SLOVENSKI STANDARD
oSIST prEN 289:2012

01-november-2012

Stroji za predelavo gume in plastike - Stiskalnice za oblikovanje in brizganje - Varnostne zahteve

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

Kunststoff- und Gummimaschinen - Formpressen und Spritzpressen - Sicherheitsanforderungen

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

Ta slovenski standard je istoveten z: **prEN 289 rev**

ICS:

25.120.10	Kovaški stroji. Stiskalnice. Škarje	Forging equipment. Presses. Shears
83.200	Oprema za gumarsko industrijo in industrijo polimernih materialov	Equipment for the rubber and plastics industries

oSIST prEN 289:2012 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 289 rev

August 2012

ICS 83.200

Will supersede EN 289:2004+A1:2008

English Version

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

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 145.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Foreword

This document (prEN 289:2012) has been prepared by Technical Committee CEN/TC 145 “Plastics and rubber machines”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document will supersede 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(s).

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

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 document 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 the word “presses” is used to designate the above described compression moulding machines and transfer moulding machines.

All hazards listed in clause 4 are covered by this document.

The following machines or units are excluded:

— pneumatic presses for plastic and rubber;

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

— presses for curing pneumatic tyres;

— 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+A1:2009;

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

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

The safety requirements for the additional hazards arising from the interaction between presses and ancillary equipment especially loading and unloading devices are specified. The safety requirements for the ancillary equipment itself are not specified.

This standard covers presses equipped with magnetic clamping systems only if such systems are integrated by the press manufacturer.

This document does not cover:

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

— 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.

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 moveable guards.*

EN 1760-1:1997+A1:2009, *Safety of machinery – Pressure sensitive protective devices – Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors.*

EN 1760-2:2001+A1:2009, *Safety of machinery – Pressure sensitive protective devices – Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars.*

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

EN 60529:1992, *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.*

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

EN 61496-1:2004+A1:2008/AC:2010, *Safety of machinery – Electro-sensitive protective equipment – Part 1: General requirements and tests (IEC 61496-1:2004, modified).*

prEN 61496-2:2011 *Safety of machinery - Electro-sensitive protective equipment - Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs).*

EN 61800-5-2:2007 *Adjustable speed electrical power drive system - Part 5-2: Safety requirements – Functional.*

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 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 14122-1:2001/A1:2010, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels — Amendment 1 (ISO 14122-1:2001/Amd 1:2010)*

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 14122-2:2001/A1:2010, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways — Amendment 1 (ISO 14122-2:2001/Amd 1:2010)*

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 14122-3:2001/A1:2010, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails — Amendment 1 (ISO 14122-3:2001/Amd 1:2010)*

EN ISO 14122-4:2004, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders (ISO 14122-4:2004+Amd 1:2010)*

EN ISO 14122-4:2004/A1:2010, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders - Amendment 1 ((ISO 14122-4:2004/Amd 1:2010))*

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).*

3 Terms and definitions

For the purposes of this European Standard, 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 3.6)

3.1.1
compression moulding
process in which the moulding material is placed into the open mould. When the press is closed, the moulding process is carried out under the influence of pressure with or without heat (see Figures 1 and 2)

Note 1 to entry: This process may be used as well for laminating sheets or plates.

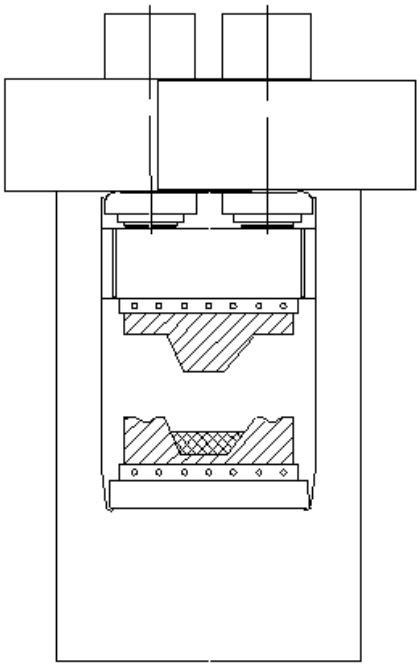

Figure 1 — Press for compression moulding shown with mould open and loaded with moulding material

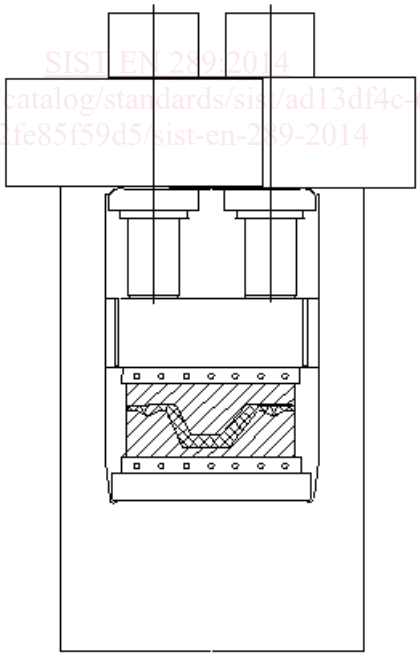

Figure 2 — Press for compression moulding shown with mould closed and moulding material formed into shape

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).

