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Mobile road construction machinery — Safety —

Part 1:
Common requirements

Machines mobiles pour la construction de routes — Sécurité —

Partie 1: Prescriptions communes

ICS: 93.080.10

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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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 195, *Building construction machinery and equipment.*

ISO 20500 consists of the following parts, under the general title *Mobile road construction machinery — Safety*:

— *Part 1: Common requirements*

— *Part 2: Specific requirements for road-milling machines*

— *Part 3: Specific requirements for soil-stabilising machines and recycling machines*

— *Part 4: Specific requirements for compaction machines*

— *Part 5: Specific requirements for paver-finishers*

— *Part 6: Specific requirements for mobile feeders*

— *Part 7: Specific requirements for slip form pavers and texture curing machines*

A list of all parts in the ISO 20500 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The structure of safety standards in the field of machinery is as follows.

a) Type-A standards (basis standards) give basic concepts, principle for design and general aspects that can be applied to machinery.

b) Type-B standards (generic safety standards) dealing with one or more safety aspect(s) or one or more type(s) of safeguards that can be used across a wide range of machinery:

   — type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise);

   — type-B2 standards on safeguards (e.g. two-hands controls, interlocking devices, pressure sensitive devices, guards).

c) Type-C standards (machinery safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

This International Standard is a type-C standard, as stated in ISO 12100.

When provisions of this type-C standard are different from those which are stated in type-A or type-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.

Mobile road construction machinery — Safety —

Part 1: Common requirements

1 Scope

This document specifies the common safety requirements for mobile road construction machinery. The ISO 20500 series is applicable to mobile road construction machinery as listed in Annex A.

NOTE 1 For travelling on public roads, the national roading regulations apply (e.g. braking, steering, lighting).

This document deals with the significant hazards common to mobile road construction machinery, when they are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer associated with the whole life time of the machine.

NOTE 2 The requirements specified in this document are common to two or more families of mobile road construction machinery.

This document gives safety requirements for all types of mobile road construction machinery and shall be used in conjunction with one of parts 2 to 7. These machine specific parts do not repeat the requirements from part 1 but add to or replace (supplement or modify) the requirements for the type of mobile road construction machinery in question.

This document does not deal with hazards related to transport of dangerous goods by road.

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

This International Standard applies to machines which are manufactured after the date of publication of this International Standard by ISO.

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.

CR 1030-1:1995, *Hand-arm vibration — Guidelines for vibration hazards reduction — Part 1: Engineering methods by design of machinery*

prEN 143:2017, *Respiratory protective devices — Particle filters — Requirements, testing, marking*

EN 1822-1:2019, *High efficiency air filters (EPA, HEPA and ULPA) — Part 1: Classification, performance testing, marking*

EN 12021:2014, *Respiratory equipment — Compressed gases for breathing apparatus*

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 16890-1:2016, *Air filters for general ventilation — Part 1: Technical specifications, requirements and classification system based upon particulate matter efficiency (ePM) (ISO 16890-1:2016)*

IEC 60204-1:2012, Ed. 6, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 60364-4-41:2005, *Low-voltage electrical installations — Part 4-41: Protection for safety — Protection against electric shock*

IEC 60364-5-55:2011+AMD 1:2012, *Electrical installations of buildings — Part 5-55: Selection and erection of electrical equipment — Other equipment; Amendment 1*

IEC 60529:2001, Ed. 2.1, *Degrees of protection provided by enclosures (IP Code)*

IEC 62841-1:2014, *Electric Motor-Operated Hand-Held, Transportable Tools and Lawn and Garden Machinery — Safety — Part 1: General requirements*

ISO 2860:1992, *Earth-moving machinery — Minimum access dimensions*

ISO 2867:2011, *Earth-moving machinery — Access systems*

ISO 3411:2007, *Earth-moving machinery — Physical dimensions of operators and minimum operator space envelope*

ISO 3450:2011, *Earth-moving machinery — Wheeled or high-speed rubber-tracked machines — Performance requirements and test procedures for brake systems*

ISO 3795:1989, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

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

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

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

ISO 5006:2017, *Earth-moving machinery — Operator's field of view — Test method and performance criteria*

ISO 5010:2007, *Earth-moving machinery — Rubber-tyred machines — Steering requirements*

ISO 5353:1995, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point*

ISO 6395:2008, *Earth-moving machinery — Determination of sound power level — Dynamic test conditions*

ISO 6396:2008, *Earth-moving machinery — Determination of emission sound pressure level at operator's position — Dynamic test conditions*

ISO 6396:2008 Technical Corrigendum 1:2009, *Earth-moving machinery — Determination of emission sound pressure level at operator's position — Dynamic test conditions; Technical Corrigendum 1*

