
**Stroji in oprema za pridobivanje in obdelavo naravnega kamna - Varnost - 1. del:
Zahteve za nepremične enožične diamantne žage**

Machines and installations for the exploitation and processing of natural stone - Safety -
Part 1: Requirements for stationary diamond wire saws

Maschinen und Anlagen zur Gewinnung und Bearbeitung von Naturstein - Sicherheit -
Teil 1: Anforderungen für stationäre Diamantseilsägen

Machines et installations pour l'exploitation et la transformation de la pierre naturelle -
Sécurité - Partie 1 : Prescriptions pour les scies à fil diamanté stationnaires

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Ta slovenski standard je istoveten z: prEN 15163-1

ICS:

25.100.40	Žagni listi	Saws
73.120	Oprema za predelavo rudnin	Equipment for processing of minerals

oSIST prEN 15163-1:2020

en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 15163-1

June 2020

ICS 73.120

Will supersede EN 15163:2017

English Version

**Machines and installations for the exploitation and
processing of natural stone - Safety - Part 1: Requirements
for stationary diamond wire saws**

Machines et installations pour l'exploitation et la
transformation de la pierre naturelle - Sécurité - Partie
1 : Prescriptions pour les scies à fil diamanté
stationnaires

Maschinen und Anlagen zur Gewinnung und
Bearbeitung von Naturstein - Sicherheit - Teil 1:
Anforderungen für stationäre Diamantseilsägen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 151.

If this draft becomes a European Standard, 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.

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Contents	Page
European foreword.....	4
Introduction	5
1 Scope	6
2 Normative references.....	6
3 Terms and definitions	8
4 Safety requirements and/or protective measures	16
4.1 General.....	16
4.2 Controls.....	16
4.2.1 Safety and reliability of control systems	16
4.2.2 Position of controls.....	17
4.2.3 Starting.....	17
4.2.4 Normal stop	18
4.2.5 Emergency stop.....	18
4.2.6 Mode selection	19
4.2.7 Failure of power supply	20
4.2.8 Failure of the control system	20
4.3 Protection against mechanical hazards.....	20
4.3.1 Transport of the machine.....	20
4.3.2 Installation and stability of machine	20
4.3.3 Prevention of access to moving parts	21
4.3.4 Safeguards and protective device to minimize the effect of ejection.....	22
4.4 Protections against no mechanical hazards.....	25
4.4.1 Fire.....	25
4.4.2 Noise	25
4.4.3 Electrical hazards.....	26
4.4.4 Lighting.....	26
4.4.5 Ergonomics and handling.....	26
4.4.6 Hydraulic and pneumatic components	27
4.4.7 Electromagnetic compatibility	27
4.4.8 Laser radiation.....	27
4.4.9 Isolation.....	27
4.4.10 Hazardous materials and substances	28
4.4.11 Risk of slipping, tripping or falling.....	28
4.4.12 Lightning	30
4.4.13 Maintenance.....	30
5 Information for use	30
5.1 General.....	30
5.2 Signals and warning devices	30
5.3 Marking, signs and written warnings	30
5.4 Instruction handbook.....	31
5.4.1 General.....	31
5.4.2 Operator's manual	31
5.4.3 Maintenance manual.....	33
Annex A (informative) List of significant hazards	35
Annex B (normative) Noise-test code	38

B.1	Introduction.....	38
B.2	Measurement of the A-weighted emission sound pressure level at the operator's positions or other specified positions.....	38
B.2.1	Basic standards	38
B.2.2	Measurement procedure and positions	38
B.2.3	Measurement uncertainty	39
B.3	Determination of A-weighted sound-power level.....	39
B.3.1	Measurement procedure and positions	39
B.4	Installation, mounting and operating conditions for noise-emission measurement	39
B.5	Information to be recorded and reported	40
B.6	Declaration and verification of noise-emission values.....	50
B.6.1	General	50
B.6.2	Example of a declaration and verification of noise-emission values in the instruction handbook.....	51
Annex C (informative)	Types of granites for noise-test measurement	54
Annex ZA (informative)	Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered.....	57
Bibliography		61

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 oSIST prEN 15163-1:2020

prEN 15163-1:2020 (E)**European foreword**

This document (prEN 15163-1:2020) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 15163:2017.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This document deals with safety requirements of stationary diamond wire saws previously treated in EN 15163:2017 with safety requirements of transportable diamond wire saws now treated in prEN 15163-2:2020. As safety requirements related two types of machines have been separated, this document edition is completely different from the previous one.

