



SLOVENSKI STANDARD

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Varnost lesnoobdelovalnih strojev - Kombinirani lesnoobdelovalni stroji

Safety of woodworking machines - Combined woodworking machines

Sicherheit von Holzbearbeitungsmaschinen - Kombinierte Holzbearbeitungsmaschinen
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Sécurité des machines pour le travail du bois - Machines combinées pour le travail du bois

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ICS:

79.120.10 Lesnoobdelovalni stroji Woodworking machines

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EUROPEAN STANDARD
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Safety of woodworking machines - Combined woodworking machines

Sécurité des machines pour le travail du bois - Machines combinées pour le travail du bois

Sicherheit von Holzbearbeitungsmaschinen - Kombinierte Holzbearbeitungsmaschinen

This European Standard was approved by CEN on 10 July 2009.

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

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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EN 940:2009 (E)**Foreword**

This document (EN 940:2009) 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of an identical text or by endorsement, at the latest by February 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 940:1997.

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 the Machinery Directives 98/37/EC and 2006/42/EC.

For relationship with EU Directives 98/37/EC and 2006/42/EC, see informative Annexes ZA and ZB, which are integral parts of this document.

Organisation contributing to the preparation of this European standard include the European Association of Manufacturers of woodworking machines "EUMABOIS".

The main modifications to EN 940:1997 relate to exclusion of mortising unit driven by a separate motor, to the introduction of categories and requirements on electronic components for control systems.

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 the introduction of EN ISO 12100-1:2003 and/or EN ISO 12100-2:2003 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 the United Kingdom.

Introduction

This document has been prepared to be a harmonised standard to provide one means of conforming with the Essential Safety Requirements of the Machinery Directive and associated EFTA Regulations and 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 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 C type 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 combined woodworking machines. They are also useful for designers.

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

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

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EN 940:2009 (E)**1 Scope**

This document specifies all significant hazards, hazardous situations and events as listed in Clause 4 which are relevant to stationary and displaceable combined woodworking machines with two or more of only the following integrated units:

- surface planing,
- circular sawing (working simultaneously or not with vertical spindle moulding unit),
- vertical spindle moulding,
- boring [mortising] and
- thickness planing

hereinafter referred to as machines, designed to cut solid wood, chipboard, fibreboard, plywood, and also these materials where they are covered with plastic laminates or edging or veneer, when they are used as intended and under the conditions foreseen by the manufacturer.

NOTE 1 For the definitions of stationary and displaceable machine see 3.12 and 3.13.

NOTE 2 The specific requirements on demountable power feed unit will be considered during next revision of this document.

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This document does not apply to:

- combined machines which consist only of a surface planing unit and a thickness planing unit;

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NOTE 3 Combined machines consisting of only of a surface planing unit and a thickness planing unit are dealt with in EN 861:2007.

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- combined machines with a band saw unit;
- transportable motor-operated electric combined tools, or any adaptation permitting their use in a different mode, i.e. bench mounting;

NOTE 4 Transportable motor-operated electric combined tools are covered by the requirements of EN 61029-1:2000 and EN 61029-2-11:2003.

- machines with mortising unit driven by a separate motor.

This document is not applicable to combined woodworking machines which are manufactured before the date of its publication as EN.

NOTE 5 Machines covered by this European Standard are listed under A.5 of Annex IV of the Machinery Directive 98/37/EC and under 5 of Annex IV of Machinery Directive 2006/42/EC.

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 349:1993, *Safety of machinery – Minimum gaps to avoid crushing of parts of the human body*

- EN 614-1:2006, *Safety of machinery – Ergonomic design principles – Part 1: Terminology and general principles*
- EN 847-1:2005, *Tools for woodworking – Safety requirements – Part 1: Milling tools, circular saw blades*
- EN 848-1:2007, *Safety of woodworking machines – One side moulding machines with rotating tool – Part 1: Single spindle vertical moulding machines*
- EN 859:2007, *Safety of woodworking machines – Hand fed surface planing machines*
- EN 860:2007, *Safety of woodworking machines – One side thickness planing machines*
- EN 861:2007, *Safety of woodworking machines – Surface planing and thicknessing machines*
- EN 894-3:2000, *Safety of machinery – Ergonomics requirements for the design of display and control actuators – Part 3: Control actuators*
- 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 1005-3:2002, *Safety of machinery – Human physical performance – Part 3: Recommended force limits for machinery operation*
- 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 1870-1:2007, *Safety of woodworking machines – Circular sawing machines – Part 1: Circular saw benches (with and without sliding table), dimension saws and building site saws*
- 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 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 electronic control systems (IEC 62061:2005)*
- 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)*

