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Railway applications - Requirements for running capability in case of fire on board of rolling stock

EESTI STANDARDI EESSÕNA

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See Eesti standard EVS-EN 50553:2012 sisaldab Euroopa standardi EN 50553:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 50553:2012 consists of the English text of the European standard EN 50553:2012.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English version

Railway applications - Requirements for running capability in case of fire on board of rolling stock

Applications ferroviaires - Exigences en matière d'aptitude au roulement en cas d'incendie à bord des véhicules ferroviaires

Bahnanwendungen - Anforderungen an die Fahrfähigkeit im Brandfall an Bord von Bahnfahrzeugen

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This document (EN 50553:2012) has been prepared by CLC/TC 9X, "Electrical and electronic applications for railways".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2013-01-23
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2015-01-23

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

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Introduction

The purpose of this European Standard is to define requirements for running capability under fire conditions which are applicable to railway rolling stock with passengers, so that a train will be able to reach a "safe area" as defined in the Safety in Rail Tunnels TSI (TSI SRT) 1.1.3.

Specifically, this standard is intended to clarify and rationalise the requirements for rolling stock running capability in the EN 45545 series (Operation Categories 2, 3 and 4) and in the TSI SRT (Fire Safety Categories A and B). It is also intended to define specific technical measures, compliance with which will allow a 'Presumption of Conformity' with the TSI SRT to be made by the Notified Body assessing the Rolling Stock.

NOTE 1 In several cases it might appear that requirements are included which are duplicating requirements given in the EN 45545 series and/or which are dealt with in other ways by the EN 45545 series. This is not the intention and is not the case. The EN 45545 series introduces running capability functional requirements but does not generally define how they are to be met nor to what level of performance. Also, a number of requirements which are included in the EN 45545 series, would be relevant to, or suitable for, running capability use but are not identified for this use within the TS. It is therefore necessary to include requirements which are apparently duplicating the EN 45545 series in this standard but which actually do not duplicate the TS when examined in detail. If desired it should be possible, when converting EN 45545 to an EN, to include these requirements during the process which would allow them to be removed from this standard.

Reference to Annex A shows that it is necessary for this standard specifically to address 4.2.5.5 of the TSI SRT.

This standard considers the requirement to "improve the probability that a passenger train with a fire on board will continue to operate…" in a "reasonably practicable" context. It is understood that "train" includes all vehicles such as locomotives and power cars which are associated with the passenger vehicles.

Requirements for running capability cannot be defined without a knowledge of other fire characteristics of the train, specifically its reaction to fire and fire resistance specification. The assumption is made that the fire standard applied is the EN 45545 series or any standard for which technical equivalence can be demonstrated.

NOTE 2 In defining conditions to assure running capability it is only the intention to define requirements which allow the train to remain capable of controlled movement. The general safety level of the train when operating under these conditions (for example the level of lighting within the saloon) is not within the scope. Matters such as this are dealt with in other standards (including, but not limited to, the EN 45545 series).

The standard defines requirements based on a philosophy which recognises that stopping a train is not itself a life-threatening event. It is therefore not required to have running capability for all fires; only those fires which may cause serious injury and/or develop to threaten life.

For example, situations such as the combustion of an individual electrical component inside a technical cabinet meeting criteria for fire resistance in accordance with the EN 45545 series, do not attract running capability requirements under this standard. In a similar manner, if any fire is extinguished with no reignition during the relevant period of the incident, it is deemed that there is no longer a requirement for running capability and the train can be stopped (as if it was a non-safety threatening technical fault). These examples illustrate how the impracticability of addressing all thermal events that could stop a train is circumvented by the philosophy applied.

Compliance with the running capability requirements for any relevant system function is derived from one or more of the following:

– absence of a relevant fire;
– assuring system function under the fire;
– assuring system function for a redundant array under the fire;
– extinguishing the fire;
– assuring sufficient remaining Tractive Effort under the fire.

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NOTE 3 This document does not cover requirements regarding maintenance, cleaning or prevention of arson. Nevertheless these are important considerations in the management of fire safety and must be recognised by those using this standard. They may be covered appropriately by the Maintenance requirements of Technical Specifications for Interoperability and the Safety Management Systems of Railway Undertakings.

