SLOVENSKI STANDARD
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Železniške naprave - Požarna zaščita na železniških vozilih - 6. del: Obvladovanje požara in sistemi upravljanja

Railway applications - Fire protection on railway vehicles - Part 6: Fire control and management systems

Bahnanwendungen - Brandschutz in Schienenfahrzeugen - Teil 6: Brandmelde- und Brandbekämpfungseinrichtungen und begleitende Brandschutzmaßnahmen

Applications ferroviaires - Protection contre les incendies dans les véhicules ferroviaires - Partie 6 : Systèmes de gestion et de contrôle des incendies

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Railway applications - Fire protection on railway vehicles - Part 6: Fire control and management systems

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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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European foreword

This document (prEN 45545-6:2022) 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 45545-6:2013.

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.

The main changes from EN 45545-6:2013 are:

— addition of “Lithium ion batteries for main auxiliary supplies” in Table 1;

— deletion of footnote c for S and DS categories in Table 1;

— modification of 5.3.1;

— modification of 5.3.3;

— new requirements in 6.3.1;

— new requirements in 6.3.3;

— deletion of Clause 8.

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 45545-6 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 45545-1:2013, the requirements laid down in this part take into account the current operating conditions for European public rail transport.

1 Scope

This document specifies requirements for fire detection, alarm systems, equipment shutdown, information and communication systems, emergency lighting, emergency brake systems and fire fighting systems to cover the objectives defined in EN 45545-1:2013.

The measures and requirements specified in this document aim to protect passengers and staff in railway vehicles in the event of a fire on board by alerting staff and passengers to a fire, delaying the fire development and controlling the movement of smoke.

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.

This part is valid for railway vehicles defined in EN 45545-1:2013.

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 2:1992,[1] *Classification of fires*

EN 3-7:2004+A1:2007, *Portable fire extinguishers — Part 7: Characteristics, performance requirements and test methods*

EN 3-8:2021, *Portable fire extinguishers — Part 8: Requirements for the construction, pressure resistance and mechanical tests for extinguishers with a maximum allowable pressure equal to or lower than 30 bar, which comply with the requirements of EN 3-7*

EN 3-9:2006,[2] *Portable fire extinguishers — Part 9: Additional requirements to* EN 3-7 *for pressure resistance of CO_2 extinguishers*

EN 3-10:2009, *Portable fire extinguishers — Part 10: Provisions for evaluating the conformity of a portable fire extinguisher to* EN 3-7

EN 54-3:2014+A1:2019, *Fire detection and fire alarm systems — Part 3: Fire alarm devices — Sounders*

EN 54-23:2010, *Fire detection and fire alarm systems — Part 23: Fire alarm devices — Visual alarm devices*

EN 1869:2019, *Fire blankets*

EN 16334:2014, *Railway applications — Passenger Alarm Systems — System requirements*

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

EN 45545-2:2020, *Railway applications — Fire protection of railway vehicles — Part 2: Requirements for fire behaviour of materials and components*

EN 45545-3:2013, *Railway applications — Fire protection of railway vehicles — Part 3: Fire resistance requirements for fire barriers*

[1] As impacted by EN 2:1992/A1:2004.
[2] As impacted by EN 3-9:2006/AC:2007.

EN 50553:2012,[3] *Railway applications — Requirements for running capability in case of fire on board of rolling stock*

3 Terms and definitions

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

4 General requirements

The design, construction or assembly of components which are critical for fire safety, e.g. for fire detection and for fire fighting, shall comply with the objectives in EN 45545-1:2013.

All passenger vehicles shall be fitted with a passenger alarm system to inform on-board staff and/or control centre staff about a possible fire detected by a passenger.

All passenger vehicles shall have an emergency lighting system implemented, which has sufficient light intensity and duration for evacuation of the vehicles.

All passenger vehicles shall be equipped with a passenger alarm system that provides a means of conveying information to passengers from on-board staff or control centre staff.

Fire barrier doors for passenger use shall be of the self-closing type. Powered fire barrier doors for passenger use shall stop in a fully closed position as a result of the impact of fire.

NOTE For architecture of passenger alarm system refer to EN 16334:2014.

5 Requirements for systems used in automatically initiated processes

5.1 General

When applicable, the process steps are automatic detection, leading to alarm and leading to action.

