

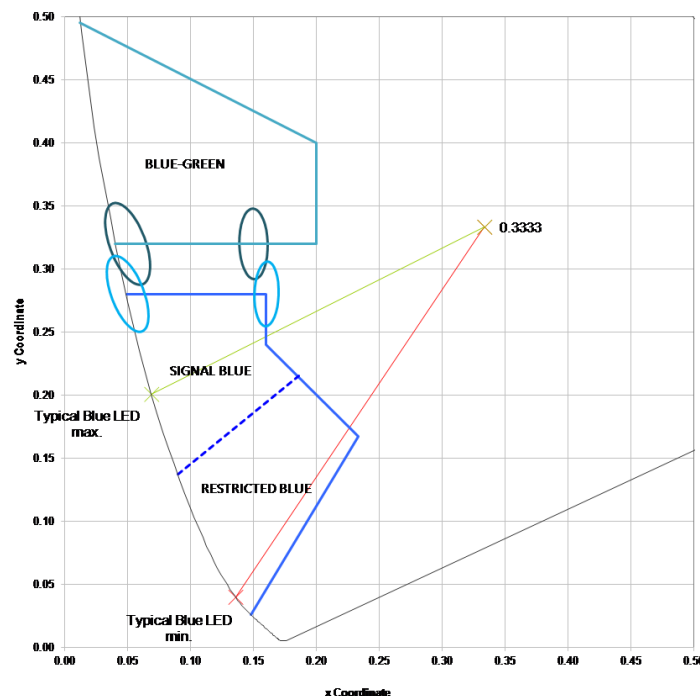
(R) Chromaticity Requirements for Ground Vehicle Lamps and Lighting Equipment

RATIONALE

The title of the document was revised to better describe the content.

Added 3.1.6 to define a “blue-green” color space for use by automated driving system (ADS) lamps as specified in SAE J3134. Figure 1 was also revised to reflect this addition.

In 3.1.5.2, the signal blue color space boundary toward green was changed from $y = 0.320$ to $y = 0.280$. This change was made to minimize the likelihood that blue-green sources would be mistaken for signal blue sources and vice versa. The signal blue color space boundary toward green falls outside the limits of seven-step MacAdam ellipses originating at points along the blue-green color space boundary toward blue to ensure a visible color difference. Figure 1 was also revised to reflect this change.



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The references to warning device reflex reflectors were removed from the document since both SAE J774 and CFR Title 49 Part 571.125 contain color specifications and neither reference this standard. Consequently, 2.1.1 (SAE Publications) and A.3 were deleted and subsequent entries renumbered.

In 2.1.3, the CIE 1931 reference was replaced with references to CIE 15 and CIE S 014-1/E. CIE 1931 is a color space, not a document. The newly referenced documents contain the CIE 1931 color space definition.

In 4.1, the sentence concerning operating temperature was deleted.

Added A.4, which contains the equations used to convert coordinates from the CIE 1976 u'v' color space to the CIE 1931 xy color space. The color boundaries defined in this document are plotted in the CIE 1976 u'v' color space and the equations are provided for the convenience of users of this document, since LM-80-15, "IES Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules," requires color measurement using the CIE 1976 u'v' color space and SAE J2938 requires the use of LM-80-15.

In 2.2.1, the document number was changed from IES TM-27-24 to IES TM-27-14 to correct the document reference.

In 3.1.2 and 3.1.3, some of the boundary point coordinates were changed to correct rounding errors in the original calculations.

Deleted A.3, since the color fluorescent orange is outside the scope of this document.

In 4.1.2, the sentence referring to a referee approach was deleted, since the spectrophotometric method is now the method commonly used by test labs.

1. SCOPE

This SAE Standard defines and provides a means for the control of colors employed in motor vehicle external lighting equipment, including lamps and reflex reflectors. The document applies to the overall effective color of light emitted by the device in any given direction, and not to the color of the light from a small area of the lens. It does not apply to pilot, indicator, or tell-tale lights.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 Code of Federal Regulations (CFR) Publications

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-1800, www.gpo.gov.

CFR Title 49 Part 571.108 Lamps, Reflective Devices and Associated Equipment (FMVSS 108)

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E308 Standard Practice for Computing the Colors of Objects by Using the CIE System

2.1.3 CIE Publications

Available from CIE Central Bureau, Babenbergerstrasse 9/9A, 1010 Vienna, Austria, Tel: +43 1 714 31 87, www.cie.co.at.

CIE 15 Colorimetry

CIE S 014-1/E Colorimetry - Part 1: CIE Standard Colorimetric Observers

2.2 Related Documents

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 IES Publications

Available from Illuminating Engineering Society, 120 Wall Street, Floor 17, New York, NY 10005-4001, Tel: 212-248-5000, www.ies.org.

IES TM-27-14 IES Standard Format for the Electronic Transfer of Spectral Data.

3. DEFINITIONS

3.1 CHROMATICITY COORDINATES

The fundamental requirements for color are expressed as chromaticity coordinates according to the CIE (1931) standard colorimetric system (see Figure 1). The following requirements shall apply when measured by the tristimulus or spectrophotometric methods.