



SLOVENSKI STANDARD
SIST EN 12418:2000+A1:2009
01-maj-2009

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Masonry and stone cutting-off machines for job site - Safety

Steintrennmaschinen für den Baustelleneinsatz - Sicherheit

Scies de chantier à tronçonner les matériaux - Sécurité

Ta slovenski standard je istoveten z: **EN 12418:2000+A1:2009**

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91.220 Gradbena oprema Construction equipment

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12418:2000+A1

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ICS 91.220

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English Version

Masonry and stone cutting-off machines for job site - Safety

Scies de chantier à tronçonner les matériaux - Sécurité

Steintrennmaschinen für den Baustelleneinsatz - Sicherheit

This European Standard was approved by CEN on 3 May 2000 and includes Amendment 1 approved by CEN on 15 February 2009.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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

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Foreword

This document (EN 12418:2000+A1:2009) has been prepared by Technical Committee CEN/TC 151 "Construction equipment and building material machines - Safety", 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of an identical text or by endorsement, at the latest by September 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2009-02-15.

This document supersedes EN 12418:2000.

The start and finish of text introduced or altered by amendment is indicated in the text by tags \square_{A1} \square_{A1} .

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 EU Directive(s).

\square_{A1} For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. \square_{A1}

The annex A is normative and contains "Noise test code - Grade 2 of accuracy", annex B is normative and contains "Dimensions of the flanges for cutting-off diamond wheel", annex C is normative and contains "Strength of cutting-off wheel guards", the annex D is normative and contains "Pictograms", the annex E is normative and contains "Verification of surface temperature" \square_{A1} , the Annex F is normative and contains "Vibration text code" \square_{A1} and the annex ZA is informative and contains "Relationship of this European Standard with EU Directives"; this European Standard also contains a Bibliography.

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.

EN 12418:2000+A1:2009 (E)**Introduction**

This European standard is a Type C-standard as stated in  EN ISO 12100-1:2003 .

The machinery concerned and the extent to which hazards are covered is indicated in the scope of this standard.

1 Scope

This European Standard applies to transportable masonry and stone cutting-off machines stationary during work, principally used on job site building construction for cutting-off stones, other mineral construction materials and composite materials having at least one supporting surface. The power for the tool rotation is supplied by electrical or internal combustion prime motor. This European Standard deals with all significant hazards pertinent to masonry and stone cutting-off machines for job site (see clause 4), when they are used as intended and under the conditions foreseen by the manufacturer. This European Standard specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards.

These machines are designed for use with rotating diamond cutting-off wheels with a continuous rim and/or segmented rim.

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This European Standard does not apply to:

- metal cutting-off machines;
- wood and timber sawing machines; [SIST EN 12418:2000+A1:2009](https://standards.iteh.ai/catalog/standards/sist/8f2a2c7a-153e-459b-9a9-7b58a0b128d4/sist-en-12418-2000a1-2009)
- machines with a feed or descent mechanism other than manual, or with a pedal;
- mobile machines on a trolley travelling on the ground;
- hand-held portable grinding and cutting-off machines;
- hand-held portable grinding and cutting-off machines mounted on a support to be used in a fixed position.

This European Standard does not cover the operation of transportable masonry and stone cutting-off machines in potential explosive atmospheres.

This European Standard covers electrical hazards making reference to relevant European Standards (see 5.2).

Those hazards that are relevant for all mechanical, electrical, hydraulic, pneumatic and other equipment of machinery and that are dealt with in standards for common use are not covered by this European Standard. Reference to pertinent standards of this kind is made where such standards are applicable and so far necessary.

In this standard, the masonry and stone cutting-off machines for job site construction are called: "cutting-off machines" or "machines", and cutting-off wheels are also called: "tools".

This standard applies primarily to the machines which are manufactured after the date of approval of the standard by CEN.

