TÖÖPINKIDE OHUTUS. PRESSID. OSA 2: MEHAANILISTE PRESSIDE OHUTUSNÕUDED

Machine tools safety - Presses - Part 2: Safety requirement for mechanical presses (ISO 16092-2:2019)



#### EESTI STANDARDI EESSÕNA

#### NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 16092-2:2020 sisaldab Euroopa standardi EN ISO 16092-2:2020 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 16092-2:2020 consists of the English text of the European standard EN ISO 16092-2:2020.
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 09.09.2020.	Date of Availability of the European standard is 09.09.2020.
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 25.080.01

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 <a href="www.evs.ee">www.evs.ee</a>; telefon 605 5050; e-post <a href="mailto:info@evs.ee">info@evs.ee</a>

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 NORME EUROPÉENNE

#### **EN ISO 16092-2**

EUROPÄISCHE NORM

September 2020

ICS 25.080.01

Supersedes EN 692:2005+A1:2009

#### **English Version**

# Machine tools safety - Presses - Part 2: Safety requirement for mechanical presses (ISO 16092-2:2019)

Sécurité des machines-outils - Presses - Partie 2 : Exigences de sécurité pour les presses mécaniques (ISO 16092-2:2019) Werkzeugmaschinen - Sicherheit von Pressen - Teil 2: Mechanische Pressen (ISO 16092-2:2019)

This European Standard was approved by CEN on 29 July 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 16092-2:2020) has been prepared by Technical Committee ISO/TC 39 "Machine tools" in collaboration with Technical Committee CEN/TC 143 "Machine tools - Safety" the secretariat of which is held by SNV.

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 March 2021, and conflicting national standards shall be withdrawn at the latest by March 2021.

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 692:2005+A1:2009.

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**

The text of ISO 16092-2:2019 has been approved by CEN as EN ISO 16092-2:2020 without any modification.

### **Annex ZA** (informative)

## Relationship between this European Standard and the essential requirements of EU 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 of 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	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.1.2 Principles of safety integration	5.1	
1.1.8 Seating	7	not covered
1.2. Control systems	5.2/5.3/5.4/5.5	
1.3.2 Risk of break-up during operation	5.2.5/5.2.10.1	
1.3.3 Risk due to falling or ejected objects	5.2.5/5.2.7/5.2.10.1/5.2.10.3/5.3.6	
1.3.7 Risks related to moving parts	5.5.1/5.5.2.1/5.5.3.1	6
1.3.8 Choice of protection against risks arising from moving parts	5.5.1/5.5.2.1/5.5.3.1	
1.3.9 Risks of uncontrolled movements	5.2.6.1/5.2.10.2/5.4.1/5.4.2.1/5.4.6/5.4.7/5.5.1/5.5.3.1	

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.4 required characteristics of guards and protective devices	5.3.2/5.4.1/5.4.7/5.5.2.1 c)/5.5.3.1 b)	
1.5.1 Electricity supply	5.8.1	
1.5.4 Errors of fitting	20.	not covered
1.6.1 Machinery maintenance	5.5.2.1/5.5.3.1/5.5.3.5	
1.7.1	5.2.6.2/7.5	
1.7.3	7.2	
1.7.4	7.4	

**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.

Con	tents		Page
Fore	word		<b>v</b>
Intro	duction		vi
1			
2	Norm	ative references	1
3	Terms	and definitions	2
4	List of	significant hazards	3
5	Safety	requirements and/or measures	3
•	5.1	General	3
	5.2	Basic design considerations	
		5.2.1 Hydraulic and pneumatic systems — Common features	
		5.2.2 Pneumatic systems	
		5.2.3 Hydraulic systems	
		5.2.4 Electric systems	
		5.2.5 Mechanical brake	
		5.2.6 Slide adjustment	
		5.2.7 Slide counterbalance systems	
		5.2.8 Operating valves and exhaust systems	
		5.2.9 Additional requirements for Group 1 presses	6
		5.2.10 Additional requirements for Group 2 presses	6
	5.3	Mechanical hazards in the tools area	
		5.3.1 Major danger zone	
		5.3.2 Safeguarding measures	6
		5.3.3 Other safety requirements	
		5.3.4 Release of trapped persons in the tools area	
		5.3.5 Release of persons trapped inside enclosed areas	
		5.3.6 Prevention of gravity fall during maintenance or repair	7
	5.4	Control and monitoring system	8
		5.4.1 Control and monitoring functions	8
		5.4.2 Muting	10
		5.4.3 Selection devices	10
		5.4.4 Position sensors	10
		5.4.5 Control devices	11
		5.4.6 Valves	11
		5.4.7 Performance level of safety functions	12
		5.4.8 Single stroke function/device	28
		5.4.9 Stopping-performance (overrun) monitoring function/device	
		5.4.10 Additional requirements for Group 1 presses	28
		5.4.11 Additional requirements for Group 2 presses	30
	5.5	Tool-setting, trial strokes, maintenance and lubrication	
		5.5.1 INCH mode	
		5.5.2 Additional requirements for Group 1 presses	31
		5.5.3 Additional requirements for Group 2 presses	31
	5.6	Mechanical hazards — Other	32
	5.7	Slips, trips and falls	32
	5.8	Protection against other hazards	32
		5.8.1 Hazards related to servo drive system	
6	Verific	cation of the safety requirements and/or measures	32
7	Inform	nation for use	37
	7.1	General	37
	7.2	Marking	37
	7.3	Warnings	
	7.4	Instruction handbook	38

Annex B (normative) Calculation of minimum distances  Annex C (informative) The setting of the rotary cam arrangement  Annex D (informative) Determination of the stopping time t <sub>2</sub> for Group 1 presses  Bibliography	44 54
nnex D (informative) Determination of the stopping time $t_2$ for Group 1 presses	54
" is a protection sometimes of the sound of	

#### 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 <a href="www.iso.org/directives">www.iso.org/directives</a>).

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 <a href="https://www.iso.org/patents">www.iso.org/patents</a>).

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 <a href="https://www.iso.org/iso/foreword.html">www.iso.org/iso/foreword.html</a>.

This document was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 10, *Safety*.

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 <a href="https://www.iso.org/members.html">www.iso.org/members.html</a>.

A list of all parts in the ISO 16092 series can be found on the ISO website.

#### 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 the 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 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.