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

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 13849-1:2008¹⁾, *Safety of machinery – Safety related parts of controls systems – Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13849-2:2008, *Safety of machinery – Safety related parts of control systems – Part 2: Validation (ISO 13849-2:2003)*

EN ISO 13850:2008, *Safety of machinery – Emergency stop – Principles for design (ISO 13850:2006)*

EN ISO 13857:2008, *Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

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

3 Terms and definitions

For the purposes of this document the terms and definitions given in EN ISO 12100-1:2003, in 3.1 of EN 847-1:2005 and the following apply:

NOTE The elements of combined machines and their terminology are illustrated in 3.3 of EN 848-1:2007, EN 859:2007, EN 860:2007, EN 861:2007 and EN 1870-1:2007 (see also Figure 3).

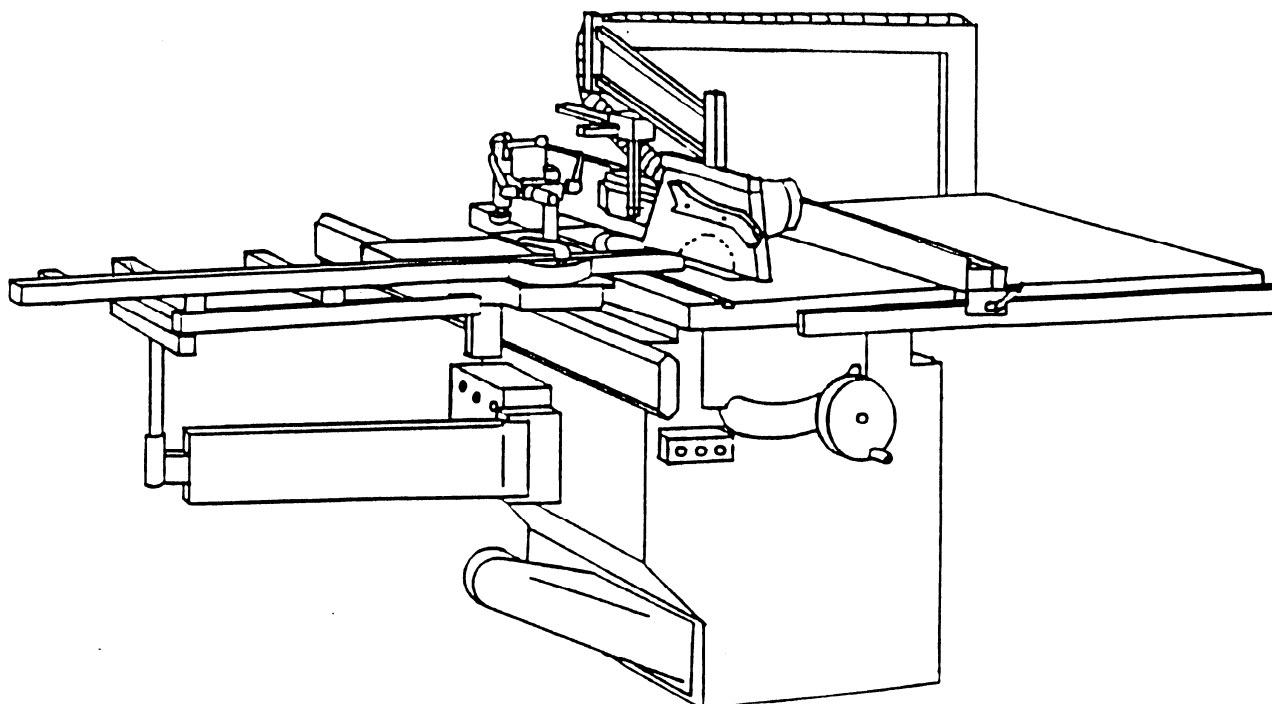
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3.1 combined machine

machine incorporating two or more units such as planer, circular saw, spindle moulder, thicknesser, mortiser, and designed and constructed in such a way as to enable each unit to be used separately, where the workpiece is primarily fed by hand and manually removed between each operation as illustrated in Figures 1a), 1b) and 2a), 2b)

NOTE It can also have facilities for connection of a demountable power feed unit, for saw unit and moulding unit to work at the same time, for grooving (with saw unit), for post formed edge pre-cutting (with saw unit).

