



# SLOVENSKI STANDARD

## SIST EN 289:2004

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Nadomešča:  
SIST EN 289:2000

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### Stroji za predelavo gume in plastike – Stiskalnice – Varnostne zahteve

Plastics and rubber machines - Presses - Safety requirements

Kunststoff- und Gummimaschinen - Pressen - Sicherheitsanforderungen

Machines pour les matières plastiques et le caoutchouc - Presses - Prescriptions de sécurité

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83.200	Oprema za gumarsko industrijo in industrijo polimernih materialov	Equipment for the rubber and plastics industries

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 289**

July 2004

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English version

## Plastics and rubber machines - Presses - Safety requirements

Machines pour les matières plastiques et le caoutchouc -  
Presses - Prescriptions de sécurité

Kunststoff- und Gummimaschinen - Pressen -  
Sicherheitsanforderungen

This European Standard was approved by CEN on 16 April 2004.

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 Central Secretariat or to any CEN member.

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

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## Foreword

This document (EN 289:2004) 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of an identical text or by endorsement, at the latest by January 2005, and conflicting national standards shall be withdrawn at the latest by January 2005.

This document supersedes EN 289:1993.

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 Directives, see informative annex ZA, which is an integral part of this document.

The annexes A, B, C, D, E, F, G and H are normative.

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

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**EN 289:2004 (E)****Introduction**

This document is a type C standard as stated in EN 1070.

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.

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## 1 Scope

This document specifies the essential safety requirements for hydraulic presses, including toggle and hydro-mechanic ones, with a vertical closing movement more than 6 mm for the moulding of plastics and/or rubber.

This document covers both compression moulding (see 3.1.1) and transfer moulding (see 3.1.2).

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

The following machines are excluded:

- injection moulding machines (see EN 201);
- presses for curing pneumatic tyres;
- presses for curing inner tubes and curing bags;
- hydraulic presses as covered by EN 693;
- mechanical presses as covered by EN 692;
- thermoforming machines (see EN 12409);
- RIM machines (see EN 1612-1 and EN 1612-2).

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 document does not cover:

- 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 publication of this document by CEN.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 294:1992, *Safety of machinery – Safety distances to prevent danger zones being reached by the upper limbs*

EN 418:1992, *Safety of machinery – Emergency stop equipment, functional aspects – Principles for design*

EN 563:1994, *Safety of machinery – Temperatures of touchable surfaces – Ergonomics data to establish temperature limit values for hot surfaces*

EN 574:1996, *Safety of machinery – Two hand control devices – Functional aspects – Principles for design*

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EN 953:1997, *Safety of machinery – Guards – General requirements for the design and construction of fixed and moveable guards*

EN 954-1:1996, *Safety of machinery – Safety related parts of control systems – Part 1: General principles for design*

EN 982:1996, *Safety of machinery – Safety requirements for fluid power systems and their components – Hydraulics*

EN 983:1996, *Safety of machinery – Safety requirements for fluid power systems and their components – Pneumatics*

EN 999:1998, *Safety of machinery – The positioning of protective equipment in respect of approach speeds of parts of the human body*

EN 1070:1998, *Safety of machinery – Terminology*

EN 1088:1995, *Safety of machinery – Interlocking devices associated with guards – Principles for design and selection*

EN 1760-1:1997, *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, *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 60204-1:1997, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements (IEC 60204-1:1997)*

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

EN 61496-1:1997, *Safety of machinery – Electro-sensitive protective equipment – Part 1: General requirements and tests (IEC 61496-1:1997)*

EN 61496-3:2001, *Safety of machinery – Electro-sensitive protective equipment – Part 3: Particular requirements for Active Opto-electronic Protective Devices responsive to Diffuse Reflection (AOPDDR) (IEC 61496-3:2001)*

EN ISO 3744:1995, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering method in an essentially freefield over a reflecting plane (ISO 3744:1994)*

EN ISO 3746:1995, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995)*

EN ISO 3747:2000, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Comparison method for use in situ (ISO 3747:2000)*

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

EN ISO 9614-1:1995, *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 11201:1995, *Acoustics – Noise emitted by machinery and equipment – Measurement of emission sound pressure levels at a work station and at other specified positions – Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995)*

