

---

**Stroji za mehansko obdelavo mineralov in podobnih trdnih snovi - Varnost - 1. del:  
Splošne zahteve za stroje in predelovalne obrate**

Machines for mechanical processing of minerals and similar solid materials - Safety -  
Part 1: Common requirements for machinery and processing plants

Maschinen für die mechanische Aufbereitung von Mineralien und ähnlichen festen  
Stoffen - Sicherheit - Teil 1: Gemeinsame Anforderungen für unvollständige Maschinen,  
Aufbereitungsmaschinen und Aufbereitungsanlagen

(standards.iteh.ai)

Machines pour le traitement mécanique des minéraux et des matières solides similaires -  
Sécurité - Partie 1 : Prescriptions communes pour les machines et installations pour le  
traitement des matériaux

**Ta slovenski standard je istoveten z: EN 1009-1:2020**

---

**ICS:**

13.110	Varnost strojev	Safety of machinery
73.120	Oprema za predelavo rudnin	Equipment for processing of minerals
91.220	Gradbena oprema	Construction equipment

**SIST EN 1009-1:2020****en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 1009-1:2020

<https://standards.iteh.ai/catalog/standards/sist/07054f51-4a8b-468e-a7e2-c043b5eedcbf/sist-en-1009-1-2020>

EUROPEAN STANDARD

**EN 1009-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2020

ICS 73.120; 91.220

English Version

## Machines for mechanical processing of minerals and similar solid materials - Safety - Part 1: Common requirements for machinery and processing plants

Machines pour le traitement mécanique des minéraux et des matières solides similaires - Sécurité - Partie 1 : Prescriptions communes pour les machines et installations pour le traitement des matériaux

Maschinen für die mechanische Aufbereitung von Mineralien und ähnlichen festen Stoffen - Sicherheit - Teil 1: Gemeinsame Anforderungen für unvollständige Maschinen, Aufbereitungsmaschinen und Aufbereitungsanlagen

This European Standard was approved by CEN on 13 April 2020.

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-CENELEC Management Centre or to any CEN member.

(standards.iteh.ai)

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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Turkey and United Kingdom.



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

<b>Contents</b>	<b>Page</b>
European foreword.....	4
Introduction .....	5
<b>1 Scope.....</b>	<b>6</b>
<b>2 Normative references.....</b>	<b>7</b>
<b>3 Terms and definitions .....</b>	<b>10</b>
<b>4 Safety requirements and/or protective/risk reduction measures.....</b>	<b>12</b>
4.1 General.....	12
4.2 Openings.....	12
4.3 Prevention of enclosing of persons .....	14
4.4 Permanent means of access .....	14
4.5 Operator's station .....	14
4.6 Manual sorting station .....	15
4.7 Storage equipment .....	15
4.8 Dust removal devices.....	16
4.9 Visibility.....	17
4.10 Control devices.....	17
4.11 Safeguarding .....	21
4.12 Access to the fixed enclosures by doors where parts are running (e.g. scrubber, ball mill).....	22
4.13 Safety related parts of control systems.....	22
4.14 Hydraulics and pneumatics.....	27
4.15 Supports for service and maintenance.....	27
4.16 Electrical equipment.....	28
4.17 Lifting, tying down and transport .....	28
4.18 Maintenance.....	30
4.19 Suspension units.....	30
4.20 Noise .....	30
4.21 Vibrations .....	31
<b>5 Verification of the safety requirements and/or protective/risk reduction measures.....</b>	<b>32</b>
<b>6 Information for use .....</b>	<b>37</b>
6.1 General.....	37
6.2 Signals and warning devices .....	37
6.3 Accompanying documents (in particular: instruction handbook) .....	37
6.4 Marking.....	40
6.5 Pictorials .....	41
6.6 Erection and transport instructions.....	41
<b>Annex A (normative) Cableless controls.....</b>	<b>42</b>
<b>Annex B (informative) Minimum passage opening.....</b>	<b>45</b>
<b>Annex C (informative) Calculation of the dimensions of openings .....</b>	<b>46</b>
<b>Annex D (informative) Examples for mechanical processing machines and terminology.....</b>	<b>47</b>
<b>Annex E (normative) Noise test code .....</b>	<b>51</b>
<b>Annex F (informative) List of significant hazards .....</b>	<b>66</b>

