

SVENSK STANDARD

SS-EN 45545-1:2013



Fastställt/Approved: 2013-03-10

Publicerad/Published: 2013-03-13 (Korrigerad version/Corrected version, March 2013)

Utgåva/Edition: 1

Språk/Language: engelska/English

ICS: 13.220.20; 45.060.01

Järnvägar – Järnvägsfordons brandsäkerhet – Del 1: Allmänna krav

Railway applications – Fire protection on railway vehicles – Part 1: General

This preview is downloaded from www.sis.se. Buy the entire standard via <https://www.sis.se/std-89328>

Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.



Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00



Europastandarden EN 45545-1:2013 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 45545-1:2013.

Denna standard ersätter SIS-CEN/TS 45545-1:2009, utgåva 1.

The European Standard EN 45545-1:2013 has the status of a Swedish Standard. This document contains the official version of EN 45545-1:2013.

This standard supersedes the Swedish Standard SIS-CEN/TS 45545-1:2009, edition 1.

**Denna korrigerade version innehåller följande rättelse/
This corrected version contains the following correction**

In 4.2, replace the existing three dashes with the new ones:

"

- fire spreading through the passenger and staff areas (see Part 2 relating to material reaction to fire properties and Part 3 relating to fire barriers);
- endangering passengers and staff by obscuration of escape routes (see Part 2 relating to material reaction to fire properties in particular smoke emission, Part 3 relating to fire barriers and Part 4 relating to design principles and evacuation requirements);
- endangering passengers and staff by the presence of toxic fumes (see Part 2 relating to material reaction to fire properties in particular toxic products of combustion)."

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Järnvägar, SIS/TK 254.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

EN 45545-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2013

ICS 45.060.01; 13.220.20

Supersedes CEN/TS 45545-1:2009

English Version

Railway applications - Fire protection on railway vehicles - Part 1: General

Applications ferroviaires - Protection contre les incendies
dans les véhicules ferroviaires - Partie 1: Généralités

Bahnanwendungen - Brandschutz in Schienenfahrzeugen -
Teil 1: Allgemeine Regeln

This European Standard was approved by CEN on 7 December 2012.

CEN and CENELEC 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 and CENELEC 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 and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN and CENELEC members are the national standards bodies and national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



**CEN-CENELEC Management Centre:
Avenue Marnix 17, B-1000 Brussels**

Contents

Page

Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	6
3 Terms and definitions	6
4 Objectives.....	13
4.1 General.....	13
4.2 Fire resulting from accidental ignition or arson.....	13
4.3 Fire resulting from technical defects.....	14
4.4 Fire resulting from larger ignition models than those described in 4.2 and 4.3	14
5 Operation Categories and Design Categories of railway vehicles	14
5.1 General.....	14
5.2 Operation Categories	15
5.2.1 General.....	15
5.2.2 Vehicles operating on infrastructure subject to the Directive	15
5.2.3 Vehicles operating on infrastructure not subject to the Directive	16
5.3 Design Categories	16
6 Vehicle classification	16
7 Fire protection measures.....	17
8 Evaluation of conformity.....	17
8.1 General.....	17
8.2 Design verification and validation	17
8.3 Quality management	17
Annex A (informative) Ignition models within the scope of the document.....	18
Annex B (informative) Guidance on the designation of Operation Categories	19
B.1 Operation Category 1 (OC1)	19
B.2 Operation Category 2 (OC2)	19
B.3 Operation Category 3 (OC3)	19
B.4 Operation Category 4 (OC4)	19
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC	20
Bibliography.....	23

Foreword

This document (EN 45545-1:2013) 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 September 2013, and conflicting national standards shall be withdrawn at the latest by March 2016.

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 CEN/TS 45545-1:2009.

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.

This series of European standards *Railway applications — Fire protection on railway vehicles* consists of:

- Part 1: General;
- Part 2: Requirements for fire behaviour of materials and components;
- Part 3: Fire resistance requirements for fire barriers;
- Part 4: Fire safety requirements for railway rolling stock design;
- Part 5: Fire safety requirements for electrical equipment including that of trolley buses, track guided buses and magnetic levitation vehicles;
- Part 6: Fire control and management systems;
- Part 7: Fire safety requirements for flammable liquid and flammable gas installations.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, 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.

