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AUTOMOTIVE INDUSTRY STANDARD

Performance Requirements for Direction Indicators for Motor Vehicles

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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 direction indicators for motor vehicles.

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

Revision 6 - Amendment 4 Supplement 29 to the 01 series of amendments – Date of entry into force: 16 October 2018	Uniform Provisions Concerning the Approval of Direction Indicators for Power-Driven Vehicles and their Trailers

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

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-010 (Part 5) (Rev. 2)	Requirements of Chromaticity Co-ordinates of Colour of Light Emitted from Lighting and Light-Signalling Devices
AIS-037	Procedure for Type Approval and Establishing Conformity of Production for Safety Critical Components
IEC Publication 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
AIS 062	Performance Requirements of Lighting and Light-Signalling Devices for Agricultural Tractors
UN R 6	Uniform Provisions Concerning the Approval of Direction Indicators for Power-Driven Vehicles and their Trailers
AIS 009	Automotive Vehicles - Installation Requirements of Lighting and Light-signalling Devices for L Category Vehicles, their Trailers and Semi-Trailers
IEC 60809	Lamps and light sources for road vehicles - Dimensional, electrical and luminous requirements

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 Direction Indicators for Motor Vehicles

Performance Requirements for Direction Indicators for Motor Vehicles

0. SCOPE

This standard applies to direction indicators for vehicles of categories L, M, N, T and A[1/].

Note: The permission to use direction indicator lamps covered by this standard are governed by requirements specified by the standard for installation of requirements of that category of vehicles.

1. DEFINITIONS

For the purpose of this standard:

1.1 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.

1.2. "**Direction indicator**" means a device mounted on a motor vehicle or trailer which, when operated by the driver, signals the latter's intention to change the direction in which the vehicle is proceeding. The present standard applies solely to fixed-position flashing light devices whose flashing is obtained by the intermittent supply of electric current to the lamp.

1.3. "**Direction indicators of different types**" means lamps which 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 (levels of intensity, light distribution angles, category of light source, light source module, etc.);

(c) The category of direction indicator lamps;

(d) The variable intensity control, if any.

(e) The sequential activation of light sources, if any.

1/ As defined in IS 14272: Automotive Vehicles - Types - Terminology

Nevertheless, direction indicators capable of being activated in different modes (sequential or not) without any modification of the optical characteristics of the lamp do not constitute "*Direction indicators of different types*".

A change of the colour of the light source or the colour of any filter does not constitute a change of type.

1.4. References made in this standard shall be referred to AIS-034(Part 1) (Rev.2) and its amendments at the time of application for type approval.

References made in this Standard to standard (étalon) LED light source(s) and to AIS:130 shall refer to AIS:130 and its series of amendments in force at the time of application for type approval.

2. APPLICATION FOR APPROVAL

2.1. The application for approval of a type of direction indicator shall be submitted by the applicant. It shall specify to which category or to which of the categories 1, 1a, 1b, 2a, 2b, 5 or 6 according to Annex A, the direction indicator belongs and, if it belongs to category 2, whether it has steady luminous intensity (category 2a) or whether it has variable luminous intensity (category 2b) and if the direction indicator may also be used in an assembly of two lamps of the same category. At the choice of the lamp manufacturer, it will also 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 technical information (see Annex B).

2.2. For each type of direction indicator, the application shall be accompanied by the following:

2.2.1. drawings, in triplicate, in sufficient detail to permit identification of the type and category and showing geometrically in what position(s) the direction indicator 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 degrees, vertical angle V = 0 degrees); and the point to be taken as the centre of reference in the said tests.

The geometrical conditions of installation of the device(s) that meet(s) the requirements of paragraph 6. below.

In the case of an interdependent lamp system, the interdependent lamp or the combination of interdependent lamps that fulfill the requirements of paragraph 5.7, paragraph 6.1. below and of Annex D to this standard.

The drawings shall show the position intended for the approval number and the additional symbols in relation to the approval mark;

2.2.2. 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 contained in AIS-034 (Part 1)(Rev. 2) and its amendments 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:130-2015 and its series of amendments in force at the time of application for type approval; and/or

(c) The light source module specific identification code.

2.2.3. For a direction indicator of category 2b, a concise description of the variable intensity control, an arrangement diagram and a specification of the characteristics of the system ensuring the two levels of intensity;

2.2.4. For a direction indicator lamp of categories 1, 1a, 1b, 2a and 2b, information regarding the signal according to paragraphs 5.6 and 6.2.2 below.

2.2.5. Two samples; if the approval is applied for devices which are not identical but are symmetrical and suitable for mounting one on the left and one on the right side of the vehicle, 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.

For a direction indicator of category 2b, the application shall also be accompanied by variable intensity control or a generator providing the same signal(s).

2.2.6. 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:

2.2.6.1. 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;

2.2.6.2. Two samples bearing the new trade name or mark or equivalent documentation."

2.2.7. 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 5.6. of this Standard.

3. MARKINGS

Devices submitted for approval shall:

3.1. Bear the trade name or mark of the lamp manufacturer; this marking shall be clearly legible and indelible;

3.2. With the exception of lamps with non-replaceable light sources, 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.

3.3 Comprise a space of sufficient size for the approval marking and the additional symbols prescribed in paragraph 4.2. below; this space shall be shown in the drawings mentioned in paragraph 2.2.1. above;

3.4. In case of lamps with an electronic light source control gear or a variable intensity control and/or non-replaceable light sources and/or light source module(s), bear the marking of the rated voltage or range of voltage.

3.5. In the case of lamps with light source module(s), the light source module(s) shall bear:

3.5.1. The trade name or mark of the lamp manufacturer; this marking shall be clearly legible and indelible;

3.5.2. 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 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 lamp manufacturer.

