

**SLOVENSKI STANDARD**  
**SIST EN 848-2:2007+A1:2010**  
**01-januar-2010**

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Safety of woodworking machines - One side moulding machines with rotating tool - Part 2: Single spindle hand fed/integrated fed routing machines

Sicherheit von Holzbearbeitungsmaschinen - Fräsmaschinen für einseitige Bearbeitung mit drehendem Werkzeug - Teil 2: Einspindelige Oberfräsmaschinen mit Handvorschub/mechanischem Vorschub

SÉCURITÉ des machines pour le travail du bois - Machines à fraiser sur une face à outil rotatif - Partie 2: Défonceuses monobroches à avance manuelle/mécanisée

**Ta slovenski standard je istoveten z: EN 848-2:2007+A1:2009**

**ICS:**

79.120.10 Lesnoobdelovalni stroji Woodworking machines

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 848-2:2007+A1**

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English Version

**Safety of woodworking machines - One side moulding machines  
with rotating tool - Part 2: Single spindle hand fed/integrated fed  
routing machines**

Sécurité des machines pour le travail du bois - Machines à  
fraisier sur une face à outil rotatif - Partie 2: Défonceuses  
monobroches à avance manuelle/mécanisée

Sicherheit von Holzbearbeitungsmaschinen -  
Fräsmaschinen für einseitige Bearbeitung mit drehendem  
Werkzeug - Teil 2: Einspindelige Oberfräsmaschinen mit  
Handvorschub/mechanischem Vorschub

This European Standard was approved by CEN on 13 January 2007 and includes Amendment 1 approved by CEN on 3 October 2009.

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**EN 848-2:2007+A1:2009 (E)****Foreword**

This document (EN 848-2:2007+A1:2009) 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of an identical text or by endorsement, at the latest by May 2010, and conflicting national standards shall be withdrawn at the latest by May 2010.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 includes Amendment 1, approved by CEN on 2009-10-03.

This document supersedes <sup>A1</sup> EN 848-2:2007 <sup>A1</sup>.

The start and finish of text introduced or altered by amendment is indicated in the text by tags <sup>A1</sup> <sup>A1</sup>.

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 <sup>A1</sup> Machinery Directives <sup>A1</sup>.

<sup>A1</sup> For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. <sup>A1</sup>

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).

<sup>A1</sup> EN 848 *Safety of woodworking machines — One side moulding machines with rotating tool* consists of the following parts:

*Part 1: Single spindle vertical moulding machines*

*Part 2: Single spindle hand fed/integrated fed routing machines*

*Part 3: Numerically controlled (NC) boring and routing machines* <sup>A1</sup>

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 ISO 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 according to the provisions of this type C standard.

The requirements of this document are directed to manufacturers and their authorised representatives of single spindle hand fed/integrated fed routing machines. It is also useful for designers.

This document also includes examples of information which are 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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**EN 848-2:2007+A1:2009 (E)****1 Scope**

This document <sup>[A1]</sup> specifies all significant <sup>[A1]</sup> hazards, hazardous situations and events as listed in Clause 4 which are relevant to stationary and displaceable single spindle hand fed/integrated fed routing machines with fixed head but allowing only movement along the axis of the tool during machining hereinafter referred to as "machines" designed to cut solid wood, chip board, fibreboard, plywood and also these materials if they are covered with plastic laminate, edgings or veneer 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) inverted pin routers and radial arm routers (machines where the work piece is fixed and the tool head is manually moved);
- b) NC boring machines and NC routing machines;

NOTE 2 NC boring machines and NC routing machines are dealt with in EN 848-3:2007.

- c) hand-held routers or any adaptation permitting their use in a different mode, e.g. bench mounting;

NOTE 3 Hand-held motor-operated electric tools are dealt with in EN 60745-1:2003 together with EN 60745-2-17:2003.

- d) routing 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 4 Transportable motor-operated electric tools are dealt with in EN 61029-1:2000 together with <sup>[A1]</sup> EN 61029-2-8:2003 <sup>[A1]</sup>.

