SLOVENSKI STANDARD
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Železniške naprave - Zunanje vidne in zvočne opozorilne naprave - 1. del: Čelne, označevalne in sklepne luči za glavni tir

Railway applications - External visible and audible warning devices - Part 1: Head, marker and tail lamps for mainline rail

Bahnanwendungen - Externe optische und akustische Warneinrichtungen - Teil 1: Frontscheinwerfer, Spitzensignale und Zugschlusssignale für Eisenbahnfahrzeuge

Applications ferroviaires - Dispositifs externes d'avertissement optiques et acoustiques - Partie 1 : Signaux de face avant, signaux d'extrémité avant et signaux de face arrière pour les grandes lignes

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English Version

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 256.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN 15153-1:2017) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15153-1:2013+A1:2016.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC.

For relationship with EU Directive 2008/57/EC, see informative Annex ZA which is an integral part of this document.

The main changes with respect to the previous edition are:

— technical requirements have been brought in line with the conventional TSIs, and

— requirements have been revised to permit new technologies.

This series of documents *Railway applications — External visible and audible warning devices* consists of the following parts:

— *Part 1: Head, marker and tail lamps for mainline rail* (this document);

— *Part 2: Warning horns for mainline rail;*

— *Part 3: External visible warning devices for urban rail;*

— *Part 4: Warning horns for urban rail.*

Introduction

This European Standard was produced following the creation of prEN 15153-3 for urban rail vehicles. This European Standard was re-named to make a clear distinction between mainline rail and urban rail.

1 Scope

This European Standard defines the functional and technical requirements for head, marker and tail lamps for high speed trains and conventional trains, excluding road, metro and self-contained systems.

This European Standard also defines the requirements for testing and conformity assessment.

Portable lamps are excluded from the scope of this European Standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16186-2:2017, *Railway applications — Driver's cab — Part 2: Integration of displays, controls and indicators*

CIE 15:2004, *Colorimetry*[1)]

CIE 69:1987, *Methods of characterizing illuminance meters and luminance meters; performance, characteristics and specifications* [1)]

CIE 70:1987, *The measurement of absolute luminous intensity distributions* [1)]

ISO 11664-1:2007, *Colorimetry — Part 1: CIE standard colorimetric observers* [1)]

NOTE ISO 11664-1 was previously published as ISO 10527:2007, which has been withdrawn.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
high speed train
train which is designed to operate at speeds equal to or greater than 190 km/h

Note 1 to entry: This includes Class 1 and Class 2 high speed trains as defined in the EU Regulation 1302/2014 (2nd LOC and PAS TSI).

3.2
conventional train
train which is designed to operate at a maximum speed lower than 190 km/h and designed to travel on all or part of the conventional lines of the TEN (Trans-European rail system Network)

Note 1 to entry: See also 2nd LOC and PAS TSI §2.1.

[1)] Available from: International Commission of Illumination, CIE Central Bureau, Babenbergerstraße 9/9A, 1010 Vienna, AUSTRIA.

3.3
head lamp
device fitted to the front of the train that emits white light, intended to provide visual warning of an approaching train, and/or to illuminate the lineside

3.4
marker lamp
device fitted to the front of the train that emits white light, intended to indicate the presence of a train, to provide visual warning of an approaching train and/or to illuminate retro-reflective lineside signs

3.5
tail lamp
device fitted to the rear of the train that emits red light, intended to indicate the presence of a train, and to indicate the end of the complete train formation

3.6
light source
system for generating light in a lamp

3.7
CIE (1931) standard colorimetric system (x, y, z)
system for specifying colour by determining the tristimulus values of the spectral power distribution of a coloured light using the set of reference colour stimuli [X], [Y], [Z] and the three CIE colour matching functions x(λ), y(λ), z(λ), adopted by the CIE in 1931 (see CIE 15)

3.8
optical axis of lamp
axis defined by the manufacturer against which the luminous intensity requirements are assessed

3.9
centre-line of rails
line parallel and equidistant to the rails

[SOURCE: EN 13232-1:2003, modified]

3.10
lit area
active optical area of a lamp projected into a plane perpendicular to the optical axis

3.11
technical specification
document, describing specific parameter and/or product requirements as an addition to the requirements of this standard

4 Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply.

cd	Candela, the SI unit for luminous intensity
CIE	International Commission on Illumination
LED	Light Emitting Diode

RST	Rolling Stock
TEN	Trans-European rail system Network
TSI	Technical Specification for Interoperability relating to the rolling stock subsystem of the TEN
UIC	International Union of Railways

5 Requirements

5.1 General

The provision of lamps is specified in 5.2.

The technical requirements for head, marker and tail lamps are set out in 5.3, 5.4 and 5.5 (respectively).

The testing requirements are set out in Clause 6 and Annex A.

