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Continuous surface miners (CSM) — Safety requirements

Mineurs continus de surface — Exigences de securité

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 82, *Mining*.

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Introduction

This document is a type-C standard as stated in 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 organisations, 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.

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Continuous surface miners (CSM) — Safety requirements

1 Scope

This document deals with safety requirements for continuous surface miners (CSM). It specifies common requirements for the design and construction of CSM to protect workers from accidents and health hazards that can occur during operation, loading, transport and maintenance.

This document deals with known significant hazards, hazardous situations or hazardous events relevant to CSM, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Annex A).

This document also specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards as identified in Annex A.

This document is not applicable to CSM manufactured before the date of its publication.

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.

ISO 2860, *Earth-moving machinery — Minimum access dimensions*

ISO 2867, *Earth-moving machinery — Access systems*

ISO 3411, *Earth-moving machinery — Physical dimensions of operators and minimum operator space envelope*

ISO 3449, *Earth-moving machinery — Falling-object protective structures — Laboratory tests and performance requirements*

ISO 3457, *Earth-moving machinery — Guards — Definitions and requirements*

ISO 3471:2008, *Earth-moving machinery — Roll-over protective structures — Laboratory tests and performance requirements*

ISO 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 4413, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 4414, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

ISO 6682, *Earth-moving machinery — Zones of comfort and reach for controls*

ISO 6750, *Earth-moving machinery — Operator's manual — Content and format*

ISO 8643, *Earth-moving machinery — Hydraulic excavator and backhoe loader lowering control device — Requirements and tests*

ISO 9244, *Earth-moving machinery — Machine safety labels — General principles*

ISO 10263-4, *Earth-moving machinery — Operator enclosure environment — Part 4: Heating, ventilating and air conditioning (HVAC) test method and performance*

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ISO 10265, *Earth-moving machinery — Crawler machines — Performance requirements and test procedures for braking systems*

ISO 10532, *Earth-moving machinery — Machine-mounted retrieval device — Performance requirements*

ISO 10533, *Earth-moving machinery — Lift-arm support devices*

ISO 11112, *Earth-moving machinery — Operator's seat — Dimensions and requirements*

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

ISO/TR 11688-2, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 2: Introduction to the physics of low-noise design*

ISO 11862, *Earth-moving machinery — Auxiliary starting aid electrical connector*

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

ISO 12508, *Earth-moving machinery — Operator station and maintenance areas — Bluntness of edges*

ISO 12509, *Earth-moving machinery — Lighting, signalling and marking lights, and reflex-reflector devices*

ISO 13766, *Earth-moving machinery — Electromagnetic compatibility*

ISO 13850, *Safety of machinery — Emergency stop function — Principles for design*

ISO 14120, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

ISO 16528-1, *Boilers and pressure vessels — Part 1: Performance requirements*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

UNE/CR 1030-1, *Hand-arm vibration. Guidelines for vibration hazards reduction. Part 1: Engineering methods by design of machinery*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100 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
continuous surface miner
CSM
self-propelled mining machine that, in surface mining operations, removes minerals in layers by the use of a cutting drum

3.2
operating mass
mass of the base machine with all standard equipment, with an operator (75 kg), with full fuel tank and all fluid systems at levels specified by the manufacturer and, when applicable, with sprinkler water tank half full

Note 1 to entry: The operating mass can also include a cabin, a ROPS and other ancillary equipment.

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3.3
cutting drum
power driven rotating body that is equipped with cutting tools

3.4
ROPS for moveable cabins
roll over protective module
ROPM
system of structural members, the primary purpose of which is to reduce the possibility that a seat-belted operator in a moveable cabin be crushed in the event of a machine roll-over, and the strength of which is self-contained and is not dependent upon attachment to the machine

4 Safety requirements and/or protective/risk reduction measures

4.1 General

CSM shall comply with the safety requirements and/or protective measures of this clause.

In addition, the machines shall be designed according to the principles of ISO 12100 for relevant but not significant hazards which are not dealt with by this document (e.g. sharp edges).

4.2 Lighting, signalling and marking lights and reflex-reflector devices

Lighting, signalling and marking lights and reflex-reflector devices, if available, shall comply with the applicable clauses of ISO 12509.

4.3 Operation and handling

4.3.1 Uncontrolled movements

Movements of the machine, its equipment, or its attachments from the holding position (except for setting controls by the operator), e.g. due to drifting and/or creeping (e.g. caused by leakage of oil) shall only be possible in such a way that these movements do not create a hazard to exposed persons.

4.3.2 Retrieval, transportation, lifting and towing

4.3.2.1 General

If applicable, devices shall be available so that they can be used for retrieval, tie-down, lifting and towing.

4.3.2.2 Lifting (slinging) points for lifting and loading

Lifting points (e.g. lugs, lifting-eyes or lifting-lugs) shall be fitted to ensure safe loading, retrieval and transportation.

NOTE ISO 15818 deals with lifting and tie-down attachment points.

The equipment shall facilitate reliable fitting of load handling devices and shall be arranged to allow safe lifting and recovery of the machine.

If necessary, the method of lifting heavy attachments, machine components and machines which are transported shall be described in the information for use.

Lifting points shall be easily identified on the machine (e.g. coloured marking or symbol 9.47 of ISO 6405-1:2017) and described in the information for use.

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