

STN	Dráhové aplikácie Dráhové vozidlá Skúšanie dráhových vozidiel po ich zhotovení a pred uvedením do prevádzky	STN EN IEC 61133 34 1565
------------	--------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------

Railway applications - Rolling stock - Testing of rolling stock on completion of construction and before entry into service

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/22

Obsahuje: EN IEC 61133:2021, IEC 61133:2016

Oznámením tejto normy sa od 29.11.2024 ruší
STN EN 50215 (34 1565) z augusta 2010

134385

EUROPEAN STANDARD

EN IEC 61133

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2021

ICS 45.060

Supersedes EN 50215:2009 and all of its amendments
and corrigenda (if any)

English Version

**Railway applications - Rolling stock - Testing of rolling stock on
completion of construction and before entry into service
(IEC 61133:2016)**

Applications ferroviaires - Matériel roulant - Essais sur
matériel roulant après achèvement et avant mise en service
(IEC 61133:2016)

Bahnanwendungen - Fahrzeuge - Prüfung von
Bahnfahrzeugen nach Fertigstellung und vor
Indienststellung
(IEC 61133:2016)

This European Standard was approved by CENELEC on 2021-11-29. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 61133:2021 (E)**European foreword**

This document (EN IEC 61133:2021) consists of the text of IEC 61133:2016 prepared by IEC/TC 9 "Electrical equipment and systems 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) 2022-11-29
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2024-11-29

This document supersedes EN 50215:2009 and all of its amendments and corrigenda (if any).

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

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 61133:2016 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60077	series	Railway applications - Electric equipment for rolling stock	EN 60077	series
IEC 60310	2016	Railway applications - Traction transformers and inductors on board rolling stock	EN 60310	2016
IEC 60322	2001	Railway applications - Electric equipment for rolling stock - Rules for power resistors of open construction	EN 60322	2001
IEC 60349	series	Electric traction - Rotating electrical machines for rail and road vehicles	EN 60349	series
IEC 60494-1	2013	Railway applications - Rolling stock - Pantographs - Characteristics and tests - Part 1: Pantographs for main line vehicles	EN 50206-1	2010
IEC 60494-2	2013	Railway applications - Rolling stock - Pantographs - Characteristics and tests - Part 2: Pantographs for metros and light rail vehicles	EN 50206-2	2010
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 +AC +A1 +A2 +AC +AC	1991 1993 2000 2013 2016 2019
IEC 60571	2012	Railway applications - Electronic equipment used on rolling stock	EN 50155	2021 ¹

¹ For this standard, the directly equivalent European standard has been withdrawn; the standard listed is the current version.

EN IEC 61133:2021 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60850	2014	Railway applications - Supply voltages of traction systems	EN 50163 + A1 + corrigendum May + AC + A2	2004 2007 2010 2013 2020
IEC 61287	series	Railway applications - Power converters installed on board rolling stock	EN 61287	series
IEC 61377-1	-	Electric traction - Rolling stock - Combined testing - Part 1: Combined testing of inverter-fed alternating current motors and their control	EN 61377	-
IEC 61377-2	-	Railway applications - Rolling stock - Combined testing - Part 2: Chopper-fed direct current traction motors and their control	EN 61377	-
IEC 61377-3	-	Railway applications - Rolling stock - Part 3: Combined testing of alternating current motors, fed by an indirect convertor, and their control system	EN 61377	-
IEC 61991	2000	Railway applications - Rolling stock - Protective provisions against electrical hazards	EN 50153 + A1 + A2	2014 ¹ 2017 ¹ 2020 ¹
IEC 62236-3-1	2008	Railway applications - Electromagnetic compatibility - Part 3-1: Rolling stock - Train and complete vehicle	EN 50121-3-1 + A1	2017 ¹ 2019 ¹
IEC 62236-3-2	2008	Railway applications - Electromagnetic compatibility - Part 3-2: Rolling stock - Apparatus	EN 50121-3-2 + A1	2016 ¹ 2019 ¹
IEC 62278	2002	Railway applications - Specification and demonstration of reliability, availability, maintainability and safety (RAMS)	EN 50126-1 EN 50126-2	2017 ¹ 2017 ¹
IEC 62313	2009	Railway applications - Power supply and rolling stock - Technical criteria for the coordination between power supply (substation) and rolling stock	EN 50388 + AC	2012 ¹ 2013 ¹
IEC 62425	-	Railway applications - Communication, signalling and processing systems - Safety related electronic systems for signalling	EN 50129	-
IEC 62427	2007	Railway applications - Compatibility between rolling stock and train detection systems	EN 50238-1	2019 ¹
IEC 62845	-	Railway applications - Radio remote control system of traction vehicles for shunting application	EN 50239	-