Safety requirements treated in Clause 4, information for use treated in Clause 5 and related annexes have been deeply modified, in addition, the following changes have been introduced:

- list of the significant hazards has been moved from Clause 4 to Annex A, according to Clause 6.10.3.1 of CEN Guide 414;
- normative references have been modified and updated to Clause 2;
- new terms and definitions have been introduced and improved to Clause 3 (e.g. coated diamond wire);
- Annex ZA has been modified according to the last edition of CEN Guide 414.

Introduction

This document has been prepared to be a harmonized standard to provide one means of conforming to the essential health and safety requirements of the Machinery Directive and associated EFTA Regulations.

This document is a type-C standard as stated in EN 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 organizations, 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, e.g. 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.

1 Scope

This document deals with all significant hazards, hazardous situations and events, as listed in Annex A, which are relevant to stationary diamond wire saws (stationary diamond mono-wire saws and stationary diamond multi-wire saws), as defined in Clause 3.

Stationary diamond wire saws may be used in quarries or in sawmill for cutting natural stones (e.g. marble, granite), when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Annex A).

This document deals only with stationary diamond wire saws using coated diamond wire as tool.

This document specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards.

This document deals all significant hazards that may occur within the expected lifetime of the machinery including the phases of transport, assembly, dismantling, disabling and scrapping.

This document does not deal with the significant hazards arising by the use of other facilities/devices not described in this document, that may be fitted on the machines or that may be used during the work cycle.

This document does not deal with:

- a) operation under extreme ambient conditions (outside the limits defined in EN 60204-1:2018);
- b) upstream and downstream conveying elements, not integrated with stationary diamond wire saws, for transporting of the work-pieces.

This document is not applicable to machines which are manufactured before the date of publication of this document by CEN.

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.

EN 166:2001, *Personal eye-protection — Specifications*

EN 207:2017, *Personal eye-protection equipment — Filters and eye-protectors against laser radiation (laser eye-protectors)*

EN 1005-2:2003+A1:2008, *Safety of machinery — Human physical performance — Part 2: Manual handling of machinery and component parts of machinery*

EN 1005-4:2005+A1:2008, *Safety of machinery — Human physical performance — Part 4: Evaluation of working postures and movements in relation to machinery*

EN 1837:1999+A1:2009, *Safety of machinery — Integral lighting of machines*

EN 50370-1:2005, *Electromagnetic compatibility (EMC) — Product family standard for machine tools — Part 1: Emission*

EN 50370-2:2003, *Electromagnetic compatibility (EMC) — Product family standard for machine tools — Part 2: Immunity*

EN 60204-1:2018, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2016)*

EN 60529:1991,¹ *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60825-1:2014,² *Safety of laser products — Part 1: Equipment classification and requirements (IEC 60825-11:2014)*

EN 61439-1:2011, *Low-voltage switchgear and controlgear assemblies — Part 1: General rules (IEC 61439-1:2011)*

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

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

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN 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 11202:2010)*

EN ISO 11204:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204:2010)*

EN ISO 11688-1:2009, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

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

EN 13236:2019, *Safety requirements for superabrasive products*

EN ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

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

EN ISO 14118:2018, *Safety of machinery — Prevention of unexpected start-up (ISO 14118:2017)*

¹ As impacted by EN 60529:1991/AC:2006-12, EN 60529:1991/A1:2000, EN 60529:1991/A2:2013 and EN 60529:1991/A2:2013/AC:2019-02.

² As impacted by EN 60825-1:2014/AC:2017-06, EN 60825-1:2014/A11:2020.

prEN 15163-1:2020 (E)

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

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

EN ISO 14122-2:2016, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2016)*

EN ISO 14122-3:2016, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2016)*

EN ISO 14122-4:2016, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders (ISO 14122-4:2016)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <http://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

3.1**stationary diamond wire saw**

integrated fed machine designed for cutting natural stones (e.g. marble, granite), in quarries or in sawmills, by the use of one or more coated diamond wires as tools

Note 1 to entry: Stationary diamond wire saw may work in one main axis as well as in several axes.

