

Safety of machinery - Safety requirements for strip processing line machinery and equipment

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 15061:2022 sisaldab Euroopa standardi EN 15061:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 15061:2022 consists of the English text of the European standard EN 15061:2022.
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English Version

Safety of machinery - Safety requirements for strip processing line machinery and equipment

Sécurité des machines - Prescription de sécurité pour machines et installations de traitement des bandes

Sicherheit von Maschinen - Sicherheitsanforderungen an Bandbehandlungsanlagen und Einrichtungen

This European Standard was approved by CEN on 12 December 2021.

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European foreword

This document (EN 15061:2022) 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of an identical text or by endorsement, at the latest by September 2022, and conflicting national standards shall be withdrawn at the latest by September 2022.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 15061:2007+A1:2008.

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Introduction

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

This document is not applicable to strip processing lines manufactured before the date of its publication.

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 operators/ 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 in the drafting process of this document.

1 Scope

This document defines the general safety requirements of strip processing lines.

This document applies to:

Strip processing lines for treating metal strip, from

- coil take-over-point of the entry section (terminal equipment, see 3.2) through the
- process (processing and terminal equipment, see 3.3 and 3.2) up to the
- coil take-over-point of the exit section or interface to other lines (terminal equipment), see Figure 1.

Terminal equipment for:	Processing and terminal equipment for:
Entry section	Chemical and/or electro-chemical treatment lines (e.g., pickling, cleaning) Hot dipping lines Electro plating lines Coating lines (e.g., roll coating) Annealing lines
Exit section	

Figure 1 — Terminal and processing equipment

NOTE 1 The aforementioned processes can also occur in combination.

If the aforementioned processes will be combined with processes which are not covered by the scope of this document, this document can be used as a guideline.

NOTE 2 Thermo process equipment integrated in strip processing lines is covered by the EN 746 series. For dryers and ovens, in which flammable substances are released, EN 1539 applies.

This document does not cover:

- thermo process equipment, e.g. in accordance with the EN 746 series;
- dryers and ovens in accordance with EN 1539;
- 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;
- acid regeneration plants;
- regeneration plants which are not integral part of the strip processing line;
- storage equipment for coils;
- rolling mill stands (i.e. skin pass and reduction stands) according to EN 15094;

- rollshop equipment;
- separate process technology (e.g. compressed air system, treatment of water and treatment of rolling lubricant);
- separate cleaning system for exhaust air;
- firefighting systems.

NOTE 3 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 strip processing lines, 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, use, de-commissioning and maintenance periods, as well as in the event of foreseeable failures or malfunctions that can occur in the equipment.

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

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

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

EN 746 (all parts), *Industrial thermoprocessing equipment*

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

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

EN 1299, *Mechanical vibration and shock - Vibration isolation of machines - Information for the application of source isolation*

EN 12198 (all parts), *Safety of machinery - Assessment and reduction of risks arising from radiation emitted by machinery*

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 (all parts), *Metallic industrial piping*

EN 14253, *Mechanical vibration - Measurement and calculation of occupational exposure to whole-body vibration with reference to health – Practical guidance*

EN 15154-2, *Emergency safety showers - Part 2: Plumbed-in eye wash units*

EN 15154-5, *Emergency safety showers - Part 5: Water overhead body showers for sites other than laboratories*

EN 15154-6, *Emergency safety showers - Part 6: Plumbed-in multiple nozzle body showers for sites other than laboratories*

CLC/TR 60079-32-1:2018, *Explosive atmospheres - Part 32-1: Electrostatic hazards, guidance*

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

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

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

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

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

EN 61800-5-2:2017, *Adjustable speed electrical power drive systems - Part 5-2: Safety requirements – Functional (IEC 61800-5-2:2016)*

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

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

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

EN ISO 10218-2, *Robots and robotic devices - Safety requirements for industrial robots - Part 2: Robot systems and integration (ISO 10218-2)*

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

EN ISO 11064-2, *Ergonomic design of control centres - Part 2: Principles for the arrangement of control suites (ISO 11064-2)*

EN ISO 11064-3, *Ergonomic design of control centres - Part 3: Control room layout (ISO 11064-3)*

EN ISO 11064-6, *Ergonomic design of control centres - Part 6: Environmental requirements for control centres (ISO 11064-6)*

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 11553-1, *Safety of machinery - Laser processing machines - Part 1: Laser safety requirements (ISO 11553-1)*

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

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

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

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 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 ISO 14120:2015, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

EN ISO 14122 (all parts), *Safety of machinery - Permanent means of access to machinery (ISO 14122)*

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)*

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

ISO/TR 22100-4:2018, *Safety of machinery — Relationship with ISO 12100 — Part 4: Guidance to machinery manufacturers for consideration of related IT-security (cyber security) aspects*

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 <https://www.electropedia.org/>

NOTE Definitions used in EN and ISO standards referred to in this document are also valid for this document.

3.1

strip processing line

assembly of equipment for treating metal strip (surface treatment and/or to change the metal properties) in which single machines (as described in 3.2 and 3.3) are linked by strip transport facilities and/or the strip itself, including ancillary equipment

3.2

terminal equipment

equipment for moving, guiding, connecting, dividing and trimming the metal strip, coil handling equipment and related ancillary equipment like hydraulic and pneumatic equipment and systems

3.3

processing equipment

equipment for surface treatment and/or modifying the metal strip properties

3.4

safety layout

graphic overview of the strip processing line with the arrangement of specific safety-related elements and areas

Note 1 to entry: 5.2.5 specifies the safety related elements to be shown on the safety layout.

3.5

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]

3.6

take-over-point

point(s) where the strip processing line is connected to incoming/outgoing material (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.