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Järnvägar – Elbelysning i spårbundna fordon för kollektivtrafik

Railway applications – Electrical lighting for rolling stock in public transport systems

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Denna standard ersätter SS-EN 13272, utgåva 1.

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This standard supersedes the Swedish Standard SS-EN 13272, edition 1.

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EUROPEAN STANDARD

EN 13272

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2012

ICS 45.060.01; 91.160.10

Supersedes EN 13272:2001

English Version

Railway applications - Electrical lighting for rolling stock in public transport systems

Applications ferroviaires - Eclairage électrique pour matériel roulant des systèmes de transport public

Bahnanwendungen - Elektrische Beleuchtung in Schienenfahrzeugen des öffentlichen Verkehrs

This European Standard was approved by CEN on 16 December 2011.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Contents

	Page
Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Requirements for lighting in passenger areas	6
4.1 General lighting.....	6
4.2 Stand-by lighting.....	10
4.3 Emergency lighting.....	10
5 Lighting in service areas.....	12
5.1 General lighting.....	12
5.2 Stand-by lighting.....	13
5.3 Emergency lighting.....	13
6 Measuring equipment, conditions and measuring points.....	15
6.1 General.....	15
6.2 Measuring equipment.....	15
6.3 Conditions for illuminance measurement.....	15
6.4 Locations for illuminance measurement.....	15
6.5 Measurement of illuminance and glare	16
7 Further requirements on the design of lighting systems.....	16
7.1 General.....	16
7.2 Maintenance	17
7.3 Electromagnetic compatibility (EMC).....	17
Annex A (normative) Contractual statements.....	18
A.1 Information and requirements to be agreed and documented	18
Annex B (normative) Definition of the door and access step width requirement for illuminance measurements.....	19
Annex C (informative) Test pulse characteristics.....	20
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC	21
Bibliography	24

Foreword

This document (EN 13272:2012) has been prepared by Technical Committee CEN/TC 256 "Railway applications", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2012, and conflicting national standards shall be withdrawn at the latest by August 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13272:2001.

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(s).

For relationship with EU Directive(s), 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 applicable TSIs; and requirements permitting new lighting technologies.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

SS-EN 13272:2012 (E)

1 Scope

This European Standard contains performance requirements and recommendations for electrical lighting systems in the interiors of public transport railway rolling stock under all operating and emergency conditions. This European Standard does not address lighting installed in instruments or controls.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CEN/TS 45545 (all parts), *Railway applications — Fire protection on railway vehicles*

EN 50121 (all parts), *Railway applications — Electromagnetic compatibility*

EN 50153, *Railway applications — Rolling Stock — Protective provisions relating to electrical hazards*

CIE S 008/E:2001/8995-1:2002(E) *Lighting of Work Places — Part 1: Indoor [incl. Technical Corrigendum ISO 8995:2002/Cor.1 2005(E)]*

CIE Publication No 17.4, *International Lighting Vocabulary*

3 Terms and definitions

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

3.1 General

3.1.1

passenger area

all areas designed for passenger use

3.1.2

service area

all areas which are intended to be occupied by service personnel only

3.1.3

seating area

passenger area intended for seated persons, including wheelchair spaces

3.1.4

open gangway

wide gangway designed to be occupied by travelling passengers

Note 1 to entry: This excludes the gangways that are only to be used to pass from one vehicle to another.

3.1.5

vehicle access step

first fixed part of the floor threshold inside the vehicle

3.1.6

luminance (in a given direction at a given point of surface) (L)

luminous intensity of the light emitted in a given direction from an element of the surface, divided by the area of the element projected in the same direction

Unit: candela per square metre (cd/m^2)

Note 1 to entry: Adapted from EN 12665.

3.1.7

luminous flux (Φ)

quantity derived from radiant flux (radiant power) by evaluating the radiation according to the spectral sensitivity of the human eye (as defined by the CIE standard photometric observer)

Unit: lumen (lm)

Note 1 to entry: It is the light power emitted by a source.