3.5.3. The marking of the rated voltage or range of voltage.

3.6. An electronic light source control gear or a variable intensity control being part of the lamp but not included into the lamp body shall bear the name of the manufacturer and its identification number.

3.7. On the Prototype for type approval, the markings may be provided by suitable temporary methods and need not be obtained from the tools used for series production.

4. APPROVAL

4.1. General

4.1.1. If the two devices submitted for approval in pursuance of paragraph 2.2.4. above meet the requirements of this standard, approval shall be granted. All the devices of an interdependent lamp system shall be submitted for type approval by the same applicant.

4.1.2. Where grouped, combined or reciprocally incorporated lamps have been found to comply with the requirements of several standards of AIS-012 or AIS-010 (Parts as applicable), 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 these standards.

4.2. Composition of the approval mark

4.2.1. The Approval marking shall be as per the provisions of AIS-037.

4.2.2. The following additional symbol (or symbols):

4.2.2.1. One or more of the numbers: 1, 1a, 1b, 2a, 2b, 5 or 6, according to whether the device belongs to one or more categories 1, 1a, 1b, 2a, 2b, 5 or 6 for which approval is sought in accordance with paragraph 2.1.;

4.2.2.2. On devices which may not be mounted on either side of the vehicle indiscriminately, a horizontal arrow showing in which position the device is to be mounted (the arrow shall be directed outwards from the vehicle in the case of devices of categories 1, 1a, 1b, 2a and 2b and towards the front of the vehicle in the case of devices of categories 3, 4, 5 and 6). In addition, for devices of category 6 an indication "R" or "L" shall in this case be shown on the device, indicating the right or left side of the vehicle.

4.2.2.3. To the right side of the symbol mentioned in paragraph 4.2.2.1. above; it shall be marked on each device:

(a) The additional letter "D", on devices which may be used as part of an assembly of two lamps.

(b) The additional letter "Y", on devices which may be used as part of an interdependent lamps system.

4.2.2.4. On devices with reduced light distribution in conformity to paragraph D 2.1.3. of Annex D to this standard a vertical arrow starting from a horizontal segment and directed downwards.

4.2.2.5. The two digits of the approval number which indicate the amendments at the time of issue of the approval and, if necessary, the required arrow may be marked close to the above additional symbols;

4.2.2.6. The marks and symbols referred to in paragraphs 4.2.1. and 4.2.2. above shall be clearly legible and be indelible even when the device is fitted in the vehicle.

4.3. **Arrangement of the approval mark**

4.3.1. Independent lamps

Annex 3, Figure 1, of UN R 06 gives an example of arrangement of the approval mark with the above-mentioned additional symbols.

If different types of lamps complying with the requirements of several Standards, use the same outer lens having the same or different colour, a single approval mark may be affixed, consisting of an approval number. This approval mark may be located anywhere on the lamp, provided that:

4.3.1.1. It is visible after their installation.

4.3.1.2 The identification symbol for each lamp appropriate to each standard under which approval has been granted, together with the corresponding amendments incorporating the most recent major technical amendments to the standard at the time of issue of the approval and if necessary, the required arrow shall be marked.

4.3.1.3. 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 under which approval has been granted.

4.3.1.4. The main body of the lamp shall include the space described in paragraph 3.3. above and shall bear the approval mark of the actual function(s).

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 standards, a single approval mark may be applied as per the provisions of AIS-037. 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 after the installation of the lamps;

4.3.2.1.2. no part of the grouped, combined or reciprocally incorporated lamps that transmits light may be removed without at the same time removing the approval mark.

4.3.2.2. An identification symbol for each lamp appropriate to each standard under which approval has been granted, together with the corresponding amendments incorporating the most recent major technical amendments to the standard 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 standard under which approval has been granted.

4.3.3. Lamps reciprocally incorporated with other lamps, of which the lens may also be used for other types of headlamps

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 3.3. 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.

4.4. 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 may not 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.

5. GENERAL SPECIFICATIONS

The requirements contained in sections 5. "General specifications" and 6. "Individual specifications" and in the Annexes referenced in the said sections of AIS standards i.e. AIS:008, AIS:009, AIS:062 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.

5.1. Each device supplied shall conform to the specifications set forth in paragraphs 6. and 8. below.

5.2. The devices shall be so designed and constructed that under normal conditions of use and notwithstanding the vibrations to which they may be subjected in such use, their satisfactory operation remains assured and they retain the characteristics prescribed by this standard.

5.3. In case of light source modules, it shall be checked that:

5.3.1. The design of the light source module(s) shall be such as:

(a) That each light source module may only be fitted in no other position than the designated and correct one and may 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 may not be interchanged within the same lamp housing.

5.3.2. The light source module(s) shall be tamperproof.

5.3.3. 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.

5.4. In case of failure of the variable intensity control of a direction indicator of category 2b emitting more than the maximum value of category 2a, requirements of steady luminous intensity of category 2a shall be fulfilled automatically.

5.5. In case of replaceable light sources(s):

5.5.1. The device 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."

5.5.2. The design of the device shall be such that the light source cannot be fixed in any other position but the correct one.

5.5.3. The light source holder shall conform to the characteristics given in IEC publication 60061. The holder data sheet relevant to the category of light source used, applies.

