



SLOVENSKI STANDARD
SIST EN 1248:2002+A1:2009
01-junij-2009

Livarski stroji - Varnostne zahteve za opremo za peskanje

Foundry machinery - Safety requirements for abrasive blasting equipment

Gießereimaschinen - Sicherheitsanforderungen für Strahlanlagen

Machines de fonderie - Prescriptions de sécurité pour équipements de grenailage

Ta slovenski standard je istoveten z: EN 1248:2001+A1:2009

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ICS:

25.120.30 Livarska oprema Moulding equipment

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Foundry machinery - Safety requirements for abrasive blasting equipment

Machines de fonderie - Prescriptions de sécurité pour
équipements de grenailage

Gießereimaschinen - Sicherheitsanforderungen für
Strahlanlagen

This European Standard was approved by CEN on 8 March 2001 and includes Amendment 1 approved by CEN on 1 March 2009.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Contents

	Page
Foreword.....	4
Introduction	5
1 Scope	5
2 Normative references	6
3 Terms and definitions	7
4 A1 List of significant hazards A1	8
5 Safety requirements and/or measures	9
5.1 A1 General A1	9
6 Verification of the safety requirements and/or measures	24
7 Information for use	24
7.1 A1 General	24
7.2 Warning devices and safety signs	24
7.3 Marking	25
7.4 Accompanying documents A1	25
8 Maximum concentration of hazardous substances in shot blasting abrasives	27
Annex A (normative) Description of equipment covered by this standard.....	28
Annex B (informative) Illustrative solutions for safety measures of blasting equipment	29
Annex ZA (informative) A1 Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC A1	37
Annex ZB (informative) A1 Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC A1	38
Bibliography	39
Figures	
Figure B.1 — Processing scheme with abrasive blasting media preparation (see 3.2) A1	29
Figure B.2 — Shot blast wheel cover safety device (see 5.2).....	30
Figure B.3 — Shot blast wheel cover safety device (see 5.2).....	31
Figure B.4 — Safety measures against the propelling of abrasive blasting media (see 5.3.1.2).....	32
Figure B.5 — Blasting chamber door (see 5.3.1.3 and 5.3.1.5)	33
Figure B.6 — Door locking (see 5.3.1.3)	34
Figure B.7 — Safety catch of loading flap (see 5.6.1).....	35
Figure B.8 — Fixed guard (see 5.7.1)	36

Tables

Table 1 — Significant hazards, hazardous situations, safety requirements and/or measures11

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 1248:2002+A1:2009
<https://standards.iteh.ai/catalog/standards/sist/8e6d0533-3df8-4764-8e83-4a5c65714520/sist-en-1248-2002a1-2009>

EN 1248:2001+A1:2009 (E)**Foreword**

This document (EN 1248:2001+A1:2009) has been prepared by Technical Committee CEN/TC 202 "Foundry machinery", 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 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2009-03-01.

This document supersedes EN 1248:2001.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\boxed{A_1}$ $\boxed{A_1}$.

This European Standard 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).

$\boxed{A_1}$ For relationship with EC Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. $\boxed{A_1}$

An assessment of the foreseeable risks arising from the use of the equipment was carried out when this standard was drafted by CEN/TC 202/WG 4, comprising experts from the following countries: France, Germany, Italy, Sweden and United Kingdom.

Annex A is normative, and Annex B is informative.

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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 United Kingdom.

Introduction

A1 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 preventative measure is given in the text, this should not be considered as the only possible solution. Other solutions can be used as far as they fulfil correctly the criteria expressed in the requirement.

This European Standard assumes, that the equipment is operated and maintained by trained personnel. **A1**

1 Scope

This standard specifies requirements to be met by the manufacturer of abrasive blasting equipment for the foreseeable significant hazards due to design, construction and installation, during commissioning, operation, maintenance and decommissioning of the equipment which employ either centrifugal force or compressed air as a means of accelerating abrasive to achieve the desired result.

Abrasive blasting equipment covers: [SIST EN 1248:2002+A1:2009](https://standards.iteh.ai/catalog/standards/sist/8e6d0533-3df8-4764-8e83-4a5c65714520/sist-en-1248-2002a1-2009)

- centrifugal blasting machines;
- air blasting machines;
- loading, conveying and unloading systems for the workpieces.

See Annex A for more details.

This standard covers all foreseeable significant hazards which could be encountered during the lifetime of the machine as listed in clause 5.

This standard does not apply to:

- mobile centrifugal blasting equipment;
- mobile air blasting equipment;
- wet blasting equipment;
- the general works compressed air supply system.