<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC aimed to be covered.....</b>	<b>86</b>
<b>Bibliography .....</b>	<b>89</b>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 1009-1:2020

<https://standards.iteh.ai/catalog/standards/sist/07054f51-4a8b-468e-a7e2-c043b5eedcbf/sist-en-1009-1-2020>

**EN 1009-1:2020 (E)****European foreword**

This document (EN 1009-1:2020) 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 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 November 2020, and conflicting national standards shall be withdrawn at the latest by May 2022.

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 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 part of EN 1009 is intended to be used in conjunction with at least one specific part EN 1009-2 to prEN 1009-6.

EN 1009 “Machines for mechanical processing of minerals and similar solid materials — Safety” comprises the following parts:

- *Part 1: Common requirements for machinery and processing plants*
- *Part 2: Specific requirements for feeding machinery and continuous handling equipment*
- *Part 3: Specific requirements for crushing and milling machinery*
- *Part 4: Specific requirements for screening machinery*
- *Part 5: Specific requirements for cleaning, recycling and mud treatment machinery*
- *Part 6: Specific requirements for mobile machinery (in preparation)*

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Turkey and the United Kingdom.

## Introduction

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 and events are covered are indicated in the scope of this document.

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.

**EN 1009-1:2020 (E)****1 Scope**

This document applies to machines for mechanical processing of minerals (cement, lime and gypsum, sand and gravel, industrial minerals, metalliferous ore and hard and soft rock aggregates, coal) and -products (slag and ashes, production and demolition waste) in construction and industry.

It deals with the following types of individual machines for the mechanical processing of minerals and similar solid materials:

- feeding machinery in accordance with EN 1009-2;
- crushing machinery in accordance with EN 1009-3;
- milling machinery in accordance with EN 1009-3;
- screening machinery in accordance with EN 1009-4;
- machinery for cleaning, water recycling, sorting (other than screens) and mud treatment in accordance with EN 1009-5;
- mobile machinery in accordance with prEN 1009-6.

This document gives the common safety requirements for mechanical processing machines used for quarrying, recycling and processing mineral and by-products (cement, lime and gypsum, sand and gravel, industrial minerals, metalliferous ore, production and demolition waste, slag handling, hard and soft rock aggregates, coal) in construction and surface mining and is intended to be used in conjunction with one of the parts EN 1009-2 to prEN 1009-6. These machine specific parts (EN 1009-2 to prEN 1009-6) do not repeat the requirements from this document, but add or replace the requirements for the machine type in question.

SIST EN 1009-1:2020

NOTE 1 The requirements specified in this part of EN 1009 are common to two or more types of machines for the mechanical processing of minerals and similar solid materials.

Specific requirements in EN 1009-2 to prEN 1009-6 take precedence over the respective requirements of this document.

This document also covers assemblies of two or more of the mentioned machines which function as an integrated whole. The machines included in the scope of this document can be fixed, semi-mobile or mobile.

NOTE 2 prEN 1009-6 “Specific requirements for mobile and semi mobile equipment” is under preparation to cover specific requirements (e.g. mobility, braking, access, frequent transportation), including exceptions and additional requirements for mobile and semi mobile equipment. This means that mobile machines are not covered as long as EN 1009-6 is not published by CEN.

This document covers transportation, erection, commissioning, use and maintenance of single machines or combination of single machines.

This document deals with significant hazards, common to the types of machines listed in this scope when they are used as intended and under conditions for misuse which are reasonably foreseeable by the manufacturer (see Annex F) and to the hazards due to the combination of these machines and specifies the appropriate measures to eliminate or reduce the risks arising from the significant hazards.

Design relating to road traffic regulations is not covered by this document.



This document does not cover:

- design relating to road traffic regulations;
- hazards arising from the use of the machines in potentially explosive atmospheres as well as from processing of explosive materials and risks related to electromagnetic compatibility;
- specific hazards related to mobile machinery.