Note 2 to entry: Stationary diamond wire saws include two types of machines as listed below:

- stationary diamond mono-wire saws;
- stationary diamond multi-wire saws.

3.1.1**stationary diamond mono-wire saw**

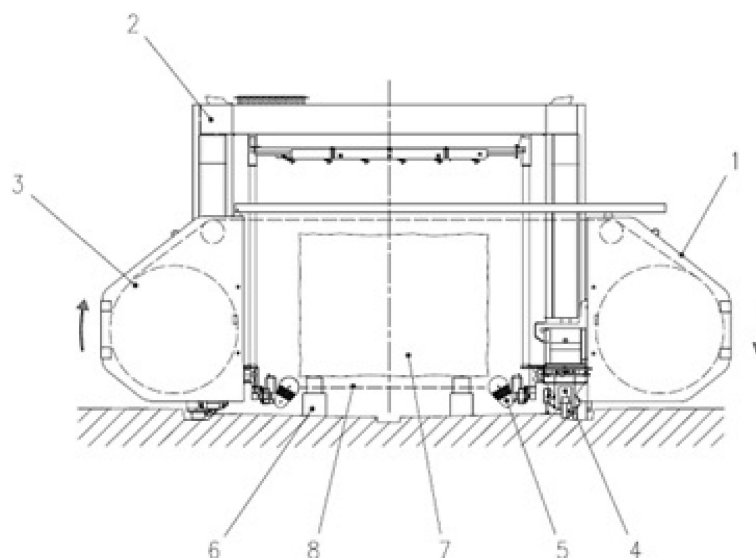
diamond wire saw, intended for both indoor and outdoor use, powered by an electric motor as main drive, for cutting natural stones into benches, blocks and slabs using an only coated diamond wire as tool and where the cutting is performed by the movement of the wire joined to the moving down of the structure of machine along its vertical columns or joined to the horizontal translation of the machinery or the block trolley

Note 1 to entry: During cutting operation, the coated diamond wire can be cooled by water.

3.1.1.1**travelling diamond mono-wire saw**

stationary diamond mono-wire saw with a carriage on which the machinery may move towards the stone block

Note 1 to entry: The machinery, by means of the movement on its carriage, in addition to the vertical cutting, allows performing the horizontal cutting of the stone block.

**Key**

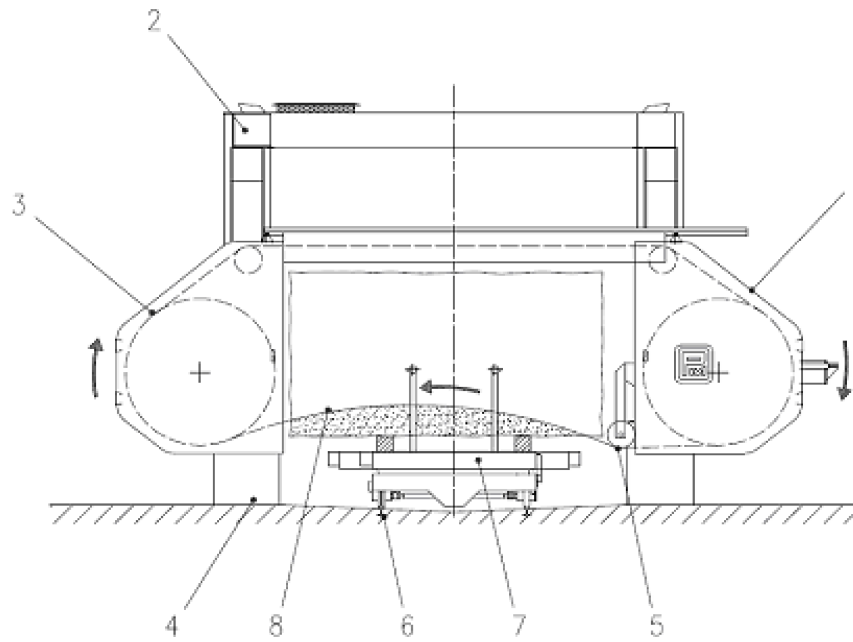
1 guard	4 carriage	7 block
2 machine frame	5 guide wheel	8 coated diamond wire
3 wire wheel	6 sill	