5.6. 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 Authority responsible for type approval, that demonstrates compliance of these non-replaceable filament lamp(s) with the requirements as specified in paragraph 4.11. of IEC 60809, Edition 3

5.6. For direction indicator lamps of categories 1, 1a, 1b, 2a or 2b the flash may be produced by sequential activation of their light sources if the following conditions are met:

(a) Each light source, after its activation, shall remain lit until the end of the ON cycle;

(b) The sequence of activation of the light sources shall produce a signal which proceeds in a uniform progressive manner from inboard towards the outboard edge of the light emitting surface;

(c) It shall be one signal with no interruption and no vertical oscillations (e.g. not more than one change of direction along the vertical axis). The distance between two adjacent/tangential distinct parts of the light emitting surface of the sequential direction indicator shall not exceed 50mm, when measured perpendicularly to the reference axis, instead of the values defined in paragraph 5.7.2. of AIS :008. These interruptions of the signal shall not create any overlap in the vertical axis between the different parts, from inboard towards the outboard of the vehicle, and shall not be used for any other lighting or light signalling functions;

(d) The variation shall finish no more than 200 ms after the beginning of the ON cycle;

(e) The orthogonal projection of the light emitting surfaces of the direction indicator in the direction of the axis of reference shall be circumscribed by a rectangle on a plane normal to the axis of reference and having its longer sides parallel to the H-plane. The ratio of the horizontal to the vertical sides shall not be less than 1.7.

Compliance to the conditions mentioned above shall be verified in flashing mode.

5.7. An interdependent lamp system shall meet the requirements when all its interdependent lamps are operated together.

However, if the interdependent lamp system providing the rear direction indicator function is partly mounted on the fixed component and partly mounted on a movable component, the interdependent lamp(s) specified by the Applicant shall meet the geometric visibility, colorimetric and photometric requirement, at all fixed positions of the movable component(s). This does not apply to interdependent direction indicator lamp(s) intended for fitting on vehicle(s) where, to fulfil or complete the geometric visibility angle, additional lamps are activated when the movable component is in any fixed open position, provided that these additional lamps satisfy all the position, photometric and colorimetric requirements applicable to the direction indicator lamps installed on the movable component.

6. INTENSITY OF LIGHT EMITTED

6.1. The light emitted by each of the two lamps supplied must be in the case of direction indicators of categories 1, 1a, 1b, 2a, 2b in the reference axes, in the case of direction indicators of categories 5 or 6 in direction A according to Annex A of not less than the minimum intensity and of not more than the maximum intensity specified below:

Direction indicator of category	*Minimum luminous intensity in cd*	*Maximum luminous intensity in cd when used as*	
		Single lamp	*Lamp (single) marked "D" (see paragraph 4.2.2.3. above)*
1	175	1000	500
1a	250	1200	600
1b	400	1200	600
2a (steady)	50	500	250
2b (variable)	50	1000	500
5	0.6	280	140
6	50	280	140

6.1.1. For an assembly of two or more direction indicator lamps the total intensity shall not exceed the maximum value.

6.1.2. When an assembly of two lamps marked "D" having the same function is deemed to be a single lamp it shall comply with the requirements for:

(a) Maximum intensity when all lamps together are lit ;
(b) Minimum intensity if one lamp has failed.

6.2. In case of failure of a single lamp of the categories 1, 1a, 1b, 2a and 2b, containing more than one light source the following provisions shall apply:

6.2.1. 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.

6.2.2. A signal for activation of the tell-tale prescribed in paragraph 6.5.8 of AIS-008 (Rev. 1) shall be produced if:

(a) Any one light source has failed or

(b) In case of a lamp designed for only two light sources, the intensity in the axis of reference is less than 50 per cent of the minimum intensity, or

(c) As a consequence of a failure of one or more light sources, the intensity in one of the following directions as indicated in Annex D to this standard is less than the minimum intensity required:

(i) H= 0°, V=0°
(ii) H=20° to the outside of the vehicle, V= +5°
(iii) H=10° to the inside of the vehicle, V= 0°.

6.3. Outside the reference axis, within the angular fields specified in the arrangement diagrams in Annex A to this standard, the intensity of the light emitted by each of the two devices supplied shall:

6.3.1. In each direction corresponding to the points in the relevant table of luminous-intensity distribution reproduced in Annex D to this standard, be not less than the minimum specified in paragraph 6.1. above multiplied by the percentage specified in the said table for the direction in question;

6.3.1.1. In divergence from paragraphs 6.3. and 6.3.1., for categories 5 direction indicators, to the rear, a minimum value of 0.6 cd is required throughout the fields specified in Annex A;

6.3.2. In no direction within the area from which the indicator lamp is visible, exceed the maximum specified in paragraph 6.1. above;

6.3.3. Moreover,

6.3.3.1. Throughout the fields defined in the diagrams in Annex A, the intensity of the light emitted shall be not less than 0.7 cd for devices of category 1b, not less than 0.3 cd for devices of categories 1, 1a, 2a, 2b, towards the front and for those of category 2b by day; it shall not be less than 0.07 cd for devices of category 2b by night;

6.3.3.2. The provisions of D 2.2 to this standard on local variations of intensity shall be observed.

6.4. In general the intensities shall be measured with the light source(s) continuously alight.

However, depending on the construction of the device, for example, the use of light-emitting diodes (LED), or the need to take precautions to avoid overheating, it is allowed to measure the lamps in flashing mode.

This shall be achieved by switching with a frequency of $f = 1.5 \pm 0.5$ Hz with the pulse width greater than 0.3 s, measured at 95 per cent peak light intensity.

In the case of replaceable filament lamps, the filament lamps shall be operated at reference luminous flux during on time.

In the case of LED light sources all measurements shall be made at 6.75 V, 13.5 V or 28.0 V; the luminous flux value produced during on time shall be corrected. The correction factor is the ratio between the objective luminous flux and the value of the luminous flux during on time found at the voltage applied.

In all other cases the voltage as required in paragraph 7.1.1. shall be switched with a rise time and fall time shorter than 0.01 s; no overshoot is allowed.
In the case of measurements taken in flashing mode the reported luminous intensity shall be represented by the maximum intensity.

