
Železniške naprave - Infrastruktura - Stroji brez tirnih koles in pripadajoča oprema, namenjena za delo na železniški infrastrukturi - Tehnične in varnostne zahteve za delo

Railway applications - Infrastructure - Machines without rail wheels, and associated equipment, intended for work on railway infrastructure - Technical and safety requirements for working

Bahnanwendungen - Infrastruktur - Maschinen ohne Schienenräder und zugehörige Ausstattung, vorgesehen für Arbeiten an der Bahninfrastruktur - Technische und sicherheitstechnische Anforderungen an den Arbeitseinsatz

Applications ferroviaires - Infrastructure - Machines sans roues ferroviaires et équipements annexes destinés à l'infrastructure ferroviaire - Exigences techniques et de sécurité pour le travail

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**Railway applications - Infrastructure - Machines without
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requirements for working**

Applications ferroviaires - Infrastructure - Machines
sans roues ferroviaires et équipements annexes
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Bahnanwendungen - Infrastruktur - Maschinen ohne
Schienenräder und zugehörige Ausstattung,
vorgesehen für Arbeiten an der Bahninfrastruktur -
Technische und sicherheitstechnische Anforderungen
an den Arbeitseinsatz

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

If this draft becomes a European Standard, CEN 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.

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European foreword

This document (prEN 18146:2025) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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prEN 18146:2025 (E)**Introduction**

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document.

Machines Without Railwheels (MWR) as specified in 3.1 form the object of this document.

This document deals with railway specific risks of the MWR, as defined in Clause 4, when used on railway infrastructure.

Deviations or special national conditions are dealt with in Annex A.

The hazards which exist in all mechanical, electrical, hydraulic, pneumatic and other components of MWRs and which are dealt within other relevant European standards are not within the scope of this document. Where necessary, references are made to appropriate standards of this type.

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1 Scope

1.1 General

This document specifies the requirements for machines and associated equipment, without rail-wheels, designed and intended for work on railway infrastructure, henceforward referred to as 'MWR'. This document also covers MWR intended for use on urban rail infrastructure. The types of MWR covered by this document also include:

- MWR with power driven mechanisms;
- MWR with manually driven mechanisms;
- hand-held machines (with ability to attach to track).

NOTE 1 Railway maintenance and infrastructure inspection machines fitted with rail-wheels are dealt with in other European standards, see CEN/TR 17498:2020.

This document specifies the requirements to deal with the common hazards during transport, assembly and installation, commissioning, working, including setting up, programming, and process changeover, operation, cleaning, fault finding, maintenance and decommissioning of MWR and associated equipment when they are used as intended and under conditions of misuse which are reasonably foreseeable.

The requirements set out in this document are intended to control the hazards associated with the engineering aspects of MWR.

NOTE 2 It is anticipated that a safe system of work (see EN 16704-1:2016+A1:2021) will additionally be required.

NOTE 3 It is anticipated that the manufacturer of the MWR will comply with the Machinery Directive/Machinery Regulations.

1.2 Validity of this document

This document applies to all machines, which are ordered one year after the publication date by CEN of this document.

1.3 Additional application of this document

Infrastructure managers could use this document for certain aspects of a machine that has not been designed specifically for use in a railway environment where the design of these aspects assumes an additional safety relevance when used in a railway environment.

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 2:1992,¹ *Classification of fires*

EN 3 (all parts), *Portable fire extinguishers*

EN 280 (all parts), *Mobile elevating work platforms*

¹ As impacted by EN 2:1992/A1:2004.

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EN 474 (all parts), *Earth-moving machinery — Safety*

EN 547-2:1996+A1:2008, *Safety of machinery — Human body measurements — Part 2: Principles for determining the dimensions required for access openings*

EN 614-1:2006+A1:2009, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 614-2:2000+A1:2008, *Safety of machinery — Ergonomic design principles — Part 2: Interactions between the design of machinery and work tasks*

EN 12077-2:2024, *Cranes safety — Requirements for health and safety — Part 2: Limiting and indicating devices*

EN 13977:2011, *Railway applications — Track — Safety requirements for portable machines and trolleys for construction and maintenance*

prEN 14033-1:2024, *Railway applications — Infrastructure — Railbound construction and maintenance machines — Part 1: Technical requirements for running*