EN IEC 61133:2021 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62846	-	Railway applications - Current collection systems - Requirements for and validation of measurements of the dynamic interaction between pantograph and overhead contact line	EN 50317	-
ISO/IEC 17025 -		General requirements for the competence of testing and calibration laboratories	EN ISO/IEC 17025	-
ISO 3095	-	Acoustics - Railway applications - Measurement of noise emitted by railbound vehicles	EN ISO 3095	-
ISO 3381	-	Railway applications - Acoustics - Measurement of noise inside railbound vehicles	EN ISO 3381	-
ISO 9001	2015	Quality management systems - Requirements	EN ISO 9001	2015



IEC 61133

Edition 3.0 2016-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Railway applications – Rolling stock – Testing of rolling stock on completion of construction and before entry into service

Applications ferroviaires – Matériel roulant – Essais de matériel roulant après achèvement et avant mise en service





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2016 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
 3, rue de Varembe
 CH-1211 Geneva 20
 Switzerland

Tel.: +41 22 919 02 11
 Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

65 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.



IEC 61133

Edition 3.0 2016-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Railway applications – Rolling stock – Testing of rolling stock on completion of construction and before entry into service

Applications ferroviaires – Matériel roulant – Essais de matériel roulant après achèvement et avant mise en service

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 45.060

ISBN 978-2-8322-3178-4

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	6
1 Scope.....	8
2 Normative references.....	8
3 Terms, definitions and abbreviations	10
4 Requirements	12
4.1 General.....	12
4.2 Third party test facilities	13
4.3 Test plan.....	13
5 Categories of tests	14
5.1 General.....	14
5.2 Preliminary adjustment tests.....	14
5.3 Acceptance tests.....	14
5.3.1 Type tests.....	14
5.3.2 Routine tests.....	15
5.3.3 Tests required by Approval Authority	15
5.4 Investigation tests	15
6 Test conditions	16
6.1 General.....	16
6.2 Static tests.....	16
6.3 Dynamic tests	16
7 Validation documentation.....	17
8 Schedule of static tests.....	17
8.1 General.....	17
8.2 Dimensional tests.....	17
8.2.1 Objective	17
8.2.2 Type tests.....	18
8.2.3 Routine tests.....	19
8.3 Gauging test	19
8.3.1 Objective	19
8.3.2 General (type and safety-related test).....	19
8.3.3 Coefficient of flexibility test (type test and safety-related test, voluntary or obligatory)	19
8.3.4 Routine test or equivalent (safety-related test).....	19
8.4 Lifting ability test (type and safety-related test).....	19
8.4.1 Objective	19
8.4.2 Type test	20
8.5 Weighing tests	20
8.5.1 Objective	20
8.5.2 Load cases	20
8.5.3 Type tests (safety-related test).....	21
8.5.4 Routine tests (safety-related test).....	22
8.6 Sealing tests	22
8.6.1 Objective	22
8.6.2 Type tests.....	22
8.6.3 Routine tests (voluntary test).....	23
8.7 Electrical insulation tests (routine tests).....	23

8.7.1	General	23
8.7.2	Voltage withstand test	23
8.7.3	Insulation impedance test	24
8.8	Protective bonding and return circuits tests (routine and safety-related test)	24
8.9	Air system tests	24
8.9.1	General	24
8.9.2	Air tightness of main reservoirs and other air equipment (routine and safety-related test)	25
8.9.3	Air tightness of brake cylinders and auxiliary reservoirs (routine and safety-related test)	25
8.9.4	Checking operation of compressed air equipment (type and safety-related test where appropriate)	25
8.10	Hydraulic system tests (type, routine and safety-related test where appropriate)	26
8.11	Friction brake system tests	26
8.11.1	General	26
8.11.2	Pneumatically applied brake systems	27
8.11.3	Other systems (type, routine and safety-related as appropriate)	27
8.11.4	Sanding systems (type, routine and safety-related test)	27
8.12	Parking brake type tests (safety-related test)	28
8.13	Auxiliary power supply system tests	28
8.13.1	Objective	28
8.13.2	Type tests (safety-related tests where appropriate)	28
8.13.3	Routine tests	29
8.14	Battery charging tests	29
8.14.1	Objective	29
8.14.2	Type test	29
8.14.3	Routine test	29
8.15	Auxiliary and control system tests	30
8.15.1	Objective	30
8.15.2	General tests	30
8.15.3	Train control (safety-related tests where appropriate)	31
8.15.4	Door control systems (safety-related test)	31
8.15.5	Heating, ventilation and air-conditioning system tests (safety-related test where appropriate)	32
8.15.6	Lighting system (interior)	32
8.15.7	Other systems (type, routine and safety-related tests where appropriate)	32
8.15.8	Software controlled systems (safety-related test where appropriate)	33
8.16	Tests on thermal engine and associated generating sets or transmission	33
8.16.1	General	33
8.16.2	Operating speed tests of the thermal engine (type tests)	33
8.16.3	Thermal engine protective devices (type test)	34
8.16.4	Thermal engine fluid, air and exhaust circuits (routine test, safety-related test where appropriate)	34
8.16.5	Engine driven auxiliaries	34
8.16.6	Cranking of the thermal engine (type test)	34
8.16.7	Operation of the thermal engine	34
8.17	Traction system tests (type, routine and safety-related tests where appropriate)	35

