



SLOVENSKI STANDARD

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SIST EN 1870-4:2002+A1:2009

Varnost lesnoobdelovalnih strojev - Krožne žage - 4. del: Večlistne krožne žage za vzdolžni rez z ročnim podajanjem in/ali odvzemom

Safety of woodworking machines - Circular sawing machines - Part 4: Multi-blade rip sawing machines with manual loading and/or unloading

Sicherheit von Holzbearbeitungsmaschinen - Kreissägemaschinen - Teil 4: Mehrblattkreissägemaschinen für Längsschnitt mit Handbeschickung und/oder Handentnahme

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Sécurité des machines pour le travail du bois - Machines à scier circulaires - Partie 4 : Scies circulaires à déligner multi-lames à chargement et/ou déchargement manuel

Ta slovenski standard je istoveten z: EN 1870-4:2012

ICS:

25.080.60	Strojne žage	Sawing machines
79.120.10	Lesnoobdelovalni stroji	Woodworking machines

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EUROPEAN STANDARD

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Safety of woodworking machines - Circular sawing machines - Part 4: Multiblade rip sawing machines with manual loading and/or unloading

Sécurité des machines pour le travail du bois - Machines à
scies circulaires - Partie 4: Scies circulaires à délogner
multilames à chargement et/ou déchargement manuel

Sicherheit von Holzbearbeitungsmaschinen -
Kreissägemaschinen - Teil 4:
Mehrblattkreissägemaschinen für Längsschnitt mit
Handbeschickung und/oder Handentnahme

This European Standard was approved by CEN on 21 January 2012.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

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Contents

	Page
Foreword.....	4
Introduction	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	9
3.1 General.....	9
3.2 Definitions	10
4 List of significant hazards	13
5 Safety requirements and/or measures	16
5.1 General.....	16
5.2 Controls	16
5.2.1 Safety and reliability of control systems.....	16
5.2.2 Position of controls	18
5.2.3 Starting	19
5.2.4 Normal stopping	20
5.2.5 Emergency stop	20
5.2.6 Mode selection	21
5.2.7 Powered adjustments.....	23
5.2.8 Integrated feed	23
5.2.9 Feed speed control	24
5.2.10 Failure of the power supply	24
5.2.11 Failure of the control circuits	24
5.3 Protection against mechanical hazards	24
5.3.1 Stability	24
5.3.2 Risk of break up during operation	25
5.3.3 Tool holder and tool design.....	25
5.3.4 Braking.....	26
5.3.5 Devices to prevent the possibility or the effect of ejection.....	27
5.3.6 Workpiece supports and guides	45
5.3.7 Prevention of access to moving parts.....	45
5.4 Protection against non-mechanical hazards	47
5.4.1 Fire	47
5.4.2 Noise	47
5.4.3 Emission of chips and dust.....	48
5.4.4 Electricity.....	49
5.4.5 Ergonomics and handling.....	49
5.4.6 Pneumatics.....	50
5.4.7 Hydraulics.....	50
5.4.8 Electromagnetic compatibility.....	50
5.4.9 Laser	50
5.4.10 Static electricity	51
5.4.11 Errors of fitting.....	51
5.4.12 Supply disconnection (Isolation)	51
5.4.13 Maintenance	51
6 Information for use	52
6.1 General.....	52
6.2 Marking	52
6.3 Instruction handbook	53

Annex A (normative) Dimensional tolerances of saw spindles	57
Annex B (normative) Braking tests	58
B.1 Conditions for all tests	58
B.2 Tests	58
B.2.1 Un-braked run-down time	58
B.2.2 Braked run-down time	58
Annex C (normative) Type test for anti-splinter system	59
C.1 General	59
C.2 Test method	59
C.2.1 Preliminary remarks	59
C.2.2 Test equipment	59
C.2.3 Test sample, tools, installation	61
C.2.4 Test operation	62
C.3 Test result	62
C.4 Test report	63
Annex D (normative) Impact test method for guards	64
D.1 General	64
D.2 Test method	64
D.2.1 Preliminary remarks	64
D.2.2 Testing equipment	64
D.2.3 Projectile for guards	64
D.2.4 Sampling	65
D.2.5 Test procedure	65
D.3 Results	65
D.4 Assessment	65
D.5 Test report	66
D.6 Test equipment for impact test	66
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC	67
Bibliography	70

EN 1870-4:2012 (E)**Foreword**

This document (EN 1870-4:2012) 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 September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

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 1870-4:2001+A1:2009.