Note 2 to entry If the moulding material is injected into the closed mould through a nozzle, see EN 201.

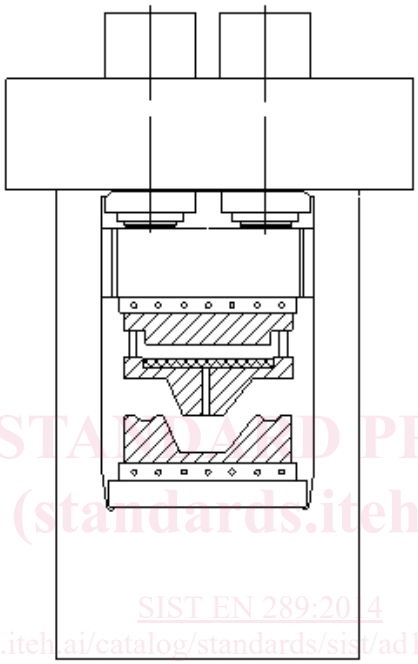

Figure 3 — Press for transfer moulding shown with moulding material in transfer cavity

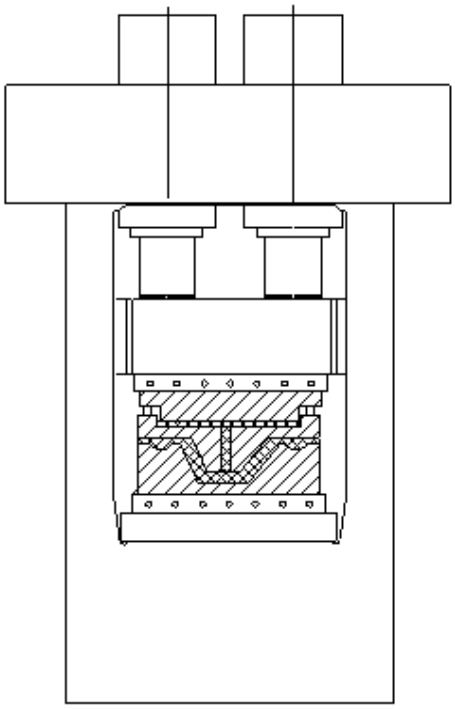

Figure 4 — Press for transfer moulding shown with moulding material fed into the moulding cavity

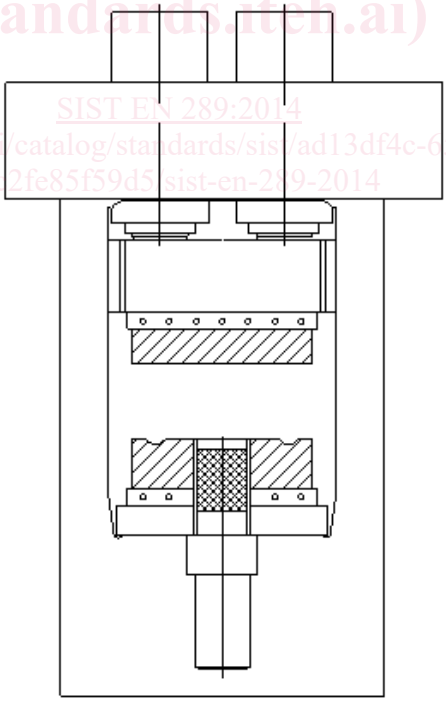

Figure 5 — Press for transfer moulding shown with separate cylinder and with moulding material in transfer cavity

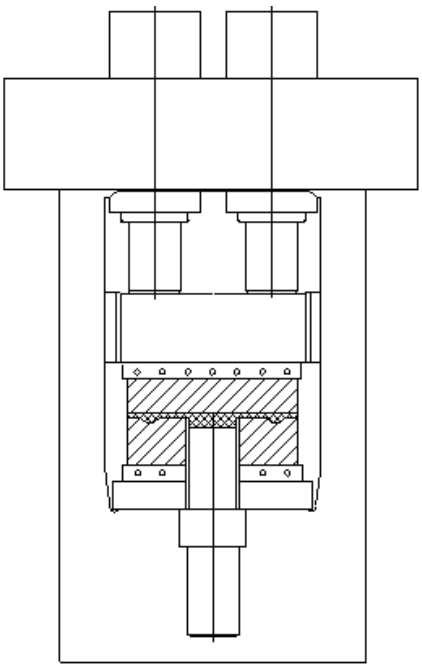

Figure 6 — Press for transfer moulding shown with separate cylinder and with moulding material fed into the moulding cavity

3.2
mould area
area between the platens

3.3
clamping unit
the part of the press comprising fixed and mobile platens and associated drive mechanism

3.4
shuttle/turntable machine
press designed to contain one or more moulds attached to a table that indexes the mould(s) by a sliding or rotary motion between the loading/unloading station and the moulding position

3.5

carousel machine

machine composed by an extruder and compression units mounted on a carousel

Note 1 to entry: For the extruder see EN 1114-1:2011.

