side-marker lamp | 0 per cent |
| | one side-marker lamp more than | 30 per cent |

G2.3.3. or, if the conditions of paragraph G.1.2.2. for samples A and B are not fulfilled.

G3.0 REPEATED SAMPLING

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

G3.1. **The conformity is not contested**

G3.1.1. Following the sampling procedure shown in Figure 1 of this annex the conformity of mass-produced side-marker lamps shall not be contested if the deviations of the measured values of the side-marker lamps are:

G3.1.1.1. sample C

C1:	one side-marker lamp	0 per cent
	one side-marker lamp not more than	20 per cent
C2:	both side-marker lamps more than	0 per cent
	but not more than	20 per cent
	go to sample D	

G3.1.1.2. sample D

D1:	in the case of C2	
	both side-marker lamps	0 per cent

G3.1.2. or, if the conditions of paragraph G.1.2.2. for sample C are fulfilled.

G3.2. **The conformity is contested**

G3.2.1. Following the sampling procedure shown in Figure 1 of this annex the conformity of mass-produced side-marker lamps shall be contested and the manufacturer requested to make his production meet the requirements (alignment) if the deviations of the measured values of the side-marker lamps are:

G3.2.1.1. sample D

D2:	in the case of C2	
	one side-marker lamp more than	0 per cent
	but not more than	20 per cent
	one side-marker lamp not more than	20 per cent

G3.2.1.2. or, if the conditions of paragraph G.1.2.2. for sample C are not fulfilled.

G3.3. **Non conformity established**

Conformity shall be contested and paragraph 12. applied if, following the sampling procedure in Figure 1 of this annex, the deviations of the measured values of the side-marker lamps are:

G3.3.1. sample C

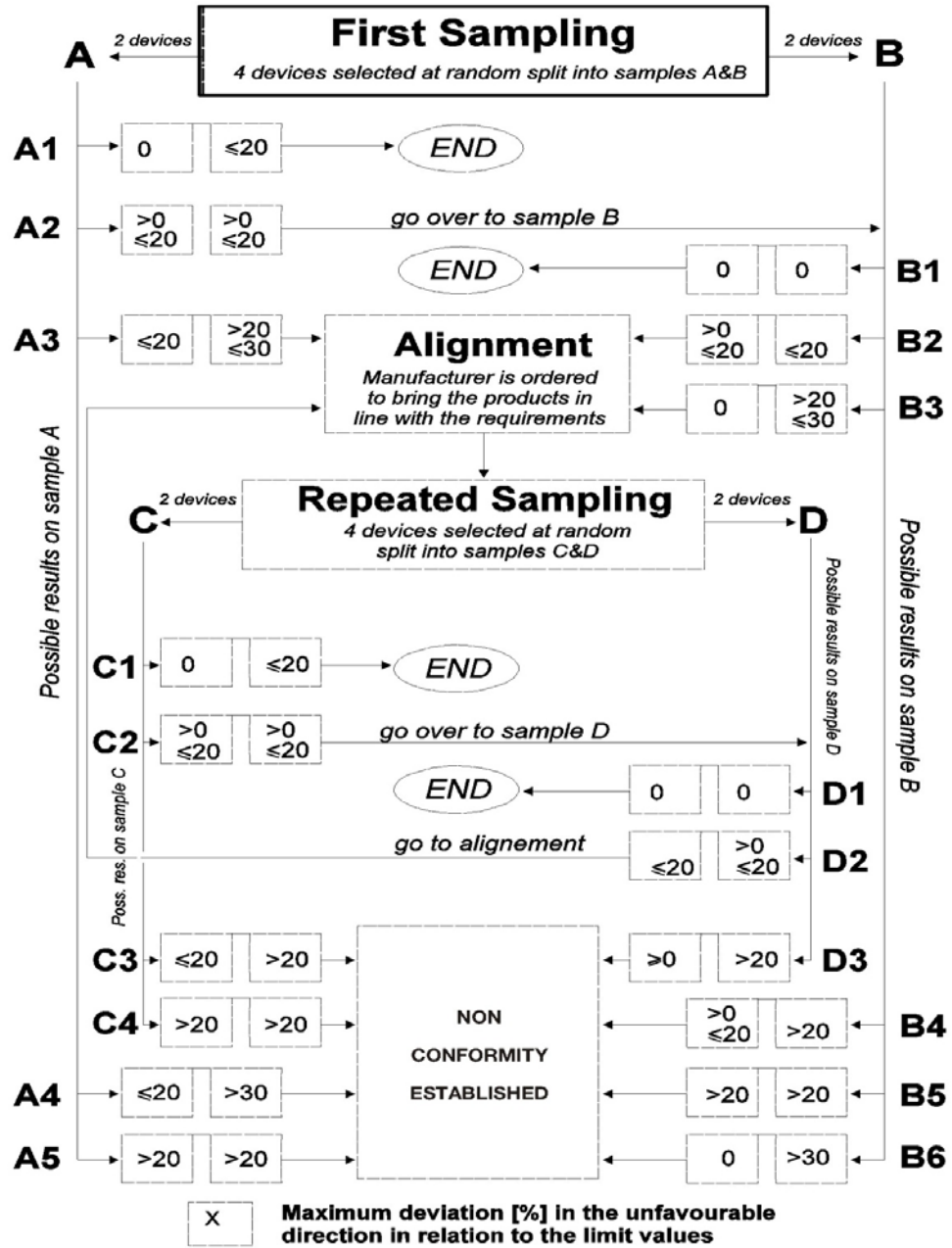
- C3: one side-marker lamp not more than 20 per cent
- one side-marker lamp more than 20 per cent
- C4: both side-marker lamps more than 20 per cent

G3.3.2. sample D

- D3: in the case of C2
- one side-marker lamp 0 or more than 0 per cent
- one side-marker lamp more than 20 per cent

G3.3.3. or, if the conditions of paragraph G.1.2.2. for samples C and D are not fulfilled.

Figure 1



ANNEX H
(See introduction)

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

Convener	
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Mr. B. V. Shamsundara	The Automotive Research Association of India (ARAI)
Mr. D. P. Saste	Central Institute of Road Transport (CIRT)
Mr. V. D. Chavan	Central Institute of Road Transport (CIRT)
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Mr. T.C. Gopalan,	Tractor Manufacturers Association (TMA)
Mr. K. N. D. Nambudiripad	Automotive Component Manufacturers Association (ACMA)
Mr. G. V. George	FIEM Industries Ltd. (ACMA)
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Mr. Rajiv Agarwal	All India Auto & Miniature Bulbs & Component Mfrs. Association
Mr. C. K. Choudhari	All India Auto & Miniature Bulbs & Component Mfrs. Association

* At the time of approval of this Automotive Industry Standard (AIS)

ANNEX J
(See introduction)

COMMITTEE COMPOSITION*
Automotive Industry Standards Committee

Chairman	
Shri Shrikant R. Marathe	Director The Automotive Research Association of India, Pune
Members	Representing
Representative from	Ministry of Road Transport & Highways (Dept. of Road Transport & Highways), New Delhi
Representative from	Ministry of Heavy Industries & Public Enterprises (Department of Heavy Industry), New Delhi
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Shri C. P. Ramnarayanan	Vehicles Research & Development Establishment, Ahmednagar
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Sr. Deputy Director
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