8.18	Operability and maintainability (type test)	36
8.18.1	General	36
8.18.2	Cabs and traincrew areas (safety-related test)	36
8.18.3	Passenger areas (safety-related test where appropriate)	37
8.18.4	Rescue (safety-related test where required)	37
8.19	Noise and vibration tests (type test, safety-related test where appropriate)	37
8.20	Safety-related system tests (routine tests)	37
9	Schedule of dynamic tests	38
9.1	General	38
9.2	Traction performance (tractive effort/speed characteristics)	38
9.2.1	Type test	38
9.2.2	Routine test	39
9.3	Traction performance (journey time check) (voluntary type test)	39
9.4	Braking tests	40
9.4.1	Type test (safety-related tests)	40
9.4.2	Routine tests (safety-related tests)	44
9.5	Traction and braking thermal capacity tests (type test, safety-related test where appropriate)	44
9.6	Resistance to motion (voluntary type test)	45
9.7	Speed regulating system tests (type and routine tests, safety-related where appropriate)	45
9.8	Automatic train protection systems (type, routine and safety-related tests)	46
9.9	Vehicle/track interaction	46
9.9.1	Safety of running	46
9.9.2	Suspension clearances, inter-vehicle clearances (voluntary type and safety-related test where appropriate)	47
9.10	Ride comfort quality (voluntary tests)	48
9.10.1	Objective	48
9.10.2	Type test	48
9.10.3	Routine test (voluntary test)	48
9.11	Kinematic envelope	48
9.11.1	Type test (safety-related test)	48
9.11.2	Routine test (voluntary)	48
9.12	Operation of wheel flange lubricators (safety-related routine test only)	48
9.13	Current collector and power supply contact system compatibility tests (safety-related type test only)	49
9.14	Aerodynamic effects (type tests only, safety-related where appropriate)	49
9.15	Electromagnetic compatibility (type tests only)	50
9.15.1	Internal interference within the vehicle (safety-related where appropriate)	50
9.15.2	External interference produced by the vehicle (safety-related where appropriate)	50
9.15.3	Radio frequency interference	51
9.15.4	External interference to the vehicle	51
9.15.5	Electrostatic discharges (voluntary test)	51
9.16	Interruption and voltage/jump and short circuit test (voluntary type test only)	51
9.16.1	General	51
9.16.2	Voltage jump tests	52
9.16.3	Interruption tests	52
9.16.4	Voltage variation testing	52

9.16.5	Short circuit test.....	53
9.17	Noise tests.....	53
9.17.1	Type test	53
9.17.2	Routine test (voluntary test)	53
9.18	Air systems – compressor duty cycle (type test, safety-related where appropriate)	53
9.19	Windscreen wipers (type test).....	54
9.20	Train control system (type test, safety-related where appropriate)	54
Annex A (informative) List of tests.....		56
Annex B (informative) Requirements for the European Community – Legal requirement in accordance with AC/135/2002		61
B.1	General.....	61
B.2	Legal references	61
B.2.1	Directives	61
B.2.2	Technical specifications for interoperability.....	61
B.3	European Standards relevant to Clauses in IEC 61133.....	62
Bibliography		65
Table 1 – Recommended load cases		20
Table A.1 – List of static tests (1 of 4)		56
Table A.2 – List of dynamic tests (1 of 2).....		59

INTERNATIONAL ELECTROTECHNICAL COMMISSION

RAILWAY APPLICATIONS – ROLLING STOCK – TESTING OF ROLLING STOCK ON COMPLETION OF CONSTRUCTION AND BEFORE ENTRY INTO SERVICE

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61133 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This standard is derived from EN 50215.

