KUMMI- JA PLASTITÖÖTLUSMASINAD. SURVEVALUMASINAD. OHUTUSNÕUDED

Plastics and rubber machines - Injection moulding machines - Safety requirements (ISO 20430:2020)



EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 20430:2020 sisaldab Euroopa standardi EN ISO 20430:2020 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 20430:2020 consists of the English text of the European standard EN ISO 20430:2020.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 01.07.2020.	Date of Availability of the European standard is 01.07.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile <u>standardiosakond@evs.ee</u>.

ICS 83.200

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega: Koduleht <u>www.evs.ee</u>; telefon 605 5050; e-post <u>info@evs.ee</u>

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

EN ISO 20430

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2020

ICS 83.200

Supersedes EN 201:2009

English Version

Plastics and rubber machines - Injection moulding machines - Safety requirements (ISO 20430:2020)

Machines pour les matières plastiques et le caoutchouc - Machines de moulage par injection - Prescription de sécurité (ISO 20430:2020)

Kunststoff- und Gummimaschinen -Spritzgießmaschinen - Sicherheitsanforderungen (ISO 20430:2020)

This European Standard was approved by CEN on 26 April 2020.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION COMITÉ EUROPÉEN DE NORMALISATION EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 20430:2020) has been prepared by Technical Committee ISO/TC 270 "Plastics and rubber machines" in collaboration with Technical Committee CEN/TC 145 "Plastics and rubber machines" the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2021, and conflicting national standards shall be withdrawn at the latest by July 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 201:2009.

Compared with EN 201:2009, the following significant technical changes have been made:

- modification of the scope;
- cancellation of the safety requirements for magnetic clamping systems;
- cancellation of the safety requirements for other ancillary requirements;
- adaption of the normative references and referring to ISO standards;
- consideration of revised type-A and type-B standards;
- moving of the list of significant hazards to an informative annex;
- modification of the safety requirements and protective measures by taking into consideration the technological progress in the plastics and rubber industry and the continuous development of the safety technology;
- modification of all annexes;
- fundamental modification of the annexes specifying the protective types and addition of further examples of application;
- moving of the annex indicating the relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC to informative Annex ZA;
- cancellation of the annex indicating the relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZA, which is an integral part of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

.20 has been ap. The text of ISO 20430:2020 has been approved by CEN as EN ISO 20430:2020 without any modification.

Annex ZA (informative)

Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered

This European Standard has been prepared under a Commission's standardization request "M/396 Mandate to CEN and CENELEC for Standardisation in the field of Machinery" to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast).

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Annex I of Directive 2006/42/EC

The relevant Essential Requirements of Directive 2006/42/EC (MD)	Clause(s)/subclause(s) of this EN	Remarks/Notes
1.1.2	4, 5, 6	
1.1.3	4.1, 4.8.2, 6.2.23	
1.2.1	4.1.1	
1.2.2	4.1.5, 4.2.1.3, 4.2.3.2, 4.2.7, 4.2.8, 4.8.10, Annex E, Annex F	
1.2.3	4.1.2, 4.2.4	
1.2.4.1	4.1.2.2	
1.2.4.2	4.1.2.2	
1.2.4.3	4.1.3	
1.2.5	4.2.3.2, 4.5.1, 4.6.1	Y _x
1.2.6	4.1.2.3, 4.8.10	0
1.3.2	4.8.1, 4.8.2, 4.9.4	Q.
1.3.3	4.5, 4.9.4, Annex H	Ó,
1.3.7	4.1.4, 4.1.5, 4.1.6, 4.1.7, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8.10, 4.9, Annex B, Annex C, Annex D, Annex E, Annex F	
1.3.8	4.1.4, 4.1.5, 4.1.6, 4.1.7, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8.10, 4.9, Annex B, Annex C, Annex D, Annex E, Annex F	Q,

The relevant Essential Requirements of Directive 2006/42/EC (MD)	Clause(s)/subclause(s) of this EN	Remarks/Notes
1.3.9	4.1.8, 4.2.6, 4.3.2, 4.3.3, Annex B, Annex C, Annex D, Annex E	
1.4	4.1.4, 4.1.5, 4.1.6, 4.1.7, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8.10, 4.9	
1.5.1	4.8.4	
1.5.3	4.8.9	
1.5.4	4.8.3	
1.5.5	4.2.5, 4.5, 4.6.2, 4.6.3, 4.8.5	
1.5.8	4.8.6, Annex I	
1.5.10	4.8.4	
1.5.11	4.8.4	
1.5.13	4.8.1, 4.8.2, 4.8.7	
1.5.14	4.2.7, 4.2.8	
1.5.15	4.8.8	
1.6.1	4.2.6, 4.3.2, 4.8.3, 4.8.8	
1.6.2	4.8.8	
1.6.3	4.1.1	
1.7.1	4.8.8, 6.1, 6.4, 6.5	
1.7.1.2	4.2.3.2, 4.8.11, 4.9.3, 4.9.4.3, 4.9.4.4, 6.5, Annex F, F.2	
1.7.2	4.2.3.2, 4.8.11, 6.4	7
1.7.3	6.2.21, 6.3, Annex H	
1.7.4.1	6.1	
1.7.4.2	6.2, Annex I	Q _x
1.7.4.3	6.2.24, Annex I	,0

