Kummi- ja plastitöötlusmasinad. Survevorm- ja survepritsvalu masinad. Ohutusnõuded

Plastics and rubber machines - Compression moulding machines and transfer moulding machines - Safety requirements

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA	NATIONAL FOREWORD
See Eesti standard EVS-EN 289:2014 sisaldab Euroopa standardi EN 289:2014 ingliskeelset teksti.	This Estonian standard EVS-EN 289:2014 consists of the English text of the European standard EN 289:2014.
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 18.06.2014.	Date of Availability of the European standard is 18.06.2014.
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Plastics and rubber machines - Compression moulding machines and transfer moulding machines - Safety requirements

Machines pour les matières plastiques et le caoutchouc - Machines de moulage par compression et machines de moulage par transfert - Prescriptions de sécurité

Kunststoff- und Gummimaschinen - Formpressen und Spritzpressen - Sicherheitsanforderungen

This European Standard was approved by CEN on 24 April 2014.

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

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Foreword

This document (EN 289:2014) has been prepared by 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of an identical text or by endorsement, at the latest by December 2014, and conflicting national standards shall be withdrawn at the latest by December 2014.

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

This document supersedes EN 289:2004+A1:2008.

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.

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

Compared with EN 289:2004+A1:2008, the following significant changes have been made:

a) modification of main element of the title;

b) replacement of safeguard groups I, II and III by more precise specifications of the safeguards in the respective clauses;

c) specification of the safety related parts of control systems with reference to EN ISO 13849-1:2008 instead of specified types I, II and III and EN 954 and deletion of corresponding normative Annexes A, B, C, D, E and H;

d) addition of safety requirements for:

    1) electromagnetic interference;

    2) machines with electrical axes;

    3) platen movements by gravity on upstroking presses;

    4) magnetic clamping systems;

    5) carousel machines;

    6) power operated mould changing equipment;

    7) hazards generated by neglecting ergonomic principles in machine design;

e) deletion of Annex G.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

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

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

This European Standard specifies the essential safety requirements for compression moulding machines and transfer moulding machines for the moulding of plastics and/or rubber with a closing movement more than 6 mm.

In this document a compression moulding machine or transfer moulding machine as described above is designated by the term “press” (see 3.1).

This document deals with all significant hazards, hazardous situations and events relevant to presses, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

The safety requirements are specified for the additional hazards arising from:

— shuttle/turn tables used for loading/unloading and/or cooling,

— magnetic clamping systems.

For other ancillary equipment, as defined in 3.7, that is not part of the press, only the requirements for the interaction between presses and ancillary equipment, especially loading and unloading devices are specified.

The following machines or units are excluded:

— pneumatic presses for plastic and rubber;

— injection moulding machines (see EN 201:2009);

— tyre curing machines (see prEN 16474);

— presses for curing inner tubes and curing bags;

— hydraulic presses for the cold working of metals as covered by EN 693:2001+A2:2011;

— mechanical presses for the cold working of metals as covered by EN 692:2005+A1:2009;

— pneumatic presses for the cold working of metals as covered by EN 13736:2003+A1:2009;

— thermoforming machines (see EN 12409:2008+A1:2011);

— reaction injection moulding (RIM) machines (see EN 1612-1:1997+A1:2008);

— the extruder of the carousel machine(see EN 1114-1:2011).

This standard does not cover:

— hazards caused by the processing of materials which may lead to a risk of explosion, see 7.2.2;

— the requirements of Directive 94/9/CE concerning equipment and protective systems intended for use in potentially explosive atmospheres;

— requirements for the design of exhaust ventilation systems, see 5.3.5 and 7.2.8.

This document is not applicable to presses manufactured before the date of its publication as EN.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 574:1996+A1:2008, *Safety of machinery - Two-hand control devices - Functional aspects - Principles for design*

EN 953:1997+A1:2009, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 61000-6-2:2005, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments (IEC 61000-6-2:2005)*

EN 61000-6-4:2007, *Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments (IEC 61000-6-4:2006)*

EN 61496-1:2004, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2004, modified)*

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

CLC/TS 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 61496-3:2008)*

EN 61800-5-2:2007, *Adjustable speed electrical power drive system — Part 5-2: Safety requirements — Functional (IEC 61800-5-2:2007)*

EN ISO 3744:2010, *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 3744:2010)*

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

EN 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 3747:2010)*

EN ISO 4413:2010, *Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413:2010)*

EN ISO 4414:2010, *Pneumatic fluid power - General rules and safety requirements for systems and their components (ISO 4414:2010)*

EN ISO 4871:2009, *Acoustics - Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 9614-1:2009, *Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 1: Measurement at discrete points (ISO 9614-1:1993)*

EN ISO 9614-2:1996, *Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 2: Measurement by scanning (ISO 9614-2:1996)*

EN ISO 11201:2010, *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 11201:2010)*

EN ISO 11202:2010, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections (ISO 11202:2010)*

EN ISO 11204:2010, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204:2010)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13732-1:2008, *Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces - Part 1: Hot surfaces (ISO 13732-1:2006)*

EN ISO 13849-1:2008, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13850:2008, *Safety of machinery - Emergency stop - Principles for design (ISO 13850:2006)*

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

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

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

EN ISO 13857:2008, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

EN ISO 14122-1:2001, *Safety of machinery - Permanent means of access to machinery - Part 1: Choice of fixed means of access between two levels (ISO 14122-1:2001)*

EN ISO 14122-2:2001, *Safety of machinery - Permanent means of access to machinery - Part 2: Working platforms and walkways (ISO 14122-2:2001)*

EN ISO 14122-3:2001, *Safety of machinery - Permanent means of access to machinery - Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2001)*

EN ISO 14122-4:2004, *Safety of machinery - Permanent means of access to machinery - Part 4: Fixed ladders (ISO 14122-4:2004)*

3 Terms and definitions

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

3.1
press
machine for the discontinuous production of moulded parts from plastics or rubber compounds which essentially consists of one or more clamping units, drive and control systems and possibly ancillary equipment (see 3.7)

3.1.1
compression moulding
process in which the moulding material is placed into the open mould

Note 1 to entry: When the press is closed, the moulding process is carried out under the influence of pressure with or without heat.

Note 2 to entry: See Figures 1 and 2.

Note 3 to entry: This process may be used as well for laminating sheets or plates.

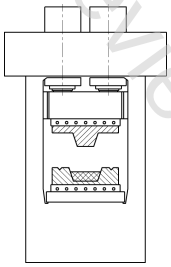

Figure 1 — Compression moulding machine shown with mould open and loaded with moulding material

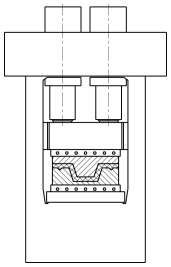

Figure 2 — Compression moulding machine shown with mould closed and moulding material formed into shape

3.1.2
transfer moulding
process in which the moulding material is fed into a separate cavity (transfer cavity) in the mould and is pressed into the moulding cavity by the pressure of the transfer plunger

Note 1 to entry: The movement of the transfer plunger is obtained either directly by the closing movement of the mould (see Figures 3 and 4) or via a separate cylinder (see Figures 5 and 6).