



SLOVENSKI STANDARD

SIST EN 14658:2005

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Naprave in sistemi za kontinuirni transport – Splošne varnostne zahteve za kontinuirne transporterje pri dnevni kopih rjavega premoga in lignita

Continuous handling equipment and systems - General safety requirements for continuous handling equipment for opencast lignite mining

Stetigförderer und Systeme - Allgemeine Sicherheits-Anforderungen an Stetigförderer im Braunkohlentagebau

Equipements et systèmes de manutention continue - Prescriptions générales de sécurité aux équipements de manutention continue utilisés dans les mines de lignite à ciel ouvert

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53.040.10 Transporterji Conveyors

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Continuous handling equipment and systems - General safety requirements for continuous handling equipment for opencast lignite mining

Equipements et systèmes de manutention continue -
Prescriptions générales de sécurité aux équipements de
manutention continue pour les mines de lignite à ciel ouvert

Stetigförderer und Systeme - Allgemeine Sicherheits-
Anforderungen an Stetigförderer im Braunkohlentagebau

This European Standard was approved by CEN on 25 March 2005.

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 Central Secretariat or to any CEN member.

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EN 14658:2005 (E)**Foreword**

This European Standard (EN 14658:2005) has been prepared by Technical Committee CEN/TC 148 "Continuous handling equipment and systems - Safety", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by November 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association (EFTA) and supports essential requirements of EU directives.

For relationship with EU Directives, see informative annex ZA which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

This European Standard is a type C standard as defined in EN 12100-1.

The machinery concerned and the hazards covered are indicated in the scope of this European Standard.

In the preparation of this standard, it has been assumed that:

- discussions have taken place between the manufacturer and the user concerning particular conditions for the use and the site of use of the machinery, with regard to health and safety;
- only experts will operate, clean, check, maintain, inspect and repair the machinery and adapt it to the changeable requirements of opencast mining;
- the machinery components are kept in a good state of repair and working order so that the required characteristics related to health and safety are maintained despite wear and tear;
- the place of installation is adequately illuminated;
- the place of installation allows safe use of the machinery;
- the design of the loadbearing elements ensures safe operation of the machinery in the required load range and during testing;
- all parts of the machinery not subject to specific requirements:
 - a) are made from materials of adequate strength and durability and of suitable quality;
 - b) function in a sound manner mechanically;
 - c) have been designed in accordance with standard engineering practice and calculation methods, taking account of all failure modes and appropriate safety factors.

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 14658:2005 (E)**1 Scope**

This European Standard applies to mechanical continuous handling equipment used in opencast lignite mines and the particular mechanical continuous handling equipment used:

- to convey lignite or overburden from opencast mines;
- to convey residuals and tailings from lignite processing to opencast mines;
- to convey lignite, overburden or lignite treatment processing residuals and tailings from one opencast mine to another.

This standard applies to continuous handling equipment operating in delimited site areas that are off-limits to the public and accessible only to authorized persons.

It specifies the safety requirements for stationary, mobile and shiftable continuous handling equipment designed to transport bulk goods by continuous movement from a loading point to a discharge point.

The standard considers the significant hazards that arise during the use, movement and shifting of continuous handling equipment, as well as the measures for eliminating or reducing these hazards provided the continuous handling equipment is used as intended and the remaining risk is foreseen and taken into account by the manufacturer. A complete list of all the hazards specified in EN 1050 is given in Annex A (normative).

The requirements of this standard do not apply to equipment and systems manufactured and put into operation before the publication date of this standard.

This standard does not cover:

- a) safety requirements of wireless remote control systems; <https://standards.iteh.ai/catalog/standards/sist/82127cd7-9641-4d78-b35a-30440d2cb24f/sist-en-14658-2005>
- b) hazards generated by noise;
- c) hazards generated by vibration;
- d) hazards generated by explosion;
- e) hazards generated by electromagnetic interference (EMC).

NOTE Directive 94/9/EC concerning equipment and protective systems intended for use in potentially explosive atmospheres and Directive 89/336/EEC relating to electromagnetic compatibility may be applicable to equipment or components covered by this European Standard. This Standard is not intended to provide means of complying with the essential health and safety requirements of the above Directives.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 294, *Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs*

EN 349, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 418, *Safety of machinery — Emergency stop equipment, functional aspects — Principles for design*

EN 457, *Safety of machinery — Auditory danger signals — General requirements, design and testing (ISO 7731:1986, modified)*

EN 811, *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs.*

EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 1037, *Safety of machinery — Prevention of unexpected start-up*

EN 1050:1996, *Safety of machinery — Principles for risk assessment*

EN 60204-1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:1997)*

EN 60204-11, *Safety of machinery — Electrical equipment of machines — Part 11: General requirements for HV equipment for voltages above 1 000 V a.c. or 1 500 V d.c. and not exceeding 36 kV (IEC 60204-11:2000)*

EN 60947-5-1, *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices (IEC 60947-5-1:2003)*

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 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of a fixed means of access between two levels (ISO 14122-1:2001)*

EN ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2001)*

EN ISO 14122-3, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2001)*

EN ISO 14122-4, *Safety of machinery — Permanent means of access to machines and industrial plants — Part 4: Fixed ladders (ISO 14122-4: 2004)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003, EN ISO 12100-2:2003 and the following terms and definitions apply.

