



# SLOVENSKI STANDARD

## SIST EN 15061:2008

01-april-2008

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**Varnost strojev - Varnostne zahteve za linijske stroje in opremo za obdelavo (kovinskih) trakov**

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

Sicherheit von Maschinen - Sicherheitsanforderungen an Bandbehandlungsanlagen und Einrichtungen

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

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EUROPEAN STANDARD

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

Sécurité des machines - Prescriptions 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 23 September 2007.

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## Foreword

This document (EN 15061:2007) has been prepared by Technical Committee CEN/TC 322 "Equipments 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of an identical text or by endorsement, at the latest by May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

This standard was elaborated by CEN/TC 322/WG4 comprising experts from the following countries: Austria, Germany, Italy, The Netherlands and Sweden.

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.

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, 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 the United Kingdom.

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## 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 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 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 preventive measure is given in this standard, 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.

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## 1 Scope

This European Standard defines the health and safety requirements of strip processing lines (see 3.1).

This European Standard deals with all significant hazards, hazardous situations and events relevant for strip processing line machinery and equipment, when used as intended and under conditions foreseen by the manufacturer, but also includes foreseeable faults and malfunctions in case of misuse.

This European Standard specifies the requirements to ensure the safety of persons which are to be considered and met during the design, assembly, transport, commissioning, operation, maintenance and decommissioning of the equipment.

### This European Standard applies to:

Strip processing lines for treating metal strip: from take-over point (see 3.6) 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 take-over point of the exit section or interface to other lines (terminal equipment).

<u>Terminal equipment for:</u>	<u>Processing and terminal equipment for:</u>	<u>Terminal equipment for:</u>
Entry section	<ul style="list-style-type: none"> <li>— Pickling (5.3.5) <sup>(1)</sup></li> <li>— Pre-treatment (5.3.6) <sup>(1)</sup></li> <li>— Hot dipping (5.3.7) <sup>(1)</sup></li> <li>— Electro plating (5.3.8) <sup>(1)</sup></li> <li>— Tension levelling/scale breaking (5.3.9) <sup>(1)</sup></li> <li>— Organic coating by roll coater (5.3.10) <sup>(1)</sup></li> <li>— Chemical post-treating (5.3.11) <sup>(1)</sup></li> <li>— Annealing <sup>(1), (2)</sup></li> </ul> <p><sup>(1)</sup> it may include also terminal equipment according to 5.2</p> <p><sup>(2)</sup> for annealing lines the requirement for related processing equipment (5.3.5 to 5.3.11) is covered by this standard. The requirements for the furnace of annealing lines are covered by EN 746-1, EN 746-2 and EN 746-3</p>	Exit section

### This European Standard does not cover:

- Furnaces in accordance with EN 746-1, EN 746-2 and EN 746-3;
- Dryers and ovens in accordance with EN 1539;
- Coil transporting system before take-over-point at the entry section and after take-over-point at the exit section, e. g., hook conveyors, overhead cranes, fork lift and railway trucks and other vehicles;
- Storage equipment for coils;
- Rolling mill stands (i. e., skin pass and reduction stands) according to prEN 15094;

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— Rollshop equipment.

If applicable, the safety requirements of those standards mentioned above should be considered.

This European Standard is not applicable to strip processing line machinery and equipment, which are manufactured before the date of publication of this standard by CEN.

