SLOVENSKI STANDARD
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Stroji za predelavo gume in plastike - Stroji za brizgalno vlivanje - Varnostne zahteve (ISO/DIS 20430:2017)

Plastics and rubber machines - Injection moulding machines - Safety requirements (ISO/DIS 20430:2017)

Kunststoff- und Gummimaschinen - Spritzgießmaschinen - Sicherheitsanforderungen (ISO/DIS 20430:2017)

Machines pour les matières plastiques et le caoutchouc - Machines de moulage par injection - Prescription de sécurité (ISO/DIS 20430:2017)

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Plastics and rubber machines — Injection moulding machines — Safety requirements

Machines pour les matières plastiques et le caoutchouc — Machines de moulage par injection — Prescription de sécurité

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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 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.

The committee responsible for this document is ISO/TC 270 *Plastics and rubber machines*, and by Technical Committee CEN/TC 145 *Plastics and rubber machines*, in collaboration.

Introduction

This document is a type-C standard as stated in ISO 12100.

This document is of relevance, in particular, for the following groups representing the stakeholders with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organisations, market surveillance etc.);

— machine distributers, resellers, rebuilders and integrators;

— machine users/employers (small, medium and large enterprises);

— machine operators/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e. g. for maintenance (small, medium and large enterprises).

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.

1 Scope

This International Standard specifies the essential safety requirements for the design and construction of injection moulding machines for the processing of plastics and/or rubber and provides information for their safe use.

This standard is only applicable to injection moulding machines with hydraulic and/or electrical drives for platen movement.

This standard prescribes the interfaces to the mould provided by the machine manufacturer. It does not cover the design and construction of the mould itself.

This standard deals with all significant hazards, hazardous situations or hazardous events that are listed in Annex A, when injection moulding machines are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer.

This standard covers safety requirements and/or protective measures related to the integration of ancillary equipment.

The following are not covered:

— machines on which the clamping unit can only be operated by the physical force of the operator;

— machine for which the hydraulic jack is manually operated;

— injection blow moulding machines;

— machines for reaction injection moulding;

— compression moulding machines and transfer moulding machines for plastics and rubber;

— direct-on sole moulding machines, unit sole and footwear component moulding machines, full shoe and boot moulding machines;

— design of an exhaust system.

This standard is not applicable to injection moulding 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.

IEC 60204-1:2005, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 61496-1:2012, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests*

IEC 61496-2:2013, *Safety of machinery — Electrosensitive protective equipment — Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)*

IEC 61496-3:2008, *Safety of machinery — Electro-sensitive protective equipment — Part 3: Particular requirements for Active opto-electronic protective devices responsive to diffuse reflection (AOPDDR)*

IEC 61800-5-2:2016, *Adjustable speed electrical power drive systems — Part 5-2: Safety Requirements — Functional*

ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane*

ISO 11202:2010, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Survey method in situ*

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

ISO 13732-1:2006, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces*

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

ISO 13849-2:2012, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation*

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

ISO 13851:2002, *Safety of machinery — Two-hand control devices — Functional aspects — Principles for design*

ISO 13855:2010, *Safety of machinery — Positioning of safeguards with respect to the approach speeds of parts of the human body*

ISO 13856-1:2013, *Safety of machinery — Pressure sensitive protective devices — Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors*

ISO 13856-2:2013, *Safety of machinery — Pressure sensitive protective devices — Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars*

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 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering method in an essentially free-field over a reflecting plane*

ISO 3746:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method employing an enveloping measurement surface over a reflecting plane*

ISO 3747:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering/survey methods for use in situ in a reverberant environment*

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/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100:2010 and the following apply.

3.1
injection moulding machine
machine for the cyclic production of moulded parts from plastics and/or rubber

Note 1 to entry: The material is injected through a nozzle into a mould containing one or more cavities in which the article is formed.

Note 2 to entry: An injection moulding machine essentially consists of one or more clamping units, one or more injection units, drive and control systems.

Note 3 to entry: Examples for horizontal and vertical injection moulding machine are shown in Annex A.

3.2
mould area
area between the platens

3.3
clamping unit
part of the machine that holds, opens and closes the mould

3.4
clamping mechanism area
area which comprises mechanisms for the movement of the mobile platen and/or the application of the clamping force

3.5
injection unit
unit for processing (plasticising and/or homogenizing) and delivering material through a nozzle

3.6
carousel machine
machine consisting of two or more clamping units mounted on a carousel in either a vertical or horizontal configuration to index on one or more fixed injection units (see Figure 1)

