

## **Safety of machinery - Safety requirements for hydraulically powered open die hot forging presses for the forging of steel and non-ferrous metals**

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 14673:2006 sisaldab Euroopa standardi EN 14673:2006 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 21.12.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 14673:2006 consists of the English text of the European standard EN 14673:2006.</p> <p>This document is endorsed on 21.12.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>This European Standard applies to:- hydraulically powered open die forging presses for hot working;- handling and cooling equipment connected with the control system of the forging line, e. g., manipulators, rotating type handling devices, die shifting devices, table devices and tool changing devices;- handling equipment designed specifically to be used within the forging line, e. g., material manipulation devices, turnover or handling devices attached to fork lift trucks or cranes etc.</p>	<p><b>Scope:</b></p> <p>This European Standard applies to:- hydraulically powered open die forging presses for hot working;- handling and cooling equipment connected with the control system of the forging line, e. g., manipulators, rotating type handling devices, die shifting devices, table devices and tool changing devices;- handling equipment designed specifically to be used within the forging line, e. g., material manipulation devices, turnover or handling devices attached to fork lift trucks or cranes etc.</p>
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English Version

**Safety of machinery - Safety requirements for hydraulically  
powered open die hot forging presses for the forging of steel  
and non-ferrous metals**

Sécurité des machines - Exigences de sécurité pour les  
presses à commande hydraulique de forgeage libre pour le  
formage à chaud de l'acier et des métaux non ferreux

Sicherheit von Maschinen - Sicherheitsanforderungen an  
hydraulisch angetriebene Warm-Freiformschmiedepressen  
zum Schmieden von Stahl und NE-Metallen

This European Standard was approved by CEN on 11 September 2006.

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.

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 Central Secretariat has the same status as the official versions.

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



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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 14673:2006) has been prepared by Technical Committee CEN/TC 322 "Equipments for making and shaping of metals - Safety requirements", the secretariat of which is held by DIN.

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 May 2007, and conflicting national standards shall be withdrawn at the latest by May 2007.

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.

This European Standard was elaborated by CEN/TC 322/WG5, comprising experts from the following countries: France, Germany, Sweden and United Kingdom.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

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

Where for clarity an example of a preventative measure is given in the text, this should not be considered as the only possible solution. Any other solution leading to the same risk reduction is permissible if an equivalent level of safety is achieved.

This European Standard assumes that the equipment is operated and maintained by trained personnel.

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 applies to:

- hydraulically powered open die forging presses for hot working;
- handling and cooling equipment connected with the control system of the forging line, e. g., manipulators, rotating type handling devices, die shifting devices, table devices and tool changing devices;
- handling equipment designed specifically to be used within the forging line, e. g., material manipulation devices, turnover or handling devices attached to fork lift trucks or cranes etc.

It specifies the health and safety requirements at all stages in the life of the equipment, its design, ordering, construction, use and disposal.

This European Standard specifies requirements to be met by the manufacturer to ensure the health and safety of persons during construction, transport, commissioning, operation, maintenance and de-commissioning, as well as in the event of foreseeable faults as malfunctions which may occur in the equipment.

This European Standard deals with all significant hazards, hazardous situations and events relevant to hydraulically powered hot forging presses when they are used as intended and under conditions foreseeable by the manufacturer (see Clause 4).

This European Standard does not cover:

- hydraulically controlled closed die forging presses for hot working;
- mechanically powered hot forging presses;
- mobile manipulators as defined in 3.4.2;
- standard transport and lifting equipment modified for use with material manipulation devices, turnover and handling devices such as for fork lift trucks and cranes.

This European Standard is not applicable to machinery which was manufactured before the date of publication of this standard by CEN.

