SLOVENSKI STANDARD
SIST EN 1218-1:2000

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Varnost lesnoobdelovalnih strojev - Stroji za izdelovanje ţ epov in utorov - 1. del: Enostranski stroji s podajalno mizo

Safety of woodworking machines - Tenoning machines - Part 1: Single end tenoning machines with sliding table

Sicherheit von Holzbearbeitungsmaschinen - Zapfenschneid- und Schlitzmaschinen - Teil 1: Einseitige Zapfenschneid- und Schlitzmaschinen mit Schiebetisch

Sécurité des machines pour le travail du bois - Tenonneuses - Partie 1: Tenonneuses simples a table roulante

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Safety of woodworking machines - Tenoning machines - Part 1: Single end tenoning machines with sliding table

Sécurité des machines pour le travail du bois - Tenonneuses - Partie 1: Tenonneuses simples à table roulante

Sicherheit von Holzbearbeitungsmaschinen - Zapfenschneid- und Schlitzmaschinen - Teil 1: Einseitige Zapfenschneid- und Schlitzmaschinen mit Schiebetisch

This European Standard was approved by CEN on 8 July 1999.

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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.

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

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 142 "Woodworking machines - Safety", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by February 2000, and conflicting national standards shall be withdrawn at the latest by February 2000.

This European Standard 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 standard.

Organisations contributing to the preparation of this European standard include the European Committee of Woodworking Machinery Manufacturers Association "EUMABOIS".

Normative and informative annexes to this standard are listed in the Contents list.

The European Standards produced by CEN/TC142 are particular to woodworking machines and complement the relevant A and B standards on the subject of general safety (see introduction of EN 292-1 : 1991 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European standard 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 European Standard is a type “C” standard as defined in EN 292 : 1991.

The extent to which hazards are covered is indicated in the scope of this standard.

The requirements of this standard concern designers, manufacturers, suppliers and importers of single end tenoning machines with sliding table.

This European Standard also includes information to be provided by the manufacturer to the user.

Common requirements for tooling are given in EN 847-1 : 1997.

1 Scope

This European Standard specifies the requirements and/or measures to remove the hazards and limit the risks on single end tenoning machines with sliding table, hereinafter referred to

as "machines", designed to cut solid wood, chipboard, fibreboard, plywood and also these materials where they are covered with plastic laminate or edgings.

This European Standard covers all the hazards relevant to this machine. These hazards are listed in 4. This European standard does not cover the hazards related to Electromagnetic compatibility (EMC) as stated in the EMC directive 89/336 EEC dated 03.05.89.

This standard does not apply to :

a) machines where the tenon is produced only by means of saw blades;

b) machines where the design speed of any tool spindle exceeds 6000 min^{-1};

c) machines where the average sliding table feed speed in either direction exceeds 25 m min^{-1} + 5%;

d) combined machines used for tenoning (see EN 940 : 1997);

e) tenoning attachments on a vertical spindle moulding machine (see EN 848-1 : 1997).

NOTE : Single and double end tenoning machines fed by chain or chains are dealt with in prEN 1218-2. Single end tenoning machines where the tenon is produced only by means of saw blades are dealt with in prEN 1218-3.

This European Standard is primarily applicable to machines which are manufactured after the date of issue of his standard.

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.

EN 292 - 1 :	1991	Safety of machinery - Basic concepts - General principles for design - Part 1 : Basic terminology, methodology
EN 292 - 2 : EN 292-2/ A1 :	1991 1995	Safety of machinery - Basic concepts - General principles for design - Part 2 : Technical principles and specifications
EN 294 :	1992	Safety of machines - Safety distances to prevent danger zones being reached by the upper limbs
EN 349 :	1993	Safety of machinery - Minimum distances to avoid crushing of parts of the human body
EN 418 :	1992	Safety of machinery - Emergency stop equipment - Functional aspects - Principles for design