5.2 Fire detection

Fire detection devices shall be switched on and in use when passengers or staff are onboard. They shall monitor the areas or equipment defined in Table 1. Fire detection devices shall be functionally suitable for the expected fire products, e.g. flames, smoke and heat.

The following points shall be taken into consideration for the verification of functionality:

1) the origin of the fire;

2) the size of the fire;

3) the materials involved in the fire;

4) the nature of any detectors;

5) the air flow.

[3] As impacted by EN 50553:2012/AC:2013, EN 50553:2012/A1:2016 and EN 50553:2012/A2:2020.

Table 1 — Fire detection

	Operation category	Passenger areas	Corridors	Toilets	Staff areas	Cooking or catering area	Combustion engines	Technical cabinets containing traction equipment [d]	Other technical cabinets	Luggage compartment	Lithium ion batteries for principal auxiliary supplies [e]
Design Categories N and D	1	nr	nr	nr	nr	nr	X	nr	nr	X	X
	2	nr	nr	X	X [c]	X [c]	X	X	nr	X	X
	3	X [c]	nr	X	X [c]	X [c]	X	X	nr	X	X
	4	X [c]	nr	X	X	X	X	X	nr	X	X
Design Categories S and DS	1	X	X	X [a]	X	X	X	X	X [b]	X	X
	2	X	X	X [a]	X	X	X	X	X [b]	X	X
	3	X	X	X [a]	X	X	X	X	X [b]	X	X
	4	X	X	X [a]	X	X	X	X	X [b]	X	X
Design Category A	1	nr	nr	nr	nr	nr	X	X	nr	X	X
	2	nr	nr	X	nr	nr	X	X	nr	X	X
	3	X [c]	nr	X	nr	nr	X	X	X [b]	X	X
	4	X [c]	nr	X	nr	nr	X	X	X [b]	X	X

X indicates requirement.

nr indicates no requirement.

a There are no requirements for toilets inside a sleeper compartment.

b There are no requirements if there is no electrical high-power equipment in the technical cabinet, and if the technical cabinet complies with one of the following conditions:
- the technical cabinet content is compliant to EN 45545-2:2020;
-the technical cabinet is contained in a manner compliant to EN 45545-3:2013.

c There are no requirements if the Railway vehicle is not in the field of Directive (EU) 2016/797 on the interoperability of the rail system within the Community.

d Does not apply to traction motors outside the body shell.

e Applies especially to lithium ion batteries with the risk of thermal runaway.

5.3 Response to automatic detection

5.3.1 General

When a fire detector is activated:

— an automatic local and/or remote alarm shall be triggered in accordance with 5.3.2 and 5.3.3;

— automatic alarm responses shall be triggered in accordance with 5.4.1 to 5.4.4.

The triggering time shall be as defined in EN 50553:2013[3].

5.3.2 Local alarm

For design categories D, S and DS, a local alarm shall be given in the vicinity of the activated detector in passenger areas and sleeper compartments.

The alarm shall be audible and may be visible depending on its location, in all modes of service. Alarms in sleeper compartments shall be able to wake a sleeping occupant in accordance with EN 54-3:2014+A1:2019 and to EN 54-23:2010.

5.3.3 Remote alarm

All detections as defined in 5.2 shall trigger a remote alarm. This remote alarm shall:

— alert the driver, or for vehicles in design category A, alert the control centre;

— be visible and audible in all modes of service;

— be able to indicate the location of the activation to on-board staff or the control centre.

5.4 Specified responses to automatic alarms

5.4.1 General

This section specifies the responses required for vehicles equipped with automatic alarm systems.

5.4.2 Selective shut down of energy

5.4.2.1 General

There are primary and secondary level requirements, based on the following principles.

The primary level requirements apply to the areas defined in Table 2. For example, if a detector associated with a specific item of equipment is activated, the requirement is only to shut down that specific item of equipment.

The secondary level requirements apply where equipment may exacerbate the hazards arising from the fire. For example, if a detector associated with a passenger or staff area is activated, there will be a need for certain items of vehicle equipment to react in a specific manner.

Thus, the selective shut down of energy supply has three aims:

1) to avoid the supply of additional energy to the fire (primary);

2) to avoid collateral fire problems which may arise from the impact of fire and/or the affected equipment on its surroundings as it fails (secondary);

3) to facilitate fire fighting.