ISO 6405-1:2017, *Earth-moving machinery — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 6405-2:2017, *Earth-moving machinery — Symbols for operator controls and other displays — Part 2: Symbols for specific machines, equipment and accessories*

ISO 6682:1986 + AMD 1:1989, *Earth-moving machinery — Zones of comfort and reach for controls; amendment 1*

ISO 6750:2005, *Earth-moving machinery — Operator's manual — Content and format*

ISO 7010:2011+AMD 3:2012, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 7096:2000, *Earth-moving machinery — Laboratory evaluation of operator seat vibration*

ISO 7165:2017, *Fire fighting — Portable fire extinguishers — Performance and construction*

ISO 8643:2017, *Earth-moving machinery — Hydraulic excavator and backhoe loader lowering control device — Requirements and tests*

ISO 9244:2008, *Earth-moving machinery — Machine safety labels — General principles*

ISO 9533:2010, *Earth-moving machinery — Machine-mounted audible travel alarms and forward horns — Test methods and performance criteria*

ISO 10261:2002, *Earth-moving machinery — Product identification numbering system*

ISO 10263-2:2009, *Earth-moving machinery — Operator enclosure environment — Part 2: Air filter element test method*

ISO 10263-4:2009, *Earth-moving machinery — Operator enclosure environment — Part 4: Heating, ventilating and air conditioning (HVAC) test method and performance*

ISO 10265:2008, *Earth-moving machinery — Crawler machines — Performance requirements and test procedures for braking systems*

ISO 10532:1995+Amd1:2004+TC 1:2006, *Earth-moving machinery — Machine-mounted retrieval device — Performance requirements*

ISO 10570:2004, *Earth-moving machinery — Articulated frame lock — Performance requirements*

ISO/DIS 10968:2019, *Earth-moving machinery — Operator's controls*

ISO 11112:1995+AMD 1:2001, *Earth-moving machinery — Operator's seat — Dimensions and requirements; Amendment 1*

ISO 11862:1993, *Earth-moving machinery; auxiliary starting aid electrical connector*

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

ISO 12508:1994, *Earth-moving machinery — Operator station and maintenance areas — Bluntness of edges*

ISO 12509:2004, *Earth-moving machinery — Lighting, signalling and marking lights, and reflex-reflector devices*

ISO 13333:1994, *Earth-moving machinery — Dumper body support and operator's cab tilt support devices*

ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces*

ISO 13766-1:2018, *Earth-moving and building construction machinery — Electromagnetic compatibility (EMC) of machines with internal electrical power supply — Part 1: General EMC requirements under typical electromagnetic environmental conditions*

ISO 13766-2:2018, *Earth-moving and building construction machinery — Electromagnetic compatibility (EMC) of machines with internal electrical power supply — Part 2: Additional EMC requirements for functional safety*

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

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

ISO 13857:2008, Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs

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

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

ISO 14396:2002, *Reciprocating internal combustion engines — Determination and method for the measurement of engine power — Additional requirements for exhaust emission tests in accordance with ISO 8178*

ISO 14401-1:2009, *Earth-moving machinery — Field of vision of surveillance and rear-view mirrors — Part 1: Test methods*

ISO 14401-2:2009, *Earth-moving machinery — Field of vision of surveillance and rear-view mirrors — Part 2: Performance criteria*

ISO 14990-3:2016, *Earth-moving machinery— Electrical safety of machines utilizing electric drives and related components and systems — Part 3: Particular requirements for self-powered machines*

ISO 15817, *Earth-moving machinery — Safety requirements for remote operator control systems*

ISO 15818:2017, *Earth-moving machinery — Lifting and tying-down attachment points — Performance requirements*

ISO 16001:2017, *Earth-moving machinery — Object detection systems and visibility aids — Performance requirements and tests*

ISO 16528-1:2007, *Boilers and pressure vessels — Part 1: Performance requirements*

ISO 16528-2:2007, *Boilers and pressure vessels — Part 2: Procedures for fulfilling the requirements of ISO 16528-1*

ISO 17063:2003, *Earth-moving machinery — Braking systems of pedestrian-controlled machines — Performance requirements and test procedures*

ISO 29463-5:2011, *High-efficiency filters and filter media for removing particles in air — Part 5: Test method for filter elements*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
mobile road construction machinery
machine intended for either one of, or a combination of construction, maintenance and marking of roads or other road like surfaces

Note to entry: The machines are listed in Annex A.

3.1.1
compact machine
mobile road construction machinery (3.1), except for vibratory plates and rammers (ISO 20500-4), having an operating mass (3.2.1) of 4 500 kg or less

3.1.2
direct-control machine
self-propelled *mobile road construction machinery* (3.1) where the machine is controlled by an operator in physical contact with the machine

3.1.3
ride-on machine
self-propelled *direct-control machine* (3.1.2) where the control devices are located on the machine and the machine is controlled by an operator carried on the machine