It should be noted that certain lighting technology degrades throughout its service life. It is important to ensure that the requirements in this European Standard are maintained.

5.2 Provision of lamps

A minimum of two white head lamps shall be installed at the front of the train.

Additionally, If required by the technical specification, a maximum of two upper head lamps may be installed.

Three white marker lamps shall be installed at the front of the train.

Two red tail lamps shall be installed at the rear of the train.

If required by the technical specification, additional tail lamp(s) and marker lamp(s) with special warning or signalling functions may be installed, provided that they comply with the prescribed optical requirements and that they do not adversely affect the parameters given in this European Standard.

Combined lamps (i.e. lamps capable of different functions) are permissible provided that the requirements for individual lamp functions are achieved.

All lamps at intermediate locations of the train shall be unlit.

5.3 Head lamps

5.3.1 Positioning of head lamps

The two head lamps shall both be located at the same height, with their geometric centres between 1 500 mm and 2 000 mm above the upper surface of the rail.

The arrangement of the two head lamps shall be such that the distance between their geometric centres is not less than 1 000 mm and that the head lamp geometric centres are symmetrical about the centre-line of rails.

Where upper head lamps are installed, these shall be located above the windscreen, as close to the vehicle centre line as possible.

5.3.2 Dimensions of head lamps

Each head lamp shall have a maximum lit area of 33 400 mm^2, a minimum lit area of 17 650 mm^2 and a minimum dimension of this lit area of 110 mm.

The whole of the head lamp area shall appear to be lit when arranged in the installed condition and viewed along the optical axis.

5.3.3 Colour of head lamps

The colour of light emitted by head lamps, when measured in accordance with 6.3, shall lie within the colour space defined by the intersection points as given in Table 1, and illustrated in Figure 1.

Table 1 — The chromaticity coordinates of the intersection points of the colour specification for head lamps

Colour of head lamp	CIE (1931) chromaticity coordinates of the intersection points						
White	Point	I*	J	J'	K'	K	L*
	x	0,310	0,440	0,500	0,500	0,440	0,310
	y	0,348	0,432	0,440	0,382	0,382	0,283

NOTE This specification is based on CIE S 004 White Class B with a restricted blue limit. The chromaticity coordinates indicated with * define the restricted blue limit.

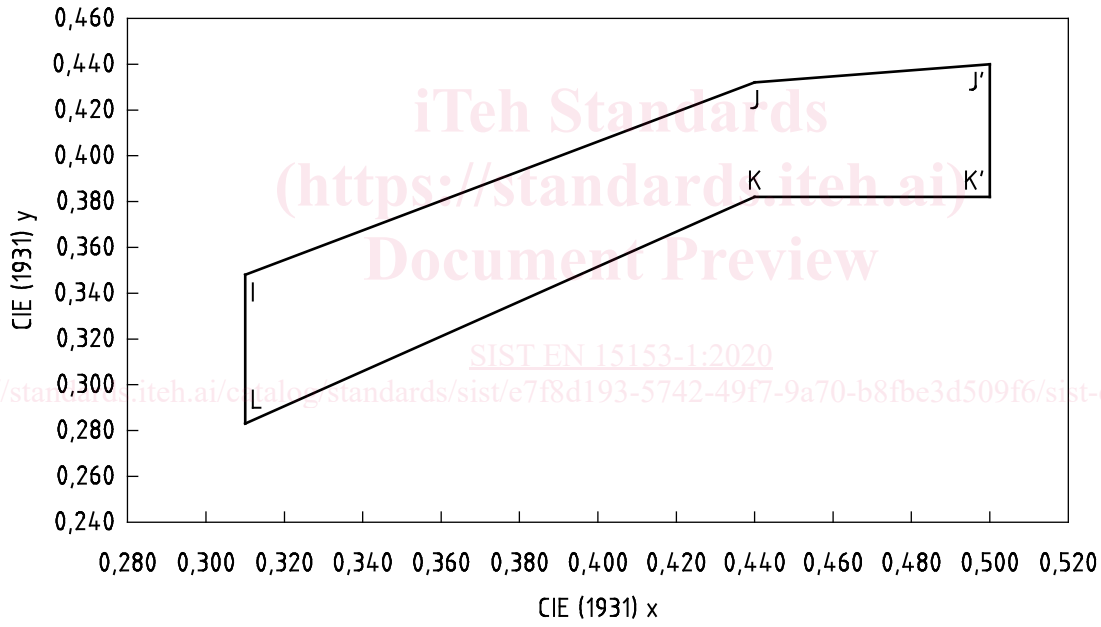

Figure 1 — Chromaticity diagram to illustrate the colour specification for head lamps according to Table 1

If required by the technical specification, the spectral radiation distribution requirements of 5.4.3.2 shall apply to head lamps.

5.3.4 Luminous intensity of head lamps

The luminous intensities of individual head lamps shall be as shown in Table 2.