
**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*

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 20430:2020

<https://standards.iteh.ai/catalog/standards/iso/0d6c9690-9179-4e22-a16b-7aaed420ad9e/iso-20430-2020>



iTeh Standards
(<https://standards.itih.ai>)
Document Preview

ISO 20430:2020

<https://standards.itih.ai/catalog/standards/iso/0d6c9690-9179-4e22-a16b-7aaed420ad9e/iso-20430-2020>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	vi
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	3
3.1 Terms and definitions	3
3.2 Abbreviated terms	11
4 Safety requirements and/or protective/risk reduction measures	11
4.1 Basic requirements	11
4.1.1 General	11
4.1.2 Start, stop and restart functions	11
4.1.3 Emergency stop	12
4.1.4 Guards	12
4.1.5 ESPE in the form of light curtains	15
4.1.6 Two-hand control devices	15
4.1.7 Pressure-sensitive mats, floors and edges	16
4.1.8 Requirements for automatic monitoring	16
4.1.9 Movements caused by gravity during production	17
4.2 Mould area	17
4.2.1 Hazards due to the closing movement of the platen during production	17
4.2.2 Hazards due to the closing movement of the platen on sides of the machine where a cycle cannot be initiated	19
4.2.3 Hazards due to movements other than the closing movement of the platen during production	20
4.2.4 Use of control guards	21
4.2.5 Thermal hazards	24
4.2.6 Additional safety requirements for machines with a downstroking platen	24
4.2.7 Additional requirements for machines where whole-body access is possible between the interlocking guard or light curtain for the mould area and the mould area itself	25
4.2.8 Additional requirements for machines where whole-body access to the mould area is possible	26
4.3 Clamping mechanism area or area behind the movable platen	28
4.3.1 Basic safety requirements	28
4.3.2 Additional safety requirements for machines with an upstroking platen	28
4.3.3 Additional requirements for machines with toggle systems	29
4.4 Area of movement of cores and ejectors and their drive mechanisms outside the mould and/or clamping mechanism areas	29
4.5 Nozzle area	29
4.5.1 Mechanical hazards	29
4.5.2 Thermal hazards	30
4.6 Injection unit area	30
4.6.1 Mechanical hazards	30
4.6.2 Thermal hazards	31
4.6.3 Mechanical and/or thermal hazards	32
4.7 Discharge area	32
4.8 Safety requirements and/or protective measures against hazards not associated with a particular area of the machine	33
4.8.1 Hazards due to flexible hoses	33
4.8.2 Release of fluids under pressure	33
4.8.3 Hazards during adjustment and maintenance	33
4.8.4 Electrical hazards and hazards due to electromagnetic interference	33
4.8.5 Thermal hazards	34

4.8.6	Hazards generated by noise	34
4.8.7	Hazards generated by gases, fumes and dusts	34
4.8.8	Slip, trip and fall hazards	35
4.8.9	Hydraulic and pneumatic systems	35
4.8.10	Power-operated guards	35
4.8.11	Hazards due to unintentionally interrupted forward movement of the screw/piston	35
4.9	Additional safety requirements and/or protective measures associated with specific machine design	36
4.9.1	Shuttle-table machines/machines with sliding table/platen and turn-table machines and carousel machines	36
4.9.2	Multi-station machines with mobile injection unit	36
4.9.3	Cellular foam injection moulding machines	36
4.9.4	Additional requirements for machines where the injection unit discharges towards the operating position	37
5	Verification of the safety requirements and/or protective measures	39
6	Information for use	41
6.1	General	41
6.2	Instruction handbook	42
6.2.1	General	42
6.2.2	Emergency stop	42
6.2.3	Overall system stopping performance	42
6.2.4	Stopping time	42
6.2.5	Light curtains	42
6.2.6	Moulds and extensions	42
6.2.7	Movements of cores and ejectors	42
6.2.8	Machines with toggle systems	43
6.2.9	Machines with a downstroking or upstroking platen	43
6.2.10	Thermal hazards in the mould area	43
6.2.11	Maintenance operations on machines with vertical clamping unit	43
6.2.12	Machines where whole-body access is possible	43
6.2.13	Presence detecting devices in the mould area	43
6.2.14	Injection unit	43
6.2.15	Machines where the injection unit discharges towards the operating position	44
6.2.16	Interrupted forward movement of the screw/piston	44
6.2.17	Flexible hose assemblies	44
6.2.18	Adjustment and maintenance	44
6.2.19	Exhaust system	44
6.2.20	Non-permanent safe means of access	44
6.2.21	Designated access and working positions	45
6.2.22	Cellular foam injection moulding	45
6.2.23	Cleaning of hydraulic system	45
6.2.24	Noise emission	45
6.2.25	Splashing hazards where two-hand control devices are used	45
6.3	Marking	45
6.4	Warning signs	46
6.5	Warning devices	46
Annex A (informative)	List of significant hazards	47
Annex B (normative)	Protective Type I	55
Annex C (normative)	Protective Type II	67
Annex D (normative)	Protective Type III	81
Annex E (normative)	Two-hand control device for the mould area	125
Annex F (normative)	Acknowledgement system	136
Annex G (normative)	Use of proportional valves for the platen movement	137

Annex H (informative) Warning signs, prohibition signs and mandatory action signs.....	138
Annex I (normative) Noise test code.....	142
Bibliography	148

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 20430:2020

<https://standards.iteh.ai/catalog/standards/iso/0d6c9690-9179-4e22-a16b-7aaed420ad9e/iso-20430-2020>

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 270, *Plastics and rubber machines*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 145, *Plastics and rubber machines*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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

This document is a type-C standard as stated in ISO 12100:2010.

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 organizations, 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 distributors, 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 in 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.

ISO 20430:2020

<https://standards.iteh.ai/catalog/standards/iso/0d6c9690-9179-4e22-a16b-7aaed420ad9e/iso-20430-2020>