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

Bahnanwendungen - Brandschutz in Schienenfahrzeugen - Teil 1: Allgemeine Regeln

Applications ferroviaires - Protection contre les incendies dans les véhicules ferroviaires - Partie 1: Généralités

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

Applications ferroviaires - Protection contre les incendies dans les véhicules ferroviaires - Partie 1: Généralités

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This Technical Specification (CEN/TS) was approved by CEN on 8 June 2008 for provisional application.

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Foreword

This document (CEN/TS 45545-1:2009) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

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 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

CEN/TS 45545 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 this part, the requirements laid down in the different parts of CEN/TS 45545 will take into account the current operating conditions for European public rail transport.

1 Scope

CEN/TS 45545 specifies:

— measures on railway vehicles for fire protection;

— verification of these measures.

CEN/TS 45545 specifies prevention measures. The measures and requirements specified in CEN/TS 45545 are intended to protect passengers and staff in railway vehicles in the event of a fire on board. This protection of passenger and staff is essentially based on the ability of the rolling stock to allow for evacuation in safety, satisfying conditions (according to the objectives in Clause 4) in the frame of a guided transportation system which includes in particular vehicles, infrastructure and operation rules.

The present Technical Specification describes the measures to be taken in the design of the vehicles in the context of the infrastructure within which they operate.

It is not within the scope of CEN/TS 45545 to describe measures that ensure the preservation of the vehicles in the event of a fire.

This Technical Specification is valid for railway vehicles as defined in 3.1.

Freight transportation vehicles are not covered by CEN/TS 45545.

This part of CEN/TS 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 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.

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

ISO 8421-1:1987, *Fire protection — Vocabulary — Part 1: General terms and phenomena of fire*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 13943:2000 and ISO 8421-1:1987, and the following apply.

3.1
railway vehicles
track guided public passenger land transport vehicles such as:

— locomotives and dedicated power vehicle (self-propelled);

— multiple units;

— coaches, including driving trailers;

— light rail vehicles;

— underground vehicles;

— trams;

— luggage and post vans running as part of a passenger train;

— passenger occupied motor vehicle transporters.

The following vehicles are also considered as railway vehicles:

— track guided buses;

— trolley buses (only in relation to the electrical equipment);

— magnetic levitation vehicles

3.2
dwell time
period of time during which passengers and staff stay in an area susceptible to being affected by fire or its effluents

3.3
staff
all persons on duty on board railway vehicles including:

— passport inspectors;

— customs officers;

— security officers;

— catering/cooking persons

3.4
operation category of a railway vehicle
relationship between service, infrastructure and evacuation conditions for passengers and staff

3.5
refurbishment
programme of interior/exterior work, other than routine maintenance or repair, undertaken on a vehicle to restore or enhance the level of design and performance

3.6
Fire Critical Effect (FCE)
state at which a person, as a result of exposure to the products of fire within a defined passenger and staff area, would be unable to leave the defined passenger and staff area unaided

3.7
place of relative safety
area where a person has temporary shelter from the immediate effects of a fire before a place of ultimate safety can be reached

3.8
place of ultimate safety
place away from the burning vehicle in which a person is no longer in danger from the effects of fire

4 Objectives

4.1 General

The objectives of this Technical Specification are to minimize the probability of a fire starting, to control the rate and extent of fire development and through this, to minimize the impact of the products of fire on passengers and staff. The objectives are considered in the context of the operation and design categories of the train.

The different ignition models within the scope of the Technical Specification are described in Annex A.

4.2 Fire resulting from accidental ignition or arson

Typical ignition models involving newspaper, matches, cigarettes and gas lighters shall be taken into consideration in any position freely accessible to passengers and staff.

Measures shall be taken to reduce the risk of:

— fire spreading through the passenger and staff areas;

— the endangering of passengers and staff by obscuration of escape routes;

— the endangering of passengers and staff by the presence of toxic fumes.

4.3 Fire resulting from technical defects

Ignition models, comparable to electric arcs or abnormal temperatures shall be taken into consideration. The effects of any flammable gases or flammable liquids which may be present shall also be taken into account.

Measures shall be taken to reduce the risk of:

- fire spreading through the passenger and staff areas;
- the endangering of passengers and staff by obscuration of escape routes;
- the endangering of passengers and staff by the presence of toxic fumes.

4.4 Fire resulting from larger ignition models than those described in 4.2 and 4.3

To reduce the hazards to passenger and staff, the following requirements, which are defined in all parts of this Technical Specification, are intended to cover cases with ignition models bigger than those described in 4.2 and 4.3:

- specification of design to aid evacuation and to limit dwell times;
- arrangement of materials to reduce fire spread and fire effluents;
- use of materials with higher reaction to fire performance than performances required to satisfy requirements of 4.2 and 4.3;
- means to contain fire and fire effluents (e.g. fire barriers);
- means for fire detection, fire fighting and evacuation management.

5 Operation and design categories of railway vehicles

5.1 Operation category

Railway vehicles are classified under the operation categories:

Operation Category 1

Vehicles that are not designed or equipped to run on underground sections, tunnels and/or elevated structures and which may be stopped with minimum delay, after which immediate side evacuation to a place of ultimate safety is possible.

Operation Category 2

Vehicles that are designed or equipped to run on underground sections, tunnels and/or elevated structures, with side evacuation available and where there are stations or emergency stations that offer a place of ultimate safety to passengers, reachable within a short running time.

Operation Category 3

Vehicles that are designed or equipped to run on underground sections, tunnels and/or elevated structures, with side evacuation available and where there are stations or emergency stations that offer a place of ultimate safety to passengers, reachable within a long running time.