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Safety of woodworking machines - One side moulding machines with rotating tool - Part 1: Single spindle vertical moulding machines

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Sicherheit von Holzbearbeitungsmaschinen - Fräsmaschinen für einseitige Bearbeitung mit drehendem Werkzeug - Teil 1: Einspindelige senkrechte Tischfräsmaschinen

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Sécurité des machines pour le travail du bois - Machines à fraiser sur une face, à outil rotatif - Partie 1: Toupie monobroche à broche verticale

Ta slovenski standard je istoveten z: EN 848-1:2007

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English Version

**Safety of woodworking machines - One side moulding machines
with rotating tool - Part 1: Single spindle vertical moulding
machines**

Sécurité des machines pour le travail du bois - Machines à
fraisier sur une face, à outil rotatif - Partie 1: Toupie
monobroche à arbre verticale

Sicherheit von Holzbearbeitungsmaschinen -
Fräsmaschinen für einseitige Bearbeitung mit drehendem
Werkzeug - Teil 1: Einspindelige senkrechte
Tischfräsmaschinen

This European Standard was approved by CEN on 13 January 2007.

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 CEN Management Centre 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 CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN 848-1:2007) has been prepared by Technical Committee CEN/TC 142 "Woodworking machines - Safety", 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of an identical text or by endorsement, at the latest by August 2007, and conflicting national standards shall be withdrawn at the latest by August 2007.

This document supersedes EN 848-1:1998.

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 Directive.

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

Organisation contributing to the preparation of this document include the European Association of Manufacturer of Woodworking Machines "EUMABOIS".

The European Standards produced by CEN/TC 142 are particular to woodworking machines and compliment 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).

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, 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 document has been prepared to be a harmonised standard to provide one means of conforming to the essential safety requirements of the Machinery Directive, and associated EFTA Regulations.

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

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 other standards, for machines that have been designed and built in accordance with the requirements of the provisions of this type C standard.

The requirements of this document are directed to manufacturers and their authorised representatives of single spindle vertical moulding machines. It 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, EN 847-2:2001 and EN 847-3:2004.

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1 Scope

This document deals with the significant hazards, hazardous situations and events as listed in Clause 4 which are relevant to stationary and displaceable hand fed single spindle vertical moulding machines (with or without demountable power feed unit), herein after referred to as "machines", designed to cut solid wood, chip board, fibreboard, plywood and also these materials if they are covered with plastic laminate or edgings when they are used as intended and under the conditions foreseen by the manufacturer.

NOTE 1 For the definition of stationary and displaceable machine see 3.2.17 and 3.2.18.

This document does not apply to:

- a) machines equipped with outboard bearings;
- b) machines equipped with powered movements of front extension table and/or tenoning travelling table;
- c) hand held woodworking machines or any adaptation permitting their use in a different mode, i.e. bench mounting;

NOTE 2 Hand-held motor-operated electric tools are dealt with in EN 60745-1:2003 together with EN 60745-2-17:2003.

- d) machines set up on a bench or a table similar to a bench, which are intended to carry out work in a stationary position, capable of being lifted by one person by hand. The bench can also be an integrated part of the machine if it consists of hinged legs which can be extended down;

NOTE 3 Transportable motor-operated electric tools are dealt with in EN 61029-1:2000 together with prEN 61029-2-8:2003.

This document is not applicable to hand fed single spindle vertical moulding machines which are manufactured before the date of its publication as EN.

NOTE 4 Machines covered by this document are listed under A.7 of Annex IV of the Machinery Directive.

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 distance to prevent danger zones being reached by the upper limbs*

EN 847-1:2005, *Tools for woodworking — Safety requirements — Part 1: Milling tools, circular saw blades*

EN 847-2:2001, *Tools for woodworking — Safety requirements — Part 2: Requirements for the shank of shank mounted milling tools*

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*

EN 894-3:2000, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*

- EN 982:1996, *Safety of machinery — Safety requirements for fluid power systems and components — Hydraulics*
- EN 983:1996, *Safety of machinery — Safety requirements for fluid power systems and 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, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*
- EN 1837:1999, *Safety of machinery — Integral lighting of machines*
- 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, *Low-voltage switchgear and controlgear assemblies — Part 1: Type-tested and partially type-tested assemblies (IEC 60439-1:1999)*
- EN 60529:1991, *Degree of protection provided by enclosure (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 61508-3:2001, *Functional safety of electrical/electronic/programmable electronic safety related systems — Part 3: Software requirements (IEC 61508-3:1998 + Corrigendum 1999)*
- EN 62061:2005, *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable control systems (IEC 62061:2005)*
- EN ISO 3743-1:1995, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for small movable sources in reverberant fields — Part 1: Comparison method for hard-walled test rooms (ISO 3743-1:1994)*

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EN ISO 3743-2:1996, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields — Part 1: 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, *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 discreet points (ISO 9614-1:1993)*