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 *deleted text* **A1**

A1 EN 953 **A1**, *Safety of machinery - General requirements for the design and construction of guards (fixed, movable)*

A1 *deleted text* **A1**

A1 EN 12096:1997, *Mechanical vibration — Declaration and verification of vibration emission values* **A1**

A1 EN 13218:2002 **A1**, *Machine tools — Safety — Stationary grinding machines*

A1 EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)* **A1**

A1 EN 60335-1:2002, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60033-1:2001, modified)* **A1**

A1 EN 60335-2-41:2003, *Household and similar electrical appliances — Safety — Part 2-41: Particular requirements for pumps (IEC 60335-2-41:2002)* **A1**

A1 EN 61029-1:2000 **A1**, *Safety of transportable motor operated electric tools — Part 1: General requirements (IEC 61029-1:1990, modified)*

prEN 61029-2-7:1992, *Safety of transportable motor operated electric tools — Part 2-7: Particular requirements for diamond saws with water supply*

A1 prEN ISO 3744:2006, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO/DIS 3744:2006)* **A1**

A1 EN ISO 5349-2:2001, *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 2: Practical guidance for measurement at the workplace (ISO 5349-2:2001)*

EN ISO 8041:2005, *Human response to vibration — Measuring instrumentation (ISO 8041:2005)* **A1**

EN ISO 11201:1995, **A1** *Acoustics — Noise emitted by machinery and equipment — Measurement 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)* **A1**

A1 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 13732-1:2008, *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 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

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EN ISO 20643:2008, *Mechanical vibration — Hand-held and hand-guided machinery — Principles for evaluation of vibration emission (ISO 20643:2005)*

ISO 5348:1998, *Mechanical vibration and shock — Mechanical mounting of accelerometers*

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

ISO 16063-1:1998, *Methods for the calibration of vibration and shock transducers — Part 1: Basic concepts* ^(A1)

3 Terms and definitions

For the purposes of this Standard the terms and definitions stated in ^(A1) EN ISO 12100-1:2003 ^(A1) apply. Additional terms and definitions specifically needed for this Standard are added below.

3.1**cutting-off machine**

transportable machine used in building and site construction, operating at a stationary position and is intended for cutting primarily construction material of different weight, shape and dimensions, for example natural stone, concrete (reinforced or otherwise), bricks, concrete blocks (breeze blocks), paving slabs or cobblestones, roof tiles and ceramic tiles.

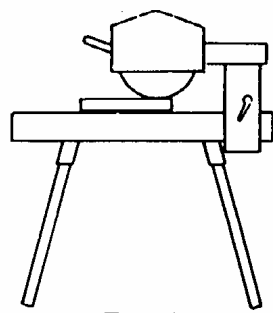
The feed of the material or of the table where it is placed is made by hand. The cutting head, if movable, is moved manually or by a pedal.

The power source of a cutting-off machine is an electrical motor or an internal combustion engine with built-in tank.

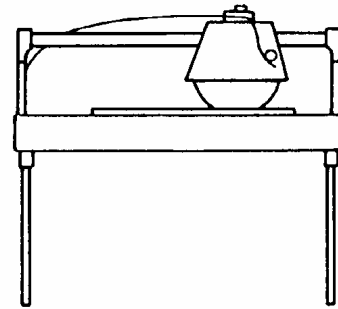
3.2**types of cutting-off machines**

cutting-off machines can be basically classified in four different types defined below:

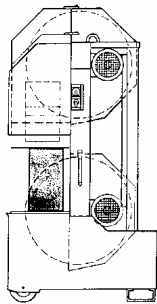
- Type 1: Machine with a movable table having a fixed (permanently or by means of clamps) or swinging moveable cutting head (tiltable or not) which is located over the table;
- Type 2: Machine with a fixed table having a horizontal moving cutting head and, if applicable, vertically adjustable and tiltable cutting head located over the table;
- Type 3: Machine with a fixed table having a vertically moving cutting head;
- Type 4: Machine with a fixed or movable and/or inclinable table having a fixed cutting head, and only intended for use with continuous rim tools having a maximum diameter of 250 mm. The motor is located under the table



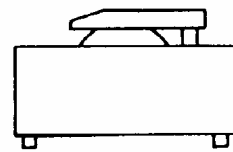
Type 1



Type 2



Type 3



Type 4

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Figure 1 — Sketches of the different types of cutting-off machines