EN 847-1 :	1997	Tools for woodworking - Safety requirements - Part 1 : Milling tools and circular sawblades
EN 848-1 :	1997	Safety of woodworking machines - One side moulding machines with rotating tool - Part 1 : Single spindle vertical moulding machines
EN 940 :	1997	Safety of woodworking machines - Combined wood-working machines
EN 953 :	1997	Safety of machinery - General requirements for the design and construction of guards (fixed, movable)
EN 982 :	1996	Safety requirements for fluid power systems and components - Hydraulics
EN 983 :	1996	Safety requirements for fluid power systems and components - Pneumatics
EN 1088 :	1995	Safety of Machinery - Interlocking devices with and without guard locking - General principles and specifications for design
EN 60204-1 :	1992	Safety of Machinery - Electrical equipment of Machines - Part 1 : General requirements (IEC 204-1 : 1992, modified)
EN 60529 :	1991	Degrees of protection provided by enclosures (IP Code) (IEC 529 : 1989)
EN 60947-4-1 :	1992	Low voltage switchgear and control gear - Part 4 : Contactors and motor starters - Section 1 : Electromechanical contactors and motor starters (IEC 947-4-1 : 1990)
EN 60947-5-1 :	1991	Low voltage switchgear and control gear - Part 5 : Control circuit devices and switching elements - Section 1 : Electromechanical control circuit devices (IEC 947-5-1 : 1990)
EN ISO 3743-1 :	1995	Acoustics - Determination of sound power levels of noise sources using sound pressure - 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 - Engineering methods for small, moveable sources in reverberant fields - Part 2 : Method 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 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	1997	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 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 the workstation and at other specified positions - Method requiring environmental corrections (ISO 11204 : 1995)
ISO 230 :	1996	Test code for machine tools
ISO 3745 :	1977	Acoustics - Determination of sound power levels of noise sources - Precision methods for anechoic and semi anechoic rooms
ISO 7960 :	1995	Airborne noise emitted by machine tools - Operating conditions for woodworking machines
ISO 7988 :	1988	Woodworking machines - Double-end tenoning machines - Nomenclature and acceptance conditions
ISO/TR 11688-1 :	1995	Acoustics - Recommended practice for the design of low noise machinery and equipment - Part 1 : Planning
HD 21.1 S3	1997	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V - Part 1 : General requirements.
HD 22.2 S3	1997	Rubber insulated cables of rated voltages up to and including 450/750V - Part 1 : General requirements

3 Definitions

For the purposes of this European Standard the following definitions apply :

3.1 single end tenoning machine with sliding table

A machine designed for the production of a tenon on one end of a workpiece during one cycle. The tenon is cut by means of milling tools and saw blade(s) mounted on one or more spindles.

3.2 tenon

The machined projections and slots on the end of a workpiece to facilitate the joining of workpieces. This includes profiled tenons.

3.3 hand feed

The manual holding and/or guiding of the workpiece or of a machine element incorporating a tool. Hand feed includes the use of a hand operated carriage on which the workpiece is placed manually or clamped and the use of a demountable power feed unit.

3.4 integrated feed

A feed mechanism for the workpiece or tool which is integrated with the machine and where the workpiece or machine element with incorporated tool are held and controlled mechanically during the machining operation.

3.5 ejection

The unexpected movement of the workpiece, parts of it or part of the machine from the machine during processing.

3.6 run-up time

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

3.7 confirmation

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

3.8 machine actuator

A power mechanism used to effect the motion of the machine.

3.9 run-down time

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

4 List of hazards

This standard deals with all hazards relevant to the machine as defined in the scope :

- for significant hazards by defining safety requirements and/or measures or by reference to relevant type B standards;

- for hazards which are not significant e.g. general, minor or secondary hazards by reference to the relevant type A standards especially to EN 292-1 : 1991 and EN 292-2 : 1991.

These hazards are listed in table 1 in accordance with annex A of EN 292- 2 : 1991/A1 : 1995

Table 1 : List of hazards

Number	Hazard	Relevant clause of this standard
1	Mechanical hazards (caused for example by : - shape - relative location - mass and stability (potential energy of elements) - mass and velocity (kinetic energy of elements) - inadequacy of the mechanical strength - accumulation of potential energy by : . elastic elements (springs), or . liquids or gases under pressure, or . vacuum of the machine parts or workpieces	
1.1	Crushing hazard	5.2.1, 5.2.7, 5.2.8
1.2	Shearing hazard	5.2.7, 5.2.8
1.3	Cutting or severing hazard	5.2.2, 5.2.3, 5.2.7, 5.2.8
1.4	Entanglement hazard	5.2.3, 5.2.4, 5.2.6, 5.2.7
1.5	Drawing in or trapping hazard	5.2.7, 5.2.8
1.6	Impact hazard	5.2.7
1.7	Stabbing or puncture hazard	Not relevant
1.8	Friction or abrasion hazard	Not relevant
1.9	High pressure fluid injection hazard	5.3.7, 5.3.8
1.10	Ejection of parts (of machinery and processed materials/workpieces)	5.2.2, 5.2.3, 5.2.5, 5.2.6, 5.2.8
1.11	Loss of stability (of machinery and machine parts)	5.2.1
1.12	Slip, trip and fall hazards in relationship with machinery (because of their mechanical nature)	Not relevant
2	Electrical hazards (caused for example by) :	
2.1	Electrical contact (direct or indirect)	5.3.4, 5.3.15
2.2	Electrostatic phenomena	Not relevant
2.3	Thermal radiation or other phenomena such as ejection of molten particles, and chemical effects from short circuits, overloads, etc.	Not relevant
2.4	External influences on electrical equipment	5.1.1, 5.3.4, 5.3.12
3	Thermal hazards resulting in :	
3.1	Burns and scalds, by a possible contact of persons, by flames or explosions and also by the radiation of heat sources	Not relevant
3.2	Health damaging effects by hot or cold work environment	Not relevant
4	Hazards generated by noise, resulting in :	
4.1	Hearing losses (deafness), other physiological disorders (e.g. loss of balance, loss of awareness)	5.3.2
4.2	Interference with speech communication, acoustic signals, etc.	5.3.2