6.5. In the case of devices of category 2b the time that elapses between energising the light source(s) and the light output measured on the reference axis to reach 90 per cent of the value measured in accordance with paragraph 6.3. above shall be measured for the extreme levels of luminous intensity produced by the direction indicator. The time measured to obtain the lowest luminous intensity shall not exceed the time measured to obtain the highest luminous intensity.

6.6. The variable intensity control shall not generate signals which cause luminous intensities:

6.6.1. Outside the range specified in paragraph 6.1. above and

6.6.2. Exceeding the category 2a maximum specified in paragraph 6.1.:

(a) For systems depending only on daytime and night time conditions: under night time conditions

(b) For other systems: under reference conditions as demonstrated by the manufacturer 1/.

6.7. Annex D, referred to in paragraph 6.2.1. above, gives particulars of the measurement methods to be used.

7. TEST PROCEDURE

7.1. All measurements, photometric and colorimetric, shall be made:

7.1.1. In the case of a lamp with replaceable light source, if not supplied by an electronic light source control gear or a variable intensity control, 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 lamp(s), it is necessary to produce the reference luminous flux required for that category of filament lamp;

(b) In the case of LED light source(s) of 6.75 V, 13.5 V or 28.0 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.

7.1.2. In the case of a lamp equipped with non-replaceable light sources (filament lamps and other), at 6.75 V, 13.5 V or 28.0 V respectively.

1/ Good visibility (meteorological optical range MOR > 2,000 m defined according to WMO, Guide to Meteorological Instruments and Methods of Observation, Sixth Edition, ISBN: 92-63-16008-2, pp 1.9.1/1.9.11, Geneva 1996) and clean lens.

7.1.3. In the case of a system that uses an electronic light source control gear or a variable intensity control, being part of the lamp [1/] 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.

7.1.4. In the case of a system that uses an electronic light source control gear or a variable intensity control, not being part of the lamp with the voltage declared by the manufacturer applied to the input terminals of the lamp.

7.2. However in the case of a direction indicator of category 2b operated by a variable intensity control to obtain variable luminous intensity, photometric measurements shall be performed according to the lamp manufacturer's description.

7.3. The test laboratory shall require from the manufacturer the light source control gear or a variable intensity control needed to supply the light source and the applicable functions.

7.4. The voltage to be applied to the lamp shall be noted in the application for approval Annex B of this standard.

7.5. The limits of the apparent surface in the direction of the reference axis of a light-signalling device shall be determined. However, in the case of category 5 and 6 direction indicators, the limits of the light emitting surface shall be determined.

8. COLOUR OF LIGHT EMITTED

The colour of the light emitted inside the field of the light distribution grid defined in paragraph D 2. of Annex D shall be amber. For testing see Annex E to this standard. Outside this field, no sharp variation of colour shall be observed. These requirements shall also apply within the range of variable luminous intensity produced by direction indicators of category 2b.

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 7.1. of this Standard.

1/ For the purpose of this standard "being part of the lamp" means to be physically included in the lamp body or to be external, separated or not, but supplied by the lamp manufacturer as part of the lamp system.

9. MODIFICATIONS OF THE TYPE OF DIRECTION INDICATOR FOR MOTOR VEHICLES AND THEIR TRAILERS AND EXTENSION OF APPROVAL

9.1. Every modification pertaining to the information, even if the changes are not technical in nature declared in accordance with para. 2 of this standard shall be intimated by the manufacturer 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,

9.1.1. The device with changed specification still complies with provisions, or

9.1.2. Any further verification is required to establish compliance.

9.2. For considering whether testing is required or not, guidelines given in criteria for extension of approval shall be used.

9.3. In case of 9.1.2 above for further verification, only those parameters which are affected by the modifications need be carried out.

9.4. In case of fulfilment of 9.1.1 or 9.1.2 above, the approval for compliance shall be extended for the changes carried out.

9.5 CRITERIA FOR EXTENSION OF APPROVAL

The criteria shall be as agreed between the test agency and lamp manufacturer.

10. CONFORMITY OF PRODUCTION

10.1 Direction indicators shall be so manufactured as to conform to the type approved under this Regulation.

The compliance with the requirements set forth in paragraphs 6. and 8. above shall be verified as follows

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

10.1.1.1. During the verification as per 10.2, if tests are required, the following tests shall be carried out:

10.1.1.1.1. Intensity of light emitted (See 6).

10.1.1.1.2. Colour of light emitted (See 8).

10.1.2 Devices with apparent defects are disregarded.

10.2 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.

10.3. The reference mark is disregarded.

10.4. The normal frequency of these verifications shall be once every two years.

11. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

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

12. Reserved

13. Reserved

14. TRANSITIONAL PROVISIONS

14.1 At the request of the applicant, type approvals for compliance to AIS-012(Part 5)(Rev. 2): 20xx shall be granted by test agencies from (date of adoption of this standard in CMVR-TSC). Such type approvals shall be deemed to be compliant to AIS-012 (Part 5) (Rev.2):2021

14.2 At the request of applicant, type approval to the compliance to AIS- AIS 012(Part 5)(Rev. 2): 2021 shall be granted up to the notified date of implementation of AIS-012(Part 5)(Rev. 2): 20XX

14.3 Type approvals issued for compliance to AIS-012 (Part 5) (Rev.2):2021 shall be extended to approval of AIS-012(Part 5) (Rev. 2): 20XX subject to satisfactory compliance to the requirements of this standard.

15. ESTABLISHING COMPLIANCE OF "E"/"e" APPROVED DIRECTION INDICATORS TO THIS STANDARD

15.1. As an exception to 7.4 of AIS-037 (or related administrative decisions) for certifying compliance of "E"/"e" approved direction indicators to this standard, the following test shall be carried out by testing agency.

