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Railway applications – Fire protection on railway vehicles – Part 4: Fire safety requirements for rolling stock design

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Denna standard ersätter SIS-CEN/TS 45545-4:2009, utgåva 1.

The European Standard EN 45545-4:2013 has the status of a Swedish Standard. This document contains the official version of EN 45545-4:2013.

This standard supersedes the Swedish Standard SIS-CEN/TS 45545-4:2009, edition 1.

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EUROPEAN STANDARD

EN 45545-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes CEN/TS 45545-4:2009

English Version

Railway applications - Fire protection on railway vehicles - Part 4: Fire safety requirements for rolling stock design

Applications ferroviaires - Protection contre les incendies
dans les véhicules ferroviaires - Partie 4: Exigences de
sécurité incendie pour la conception des véhicules
ferroviaires

Bahnwendungen - Brandschutz in Schienenfahrzeugen -
Teil 4: Brandschutzanforderungen an die konstruktive
Gestaltung von Schienenfahrzeugen

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

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Foreword

This document (EN 45545-4:2013) 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of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by March 2016.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 45545-4:2009.

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 45545-4 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.

1 Scope

This part specifies fire safety requirements for railway vehicle design to cover the objectives defined in EN 45545-1.

The measures and requirements specified in this part of EN 45545 aim to protect passengers and staff in railway vehicles in the event of a fire on board by minimizing the risk of a fire starting, delaying the fire development and controlling the spread of fire products through the railway vehicle, thus aiding evacuation.

It is not within the scope of this standard to describe measures which ensure the preservation of the railway vehicles in the event of a fire.

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 14752, *Railway applications — Bodyside entrance systems*

EN 15663, *Railway applications — Definition of vehicle reference masses*

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

EN 45545-2, *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*

EN 45545-6, *Railway applications — Fire protection of railway vehicles — Part 6: Fire control and management systems*

EN 45545-7, *Railway applications — Fire protection of railway vehicles — Part 7: Fire safety requirements for flammable liquid and flammable gas installations*

EN 50553, *Railway applications — Requirements for running capability in case of fire on board of rolling stock*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 45545-1:2013 and EN ISO 13943:2010 apply.

4 Fire protection measures

4.1 General

In consideration of the wide range of possible interior layouts for rail vehicles it is only possible to specify a limited number of normative requirements to control the risks of fires starting accidentally or deliberately and to then control the risks of such fires spreading. Informative guidance is therefore set out in Annex A to provide accepted good practice and design aspects to be considered.

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4.2 Minimizing the risk of a fire starting

4.2.1 General preventive measures

Access shall be denied to all areas not intended for passenger use. These shall include, where applicable, but are not limited to:

- driver's cabs;
- staff areas, for example staff offices, compartments, catering and cooking areas;
- luggage compartments;
- areas behind ceiling hatches or access panels;
- the interior of technical cabinets (including engine compartments);
- the interior of underfloor equipment cases.

Unauthorised areas shall be locked or otherwise secured. Locking devices shall take into account requirements for evacuation as set out in 4.3.

The surface temperature of equipment or equipment enclosures in passenger, staff and luggage areas shall not exceed 60 °C under normal conditions with the exception of catering or cooking equipment (see 4.2.2).

Typical examples of equipment acting as local sources of heat in passenger, staff and luggage areas are heating unit enclosures, lighting diffusers and/or lighting enclosures. This requirement should not be applied to equipment in technical areas for example engine compartments.

The design of railway vehicles shall limit the risk of fires starting or developing by application of the measures in this document and the other parts of this standard and in addition by consideration of:

- the vehicle layout and shape of the vehicle and/or the layout and shape of elements of the vehicle;
- the potential for the build up of combustible materials for example litter, oil or grease;
- requirements for cleaning;
- the potential for misuse and/or vandalism.

Guidance is set out in Annex A.

4.2.2 Catering and cooking areas

Cooking and catering appliances shall be installed so that the transfer of heat to adjacent surfaces and equipment is limited. The temperature of adjacent surfaces and equipment shall not exceed 60 °C.

Touchable surfaces of cooking and catering equipment except where required for the equipment's function shall not exceed 60 °C.

Gas installations shall comply with the requirements of EN 45545-7.

Cooking and catering equipment should be designed so that railway vehicle movements should not produce a fire hazard for example due to spillage of combustible liquids onto hot surfaces or by spillages leading to an accumulation of combustible waste over time.

4.2.3 Luggage storage inside passenger areas

Objects placed on overhead luggage racks shall be visible from below.

Luggage stacks shall not be used in operation Category 4 vehicles.

Luggage stacks installed on the lower decks of a double deck vehicle and where evacuation of the upper deck requires descent to the lower deck shall be either:

— enclosed by partitions or panelling, except where access is required for loading or unloading, that provides at least the fire resistance equivalent to a fire barrier with an E15 rating set out in EN 45545-3:2013 (see 5.6.4, Table 2);

or

— protected by a fire extinguishing system installed in accordance with EN 45545-6.

4.2.4 Visibility in passenger areas

Visibility shall be maintained throughout passenger areas even if the passenger area is subdivided into smaller areas or compartments. The level of visibility shall be sufficient for standing passengers or staff to view adjacent passenger areas. This requirement does not apply to toilets or sleeping compartments.

If a passenger area or compartment is equipped with a fire detection system in accordance with EN 45545-6, visibility from adjacent areas is not required.

4.2.5 Litter bins, ash trays and refuse containers

In areas where smoking is permitted, ashtrays shall be provided.

Ashtrays, litter bins, paper towel dispensers and receptacles for used paper towels shall be designed with the objective that an internal fire is prevented from spreading.

This can be achieved, for example, by the use of a metal container or a container constructed from materials that give a fire resistance performance of at least E10, as set out in EN 45545-3:2013 (see 5.6.4, Table 2) and with a self closing lid.

4.2.6 Monitors and televisions

The surface of monitor screens shall be made from a material that meets the requirements of EN 45545-2, or protected by glass. These monitors need not be additionally contained.

4.3 Evacuation and escape

4.3.1 Passenger emergency exits

4.3.1.1 General

Railway vehicles intended to carry passengers shall be equipped with emergency exits for the purposes of evacuation and escape in accordance with the following requirements:

- a) there shall be at least one emergency exit on each vehicle side;
- b) vehicles designed to contain a normal payload of up to 40 passengers shall have at least two emergency exits. Vehicles designed to contain a normal payload of more than 40 passengers shall have at least three emergency exits. The normal payload shall be determined in accordance with EN 15663;