(continued)

Table 1 : List of hazards (continued)

Number	Hazard	Relevant clause of this standard
5	Hazards generated by vibration (resulting in a variety of neurological and vascular disorders)	Not relevant
6	Hazards generated by radiation, especially by :	
6.1	Electrical arcs	Not relevant
6.2	Lasers	Not relevant
6.3	Ionising radiation sources	Not relevant
6.4	Machines making use of high frequency electro magnetic fields	Not relevant
7	Hazards generated by materials and substances processed, used or exhausted by machinery for example :	
7.1	Hazards resulting from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.3
7.2	Fire and explosion hazard	5.3.1
7.3	Biological and microbiological (viral or bacterial) hazards	Not relevant
8	Hazards generated by neglecting ergonomic principles in machine design (mismatch of machinery with human characteristics and abilities) caused for example by :	
8.1	Unhealthy postures or excessive efforts	5.1.2
8.2	Inadequate consideration of human hand/arm or foot/leg anatomy	Not significant
8.3	Neglected use of personal protection equipment	6.3
8.4	Inadequate area lighting	Not significant
8.5	Mental overload or underload, stress, etc.	Not relevant
8.6	Human error	6.3
9	Hazard combinations	5.1.7
10	Hazards caused by failure of energy supply, breaking down of machinery parts and other functional disorders, for example :	
10.1	Failure of energy supply (of energy and/or control circuits)	5.1.10
10.2	Unexpected ejection of machine parts or fluids	5.2.5, 5.3.15
10.3	Failure, malfunction of control system (unexpected start-up, unexpected overrun).	5.1.11
10.4	Errors of fitting	6.3
10.5	Overturn, unexpected loss of machine stability	5.2.1

(continued)

Table 1 : List of hazards (concluded)

Number	Hazard	Relevant clause of this standard
11	Hazards caused by (temporary) missing and/or incorrectly positioned safety related measures/means, for example :	
11.1	All kinds of guards	5.2.7
11.2	All kinds of safety related (protection) devices	5.1.1, 5.2.7
11.3	Sarting and stopping devices	5.1.2, 5.1.3, 5.1.4
11.4	Safety signs and signals	6.1, 6.2
11.5	All kinds of information or warning devices	6.1, 6.2, 6.3
11.6	Energy supply disconnecting devices	5.3.15
11.7	Emergency devices	5.1.5
11.8	Feeding/removal means for workpieces	5.2.5
11.9	Essential equipment and accessories for safe adjusting and/or maintaining	5.3.16
11.10	Equipment evacuating gases, etc.	5.3.3

5 Safety requirements and/or measures

For guidance in connection with risk reduction by design, see clause 3 of EN 292-2 : 1991/A1 : 1995 and in addition :

5.1 Controls

5.1.1 Safety and reliability of control systems

For the purpose of this standard safety related parts of control systems means the system from and including the initial manual control or position detector or other sensor to the point of input to the final actuator or element e.g. motor. The safety related control systems of this machine are those for :

- starting (see 5.1.3);
- normal stopping (see 5.1.4);
- emergency stop (see 5.1.5);
- interlocking (see 5.2.7);
- interlocking with guard locking (see 5.2.7);
- trip devices (see 5.2.7);
- opening or closing the guard during sliding table movement (see 5.2.7) which :

  a) ensures that the workpiece remains clamped in the event of power failure (see 5.2.8); and

  b) on integrated fed machines prevents movement of the table if the workpiece is not clamped (see 5.2.8).

- spindle positioning (see 5.2.3);
- the dumping of residual pressure (see 5.3.15);
- preventing unexpected start up in the event of power supply failure(see A.1.2.6 of EN 292-2 : 1991/A1 : 1995);
- mode selection (see 5.1.7);