



SLOVENSKI STANDARD
SIST EN 13218:2003+A1:2008

01-oktober-2008

Nadomešča:
SIST EN 13218:2003

Obdelovalni stroji - Varnost - Stacionarni brusni stroji

Machine tools - Safety - Stationary grinding machines

Werkzeugmaschinen - Sicherheit - Ortsfeste Schleifmaschinen

Machines-outils - Sécurité - Machines à meuler fixes

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ICS:

25.080.50 Brusilni in polirni stroji Grinding and polishing machines

SIST EN 13218:2003+A1:2008 **en,fr,de**

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EUROPEAN STANDARD
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Machine tools - Safety - Stationary grinding machines

Machines-outils - Sécurité - Machines à meuler fixes

Werkzeugmaschinen - Sicherheit - Ortsfeste Schleifmaschinen

This European Standard was approved by CEN on 26 August 2001 and includes Amendment 1 approved by CEN on 29 June 2008.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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EN 13218:2002+A1:2008 (E)**Foreword**

This document (EN 13218:2002+A1:2008) has been prepared by Technical Committee CEN/TC 143 "Machine tools - Safety", the secretariat of which is held by SNV.

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of an identical text or by endorsement, at the latest by January 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2008-06-29.

This document supersedes EN 13218:2002.

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 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).

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

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. [SIST EN 13218:2003+A1:2008](https://standards.iteh.ai/catalog/standards/sist/199d3d6a-90f2-426a-a9aa-330276d4fb67/sist-en-13218-2003a1-2008)

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Introduction

This European standard has been prepared to be a harmonised standard to provide one means of conforming with the essential safety requirements of the Machinery Directive and associated EFTA regulations. This standard is a type C standard as stated in A1 EN ISO 12100-1:2003 A1 .

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

1 Scope

This standard specifies the technical safety requirements and/or protective measures to be adopted by persons undertaking the design, construction and supply (including installation and dismantling, arrangements for transport and maintenance) of stationary grinding machines as defined in 3.1 and 3.2 and intended to be used for the grinding of workpieces of cold metal.

This standard deals with the significant hazards as listed in 4.

This standard does not apply to honing, polishing and belt grinding machines.

This standard applies to machines which are manufactured after the date of issue of this standard.

2 Normative references

[SIST EN 13218:2003+A1:2008](https://standards.iteh.ai/catalog/standards/sist/199d3d6a-90f2-426a-a9aa-309a5d4b6a0c/en-13218-2003-a1-2008)

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This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

CR 1030-1, *Hand arm vibration – Guidelines for vibration hazards reduction – Part 1: Engineering methods by design of machinery*

EN 287-1, *Approval testing of welders – Fusion welding – Part 1: Steels*

EN 287-2, *Approval testing of welders – Fusion welding – Part 2: Aluminium and aluminium alloys*

EN 288-1, *Specification and qualification of welding procedures for metallic materials – Part 1: General rules for fusion welding*

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EN 294, *Safety of machinery – Safety distances 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 418, *Safety of machinery – Emergency stop equipment, functional aspects – Principles for design*

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EN 547-1, *Safety of machinery - Human body measurements – Part 1: Principles for determining the dimensions required for openings for whole body access into machinery*

EN 547-2, *Safety of machinery - Human body measurements – Part 2: Principles for determining the dimensions required for access openings*

EN 614-1, *Safety of machinery - Ergonomic design principles – Part 1: Terminology and general principles*

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 729-1, *Quality requirements for welding – Fusion welding of metallic materials – Part 1: Guidelines for selection and use*

EN 953, *Safety of machinery – Guards – General requirements for the design and construction of fixed and movable guards*

EN 954-1, *Safety of machinery – Safety related parts of control systems – Part 1: General principles for design*

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 1033, *Hand arm vibration – Laboratory measurement of vibration at the grip surface of hand guided machinery – General*

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

EN 1050:1996, *Safety of machinery – Principles for risk assessment*

EN 1070, *Safety of machinery – Terminology*

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

EN 1127-1:1997, *Explosive atmospheres – Explosion prevention and protection – Part 1: Basic concepts and methodology*