¹⁾ EN ISO 13849-1:2006 superseded EN 954-1:1996.

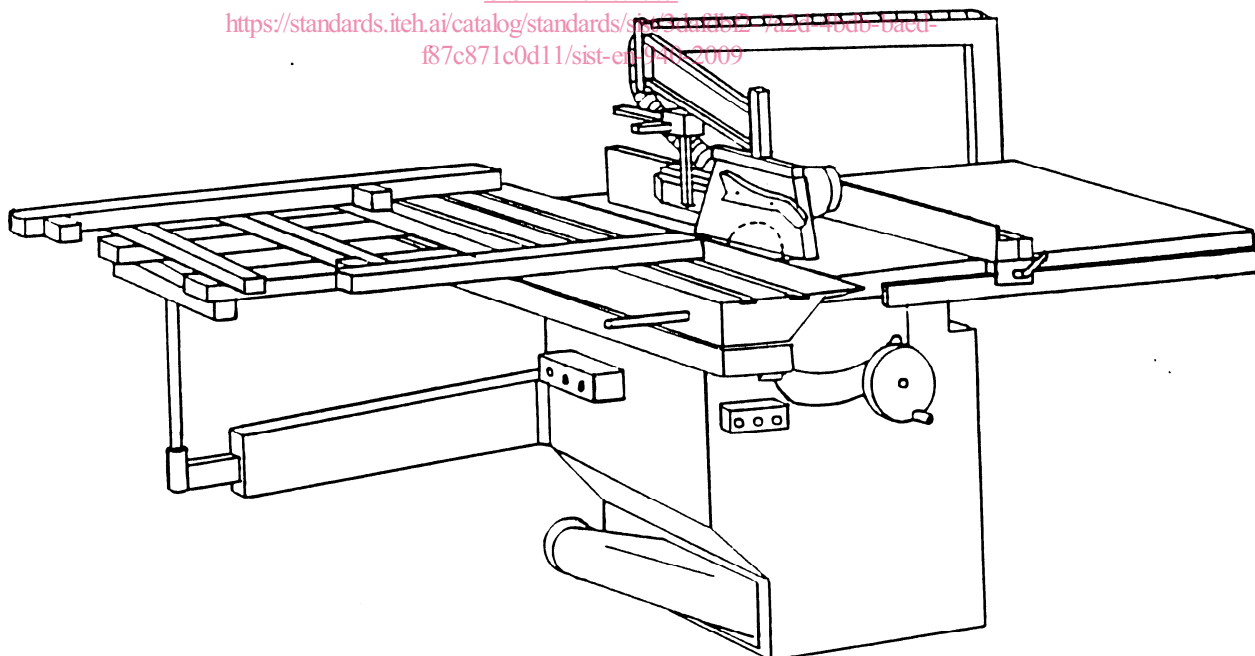


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a) Example of combined woodworking machine with saw bench and spindle moulder fitted with travelling table
