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oSIST prEN 12750:2008
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Varnost lesnoobdelovalnih strojev - Rezkalnik za štiristransko obdelavo

Safety of woodworking machines - Four sided moulding machines

Sicherheit von Holzbearbeitungsmaschinen - Fräsmaschinen für vierseitige Bearbeitung

Sécurité des machines pour le travail du bois - Machines à moulurer sur quatre faces

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Safety of woodworking machines - Four sided moulding machines

Sécurité des machines pour le travail du bois - Machines à moulurer sur quatre faces

Sicherheit von Holzbearbeitungsmaschinen - Fräsmaschinen für vierseitige Bearbeitung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 142.

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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Foreword

This document (prEN 12750:2008) has been prepared by Technical Committee CEN/TC 142 "Woodworking machines - Safety", the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12750:2001.

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 the Machinery Directives.

For relationship with EC Directives, see informative Annex ZA and Annex ZB, which are integral part of this document.

Organisations contributing to the preparation of this European Standard include the European Manufacturers Association "EUMABOIS".

The European Standards produced by CEN/TC 142 are particular to woodworking machines and complement the relevant A and B Standards on the subject of general safety (see introduction of EN ISO 12100-1:2003 for a description of A, B and C standards).

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Introduction

This document has been prepared to be a harmonised standard to provide one means of conforming to the Essential Health and Safety Requirements of the Machinery Directive and associated EFTA Regulations.

This document is intended to replace EN 12750:2001. EN 12750:2001 can be further applied until 29/12/2009.

This document is a type C standard as defined in EN ISO 12100-1:2003.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered is 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 other standards, for machines that have been designed and built according to the provisions of this type C standard.

The requirements of this document are directed to manufacturers and their authorised representatives of four sided moulding machines. This document is also useful for designers.

This document also includes provisions and examples of information to be provided by the manufacturer to the user.

Common requirements for tooling are given in EN 847-1:2005 + A1:2007.

1 Scope

This document deals with the significant hazards, hazardous situations and events as listed in clause 4, which are relevant to stationary four sided moulding machines with a maximum working width of 350 mm and a maximum speed of the integrated work-piece feed of 200 m/min, with electrical and/or electronic control system, hereafter referred to as "machines" designed to cut solid wood, chipboard, fibreboard, plywood and also these materials where these are covered with plastic laminate or edgings when they are used as intended and under the conditions foreseen by the manufacturer, including reasonably foreseeable misuse of the machine (see 6.3 c)).

NOTE 1 For the definition of a stationary machine see 3.2.1.

This document deals also with hazards relating to the following optional work units:

universal spindle;

glass bead cutting unit.

This document is not applicable to machines designed for machining logs which have not previously been machined.

This document does not deal with any hazards relating to:

- 1) infeed devices (magazines, hoppers, etc.);

NOTE 2 For mechanical infeed devices which also prevent access to the infeed opening see 5.3.7.2.

- 2) single machines being used in combination with any other machine (as part of a line);
- 3) hot surfaces related to feed speeds exceeding 120 m min⁻¹;
- 4) outfeed devices (e.g. mechanical handling systems) except for hazards related to ejection from the machine due to climb cutting.

This document is not applicable to four sided moulding machines which are manufactured before the date of its publication as EN.

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

EN 847-1:2005 + A1:2007, *Tools for woodworking – Safety requirements – Part 1: Milling tools, circular saw blades*

EN 894-1:1997, *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 894-2:1997, *Safety of machinery – Ergonomics requirements for the design of displays and control actuators – Part 2: Displays*

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EN 894-3:2000, *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 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 1005-1:2001, *Safety of machinery — Human physical performance — Part 1: Terms and definitions*

EN 1005-2:2003, *Safety of machinery — Human physical performance — Part 2: Manual handling of machinery and component parts of machinery*

EN 1005-3:2002, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation*

EN 1005-4:2005, *Safety of machinery — Human physical performance — Part 4: Evaluation of working postures and movements in relation to machinery*

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

EN 1088:1995 + A1:2007, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

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 50178:1997, *Electronic equipment for use in power installations*

EN 50370-1:2005, *Electromagnetic compatibility (EMC) — Product family standard for machine-tools — Part 1: Emission*

EN 50370-2:2003, *Electromagnetic compatibility (EMC) — Product family standard for machine-tools — Part 2: Immunity*

