
Železniške naprave - Požarna zaščita na železniških vozilih - 3. del: Zahteve za požarno odpornost požarnih pregrad

Railway applications - Fire protection on railway vehicles - Part 3: Fire resistance requirements for fire barriers

Bahnanwendungen - Brandschutz in Schienenfahrzeugen - Teil 3: Feuerwiderstand von Feuerschutzabschlüssen

Applications ferroviaires - Protection contre les incendies dans les véhicules ferroviaires - Partie 3: Exigences de résistance au feu des barrières au feu

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English Version

**Railway applications - Fire protection on railway vehicles -
Part 3: Fire resistance requirements for fire barriers**

Applications ferroviaires - Protection contre les
incendies dans les véhicules ferroviaires - Partie 3:
Exigences de résistance au feu des barrières au feu

Bahnwendungen - Brandschutz in
Schienenfahrzeugen - Teil 3: Feuerwiderstand von
Feuerschutzabschlüssen

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 foreword

This document (prEN 45545-3:2021) 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 45545-3:2013.

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.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

Introduction

EN 45545-3 has been 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 EN 45545-1, the requirements laid down in this part take into account the current operating conditions for European public rail transport.

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1 Scope

This document specifies the fire resistance requirements and testing methods for fire barriers for railway vehicles.

The objective of the measures and requirements, specified in this document, is to protect passengers and staff in railway vehicles in the event of a developing fire on board.

Use of a Fire Containment and Control System, where permitted as an alternative to a fire barrier, is not in the scope of this document. It is not within the scope of this document to describe measures that ensure the preservation of the railway vehicles in the event of a fire.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1363-1:2020, *Fire resistance tests - Part 1: General requirements*

EN 1364-1:2015, *Fire resistance tests for non-loadbearing elements - Part 1: Walls*

EN 1364-2:2018, *Fire resistance tests for non-loadbearing elements - Part 2: Ceilings*

EN 1634-1:2014+A1:2018, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 1: Fire resistance test for door and shutter assemblies and openable windows*

EN 13501-2:2016, *Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN 45545-1:2013, *Railway applications - Fire protection on railway vehicles - Part 1: General*

EN 45545-5:2013+A1:2015, *Railway applications - Fire protection on railway vehicles - Part 5: Fire safety requirements for electrical equipment including that of trolley buses, track guided buses and magnetic levitation vehicles*

EN ISO 1182:2020, *Reaction to fire tests for products - Non-combustibility test (ISO 1182:2020)*

EN ISO 1716:2018, *Reaction to fire tests for products - Determination of the gross heat of combustion (calorific value) (ISO 1716:2018)*

EN ISO 13943:2017, *Fire safety - Vocabulary (ISO 13943:2017)*

ISO 834-1:1999+A1:2012, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 45545-1:2013 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Application of fire barriers

Railway vehicles shall be equipped with fire barriers at the locations specified in Table 1.

5 Classification, requirements and test procedures

5.1 General requirements

The use of the following parameters shall be in accordance with the principles described in EN 13501-2 integrity criterion E, insulation criterion I and radiation criterion W.

5.2 Classification of fire barriers

Fire barriers shall have fire resistance properties verified by:

- a fire resistance test based on the principles of EN 1363-1; or
- assessment based on fire resistance testing.

Fire barriers shall have performance based on the three parameters (E, W, I) as specified in Table 1.

NOTE For example E30, I15, means integrity is maintained for 30 min and insulation is maintained for 15 min.

5.3 Arc barrier Type A

Type A arc barriers in accordance with EN 45545-5 shall satisfy the requirements for an E15 fire barrier.

5.4 Arc barrier Type B

Type B arc barriers in accordance with EN 45545-5 shall satisfy the requirements for an E60 fire barrier.

5.5 Requirements

The requirements for fire barriers depend upon the operation and design categories and their location in the railway vehicle.

The fire barriers shall be located as specified in Table 1. Examples of the barriers in Table 1 are described in Annex B.

All vertical fire barriers in the cross section of a railway vehicle shall cover the entire area between the structural floor and the structural roof. In this context, the middle floor of a double decked vehicle shall be considered as a floor for the upper deck and as a roof for the lower deck. Where a vertical barrier reaches the side wall, it shall be extended to the body shell.

Closing devices for ventilation ducts shall conform to the following requirements:

- a) where a ventilation duct passes through a fire barrier, the duct shall have a closing device where it passes through the barrier unless the complete duct meets the same level of fire resistance requirements as the barrier for:
 - its entire length,
 - its length to the next fire barrier, the next closing device, or to the exterior of the vehicle.
- b) closing devices shall meet the same fire resistance requirements as fire barriers;
- c) closing devices shall operate on reaction to a fire.

Penetrations through fire barriers, for example for ducts or cables, shall not reduce the fire resistance of the barrier.

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Table 1 — Fire barrier requirements

No	Fire origin	Protected location	Remarks	Operation category	Requirements
1	Underfloor technical cabinet containing electrical high power components (other than brake and heating resistors and cables between joints) and lithium ion batteries for traction or auxiliary supply	Passenger and staff area including driver's cab	Tested in accordance with EN 1364-2. Requirements are defined from underfloor to the top of the floor covering.	1, 2 and 4 3	E15 E15, I15
2	Underfloor traction transformers, reactors and cooling components filled with insulation fluid	Passenger and staff area including driver's cab	Tested in accordance with EN 1364-2. For vehicles without underfloor side skirts: Whole cross section and 1 m longer than the object in each longitudinal direction. For vehicles with underfloor side skirts: the section with underfloor side skirts shall meet the requirement. ^a Requirements are defined from underfloor to the top of the floor covering.	1 and 2 3 and 4	E15 E15, I15
3	Underfloor combustion engine or fuel cells (including heating equipment, fuel tank and pipe work)	Passenger and staff area including driver's cab	Tested in accordance with EN 1364-2. For vehicles without underfloor side skirts: Whole cross section and 1 m longer than the object in each longitudinal direction. For vehicles with underfloor side skirts: the section with underfloor side skirts shall meet the requirement. Requirements are defined from underfloor to the top of the floor covering.	1 and 2 3 and 4	E15 E15, I15
4	Underfloor area not covered by positions 1-3	Passenger and staff area including driver's cab	None	1 to 4	No requirement

No	Fire origin	Protected location	Remarks	Operation category	Requirements
5	On the roof of carbody	Passenger and staff area including driver's cab	None	1 to 4	No requirement
6	Passenger area	Adjacent passenger or staff area excluded driver cabs	Tested in accordance with EN 1364-1 (walls). The full cross section shall be tested with all elements positioned as they would be present in an actual railway vehicle.	1, 2, 4 3	No requirements E15 for the full cross section. Elements shall be located at a distance not exceeding 30 m from another full cross section element
7	Passenger area	Driver's cab	Fire barriers are tested in accordance with EN 1364-1 (walls) and Sub-Clause 5.6 of this document. The full cross section shall be tested with all elements positioned as they would be present in an actual railway vehicle.	1 and 2 4 3	No requirements E10 E15, I15 ^b
8	Inside the luggage container	Outside the luggage container	Tested in accordance with EN 1364-1 (walls).	1 to 4	E15
9	Luggage Compartments	Passenger and staff areas including driver's cab	Tested in accordance with EN 1364-1 (walls).	1 2 3	No requirement E15 E30
		All areas (including exteriors)		4	E30
10	High power electrical equipment located inside the body shell	Passenger and staff areas including driver's cab	Tested in accordance with EN 1364-1 (walls).	1, 2 and 4 3	E15 E15, I15