EN 1837, *Safety of machinery - Integral lighting of machines*

EN 10025, *Hot rolled products of non-alloy structured steels - Technical delivery conditions*

EN 10130:1991+A1, *Cold-rolled low carbon steel flat products for cold forming – Technical delivery conditions*

EN 12096, *Mechanical vibration – Declaration and verification of vibration emission values*

EN 12413, *Safety requirements for bonded abrasive products*

EN 13236, *Safety requirements for superabrasives*

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

EN 22553, *Welded, brazed and soldered joints – Symbolic representation on drawings (ISO 2553:1992)*

EN 25817:1992, *Arc welded joints in steel – Guidance on quality levels for imperfections (ISO 5817:1992)*

- ENV 26385, *Ergonomic principles for the design of work systems (ISO 6385:1981)*
- EN 50081-2, *Electromagnetic compatibility – Generic emission standard – Part 2: Industrial environment*
- EN 50082-2, *Electromagnetic compatibility – Generic immunity standard – Part 2: Industrial environment*
- EN 60204-1:1997, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements (IEC 60204 1:1997)*
- EN 61310-2, *Safety of machinery – Indication, marking and actuation – Part 2: Requirements for marking (IEC 61310 2:1995)*
- EN ISO 3744, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)*
- EN ISO 3746, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995)*
- EN ISO 4871, *Acoustics – Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*
- EN ISO 11201, *Acoustics – Noise emitted by machinery and equipment – Measurements of emission sound pressure levels at a work station and at other specified positions – Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995)*
- EN ISO 11202, *Acoustics – Noise emitted by machinery and equipment – Measurements of emission sound pressure levels at a work station and at other specified positions – Survey method in situ (ISO 11202:1995)*
- EN ISO 11204, *Acoustics – Noise emitted by machinery and equipment – Measurements of emission sound pressure levels at a work station and at other specified positions – Method requiring environmental corrections (ISO 11204:1995)*
- 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)* Ⓐ
- ISO 230-5, *Test code for machine tools – Part 5: Determination of the noise emission*
- ISO 666, *Machine tools – Mounting of plain grinding wheels by means of hub flanges*
- ISO 1052, *Steels for general engineering purposes*
- ISO 1083, *Spheroidal graphite cast iron – Classification*
- ISO 3522, *Cast aluminium alloys – Chemical composition and mechanical properties*
- ISO 3574, *Cold reduced carbon steel sheet of commercial and drawing qualities*
- ISO 4997, *Cold reduced steel sheet of structural quality*
- ISO 6316, *Hot rolled steel strip of structural quality*
- ISO 6361-2, *Wrought aluminium and aluminium alloy sheets, strips and plates – Part 2: Mechanical properties*

EN 13218:2002+A1:2008 (E)**3 Terms and definitions**

For the purposes of this European Standard, the terms and definitions given in EN 1070 and the following terms and definitions apply.

Additional terms and definitions specifically needed for this standard are added below.

- 3.1**
grinding machine
machine tool intended to machine workpieces by means of abrasive products
- 3.2**
stationary grinding machine
grinding machine fixed in position during operation and capable of a combination of one or more types of operations, examples see Table 1

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Table 1 — Stationary grinding machines

