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Building construction machinery and equipment — Machinery for concrete surface floating and finishing —

Part 2: Safety requirements and verification

Machines et matériels pour la construction des bâtiments — Talocheuses-lisseuses de mortier —

Partie 2: Exigences de sécurité et de vérification

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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 document 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).

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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*, Subcommittee SC 1, *Machinery and equipment for concrete work*.

This second edition cancels and replaces the first edition (ISO 13105-2:2014), which has been technically revised. It also incorporates the Amendment ISO 13105-2:2014/Amd 1:2017.

The main changes are as follows:

— updated normative references;

— updated general requirements in 4.2;

— added NOTE in 4.2.11;

— updated A.1 and A.5;

— added Annex C.

A list of all parts in the ISO 13105 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.

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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 this 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 the 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 type-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.

The ISO 13105 series deals with machinery designed for smoothing and finishing concrete on construction sites. These machines are commonly referred to as “power trowels”.

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Building construction machinery and equipment — Machinery for concrete surface floating and finishing —

Part 2: Safety requirements and verification

1 Scope

This document specifies safety requirements for machines used for concrete surface floating and finishing. This includes pedestrian-controlled equipment and ride-on equipment.

This document is not applicable to:

— internal or external vibrators or ancillary equipment used with internal and external vibrators, e.g. air compressors, hydraulic power sources, and voltage transformers;

— remote-controlled or hand-held smoothing machines and self-acting (e.g. robotic) smoothing machines;

— strike-off type machines commonly known as screeds.

This document deals with significant hazards, hazardous situations, or hazardous events relevant to machinery for concrete surface floating and finishing (power trowels) when used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer.

This document is not applicable to machines which are 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 2631-1, *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 1: General requirements*

ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane*

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 7000, *Graphical symbols for use on equipment — Registered symbols*

ISO 11201, *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 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13105-1, *Building construction machinery and equipment — Machinery for concrete surface floating and finishing — Part 1: Terms and commercial specifications*

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

IEC 60204-1:2016, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 60309-1, *Plugs, socket-outlets and couplers for industrial purposes — Part 1: General requirements*

IEC 60529:2001, *Degrees of protection provided by enclosures (IP code)*

ASTM E-1155, *Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers*

EN 50525-2-21, *Electric cables — Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U) — Part 2-21: Cables for general applications — Flexible cables with crosslinked elastomeric insulation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100, ISO 13105-1, and the following apply.

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

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

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

3.1
nylon 6/6 substrate
polyhexamethylene adipamide material

Note 1 to entry: See ISO 1874-1 for more information.

4 Safety requirements and/or protective/risk reduction measures

4.1 Overview

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

In addition, the machine shall be designed according to the principles of ISO 12100 for relevant but not significant hazards (see Annex B), which are not dealt with by this document.

4.2 General requirements for all machines

4.2.1 Guarding of the rotating blades

A means shall be provided to protect the operator or bystanders from inadvertently coming in contact with rotating blades. The guarding device shall be designed so that the operator can visually see the interaction of the blades with the concrete surface and in conformity with the dimensions given in Annex C.

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