15.1.1. Photometric requirements measured with a standard filament lamp as referred to in 7 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 6.0.

15.1.2. Colorimetric requirements shall be specified in 8.0 within the limits specified.

16. AMENDMENTS TO ECE REGULATION 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 2.1)

CATEGORIES OF DIRECTION INDICATORS: MINIMUM ANGLES REQUIRED FOR LIGHT DISTRIBUTION IN SPACE OF THESE CATEGORIES OF DIRECTION INDICATORS 1/

In all cases, the minimum vertical angles of light distribution in space of direction indicator lamps are 15° above and 15° below the horizontal except:

(a) Direction indicator lamps intended to be installed with the H plane of the lamp at a mounting height of less than 750 mm above the ground, for which they are 15° above and 5° below the horizontal;

(b) Optional direction indicator lamps intended to be installed with the H plane of the lamp at a mounting height of more than 2100 mm above the ground, for which they are 5° above and 15° below the horizontal;

(c) Direction indicator lamps of Category 6, for which they are 30° above and 5° below the horizontal.

MINIMUM HORIZONTAL ANGLES OF LIGHT DISTRIBUTION IN SPACE:

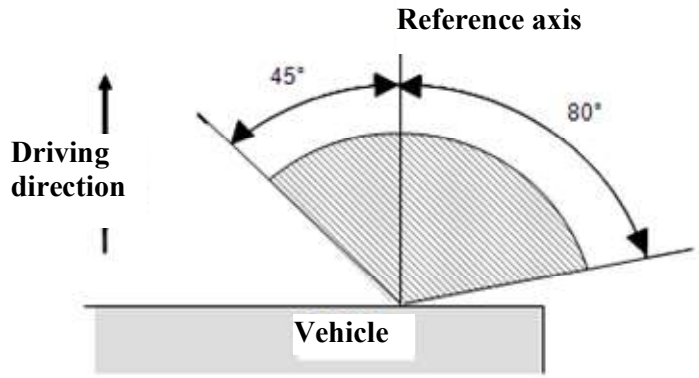
Categories 1, 1a and 1b: Direction indicators for the front of the vehicle

Category 1: For use at a distance not less than 40 mm from the headlamp and/or the front fog lamp

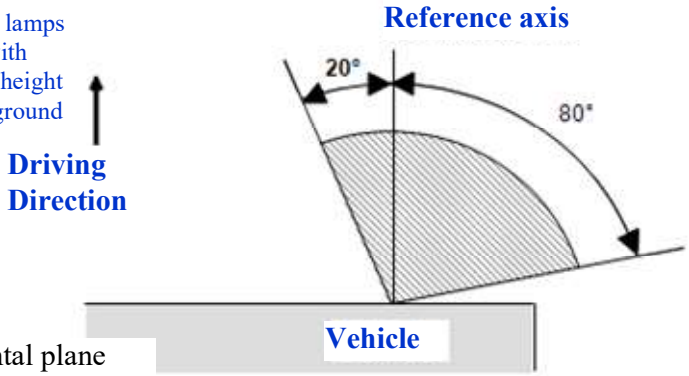
Category 1a: For use at a distance greater than 20 mm but less than 40 mm from the headlamp and/or the front fog lamp

Category 1b: For use at a distance less than or equal to 20 mm from the dipped-beam headlamp and/or the front fog lamp

1/ The angles shown in these arrangements are correct for devices to be mounted on the right side of the vehicle. The arrows in these diagrams point towards the front of the vehicle.



Under the H plane for for lamps intended to be installed with this plane at as mounting height less than 750 mm above ground

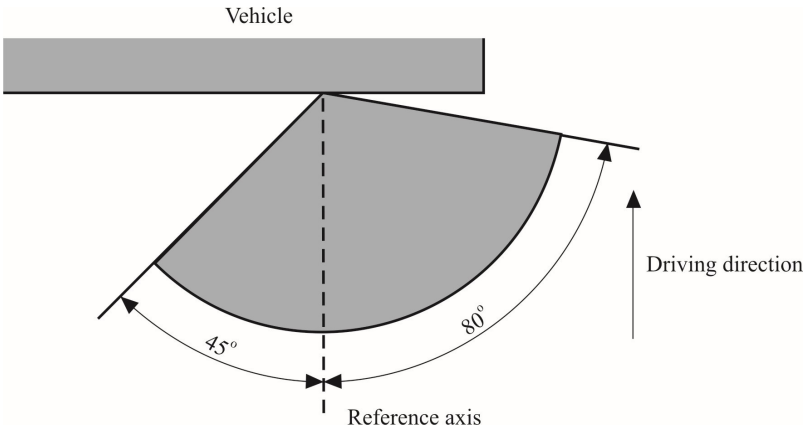


H plane: "horizontal plane going through the reference centre of the lamp"

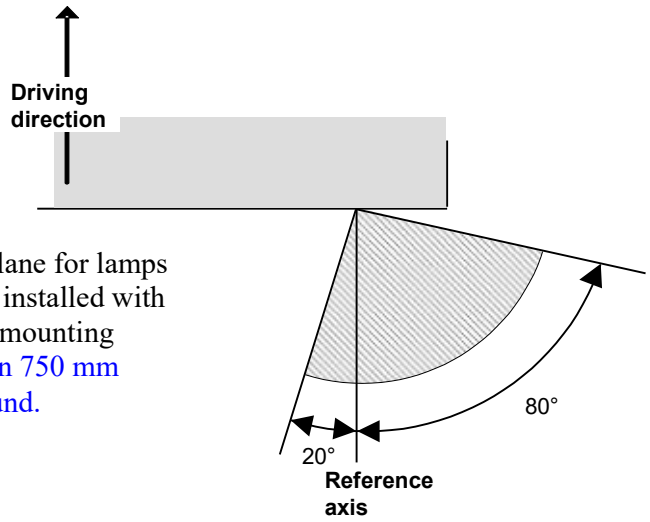
Categories 2a and 2b: Direction indicators for the rear of the vehicle

