SLOVENSKI STANDARD
SIST EN 1009-2:2020

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Stroji za mehansko obdelavo mineralov in podobnih trdnih snovi - Varnost - 2. del: Posebne zahteve za nakladalne stroje in opremo za kontinuirni transport

Machines for mechanical processing of minerals and similar solid materials - Safety - Part 2: Specific requirements for feeding machinery and continuous handling equipment

Maschinen für die mechanische Aufbereitung von Mineralien und ähnlichen festen Stoffen - Sicherheit - Teil 2: Spezifische Anforderungen für Aufgabemaschinen und Stetigförderer

Machines pour le traitement mécanique des minéraux et des matériaux solides similaires - Sécurité - Partie 2 : Prescriptions spécifiques pour les machines d'alimentation et équipements de manutention continue

Ta slovenski standard je istoveten z: **EN 1009-2:2020**

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73.120	Oprema za predelavo rudnin	Equipment for processing of minerals
91.220	Gradbena oprema	Construction equipment

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Machines for mechanical processing of minerals and similar solid materials - Safety - Part 2: Specific requirements for feeding machinery and continuous handling equipment

Machines pour le traitement mécanique des minéraux et des matières solides similaires - Sécurité - Partie 2 : Prescriptions spécifiques pour les machines d'alimentation et équipements de manutention continue

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 1009-2:2020) 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of an identical text or by endorsement, at the latest by November 2020, and conflicting national standards shall be withdrawn at the latest by May 2022.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 EN 1009-1:2020.

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 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 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, to be used together with EN 1009-1, specifies the safety requirements and their verification for the design and construction of feeding machinery and continuous handling equipment for the mechanical processing in quarrying, recycling and processing mineral and by-products. In addition, it specifies the specific information (including residual risks) to be provided by the manufacturer.

When requirements of this document are different from those which are stated in EN 1009-1:2020, the requirements of this part of EN 1009 take precedence over the requirements of EN 1009-1:2020 for machines that have been designed and built according to the provisions of this document.

This document, together with EN 1009-1:2020, deals with all the significant hazards, hazardous situations and events relevant to feeding machinery when they are used as intended and under the conditions foreseen by the manufacturer (see Annex C).

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 1 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.

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 is not applicable to feeding machinery and continuous handling equipment 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 618:2002+A1:2010, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors*

EN 620:2002+A1:2010, *Continuous handling equipment and systems — Safety and EMC requirements for fixed belt conveyors for bulk materials*

EN 1009-1:2020, *Machines for mechanical processing of minerals and similar solid materials — Safety — Part 1: Common requirements for machinery and processing plants*

EN 61800-5-2:2007, *Adjustable speed electrical power drive systems — Part 5-2: Safety requirements — Functional (IEC 61800-5-2:2007)*

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

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 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 13854:2019, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body (ISO 13854:2017)*

EN 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 (ISO 13856-2:2013)*

EN 61496-1:2013, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, EN 1009-1:2020, EN 618:2002+A1:2010, EN 620:2002+A1:2010 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/

NOTE Annex A shows examples for feeding machinery and continuous handling equipment.

3.1
apron feeder
feeder that transfers material on an apron conveyor typically made up of multiple steel assemblies with a depth of material and/or speed of conveyor determining the feed rate

3.2
belt feeder
shortened form of belt conveyor, normally running at slow speed, designed to extract or control the rate of flow of bulk materials from hoppers

[SOURCE: EN 620:2002+A1:2010, 3.2.4]

3.3
reciprocating table feeder
reciprocating plate feeder
feeder composed of a horizontal or declined tray or trough to which reciprocating motion is imparted usually by crank shaft or hydraulic cylinder which is fed when the tray is moving backwards and material slides off in the front

3.4
vibrating feeder
shaking feeder
feeder that uses vibration as the main means to “feed” material to a process or machine

3.5
screw conveyor
screw feeder
conveyor for loose bulk materials with a trough or tube as the carrying medium, the material being moved by the action of a rotating screw

Note 1 to entry: This screw can be rigid or flexible to take curves.

[SOURCE: EN 618:2002+A1:2010, 3.1.4, modified]

3.6
roller grizzly feeder
grizzly feeder
feeder separating oversized material preventing fine material from entering the crusher and/or further process

3.7
blade feeder
feeder using blades to position material from a 3D point of view

3.8
bucket elevator
elevator for loose bulk materials with buckets as the carrying medium attached to a belt or chains as the driving medium

[SOURCE: EN 618:2002+A1:2010, 3.1.3]

4 Safety requirements and/or protective/risk reduction measures

4.1 General

4.1.1 Feeding machinery and continuous handling equipment shall comply with the requirements of EN 1009-1:2020, as far as not modified or replaced by the requirements of this part.

4.1.2 To avoid overflow, feed bin design for feeders shall consider the size of the feeding equipment, e.g. trucks, shovels or similar to be used. Especially at the feed- and transfer points, guide plates or similar means shall be provided to prevent material from overflowing and falling down. If necessary, fixed guards as specified in EN 1009-1:2020, 4.11.2 shall be located around the hopper to prevent access.

Feeding equipment provides a free passage for material to be passed to the next stage of the processing plant. If this free passage can be blocked by a particularly large piece of rock or stone, then suitable clearance methods and equipment shall be provided to ensure the operator does not have cause to approach the feeder or associated equipment whilst it is in operation. The material guides shall be designed in such a way that material blockage and material accumulation are minimized (see also 6.3). The manufacturer shall define provisions and/or methods for clearing of the obstruction in such a manner that danger to personnel is kept to a minimum.

