SLOVENSKI STANDARD
SIST-TS CEN/TS 45545-4:2009

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Železniške naprave - Požarna zaščita na železniških vozilih - 4. del: Protipožarne varnostne zahteve pri konstrukciji železniških vozil

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

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

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

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Foreword

This document (CEN/TS 45545-4:2009) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

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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 EC Directive(s).

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

This series of Technical Specifications *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 organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This part is based on 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 CEN/TS 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 CEN/TS 45545-1.

The measures and requirements specified in this part of the Technical Specification 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 vehicle, thus aiding evacuation.

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

This part is valid for railway vehicles defined in CEN/TS 45545-1.

2 Normative references

The following referenced documents are indispensable for the application 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.

CEN/TS 45545-1:2009, *Railway applications — Fire protection of railway vehicles — Part 1: General*

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

CEN/TS 45545-5, *Railway applications — Fire protection of railway vehicles — Part 5: Fire safety requirements for electrical equipment including that of trolley buses, track guided buses and magnetic levitation vehicles*

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

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

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN ISO 13943:2000, *Fire safety — Vocabulary (ISO 13943:2000)*

EN ISO 15540, *Ships and marine technology — Fire resistance of hose assemblies — Test methods (ISO 15540:1999)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 45545-1:2009, EN ISO 13943:2000 and the following apply.

3.1
luggage compartment
single volume contained on a defined number of sides (which may include floor and ceiling) by elements with specified fire resistance performance (including joints and/or fixings to the surrounding structure), to which passengers have no access without authorisation. Luggage placed in luggage compartments shall no longer be considered as luggage for the purposes of other requirements

3.2
luggage stack
vertical arrangement of more than one level of luggage racks

3.3
passenger area
area to which passengers have legitimate access

3.4
passenger door
doors between passenger areas and doors between passenger area and exterior

3.5
passenger or staff compartment
passenger or staff area not intended as a through route for passengers or staff respectively

3.6
running capability
ability of a train to reach an evacuation point in case of a fire on board

3.7
staff area
area to which only members of staff have legitimate access

3.8
staff door
doors giving access to and from staff areas

3.9
saloon
passenger area with more than one passenger door intended as a through route for passengers or staff respectively

3.10
train set
number of cars which are indivisible in service, able to run either singled or coupled to another train set

4 Characteristics

4.1 Minimizing the risk of a fire starting

4.1.1 General preventative measures

To minimize the risk of a fire starting, the following preventative measures shall be taken:

a) vehicles in Operation Categories 2, 3 and 4, as defined in CEN/TS 45545-1, shall be shaped to minimize cavities, ledges and other areas which can trap combustible materials, e.g. avoid gutter shaped open elements for indirect lighting;

b) open recesses shall be used only if they are indispensable for functional reasons;

c) access to any area other than passenger areas shall be lockable (see 4.1.5.2);

d) the overhead luggage racks shall permit the visibility of objects placed on them;

e) in gangways the gap between moving parts accessible to passengers shall be kept so that the insertion of objects is minimized;

NOTE Gaps of less than 50 mm are preferred.

f) air inlets and outlets shall be designed so that the insertion of objects is minimized;

g) the inside and outside of the vehicles shall be designed so as to minimize accumulation of combustible products, e.g. waste, dust, brake dust, oil and grease. In particular attention shall be paid to the following:

1) protruding parts, overhangs, ledges or cavities shall be avoided;

2) heater enclosures shall be designed to limit the ingress of dirt and permit its easy removal;

3) vehicles, including any air conditioning and ventilation systems, shall be designed so that they can be easily cleaned;

h) if combustible materials are located near heating equipment, or any other equipment which may operate at high temperature, e.g. brake equipment, they shall be arranged so that can not accumulate heat, increasing the risk of ignition;

i) the temperature of the surface casing of heating units, lighting and any other equipment in passenger, staff and luggage areas shall not exceed 60 °C in normal conditions. The shape and position of heaters shall be such that hot air outlets or heat radiating surfaces, which are designed to function when not covered, cannot easily be covered by objects laid in front of or on them. The cross-sectional area of the air outlets shall not be reduced by deposit of dust and dirt carried by the air itself.

4.1.2 Protection against sparks

Shielding shall be provided to prevent ignition of combustible materials by sparks from any electrical or mechanical sources, e.g. current collection devices, brake shoes.

4.1.3 Seats

To minimize the risk of a fire starting, the following preventative measures shall be taken:

a) seats shall be shaped to minimize cavities, ledges and other areas which can trap combustible waste materials;

b) seats shall be designed so that combustible products (e.g. waste paper, rubbish) can be removed easily during cleaning and maintenance.

4.1.4 Catering and cooking areas

To minimize the risk of a fire starting, the following preventative measures shall be taken:

a) all cooking and catering appliances shall be designed and installed to prevent transfer of heat to adjacent surfaces and equipment. The temperature of adjacent surfaces and equipment shall not exceed 60 °C;

b) the requirement of adjacent surface and equipment is not applicable for cooking and catering equipment;

c) cooking and catering equipment, shall be designed so that vehicle movements shall not produce a fire hazard;

d) gas installations shall conform to CEN/TS 45545-7.

4.1.5 Prevention of fire caused by arson

4.1.5.1 Visibility in passenger areas

Where a passenger area is divided into smaller passenger areas, then it shall be possible to view adjacent passenger areas, except toilets and sleeping compartments, to minimize hiding places.

If the passenger area is equipped with a fire detection system in accordance with CEN/TS 45545-6 transparent elements are not required.

4.1.5.2 Access to unauthorized areas

Passengers shall be denied access to unauthorized areas, e.g.

— driver's cab;

— staff compartment;

— cooking area;

— engine compartments;

— interior of technical cabinets;

— interior of containers for underfloor equipment;

— areas behind ceiling hatches and similar;

— luggage compartment.

In each case the type of locking device shall be chosen in relation to the fire risk in the enclosed area and shall take into account the evacuation measures given in 4.4.1.