Category 2a: Rear direction indicator lamps with steady luminous intensity

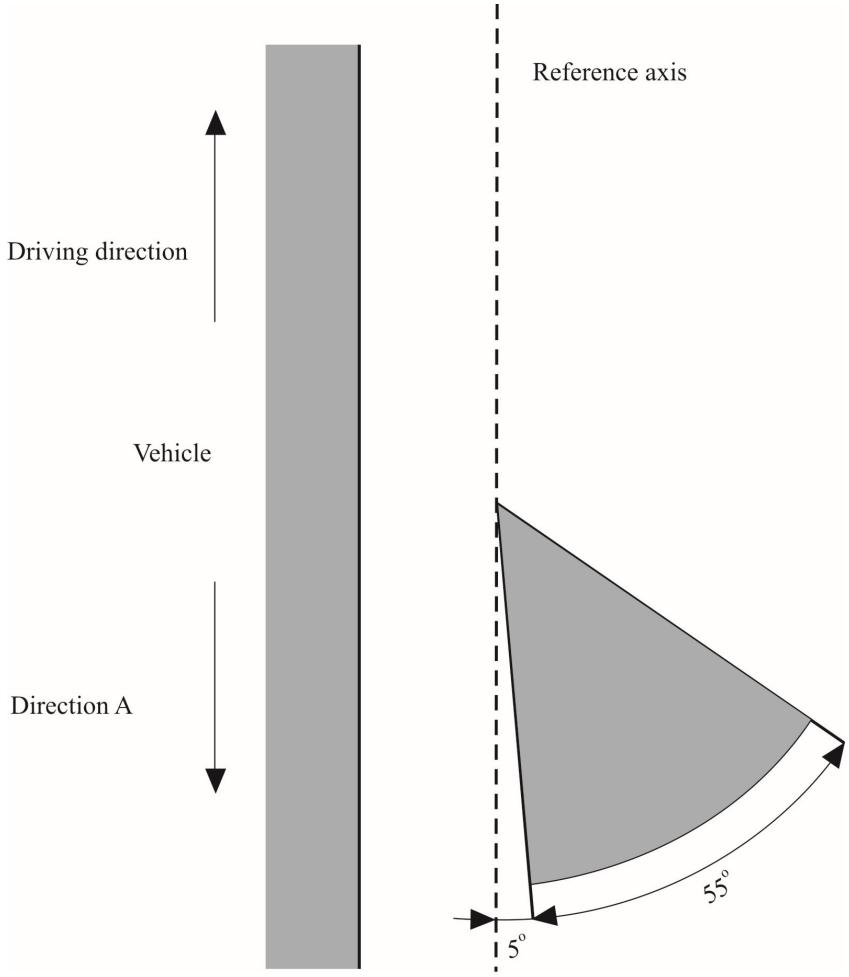
Category 2b: Rear direction indicator lamps with variable luminous intensity



Under the H plane for lamps intended to be installed with this plane at a mounting height less than 750 mm above the ground.



Categories 5 and 6: **Supplementary side direction indicators** for use on a vehicle also equipped with categories 1, 1a or 1b and 2a or 2b direction indicators



ANNEX B
(See 2.0)

APPLICATION FOR APPROVAL

Technical Information to be submitted by the Applicant at the time of Approval

B 1. Trade name or mark of the device: .....

B 2. Manufacturer's name for the type of device: .....

B 3. Manufacturer's name and address: .....

B 4. If applicable, name and address of the manufacturer's representative: .....

B 5. Submitted for approval on: .....

B 6. Concise description:

Category: 1, 1a, 1b, 2a, 2b, 5, 6 [1/], [2/]

Number, category and kind of light source(s): .....

Function(s) produced by an interdependent lamp forming part of an interdependent lamps system:.....

Voltage and wattage: .....

Light source module specific identification code: .....

Only for limited mounting height of equal to or less than 750 mm above the ground: yes/no [1/]

Geometrical conditions of installation and relating variations, if any: .....

Application of an electronic light source control gear/variable intensity control:

(a) Being part of the lamp: yes/no [1/]

(b) Being not part of the lamp: yes/no [1/]

Input voltage(s) supplied by an electronic light source control gear/variable intensity control:

Electronic light source control gear/variable intensity control manufacturer and identification number (when the light source control gear is part of the lamp but is not included into the lamp body): .....

Variable luminous intensity: yes/no [1/]

Sequential activation of light sources
(see paragraph 5.6. of this Standard): yes/no[2]

B 7 Position of the approval mark: .....

B 8. Reason(s) for extension (if applicable): .....

B 9. Approval granted/extended/refused/non conformity established: 1/

B 10. Place: .....

B 11. Date: .....

B 12. Signature: .....

B 13. The list of documents deposited with the Administrative Service which has granted approval is annexed to this communication and may be obtained on request.

1/ Strike out what does not apply.

2/ For direction indicator lamps of categories 1, 1a, 1b, 2a, and 2b, information regarding the signal according to paragraph 6.4.2.

ANNEX C
(Reserved)

ANNEX D

(See 6.2.2)

PHOTOMETRIC MEASUREMENTS

D 1. MEASUREMENT METHODS

D 1.1. During photometric measurements, stray reflections shall be avoided by appropriate masking.