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

EN ISO 11202:1995/AC:1997, *Acoustics — Noise emitted by machinery and equipment — Measurement method of emission sound pressure levels at a work station and at other specified positions — Survey method in situ (ISO 11202:1995/Cor.1:1997)*

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 11204:1995/AC:1997, *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/Cor.1:1997)*

EN ISO 11688-1:1998, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

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 control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13849-2:2003, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2003)*

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

ISO 7009:1983, *Woodworking machines — Single spindle moulding machines — Nomenclature and acceptance conditions*

ISO 7960:1995, *Airborne noise emitted by machine tools — Operating conditions for woodworking machines*

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

single spindle vertical moulding machine

hand fed machine fitted with a single vertical spindle (fixed or removable) the position of which is fixed during machining and a horizontal table, all or part of which are fixed during operation. The spindle passes through the table and its drive motor is situated beneath the table. The machine may have any of the following features:

- a) the facility for the spindle to be vertically adjustable relative to the table;
- b) the facility to tilt the spindle;
- c) the facility for fitting an additional manually operated tenoning travelling table;
- d) the facility for the glass bead recovery;
- e) the facility for an adjustable table insert

3.2.2

straight work

shaping of a work-piece with one face in contact with the table and a second with the fence, and where the work starts at one end of the work-piece and continues through to the other end (see Figure 1)

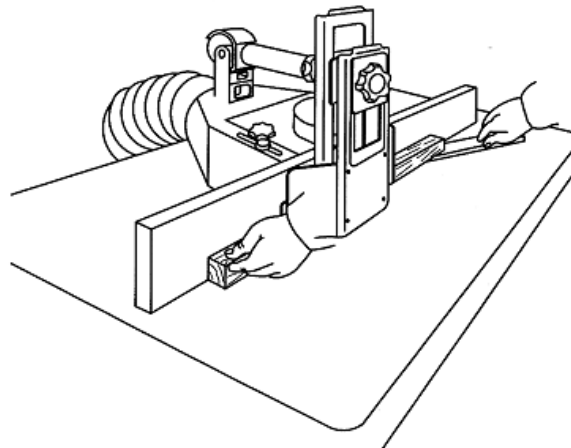
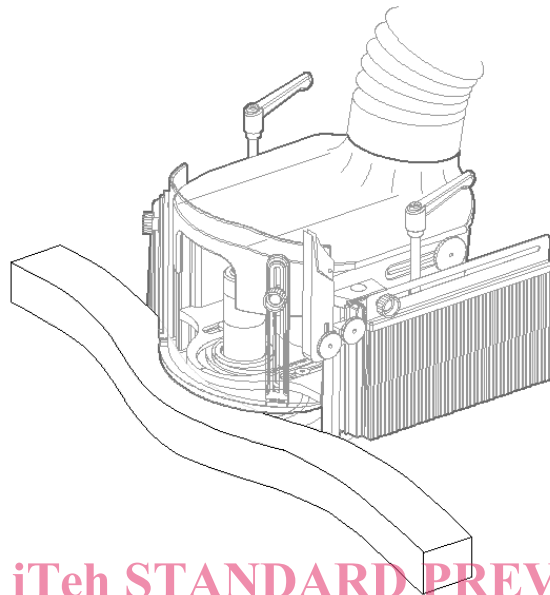


Figure 1 — Example of straight work

**3.2.3
curved work**

machining of a curve on a work-piece by having one side in contact with the table (or if held in a jig with the jig in contact with the table) and the other in contact with the vertical reference of a steady (see Figure 2) or ball ring guide when using a jig



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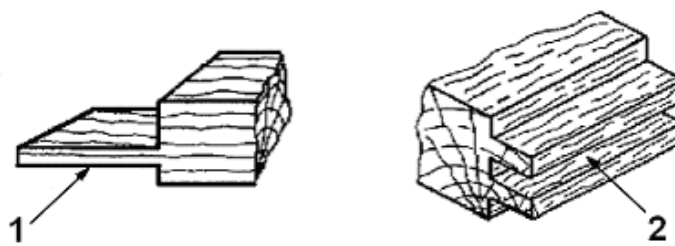
Figure 2 — Example of curved work

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**3.2.4
tenoning**

machining of projections and slots on the end of a work-piece to facilitate the joining of work-pieces. This includes profiled tenons (see Figure 3)