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

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

EN 14033-4:2017, *Railway applications — Track — Railbound construction and maintenance machines — Part 4: Technical requirements for running, travelling and working on urban rail*

EN 15746-1:2020, *Railway applications — Track — Road-rail machines and associated equipment — Part 1: Technical requirements for travelling and working*

EN 15746-2:2020, *Railway applications — Track — Road-rail machines and associated equipment — Part 2: General safety requirements*

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 15955-1:2024, *Railway applications — Infrastructure — Demountable machines, trailers and associated equipment — Part 1: Technical requirements for travelling and working*

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

EN 16704-1:2016+A1:2021, *Railway applications — Track — Safety protection on the track during work. Railway risks and common principles for protection of fixed and mobile work sites*

EN 16860:2019, *Railway applications — Requirements and general principles for securing payload in rail freight transport*

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

EN 50121-2:2017, *Railway applications — Electromagnetic compatibility — Part 2: Emission of the whole railway system to the outside world*

EN 50121-3-1:2017,² *Railway applications — Electromagnetic compatibility — Part 3-1: Rolling stock — Train and complete vehicle*

EN 50121-3-2:2016,³ *Railway applications — Electromagnetic compatibility — Part 3-2: Rolling stock — Apparatus*

EN 50121-4:2016,⁴ *Railway applications — Electromagnetic compatibility — Part 4: Emission and immunity of the signalling and telecommunications apparatus*

EN 50153:2014,⁵ *Railway applications — Rolling stock — Protective provisions relating to electrical hazards*

EN 60204-1:2018, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2016)*

EN 60825-1:2014,⁶ *Safety of laser products — Equipment classification and requirements (IEC 60825-1:2014)*

EN 61508-3:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems — Part 3: Software requirements (IEC 61508-3:2010)*

EN ISO 3449:2008, *Earth-moving machinery — Falling-object protective structures — Laboratory tests and performance requirements (ISO 3449:2005)*

EN ISO 3450:2011, *Earth-moving machinery — Wheeled or high-speed rubber-tracked machines — Performance requirements and test procedures for brake systems (ISO 3450:2011)*

EN ISO 3471:2008, *Earth-moving machinery — Roll-over protective structures — Laboratory tests and performance requirements (ISO 3471:2008)*

EN ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

EN ISO 4414:2010, *Pneumatic fluid power — General rules and safety requirements for systems and their components (ISO 4414:2010)*

EN ISO 11688-1:2009, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2023, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2023)*

EN ISO 13849-2:2012, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2012)*

² As impacted by EN 50121-3-1:2017/A1:2019.

³ As impacted by EN 50121-3-2:2016/A1:2019.

⁴ As impacted by EN 50121-4:2016/A1:2019.

⁵ As impacted by EN 50153:2014/A1:2017 and EN 50153:2014/A2:2020.

⁶ As impacted by EN 60825-1:2014/A11:2021, EN 60825-1:2014/A11:2021/AC:2022-03 and EN 60825-1:2014/AC:2017-06.

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EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

EN ISO 14122-2:2016, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2016)*

EN ISO 14122-3:2016, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2016)*

EN ISO 19353:2019, *Safety of machinery — Fire prevention and fire protection (ISO 19353:2019)*

ISO 7010:2019, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 8755:2001, *Commercial road vehicles — 40mm drawbar eye — Basic, mounting and interchangeability*

ISO 12117-2:2008,⁷ *Earth-moving machinery — Laboratory tests and performance requirements for protective structures of excavators — Part 2: Roll-over protective structures (ROPS) for excavators of over 6 t*

ISO 16754:2008, *Earth-moving machinery — Determination of average ground contact pressure for crawler machines*

ISO 10265:2008, *Earth-moving machinery — Crawler machines — Performance requirements and test procedures for braking systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17343:2023 and the following apply.

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

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

3.1

machine without railwheels

MWR

machines designed and intended for use in the railway environment which are not fitted with rail wheels for movement along the track

Note 1 to entry: Rail wheels in this context mean profiled wheels for travelling and working along the rail head.

4 Hazards and categories

4.1 List of significant hazards

Hazards dealt with by this document are those presented by the following specific MWR functions when undertaken in the railway environment:

- lifting;

⁷ As impacted by ISO 12117-2:2008/COR 1:2010 and ISO 12117-2:2008/A1:2016.