EN 1248:2001+A1:2009 (E)**2 Normative references**

[A1] 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. **[A1]**

[A1] EN 286-1, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 1: Pressure vessels for general purposes*

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

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

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

EN 999, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts of the human body*

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

EN 1088:1995, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

EN 1265, *Noise test code for foundry machines and equipment*

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

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

EN 60529, *Degrees of protection provided by enclosures (IP-Code) (IEC 60529:1989)*

EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals (IEC 61310-1:2007)*

EN 61310-2, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking (IEC 61310-2:2007)*

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

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*

CENELEC R044-001, February 1999, *Safety of machinery — Guidance and recommendations for the avoidance of hazards due to static electricity* ^(A1)

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3 Terms and definitions

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^(A1) For the purpose of this document, the terms and definitions given in EN ISO 12100:2003 and the following apply.

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NOTE Definition used in EN and ISO standards referred to in this European Standard are also valid for this European Standard. ^(A1)

3.1

blasting

process where workpiece to be cleaned or surface to be treated is subjected to continuous attack by abrasive blasting media to achieve the desired result

3.2

blasting equipment

machines employing either centrifugal force or compressed air as a means of accelerating abrasive.

The equipment comprises a chamber which contains the workpiece and also prevents the abrasive media from escaping to the environment after impacting on the workpiece. It also incorporates: a system for collecting, recycling, cleaning by air or magnetic separation or a combination of both and storage for the abrasive media ready to feed back to the dosing device for abrasive media (for examples of blasting equipment types see Annex A, for an example of a processing scheme see Annex B, Figure B.1) and a conveying system for workpieces.

^(A1) 3.3

abrasive media

granular metallic or non-metallic material to be forcibly applied to a surface to achieve the desired result

NOTE Classification of metallic abrasives see EN ISO 11124-1, of non-metallic abrasives see EN ISO 11126-1.

EN 1248:2001+A1:2009 (E)

3.4 free-jet work
manual blasting process carried out with hand held nozzles without protective separation between the operator and the rebounding abrasive media and generated dust

NOTE In general the use of an appropriate abrasive blasting helmet and other protective clothing will be necessary in this case. ^{A1}

3.5 exhaust system
extraction device which collects contaminated air under a slight negative pressure and transports it via appropriate ducting to a dust collector

3.6 dust separator
air cleaning device to remove contaminated particulates prior to discharge to the atmosphere

3.7 explosion relief panel
device to release pressure safely and rapidly

3.8 transfer car
vehicle used for transporting the workpieces into and out of the blasting chamber

NOTE The vehicle is often on rails.

3.9 machine setting
control of the actuation of a mechanism during setting phases when the machine is manually controlled; guards having been by-passed

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3.10 manual operation
any sequence or event which is manually controlled by the operator

3.11 automatic operation
every cycle initiates the next cycle automatically whereby all supplementary steps are carried out by a predetermined program

4 ^{A1} List of significant hazards ^{A1}

Abrasive blasting equipment shall be designed to take into consideration the hazards, the safety requirements and the preventative measures referred to in clause 5.

A parameter for the level of safety measures to be applied is the risk of accident to be expected, the extent of which depends upon the highest foreseeable degree of severity and effect as well as the probability of an injury e.g. exposure to risk (frequency of intervention or access or duration of stay in a danger zone). Movable safeguards or facilities with guarding functions in danger zones with fixed cycle intervention or access (e.g. during filling with molten metal, periodical manual cleaning, or trouble shooting) require a special degree of safety against unexpected start up or dangerous movements, as well as against hazardous sources and failure of relevant safeguards and control systems.

^{A1} The significant hazards, hazardous situations and events, as far as they are dealt with in this document, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk, are listed in Clause 5, Table 1, together with the appropriate safety measures. ^{A1}

This assessment formed the basis for determining

- a) The safety features which shall be incorporated into the equipment;
- b) Any special instructions which shall be communicated to the user.

A1 *deleted text* **A1**

5 Safety requirements and/or measures

5.1 **A1** General

5.1.1 Machinery shall comply with the safety requirements and/or protective measures formulated in Table 1 in relation with the different significant hazards. In addition, the machine shall be designed according to the principles of EN ISO 12100-2 for relevant but not significant hazards which are not dealt with by this document.

5.1.2 When selecting the adequate safety measures the manufacturer shall apply the following principles in the given order:

- 1) elimination or minimisation of risks by integration of the safety concept into the design of the machine;
- 2) establishment of adequate safety measures against remaining risks (e.g. guard scaffolding, light barriers);
- 3) instruction to personnel concerning the remaining risks (e.g. service manuals, danger signs).