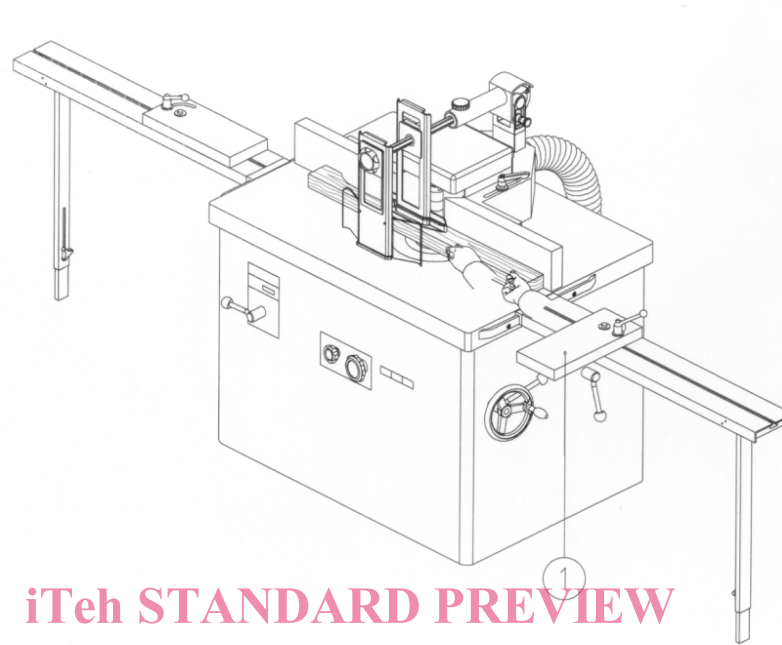
Key

- 1 tenon
- 2 slot

Figure 3 — Example of workpiece with tenon/slot

3.2.5**stopped straight work**

machining of only a part of the work-piece length (see Figure 4)



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Key

1 end stop to prevent kickback

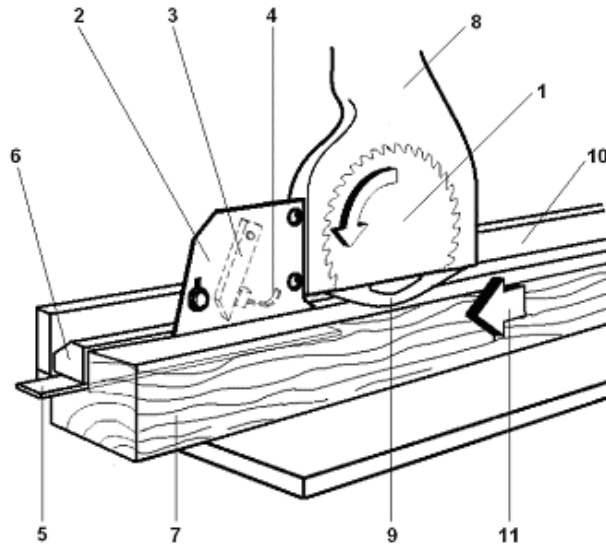
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Figure 4 — Example of stopped straight work

3.2.6**glass bead saw unit**

work unit fitted with a saw-blade to cut out a glass bead from the machined profile of the work-piece (e.g. see Figure 5)



Key

- 1 glass bead saw-blade
- 2 bead ledge separator
- 3 anti-kickback finger
- 4 pressure device
- 5 guiding channel for glass bead ledge
- 6 glass bead ledge
- 7 workpiece
- 8 fixed safeguard for glass bead saw blade
- 9 automatic guard for glass bead saw blade
- 10 fence
- 11 feed direction

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Figure 5 — Example of glass bead recovery unit

3.2.7 hand feed

manual holding and/or guiding of the work-piece. Hand feed may include the use of a hand operated carriage on which the work-piece is placed manually or clamped and the use of a de-mountable power feed unit

3.2.8 de-mountable power feed unit

power feed mechanism which is mounted on the machine so that it can be moved from its working position to a rest position and vice versa without the use of a spanner or similar additional device

3.2.9 speed range

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

3.2.10 kickback

particular form of ejection describing the uncontrolled movement of the work-piece, parts of it or parts of the machine opposite to the direction of feed during processing

3.2.11**anti-kickback device**

device which either reduces the possibility of kickback or arrests the motion during kickback of the work-piece, parts of it or parts of the machine

3.2.12**removable spindle**

tool spindle capable of being changed without removing the main spindle bearings

3.2.13**machine actuator**

power mechanism used to effect motion of the machine

3.2.14**information of the supplier**

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

3.2.15**run-up time**

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

3.2.16**run-down time**

elapsed time from the actuation of the stop control device to spindle stand still

3.2.17**stationary machine**

machine designed to be located on or fixed to the floor or other parts of the structure of the premises and to be stationary during use

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3.2.18**displaceable machine**

machine which is located on the floor, stationary during use and equipped with a device, normally wheels, which allows it to be moved between locations

3.2.19**safety related electrical control system (SRECS)**

electrical that is part of the system supplied by the manufacturer whose failure can result in an immediate increase of the risk(s) (3.2.4 of EN 62061:2005)

3.2.20**embedded software**

software that is part of the system supplied by the manufacturer that is not normally accessible for modification

NOTE 1 Firmware or system software are examples of embedded software (see 3.2.47 of EN 62061:2005).

NOTE 2 Manufacturer means manufacturer of the system.

NOTE 3 For example the operating system of a speed monitoring device.

3.2.21**application software**

software specific to the application that is specifically implemented by the designer of the SRECS, generally containing logic sequences, limits and expressions that control the appropriate inputs, outputs, calculations and decisions necessary to meet the SRECS functional requirements (see 3.2.46 of EN 62061:2005)