- excavation;
- rail maintenance and renewal;
- track maintenance including ballast tamping, ballast consolidating and renewal;
- overhead contact line system maintenance and renewal;
- snow clearing;
- maintenance of the components of the infrastructure;
- inspection and measurement of the components of the infrastructure;
- tunnel inspection/ventilation;
- emergency rescue and recovery;
- drainage;
- materials handling / movement.

This document does not have requirements for the following:

- working methods, quality of the work or performance of MWR;
- specific requirements established by the infrastructure manager or operator for the use of MWRs;
- operation subject to special rules, e.g. potentially explosive atmospheres;
- operation in severe working conditions requiring special measures, e.g. corrosive environments, contaminating environments, strong magnetic fields;
- hazards due to natural causes, e.g. earthquake, lightning, flooding;
- use of MWR on or in combination with rail wheeled machines or vehicles (such combinations need to meet the requirements of EN 13977:2011, prEN 14033-1:2024, prEN 14033-2:2024, prEN 14033-3:2024, EN 15746-1:2020, EN 15746-2:2020 or EN 15955 as applicable).

This version of the document does not address hazards associated with artificial intelligence (AI) and automated machine learning.

This document is written on the assumption that the choice of machine for use on railway infrastructure will be identified by use of a risk assessment, based on Common Safety Method Risk Evaluation and Assessment, EU/402/2013, and also that the manufacturer has designed the machine in compliance with EN ISO 12100.

4.2 Examples of MWR

Examples, pictures of MWR are shown in Annex D.

5 Requirements and/or measures

5.1 General

MWR that are specifically designed or adapted for use in a railway environment shall comply with the applicable requirements set out in Clauses 5 and 6, marked as set out in Clause 7 and be supplied with documentation in accordance with Clause 8.

The intended use of the MWR and the conditions it is intended to be used shall be fully described in the documentation, see 8.2, Table 3, line a).

The overall dimensions and mass of the MWR shall be fully described in the documentation, see 8.2, Table 3, line b).

5.2 Ease of operation

The design of MWR shall, as far as is practicable, minimize the risk associated with misuse by unauthorised persons and foreseeable misuse by authorized persons.

5.3 Ergonomics

MWR specifically designed and manufactured for use on railway infrastructure shall be designed in accordance with the principles of EN 614-1:2006+A1:2009 and EN 614-2:2000+A1:2008.

5.4 Movement outside of stowed MWR envelope

5.4.1 Stowing of moveable equipment when not in use

Any moveable equipment/component on MWR, which has the capacity to go outside the stowed position, shall be capable of being stowed in a manner which prevents accidental or unintended movement. All such moveable parts and assemblies forming part of MWR shall have the capability to be stowed and to resist the foreseeable forces encountered during their use on the railway infrastructure or during transport. It shall be obvious to anyone checking MWR that these parts of MWR are in their stowed position. Where MWR are transported on railway vehicles the locks shall comply with the accelerations described in EN 16860:2019, 4.2.4.

NOTE Moveable equipment, in its stowed state, will not necessarily require any form of locking, this is decided on the basis of a risk assessment.

All structural elements including moveable components (including covers and doors) shall resist forces generated by the aerodynamic effects of passing trains inside a tunnel. A proof load case of a uniform pressure load of 2,5 kPa without damage or permanent deformation. This load shall be applied on both internal and external surfaces.

Small MWR that are susceptible to movement due to aerodynamic effects shall be described in the documentation see 8.4, Table 5, line i).

5.4.2 Interference of adjacent tracks

MWR which are designed and intended to operate adjacent to railway lines open to traffic and are capable of encroaching the operational railway line shall incorporate features to prevent accidental encroachment by any part of MWR and associated attachments or loads. Such machines shall be labelled as specified in Annex C and shown in Figure C.2.

NOTE 1 The dimensions for what constitutes 'encroachment' does not form part of this document and will need to be declared by the infrastructure manager. Further advice is given in EN 16704-1:2016+A1:2021.

NOTE 2 Explanation: it is anticipated that individual infrastructure managers will specify their own operational safety measures. The use of any machine or equipment near a railway line will need to be assessed for the possibility