

Masinate ohutus. Ohutusnõuded varraste, ehitusterase ja terastraadi valtsimismasinatele

Safety of machinery - Safety requirements for bar mills, structural steel mills and wire rod mills

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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ICS 25.120.20; 77.180

English Version

Safety of machinery - Safety requirements for bar mills, structural steel mills and wire rod mills

Sécurité des machines - Exigences techniques de sécurité
pour machines de train à barre, train à profilés et train à fil

Sicherheit von Maschinen - Sicherheitsanforderungen an
Stab-, Formstahl- und Drahtwalzwerke

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Contents

Page

Foreword.....	5
Introduction	6
1 Scope	7
2 Normative References	8
3 Terms and definitions	11
4 List of significant hazards	13
5 Safety requirements and/or measures	13
5.1 General requirements for design, planning and risk assessment	13
5.1.1 General.....	13
5.1.2 Planning of long product rolling mills	14
5.1.3 Structural assembly	14
5.1.4 Safety layout.....	14
5.1.5 Access to working places	15
5.1.6 Access to danger zones.....	15
5.1.7 Guards	18
5.1.8 Guard-rails	18
5.1.9 Safety signs and warning devices	18
5.1.10 Safeguarding	18
5.1.11 Personal protective equipment	19
5.1.12 Electrical equipment.....	19
5.1.13 Pneumatic and fluid systems	19
5.1.14 Software manipulation	19
5.1.15 Material to be discharged to drains	19
5.1.16 Surface temperatures and heat radiation.....	19
5.1.17 Pulpits and control stands.....	19
5.1.18 Hold-to run control	19
5.1.19 Mechanical restraint devices	20
5.1.20 Fire protection.....	20
5.1.21 Ergonomics	20
5.1.22 Noise	21
5.1.23 Vibrations	23
5.1.24 Loss of energy	23
5.1.25 Product monitoring systems	23
5.1.26 Linked Equipment.....	23
5.2 List of significant hazards, hazardous situations, safety requirements and/or measures.....	23
5.2.1 General.....	24
5.2.2 Bridges and underpasses	25
5.2.3 High-pressure descaling units	25
5.2.4 Roller tables and conveyors	26
5.2.5 Rolling stands	27
5.2.6 Rolling blocks (wire rod mills and high speed bar mills)	29
5.2.7 Cross transfers, collecting beds and tilting devices	29
5.2.8 Pulpits and control stands.....	29
5.2.9 Measuring devices and display units	31
5.2.10 Hot and cold saws, shears and abrasive cutting machines.....	32
5.2.11 Cooling lines	33
5.2.12 Cooling beds	33
5.2.13 Straightening equipment	34
5.2.14 Piling equipment	35
5.2.15 Binding machines	36

5.2.16	Marking machines	36
5.2.17	Loading equipment/collecting tables	37
5.2.18	Preparation area for stands, rolls, guides, straightening rollers.....	37
5.2.19	Laying heads for wire rod mills.....	38
5.2.20	Collecting chambers for wire rod mills	38
5.2.21	Cooling boxes for wire rod mills	38
5.2.22	Pinch rolls for wire rod mills	38
6	Verification of the safety requirements and/or measures	38
7	Information for use	38
7.1	General.....	38
7.2	Warning devices and safety signs	39
7.3	Minimum marking	39
7.4	Accompanying documents.....	39
7.4.1	Instruction handbook	39
7.4.2	Machine/equipment declaration	39
7.4.3	Detailed information/instructions	40
7.5	Maintenance manual	42
Annex A	(normative) Safety requirements and/or measures for control systems at long product rolling mills.....	44
A.1	General.....	44
A.2	Special requirements for controls	44
A.3	Special requirements for shut-down equipment.....	44
A.3.1	Stop functions/emergency stop functions.....	44
A.3.2	Specific hazards at mechanical equipment	45
A.3.3	Selection of stop functions.....	45
A.3.4	Emergency stop areas	45
A.3.5	Stop functions for electrical equipment.....	46
Annex B	(normative) Fluid systems	48
B.1	Significant hazards.....	48
B.2	Safety requirements and/or measures	48
B.2.1	General.....	48
B.2.2	General design requirements.....	48
B.2.3	List of significant hazards, hazardous situations, safety requirements and/or measures.....	49
Annex C	(normative) Noise test code	53
C.1	Introduction	53
C.2	Determination of sound power level.....	53
C.3	Determination of emission sound pressure levels	54
C.3.1	Determination of the emission sound pressure level at specified measuring points.....	54
C.3.2	Determination of emission sound pressure level at work stations.....	54
C.4	Measurement uncertainty	54
C.5	Operating conditions.....	54
C.6	Information to be recorded and reported.....	55
C.7	Declaration and verification of noise emission values.....	55
Annex D	(normative) Protection of persons in case of using asphyxiant gases used in fire fighting systems	57
D.1	General.....	57
D.2	Warning devices	57
D.3	Restraint devices	58
D.4	Preliminary warning time	58
D.5	Interrupt device for extinguishing gas	59
D.6	Blocking devices	59
D.7	Pipes	59
D.8	Rooms and adjacent areas	59
D.9	Escape routes	59
D.10	Doors.....	59
D.11	Marking	60
D.12	Instruction handbook	60