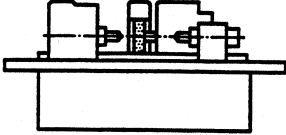
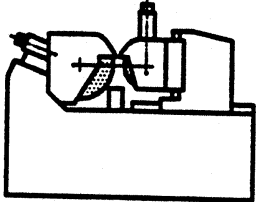
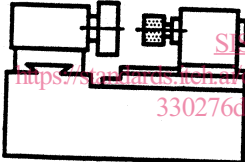
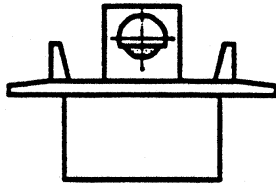
No.	Machine	Designation	Grinding method
1.1		de: Außenrundscheif- maschine en: External cylindrical grinding machine fr: Rectifieuse cylindrique extérieure	External cylindrical grind- ing The grinding of the external surface of a rotating workpiece. The workpiece and the grinding wheel are mechanically guided.
1.2		de: Spitzenlose Außen rundscheifmaschine en: Centreless external cylindrical grinding machine fr: Rectifieuse cylindrique sans centre	Centreless grinding The grinding of the external surface of a rotating workpiece. The workpiece is rotated mechanically guided with reference to the grinding wheel by means of a control-wheel and rests on a straight-edge placed between the two wheels.
1.3		de: Innenrundscheif maschine en: Internal cylindrical grinding machine fr: Rectifieuse cylindrique intérieure	Internal grinding The grinding of the internal surface of a rotating work- piece. The workpiece and the grinding wheel are mechanically guided.
1.4		de: Planscheifmaschine, Rechtecktisch, waage rechte Spindel en: Surface grinding machine, reciprocating table, horizontal spindle fr: Rectifieuse plane à table a déplacement rectiligne – broche horizontale (continued)	Surface grinding- peripheral grinding The grinding of plane surfaces of a workpiece. The workpiece is secured to a reciprocating table. The workpiece and the grinding wheel are mechanically guided.

Table 1 (continued)

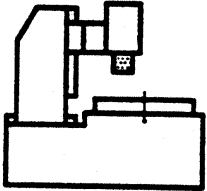
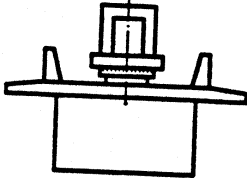
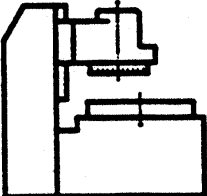
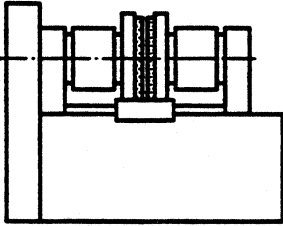
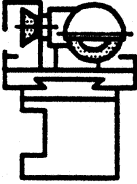
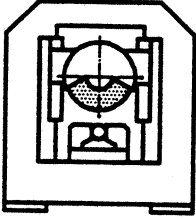
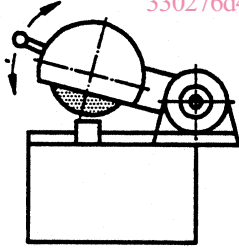
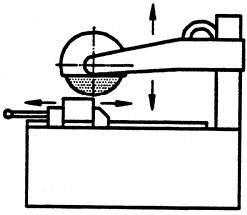
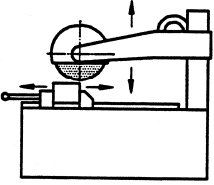
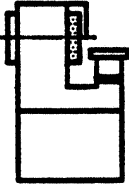
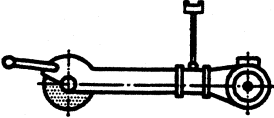
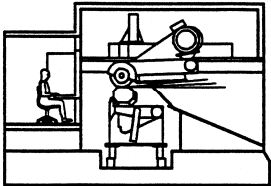
No.	Machine	Designation	Grinding method
1.5		de: Planschleifmaschine, Rundtisch, waagerechte Spindel en: Surface grinding machine, rotary table horizontal spindle fr: Rectifieuse plane à table rotative – broche hori- zontale	Surface grinding – peripheral grinding The grinding of plane surfaces of a workpiece. The workpiece is secured to a rotary table. The workpiece and the grinding wheel are mechanically guided.
1.6		de: Planschleifmaschine, Rechtecktisch, senk- rechte Spindel en: Surface grinding machine, reciprocating table, vertical spindle fr: Rectifieuse plane à table a déplacement rectiligne – broche verticale	Surface grinding – face grinding The grinding of plane surfaces of a workpiece. The workpiece is secured to a reciprocating table. The workpiece and the grinding wheel are mechanically guided.
1.7		de: Planschleifmaschine, Rundtisch, senkrechte Spindel en: Surface grinding machine, rotary table vertical spindle fr: Rectifieuse plane à table a déplacement rota- tive – broche verticale	Surface grinding – face grinding The grinding of plane surfaces of a workpiece. The workpiece is secured to a rotary table. The workpiece and the grinding wheel are mechanically guided.
1.8		de: Doppelspindel-Plan schleifmaschine, waage rechte oder senkrechte Spindeln en: Surface grinding machine, double spindle horizontal or vertical fr: Rectifieuse plane à deux (continued)	Surface grinding – face grinding The grinding of a workpiece by passing it between two disc or cylinder wheels or segments. The workpiece and the grinding wheels are mechanically guided.

