

**Raudteealased rakendused. Rööbastee. Raudteeveeremi
ja hooldusmasinate konstruktsioon. Osa 3: Üldised
ohutusnõuded KONSOLIDEERITUD TEKST**

Railway applications - Track - Railbound construction and
maintenance machines - Part 3: General safety
requirements CONSOLIDATED TEXT

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 14033-3:2010+A1:2011 sisaldab Euroopa standardi EN 14033-3:2009+A1:2011 ingliskeelset teksti.

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English Version

**Railway applications - Track - Railbound construction and
maintenance machines - Part 3: General safety requirements**

Applications ferroviaires - Voie - Machines de construction
et de maintenance empruntant exclusivement les voies
ferrées - Partie 3: Prescriptions générales pour la sécurité

Bahnanwendungen - Oberbau - Schienengebundene Bau-
und Instandhaltungsmaschinen - Teil 3: Allgemeine
Sicherheitsanforderungen

This European Standard was approved by CEN on 21 November 2009 and includes Amendment 1 approved by CEN on 13 September 2011.

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Contents

Page

Foreword.....	5
Introduction	6
1 Scope	7
1.1 General.....	7
1.2 Validity of this European Standard	8
2 Normative references	8
3 Terms and definitions	11
4 List of significant hazards	11
5 General safety requirements and/or protective measures	12
5.1 General.....	12
5.2 Access to working places	12
5.2.1 Working cabs and combined working and driving cabs	12
5.2.2 Working places, places for control and maintenance outside of cabs.....	12
5.2.3 Walkways on the machine	12
5.3 Ergonomics	13
5.4 Requirements for working cabs	13
5.4.1 Minimum dimensions in working cabs.....	13
5.4.2 Working cab floors	13
5.4.3 Storage for instruction handbook.....	13
5.4.4 Emergency exit	13
5.4.5 Climatic conditions.....	13
5.4.6 Protection from dust	14
5.4.7 Windows	14
5.4.8 Interior lighting.....	14
5.5 Operators' seats.....	14
5.6 Edges and corners.....	15
5.7 Pipes and hoses.....	15
5.8 Communications between work positions.....	15
5.9 Stability and measures preventing derailment.....	15
5.10 Visibility of working tools and working areas	15
5.11 Visibility of the track ahead of the machine in the direction of movement	15
5.12 Emergency devices	16
5.12.1 Emergency stopping devices for working equipment.....	16
5.12.2 Emergency stopping device for movement of machines	16
5.12.3 Action of emergency stopping devices.....	16
5.13 Hazards associated with high working places and their access	16
5.14 Moving parts and materials	16
5.14.1 General.....	16
5.14.2 Wheels and caterpillar tracks	17
5.15 Operator's controls and indicators	17
5.15.1 General.....	17
5.15.2 Starting systems	17
5.15.3 Inadvertent activation.....	17
5.15.4 Pedals	17
5.15.5 Protection against uncontrolled motion in working configuration	17
5.15.6 Control panels and indicators	18
5.15.7 Marking of controls and indicators.....	18
5.16 Thermal hazards	18
5.17 Electrical hazards	18