Annex E (informative) Example for manufacturer's safety instructions for maintenance at long product rolling mills	61
E.1 Precautions to reduce hazards caused by	61
E.1.1 Lack of instructions	61
E.1.2 Visual or audible checks at machinery in motion	61
E.1.3 Unintentional movements during maintenance	61
E.1.4 Work during standstill with safeguards disabled	62
E.1.5 Work with hazardous substances	62
Annex F (informative) Machines and/or equipment covered by this standard but not limited to	63
F.1 Plants	63
F.2 Equipment	63
Annex G (informative) Example for modes of operation in relation to segregated areas of long product rolling mills	65
Annex H (informative) Example for the risk analysis due to interfaces	66
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC	67
Bibliography	68

Figures

Figure 1 — Exemplary layout of a rail / section rolling mill	7
Figure 2 — Exemplary layout of a bar / wire rod mill	8
Figure G.1 — Schematic diagram of modes of operation in relation to segregated areas	65
Figure H.1 — Diagram of a hypothetical plant indicating potentially hazardous interfaces	66

Tables

Table 1 — Characteristic conditions of operating modes	17
Table 2 — Main noise sources of long product rolling mills equipment and exemplary noise reduction measures	22
Table 3 — Significant hazards, hazardous situations, safety requirements and/or measures	24
Table A.1 — Stop functions	46
Table B.1 — List of significant hazards, hazardous situations, safety requirements and/or measures	49
Table C.1 — Example of declared dual-number noise emission values for work stations and specified measuring points	56

Foreword

This document (EN 15949:2012) has been prepared by Technical Committee CEN/TC 322 "Equipment for making and shaping of metals - Safety requirements", 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 August 2012, and conflicting national standards shall be withdrawn at the latest by August 2012.

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.

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Introduction

This document is a type C standard as stated in EN ISO 12100:2010.

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

When provisions of this type C standard are different from those which are stated in type A or 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.

Where for clarity an example of a preventative measure is given in the text, this should not be considered as the only possible solution. Any other solution leading to the same risk reduction is permissible if an equivalent level of safety is achieved.

This European Standard assumes that the equipment is operated and maintained by trained personnel.