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

Co	ntent	S		Page		
For	eword			v i		
Int	roductio	n		vi i		
1	Scon	P		1		
	5.0					
2			eferences			
3		Terms, definitions and abbreviated terms				
	3.1 3.2		and definitions			
			viated terms			
4			rements and/or protective/risk reduction measures			
	4.1		requirements			
		4.1.1 4.1.2	General Start atom and vectors functions			
		4.1.2	Start, stop and restart functions Emergency stop			
		4.1.3	Guards			
		4.1.5	ESPE in the form of light curtains			
		4.1.6	Two-hand control devices			
		4.1.7	Pressure-sensitive mats, floors and edges			
		4.1.8	Requirements for automatic monitoring	16		
		4.1.9	Movements caused by gravity during production			
	4.2		area			
		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	10		
		4.2.3	machine where a cycle cannot be initiated	19		
		4.2.3	during productionduring production	20		
		4.2.4	Use of control guards	21		
		4.2.5	Thermal hazards			
		4.2.6	Additional safety requirements for machines with a downstroking platen			
		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	2.0		
	4.2	Clama	mould area is possible			
	4.3	4.3.1	ing mechanism area or area behind the movable platen			
		4.3.1	Additional safety requirements for machines with an upstroking platen			
		4.3.3	Additional requirements for machines with toggle systems			
	4.4		f movement of cores and ejectors and their drive mechanisms outside the			
		mould and/or clamping mechanism areas				
	4.5		e area			
		4.5.1	Mechanical hazards			
		4.5.2	Thermal hazards			
	4.6	,	on unit area			
		4.6.1 4.6.2	Mechanical hazardsThermal hazards			
		4.6.3	Mechanical and/or thermal hazards			
	4.7		arge area	32		
	4.8		requirements and/or protective measures against hazards not associated	0 2		
	-		particular area of the machine	33		
		4.8.1	Hazards due to flexible hoses	33		
		4.8.2	Release of fluids under pressure			
		4.8.3	Hazards during adjustment and maintenance			
		4.8.4 4.8.5	Electrical hazards and hazards due to electromagnetic interference	33 34		
		4 7 7	rnermarna/2008	54		

		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	
		4.8.9	Hydraulic and pneumatic systems	
		4.8.10	Power-operated guards	35
		4.8.11	Hazards due to unintentionally interrupted forward movement of the screw/piston	35
	4.9		onal safety requirements and/or protective measures associated with	
		specific	c machine design	36
		4.9.1	Shuttle-table machines/machines with sliding table/platen and turn-	
			table machines and carousel machines	
		4.9.2	Multi-station machines with mobile injection unit	
		4.9.3	Cellular foam injection moulding machines	
		4.9.4	Additional requirements for machines where the injection unit discharges	
			towards the operating position	
5			of the safety requirements and/or protective measures	
6	Infor	mation f	for use	41
	6.1		ıl	
	6.2	Instruc	ction handbook	
		6.2.1	General	
		6.2.2	Emergency stop	
		6.2.3	Overall system stopping performance	
		6.2.4	Stopping time	
		6.2.5	Light curtains	
		6.2.6	Moulds and extensions	
		6.2.7	Movements of cores and ejectors	
		6.2.8	Machines with toggle systems	
		6.2.9	Machines with a downstroking or upstroking platen	43
		6.2.10	Thermal hazards in the mould area	
		6.2.11	Maintenance operations on machines with vertical clamping unit	43
		6.2.12	Machines where whole-body access is possible	
		6.2.13	Presence detecting devices in the mould area	
		6.2.14	Injection unit	
		6.2.15	Machines where the injection unit discharges towards the operating position	
		6.2.16	Interrupted forward movement of the screw/piston	
		6.2.17	Flexible hose assemblies	
		6.2.18	Adjustment and maintenance	
		6.2.19	Exhaust system	
		6.2.20	Non-permanent safe means of access	
		6.2.21 6.2.22	0	
		6.2.23	, 0	
		6.2.24		
		6.2.25		
	6.3		1g	
	6.4		ng signs	
	6.5		ig devices	
Anne			e) List of significant hazards	
			Protective Type I	
	-	-	Protective Type II	
			Protective Type III	
	_	_	Two-hand control device for the mould area	
	-	-	Acknowledgement system	
	-	_	Use of proportional valves for the platen movement	

	ibition signs and mandatory action signs	
Bibliography		
7 .		
0		
4		
3		
0		
0		
	-/	
	Q _x	
	.0	
	Q.	
	0,	
)

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.