Figure 1 — Example of a travelling diamond mono-wire saw**3.1.1.2****stationary block diamond mono-wire saw**

stationary diamond mono-wire saw standing on its foundations and the stone block may be moved under the machinery by a block trolley, or by other machines or devices not integrated with the machinery

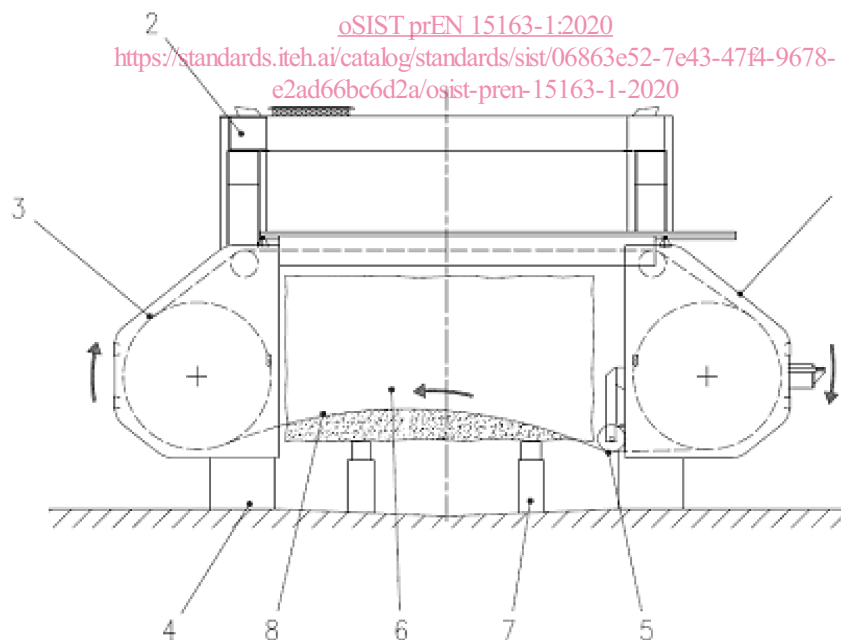
Note 1 to entry: If the stone block is moved by the block trolley, the machinery, by means of the movement of the block trolley on its rails, in addition to the vertical cutting, allows performing the horizontal cutting of the stone block.

Note 2 to entry: See Figure 2 for a stationary block diamond mono-wire saw with block trolley and Figure 3 for a stationary block diamond mono-wire saw without block trolley.

**Key**

- | | | |
|-----------------|---------------------------|-----------------------|
| 1 guard | 4 foundations | 7 block trolley |
| 2 machine frame | 5 guide wheel | 8 coated diamond wire |
| 3 wire wheel | 6 rails for block trolley | |

Figure 2 — Example of a stationary block diamond mono wire saw with block trolley

**Key**

- | | | |
|-----------------|---------------|-----------------------|
| 1 guard | 4 foundations | 7 sill |
| 2 machine frame | 5 guide wheel | 8 coated diamond wire |
| 3 wire wheel | 6 block | |

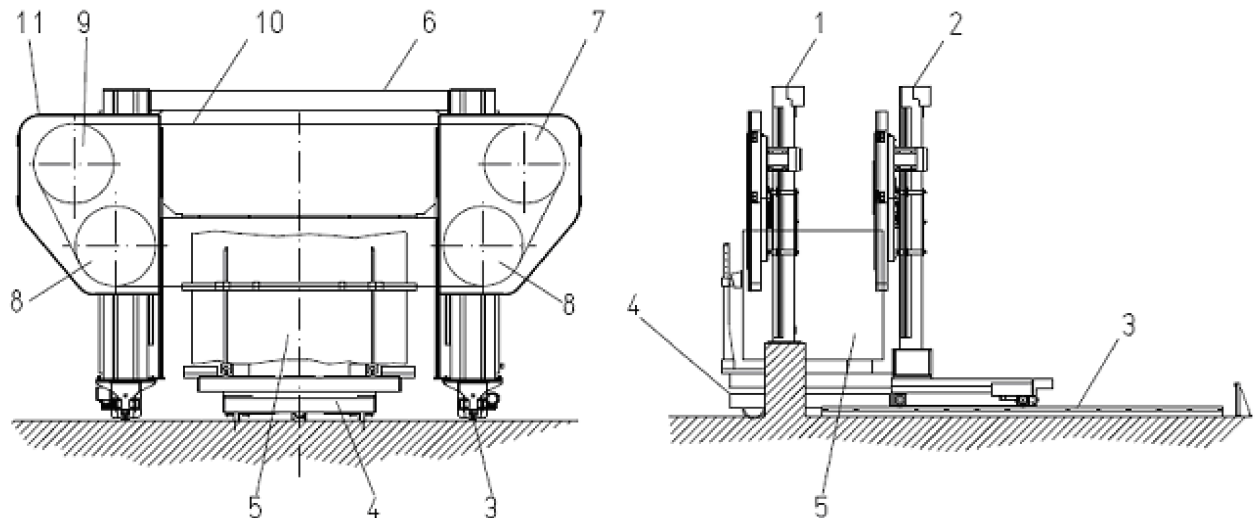
Figure 3 — Example of a stationary block diamond mono-wire saw without block trolley

