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Standards

Irish Standard  
I.S. EN 45545-1:2013

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

## I.S. EN 45545-1:2013

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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**NSAI**  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

**Sales:**  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

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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.

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

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## 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of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by March 2016.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.

## EN 45545-1:2013 (E)

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 826-12-20 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.

**3.16**

**fire barrier**

element that is intended for use in maintaining separation between two adjacent areas of a railway vehicle in the event of a fire which resists the passage of flame and/or heat and/or effluents for a period of time under specified conditions

**3.17**

**fire barrier door**

door which has specified fire resistance characteristics

**3.18**

**fire detection device**

device which responds to one or more products or effects of fire

**3.19**

**fire exposure time**

period of time during which passengers and staff stay in an area susceptible to being affected by fire or its effluents on board of railway vehicles

**3.20**

**fire fighting equipment**

- a) fixed equipment which delivers a fire extinguishing medium when either manually or automatically activated;
- b) portable or mobile equipment which delivers a fire extinguishing medium under manual control

**3.21**

**fire resistance**

ability of a test specimen to withstand fire or give protection from it for a period of time

Note 1 to entry: Typical criteria used to assess fire resistance in a standard fire test are fire integrity, thermal insulation and radiation.

Note 2 to entry: "Fire-resistant" (adj.) refers only to this ability.

Note 3 to entry: See also EN ISO 13943.

**3.22**

**flammable atmosphere**

mixture of a flammable gas or vapour from a flammable liquid with air in which the concentration of the flammable gas or vapour is between its upper and lower flammability limits

**3.23**

**flammable gas**

fuel which is in a gaseous state at a temperature of 15 °C at a pressure of 1 bar

Note 1 to entry: Directive 2009/142/EC.

**3.24**

**flammable liquid**

liquid that has a flash point of less than 55 °C as determined in accordance with EN ISO 2719 and fuel intended for combustion in thermal machines

**3.25**

**functionally suitable product**

functionally suitable product is one which will meet the required static, dynamic and mechanical properties for use in the specified operating environment, (e. g. temperature, chemicals, humidity) and have a life consistent with normal industry maintenance schedules

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