

AUTOMOTIVE INDUSTRY STANDARD

**Requirements of
Chromaticity Co-ordinates of
Colour of Light emitted from
Lighting and Light-Signalling Devices**

(Revision 1)

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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

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INTRODUCTION

- 0 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.
- 0.1 Accordingly AIS-010 covering mandatory requirements regarding colour chromaticity co-ordinates requirements for lighting and light signalling devices for use in two and three wheelers has been published in 2004 and has been implemented thereafter in 2005.
- 0.2 With technological developments in lighting and light signalling devices, AIS-010 was taken up for revision and now is prepared in five parts.
This part covers the requirements of chromaticity co-ordinates for colour of light emitted from lighting and light signalling devices covered in other parts of AIS-010 (Rev.1)
- 0.3 This part is based on the ECE R 48 (Supplement 1 to the 04 series of amendments - Date of entry into force: 15 October 2008).
- 0.4 The colour coordinates used to be prescribed in each regulation individually. These has been now consolidated in ECE R48. Since the AIS-008- Installation Requirements of Lighting and Light-Signaling Devices for Motor Vehicle having more than Three Wheels, Trailer and Semi -Trailer excluding Agricultural Tractor and Special Purpose Vehicle is based on ECE R48 is not yet aligned to that level, this part is prepared for giving cross reference of this standard in other standards for 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 A and Annex B respectively.

**Requirements of Chromaticity Co-ordinates of Colour of Light emitted
from Lighting and Light-Signalling Devices**

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Requirements of Chromaticity Co-ordinates of Colour of Light emitted from Lighting and Light-Signalling Devices

1. SCOPE

This standard applies to requirement of chromaticity coordinates of colour of light emitted from lighting and light signalling devices used in motor vehicles.

Note: Test procedure for colour measurement of light emitted from lighting & light signalling devices is given in respective part of the standard.

2. CHROMATICITY COORDINATES FOR WHITE

White" means the chromaticity coordinates (x,y) ^{1/} of the light emitted that lie inside the chromaticity areas defined by the boundaries:

| | | |
|-----------------|---------------------------|-----------------------|
| W ₁₂ | green boundary: | $y = 0.150 + 0.640 x$ |
| W ₂₃ | yellowish green boundary: | $y = 0.440$ |
| W ₃₄ | yellow boundary: | $x = 0.500$ |
| W ₄₅ | reddish purple boundary: | $y = 0.382$ |
| W ₅₆ | purple boundary: | $y = 0.050 + 0.750 x$ |
| W ₆₁ | blue boundary: | $x = 0.310$ |

with intersection points:

| | x | y |
|------------------|-------|-------|
| W ₁ : | 0.310 | 0.348 |
| W ₂ : | 0.453 | 0.440 |
| W ₃ : | 0.500 | 0.440 |
| W ₄ : | 0.500 | 0.382 |
| W ₅ : | 0.443 | 0.382 |
| W ₆ : | 0.310 | 0.283 |

3. CHROMATICITY COORDINATES FOR SELECTIVE YELLOW

"Selective-yellow" means the chromaticity coordinates (x, y) ^{1/} of the light emitted that lie inside the chromaticity areas defined by the boundaries:

| | | |
|------------------|---------------------------|-----------------------|
| SY ₁₂ | green boundary: | $y = 1.290 x - 0.100$ |
| SY ₂₃ | the spectral locus | |
| SY ₃₄ | red boundary: | $y = 0.138 + 0.580 x$ |
| SY ₄₅ | yellowish white boundary: | $y = 0.440$ |
| SY ₅₁ | white boundary: | $y = 0.940 - x$ |

with inters:

| | x | y |
|-------------------|-------|-------|
| SY ₁ : | 0.454 | 0.486 |
| SY ₂ : | 0.480 | 0.519 |
| SY ₃ : | 0.545 | 0.454 |
| SY ₄ : | 0.521 | 0.440 |
| SY ₅ : | 0.500 | 0.440 |

^{1/} CIE Publication 15.2.1986, Colorimetry, the CIE 1931 standard colorimetric observer.

