

**Masinate ohutus. Teras ümbertöötlemine.
Masinad ja seadmed vedela terase käsitlemiseks**

Safety of machinery - Secondary steelmaking -
Machinery and equipment for treatment of liquid steel

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 14677:2008 sisaldab Euroopa standardi EN 14677:2008 ingliskeelset teksti.

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English Version

Safety of machinery - Secondary steelmaking - Machinery and equipment for treatment of liquid steel

Sécurité des machines - Métallurgie secondaire - Machines et équipements pour traitement d'acier liquide

Sicherheit von Maschinen- Sekundärmetallurgie - Maschinen und Anlagen zur Behandlung von Flüssigstahl

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Foreword

This document (EN 14677:2008) has been prepared by Technical Committee CEN/TC 322 "Equipment for making and shaping of metals", 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of an identical text or by endorsement, at the latest by October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

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 EC Directive(s).

For relationship with EC Directive(s), see informative Annex ZA, ZB and ZC, which are an integral part of this document.

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.

Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

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

When provision 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 European 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.

1 Scope

This European Standard specifies the general safety requirements for secondary steelmaking machinery and equipment (SSE) as defined in 3.1 to treat liquid steel.

This European Standard covers machinery and equipment involved in the treatment process of liquid steel under vacuum or atmospheric pressure.

This European Standard deals with all significant hazards, hazardous situations and events pertinent to SSE, 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 met during the design, assembly, transport, commissioning, operation, maintenance and decommissioning of the equipment.

This European Standard assumes that SSE are operated and maintained by adequately trained and competent personnel. Manual intervention for setting, adjustment and maintenance is accepted as part of the normal use of the equipment.

NOTE 1 Annex B shows examples of SSE.

The following equipment is not covered by the scope of this European Standard:

- cranes;
- fork lift trucks or other transporting equipment;
- ladles;
- equipment for relining and preheating in the relining area;
- burners according to EN 746-2;
- dust and fume exhaust systems.

NOTE 2 Significant hazards and hazardous situations due to transporting/positioning of heavy components, e. g., by cranes (e. g., ladles, vessels, covers) are considered in this standard (see 5.2.3).

This European Standard is not applicable to SSE manufactured before the date of publication of this standard in the Official Journal.

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 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, *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 620:2002, *Continuous handling equipment and systems — Safety and EMC requirements for fixed belt conveyors for bulk materials*

EN 746-2, *Industrial thermoprocessing equipment — Part 2: Safety requirements for combustion and fuel handling systems*

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

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 — Systems of auditory and visual danger and information signals*

EN 982:1996, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*

EN 983:1996, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics*

EN 1037, *Safety of machinery — Prevention of unexpected start-up*

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 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 12464-1, *Light and lighting — Lighting of work places — Part 1: Indoor work places*

EN 13463-1:2001, *Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements*

EN 13463-5, *Non-electrical equipment intended for use in potentially explosive atmospheres — Part 5: Protection by constructional safety "c"*

EN 13478, *Safety of machinery — Fire prevention and protection*

prEN 15004-1, *Fixed firefighting systems - Gas extinguishing systems - Part 1: Design, installation and maintenance (ISO 14520-1, modified)*

EN 50171, *Central power supply systems*

EN 60079-0, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements (IEC 60079-0:2004, modified)*

EN 60079-10¹⁾, *Electrical apparatus for explosive gas atmospheres — Part 10: Classification of hazardous areas (IEC 60079-10:2002)*

EN 60079-14, *Electrical apparatus for explosive gas atmospheres — Part 14: Electrical installations in hazardous areas (other than mines) (IEC 60079-14:2002)*

EN 60204-1:2006, *Safety of machinery — Electrical equipment for machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

EN 60519-4:2006, *Safety in electroheat installations — Part 4: Particular requirements for arc furnace installations (IEC 60519-4:2006)*

EN 61241-10, *Electrical apparatus for use in the presence of combustible dust — Part 10: Classification of areas where combustible dust are or may be present (IEC 61241-10:2004)*

EN 61241-14, *Electrical apparatus for use in the presence of combustible dust — Part 14: Selection and installation (IEC 61241-14:2004)*

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

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)*

¹⁾ Will be replaced by prEN 60079-10-1 (2006-07).

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

EN ISO 14121-1, *Safety of machinery - Risk assessment - Part 1: Principles (ISO 14121-1:2007)*

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)*

ISO 7000:2004, *Graphical symbols for use on equipment — Index and synopsis*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2003 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

secondary steelmaking machinery and equipment (SSE)

machinery and equipment for treatment of liquid steel under vacuum or atmospheric pressure

NOTE Annex C shows examples of steelmaking processes.

3.2

additives

non metallic additions, e. g., lime, carbon

3.3

alloying material

ferrous and/or non-ferrous additions

3.4

chimney effect

hot exhaust gas stream to the top of steelmaking vessel

3.5

local control stand

free standing local control desks which are usually situated adjacent to machine or equipment to control part of the process