This document is not applicable to single spindle hand fed/integrated fed routing 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 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 847-3:2004, *Tools for woodworking — Safety requirements — Part 3: Clamping devices*

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 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, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*
- EN 1837:1999, *Safety of machinery — Integral lighting of machines*
- 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, *Degrees of protection provided by enclosure (IP code) (IEC 60529:1989)*
- 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)*
- 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 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 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)*

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EN ISO 9614-1:1995, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurements at discrete 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 11202:1995/AC:1997, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — 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 13849-1:2008 <sup>A1</sup>, *Safety of machinery — Safety-related parts of controls systems — Part 1: General principles for design (ISO 13849-1:2006)*

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

ISO 7948:1987, *Woodworking machines — Routing machines — Nomenclature and acceptance conditions*

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

HD 22.4 S4:2004, *Cables of rated voltages up to and including 450/750 V and having crosslinked insulation — Part 4: Cords and flexible cables*

### **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**

##### **routing machine**

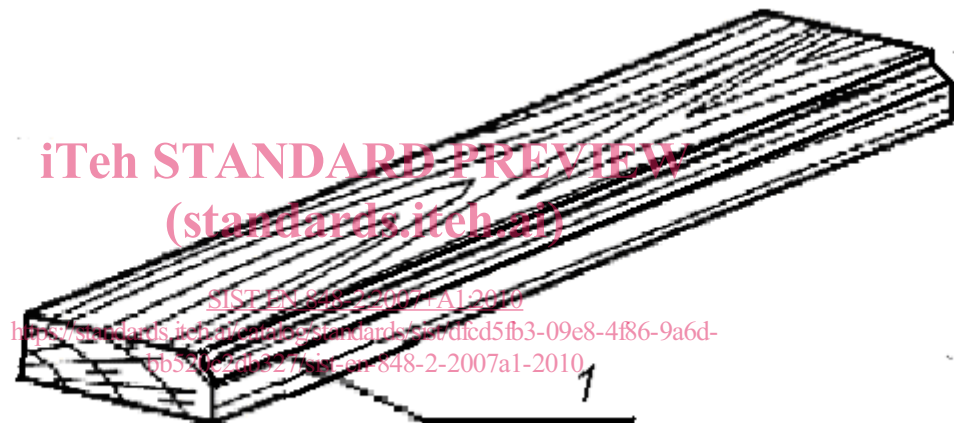
C-frame type machine for the moulding of workpieces by means of:

- a) one tool spindle located above the table and running at speeds between  $6\ 000\ \text{min}^{-1}$  and generally  $24\ 000\ \text{min}^{-1}$ . The work head is tiltable or not and may be movable only along the direction of the axis of the tool during machining;
- b) a table to support the workpiece or jig. The table is tiltable or not and/or movable in X, Y and Z directions and/or adjustable round the C axis;
- c) the tool spindle/work head is either manually or power driven moved vertically during machining or moved by means of hydraulic or pneumatic devices. The workpiece is normally fed to the machine in a direction opposite to the direction of the tool spindle either manually or by means of an integrated feed system