4. CHROMATICITY COORDINATES FOR AMBER

"Amber" means the chromaticity coordinates (x,y)^{1/} of the light emitted that lie inside the chromaticity areas defined by the boundaries:

| | | |
|-----------------|--------------------|-----------------------|
| A ₁₂ | green boundary: | $y = x - 0.120$ |
| A ₂₃ | the spectral locus | |
| A ₃₄ | red boundary: | $y = 0.390$ |
| A ₄₁ | white boundary: | $y = 0.790 - 0.670 x$ |

with intersection points:

| | x | Y |
|------------------|-------|-------|
| A ₁ : | 0.545 | 0.425 |
| A ₂ : | 0.560 | 0.440 |
| A ₃ : | 0.609 | 0.390 |
| A ₄ : | 0.597 | 0.390 |

5. CHROMATICITY COORDINATES FOR RED

"Red" means the chromaticity coordinates (x, y)^{1/} of the light emitted that lie inside the chromaticity areas defined by the boundaries:

| | | |
|-----------------|--------------------|---|
| R ₁₂ | yellow boundary: | $y = 0.335$ |
| R ₂₃ | the spectral locus | |
| R ₃₄ | the purple line | (its linear extension across the purple range of colours between the red and the blue extremities of the spectral locus). |
| R ₄₁ | purple boundary: | $y = 0.980 - x$ |

with intersection points:

| | x | y |
|------------------|-------|-------|
| R ₁ : | 0.645 | 0.335 |
| R ₂ : | 0.665 | 0.335 |
| R ₃ : | 0.735 | 0.265 |
| R ₄ : | 0.721 | 0.259 |

^{1/} CIE Publication 15.2.1986, Colorimetry, the CIE 1931 standard colorimetric observer.

ANNEX A

(See Introduction)

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

| Convener | |
|-----------------------|--|
| Mr. T. M. Balaraman | Bajaj Auto Ltd., (SIAM) |
| Members | Representing |
| Mr. A. S. Bhale | The Automotive Research Association of India (ARAI) |
| 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) |
| Dr. Madhusudan Joshi | International Centre for Automotive Technology (ICAT) |
| Mr. G.R.M. Rao | Vehicle Research & Dev. Estt. (VRDE) |
| Dr. N. Karuppaiah | National Automotive Testing and R&D Infrastructure Project (NATRIP) |
| Mr. K. K. Gandhi | Society of Indian Automobile Manufacturers (SIAM) |
| Mr. G. K. Binani | Society of Indian Automobile Manufacturers (SIAM) (Tata Motors Ltd) |
| Mr. P. K. Banerjee | Society of Indian Automobile Manufacturers (SIAM) (Tata Motors Ltd) |
| Mr. R. M. Kanitkar | Society of Indian Automobile Manufacturers (SIAM) (Force Motors Ltd.) |
| Mr. Z. A. Mujawar | Society of Indian Automobile Manufacturers (SIAM) (Mahindra and Mahindra Ltd) |
| Mr. Nagendra H. V. | Society of Indian Automobile Manufacturers (SIAM) (Toyota Kirloskar Motor Pvt. Ltd) |
| Mr. Prakash Vemali | Society of Indian Automobile Manufacturers (SIAM) (Mercedes Benz India Ltd.) |
| Mr. Jitendra Malhotra | Society of Indian Automobile Manufacturers (SIAM) (Maruti Suzuki India Ltd) |
| Mr. Sumit Sharma | Society of Indian Automobile Manufacturers (SIAM) (Volkswagen India Private Ltd.) |
| Mr. Harjeet Singh | Society of Indian Automobile Manufacturers (SIAM) (Hero Honda Motors Ltd) |
| Mr. Harsh Agrawal | Society of Indian Automobile Manufacturers (SIAM) (Hero Honda Motors Ltd) |

| | |
|------------------------------|--|
| Mr. S Ramiah | Society of Indian Automobile Manufacturers (SIAM) (TVS Motor Company Limited) |
| 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) |
| Mr. Rajagopalan | FIEM Industries Ltd. (ACMA) |
| Mr. Virendra Sachdev | Lumax Industries Ltd. (ACMA) |
| Mr. Sagar Kulkarni | Rinder India Pvt. Ltd. (ACMA) |
| Mr. T. V. Singh | Bureau of Indian Standards (BIS) |
| 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 B
(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 |
| Shri S. M. Ahuja | Office of the Development Commissioner, MSME, Ministry of Micro, Small & Medium Enterprises, New Delhi |
| Shri T. V. Singh | Bureau of Indian Standards, New Delhi |
| Director Shri D. P. Saste (Alternate) | Central Institute of Road Transport, Pune |
| Dr. M. O. Garg | Indian Institute of Petroleum, Dehra Dun |
| Shri C. P. Ramnarayanan | Vehicles Research & Development Establishment, Ahmednagar |
| Representatives from | Society of Indian Automobile Manufacturers |
| Shri T.C. Gopalan | Tractor Manufacturers Association, New Delhi |
| Shri K.N.D. Nambudiripad | Automotive Components Manufacturers Association of India, New Delhi |

Member Secretary
Mrs. Rashmi Urdhwareshe
Deputy Director
The Automotive Research Association of India, Pune

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