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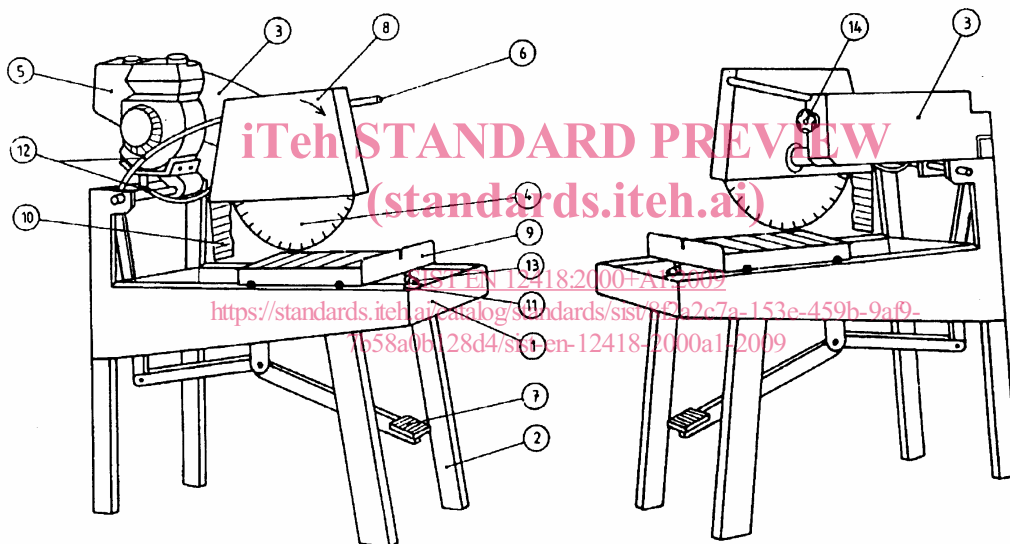
3.3

parts of a cutting-off machine

cutting-off machine comprising the following parts:

- frame;
- electric motor or an ICE (internal combustion engine) to drive the cutting-off wheel in rotation;
- cutting head;
- rotating cutting-off wheel (see clause 1);
- material-carrying table (movable and/or tiltable or not);
- cutting-off wheel guard;
- self containing water tank with an electrical or mechanical water pump or an alternative water supply

See also figure 2.



Cutting-off machine with internal combustion engine Cutting-off machine with electric motor

- 1 frame (incorporating the water tank)
- 2 legs (demountable or otherwise)
- 3 cutting head
- 4 cutting-off wheel
- 5 electric motor (or engine)
- 6 handle for moving the cutting head
- 7 foot pedal for lowering the cutting head (if any)
- 8 cutting-off wheel guard
- 9 moveable table including material stop for supporting materials to be cut
- 10 water splash deflector
- 11 table guiding tracks
- 12 water supply system
- 13 front stop of the table
- 14 cutting depth stop (for types 1 and 2 machines)

Figure 2 — Examples of cutting-off machines

3.4**cutting head**

cutting head, also called mobile unit, consisting of:

- the cutting-off wheel;
- its fixing means on the spindle;
- the power unit or if the prime mover is fixed, the power transmission to the cutting-off wheel;
- the handle;
- the control panel;
- the guards which are moveable relative to the frame

3.5**rated spindle speed**

speed of the drive spindle in revolutions per minute (min^{-1}) at the rated conditions specified by the machine manufacturer but without cutting-off wheel and under no load

3.6**nominal mass**

mass of the cutting-off machine equipped with all its dismountable parts, but without the cutting-off wheel, the tanks being empty

3.7**maximum operating mass**

mass of the cutting-off machine equipped with all its dismountable parts, ready for use, with the cutting-off wheel mounted and the tanks being full

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4 List of significant hazards

This clause contains all significant hazards and hazardous situations, as far as they are dealt with in this European Standard, identified by risk assessment significant for this type of machinery and which require action to eliminate or reduce risk.

Table 1 — List of significant hazards

	Hazards	Relevant subclauses
4.1	Crushing hazard	5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5, 5.1.6, 5.1.7, 5.1.8, 5.1.9, 5.1.10, 7.2.1
4.2	Shearing hazard	5.1.1, 5.1.2, 5.1.3, 5.1.5, 5.1.6, 5.1.8, 5.1.9, 5.1.10
4.3	Cutting and severing hazard	5.1.1, 5.1.2, 5.1.3, 5.1.6, 5.1.8, 5.1.9, 5.1.10
4.4	Entanglement hazard	5.1.1, 5.1.2, 5.1.3, 5.1.6, 5.1.8, 5.1.9, 5.1.10
4.5	Drawing-in or trapping hazard	5.1.1, 5.1.2, 5.1.3, 5.1.6, 5.1.9, 5.1.10

(continued)

Table 1 - List of significant hazards (continued)