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

EN 60439-1:1999 + A1:2004, *Low-voltage switchgear and controlgear assemblies — Part 1: Type-tested and partially type-tested assemblies (IEC 60439-1:1999)*

EN 60529:1991 + A1:2000, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

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

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

EN 61508-2:2001, *Functional safety of electrical/electronic/programmable electronic safety-related systems — Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems (IEC 61508-2:2000)*

- EN 61508-3:2001, *Functional safety of electrical/electronic/programmable electronic safety-related systems — Part 3: Software requirements (IEC 61508-3:1998 + Corrigendum 1999)*
- EN 61508-7:2001, *Functional safety of electrical/electronic/programmable electronic safety-related systems — Part 7 Overview of techniques and measures (IEC 61508-7:2000)*
- EN 62061:2005, *Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005)*
- EN ISO 20354:2003, *Acoustics - Measurement of sound absorption in a reverberation room (ISO 354:2003)*
- EN ISO 3743-1:1995, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for small, moveable sources in reverberant fields — Part 1: Comparison method for hard-walled test rooms (ISO 3743-1:1994)*
- EN ISO 3743-2:1996, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for small, moveable sources in reverberant fields — Part 2: Methods for special reverberation test rooms (ISO 3743-2:1994)*
- EN ISO 3744:1995, *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 3745:2003 + AC:2006, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Precision methods for anechoic and semi-anechoic rooms (ISO 3745:2003)*
- 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 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 11202:1995 + AC:1997, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a workstation and at other specified positions — Survey method in situ (ISO 11202:1995)*
- EN ISO 11204:1995 + AC:1997, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a workstation and at other specified positions — Method requiring environmental corrections (ISO 11204:1995)*
- EN ISO 11688-1:1998+AC:1998, *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 13849-1:2006, *Safety of machinery — Safety-related parts of controls systems — Part 1: General principles for design (ISO 13849-1:2006)*
- EN ISO 13849-2:2003, *Safety of machinery — Safety-related parts of controls systems — Part 2: Validation (ISO 13849-2:2003)*

3 Terms and definitions

3.1 General

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

3.2 Definitions

3.2.1

four sided moulding machine

machine where the work-piece once loaded manually or by magazine, moves by an integrated feed mechanism (machines where the first feed roller is fitted after the first tool are, for the purpose of this document, integrated fed machines). The machine has at least four work units, one on each side, with rotating planing or moulding tools. The spindles have horizontal and/or vertical axes which can be adjusted manually or under power.

The machine can be fitted with additional work units such as universal spindle(s) or glass bead cutting unit(s)

3.2.2

universal spindle

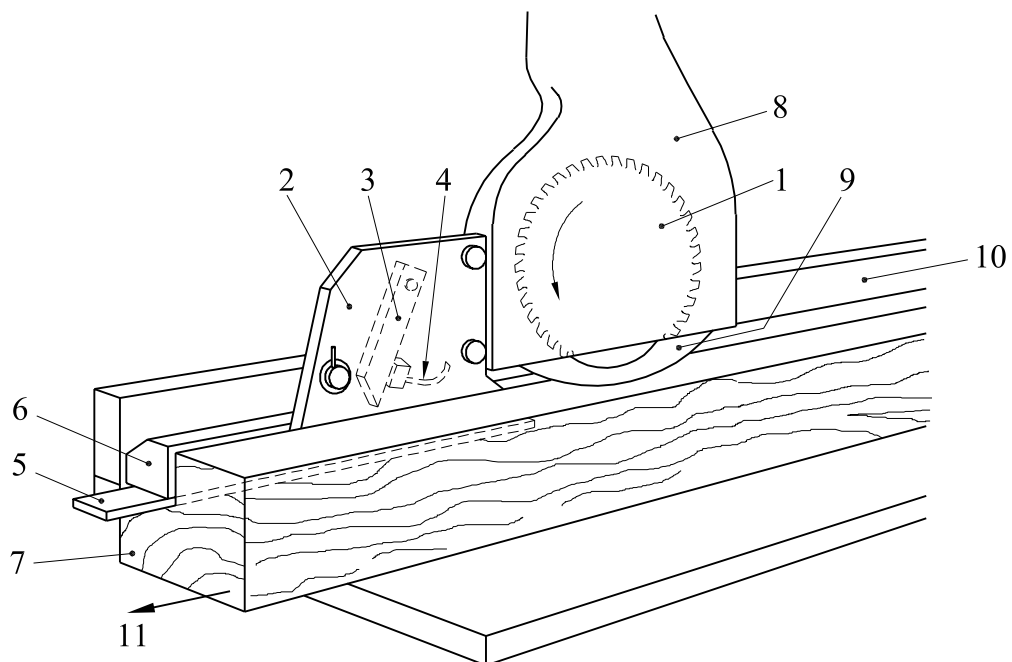
work unit, the position of which can be changed manually or under power so as to allow it to work at different positions around the work-piece