**2 Normative references**

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 294, *Safety of machinery — Safety distance to prevent danger zones being reached by the upper limbs*

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

EN 614-1:2006, *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 626-2, *Safety of machinery — Reduction of risk to health from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures*

EN 689, *Workplace atmospheres — Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy*

EN 811; *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs*

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 953:1997, *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 1050<sup>1)</sup>, *Safety of machinery — Principles for risk assessment*
- EN 1088, *Safety of machinery — Interlocking devices associated with guards - Principles for design and selection*
- EN 1127-1, *Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology*
- EN 1248, *Foundry Machinery — Safety requirements for abrasive blasting equipment*
- EN 1299, *Mechanical vibration and shock — Vibration isolation of machines — Information for the application of source isolation*
- EN 1760-2, *Safety of machinery - Pressure sensitive protective devices - Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars*
- 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 12198-3; *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 13478, *Safety of machinery — Fire prevention and protection*
- 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<sup>2)</sup>,*
- EN 13480-4, *Metallic industrial piping — Part 4: Fabrication and installation*
- EN 13480-5, *Metallic industrial piping — Part 5: Inspection and testing*
- EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*
- prEN 60825-1, *Safety of laser products — Part 1: Equipment classification and requirements*
- EN 60825-4, *Safety of laser products - Part 4: Laser guards (IEC 60825-4:2006)*

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<sup>1)</sup> Will be replaced by prEN ISO 14121-1.

<sup>2)</sup> Attention, see 5.1.11

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EN 61310-1, *Safety of machinery - Indication, marking and actuation - Part 1: Requirements for visual, auditory and tactile signals (IEC 61310-1:1995)*

EN 61310-2, *Safety of machinery - Indication, marking and actuation - Part 2: Requirements for marking (IEC 61310-2:1995)*

EN 61496-1<sup>3)</sup>, *Safety of machinery - Electro-sensitive protective equipment - Part 1: General requirements and tests (IEC 61496-1:2004, modified)*

prEN 61496-3, *Safety of machinery — Electro-sensitive protective equipment — Part 3: Particular requirements for Active Opto-electronic Protective Devices responsive to Diffuse Reflection (AOPDDR)*

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 for industrial environments - Safety requirements - Part 1: Robot (ISO 10218-1:2006)*

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

EN ISO 11064-2, *Ergonomic design of control centres - Part 2: Principles for the arrangement of control suites (ISO 11064-2:2000)*

EN ISO 11064-3, *Ergonomic design of control centres - Part 3: Control room layout (ISO 11064-3:1999)*

EN ISO 11064-4, *Ergonomic design of control centres - Part 4: Layout and dimensions of workstations (ISO 11064-4:2004)*

prEN ISO 11064-5, *Ergonomic design of control centres -- Part 5: Displays and controls (ISO/DIS 11064-5:2006)*

EN ISO 11064-6, *Ergonomic design of control centres - Part 6: Environmental requirements for control centres (ISO 11064-6:2005)*

EN ISO 11064-7, *Ergonomic design of control centres - Part 7: Principles for the evaluation of control centres (ISO 11064-7:2006)*

EN ISO 11202, *Acoustics - Noise emitted by machinery and equipment - Measurement of emission sound pressure levels at a work station and at other specified positions - Survey method in situ (ISO 11202:1995)*

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 12100-1:2003, *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)*

<sup>3)</sup> To be amended by EN 61496-1/prA1 (2006-06).

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 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 (ISO 14122-4:2004)*

EN ISO 15004-1, *Ophthalmic instruments - Fundamental requirements and test methods - Part 1: General requirements applicable to all ophthalmic instruments (ISO 15004-1:2006)*

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

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

IEC 61496-2, *Safety of machinery — Electro-sensitive protective equipment — Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)*

CLC/R 044-001:1999, *Safety of machinery — Guidance and recommendations for the avoidance of hazards due to static electricity*

SIST EN 15061:2008

<https://standards.iteh.ai/catalog/standards/sist/c4e505e8-9900-4642-815f-e2a795339092/sist-en-15061-2008>

### 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.

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

#### 3.1

##### **strip processing line**

interconnection of equipment described in 3.2 and 3.3 in which several machines or stages are linked

#### 3.2

##### **terminal equipment**

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

#### 3.3

##### **processing equipment**

equipment for treating the surface and/or modifying the product properties

#### 3.4

##### **plating section**

various number of electroplating cells in the process section of an electro processing line

NOTE E. g., see Figure D.7.