## 2 Normative references

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

EN 294, *Safety of machinery — Safety distance to prevent danger zones being reached by the upper limbs*

EN 349, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

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

EN 614-1, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 626-1, *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*

EN 811, *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs*

EN 842, *Safety of machinery - Visual danger signals - General requirements, design and testing*

EN 894-1, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*

EN 894-2, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

EN 894-3, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators - Part 3: Control actuators*

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

EN 954-1<sup>1</sup>, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

EN 981:1996, *Safety of machinery — System of auditory and visual danger and information signals*

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, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts of the human body*

EN 1037:1995, *Safety of machinery — Prevention of unexpected start-up*

EN 1050, *Safety of machinery — Principles for risk assessment*

EN 1088, *Safety of machinery — Interlocking devices associated with guards - Principles for design and selection*

EN 1299, *Mechanical vibration and shock — Vibration isolation of machines — Information for the application of source isolation*

EN 1591-1, *Flanges and their joints — Design rules for gasketed circular flange connections — Part 1: Calculation method*

EN 10204, *Metallic products — Types of inspection documents*

EN 13480-1, *Metallic industrial piping — Part 1: General*

EN 13480-2, *Metallic industrial piping — Part 2: Materials*

EN 13480-3:2002, *Metallic industrial piping — Part 3: Design and calculation*

EN 13480-4:2002, *Metallic industrial piping — Part 4: Fabrication and installation*

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<sup>1)</sup> Will be replaced by prEN ISO 13849-1.

EN 13480-5:2002, *Metallic industrial piping — Part 5: Inspection and testing*

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

EN 60825-1:1994, *Safety of laser products - Part 1: Equipment classification, requirements and user's guide (IEC 60825-1:1993)*

EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals (IEC 61310-1:1995)*

EN 61310-2, *Safety of machinery - Indication, marking and actuation - Part 2: Requirements for marking (IEC 61310-2:1995)*

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

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

EN ISO 3746, *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, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Comparison method for use in situ (ISO 3747:2000)*

EN ISO 7731, *Ergonomics - Danger signals for public and work areas - Auditory danger signals (ISO 7731:2003)*

EN ISO 9614-1, *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, *Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 2: Measurement by scanning (ISO 9614-2:1996)*

EN ISO 11064-1, *Ergonomic design of control centres — Part 1: Principles for the design of control centres (ISO 11064-1:2000)*

EN ISO 11202, *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 11688-1, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

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 13732-1, *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 14122-1, *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, *Safety of machinery - Permanent means of access to machinery - Part 2: Working platforms and walkways (ISO 14122-2:2001)*

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

ISO 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs in workplaces and public areas*

ISO 7000, *Graphical symbols for use on equipment — Index and synopsis*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.

NOTE Definitions used in EN and ISO standards referred to in this European Standard are also valid for this European Standard.

**3.1**  
**hydraulically powered open die hot forging press**  
machine, which is hydraulically powered and which is used for the mechanical forming of hot metals between flat or shaped dies where flow of the metal is not completely restricted

**3.2**  
**manufacturer**  
body responsible for the final installation and commissioning of equipment within the scope of this standard and which issues the declaration of conformity

**3.3**  
**foreseeable risk**  
hazardous event which may occur during installation, commissioning, operation, maintenance and de-commissioning (with the manufacturer's instructions) of the equipment

**3.4**  
**manipulator**  
device to supply and handle material for the forging process

**3.4.1 rail-bound manipulator**  
manipulator guided by rails to supply and handle material for the forging process. It is controlled by the control system of the forging press or manually

**3.4.2 mobile manipulator**  
free moving manipulator operated by a driver to supply and handle material for the forging process

NOTE This specifically excludes cranes and its manual operated handling equipment, mobile manipulators, fork lift trucks with specific handling equipment, tongs and other similar manual handling devices

**3.5**  
**maintenance**  
maintenance in this standard includes maintenance, inspection, servicing, repair, lubrication, adjustment and replacement of the equipment in accordance with the manufacturer's instructions

**3.6**  
**site inspection**  
any inspection carried out in order to gather information relevant to the design and construction of the equipment