NOTE 3 EN ISO 13766-1 and EN ISO 13766-2 specify test methods and acceptance criteria for evaluating the electromagnetic compatibility of all kinds of mobile construction machinery.

This document is not applicable to machinery 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 547-1:1996+A1:2008, *Safety of machinery — Human body measurements — Part 1: Principles for determining the dimensions required for openings for whole body access into machinery*

EN 547-2:1996+A1:2008, *Safety of machinery — Human body measurements — Part 2: Principles for determining the dimensions required for access openings*

EN 547-3:1996+A1:2008, *Safety of machinery — Human body measurements — Part 3: Anthropometric data*

EN 617:2001+A1:2010, *Continuous handling equipment and systems — Safety and EMC requirements for the equipment for the storage of bulk materials in silos, bunkers, bins and hoppers*

EN 620:2002+A1:2011, *Continuous handling equipment and systems — Safety and EMC requirements for the equipment for the storage of bulk materials in silos, bunkers, bins and hoppers*<sup>1)</sup>

EN 795:2012, *Personal fall protection equipment — Anchor devices*

EN 842:1996+A1:2008, *Safety of machinery — Visual danger signals — General requirements, design and testing*

EN 894-1:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*

EN 894-3:2000+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*

EN 1005-1:2001+A1:2008, *Safety of machinery — Human physical performance — Part 1: Terms and definitions*

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

---

1) Under revision. Amendment to EN 1009-1:2020 is planned to update the reference to the new edition of EN 620.

**EN 1009-1:2020 (E)**

EN 1005-3:2002+A1:2008, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation*

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 1005-5:2007, *Safety of machinery — Human physical performance — Part 5: Risk assessment for repetitive handling at high frequency*

EN 12464-1:2011, *Light and lighting — Lighting of work places — Part 1: Indoor work places*

EN 12464-2:2014, *Light and lighting — Lighting of work places — Part 2: Outdoor work places*

EN 12600:2002, *Glass in building — Pendulum test — Impact test method and classification for flat glass*

EN 14253:2003+A1:2007, *Mechanical vibration — Measurement and calculation of occupational exposure to whole-body vibration with reference to health — Practical guidance*

EN 14359:2017, *Gas-loaded accumulators for fluid power applications*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

EN 60529:1991,<sup>2)</sup> *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

EN 61310-2:2008, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking (IEC 61310-2:2007)*

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

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 7010:2020, *Graphical symbols — Safety colours and safety signs — Registered safety signs (ISO 7010:2019)*

EN ISO 7731:2008, *Ergonomics — Danger signals for public and work areas — Auditory danger signals (ISO 7731:2003)*

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

---

2) This document is impacted by the amendments EN 60529:1991/A1:2000 and EN 60529:1991/A2:2013.

- EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*
- 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 13851:2019, *Safety of machinery — Two-hand control devices — Principles for design and selection (ISO 13851:2019)*
- EN ISO 13855:2010, *Safety of machinery — Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855:2010)*
- EN ISO 14118:2018, *Safety of machinery — Prevention of unexpected start-up (ISO 14118:2017)*
- 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 14122-1:2016, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means and general requirements of access (ISO 14122-1:2016)*
- 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)*
- EN ISO 14123-1:2015, *Safety of machinery — Reduction of risks to health resulting from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers (ISO 14123-1:2015)*
- ISO 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*
- ISO 3864-2:2016, *Graphical symbols — Safety colours and safety signs — Part 2: Design principles for product safety labels*
- ISO 3864-3:2012, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*
- ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*
- ISO 7000:2019, *Graphical symbols for use on equipment — Registered symbols*

## EN 1009-1:2020 (E)

### 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 <https://www.iso.org/obp/ui>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1

##### **plant**

assembly of machines and/or components for the mechanical processing of minerals, arranged and controlled so that they function as an integral whole

Note 1 to entry: A plant may be an assembly of machines in the sense of the Machinery Directive 2006/42/EC, or not.