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 Directive.

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

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

EN 1870 *Safety of woodworking machines* — *Circular sawing machines* consists of the following parts:

- *Part 1: Circular saw benches (with and without sliding table), dimension saws and building site saws;*
- *Part 3: Down cutting cross-cut saws and dual purpose down cutting cross-cut saws/circular saw benches;*
- *Part 4: Multi-blade rip sawing machines with manual loading and/or unloading;*
- *Part 5: Circular saw benches/up-cutting cross-cut sawing machines;*
- *Part 6: Circular sawing machines for firewood and dual purpose circular sawing machines for firewood/circular saw benches, with manual loading and/or unloading;*
- *Part 7: Single blade log sawing machines with integrated feed table and manual loading and/or unloading;*
- *Part 8: Single blade edging circular rip sawing machines with power driven saw unit and manual loading and/or unloading;*
- *Part 9: Double blade circular sawing machines for cross-cutting with integrated feed and with manual loading and/or unloading;*
- *Part 10: Single blade automatic and semi-automatic up-cutting cross-cut sawing machines;*
- *Part 11: Semi-automatic and automatic horizontal cross-cut sawing machines with one saw unit (radial arm saws);*
- *Part 12: Pendulum cross-cut sawing machines;*
- *Part 13: Horizontal beam panel sawing machines;*
- *Part 14: Vertical panel sawing machines;*

- *Part 15: Multi-blade cross-cut sawing machines with integrated feed of the workpiece and manual loading and/or unloading;*
- *Part 16: Double mitre sawing machines for V-cutting;*
- *Part 17: Manual horizontal cutting cross-cut sawing machines with one saw unit (manual radial arm saws);*
- *Part 18: Dimension saws;*
- *Part 19: Circular saw benches (with and without sliding table) and building site saws.*

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 ISO 12100:2010 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, Croatia, 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, Turkey and United Kingdom.

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EN 1870-4:2012 (E)**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 defined in EN ISO 12100:2010.

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 multi-blade rip sawing machines. They are 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.

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1 Scope

This document deals with all significant hazards, hazardous situations and events as listed in Clause 4 which are relevant to stationary multi-blade rip sawing machines, hereinafter referred to as “machines”, designed to cut solid wood, chipboard, fibreboard, plywood and also these materials, if they are covered with plastic edging and/or plastic/light alloy laminates, when they are used as intended and under the conditions foreseen by the manufacturer including reasonably foreseeable misuse; see also 6.3.

This document does not apply to machines with vertical roller feed or vertical chain conveyor feed or machines designed to make the first rip cut on a log.

This document does not deal with any hazards relating to the combination of single machines with any other machine as part of a line.

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

NOTE Machines covered by this document are listed under 1.3 of the Machinery Directive.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 614-1:2006+A1:2009, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

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

EN 894-1:1997+A1:2008, *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+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

EN 894-3:2000+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*

EN 1005-1:2001+A1:2008, *Safety of machinery — Human physical performance — Part 1: Terms and definitions*

EN 1005-2:2003+A1:2008, *Safety of machinery — Human physical performance — Part 2: Manual handling of machinery and component parts of machinery*

EN 1005-3:2002+A1:2008, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation*

EN 1005-4:2005+A1:2008, *Safety of machinery — Human physical performance — Part 4: Evaluation of working postures and movements in relation to machinery*

EN 1037:1995+A1:2008, *Safety of machinery — Prevention of unexpected start-up*

EN 1049-2:1993, *Textiles — Woven fabrics — Construction — Methods of analysis — Part 2: Determination of number of threads per unit length (ISO 7211-2:1984 modified)*

EN 1870-4:2012 (E)

EN 1088:1995+A2:2008, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

EN 1760-2:2001+A1:2009, *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 60439-1:1999¹⁾, *Low-voltage switchgear and controlgear assemblies — Part 1: Type-tested and partially type-tested assemblies (IEC 60439-1:1999)*

EN 60529:1991²⁾, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60825-1:2007, *Safety of laser products — Part 1: Equipment classification and requirements (IEC 60825-1:2007)*

EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

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

EN 61800-5-2:2007, *Adjustable speed electrical power drive systems — Part 5-2: Safety requirements — Functional (IEC 61800-5-2:2007)*

EN ISO 1421:1998, *Rubber- or plastics-coated fabrics — Determination of tensile strength and elongation at break (ISO 1421:1998)*

EN ISO 2060:1995, *Textiles — Yarn from packages — Determination of linear density (mass per unit length) by the skein method (ISO 2060:1994)*

EN ISO 2286-2:1998, *Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 2: Methods for determination of total mass per unit area, mass per unit area of coating and mass per unit area of substrate (ISO 2286-2:1998)*

EN ISO 3743-1:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for small moveable sources in reverberant fields — Part 1: Comparison method for a hard-walled test room (ISO 3743-1:2010)*

EN ISO 3743-2:2009, *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)*

1) EN 60439-1:1999 is impacted by EN 60439-1:1999/A1:2004.

2) EN 60529:1991 is impacted by EN 60529:1991/A1:2000.

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 3745:2009, *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 3746:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:2010)*

EN ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

EN ISO 4414:2010, *Pneumatic fluid power — General rules and safety requirements for systems and their components (ISO 4414:2010)*

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 9614-1:2009, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurement at discrete points (ISO 9614-1:1993)*

EN ISO 11202:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections (ISO 11202:2010)*

EN ISO 11204:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204:2010)*

EN ISO 11688-1:2009, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of controls systems — Part 1: General principles for design (ISO 13849-1:2006)*

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 4649:2010, *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

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 12100:2010 and the following apply.

EN 1870-4:2012 (E)

3.2 Definitions

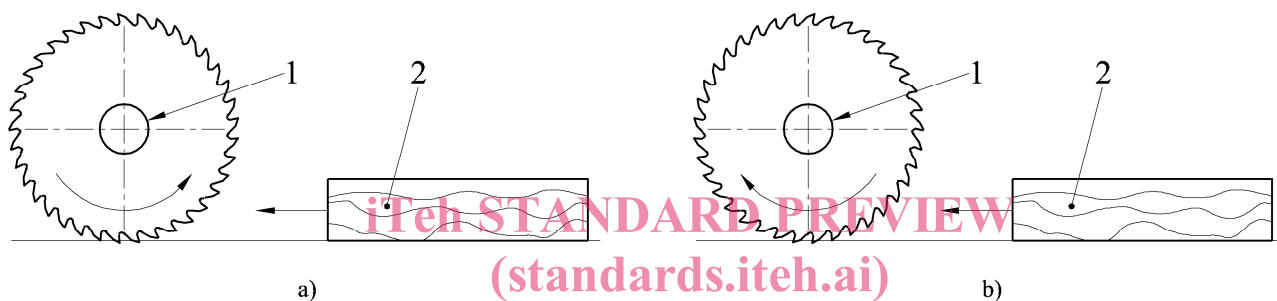
3.2.1

multi-blade rip sawing machine

machine designed to be used with saw blades at different positions on the spindle(s) which are fixed in position during cutting, where the workpiece is fed to the blades by an integrated power feed e.g. rollers, chain conveyor or chain bed, and which has manual loading and/or unloading. The saw blades can be mounted on one or more saw spindle(s) which may be capable of vertical adjustment. The saw blades may be capable of axial adjustment either relative to the spindle or together with the spindle. The saw blade spindle(s) may be arranged so that they are:

- all mounted above the workpiece support;
- all mounted below the workpiece support;
- mounted both above and below the workpiece support.

The cutting mode can be 'against the feed' or 'climb cutting' or a combination of both (see Figure 1).



a) Cutting against the feed

b) Climb cutting

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Key

- 1 fixed saw blade
2 workpiece
→ feed direction

Figure 1 — Relation between cutting direction and feed direction

3.2.2

machine actuator

power mechanism used to effect motion of the machine

3.2.3

integrated feed

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

Note 1 to entry In the case of machines covered by this document, integrated feed is in the form of rollers, chain conveyor or chain bed. The words in brackets are not applicable to the machine covered by this document.