### 3.2.2

#### straight work

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



#### Key

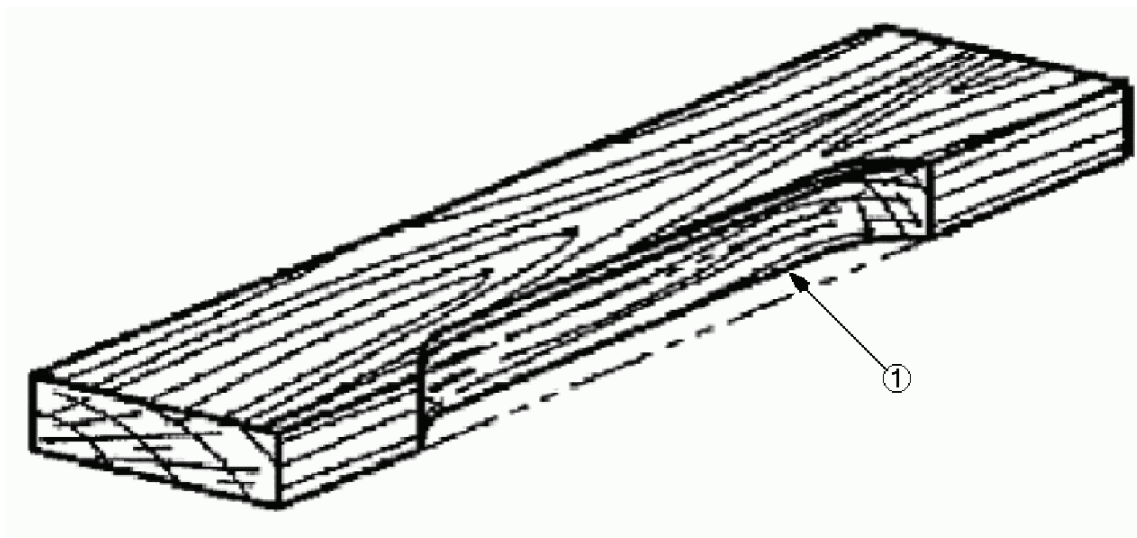
- 1 machined edge

Figure 1 — Example of straight work

### 3.2.3

#### stopped straight work

machining of only a part of the workpiece length (see Figure 2)

