

MASINAOHUTUS. KÜLMVALTSPINKIDE
OHUTUSNÕUDED

Safety of machinery - Safety requirements for cold flat
rolling mills

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 15094:2022 sisaldab Euroopa standardi EN 15094:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 15094:2022 consists of the English text of the European standard EN 15094:2022.
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English Version

Safety of machinery - Safety requirements for cold flat rolling mills

Sécurité des machines - Prescriptions de sécurité
relatives aux laminoirs à froid pour produits plats

Sicherheit von Maschinen - Sicherheitsanforderungen
an Kaltflachwalzwerke

This European Standard was approved by CEN on 13 March 2022.

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European foreword

This document (EN 15094:2022) 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of an identical text or by endorsement, at the latest by November 2022, and conflicting national standards shall be withdrawn at the latest by November 2022.

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

This document supersedes EN 15094:2008.

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Introduction

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

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

Where for clarity an example of a preventative measure is given, 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.

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

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine and/or plant manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

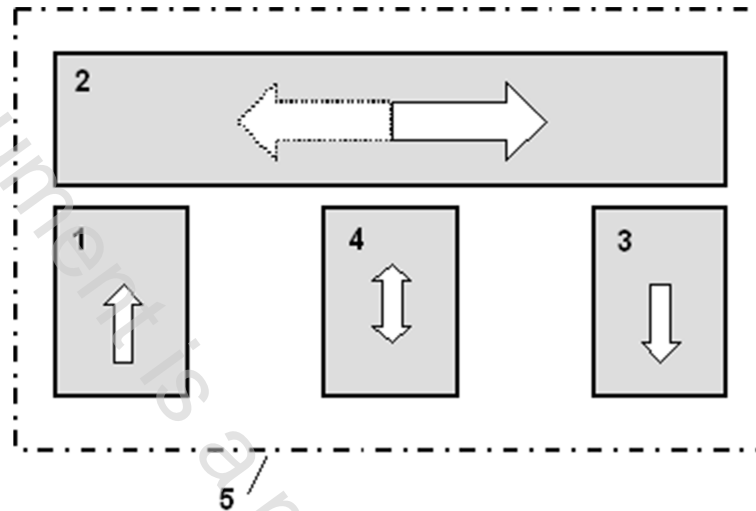
- machine and/or plant users/employers (small, medium and large enterprises);
- service providers, e.g. for maintenance (small, medium and large enterprises).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

1 Scope

This document specifies the general safety requirements for cold rolling mills for flat products as defined in 3.1.

This document is applicable to: Plant (machinery, equipment, devices according Annex D) used for the manufacturing of metal cold rolled flat products from the material supply from entry (1), via the mill stand(s) (2) with roll changing devices (4), to the material removal (3) (see Figure 1).



Key

- 1 entry section
- 2 cold rolling mill
- 3 exit section
- 4 roll changing device
- 5 border of the cold rolling mill

Figure 1 — Exemplary layout of a cold flat rolling mill

This document does not cover:

- Design and construction of buildings including cellars and their facilities;
- Thermo process equipment, e.g. in accordance with EN 746 series;
- Strip processing lines according to EN 15061, e.g. pickling line;
- Abrasive blasting plants according to EN 1248;
- Coil transporting system before coil take-over-point at the entry section and after coil take-over-point at the exit section, e.g. hook conveyors, overhead cranes, fork lift and railway trucks and other vehicles;
- Roll shop equipment;
- Hook conveyors according to EN 619;
- Non-fixed load lifting attachments, e.g. according to EN 13155;

- Storage equipment (e.g. high-bay warehouses);
- Cranes, fork lifts, trucks and railway trucks and other vehicles;
- Process technology (e.g. systems for rolling lubricant, compressed air, treatment of water, cleaning system for exhaust air);
- Firefighting system.

NOTE 1 Special requirements for protection of persons in case of using asphyxiant gases used in firefighting system is covered by this document, see Annex C.

This document deals with foreseeable significant hazards, hazardous situations and events relevant to cold rolling mills for flat products, when used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer. It provides the requirements to be met by the manufacturer to ensure the safety of persons and property during transport, commissioning, operation and de-commissioning, as well as in the event of foreseeable failures or malfunctions that can occur in the equipment.