5.17.1	Electrical equipment	18
5.17.2	Disconnection devices.....	18
5.17.3	Electrical enclosures.....	18
5.17.4	Conductors, cables and wiring practices	19
5.17.5	Batteries	19
5.17.6	Catenaries	19
5.17.7	Earthing	19
5.18	Machine safety requirements related to electromagnetic compatibility	19
5.19	Emission of gas and particles.....	20
5.19.1	Exhaust gasses	20
5.19.2	Protection from dust	20
5.20	Pressurised systems.....	20
5.21	Fuel tanks and hydraulic tanks.....	20
5.22	Noise reduction	21
5.23	Vibration	21
5.23.1	General	21
5.23.2	Whole body vibration	22
5.23.3	Hand arm vibration.....	22
5.24	Protection from the risks of fire.....	22
5.24.1	General	22
5.24.2	Material requirements	22
5.24.3	Fire detection system.....	22
5.24.4	Fire extinguishing system	22
5.24.5	Portable fire extinguishers	22
5.25	Braking systems.....	23
5.26	Lighting.....	23
5.27	Warning systems.....	23
5.27.1	General	23
5.27.2	System for warning personnel of machine or working movement	23
5.28	Maintenance	24
5.28.1	General	24
5.28.2	Frequent maintenance	24
5.28.3	Support devices.....	24
5.28.4	Access to the engine compartment.....	24
5.29	Safe handling	24
6	Additional safety requirements and/or measures for specific machine functions	24
6.1	Conveyors	24
6.2	Rail handling devices.....	25
6.3	Portal cranes mounted on railbound machines	25
6.4	Cranes and lifting devices fixed on the machine	26
6.5	Transport of loads by rail cranes.....	26
6.6	Elevating work platforms.....	26
7	Verification of the conformity to the safety requirements and/or particular safety measures	27
7.1	General	27
7.2	Methods of examination	27
7.2.1	General	27
7.2.2	Visual check.....	27
7.2.3	Measurement	27
7.2.4	Functional test	27
7.2.5	Load test(s)	27
7.2.6	Specific verification/measurements and other controls	27
8	Information for use	27
8.1	Instruction handbook.....	27
8.1.1	General	27
8.1.2	Specific information in instruction handbook.....	28
8.1.3	Restrictions of use	29
8.1.4	Warning systems.....	29

8.1.5	Information for maintenance	29
8.1.6	Vibration	29
8.2	Warning signs and written warnings	31
Annex A (normative)	List of significant hazards	32
Annex B (normative)	Check list for conformity	35
Annex C (normative)	Noise test code (grade of accuracy 2)	39
C.1	Scope	39
C.2	Definitions	39
C.3	Determination of the emission sound pressure level at the work station or other specified positions	39
C.4	Sound power level determination	39
C.5	Installation and mounting conditions.....	40
C.6	Working conditions	40
C.7	Measurement uncertainties	41
C.8	Information to be recorded	42
C.9	Information to be reported	42
C.10	Declaration and verification of noise emission values.....	42
Annex D (informative)	Structure of European Standards for track construction and maintenance machines	45
Annex ZA (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC	47
Annex ZB (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC	48
Bibliography		49

Foreword

This document (EN 14033-3:2009+A1:2011) 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 April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

This document includes Amendment 1, approved by CEN on 2011-09-13.

This document supersedes EN 14033-3:2009.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** and **A1**.

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 Directives.

For relationship with EU Directives, see informative Annexes ZA and ZB, which are integral parts of this document.

EN 14033, *Railway applications — Track — Railbound construction and maintenance machines*, consists of the following parts:

- *Part 1: Technical requirements for running*
- *Part 2: Technical requirements for working*
- *Part 3: General safety requirements*

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

Introduction

This document is a type C standard as stated in EN ISO 12100-1:2003.

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

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

1.1 General

This European Standard specifies the significant hazards, hazardous situations and events, common to rail bound machines and arising due to the adaptation for their use on railways. These machines are intended for construction, maintenance and inspection of track, structures, infrastructure and fixed electric traction equipment, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer, see Clause 4.

This European Standard applies to railbound machines and other vehicles - referred to as machines - working exclusively on the railway (utilising friction adhesion between the rail and rail wheels) but including machines that in working position are partly supported on the ballast or the formation and used for construction, maintenance and inspection of track, structures, infrastructure and fixed electric traction equipment. This European Standard applies to machines that are intended to operate signalling and control systems. Other similar machines are dealt with in other European Standards, see Annex D.

This European Standard specifies the common hazards, in normal circumstances, during running, assembly and installation, commissioning, use (including setting, programming, and process changeover), operation, cleaning, fault finding, maintenance and de-commissioning of the machines. Additional safety measures can be required by exceptional circumstances, such as extreme ambient temperatures (less than $-20\text{ }^{\circ}\text{C}$ or greater than $+40\text{ }^{\circ}\text{C}$), highly corrosive or contaminating environment; e.g. due to the presence of chemicals, and potentially explosive atmospheres. Air pressure caused by the passing of high-speed trains at more than 190 km/h is also not dealt with.