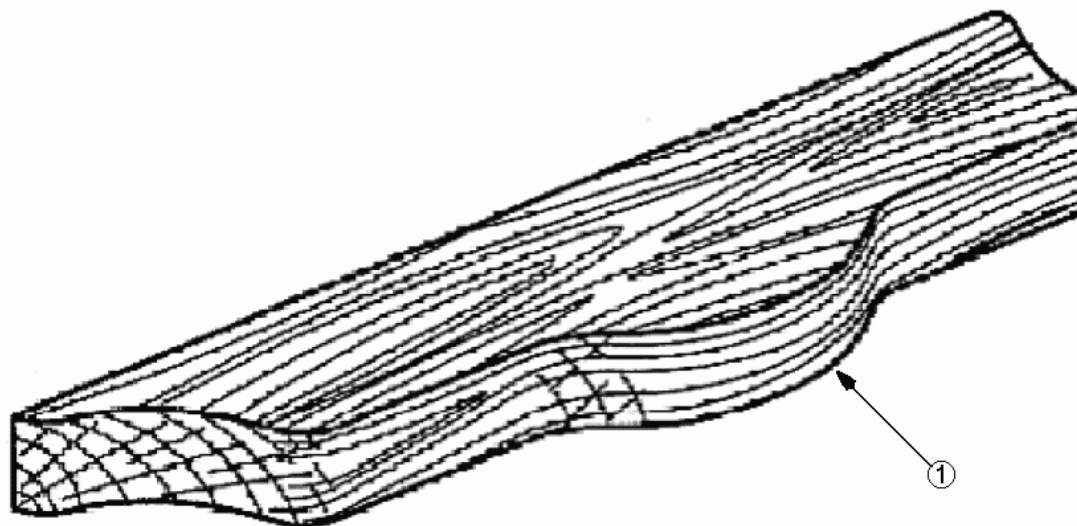
**Key**

1 machined edge

**Figure 2 — Example of stopped straight work****3.2.4****shaped work**

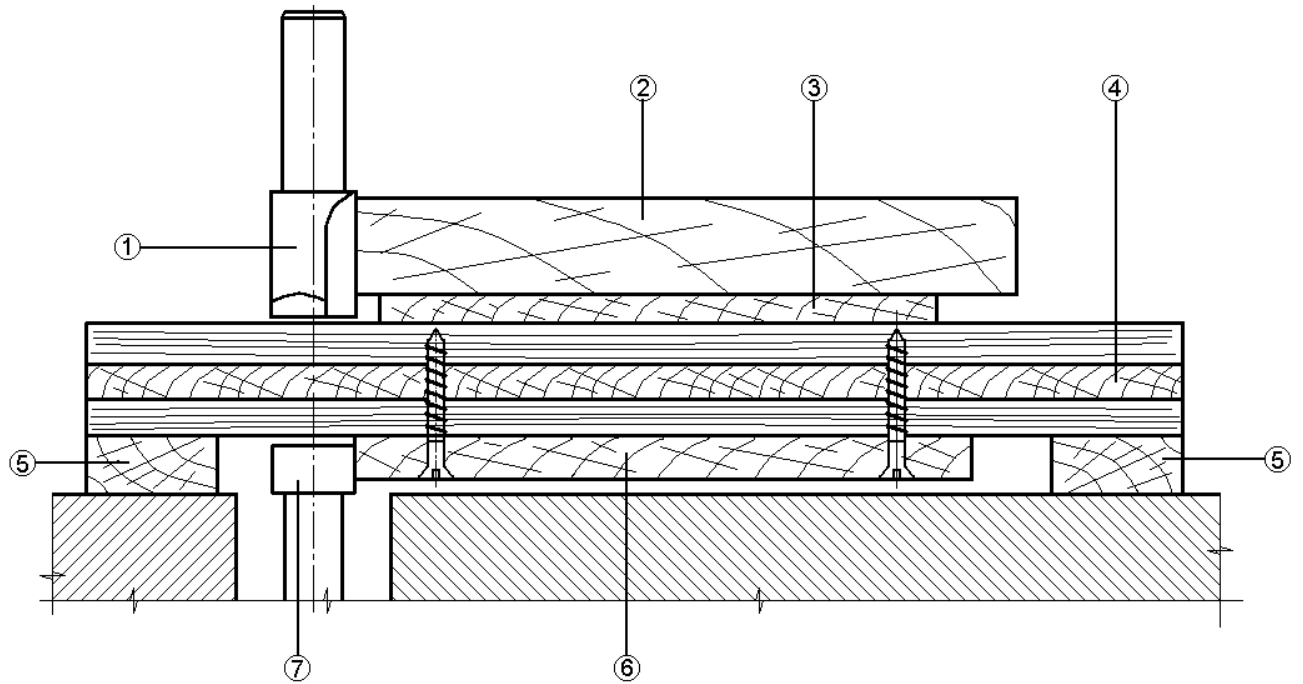
machining of a curve at the edge or on the surface of a workpiece

NOTE 1 One of the techniques is attaching the workpiece to a jig. On the underside of the jig is a template which is in contact with a reference pin located in the centre of the table directly below the cutter. The jig is moved past the pin, but in contact with it, thereby reproducing the shape of the template on the workpiece (see Figures 3 and 4).

**Key**

1 machined edge

**Figure 3 — Example of shaped work**

**Key**

- 1 tool
- 2 workpiece
- 3 plinth
- 4 jig
- 5 hard wood rail
- 6 template
- 7 guiding pin