3.2.3

glass bead cutting unit

work unit fitted with a tool, usually a saw blade, to cut out a glass bead from the machined profile of the work-piece (e.g. see figure 1)

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Key

- 1 glass bead saw-blade
- 2 bed ledge separator
- 3 anti-kickback finger
- 4 pressure device <https://standards.iteh.ai/catalog/standards/sist/857427df-f007-40c8-9037-c3872647baea/osist-pren-12750-2008>
- 5 guiding channel for glass bead ledge
- 6 glass bead ledge
- 7 work-piece
- 8 fixed safeguard for glass bead saw blade
- 9 automatic guard for glass bead saw blade
- 10 fence
- 11 feed direction

Figure 1 — Example of a glass bead cutting unit

3.2.4

hydraulic tool fixing device

device for clamping the tool to the spindle using hydraulic pressure

3.2.5

integrated feed on four sided moulding machines

feed mechanism for the work-piece or tool which is integrated with the machine and where the work-piece or machine element with incorporated tool are held and controlled mechanically during the machining operation

3.2.6

loading of four sided moulding machines

manual or automatic placing of the work-piece on to a carriage, magazine, lift, hopper, movable bed, conveyor or the presentation of the work-piece to an integrated feed device

3.2.7

climb cutting

when the relative rotational direction of the tool cutting point is in the same direction as the feed

3.2.8

cutting area of the tool

area of the tool involved in the cutting process

3.2.9

non-cutting area of the tool

area of the tool which is not involved in the cutting process

3.2.10

ejection

uncontrolled movement of the work-piece or parts of it or part of the tool from the machine during processing

3.2.11

kickback

unexpected sudden movement of the work-piece or parts of it opposite to the direction of feed during processing

3.2.12

anti-kickback device

device which either reduces the possibility of kickback or arrests the motion of the work-piece or parts of it during kickback (example see key 5 in Figure 1)

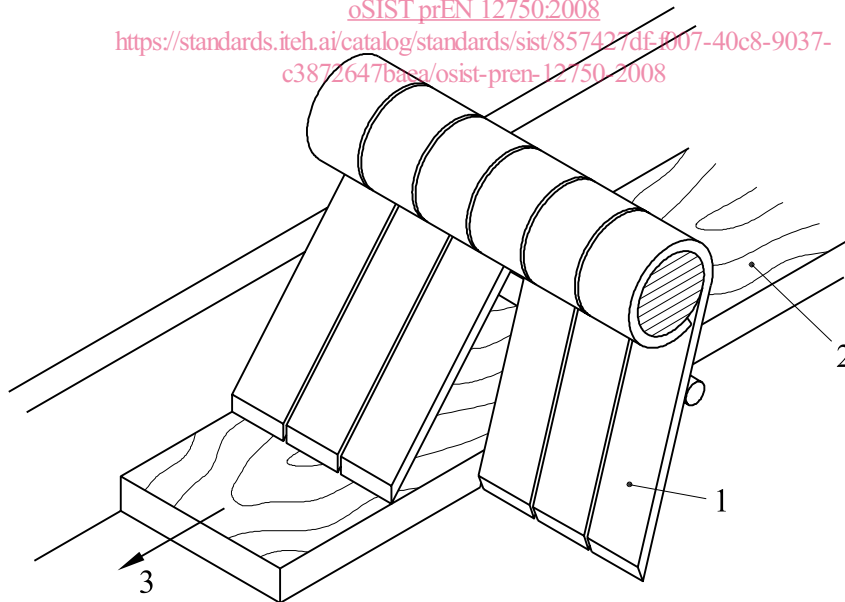
3.2.13

catching fingers device

device designed to prevent the ejection of divided work-pieces (example see Figure 2)