NOTE 1 Specific measures for exceptional circumstances are not dealt with in this European Standard. The specific measures for exceptional circumstances introduced by a railway infrastructure manager and requirements introduced by the manufacturer and/or machine operator as referred to in the scope are not dealt with in this European Standard. When such additional measures are necessary, they should be agreed between the manufacturer and the machine operator. The manufacturer will be responsible for compliance with the Directive(s) concerned independent of this European Standard for additional hazards created by any additional or alternative requirements.

NOTE 2 This European Standard deals only with the additional hazards from the adaptation of a machine for its use on rail. Other standards specific to the particular machine as far as available will need to be used in addition to this European Standard to give the complete requirements.

The common hazards specified include the general hazards presented by the machines, and also the hazards presented by the following specific machine functions, common to two or more machine types:

- ballast excavation, ballast cleaning, ballast regulating, ballast consolidating;
- tamping;
- track renewal;
- craning;
- maintenance of the components of the infrastructure;

during commissioning, use, maintenance and servicing.

This European Standard does not deal comprehensively with specific machine functions other than the common functions listed in the previous paragraph, or with all possible hazards presented by complete machines or by the combination of functions.

NOTE 3 For such specific functions or hazards, the use of specific European Standards is recommended.

This European Standard does not deal with:

- requirements with regard to the quality of work and the performance of the machine;
- machines that utilise the catenary for traction purposes;
- specific requirements introduced by a railway infrastructure manager;
- additional or alternative requirements introduced by the manufacturer and/or operator.

1.2 Validity of this European Standard

This European Standard applies to all machines, which are ordered after one year from the publication date of this European Standard.

2 Normative references

The following referenced documents are indispensable for the application 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, *Classification of fires*

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

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 — Ergonomics 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 982, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*
- EN 983, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics*
- EN 999, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts of the human body*
- EN 1032, *Mechanical vibration — Testing of mobile machinery in order to determine the vibration emission value*
- EN 1037:1995, *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 12096:1997, *Mechanical vibration — Declaration and verification of vibration emission values*
- EN 13135-1:2003, *Cranes — Safety — Design — Requirements for equipment — Part 1: Electrotechnical equipment*
- EN 13135-2:2004, *Cranes — Equipment — Part 2: Non-electrotechnical equipment*
- EN 14033-1:2011 A1, *Railway applications — Track — Railbound construction and maintenance machines — Part 1: Technical requirements for running*
- EN 14033-2:2008, *Railway applications — Track — Railbound construction and maintenance machines — Part 2: Technical requirements for working*
- EN 28662-1, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 1: General (ISO 8662-1:1988)*
- EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*
- EN 60204-32:2008, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines (IEC 60204-32:2008)*
- EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*
- EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

EN 61310-2, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking* (IEC 61310-2:2007)

EN 61310-3, *Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators* (IEC 61310-3:2007)

EN 61496-1, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests* (IEC 61496-1:2004, modified)

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

EN ISO 2860, *Earth-moving machinery — Minimum access dimensions* (ISO 2860:1992)

EN ISO 2867:2008, *Earth-moving machinery — Access systems* (ISO 2867:2006, including Cor 1:2008)

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

EN ISO 3744:2009, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane* (ISO 3744:1994)

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 5353:1995)

EN ISO 6682, *Earth moving machinery — Zones of comfort and reach for controls* (ISO 6682:1986, including Amd 1:1989)

EN ISO 7731:2008, *Ergonomics — Danger signals for public and work areas — Auditory danger signals* (ISO 7731:2003)

EN ISO 11201:2009, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane* (ISO 11201:1995, including Cor 1:1997)

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

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 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology* (ISO 12100-1:2003)

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles* (ISO 12100-2:2003)

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 13732-1:2006)

EN ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design* (ISO 13849-1:2006)

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

EN ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

EN ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2001)*

EN ISO 14122-3:2001, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2001)*

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

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs in workplaces and public areas*

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

ISO 7000, *Graphical symbols for use on equipment — Index and synopsis*

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

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 12100-1:2003 and the following apply.

3.1

working place

working cabs, combined working and driving cabs, operators places situated outside cabs and places situated at control or maintenance locations

4 List of significant hazards

Table A.1 shows 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.