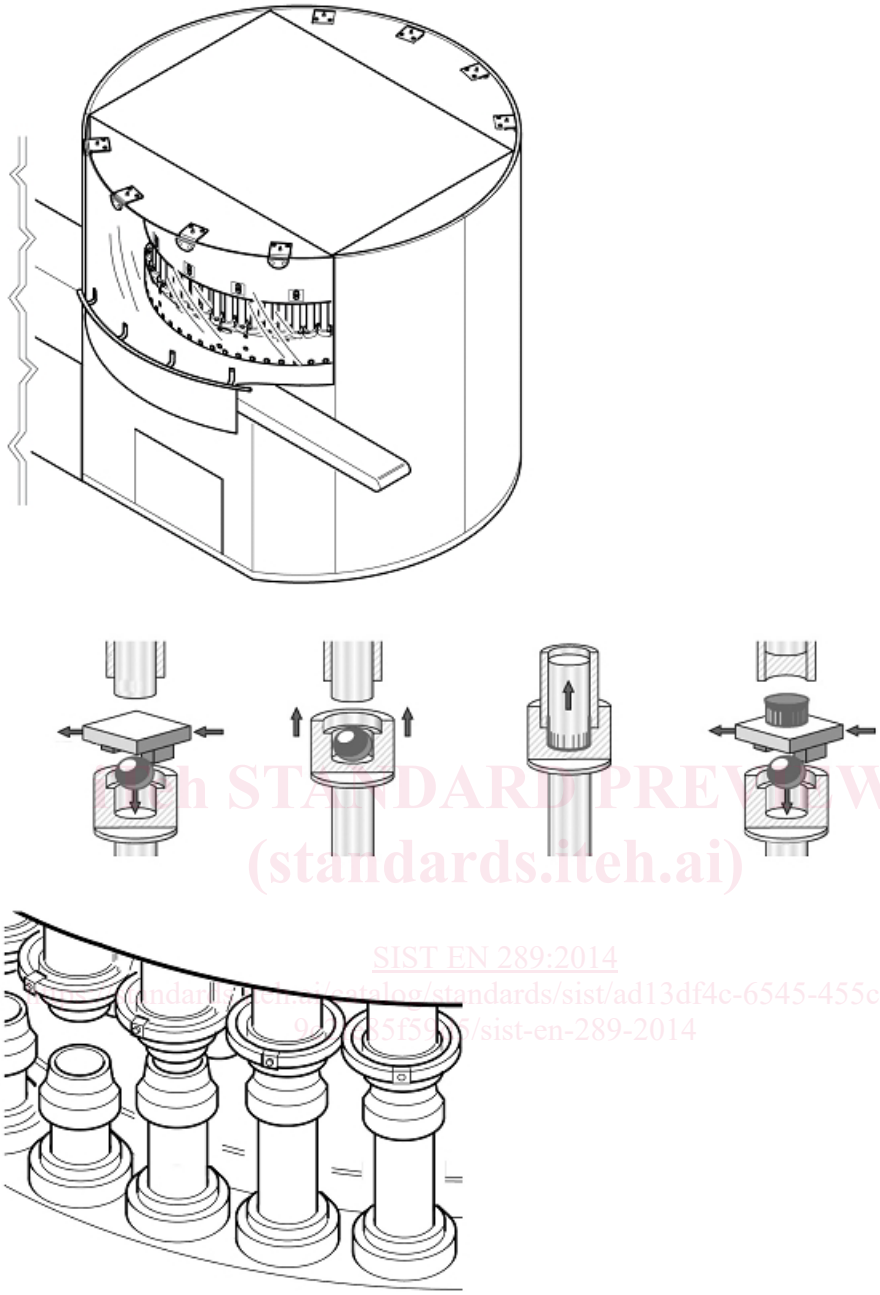

Figure 7 — Example of the main danger area on a carousel machine

3.6
ancillary equipment
equipment which interacts with the press, e.g. loading and unloading devices (including heating stations, sliding tables, robots, plasticizing units) and power operated mould clamping devices

3.7
electrical motor
any type of motor using electrical energy, e.g. servo or linear motor