D 1.2. In case the results of measurements should be challenged, measurements shall be carried out in such a way as to meet the following requirements:

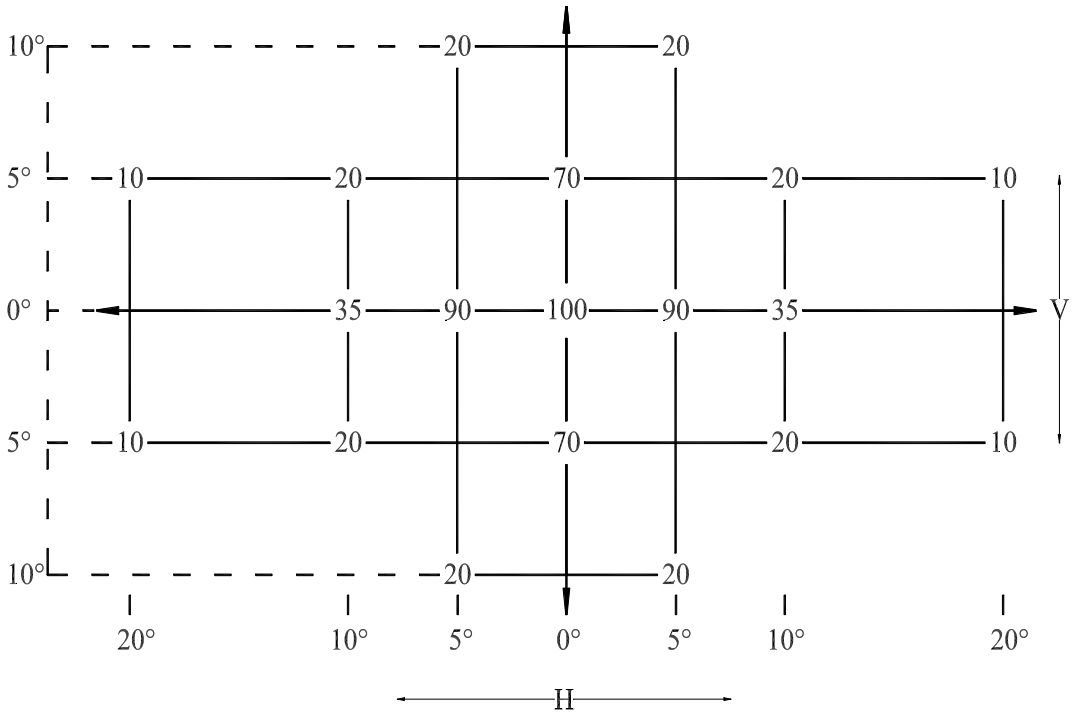
D 1.2.1. The distance of measurement shall be such that the law of the inverse of the square of the distance is applicable;

D 1.2.2. The measuring equipment shall be such that the angular aperture of the receiver viewed from the reference centre of the light is comprised between 10' and 1 degree;

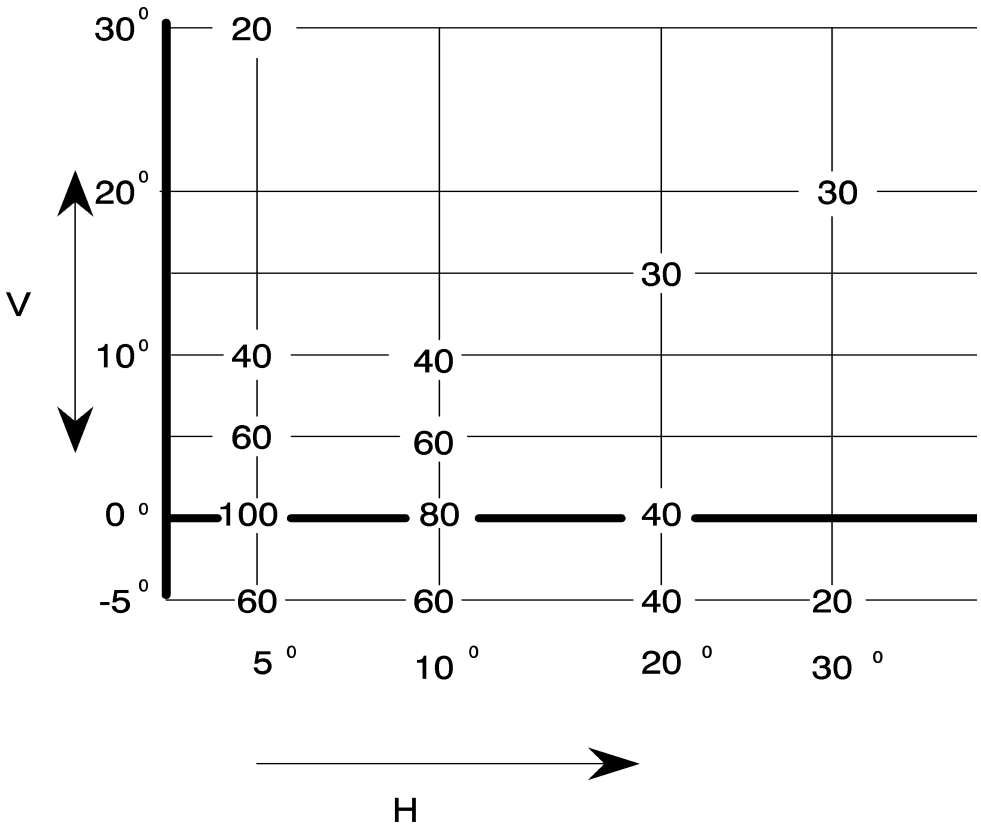
D 1.2.3. The intensity requirement for a particular direction of observation shall be deemed to be satisfied if that requirement is met in a direction deviating by not more than one-quarter of a degree from the direction of observation.

D 1.3. 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.