EN ISO 11202:1995, *Acoustics – Noise emitted by machinery and equipment – Measurement of emission sound pressure levels at a work station and at other specified positions – Survey method in situ (ISO 11202:1995)*

EN ISO 11204:1995, *Acoustics – Noise emitted by machinery and equipment – Measurement of emission sound pressure levels at a work station and at other specified positions – Method requiring environmental corrections (ISO 11204:1995)*

EN ISO 12100-1:2003, *Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles (ISO 12100-2:2003)*

EN ISO 14122-1:2001, *Safety of machinery – Permanent means of access to machinery – Part 1: Choice of a 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 European Standard, the terms and definitions given in EN 1070:1998 and the following apply.

#### 3.1

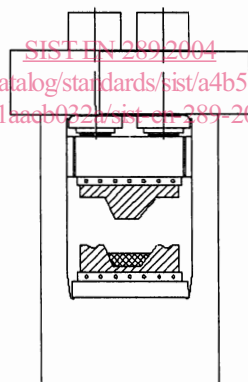
##### **press**

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 3.5)

#### 3.1.1

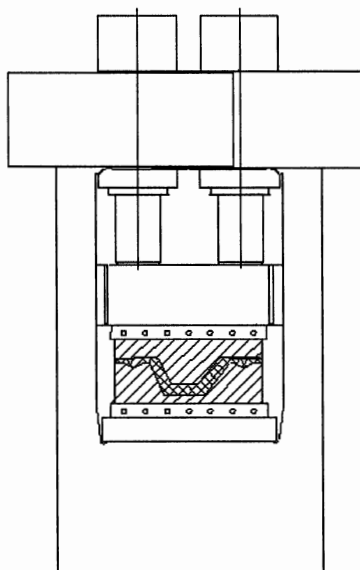
##### **compression moulding**

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). This process may be used as well for laminating sheets or plates



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

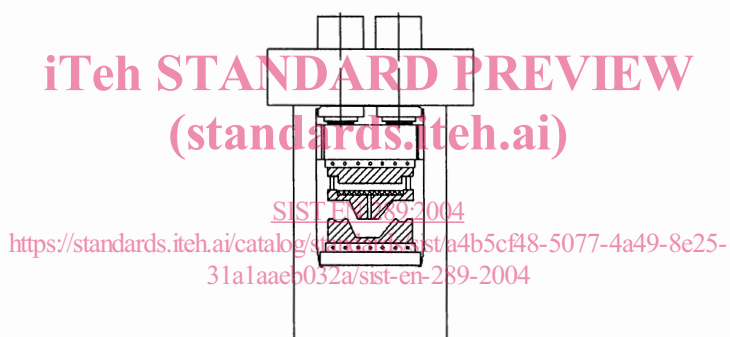


**Figure 2 — Press for compression moulding shown with mould closed and moulding material formed into shape**

### 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. 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 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**

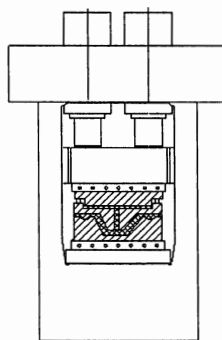


Figure 4 — Press for transfer moulding shown with moulding material fed into the moulding cavity

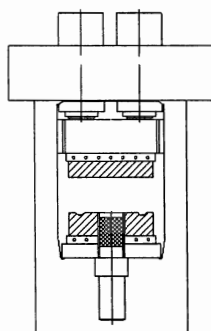
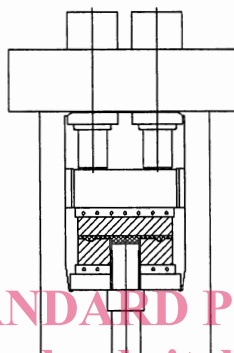


Figure 5 — Press for transfer moulding shown with separate cylinder and with moulding material in transfer cavity



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

**3.2**  
**mould area**  
zone 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**

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

**3.5****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

**4 List of significant hazards****4.1 General**

This clause lists the significant hazards associated with presses. This document differentiates between:

- general hazards;
- hazards in specific machine areas;
- additional hazards associated with specific design;
- additional hazards when using ancillary equipment.

