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Railway applications - Infrastructure - Railbound construction and maintenance machines - Part 1: Technical requirements for running

Bahnanwendungen - Oberbau - Schienengebundene Bau- und Instandhaltungsmaschinen - Teil 1: Technische Anforderungen an das Fahren

Applications ferroviaires - Infrastructure - Machines de construction et de maintenance empruntant exclusivement les voies ferrées - Partie 1: Prescriptions techniques pour la circulation

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techniques pour la circulation

Bahnanwendungen - Oberbau - Schienengebundene
Bau- und Instandhaltungsmaschinen - Teil 1:
Technische Anforderungen an das Fahren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 256.

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European foreword

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This document is currently submitted to the CEN Enquiry.

This document will supersede EN14033-1:2017.

Amended clauses compared to EN 14033-1:2017 are shown in informative Annex H.

This series of standards EN 14033, *Railway applications — Infrastructure — Railbound construction and maintenance machines*, consists of the following parts:

- Part 1: Technical requirements for running;
- Part 2: Technical requirements for travelling and working;
- Part 3: General safety requirements;
- Part 4: Technical requirements for running, travelling and working on urban rail.

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prEN 14033-1:2024 (E)**Introduction**

This document is the first of a series of four parts of the European Standard: Railway applications - Infrastructure - Railbound construction and maintenance machines:

- Part 1 covers the safety and technical requirements for the machines in running mode;
- Part 2 covers the railway specific requirements for the machines in working and travelling modes;
- Part 3 covers the safety requirements for the machines in working and travelling modes; this is a harmonized standard with the European Machinery Directive 2006/42/EC;
- Part 4 covers requirements for the machines in running, working and travelling modes when used on urban rail

The risks that exist in all mechanical, electrical, hydraulic, pneumatic and other components of machines and which are dealt with in the relevant European Standards are not within the scope of this European Standard. Where necessary, references are made to appropriate standards of this type.

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1 Scope

This document defines the specific technical railway requirements for running of machines and other vehicles used for construction, maintenance and inspection of track, structures, track formation and fixed electric traction equipment. Special national conditions applicable to specific member states are shown in Annex B.

This document applies to all railbound machines and other vehicles – referred to as machines – running exclusively on the railway (utilizing adhesion between the rail and wheels) and used for construction, maintenance and inspection of track, structures, infrastructure and fixed electric traction equipment.

This document applies to machines that are intended to operate signalling and control systems.

NOTE Other rail mounted railway maintenance and infrastructure inspection machines are dealt with in other European Standards, see Technical Report CEN/TR 17498:2020.

This document is written for 1 435 mm nominal track gauge; special requirements can apply for running on infrastructures with narrow gauge or broad gauge lines, urban railways, railways utilizing other than adhesion between the rail and wheels and road-rail machines which are not included in this standard.

This document covers the railway specific requirements for movements of the machine as a train and movements to reach work sites.

This document applies to equipment and systems which are operational on machines in running mode.

2 Normative references

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.

EN 286-3:1995, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 3: Steel pressure vessels designed for air braking equipment and auxiliary pneumatic equipment for railway rolling stock*

EN 286-4:1995, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 4: Aluminium alloy pressure vessels designed for air braking equipment and auxiliary pneumatic equipment for railway rolling stock*

EN 12080:2017+A1:2022, *Railway applications - Axleboxes - Rolling bearings*

EN 12663-1:2010+A2:2023, *Railway applications - Structural requirements of railway vehicle bodies - Part 1: Locomotives and passenger rolling stock (and alternative method for freight wagons)*

EN 12663-2:2010+A1:2023, *Railway applications - Structural requirements of railway vehicle bodies - Part 2: Freight wagons*

EN 13103-1:2017+A1:2022, *Railway applications - Wheelsets and bogies - Part 1: Design method for axles with external journals*

CEN/TS 13103-2:2020, *Railway applications - Wheelsets and bogies - Part 2: Design method for axles with internal journals*

EN 13260:2020, *Railway applications - Wheelsets and bogies - Wheelsets - Product requirements*

EN 13261:2020, *Railway applications - Wheelsets and bogies - Axles - Product requirements*

EN 13262:2020, *Railway applications - Wheelsets and bogies - Wheels - Product requirements*

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EN 13715:2020, *Railway applications - Wheelsets and bogies - Wheels - Tread profile*

EN 13749:2021+A1:2023, *Railway applications - Wheelsets and bogies - Method of specifying the structural requirements of bogie frames*

EN 13979-1:2023, *Railway applications - Wheelsets and bogies - Monobloc Wheels - Technical approval procedure - Part 1: Forged and rolled wheels*

prEN 14033-2:2024, *Railway applications — Track — Railbound construction and maintenance machines — Part 2: Technical requirements for travelling and working*

prEN 14033-3:2024, *Railway applications — Track — Railbound construction and maintenance machines — Part 3: General safety requirements*