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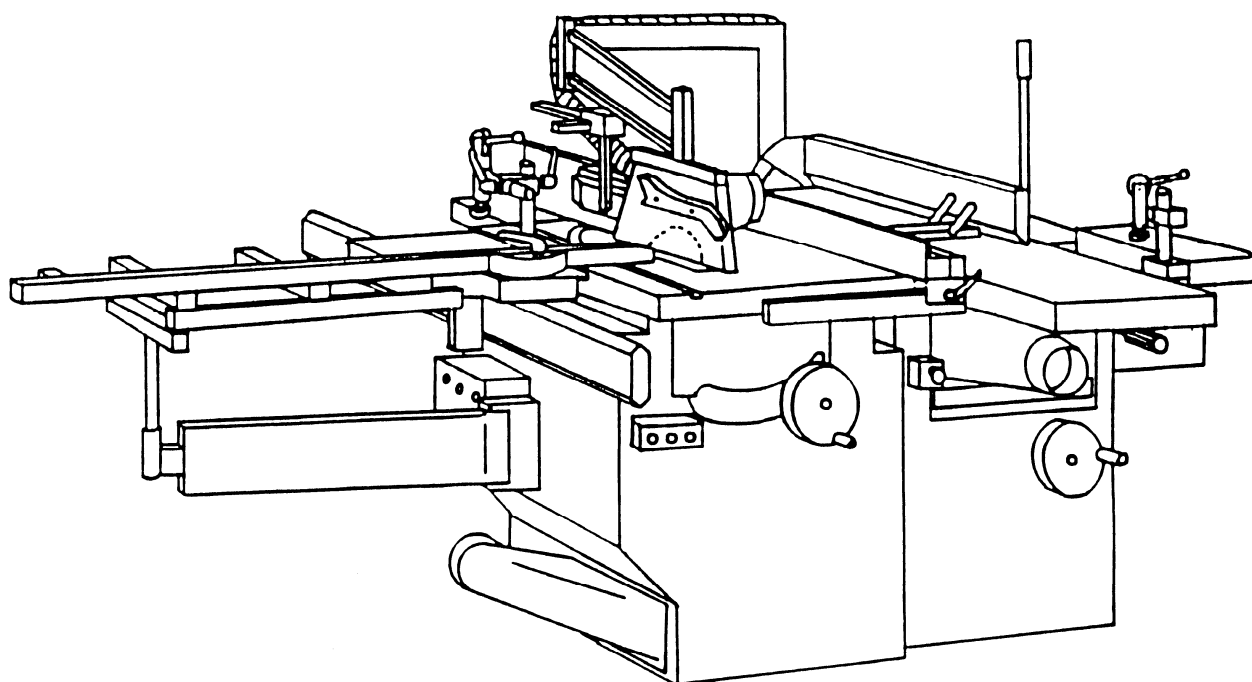
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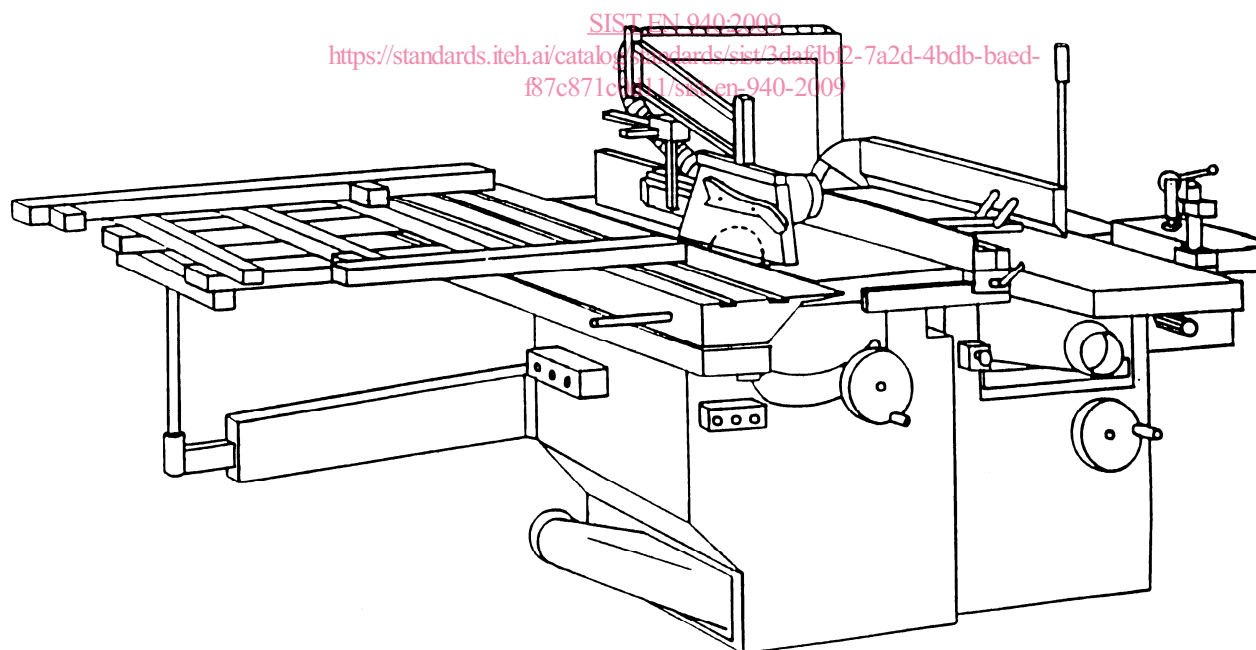
b) Example of combined woodworking machine with dimension saw and spindle moulder fitted with integral sliding table