#### 3.2

##### **mobile machine**

crawler or wheel, self-propelled, trailed or towed machine movable from a worksite to another or from a place to another on the same worksite

#### 3.3

##### **modular machinery**

module or combination of modules having no tracks, wheels or ground anchorage and designed to be partly dismantled to be transportable

#### EXAMPLE

Skid chassis. See Annex D.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)  
SIST EN 1009-1:2020  
<https://standards.iteh.ai/catalog/standards/sist/07054f51-4a8b-468e-a7e2-c043b5eedcbf/sist-en-1009-1-2020>

#### 3.4

##### **sub-assembly**

part of a *plant* (3.1) which is able to operate independently, comprising *mobile machinery* (3.2) and/or *modular machinery* (3.3) or a combination of partly completed machinery with a common control system

#### 3.5

##### **passage opening**

opening which allows the movement or the entry of a person's entire body (e.g. door, manhole)

#### 3.6

##### **access opening**

opening through which a person can lean forward, reach forward, or extend the upper body, head, arm, hand, a finger or several fingers, leg or foot

#### 3.7

##### **visual inspection opening**

opening where, due to design or size, only visual inspections are possible

#### 3.8

##### **workspace**

volume allocated to one or more persons in the work system to complete the work task

**3.9****operator's station**

area from which an operator controls the travel and/or work functions of the machine

**3.10****manual sorting station**

*workspace* (3.8) from which an operator extracts materials (e.g. contaminants such as plastics, wood, metals, etc.) from the conveying system

**3.11****automatic start/stop**

predetermined sequence of starting or stopping parts of the machine/plant by the activation of one or more buttons by the operator

**3.12****prestart warning**

audio and visual warning generated by sirens/beacons or other notification devices on the plant

**3.13****manual start/stop**

mode where for each individual machine part the operator has to take individual actions (push individual buttons) to achieve starting/stopping of this part

Note 1 to entry: The start sequence of machine parts is often pre-determined.

**3.14****maintenance start**

mode in which an item or items of plant are started by the operator, outside of normal sequence (no pre-determined starting order may exist) and is designed solely to be used for carrying out inspection, cleaning or testing of an individual machine part

**3.15****high pressure**

pressure greater than 1 MPa in pipes and hoses which contain fluids

**3.16****exceptional maintenance**

preventive maintenance which is infrequent and has a significant impact in terms of total life cycle costs

[SOURCE: EN 13306:2017, 8.13]

**3.17****silo**

that part of a continuous handling system used to contain intended kind(s) of bulk material(s) during a certain period of time. The silo is usually charged from the top and discharged from one or more outlets at the bottom or side

[SOURCE: EN 617:2001+A1:2010, 3.1]

## EN 1009-1:2020 (E)

## 4 Safety requirements and/or protective/risk reduction measures

### 4.1 General

Machinery shall comply with the safety requirements and/or protective/risk reduction measures of this clause.

In addition, the machine shall be designed according to the principles of EN ISO 12100:2010 for relevant, but not significant hazards, which are not dealt with by EN 1009-1 to prEN 1009-6.

### 4.2 Openings

#### 4.2.1 Passage openings

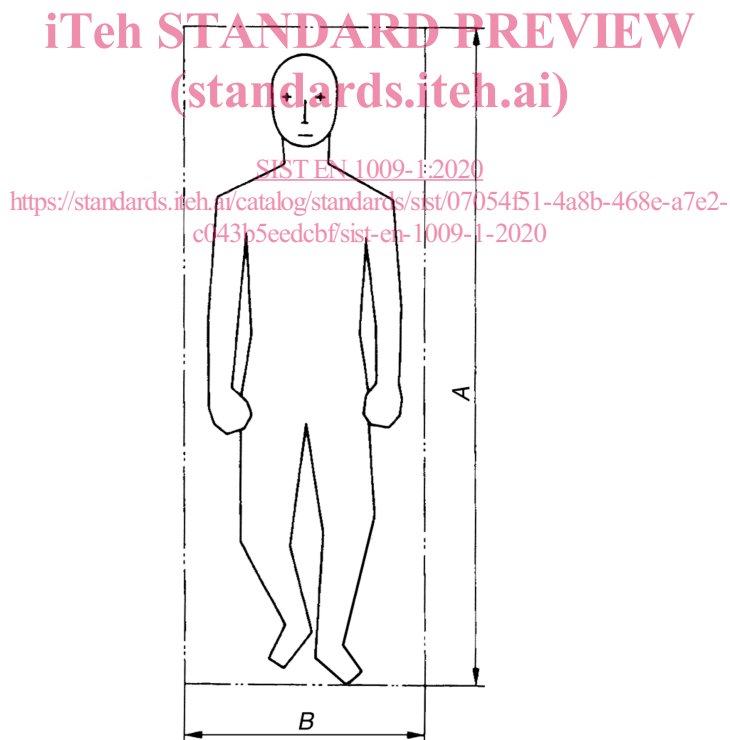
Annex C gives details of the calculation of the following dimensions.