4.1.3 When the feeding equipment gets blocked by material and it is necessary for the operators to enter the machine, means shall be provided to prevent the operator falling into the associated machine or into a chute according to EN 1009-1:2020, 4.4.

4.1.4 Where a feed device has been paused as part of the normal operation of the plant (autonomous or manual control of the feed process), no restart delay or warning is required when the device autonomously restarts, provided that the plant itself has not been stopped. This does not apply to Bucket elevators, swivelling conveyors, floating conveyors and screw conveyors

4.2 Vibrating feeders

Access to crushing points shall be prevented by guards as specified in EN 1009-1:2020, 4.11 or safety distances shall be provided according to EN ISO 13854:2019.

The residual hazards shall be identified with safety labels.

If the feeder is located under stockpile, bins or glory hole, in order to reduce burying hazard during maintenance, means shall be provided to stop material feeding and adjust the flow (e.g. inserting bars, closing gate or flap).

4.3 Reciprocating plate feeders

4.3.1 Guards in accordance with EN 1009-1:2020, 4.11 shall be provided for the crushing or shearing points due to the oscillating movement of the plate feeder (e.g. at the transfer points).

4.3.2 For inclined reciprocating plate feeders, means for locking against incidental moving during maintenance shall be provided.

If the feeder is located under stockpile, bins or glory hole, in order to reduce burying hazard during maintenance, means shall be provided to stop material feeding and adjust the flow (e.g. inserting bars, closing gate or flap).

4.4 Apron feeder

4.4.1 Particularly the design of the transporting section of inclined apron feeders shall consider that material rolling back cannot get outside the feeder or its hoppers/chutes.

4.4.2 During maintenance work, the apron feeder deck shall be protected against reverse motion, at least by means of a back stop.

4.4.3 It shall be ensured that the moving parts cannot be reached by the operator by guards complying with EN 1009-1:2020, 4.11.

If the feeder is located under stockpile, bins or glory hole, in order to reduce burying hazard during maintenance, means shall be provided to stop material feeding and adjust the flow (e.g. inserting bars, closing gate or flap).

4.5 Belt feeder

If the feeder is located under stockpile, bins or glory hole, in order to reduce burying hazard during maintenance, means shall be provided to stop material feeding and adjust the flow (e.g. inserting bars, closing gate or flap).

4.6 Reclaiming feeder (under stockpile) or bins

To reduce burying hazard during maintenance, means shall be provided to stop material feeding and adjust the flow (e.g. inserting bars, closing gate or flap).

4.7 Suspended feeders

Means (e.g. safety wire) shall be provided for feeders suspended by wire or cable, to prevent falling of the suspended feeder in case of failure of the suspension system.

4.8 Continuous handling systems

4.8.1 Bucket elevator

EN 618:2002+A1:2010 applies with the following additions.

The casing which encloses the chain/belt and buckets shall have opening(s) with interlocking guard(s) with guard locking (see EN 1009-1:2020, 4.11.4) to allow control and adjustment of tensioning devices as well as to carry out the maintenance, inspection and the removal of the material.

The following functions shall be stopped before opening the guard, they shall not be able to be started when the guard is open and shall not be automatically re-started when the guard is closed:

— drive of the wheel of the bucket elevator.

If for maintenance reasons, it is necessary to move the bucket elevator in a motorized way while the door(s) is/are open, then the following requirements apply:

— from the main control panel it shall be possible to activate a maintenance mode;

— in this mode, the drive of the upstream machinery is stopped and the normal function of the control panel for the upstream machinery is deactivated;

— close to this door(s) of the bucket elevator shall be a maintenance control station;

— this maintenance control station shall have a direct view to the maintenance point;

— from this maintenance control station it shall be possible to activate the bucket elevator;

— this control(s) shall have a hold-to-run function;

NOTE 1 A hold-to-run function is a safety function according to EN ISO 13849-1. The Performance Level is specified in EN 1009-1:2020, Table 3.

— the activated maximum speed of the bucket elevator shall not exceed 30 mm/s [safely-limited speed (SLS) according to EN 61800-5-2:2007].

NOTE 2 A safely-limited-speed is a safety function according to EN ISO 13849-1. The Performance Level is specified in EN 1009-1:2020, Table 3.

4.8.2 Belt conveyor

Belt conveyors shall comply with EN 620:2002+A1:2010, with the following adaptions:

The working area as defined in EN 620:2002+A1:2010, 3.4.23 is only applicable to areas dedicated to the sorting of waste.

Requirement EN 620:2002+A1:2010, 5.1.4.3.2, 3rd dash does not apply. All rollers, included those located under 700 mm from ground level or any platform, shall be protected at nip points preferably by nip guards.

With exception to the following subclauses of EN 620:2002+A1:2010, 5.1.1.1 to 5.1.1.5, 5.1.4.2 and 5.1.4.3 to 5.1.4.5, and regarding the nature of materials processed in plants covered by this document, each nip point (as described in EN 620:2002+A1:2010, Figure 1) shall be protected preferably with a nip guard.

Return rollers nip points shall be guarded preferably by nip guards if a structural part of the conveyor is in the trajectory of the trapped upper limbs. When the roller is at a minimum distance of 500 mm from the structural part, it does not require a protection.