3.1

delimited operating site

area delimited by man-made or natural barriers (embankments, dams, distances, etc.) from public areas and accessible only to authorized persons

3.2

scraper

device used to distribute the material handled or to remove adherent residual materials

3.3

discharge point

unloading point of continuous handling equipment

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- 3.4**
working area
area specified by the manufacturer in which persons work at or run equipment during normal operation (inspection, maintenance and cleaning are excluded)
- 3.5**
loading point
feeding point for continuous handling equipment
- 3.6**
feed hopper
funnel-shaped material charging device at the feeding point of continuous handling equipment
- 3.7**
stop device
device requiring deliberate actuation to bring continuous handling equipment to a standstill within the scope of normal operations by means of direct or indirect measures initiated in the control circuit
- 3.8**
belt conveyor
continuous handling equipment with an endless circulating belt (e.g. band) as the carrying and pulling element
- 3.9**
authorized person
person sufficiently trained and instructed to recognize general and specific hazards in the activities assigned to him/her and able to deal with the hazards in an appropriate manner
- 3.10**
unlocked operating mode
operating mode in which the control link between the drives of different continuous handling equipment units is inactive or not available
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- 3.11**
bulk handling equipment
continuous handling equipment used to mine, dump and reclaim bulk material (bucket wheel excavator, bucket chain excavator, spreader, etc.)
- 3.12**
chain conveyor
continuous handling equipment with a single or multiple-strand, endless circulating chain for horizontal or inclined conveying or a combination thereof
- 3.13**
emergency stop device
arrangement of components designed to implement the emergency stop function
- 3.14**
spillage conveyor
continuous handling equipment which collects and transports material spilled from a belt conveyor
- 3.15**
continuous handling equipment
mechanical, hydraulic or pneumatic conveying equipment by means of which material can be moved continuously via a defined conveying route of limited length from loading point to discharge point, if necessary at variable speed or cyclically
- 3.16**
idler
roller which supports and/or guides the conveyor belt

3.17**pulley**

component of a belt conveyor used for driving or returning the conveyor belt

3.18**interlocking operating mode**

operating mode in which drives of different continuous handling equipment units are interlinked by control circuits

3.19**access**

locations or facilities designed and suitable for recurring access to continuous handling equipment for operating, control, inspection, maintenance and repair purposes and at or via which persons can approach the continuous handling equipment without particular physical exertion or risk (climbing over/underneath), or move along, over or under it

4 List of significant hazards**4.1 General**

This clause lists all the significant hazards, dangerous situations and circumstances which have been identified in a risk assessment as relevant for the area defined in the scope and require definition in order to eliminate or reduce the risk. A complete list of all the hazards mentioned in EN 1050 is given in Annex A. Their precise descriptions form the basis for the safety precautions stipulated in clause 5.

Before applying this standard, it is necessary to consider the hazards relating to the continuous handling equipment and its planned use in order to ensure that all hazards have been identified.

4.2 Mechanical hazards

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4.2.1 Crushing and shearing

Crushing and shearing may occur where components move towards or closely past one another.

4.2.2 Entanglement, drawing-in and trapping

Hazards generated by the entanglement, drawing-in and trapping of persons, body parts or clothing may arise in proximity to circulating belts, pulleys, idlers, shafts and couplings, chains and sprockets or other circulating or rotating components.

Trapping and entanglement hazards occur in particular due to protruding sharp edges, teeth, bolts/screws, lubricating nipples and other projecting parts or rough surfaces of circulating or rotating components.

Belt conveyors involve drawing-in hazards, in particular at nip points where the belt runs onto pulleys or idlers, or narrow passages are formed between the belt and fixed parts, and where persons' body parts or limbs may be drawn in. It shall be remembered that belt conveyors with reversible direction of movement have two in-running nips at each pulley, idler or narrow passage.

4.2.3 Stability

Stability may be lost due to:

- a) overloading;
- b) insufficient anchoring;

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- c) inadmissible shifting and transport operations;
- d) wind;
- e) derailment.

4.2.4 Hazards generated by fracturing and rupturing during operation

Fracturing of the drum shaft (e.g. following bearing damage) may cause the belt drive to fall off, generating a hazard for equipment parts or persons.

Rupturing of pressurized hydraulic lines can generate a hazard for equipment parts or persons.

4.2.5 Hazards generated by slipping, tripping and falling

Hazards may occur in the form of slipping, tripping and falling, e.g. as a result of poorly designed walkways.

4.3 Electrical equipment hazards

Hazards may occur due to:

- a) direct contact with electrically active parts as a result of damage to insulation or sheathing;
- b) faulty disconnection of electrical power;
- c) ingress of handled material or moisture into electrical systems.

4.4 Thermal hazards

Hazards may arise due to:

- a) heat generated by the movement of defective components of the continuous handling equipment;
- b) heat generated by a relative movement (e.g. slip) between components of the continuous handling equipment;
- c) the temperature of the handled material.

4.5 Radiation hazards

Continuous handling equipment may also use radiating devices (e.g. laser measuring instruments, X-ray equipment or measuring apparatus operating with radioactive beams) for measuring and monitoring purposes. The operation of such devices may generate hazards.

4.6 Hazards due to handled materials

Hazards may arise due to the spillage, caking, ejection or falling-off of handled materials or due to dust.

4.7 Hazards due to neglect of ergonomic principles

The neglect of ergonomic principles may lead to persons having to work in an unhealthy posture at continuous handling equipment (e.g. in the control station), involving excessive physical effort or mental overload or underload.