Figure 1 — Combined woodworking machine with saw and moulding units



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- a) Example of combined woodworking machine with saw bench, spindle moulder, surface planing, thicknessing and mortising units, fitted with travelling table



- b) Example of combined woodworking machine with dimension saw, spindle moulder, surface planing, thicknessing and mortising units fitted with integral sliding table

Figure 2 — Combined woodworking machine with surface planing, thicknessing, mortising, saw and moulding units

3.2**surfacing planing unit**

element of a combined machine designed for cutting off layers of the lower surface of a workpiece by a cutterblock rotating around a horizontal axis, mounted at right angles to the infeed direction between two tables designed to position and support the workpiece

NOTE The cutterblock is a cylindrical shaped complex tool equipped with knives producing horizontal straight cuts while rotating (for a description of the complex tool, see also EN 847-1:2005). The workpiece is fed into the machine against the direction of the cut.

3.3**thicknesser unit**

element of a combined machine designed for cutting off layers of the upper surface of a workpiece by a cutterblock rotating around a horizontal axis, mounted at right angles to the infeed direction above the table designed to position and support the workpiece

NOTE The cutterblock is a cylindrical shaped complex tool equipped with knives producing horizontal straight cuts while rotating (for a description of the complex tool, see also EN 847-1:2005). The workpiece is fed into the machine against the direction of the cut.

3.4**circular saw bench unit**

element of a combined machine fitted with a single circular saw blade which is fixed during the cutting operation, and a horizontal table, all or part of which is fixed during operation

NOTE The saw blade is mounted on a horizontal spindle below the table. The unit may have any of the following main features:

- a) facility for the saw blade to be raised and lowered through the table;
- b) facility to tilt the saw blade for angled cutting;
- c) machine frame below the table may be open or closed in;
- d) additional, manually operated sliding table (not adjacent to the saw blade);
- e) facility for scoring;
- f) facility for grooving.

3.5**dimension saw unit**

element of a combined machine circular saw bench which has an integral sliding table adjacent to the saw blade which may have the facility for post-formed edge pre-cutting

3.6**vertical spindle moulder unit**

element of a combined 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.

NOTE 1 The spindle passes through the table and its drive motor is situated beneath the table.