3.1.1.3

stationary-mobile combined diamond mono-wire saw

stationary diamond mono-wire saw constituted by two frames, the first one is standing on its foundations, the second one is mobile on its rails and may move towards the stone block

Note 1 to entry: The machinery, through of the movement on its rails, in addition to the vertical cutting, allows performing the horizontal cutting of the stone block.



Key

- | | | |
|-------------------------|-------------------|-------------------------|
| 1 stationary wire saw | 5 block | 9 tensioning wire wheel |
| 2 mobile wire saw | 6 machine frame | 10 coated diamond wire |
| 3 mobile wire saw rails | 7 drive wheel | 11 guard |
| 4 block trolley | 8 idle wire wheel | |

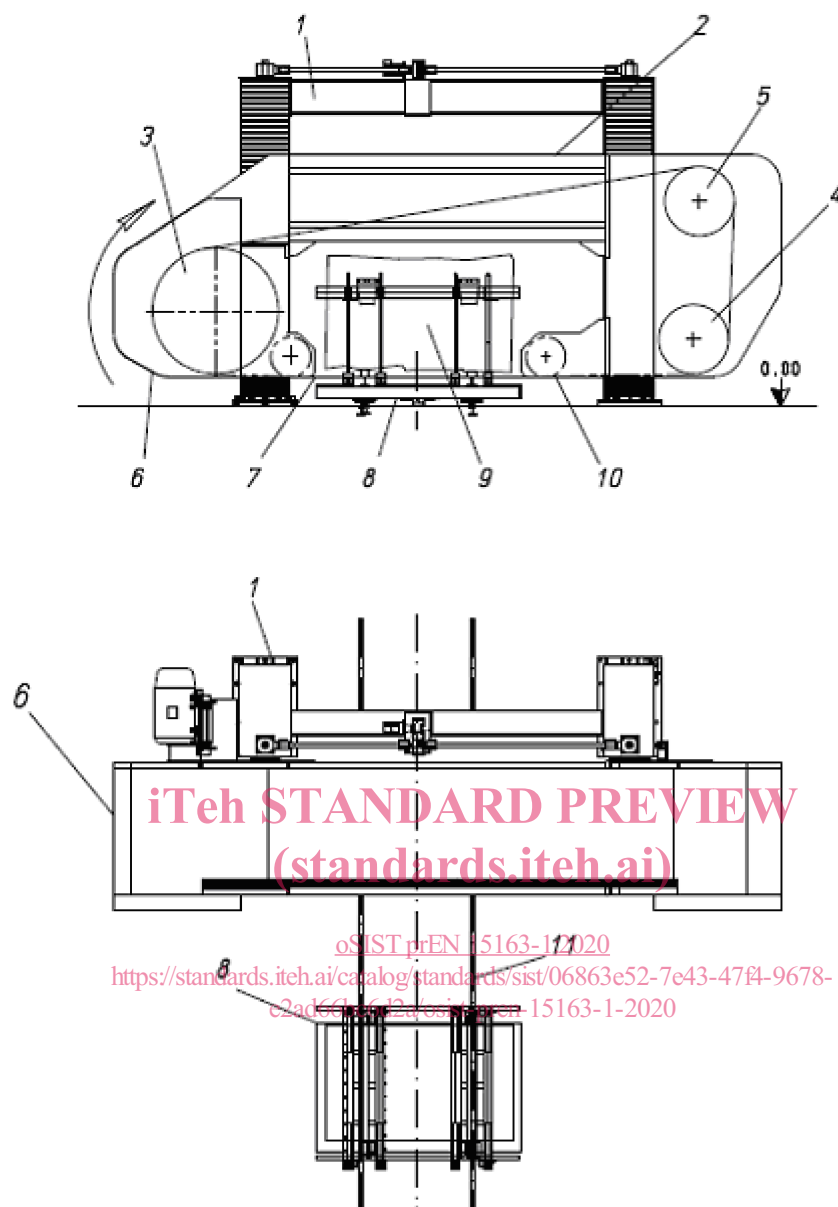
Figure 4 — Example of a stationary-mobile combined diamond mono-wire saw