- a) Opening for horizontal forward movement in upright posture (doors) shall meet the following minimum dimensions:

$$A = 2\,031 \text{ mm}$$

$$B = 695 \text{ mm.}$$

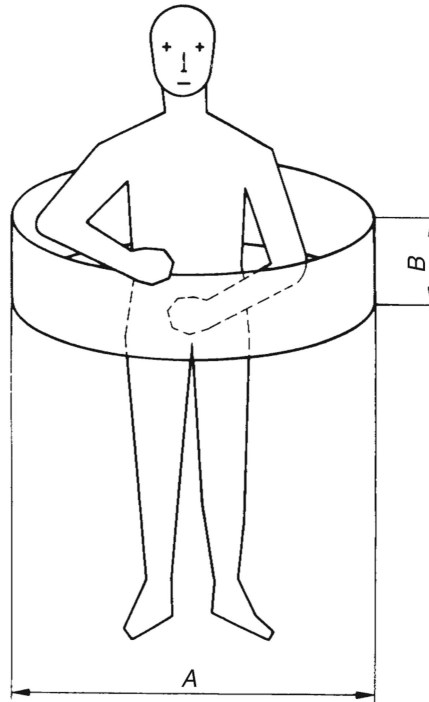
See Figure 1.



**Figure 1 — Opening for horizontal forward movement in upright posture (doors)**

- b) For manhole for vertical entry through which rapid active movement needs to be possible, the following dimensions shall comply with a diameter  $A \geq 695 \text{ mm}$ .  $B < 500 \text{ mm}$ .

See Figure 2.

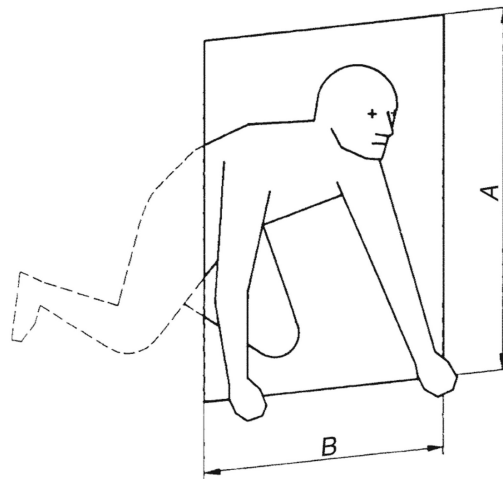


**Figure 2 — Manhole for vertical entry through which rapid active movement needs to be possible**

- c) For opening for entry in kneeling posture, the following minimum dimensions shall comply with: A = 970 mm and B = 695 mm.

SIST EN 1009-1:2020

See Figure 3. <https://standards.iteh.ai/catalog/standards/sist/07054f51-4a8b-468e-a7e2-c043b5eedcbf/sist-en-1009-1-2020>



**Figure 3 — Opening for entry in kneeling posture**

- d) For all other passage openings, according to dimensions given in Annex B, provided there is no obstacle after the hole.

If this passage opening dimension cannot be fulfilled for technical reasons (e.g. small dimension of the machine, or obstacles inside the machine due to functional devices), then all or part of the machine shall be folded, or if not possible dismantled, to allow for the access and the corresponding procedure shall be described in the instructions for use.