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Machine tools - Safety - Stationary grinding machines (ISO 16089:2025)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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EUROPÄISCHE NORM

EN ISO 16089

April 2025

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English Version

Machine tools - Safety - Stationary grinding machines (ISO 16089:2025)

Machines-outils - Sécurité - Machines à meuler fixes (ISO 16089:2025)

Werkzeugmaschinen - Sicherheit - Ortsfeste Schleifmaschinen (ISO 16089:2025)

This European Standard was approved by CEN on 15 November 2024.

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European foreword

This document (EN ISO 16089:2025) has been prepared by Technical Committee ISO/TC 39 "Machine tools" in collaboration with 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of an identical text or by endorsement, at the latest by October 2025, and conflicting national standards shall be withdrawn at the latest by October 2025.

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 ISO 16089:2015.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 16089:2025 has been approved by CEN as EN ISO 16089:2025 without any modification.

Annex ZA
(informative)

Relationship between this European Standard and the essential requirements of EU Directive 2006/42/EC aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/396 "Mandate to CEN and CENELEC for standardisation in the field of machinery" to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast).

Once this standard is cited in the Official Journal of the European Union under that Directive compliance with the normative clauses of this standard given in Table ZA.1 and application of the edition of the normatively referenced standards as given in Table ZA.2 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Directive 2006/42/EC

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1.1.2 (d)	5, 6	
1.1.2 (e)	5, 6	
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1.1.6. Ergonomics	5.8	
1.1.7. Operating positions	5.8	
1.1.8. Seating		Not covered
1.2.1. Control Systems; Safety and reliability of control systems	5.12	
1.2.2. Control Devices	5.8	
1.2.3. Starting	5.9	

Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
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1.3.3. Risks due to falling or ejected objects	5.13	
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1.4.1 General requirements	5.2.3.2, 5.13.1	
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1.4.2.2. Interlocking movable guards	5.2.3.2	
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1.5.3. Energy supply other than electricity	5.9, 7.1	
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1.5.7. Explosion	5.7.3 Annex H, Annex I,	
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1.5.11. External radiation	5.9 k)	
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Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
	7.2.1 g)	
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1.5.14. Risk of being trapped in a machine	7.2.1 n)	
1.5.15. Risk of slipping, tripping of falling	5.15	
1.6.1. Machinery maintenance	5.1.1, 5.7.2.2 i), 7.2.1	
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Table ZA.2 — Applicable Standards to confer presumption of conformity as described in this Annex ZA

Column 1 Reference in Clause 2	Column 2 International Standard Edition	Column 3 Title	Column 4 Corresponding European Standard Edition
ISO 447	ISO 447:1984	Machine tools – Direction of operation of controls	For applicable standard edition see Column 2
ISO 2553	ISO 2553:2019	Welding and allied processes – Symbolic representation on drawings – Welded joints	EN ISO 2553:2019
ISO 3834-1	ISO 3834-1:2021	Quality requirements for fusion welding of metallic materials – Part 1: Criteria for the selection of the appropriate level of quality requirements	EN ISO 3834-1:2021
ISO 4413:2010	ISO 4413:2010	Hydraulic fluid power — General rules and safety requirements for systems and their components	EN ISO 4413:2010
ISO 4414:2010	ISO 4414:2010	Pneumatic fluid power — General rules and safety requirements for systems and their components	EN ISO 4414:2010
ISO 4871	ISO 4871:1996	Acoustics — Declaration and verification of noise emission values of machinery and equipment	EN ISO 4871:2009
ISO 5817	ISO 5817:2014	Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections	EN ISO 5817:2023
ISO 9355-1	ISO 9355-1:1999	Ergonomic requirements for the design of displays and control actuators — Part 1: Human interactions with displays and control actuators	For applicable standard edition see Column 2
ISO 9355-2	ISO 9355-2:1999	Ergonomic requirements for the design of displays and control actuators — Part 2: Displays	For applicable standard edition see Column 2
ISO 9355-3	ISO 9355-3:2006	Ergonomic requirements for the design of displays and control actuators — Part 3: Control actuators	For applicable standard edition see Column 2
ISO 9606-1	ISO 9606-1:2012	Qualification testing of welders — Fusion welding — Part 1:	EN ISO 9606-1:2017