Note 2 to entry: Adapted from EN 12665.

3.1.8

illuminance (E)

ratio of the luminous flux incident on a surface to the area of the illuminated surface

Unit: lux (lx) = lm/m^2

Note 1 to entry: Illuminance was previously known as the illumination level or value.

Note 2 to entry: The orientation of the surface may be defined, e.g. horizontal, vertical.

3.1.9

average illuminance (E_{av})

illuminance averaged over the specified surface

Unit: lux (lx)

Note 1 to entry: Adapted from EN 12665.

Note 2 to entry: In practice this may be derived either from the total luminous flux falling on the surface divided by the total area of the surface, or alternatively from an arithmetic average of the illuminances at a representative number of points on the surface.

3.1.10

illuminance uniformity

ratio of the least favourable illuminance to the average illuminance within the specified measurement surface

Note 1 to entry: The least favourable illuminance may be either the minimum or maximum illuminance over all the measurement points.

3.1.11

correlated colour temperature (of a light source) (T_{cp})

temperature of a Planckian radiator whose perceived colour most closely resembles that of the given stimulus at the same brightness and under specified viewing conditions

Unit: Kelvin (K)

Note 1 to entry: Adapted from EN 12665.

SS-EN 13272:2012 (E)

3.1.12

colour rendering

effect of an illuminant on the reflective colour of objects by comparison with their reflective colour under a reference light source

Note 1 to entry: Adapted from IEC 60050-845-02-59.

3.1.13

light loss factor

ratio of the average illuminance of the illuminated surface after a certain period of use of a lighting installation to the average illuminance obtained under the same conditions for the installation considered conventionally as new

Note 1 to entry: Adapted from IEC 60050-845-09-59.

3.1.14

unified glare rating

CIE discomfort glare measure

3.1.15

contractor(s)

organization(s) responsible for

- the design, manufacture or supply of the lighting system, and
- the purchase, installation or use of the lighting system

3.2 Types of lighting

3.2.1

general lighting

lighting of an interior provided for normal operation

3.2.2

stand-by lighting

lighting condition below the level of general lighting provided for a specified time limit, taking supply interruptions into account

3.2.3

emergency lighting

lighting provided for a specified minimum time limit when the general or the stand-by lighting fails

3.2.4

reduced lighting

level of illumination as a design feature for passenger comfort and energy conservation

4 Requirements for lighting in passenger areas

4.1 General lighting

4.1.1 General

The quality of lighting influences visual performance, performance attitude, safety at work and general well-being.

The lighting for rolling stock in public transport systems shall enable a range of visual tasks to be performed.

The requirements to be met by the lighting system are based on the following criteria:

- illuminance;
- uniformity;
- limitation of glare;
- colour temperature and colour rendering.

General lighting must achieve the values set out in Table 1 or Table 2.

NOTE Where agreed by contractors, it is possible for the general lighting system to adapt to the ambient lighting, provided that the contribution from the general lighting system plus that from the ambient lighting achieves the values set out in Table 1 or Table 2.

For high speed trains and conventional trains:

- general lighting shall be provided in normal operation without interruption;
- in the event of loss of the main power supply, general lighting shall be provided for a period of not less than 10 minutes.

A lighting system can only satisfy specified requirements if all criteria mentioned above have been taken into account. Depending on the type and level of the difficulty of the visual task, orientation of seating, or of the type of accommodation to be lit, priority may be given to one or more of these criteria.

4.1.2 Illuminance and uniformity

Different requirements are made concerning the general lighting for rolling stock in public transport systems according to the service and/or location. Two classes of vehicles are defined: (a) high speed and conventional trains and (b) other trains.

- a) For high speed and conventional trains, which travel on either or both of the high speed and conventional trans-European rail systems, the minimum value of the average illuminance and uniformity requirements shall be in accordance with Table 1.
- b) For other trains, the minimum value of the average illuminance and uniformity requirements shall be in accordance with Table 2.