

Raudteealased rakendused. Rööbastee. Rööbastelt mahatõstetavad masinad ja kaasnevad seadmed. Osa 2: Üldised ohutusnõuded

Railway applications - Track - Demountable machines and associated equipment - Part 2: General safety requirements

EESTI STANDARDI EESSÕNA

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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.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 24.04.2013.	Date of Availability of the European standard is 24.04.2013.
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ICS 45.060.20, 45.120

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ICS 45.060.20; 45.120

English Version

Railway applications - Track - Demountable machines and associated equipment - Part 2: General safety requirements

Applications ferroviaires - Voie - Machines dérailables et éléments associés - Partie 2 : Prescriptions générales de sécurité

Bahnanwendungen - Oberbau - Ausgleisbare Maschinen und zugehörige Ausstattung - Teil 2: Allgemeine Sicherheitsanforderungen

This European Standard was approved by CEN on 10 February 2013.

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Foreword

This document (EN 15955-2:2013) has been prepared by Technical Committee CEN/TC 256 "Railway applications", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2013, and conflicting national standards shall be withdrawn at the latest by October 2013.

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

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

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

EN 15955, *Railway applications — Track — Demountable machines and associated equipment*, consists of the following parts:

- *Part 1: Technical requirements for running and working;*
- *Part 2: General safety requirements* (the present document).

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

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

When provisions of this type C standard are different from those which are stated in type B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

This European Standard specifies the technical requirements to deal with the significant hazards, hazardous situations and events, common to demountable machines, as defined in EN 15955-1:2013, intended for construction, maintenance inspection of the railway infrastructure, shunting and emergency rescue vehicles.

This European Standard specifies the technical requirements to deal with the common hazards during transport, assembly and installation, commissioning, running on track, use including setting, programming, and process changeover, operation, cleaning, fault finding, maintenance and de-commissioning of the machines when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer; see Clause 4.

NOTE Specific measures for exceptional circumstances are not dealt with in this European Standard. They can be the subject of negotiation between manufacturer and the machine operator.

The common hazards dealt with include the general hazards presented by the machines, as well as the hazards presented by the following specific machine functions:

- excavation;
- ballast tamping, ballast cleaning, ballast regulating, ballast consolidating;
- track renewal;
- rail maintenance;
- craning;
- catenary renewal / maintenance;
- maintenance of the components of the infrastructure;
- inspection and measurement of the components of the infrastructure;
- tunnel inspection / ventilation;
- shunting;
- emergency rescue and recovery;

during commissioning, use, maintenance and servicing.

This European Standard applies to self-propelled machines that are not intended to operate signalling and control systems. Other similar machines are dealt with in other European Standards; see Annex D.

It is assumed that a finished standard automotive chassis used as a host for a demountable machine will offer an acceptable safety level for its designed functions before conversion. This specific aspect is not dealt with in this European Standard.

This European Standard does not deal with:

- a) requirements with regard to the quality of work and the performance of the machine;
- b) machines that utilise the catenary for traction purposes;
- c) specific requirements established by a railway infrastructure manager;

- d) negotiations between the manufacturer and the machine operator for additional or alternative requirements;
- e) hazards due to air pressure caused by the passing of high-speed trains at more than 200 km/h;
- f) requirements which could be necessary in case of use in extreme conditions, such as:
 - 1) extreme ambient temperatures (below $-20\text{ }^{\circ}\text{C}$ or above $+40\text{ }^{\circ}\text{C}$);
 - 2) highly corrosive or contaminating environment, e.g. due to the presence of chemicals;
 - 3) potentially explosive atmospheres.

This European Standard applies to all machines that are ordered one year after the publication date by CEN of this standard.

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 280, *Mobile elevating work platforms — Design calculations — Stability criteria — Construction — Safety — Examinations and tests*

EN 349, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 474-1:2006+A1:2009, *Earth-moving machinery — Safety — Part 1: General requirements*

EN 547-1, *Safety of machinery — Human body measurements — Part 1: Principles for determining the dimensions required for openings for whole body access into machinery*

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

EN 547-3, *Safety of machinery — Human body measurements — Part 3: Anthropometric data*

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

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

EN 618, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors*

EN 619, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of unit loads*

EN 620, *Continuous handling equipment and systems — Safety and EMC requirements for fixed belt conveyors for bulk materials*

EN 842, *Safety of machinery — Visual danger signals — General requirements, design and testing*

EN 894-1, *Safety of machinery — Ergonomic requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*

EN 894-2, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

EN 894-3, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*

EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 981, *Safety of machinery — System of auditory and visual danger and information signals*

EN 1032, *Mechanical vibration — Testing of mobile machinery in order to determine the vibration emission value*

EN 1037:1995+A1:2008, *Safety of machinery — Prevention of unexpected start-up*

EN 1088, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

EN 1837, *Safety of machinery — Integral lighting of machines*

EN 12077-2:1998+A1:2008, *Cranes safety — Requirements for health and safety — Part 2: Limiting and indicating devices*