Introduction

EN 45545 is developed from existing fire safety regulations for railway vehicles from the International Union of Railways (UIC) and different European countries.

In using the Operation and Design Categories defined in this part, the requirements laid down in the different parts of EN 45545 will take into account the current operating conditions for European public rail transport.

1 Scope

The measures and requirements specified in EN 45545 are intended to protect passengers and staff in railway vehicles in the event of a fire on board.

EN 45545 specifies:

- fire protection measures for railway vehicles;
- verification methods for these measures.

The protection of passengers and staff is essentially based on measures to:

- prevent fires occurring due to technical faults and due to equipment design or vehicle layout (Part 1, Part 4, Part 5 and Part 7);
- minimise the possibility of ignition of materials installed on railway vehicles due to accidents or vandalism (Part 1 and Part 2);
- detect a fire should it occur (Part 6);
- limit the spread of fire by specification of materials according to their operational categories (Part 2) and by measures for containment (Part 3);
- minimise the effects of fire in terms of heat, smoke and toxic gases on passengers or staff through the specification of materials installed on railway vehicles (Part 2);
- control and manage a fire, for example by means of fire detection, suppression and/or emergency energy shut down (Part 6).

The ultimate objective in the event of a fire on board is to allow passengers and staff to evacuate the railway vehicle and reach a place of safety.

The present European Standard describes the measures to be taken in the design of the vehicles in the context of the infrastructure on which they operate.

It is not within the scope of EN 45545 to describe measures that ensure the preservation of the vehicles in the event of a fire beyond what is required to fulfil the objective to protect passengers and staff.

This European Standard is valid for railway vehicles as defined in Clause 3.

Freight transportation vehicles are not covered by EN 45545.

This part of EN 45545 covers:

- principal definitions;
- Operation Categories;
- Design Categories;
- fire safety objectives;
- general requirements for fire protection measures and their evaluation of conformity.

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 ISO 13943:2010, *Fire safety — Vocabulary (ISO 13943:2008)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

ISO 8421-1:1987, *Fire protection — Vocabulary — Part 1: General terms and phenomena of fire*

3 Terms and definitions

For the purposes of this series of documents (EN 45545-1 to EN 45545-7), the terms and definitions given in relevant Technical Specification for Interoperability (TSI) documents, EN ISO 13943:2010 and ISO 8421-1:1987, and the following definitions apply.

- 3.1**
alarm
audible and/or visual indication to staff and/or passengers of the detection of fire
- 3.2**
arc protection devices
device to contain an electrical arc within a prescribed region
- 3.3**
armrest
element which may function as a support for a seated person's arm but which may also be part of a seat which defines the width of a seat place
- 3.4**
automatic public address system
equipment that makes a pre-recorded announcement on detection of a fire
- 3.5**
ARHE – average rate of heat emission at time t
cumulative heat emission from $t = 0$ to $t = t$ divided by t

Note 1 to entry: For full details of how ARHE is generated, refer to 5.2 of EN 45545-2:2013.

3.6

cable conduits and ducts

linear electrical products such as flexible or rigid conduits, ducts or trays

Note 1 to entry: Heat shrinkable sleeves are not considered.

3.7

CIT

conventional index of toxicity

Note 1 to entry: Details of the derivation of CIT are specified in Annex C of EN 45545-2:2013.

3.8

coating

product applied as liquid or powder to a substrate that will cure or dry into a continuous surface to the substrate

3.9

corridor

passenger area intended as a through route for passengers and staff

3.10

cylinder cabinet

dedicated cabinet containing gas cylinders

3.11

dead end

non dedicated area for passenger or staff, not intended as a through route

3.12

Ds(n)

specific optical density of smoke where n is the elapsed time since the start of testing in minutes

Note 1 to entry: For more detail, see EN 45545-2.

3.13

electrical equipment

anything used, intended to be used or installed for use, to generate, provide, transmit, transform, rectify, convert, conduct, distribute, control, store, measure or use electrical energy

3.14

enclosure

housing for separating the internal and external environment from the electrical equipment

Note 1 to entry: For more functional descriptions refer to 5.4 of EN 45545-5:2013.

Note 2 to entry: IEC 60364-4-41 and EN 60529.

3.15

exposed area

facing made of combustible material which could potentially be directly exposed to an ignition source according to 4.2 and 4.3

Note 1 to entry: The term exposed surface is also used in the same context.