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1 Scope

This European Standard defines requirements for running capability under fire conditions which are applicable to passenger carrying railway rolling stock.

In particular, technical measures are specified, compliance with which will contribute to conformity with the Directive and the relevant Technical Specifications for Interoperability (TSI).

The standard specifies the fire conditions:

– for which it is not necessary to define running capability requirements as there is no significant potential for serious injury or threat to life;

– for which it is reasonable to expect trains to continue to run in a controlled manner;

– for which it is not reasonably practicable to define requirements which give complete assurance of running in a controlled manner, due to the exceptional nature of the fire incident.

The TSI SRT defines running capability requirements in respect of fires within technical areas/equipment only. However for general guidance the scope of this standard is extended to include fires from non-technical causes within passenger/staff areas which may impact train system functions adjacent to and/or passing through the affected area. This extension of applicability significantly increases the number of system functions which are potentially at risk and therefore requires that the "reasonably practicable" principles be extended to this new condition.

The standard does not consider situations where a primary non-fire incident is likely to immobilise the train by definition; for example major mechanical defect leading to derailment, even when fire then occurs.

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 3-7 +A1	2004 2007	*Portable fire extinguishers — Part 7: Characteristics, performance requirements and test methods*
EN 54	Series	*Fire detection and fire alarm systems*
EN 403	2004	*Respiratory protective devices for self-rescue — Filtering devices with hood for escape from fire — Requirements, testing, marking*
EN 15663	2009	*Railway applications — Definition of vehicle reference masses*
CEN/TS 45545-1	2009	*Railway applications — Fire protection on railway vehicles — Part 1: General*
CEN/TS 45545-2	2009	*Railway applications — Fire protection on railway vehicles — Part 2: Requirements for fire behaviour of materials and components*
CEN/TS 45545-3	2009	*Railway applications — Fire protection on railway vehicles — Part 3: Fire resistance requirements for fire barriers*
CEN/TS 45545-4	2009	*Railway applications — Fire protection on railway vehicles — Part 4: Fire safety requirements for railway rolling stock design*
CLC/TS 45545-5	2009	*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*

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CEN/TS 45545-6	2009	*Railway applications — Fire protection on railway vehicles — Part 6: Fire control and management systems*
CEN/TS 45545-7	2009	*Railway applications — Fire protection on railway vehicles — Part 7: Fire safety requirements for flammable liquid and flammable gas installations*
EN 50155	2001	*Railway applications — Electronic equipment used on rolling stock*
EN 50200	2006	*Method of test for resistance to fire of unprotected small cables for use in emergency circuits*
EN 50216-5 + A1 + A2 + corr Oct. + A3	2002 2002 2005 2006 2006	*Power transformer and reactor fittings — Part 5; Liquid level, pressure and flow indicators, pressure relief devices and dehydrating breathers*
EN 50362	2003	*Method of test for resistance to fire of larger unprotected power and control cables for use in emergency circuits*
EN 60310	2004	*Railway applications — Traction transformers and inductors on board rolling stock (IEC 60310:2004)*
EN 61034-1	2005	*Measurement of smoke density of cables burning under defined conditions — Part 1: Test apparatus (IEC 61034-1:2005)*
EN ISO 15540	2001	*Ships and marine technology — Fire resistance of hose assemblies — Test methods (ISO 15540:1999)*
IEC 60331-3	2009	*Tests for electric cables under fire conditions — Circuit integrity — Part 3: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV tested in a metal enclosure*
ISO/TR 9705-2	2001	*Reaction to fire tests — Full scale room tests for surface products — Part 2: Technical background and guidance*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 fire scenarios

3.1.1
type 1 fire
fire which, due to its size and/or location, presents no significant risk of serious injury or threat to life and for which it is not necessary to define running capability requirements

3.1.2
type 2 fire
fire which, due to its size and/or location, presents a risk of serious injury and/or threat to life and for which it is reasonably practicable to define running capability requirements

3.1.3
type 3 fire
fire which, due to its size and/or location, presents a risk of serious injury and/or threat to life but for which it is not reasonably practicable to assure running capability

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