3.1.2

stationary diamond multi-wire saw

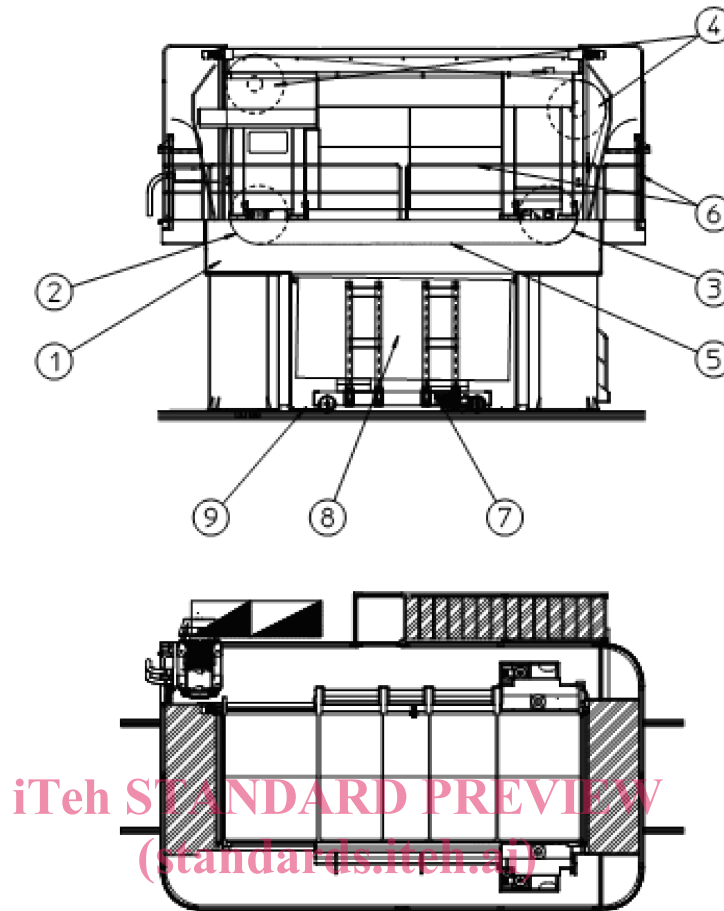
diamond wire saw, intended both for indoor and outdoor use, powered by an electric motor as main drive, for cutting blocks of natural stones into slabs using more diamond wires as tools and where the cutting is performed by the movement of the wires joined to moving down of the structure of machine along its vertical columns

Note 1 to entry: During the cutting operation the diamond wires can be cooled by water.

**Key**

1 machine frame	5 tensioning wire wheel	9 block
2 saw frame	6 guard	10 guide-wire wheel
3 drive wheel	7 coated diamond wire	11 trolley rail
4 idle wire wheel	8 block trolley	

Figure 5 — Example of a stationary diamond multi-wire saw with a single drive-wheel

**Key**

- 1 machine frame
- 2 drive wheel
- 3 idle wire wheel

- 4 tensioning wire wheel
- 5 coated diamond wire
- 6 guard

- 7 block trolley
- 8 block
- 9 trolley rail

Figure 6 — Example of a stationary diamond multi-wire saw

3.2**coated diamond wire**

plastic or rubber assembled diamond wire injected with polymer with no modification of the supporting steel cable section and used as a tool during the cutting

Note 1 to entry: The polymer, penetrating inside the strands under the threaded diamond beads creates a biting effect between the steel wire and the beads, reducing the probability of ejection of them in case of whiplash (3.22).