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Column 1 Reference in Clause 2	Column 2 International Standard Edition	Column 3 Title	Column 4 Corresponding European Standard Edition
		Steels	
ISO 9606-2	ISO 9606-2:2004	Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys	EN ISO 9606-2:2004
ISO 10218-1:2006	ISO 10218-1:2006	Robots for industrial environments — Safety requirements — Part 1: Robots	EN ISO 10218-1:2011
ISO 11202	ISO 11202:2010 EN ISO 11202:2010/Amd.1:2020	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	EN ISO 11202:2010 EN ISO 11202:2010/A1:2021
ISO 11161	ISO 11161:2007 ISO 11161:2007/Amd.1:2010	Safety of machinery — Integrated manufacturing systems — Basic requirements	EN ISO 11161:2007 EN ISO 11161:2007/A1:2010
ISO 12100:2010	ISO 12100:2010	Safety of machinery — General principles for design — Risk assessment and risk reduction	EN ISO 12100:2010
ISO 13849-1:2006	ISO 13849-1:2006	Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design	EN ISO 13849-1:2023
ISO 13850	ISO 13850:2015	Safety of machinery — Emergency stop — Principles for design	EN ISO 13850:2015
ISO 13856-2	ISO 13856-2:2013	Safety of machinery — Pressure-sensitive protective devices — Part 2: General principles for design and testing of pressure-sensitive edges and pressure-sensitive bars	EN ISO 13856-2:2013
ISO 13857:2008	ISO 13857:2008	Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs	EN ISO 13857:2019
ISO 14118:2000	ISO 14118:2000	Safety of machinery — Prevention of unexpected start-up	EN ISO 14118:2018
ISO 14119:1998	ISO 14119:1998	Safety of machinery —	EN ISO 14119:2013

Column 1 Reference in Clause 2	Column 2 International Standard Edition	Column 3 Title	Column 4 Corresponding European Standard Edition
		Interlocking devices associated with guards — Principles for design and selection	
ISO 14120:2002	ISO 14120:2002	Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards	EN ISO 14120:2015
ISO 14122-1	ISO 14122-1:2016	Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels	EN ISO 14122-1:2016
ISO 14122-2	ISO 14122-2:2016	Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways	EN ISO 14122-2:2016
ISO 14122-3	ISO 14122-3:2016	Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails	EN ISO 14122-3:2016
ISO 14122-4	ISO 14122-4:2016	Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders	EN ISO 14122-4:2016
ISO 15607	ISO 15607:2019	Specification and qualification of welding procedures for metallic materials — General rules	EN ISO 15607:2019
ISO 19719	ISO 19719:2010	Machine tools — Work holding chucks — Vocabulary	For applicable standard edition see Column 2
IEC 60204-1:2009	IEC 60204-1:2009	Safety of machinery — Electrical equipment of machines — Part 1: General requirements	EN 60204-1:2019
IEC 60825-1	IEC 60825-1:2014	Safety of laser products — Part 1: Equipment classification and requirements	EN 60825-1:2014
IEC 61000-6-2	IEC 61000-6-2:2016	Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments	EN IEC 61000-6-2:2019
IEC 61000-6-4	IEC 61000-6-4:2018	Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments	EN IEC 61000-6-4:2019

Column 1 Reference in Clause 2	Column 2 International Standard Edition	Column 3 Title	Column 4 Corresponding European Standard Edition
IEC 61800-5-2	IEC 61800-5-2:2016	Adjustable speed electrical power drive systems — Part 5-2: Safety requirements - Functional	For applicable standard edition see Column 2
IEC 62061	IEC 62061:2021	Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems	EN IEC 62061:2021
EN 1127-1	Not yet available	Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology	EN 1127-1:2019

The documents listed in the Column 1 of Table ZA.2, in whole or in part, are normatively referenced in this document, i.e. are indispensable for its application. The achievement of the presumption of conformity is subject to the application of the edition of Standards as listed in Column 4 or, if no European Standard Edition exists, the International Standard Edition given in Column 2 of Table ZA.2.

WARNING 1 Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 Other Union legislation may be applicable to the product(s) / service(s) falling within the scope of this standard.

International Standard

ISO 16089

Machine tools — Safety — Stationary grinding machines

Machines-outils — Sécurité — Machines à meuler fixes

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 10, *Safety,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 143, *Machine tools — Safety,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 16089:2015), which has been technically revised.

The main changes are as follows:

— contradictory requirements for the reliability of the control function have been corrected in Table 3;

— requirements for guards in Annex A have been revised: for example, wall thicknesses have been changed for abrasive product guards (Tables A.1 to A.6) and a new Table A.7 has been added, and for enclosures, a new calculation method for wall thicknesses has been introduced;

— Annex F “Noise test code” has been added;

— editorial corrections have been made.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

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

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organisations, 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 users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, for example, for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

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

When requirements of this type-C standard are different from those which are stated in type-A or type-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.