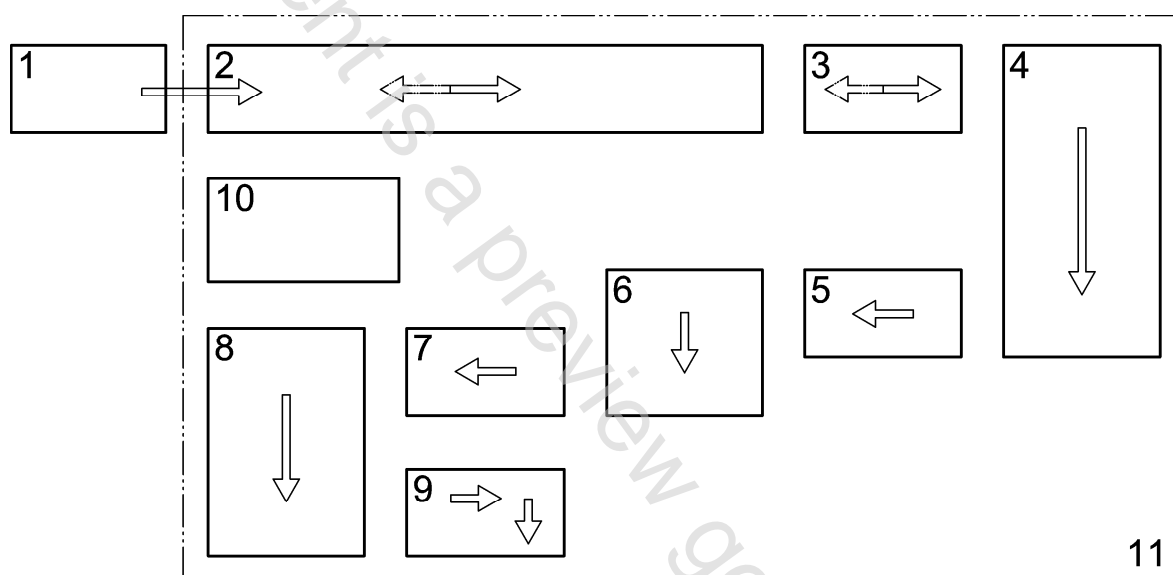
1 Scope

This European Standard defines the general safety requirements for hot rolling mills for long products as defined in 3.1.

This European Standard deals with significant hazards, hazardous situations and events relevant to hot rolling mills for long products. It deals not only with circumstances where the machinery is used as intended, but also includes other conditions foreseen by the manufacturer, such as foreseeable faults, malfunctions or misuse (see Clauses 4 and 5).

This applies also to hazards arising during various phases of the life of the machinery and equipment as described in 5.4 of EN ISO 12100:2010.

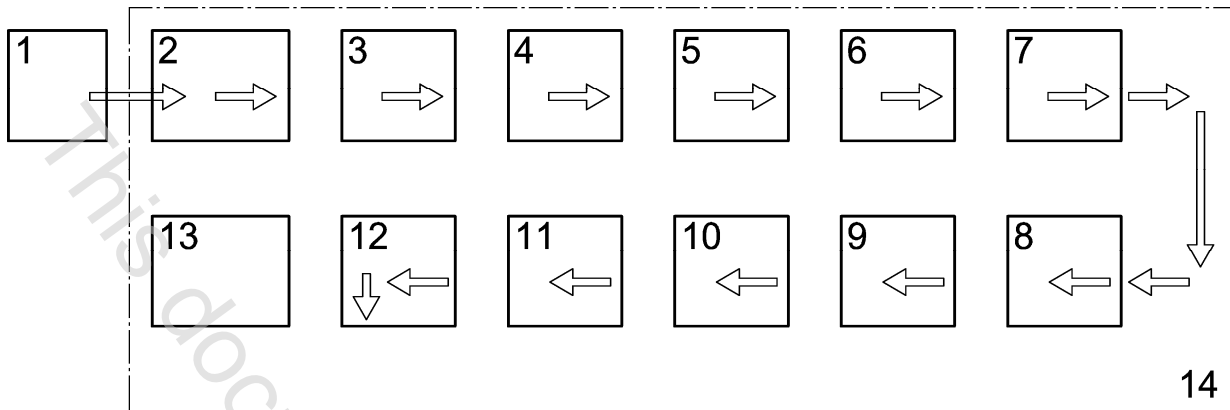
This European standard applies to: Machinery and equipment used for the manufacturing of metal rolled long products from the material supply from (1), via the rolling mill process equipment (2) to (9) including preparation area (10) (exemplary layout is given in Figure 1).



Key

- | | | | |
|---|---|----|---|
| 1 | e.g., continuous casting machine (according to EN 14753) or furnace (according to EN 746-1) | 7 | saws, shears, abrasive cutting machines |
| 2 | mill stands | 8 | piling machine |
| 3 | roller tables | 9 | binding and loading area |
| 4 | cooling beds | 10 | preparation area |
| 5 | straightening machines | 11 | border of the rail / section rolling mill |
| 6 | collecting beds | ⇒ | product flow |

Figure 1 — Exemplary layout of a rail / section rolling mill



Key

1	e.g., continuous casting machine (according to EN 14753) or furnace (according EN 746-1)	8	cooling line
2	roughing mill area	9	laying head
3	intermediate mill area	10	loop cooling conveyor
4	cooling line	11	coil station
5	shearing group	12	coil handling
6	wire rod block	13	preparation area
7	snap shear	14	border of the bar / wire rod mill
		➡	product flow

Figure 2 — Exemplary layout of a bar / wire rod mill

The following equipment is excluded:

- a) furnaces in accordance with the EN 746 series;
- b) continuous casting machines according to EN 14753;
- c) hook conveyors according to EN 619;
- d) roll and guide shop equipment (e. g., machine-tool);
- e) storage equipment (e.g., high-bay warehouses);
- f) cranes, fork lifts, trucks and railway trucks and other vehicles.