EN 14067-4:2024, *Railway applications — Aerodynamics — Part 4: Requirements and test procedures for aerodynamics on open track*

EN 14067-6:2018+A1:2022, *Railway applications — Aerodynamics — Part 6: Requirements and test procedures for cross wind assessment*

EN 14198:2016+A2:2021, *Railway applications — Braking — Requirements for the brake system of trains hauled by locomotives*

EN 14363:2016+A2:2022, *Railway applications — Testing and Simulation for the acceptance of running characteristics of railway vehicles — Running Behaviour and stationary tests*

EN 14531-1:2015+A1:2018, *Railway applications — Methods for calculation of stopping and slowing distances and immobilization braking — Part 1: General algorithms utilizing mean value calculation for train sets or single vehicles*

EN 14601:2005+A2:2021, *Railway applications — Straight and angled end cocks for brake pipe and main reservoir pipe*

EN 14813-1:2006+A1:2010, *Railway applications — Air conditioning for driving cabs — Part 1: Comfort parameters*

EN 15152:2019+A1:2023, *Railway applications — Windscreens for trains*

EN 15153-1:2020, *Railway applications — External visible and audible warning devices — Part 1: Head, marker and tail lamps for heavy rail*

EN 15153-2:2020, *Railway applications — External visible and audible warning devices — Part 2: Warning horns for heavy rail*

EN 15220:2016, *Railway applications — Brake indicators*

EN 15227:2020, *Railway applications — Crashworthiness requirements for rail vehicles*

EN 15273-1:2013+A1:2016, *Railway applications — Gauges — Part 1: General — Common rules for infrastructure and rolling stock*

EN 15273-2:2013+A1:2016, *Railway applications — Gauges — Part 2: Rolling stock gauge*

EN 15355:2019+A1:2023, *Railway applications — Braking — Distributor valves and distributor-isolating devices*

EN 15437-1:2009+A1:2022, *Railway applications — Axlebox condition monitoring — Interface and design requirements — Part 1: Track side equipment and rolling stock axlebox*

EN 15528:2021, *Railway applications — Line categories for managing the interface between load limits of vehicles and infrastructure*

EN 15551:2022, *Railway applications — Railway rolling stock — Buffers*

EN 15566:2022, *Railway applications — Railway Rolling stock — Draw gear and screw coupling*

EN 15595:2018+A1:2023, *Railway applications — Braking — Wheel slide protection*

EN 15624:2021, *Railway applications — Braking — Empty-loaded changeover devices*

EN 15663:2017+A1:2018, *Railway applications — Vehicle reference masses*

EN 15807:2021, *Railway applications — Pneumatic half couplings*

EN 15827:2011, *Railway applications — Requirements for bogies and running gears*

EN 15877-1:2012+A1:2018, *Railway applications — Marking on railway vehicles - Part 1: Freight wagons*

EN 15877-2:2013, *Railway applications — Markings of railway vehicles — Part 2: External markings on coaches, motive power units, locomotives and on track machines*

FprEN 15839:2024, *Railway applications — Testing for the acceptance of running characteristics of railway vehicles — Testing of running safety under longitudinal compressive force*

FprEN 15955-2:2024, *Railway applications — Infrastructure — Demountable machines, trailers and associated equipment — Part 2: General safety requirements*

EN 16116-2:2024, *Railway applications — Design requirements for steps, handrails and associated access for staff — Part 2: Freight wagons*

EN 16186-1:2014+A1:2018, *Railway applications — Driver's cab — Part 1: Anthropometric data and visibility*

EN 16207:2024, *Railway applications — Braking — Functional and performance criteria of Magnetic Track Brake systems for use in railway rolling stock*

EN 16404:2016, *Railway applications — Re-railing and recovery requirements for railway vehicles*

EN 16452:2015+A1:2019, *Railway applications — Braking — Brake blocks*

EN 16834:2019, *Railway applications — Braking — Brake performance*

EN 16839:2022, *Railway applications — Rolling stock — Head stock layout*

EN 17343:2023, *Railway applications — General terms and definitions*

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EN 45545-2:2020+A1:2023, *Railway applications — Fire protection on railway vehicles — Part 2: Requirements for fire behaviour of materials and components*

EN 50119:2020, *Railway applications — Fixed installations — Electric traction overhead contact lines*

EN 50121-3-1:2017,¹ *Railway applications — Electromagnetic compatibility — Part 3-1: Rolling stock - Train and complete vehicle*

EN 50125-1:2014, *Railway applications — Environmental conditions for equipment — Part 1: Rolling stock and on-board equipment*