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Key

- 1 catching finger
- 2 work-piece
- 3 feed direction

Figure 2 — Example of a catching fingers device

3.2.14**speed range**

range between the lowest and the highest rotational speed for which the spindle or tool is designed to operate

3.2.15**run-up time**

time elapsed from the actuation of the start control device until the spindle reaches the intended speed

3.2.16**run-down time**

time elapsed from the actuation of the stop control device up to spindle standstill

3.2.17**pressure sensitive protective equipment (PSPE)**

mechanically actuated assembly of devices and/or components working together for protective tripping or presence-sensing purposes comprising as a minimum:

- one or more sensing elements;
- a control unit (where necessary);
- one or more output signal switching device(s).

Safety-related control system associated with the PSPE or the PSPE itself can further include a secondary switching device, start interlock, re-start interlock etc.

NOTE

For example pressure sensitive bars

3.2.18**complete enclosure**

total machine enclosure primarily designed for noise attenuation and to permit the operator to move around freely within it and where all machine setting and adjustments are available inside it. The enclosure contains openings for work-piece loading and unloading and access is normally through a door/opening

3.2.19**integrated enclosure**

safeguarding system consisting of a combination of fixed and moveable guards as integral part of the machine which provides a measure of sound attenuation and where certain setting adjustments may be available outside it

3.2.20**machine actuator**

power mechanism used to effect motion on the machine

3.2.21**stationary machine**

machine designed to be located on or fixed to the floor or other parts of the structure of the premises

3.2.22**safety function**

function of the machine whose failure can result in an immediate increase of the risk(s) (EN ISO 12100-1:2003, 3.28)

3.2.23

safety-related part of a control system (SRP/CS)

part of a control system that responds to safety-related input signals and generates safety-related output signals (EN ISO 13849-1:2006, 3.1.1)

3.2.24

safety-related PLC

programmable logic controller dedicated to safety-related application designed in the required category according to EN ISO 13849-1:2006

3.2.25

safety-related electrical control system (SRECS)

electrical part of a control system whose failure can result in a immediate increase of the risk(s) (EN 62061:2005, 3.2.4)

3.2.26

performance level (PL)

discrete level used to specify the ability of safety-related parts of control systems to perform a safety function under foreseeable conditions (EN ISO 13849-1:2006, 3.1.23)

3.2.27

monitoring system

system with a safety function which ensures that a protective measure is initiated if the ability of a component or an element to perform its function is diminished or if the process conditions are changed in such a way that hazards are generated (EN ISO 13849-1:2006, 3.1.21)

3.2.28

safety-related application software (SRASW)

software specific to the application, that is implemented by the machine manufacturer, generally containing logic sequences, limits and expressions that control the appropriate inputs, outputs, calculations and decisions necessary to meet SRP/CS requirements (EN ISO 13849-1:2006, 3.1.36)

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3.2.29

Safety-related embedded software (SRESW)

firmware

system software

software that is part of the system supplied by the control manufacturer and is not accessible for modification by the user of the machine (EN ISO 13849-1:2006, 3.1.37)

NOTE 1 Embedded software is usually written in FVL.

NOTE 2 For example the operating system of a speed monitoring device.

3.2.30

diagnostic coverage

DC

measure of the effectiveness of diagnostics, which may be determined as the ratio between the failure rate of detected dangerous failures and the failure rate of total dangerous failures (EN ISO 13849-1:2006, 3.1.26)

NOTE Diagnostic coverage can exist for the whole or parts of a safety-related system. For example, diagnostic coverage could exist for sensors and/or logic system and/or final elements.

3.2.31

information from the supplier

statements, sales literature, leaflets or other documents where a manufacturer (supplier) declares either the compliance of the characteristics of e.g. a material or product or the conformity of a material or a product to a relevant standard.

4 List of significant hazards

This clause contains the significant hazards, hazardous situations and events (see EN 1050:1996), as far as they are dealt with in this document, identified by risk assessment as significant for the machines as defined in the scope and which require action to eliminate or reduce the risk. This document deals with these significant hazards by defining safety requirements and/or measures or by reference to relevant standards.

These hazards are listed in Table 1 in accordance with Annex A of EN 1050:1996.

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