NOTE 2 For modernization, this document (type-C standard) can be applied for the part to be modernized.

This document is not applicable to cold rolling mills for flat products manufactured before the date of its publication.

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 ISO 13854, *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body (ISO 13854)*

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 ISO 14123-1, *Safety of machinery - Reduction of risks to health resulting from hazardous substances emitted by machinery - Part 1: Principles and specifications for machinery manufacturers (ISO 14123-1)*

EN ISO 14123-2, *Safety of machinery - Reduction of risks to health resulting from hazardous substances emitted by machinery - Part 2: Methodology leading to verification procedures (ISO 14123-2)*

EN 415-8, *Safety of packaging machines - Part 8: Strapping machines*

EN 689, *Workplace exposure - Measurement of exposure by inhalation to chemical agents - Strategy for testing compliance with occupational exposure limit values*

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 ISO 14120, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards (ISO 14120)*
- EN 981, *Safety of machinery - System of auditory and visual danger and information signals*
- EN ISO 14118:2018, *Safety of machinery - Prevention of unexpected start-up (ISO 14118:2017)*
- EN ISO 14119, *Safety of machinery - Interlocking devices associated with guards - Principles for design and selection (ISO 14119)*
- EN 1299, *Mechanical vibration and shock - Vibration isolation of machines - Information for the application of source isolation*
- EN 1837, *Safety of machinery - Integral lighting of machines*
- EN ISO 11688-1, *Acoustics - Recommended practice for the design of low-noise machinery and equipment - Part 1: Planning (ISO/TR 11688-1)*
- 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 13480-1, *Metallic industrial piping - Part 1: General*
- EN 13480-2, *Metallic industrial piping - Part 2: Materials*
- EN 13480-3, *Metallic industrial piping - Part 3: Design and calculation*
- EN 13480-4, *Metallic industrial piping - Part 4: Fabrication and installation*
- EN 13480-5, *Metallic industrial piping - Part 5: Inspection and testing*
- EN 14253, *Mechanical vibration - Measurement and calculation of occupational exposure to whole-body vibration with reference to health - Practical guidance*
- EN 60204-1:2018, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements*
- EN 60825-1, *Safety of laser products - Part 1: Equipment classification and requirements*
- EN 60825-4, *Safety of laser products - Part 4: Laser guards*
- EN 61310-1, *Safety of machinery - Indication, marking and actuation - Part 1: Requirements for visual, acoustic and tactile signals*

EN 61496-1, *Safety of machinery - Electro-sensitive protective equipment - Part 1: General requirements and tests*

EN 62598, *Nuclear instrumentation - Constructional requirements and classification of radiometric gauges*

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 7010, *Graphical symbols - Safety colours and safety signs - Registered safety signs (ISO 7010)*

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

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

EN ISO 11202, *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)*

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 13849-1:2015, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)*

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

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 14122-1, *Safety of machinery - Permanent means of access to machinery - Part 1: Choice of fixed means and general requirements of access (ISO 14122-1)*

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

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

EN ISO 14122-4, *Safety of machinery - Permanent means of access to machinery - Part 4: Fixed ladders (ISO 14122-4)*

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

EN 61800-5-2:2017, *Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional*

EN 62061, *Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems*

3 Terms and definitions

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

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

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

3.1

cold rolling mills for flat products

interconnected equipment for cold rolling of flat material in which several components of the machinery or forming stages are linked by dedicated transport facilities, including associated devices

Note 1 to entry: Plant and equipment which are covered by this document are listed in Annex D.

3.2

safety layout

graphic overview of the cold rolling mill with arrangement of safety-related elements and areas

3.3

hazard zone

danger zone

any space within and/or around machinery in which a person can be exposed to a hazard

[SOURCE: EN ISO 12100:2010, 3.11]

3.4

take-over-point(s)

point(s) where the cold flat rolling mill is connected to incoming/outgoing material (e.g. coils), media, electricity (e.g. power supply and communication like input/output parameters)

Note 1 to entry: For example, coil take-over-point: Point where overhead cranes or other transport systems deposit or remove coils.

3.5

main route(s)

marked traffic route

3.6

safeguard(ing)

guard or protective device

[SOURCE: EN ISO 12100:2010, 3.26]