EN 50153:2014,² *Railway applications — Rolling stock — Protective provisions relating to electrical hazards*

EN 50206-1:2010, *Railway applications — Rolling stock — Pantographs: Characteristics and tests - Part 1: Pantographs for main line vehicles*

EN 50367:2020,³ *Railway Applications — Fixed installations and rolling stock — Technical criteria to achieve interoperability between pantographs and overhead contact line*

EN 50388-1:2022, *Railway Applications — Fixed installations and rolling stock — Technical criteria for the coordination between electric traction power supply systems and rolling stock to achieve interoperability — Part 1: General*

EN 50463-1:2017, *Railway applications — Energy measurement on board trains — Part 1: General*

EN 50463-2:2017, *Railway applications — Energy measurement on board trains — Part 2: Energy measuring*

EN 50463-3:2017, *Railway applications — Energy measurement on board trains — Part 3: Data handling*

EN 50463-4:2017, *Railway applications — Energy measurement on board trains — Part 4: Communication*

EN 50463-5:2017, *Railway Applications — Energy measurement on board trains — Part 5: Conformity assessment*

EN 50617-2:2015, *Railway Applications — Technical parameters of train detection systems for the interoperability of the trans-European railway system - Part 2: Axle counters*

EN 50716:2023, *Railway Applications — Requirements for software development*

EN 60077-1:2017, *Railway applications — Electric equipment for rolling stock — Part 1: General service conditions and general rules*

EN 60077-2:2017, *Railway applications — Electric equipment for rolling stock — Part 2: Electrotechnical components — General rules*

EN IEC 60077-3:2019, *Railway Applications — Electric equipment for rolling stock — Part 3: Electrotechnical components — Rules for DC circuit breakers*

¹ As impacted by EN 50121-3-1:2017/A1:2019.

² As impacted by EN 50153:2014/A1:2017 and EN 50153:2014/A2:2020.

³ As impacted by EN 50367-1:2020/A1:2022.

EN IEC 60077-4:2019, *Railway Applications — Electric equipment for rolling stock — Part 4: Electrotechnical components — Rules for AC circuit breakers*

EN IEC 60077-5:2019, *Railway Applications — Electric equipment for rolling stock — Part 5: Electrotechnical components — Rules for HV fuses*

EN 60310:2016, *Railway applications — Traction transformers and inductors on board rolling Stock*

EN 62625-1:2013,⁴ *Electronic railway equipment — On board driving data recording system — Part 1: System specification (IEC 62625-1:2013)*

EN ISO 7010:2020,⁵ *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 4975:2022, *Railway applications — Braking system — Quality of compressed air for pneumatic apparatus and systems*

ISO 11112:1995, *Earth-moving machinery — Operator's seat — Dimensions and requirements*

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⁴ As impacted by EN 62625-1:2013/AC:2016-10 and EN 62625-1:2013/A11:2017.

⁵ As impacted by EN ISO 7010:2020/A1:2020, EN ISO 7010:2020/A2:2022, EN ISO 7010:2020/A3:2022, EN ISO 7010:2020/A4:2023, EN ISO 7010:2020/A5:2023 and EN ISO 7010:2020/A6:2023.

prEN 14033-1:2024 (E)**3 Terms and definitions**

For the purposes of this document, the terms and definitions in EN 17343 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1**railbound construction and maintenance machine**

on-track machines and infrastructure inspection machines

Note 1 to entry: A similar definition is given in EN 17343:2023, 3.1.7.8.1.

3.2**on-track machines****OTM**

machine specially designed for construction and maintenance of the track and infrastructure and used in different modes: working configuration, travelling configuration, running configuration as a self-propelled vehicle, or running configuration as a hauled vehicle, when:

- it is running on its own rail wheels,
- it is designed to have characteristics necessary for the operation of track based train detection systems

Note 1 to entry: A similar definition is given in EN 17343:2023, 3.1.7.8.1.1.

3.3**infrastructure inspection machine**

machine used to monitor the condition of the infrastructure which, with the exception of machines which are incorporated into passenger trains, are considered to be on track machines

Note 1 to entry: Infrastructure inspection machines designed to be incorporated into passenger trains are not considered as railbound construction machines and will meet passenger car standards.

Note 2 to entry: A similar definition is given in EN 17343:2023, 3.1.7.8.1.2.

3.4**demountable module**

removable unit which is capable of being attached with dedicated fastening system to a machine, to perform a specific function

3.5**semi-permanently coupled machines**

machines which require a workshop environment to couple and uncouple (because there is no operational need or requirement to couple or uncouple between the machines)

3.6**running mode**

configuration of a machine when it allows movement along the track, all moveable parts stowed within the applicable gauge, with the machine interacting with the signalling and control systems