When more than one measure is necessary to safeguard a hazard then all the necessary measures shall be used. When selecting the safety requirements and/or measures consideration shall be given to the different hazards that may appear at the same time. Warning signs alone are not sufficient in cases of significant risk.

5.1.3 Where access is into a working area is by guards/doors the safety related parts of the electro-mechanical/electronic control system shall be in accordance with at least performance level PL=d with use of category 3 according to EN ISO 13849-1:2006. The hydraulic and pneumatic systems shall be in accordance with at least performance level PL=c with use of category 1 according to EN ISO 13849-1:2006.

5.1.4 Where it is possible to gain access to a hazardous area which is not protected by a movable guard or door, access shall be prevented by fixed guards in accordance with EN ISO 13857, EN 953 and EN 1088.

5.1.5 Emergency stop equipment shall be in accordance with EN ISO 13850 (where applicable, for determination of stop categories see Table 1).

5.1.6 The following Table 1 is developed to allow the designer and manufacturer of the equipment to apply a logical approach for checking the design against the list of significant hazards with respect to abrasive blasting equipment.

Table 1 is structured as follows:

- column 1 identifies the significant hazards;
- column 2 describes the hazardous situations;
- column 3 specifies the safety requirements and/or measures to avoid or minimize the hazards and hazardous situations;
- column 4 identifies the verification methods to be used to demonstrate conformity; the abbreviations V, P, M and D are defined as follows:


EN 1248:2001+A1:2009 (E)

V: Visual inspection verifies the required features of the components.

P: A test/check verifies that the features provided perform their function in such a way that the requirement is met.

M: Measurement verifies that requirements are met to the specified limits.

D: Drawings and/or calculations verify that the design characteristics of the components provided meet the requirements.

Verification may involve more than one method. 

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Table 1 — Significant hazards, hazardous situations, safety requirements and/or measures

Column 1	Column 2	Column 3	Column 4
Significant hazard	Hazardous situation	Safety measures according to the mentioned standards and/or specific measures	Verification
5.2 Centrifugal wheel assembly (see Annex B, Figures B.2 and B.3)			
5.2.1 Shearing and crushing. Cutting and severing	Access to shear traps between fixed and internal rotating parts from either a hooded wheel or accessible through a door when the wheel is running up or down.	3.25.5 of EN ISO 12100-1:2003 and interlocking guard with guard locking according EN 953 and EN 1088, connected with stop category 1 according 4.1.4 of EN ISO 13850:2006.	V, D
5.2.2 Impact by ejection of parts	Exposure to thrown off abrasive media/workpiece or projectile.	3.25.5 of EN ISO 12100-1:2003 and EN 953, e.g. withstand the impact of propelled abrasive media as well as an escaping wheel blade whilst the wheel is running.	V
5.2.3 Cutting, severing crushing	Access to pneumatic/hydraulic actuated moving parts of the abrasive media feed valve, e.g. in case of trouble-shooting (clogging within pipes) and during maintenance.	3.25.1 of EN ISO 12100-1:2003 (Fixed guard). 4.10 of EN ISO 12100-2:2003. Ensure possibility of depressurising when isolating the machine.	V
5.3 Blasting chamber			
5.3.1 Blasting chamber of centrifugal blasting machines			
5.3.1.1 Crushing, shearing, cutting, impact	Access to the blasting chamber with doors. Movement of the wheels and/or wheel blades escaping whilst the wheel is running. https://standards.iteh.ai/catalog/standards/sist/en-1248-2002-a1-2009/4a5c65714520-sist-en-1248-2002-a1-2009	3.25.5 of EN ISO 12100-1:2003 and 5.4.1 of EN 1088:1995/A1:2007 connected with stop category 1 according 4.1.4 of EN ISO 13850:2006. An interlocking guard with guard locking shall be fitted to prevent the wheel starting unless the blasting chamber doors are closed and to prevent the doors being opened until the wheels have come to a complete stop.	V, D
		It shall not be possible to open the door(s) until the abrasive media flow had been shut off. Either a) the wheels shall have come to a complete stop; or b) the wheel hood covers shall be in closed position.	V
		The start up of the wheels or the opening movement of the wheel hood covers shall only be possible after the doors are closed	
		4.11 of EN ISO 12100-2:2003 and EN 1037 (Design control system to prevent unexpected start-up/restart).	
5.3.1.2 Impact, abrasive media attack			