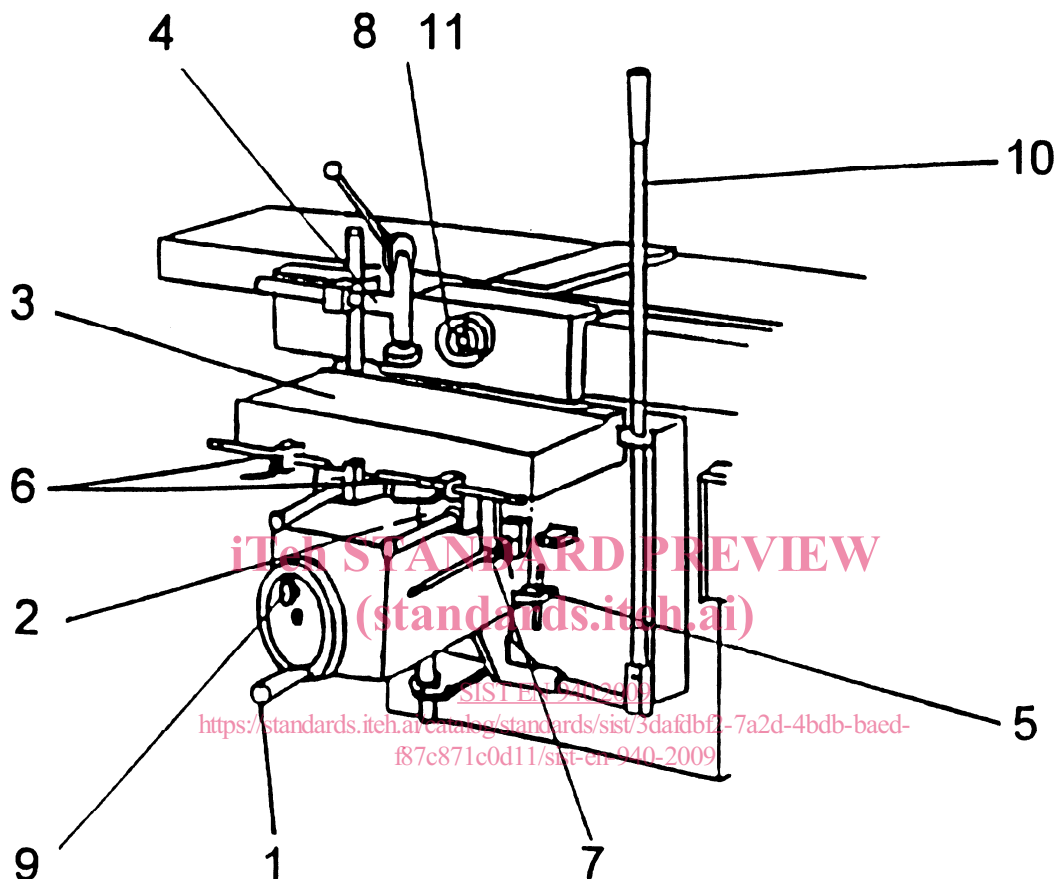
NOTE 2 The unit may have any of the following features:

- 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 sliding table;
- d) the facility for an adjustable table insert.

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3.7 mortising unit (drilling) (fixed or detachable)
 element of a combined machine which is designed for slot boring (mortising) or boring by means of a single rotating tool and a moveable table

NOTE The tool holding device e.g. chuck, is mounted on one end of the cutter block (see Figure 3).

**Key**

- 1 vertical adjustment
- 2 infeed slide
- 3 table
- 4 workpiece clamp
- 5 height stop
- 6 horizontal length stops
- 7 horizontal depth stop
- 8 chuck
- 9 vertical adjustment lock
- 10 table movement control lever
- 11 chuck guard

Figure 3 — Example of a mortising unit

3.8 surface planer/thicknesser unit
 element of a combined machine designed to plane a surface of a workpiece and to give it in a following operation a set thickness by means of a horizontally rotating cutterblock, a cylindrical shaped complex tool equipped with knives producing horizontal straight cuts while rotating

NOTE 1 For a description of the complex tool, see also EN 847-1:2005.

NOTE 2 The workpiece is fed into the machine against the direction of the cut.

NOTE 3 When planing, the workpiece is passed over the cutterblock located between two tables which are used to position and support the workpiece and the lower surface is planed. The infeed table of the surface planing unit is adjustable in height.

When thickening, both of the planing tables are raised. The workpiece rests on the thickening table the distance between it and the cutting circle diameter is adjustable. The upper surface of the workpiece is planed.

3.9

machine actuator

power mechanism designed to effect motion of the machine

3.10

hand feed

manual holding and/or guiding of the workpiece or of a machine element incorporating a tool

NOTE 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.

3.11

demountable 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

3.12

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 fixed in position during machining

3.13

displaceable machine

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

3.14

safety appliance

additional device which is not an integral part of the machine but which assists the operator in the safe feeding of the workpiece e.g. push block or push stick

3.15

kickback

particular form of ejection describing the uncontrolled movement of the workpiece or parts of it or parts of the machine opposite to the direction of feed during processing

3.16

run-up time

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

3.17

run-down time

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

3.18

cutting area of the tool

area where the tool can be involved in the cutting process

3.19

non-cutting area of the tool

area where the tool is not involved in the cutting process