Irish Standard
I.S. EN 50553:2012&AC:2013&A1:2016

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

I.S. EN 50553:2012&AC:2013&A1:2016

Incorporating amendments/corrigenda/National Annexes issued since publication:	
EN 50553:2012/A1:2016	EN 50553:2012/AC:2013

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I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

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This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

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National Foreword

I.S. EN 50553:2012&AC:2013&A1:2016 is the adopted Irish version of the European Document EN 50553:2012, Railway applications - Requirements for running capability in case of fire on board of rolling stock

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50553:2012/A1

March 2016

ICS 13.220.50; 45.060.01

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

This amendment A1 modifies the European Standard EN 50553:2012; it was approved by CENELEC on 2016-02-15. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

This document (EN 50553:2012/A1:2016) 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)	2017-02-15
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2019-02-15

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of EN 50553:2012.

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1 Modifications to 6.2.2.1, Transformers and inductances, List Entry b)

Replace:

b) Overpressure in the transformer or inductance tank:

There shall be an over-pressure valve which protects the tank from rupture arising from a catastrophic internal failure. The value of the pressure at which the valve operates shall be consistent with the tank design and shall be subject to type test. The outlet from the over-pressure valve shall not be local to potential sources of ignition.

There shall be an over-pressure valve which, on activation, opens the main circuit breaker. The pressure at which this activates shall be such that for all non-catastrophic internal failures no fluid is released from the over-pressure valve.

The overpressure valve shall be in accordance with EN 50216-5:2002/A2:2005, Clause 6.

NOTE 1 The activation pressure of the over-pressure switch is typically 0,2 bar less than the pressure at which the over-pressure valve operates.

with:

b) Overpressure in the transformer or inductance tank:

There shall be a **protection device** which protects the tank from rupture arising from a catastrophic internal failure. The value of the pressure at which the **protection device** operates shall be consistent with the tank design and shall be subject to type test. The outlet from the **protection device** shall not be local to potential sources of ignition.

There shall be a **protection device** which, on activation, opens the main circuit breaker. The pressure at which this activates shall be such that for all non-catastrophic internal failures no fluid is released from the **protection device**.

In case an overpressure valve is used, the overpressure valve shall be in accordance with EN 50216-5:2002/A2:2005, Clause 6.

NOTE 1 **In case an over-pressure valve is used the** activation pressure of the over-pressure switch is typically 0,2 bar less than the pressure at which the over-pressure valve operates.

2 Modification to 6.2.2.1, Transformers and inductances, List Entry c)

Replace:

c) Temperature and flow monitoring of the insulation liquid:

There shall be a means of monitoring the temperature and ensuring the flow of the insulation liquid.

If the rate of flow is sufficient to ensure accurate measurement of insulation liquid temperature then the power should be managed in accordance with the temperature control strategy for the transformer or inductance.

The temperature control strategy, including start up in cold temperatures, shall comprise:

– control of the tractive effort so the limit temperature of the insulation liquid is not exceeded, and

– isolating the transformer from the high power source if the temperature-rise limit of the insulation liquid is reached.

If the rate of flow is insufficient to ensure accurate measurement of insulation liquid temperature then the power should be shut down by isolating the transformer from the high power source.

NOTE 2 The limit temperature and the temperature-rise limit are described in 8.2 of EN 60310:2004.

with:

c) Temperature and flow monitoring of the insulation liquid:

There shall be a means of monitoring the temperature and ensuring the flow of the insulation liquid.

If the rate of flow is sufficient to ensure accurate measurement of insulation liquid temperature then the power should be managed in accordance with the temperature control strategy for the transformer or inductance.

The temperature control strategy, including start up in cold temperatures, shall comprise:

– control of the tractive effort so the limit temperature of the insulation liquid is not exceeded, and

– isolating the transformer from the high power source if the **temperature limit** of the insulation liquid is reached.

If the rate of flow is insufficient to ensure accurate measurement of insulation liquid temperature then the power should be shut down by isolating the transformer from the high power source.

NOTE 2 The limit **temperatures are** described in EN 60310:2004, 8.2.

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Corrigendum to EN 50553:2012

English version

In the following paragraph of Annex B, B.1:

"Using the available effort and the design mass, (the design mass m is defined in EN 15663:2009, 2.1.3.2.), calculate the maximum gradient ($i(v)$ in mm per m) which can be traversed.

$$i(v) = (F(v) - R(v))/(1\ 000.m.g)$$

where

g is the vertical acceleration due to gravity."

replace the formula " $i(v) = (F(v) - R(v))/(1\ 000.m.g)$ " by " $i(v) = (F(v) - R(v)).(1\ 000/m.g)$ ".

October 2013

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EN 50553

February 2012

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

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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:

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• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2015-01-23

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This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and supports essential requirements of EU Directives 96/48/EC (HSR) and 2001/16/EC (CONRAIL), both recast by 2008/57/EC (RAIL).

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.

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.

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*