This third edition cancels and replaces the second edition, published in 2006; it constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

- References to standards other than international have been removed from the main text so the notes refer solely to Annex B;
- Annex B has been updated with the latest European information, and cross-references between the TSIs and ENs and the clauses of IEC 61133 have been added.

The text of this standard is based on the the second edition and the following documents:

FDIS	Report on voting
9/2096/FDIS	9/2132/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

RAILWAY APPLICATIONS – ROLLING STOCK – TESTING OF ROLLING STOCK ON COMPLETION OF CONSTRUCTION AND BEFORE ENTRY INTO SERVICE

1 Scope

This International Standard specifies general criteria to demonstrate by testing that newly constructed complete railway vehicles conform with standards or other normative documents.

This International Standard, as a whole or in part, applies to all railway vehicles except special purpose vehicles such as track-laying machines, ballast cleaners and personnel carriers. The extent of application of the standard for particular vehicles will be specifically mentioned in the contract, to take account, where necessary, of any legislative requirements.

NOTE 1 The parts of the standard which are applicable will depend on the type of vehicle (e.g. passenger, freight, powered trailer, etc.).

NOTE 2 The scope of this standard excludes railbound and road/rail vehicles for construction and maintenance of railway infrastructure.

NOTE 3 This standard does not deal with tests carried out on components or equipment before fitting to the vehicle.

In so far as this International Standard is applicable, it may be used for the following:

- generator sets mounted on a vehicle provided for auxiliary purposes;
- electrical transmission used on trolley buses or similar vehicles;
- control and auxiliary equipment of vehicles with non-electrical propulsion systems;
- vehicles guided, supported or electrically propelled by systems which do not use the adhesion between wheel and rail.

NOTE 4 Specific technical requirements apply to vehicles which operate on the railways in the European Union. The source of those requirements is given in Annex B. Where a European requirement applies to a given clause, a note has been inserted at the end of the clause.

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.

IEC 60077 (all parts), *Railway applications – Electric equipment for rolling stock*

IEC 60310:2015, *Railway applications – Traction transformers and inductors on board rolling stock*

IEC 60322:2001, *Railway applications – Electric equipment for rolling stock – Rules for power resistors of open construction*

IEC 60349 (all parts), *Electric traction – Rotating electrical machines for rail and road*

IEC 60494-1:2013, *Railway applications – Rolling stock – Pantographs – Characteristics and tests – Part 1: Pantographs for main line vehicles*

IEC 60494-2:2013, *Railway applications – Rolling stock – Pantographs – Characteristics and tests – Part 2: Pantographs for metros and light rail vehicles*

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

IEC 60571:2012, *Railway applications – Electronic equipment used on rolling stock*

IEC 60850:2014, *Railway applications – Supply voltages of traction systems*

IEC 61287 (all parts), *Railway applications – Power convertors installed on board rolling stock*

IEC 61377-1, *Railway applications – Rolling stock – Part 1: Combined testing of inverter-fed alternating current motors and their control system*

IEC 61377-2, *Railway applications – Rolling stock – Combined testing – Part 2: Chopper-fed direct current traction motors and their control*

IEC 61377-3, *Railway applications – Rolling stock – Part 3: Combined testing of alternating current motors, fed by an indirect converter, and their control system*

IEC 61991:2000, *Railway applications – Rolling stock – Protective provisions against electrical hazards*

IEC 62236-3-1:2008, *Railway applications – Electromagnetic compatibility – Part 3-1: Rolling stock – Train and complete vehicle*

IEC 62236-3-2:2008, *Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus*

IEC 62278:2002, *Railway applications – Specification and demonstration of reliability, availability, maintainability and safety (RAMS)*

IEC 62313:2009, *Railway applications – Power supply and rolling stock – Technical criteria for the coordination between power supply (substation) and rolling stock*

IEC 62425, *Railway applications – Communication, signalling and processing systems – Safety related electronic systems for signalling*

IEC 62427:2007, *Railway applications – Compatibility between rolling stock and train detection systems*

IEC 62845, *Railway applications – Radio remote control system of traction vehicles for shunting application*

IEC 62846, *Railway applications – Current collection systems – Requirements for and validation of measurements of the dynamic interaction between pantograph and overhead contact line¹*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

¹ To be published.

ISO 3095, *Acoustics – Railway applications – Measurement of noise emitted by railbound vehicles*

ISO 3381, *Railway applications – Acoustics – Measurement of noise inside railbound vehicles*

ISO 9001:2015, *Quality management systems – Requirements*

NOTE For applications in the European Union, see also the references in Annex B.

koniec náhľadu – text ďalej pokračuje v platenej verzii STN