NOTE The numbering system of the safety requirements and/or measures in clause 5 corresponds with the numbering system of the significant hazards in clause 4.

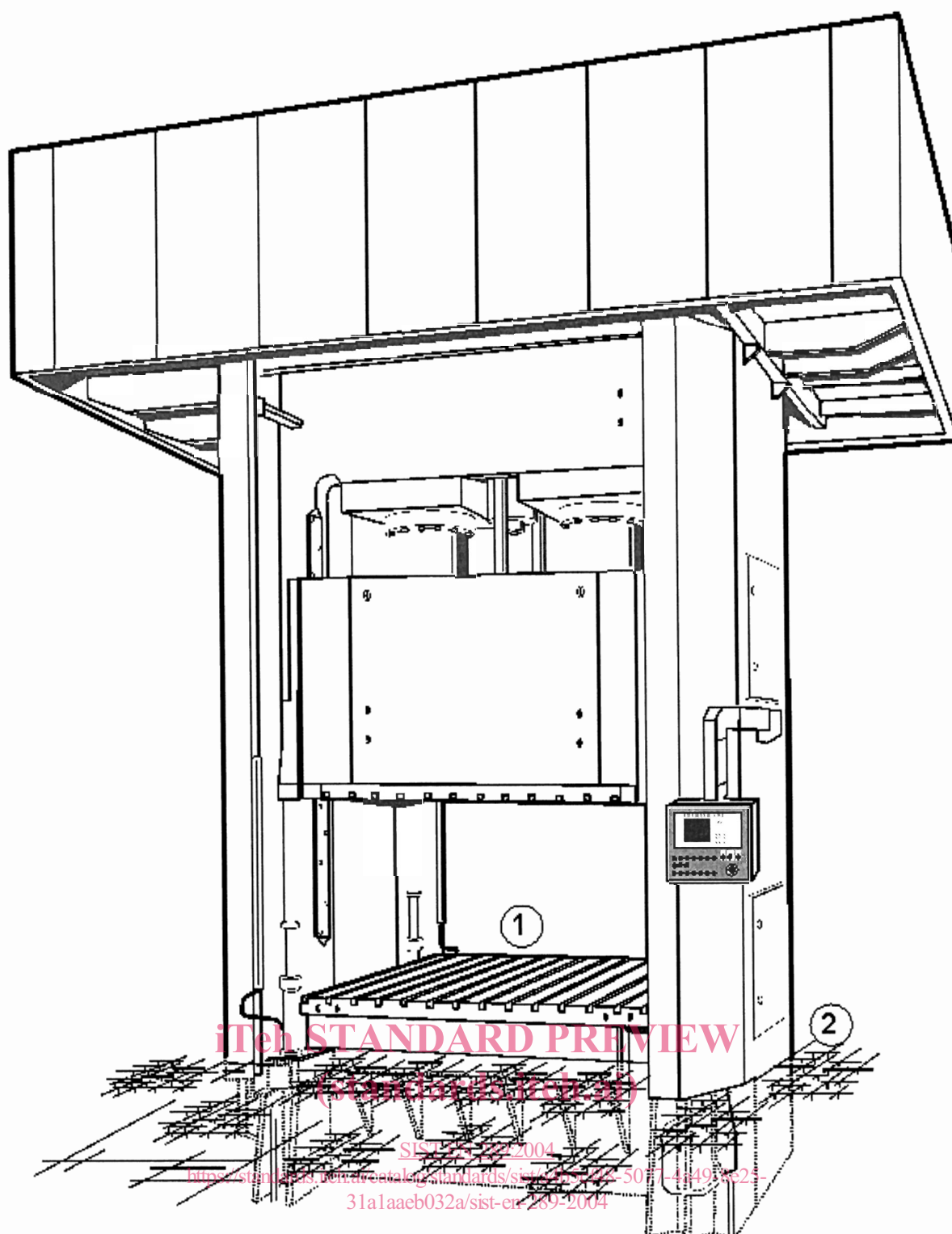
**4.2 Danger areas on presses**

The principal danger areas are shown in Figures 7, 8 and 9.

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**Key**

- 1 Mould area
- 2 Floor level

**Figure 7 — Example of the mould area on a large frame construction downstroking press, shown without mould and with electrosensitive protective equipment.**