Table 1 (continued)

No.	Machine	Designation	Grinding method
1.9		de: Werkzeugschleifmaschine en: Tool grinding machine fr: Affûteuse	Peripheral and face grinding The grinding or regrinding of cutting faces and edges of tools (workpiece). The workpieces and the grinding wheels are mechanically guided.
1.10		de: Trennschleifmaschine en: Cutting-off machine fr: Tronçonneuse	Cutting-off The grinding of workpieces for slotting or cutting-off. The workpiece is firmly fixed and the cutting-off wheel is mechanically guided.
1.11		de: Trennschleifmaschine en: Cutting-off machine fr: Tronçonneuse	Cutting-off The grinding of workpieces for cutting-off. The workpiece is firmly clamped, the cutting-off wheel is guided by hand.
1.12		de: Trennschleifmaschine en: Cutting-off machine fr: Tronçonneuse	Cutting-off The grinding of workpieces for slotting or cutting-off. The workpiece is guided by hand. The cutting-off wheel is mechanically guided.

(continued)

Table 1 (concluded)

No.	Machine	Designation	Grinding method
1.13		de: Tisch- oder Ständer schleifmaschine en: Bench or pedestal grinding machine fr: Touret pour établi ou sur	Peripheral grinding The grinding of a surface of a workpiece using the wheel periphery.
1.14		de: Ständerschleifmaschine en: Pedestal grinding machine fr: Lapidaire	Face grinding The grinding of a surface of a workpiece using the wheel face. The workpiece is guided by hand.
1.15		de: Pendelschleifmaschine en: Swing frame grinding machine fr: Meulage et tronçonnage avec machine suspendue	Peripheral grinding/cutting-off The grinding or cutting of a workpiece using the wheel periphery. The workpiece is firmly clamped or stabilized by its own weight. The grinding machine is suspended and guided by hand.
1.16		de: Hochdruckschleif- maschine en: High pressure grinding machine fr: Machine pour meulage à	Surface grinding High pressure grinding where the workpiece is secured to a table. The workpiece and the grinding wheel are mechanically guided.

3.3 abrasive product

cutting tools of varied shapes with geometrically unspecified cutting edges. They are made from abrasive grains and bond. There is a distinction between bonded abrasive products and superabrasives, see EN 12413 and EN 13236

3.4 dressing tool

fixed or rotary tool for the generation or reproduction of the grinding capacity (sharpening) and/or the geometry (truing) of abrasive products

3.5**rotational and peripheral speed**

peripheral speed of a grinding wheel is calculated by the formula:

$$v = \frac{D \times \pi \times n}{60 \times 1000}$$

The speed of rotation of a grinding wheel is calculated by the formula:

$$n = \frac{v \times 1000 \times 60}{D \times \pi}$$

where

n is the speed of rotation in rotations per minute ;

v is the peripheral speed in metres per second;

D is the outside diameter of the abrasive product in millimetres.

3.6**maximum operating speed**

maximum permissible peripheral speed of a rotating abrasive product

3.7**maximum rotational speed**

maximum rotational speed of a grinding wheel spindle under all operating conditions. Rotational speed of a new abrasive product at maximum operating speed

3.8**type of application**

see Table 2

Table 2 — Type of application

Grinding method	Type of application	Abrasive product	Workpiece
Grinding	Mechanically guided grinding	Fixed	Guided mechanically
		Guided mechanically	Fixed
		Guided mechanically	Guided mechanically
	Manually guided grinding	Guided by hand	Fixed
		Fixed	Guided by hand
Cutting-off	Mechanically guided cutting-off	Fixed	Guided mechanically
		Guided mechanically	Fixed
		Guided mechanically	Guided mechanically
	Manually guided cutting-off	Guided by hand	Fixed
		Fixed	Guided by hand