This document is not applicable to rolling mills for long products, which are manufactured before the date of its publication as an EN document.

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

EN 614-1:2006+A1:2009, *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 626-1, *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*
- 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 1063, *Glass in building — Security glazing — Testing and classification of resistance against bullet attack*
- EN 1088, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*
- EN 1299, *Mechanical vibration and shock — Vibration isolation of machines — Information for the application of source isolation*
- EN 1591-1, *Flanges and their joints — Design rules for gasketed circular flange connections — Part 1: Calculation method*
- EN 1837, *Safety of machinery — Integral lighting of machines*
- EN 12094-1, *Fixed firefighting systems — Components for gas extinguishing systems — Part 1: Requirements and test methods for electrical automatic control and delay devices*
- EN 12198-1, *Safety of machinery — Assessment and reduction of risks arising from radiation emitted by machinery — Part 1: General principles*
- EN 12198-3, *Safety of machinery — Assessment and reduction of risks arising from radiation emitted by machinery — Part 3: Reduction of radiation by attenuation or screening*
- EN 12254, *Screens for laser working places — Safety requirements and testing*
- EN 12464-1, *Light and lighting — Lighting of work places — Part 1: Indoor work places*
- EN 13478, *Safety of machinery — Fire prevention and protection*
- EN 13480-2, *Metallic industrial piping — Part 2: Materials*
- EN 13480-3:2002, *Metallic industrial piping — Part 3: Design and calculation*
- EN 13480-4:2002, *Metallic industrial piping — Part 4: Fabrication and installation*
- EN 13861, *Safety of machinery — Guidance for the application of ergonomics standards in the design of machinery*
- EN 15004-1, *Fixed firefighting systems — Gas extinguishing systems — Part 1: Design, installation and maintenance (ISO 14520-1:2006, modified)*

EN 50171, *Central power supply systems*

EN 60204-1:2011, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 44/617/CD:2010)*

EN 60447, *Basic and safety principles for man-machine interface, marking and identification — Actuating principles*

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

EN 60825-1:2008, *Safety of laser products — Part 1: Equipment classification, requirements and user's guide (IEC 60825-1:2007)*

EN 60825-4, *Safety of laser products — Part 4: Laser guards (IEC 60825- 4:2006)*

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*

EN 61496-1/A1, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2004/A1:2007 + corrigendum Jul. 2008)*

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

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

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

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

EN ISO 10218-1, *Robots and robotic devices — Safety requirements for industrial robots — Part 1: Robots (ISO 10218-1:2011)*

EN ISO 11064-1, *Ergonomic design of control centres — Part 1: Principles for the design of control centres (ISO 11064-1:2000)*

EN ISO 11202:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections (ISO 11202:2010)*

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 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 13732-1:2006)*

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

EN ISO 13850:2006, *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 13855:2010)*

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

EN ISO 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels* (ISO 14122-1:2001)

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

EN ISO 14122-4, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders — Amendment 1* (ISO 14122-4:2004 + Amd 1:2010)

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 6183, *Fire protection equipment — Carbon dioxide extinguishing systems for use on premises — Design and installation*

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

3 Terms and definitions

For the purpose of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

NOTE Definition used in EN and ISO standards referred to in this European Standard are also valid for this European Standard.

3.1

rolling mill for long products

machinery and equipment where metal is hot rolled to long products, such as bar mills, bloom and billet mills, wire rod mills, section/rail mills as well as any area inside or outside the superstructure of the building where product is being handled or stored

Note 1 to entry: Examples of machines and equipment which are covered by this standard are listed in Annex F.

3.2

product

metal to be or being hot rolled

3.3

preparation area

dedicated place to carry out the necessary maintenance activities and/or to prepare to use interchangeable equipment (e.g. roll change devices)

3.4

pulpit

enclosed room in which the control desk and monitoring facilities for a machine or equipment are located, used as a permanent work place

3.5

control stand

free standing control desk (usually situated adjacent to the machine or equipment), used as a temporarily work place