EN 12999, *Cranes — Loader cranes*

EN 13000, *Cranes — Mobile cranes*

EN 13001-1, *Cranes — General design — Part 1: General principles and requirements*

EN 13135-1:2003+A1:2010, *Cranes — Equipment — Part 1: Electrotechnical equipment*

EN 13135-2:2004+A1:2010, *Cranes — Equipment — Part 2: Non-electrotechnical equipment*

EN 13478:2001+A1:2008, *Safety of machinery — Fire prevention and protection*

EN 13557, *Cranes — Controls and control stations*

EN 14033-1:2011, *Railway applications — Track — Railbound construction and maintenance machines — Part 1: Technical requirements for running*

EN 14033-2:2008+A1:2011, *Railway applications — Track — Railbound construction and maintenance machines — Part 2: Technical requirements for working*

EN 15955-1:2013, *Railway applications — Track — Demountable machines and associated equipment — Part 1: Technical requirements for running and working*

EN 28662-1, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 1: General (ISO 8662-1)*

EN 50153:2002, *Railway applications — Rolling stock — Protective provisions relating to electrical hazards*

EN 50239, *Railway applications — Radio remote control system of traction vehicle for freight traffic*

EN 60204-1:2006,¹⁾ *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

1) This document is impacted by the amendment EN 60204-1:2006/A1:2009.

EN 60204-32, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines (IEC 60204-32)*

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

EN 62262, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code) (IEC 62262)*

EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1)*

EN 61310-2, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking (IEC 61310-2)*

EN 61310-3, *Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators (IEC 61310-3)*

EN 61496-1, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1, modified)*

EN ISO 2860, *Earth-moving machinery — Minimum access dimensions (ISO 2860)*

EN ISO 2867, *Earth-moving machinery — Access systems (ISO 2867)*

EN ISO 3411:2007, *Earth-moving machinery — Physical dimensions of operators and minimum operator space envelope (ISO 3411:2007)*

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

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

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

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 5353, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point (ISO 5353)*

EN ISO 6682, *Earth-moving machinery — Zones of comfort and reach for controls (ISO 6682)*

EN ISO 7096:2008, ²⁾ *Earth-moving machinery — Laboratory evaluation of operator seat vibration (ISO 7096:2000)*

EN ISO 7731, *Ergonomics — Danger signals for public and work areas — Auditory danger signals (ISO 7731)*

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

2) This document is impacted by the corrigendum EN ISO 7096:2008/AC:2009.

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

EN ISO 12001:2009, *Acoustics — Noise emitted by machinery and equipment — Rules for the drafting and presentation of a noise test code (ISO 12001:1996)*

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

EN ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1)*

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

EN ISO 13850, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)*

EN ISO 13855, *Safety of machinery — Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855)*

EN ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857)*

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

ISO 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 3864 (all parts), *Graphical symbols — Safety colours and safety signs*

ISO 4305, *Mobile cranes — Determination of stability*

ISO 4310, *Cranes — Test code and procedures*

ISO 5006:2006,³⁾ *Earth-moving machinery — Operator's field of view — Test method and performance criteria*

ISO 6405-1, *Earth-moving machinery — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 7000, *Graphical symbols for use on equipment — Registered symbols*

ISO 10263-2, *Earth-moving machinery — Operator enclosure environment — Part 2: Air filter element test method*

ISO 10263-3, *Earth-moving machinery — Operator enclosure environment — Part 3: Pressurization test method*

ISO 10263-5, *Earth-moving machinery — Operator enclosure environment — Part 5: Windscreen defrosting system test method*

ISO 10567, *Earth-moving machinery — Hydraulic excavators — Lift capacity*

ISO 11112:1995,⁴⁾ *Earth-moving machinery — Operator's seat — Dimensions and requirements*

3) This document is impacted by the corrigendum ISO 5006:2006/Cor 1:2008.

ISO 12508, *Earth-moving machinery — Operator station and maintenance areas — Bluntness of edges*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, EN 15955-1:2013 and the following apply.

3.1

rail configuration

state of the machine when it is in place on the track ready to work or travel along the track

Note 1 to entry: Rail configuration does not include the transient state during getting on and off the track.

3.2

working place

driving cabs, working cabs, combined working and driving cabs, operator positions situated outside cabs and places situated at control or maintenance locations including areas for conveyance of personnel

3.3

continuous brake

brake used in dynamic conditions, for which the brake force can be infinitely varied, or stepped, by the operator using a control to simultaneously apply brakes on all connected vehicles

3.4

parking brake

brake capable of operation and function without power from the machine

3.5

rated capacity indicator

RCI

device which gives, within specified tolerance limits, at least a continuous indication that the rated capacity is exceeded

Note 1 to entry: For rated capacity, see EN 12077-2.

3.6

machine operator

private or public undertaking who operates machines for the construction and maintenance of the infrastructure

4 List of significant hazards

Table A.1 contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this European Standard, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.

4) This document is impacted by the amendment ISO 11112:1995/Amd 1:2001.