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International Standard **ISO 16089:2025(en)**

Machine tools — Safety — Stationary grinding machines

1 Scope

This document specifies the requirements and/or measures to eliminate the hazards or reduce the risks in the following groups of stationary grinding machines which are designed primarily to shape metal by grinding:

— Group 1: manually controlled grinding machines without power operated axes and without numerical control;

— Group 2: manually controlled grinding machines with power operated axes and limited numerically controlled capability, if applicable;

— Group 3: numerically controlled grinding machines.

NOTE 1 For detailed information on the groups of grinding machines, see 3.1 and 3.2.

NOTE 2 Requirements in this document are, in general, applicable to all groups of grinding machines. If requirements are applicable to some special group(s) of grinding machines only, then the special group(s) of grinding machine(s) is/are specified.

This document covers the significant hazards listed in Clause 4 and applies to ancillary devices (e.g. for workpieces, tools, workpiece holding devices and handling devices), which are integral to the machine.

This document also applies to machines which are integrated into an automatic production line or grinding cell in as much as the hazards and risks arising are comparable to those of machines working separately.

This document also includes in Clause 7 a minimum list of safety-relevant information which the manufacturer has to provide to the user. See also ISO 12100:2010, Figure 2, which illustrates the interaction of the manufacturer's and user's responsibility for the operational safety.

The user's responsibility to identify specific hazards (e.g. fire and explosion) and reduce the associated risks can be critical (e.g. whether the central extraction system is working correctly).

Where additional metalworking processes (e.g. milling, turning, laser processing) are involved, this document can be taken as a basis for safety requirements. Specific information on hazards arising from other metalworking processes are covered by other International Standards.

This document applies to machines that are manufactured after the date of issue of this document.

This document does not apply to stationary honing, polishing and belt grinding machines. This document does not apply to transportable motor-operated electric tools in accordance with IEC 61029-2-4 and IEC 61029-2-10.

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.

ISO 447, *Machine tools — Direction of operation of controls*

ISO 1083, *Spheroidal graphite cast irons — Classification*

ISO 2553, *Welding and allied processes — Symbolic representation on drawings — Welded joints*

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ISO 3522, *Aluminium and aluminium alloys — Castings — Chemical composition and mechanical properties*

ISO 3574, *Cold-reduced carbon steel sheet of commercial and drawing qualities*

ISO 3746:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

ISO 3834-1, *Quality requirements for fusion welding of metallic materials — Part 1: Criteria for the selection of the appropriate level of quality requirements*

ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 4414:2010, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

ISO 4871:1996, *Acoustics — Declaration and verification of noise emission values of machinery and equipment*

ISO 4997, *Cold-reduced carbon steel sheet of structural quality*

ISO 5817:2014, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 6316, *Hot-rolled steel strip of structural quality*

ISO 6361-2, *Wrought aluminium and aluminium alloys — Sheets, strips and plates — Part 2: Mechanical properties*

ISO 9355-2, *Ergonomic requirements for the design of displays and control actuators — Part 2: Displays*

ISO 9355-3, *Ergonomic requirements for the design of displays and control actuators — Part 3: Control actuators*

ISO 9444-1, *Continuously hot-rolled stainless steel — Tolerances on dimensions and form — Part 1: Narrow strip and cut lengths*

ISO 9444-2, *Continuously hot-rolled stainless steel — Tolerances on dimensions and form — Part 2: Wide strip and sheet/plate*

ISO 10218-1:2011, *Robots for industrial environments — Safety requirements — Part 1: Robots*

ISO 11161, *Safety of machinery — Integrated manufacturing systems — Basic requirements*

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 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13849-1:2023, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 13850, *Safety of machinery — Emergency stop function — Principles for design*

ISO 13856-2, *Safety of machinery — Pressure-sensitive protective devices — Part 2: General principles for design and testing of pressure-sensitive edges and pressure-sensitive bars*

ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 14118:2017, *Safety of machinery — Prevention of unexpected start-up*

ISO 14119:2013, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

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ISO 14120:2015,
Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards

ISO 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means and general requirements of access*

ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways*

ISO 14122-3, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails*

ISO 14122-4, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders*

ISO 14737, *Carbon and low alloy cast steels for general applications*

ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules*

IEC 60204-1:2009, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

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

IEC 61000-6-2, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments*

IEC 61000-6-4, *Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments*

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

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

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