Hazards	Relevant subclauses	
4.6	Impact hazard	5.1.1, 5.1.2, 5.1.3, 5.1.5, 5.1.6, 5.1.7, 5.1.8, 5.1.9, 5.1.10, 7.2.1
4.7	Fluid ejection hazard	5.6
4.8	Hazards caused by ejection of parts (material/work pieces)	5.1.1, 5.1.2, 5.1.3, 5.1.6, 5.1.7, 5.1.8, 5.1.9, 5.1.10, 5.7, 7.2.1
4.9	Hazards caused by loss of stability (machinery and machine parts)	5.1.4, 5.1.5, 5.1.9, 7.2.1
4.10	Slip, trip and fall hazard in relationship with machinery	5.5, 7.2.1
4.11	Hazards caused by electrical contact direct or indirect	5.2, 7.2.1
4.12	Hazards resulting in burns and/or scalds, by possible contact of persons, by flames or explosions and also by radiation of heat sources	5.3, 7.2.1
4.13	Health-damaging effects by hot or cold work environment and by noise	5.8, 7.2.1
4.14	Hazards resulting from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.4, 5.5, 5.9, 7.2.1
4.15	Hazards caused by fire and/or explosion	7.2.1
4.16	Unhealthy postures or excessive efforts	5.1.5, 5.1.7, 5.1.8, 7.2.1.3
4.17	Hazards caused by inadequate local lighting	7.2.1
4.18	Hazards caused by human errors	5.1.2, 5.2.1, 7.1, 7.2.1
4.19	Hazard combinations	5.1.1, 7.1, 7.2.1
4.20	Hazard caused by failure of energy supply (of energy and/or control circuits)	5.1.10, 5.2, 7.2.1
4.21	Hazards caused by failure/disorder of control system	5.1.9, 5.1.10, 5.2, 7.2.1
4.22	Hazards caused by errors of fitting	7.1, 7.2.1
4.23	Hazards caused by temporarily missing and/or incorrectly positioned safety related measures/means as:	
4.23.1	Guards of all kinds	7.2.1
4.23.2	Safety related protection devices of all kinds	7.2.1
4.23.3	Starting and stopping devices	7.2.1
4.23.4	Information on safety signs and tags	7.1.3
4.23.5	Information and warnings of all kinds	7.1, 7.2.1
4.23.6	Essential equipment and accessories for safe adjustment and/or maintenance	5.1.8.2, 7.2.1

5 Safety requirements and/or measures

Machinery shall comply with the safety requirements and/or measures of this clause and in addition with A1 EN ISO 12100-1:2003 A1 and A1 EN ISO 12100-2:2003 A1 for hazards which are relevant but not significant and which are not dealt with in this standard.

For the application of A1 EN ISO 13857 A1 , EN 953, and EN 60204-1 the manufacturer shall carry out an adequate risk assessment for the requirements thereof where choice is necessary.

NOTE This specific risk assessment should be part of the general risk assessment relating to the hazards not covered by this standard.

Covering each significant hazard is sufficient for covering combinations of hazards.

5.1 Mechanical hazard

5.1.1 General

As components and parts have to be manually handled, all the accessible parts, with the exception of the cutting-off wheel, shall be free of sharp parts and burrs which could generate hazards when setting, using, handling, and maintaining the machine. Burrs resulting from, for example, manufacturing, casting or welding shall be eliminated and sharp edges shall be smoothed.

5.1.2 Protection against moving parts

5.1.2.1 Transmission parts

[SIST EN 12418:2000+A1:2009](https://standards.iteh.ai/catalog/standards/sist/8f2a2c7a-153e-459b-9a99-793a09128d73/EN-12418-2000+A1-2009)

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Rotating transmission parts, for example couplings and belt drives for drive shafts and mechanical water pumps shall be provided with fixed guards to prevent contact. These guards shall comply with A1 EN 953 A1 . Fixed guards shall be held in position either by welding or by mounting them in such a way that they can be opened or removed only with the aid of tools or keys.

A1 These guards shall comply with EN 953 and 5.3.2.2 of EN ISO 12100-2:2003. A1

A1 *deleted text* A1

5.1.2.2 Connection between the cutting head and the frame

For type 1 machines (see 3.2) with a swinging moveable cutting head, the cutting head, as far as it is not lockable, shall return automatically to rest position when released. In this case the area between the cutting head and the frame of the machine shall be protected to avoid any shearing hazard. This can be done either by design (taking into account the minimum distances given in EN 349:1993) or by enclosing the shearing area with guards.

5.1.2.3 Moving parts involved in the working process (protection against contact with the cutting-off wheel and its fixing devices)

The safety measures to be taken shall be adapted according to the type of machines (see 3.2).