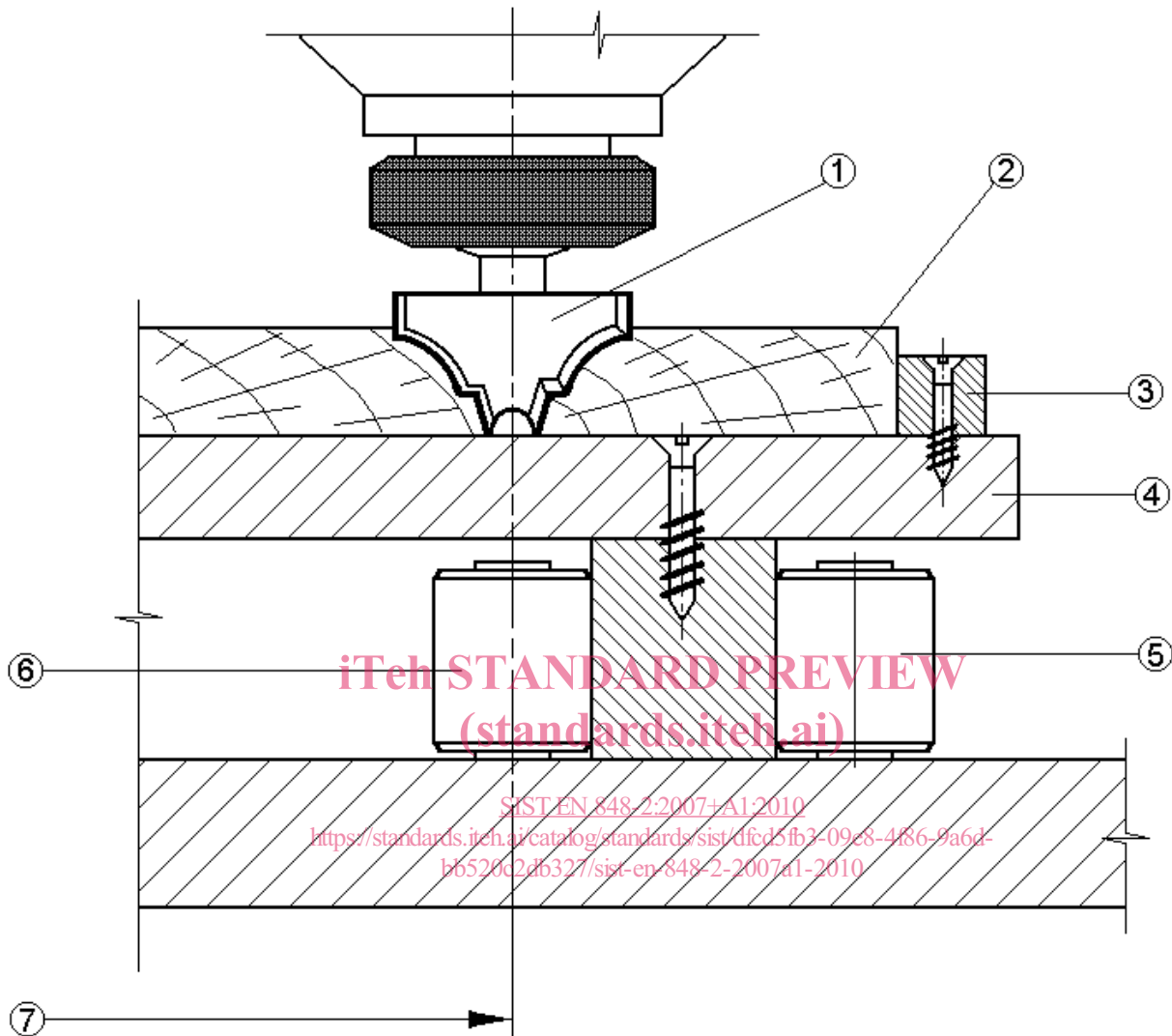
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**Figure 4 — Example of shaped work on a hand fed machine using a template**

NOTE 2 On machines fitted with an integrated workpiece feed system, the template-jig assembly is moved round by drive rollers (see Figure 5).

**Key**

- 1 tool
- 2 workpiece
- 3 stop
- 4 jig
- 5 moving roller
- 6 fixed roller
- 7 centre line

**Figure 5 — Example of shaped work on an integrated feed machine**

**3.2.5****throat capacity**

minimum distance between centre lines of the spindle and column

**3.2.6****hand feed on single spindle hand fed routing machines**

manual holding and/or guiding of the workpiece. Hand feed includes the use of a hand operated jig on which the workpiece is placed manually or clamped

**3.2.7****integrated feed on single spindle integrated feed routing machines**

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

**3.2.8****loading the machine**

manual placing of the workpiece on to a jig or the presentation of the workpiece to an integrated feed 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 workpiece, 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 workpiece, parts of it or parts of the machine

**3.2.12****run-down time**

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

**3.2.13****removable spindle**

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

**3.2.14****machine actuator**

power mechanism used to effect motion of the machine

**3.2.15****information of the supplier**

statement, 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

**3.2.16****revolving stop**

adjustment device located on the mobile part of the machining head to allow for cutting edge position setting with respect to the table for mass production machining

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