D 2. TABLE OF STANDARD LIGHT DISTRIBUTION IN SPACE FOR DIRECTION INDICATOR LAMPS OF CATEGORIES 1, 1A, 1B, 2A, 2B



For direction indicators of category 6



(outer side of the vehicle)

D 2.1. The direction H = 0° and V = 0° corresponds to the reference axis. (On the vehicle, it is horizontal, parallel to the median longitudinal plane of the vehicle and oriented in the required direction of visibility.) It passes through the centre of reference. The values shown in the tables give, for the various directions of measurement, the minimum intensities as a percentage of the minimum intensities required in the table in paragraph 6.1.:

D 2.1.1. In the direction H = 0° and V = 0° for categories 1, 1a, 1b, 2a, 2b and in the case of category 5 in the angular area in the direction A as prescribed in Annex A

D 2.1.2. In the direction H = 5° and V = 0° for category 6.

D 2.1.3. However, in the case where a 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.

D 2.2. Within the field of light distribution of paragraph D2., schematically shown as a grid, the light pattern should be substantially uniform, i.e. in so far as the light intensity in each direction of a part of the field formed by the grid lines shall meet at least the lowest minimum value being shown on the grid lines surrounding the questioned direction as a percentage.

D 3. PHOTOMETRIC MEASUREMENT OF LAMPS

The photometric performance shall be checked:

D 3.1. For non-replaceable light sources (filament lamps and other):

With the light sources present in the lamp, in accordance with the relevant sub-paragraph of paragraph 7.1. of this standard.

D 3.2. For replaceable Light source:

When equipped with Light source at 6.75 V, 13.5 V or 28.0 V, the luminous intensity values produced shall be corrected. For filament lamp, 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 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.

D 3.3. For any direction indicator lamp except those equipped with filament lamp(s), the luminous intensities measured after one minute and after 30 minutes of operation in flashing mode (f = 1.5 Hz, duty factor 50 per cent), shall comply with the minimum and maximum requirements. The luminous intensity distribution after one minute of operation may be calculated by applying at each test point the ratio of luminous intensity measured in HV after one minute and after 30 minutes of operation as above described.

ANNEX E

(See 8.0)

COLOUR OF AMBER LIGHTS

For checking these colorimetric characteristics, the test procedure described in paragraph 7. of this standard shall be applied.

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 the relevant sub-paragraph of paragraph 7.1. of this standard.

The limits of chromatic co-ordinates for Amber light are as specified in AIS-010 (Part 5)(Rev. 2).

ANNEX F

(See 10.)

MINIMUM REQUIREMENTS FOR CONFORMITY OF PRODUCTION CONTROL PROCEDURES

F 1. GENERAL

F 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 standard.

F 1.2. With respect to photometric performances, the conformity of mass-produced lamps shall not be contested if, when testing photometric performances of any lamp chosen at random according to paragraph 7. of this standard of any lamp chosen at random.

F 1.2.1. No measured value deviates unfavourably by more than 20 per cent from the values prescribed in this standard of a direction indicator of categories 1, 1a, 1b, 2a, 2b and 6.

In the case of a direction indicator of category 5 and for the minimum values required throughout the fields specified in Annex 1 the respective maximum deviations of the measured values shall correspond to the values shown in the table below:

Required minimum value	*Equivalent 20 per cent*	*Equivalent 30 per cent*
cd	*cd*	*cd*
0.7	0.2	0.4
0.6	0.2	0.4
0.3	0.1	0.2
0.07	0.02	0.04

F 1.2.2. If, in the case of a direction indicator equipped with a replaceable light source and if results of the test described above do not meet the requirements, tests on direction indicators shall be repeated using another standard light source.

F 1.3. With respect to colorimetric performance, the requirements set out in paragraph 7. of this standard shall be complied with.

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."

F 2. MINIMUM REQUIREMENTS FOR VERIFICATION OF CONFORMITY BY THE MANUFACTURER

For each type of direction indicator the lamp manufacturer 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.

F 2.1. Nature of tests

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

F 2.2. Methods used in tests

F 2.2.1. Tests shall generally be carried out in accordance with the methods set out in this standard.

F 2.2.2. 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.

F 2.2.3. 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.

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

F 2.3. Nature of sampling

Samples of direction indicators shall be selected at random from the production of a uniform batch. A uniform batch means a set of direction indicators 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.

F 2.4. **Measured and recorded photometric characteristics**

The sampled lamp shall be subjected to photometric measurements for the minimum values at the points listed in Annex D, and the chromaticity coordinates.

F 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 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 10 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

G 1. GENERAL

G 1.1. 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.

G 1.2. With respect to photometric performance, the conformity of mass-produced lamps shall not be contested if, when testing according to paragraph 7. of this Standard, the photometric performances as set forth in paragraph 6. of this Standard n of any lamp chosen at random:"

G 1.2.1. According to the requirements in paragraph 1.2.1. of Annex F to this Regulation depending on the prevailing class of direction indicator lamps are met

G 1.2.2. If, in the case of a direction indicator equipped with a replaceable light source and if results of the test described above do not meet the requirements, tests on direction indicators shall be repeated using another standard light source.

G 1.2.3. Direction indicators with apparent defects are disregarded.

G 1.3. The chromaticity coordinates shall be complied when tested under conditions of paragraph 7. of this standard.

G 2. FIRST SAMPLING

In the first sampling four 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 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.

G2.2. 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.

G3. 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.

G3.1. 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.

G3.2. The conformity of mass-produced lamps shall be contested if the deviation of at least.

G3.2.1. 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.

G3.2.2. 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.

G4. 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.

G4.1. 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.

G4.2. 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.

G5. Approval withdrawn

Approval shall be withdrawn according to paragraph 11. of this Standard.

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)