3.2.4

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

3.2.5**loading the machine**

manual or automatic placing of the workpiece onto a carriage, magazine, lift, hopper, moveable bed, conveyor or the presentation of the workpiece to an integrated feed device

3.2.6**ejection**

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

3.2.7**kickback**

particular form of ejection describing the unexpected movement of the workpiece or divided parts of it (or parts of the machine) opposite to the direction of feed during processing

Note 1 to entry The words in brackets are not applicable to the machine covered by this document.

3.2.8**anti-kickback fingers**

moveable elements at the infeed or the outfeed of the machine to prevent kickback of the workpiece or divided parts of it

3.2.9**anti-splinter fingers**

moveable elements at the infeed of the machine to prevent the ejection of splinters

3.2.10**run-up time**

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

3.2.11**run-down time**

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

3.2.12**cutting width capacity**

maximum distance between external cutting surfaces of the two outside saw blades mounted at extreme positions on the saw spindle

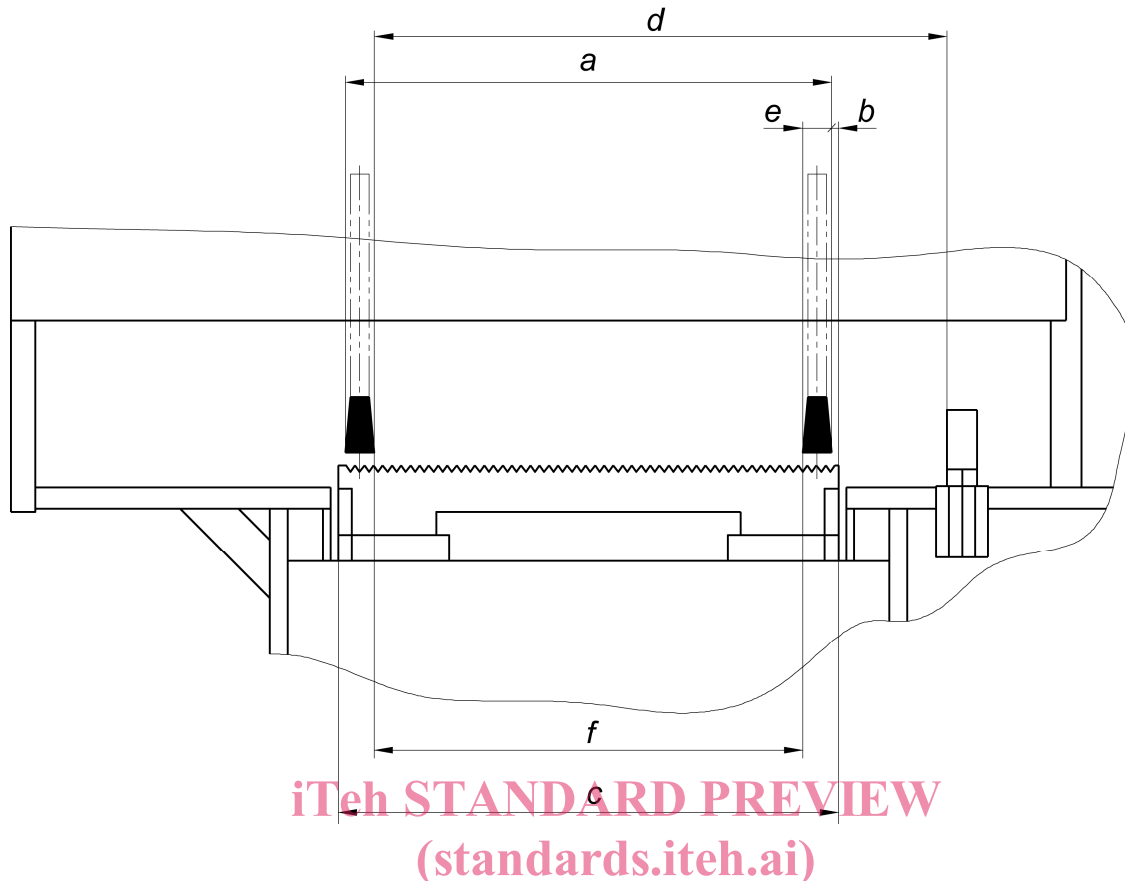
Note 1 to entry See Figure 2, f.

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**Key**

- a maximum distance between the two outer cutting planes of the outside saw blades
- b distance between the inner surface of the outside saw blade and the lateral limitation given by the feed system
- c width of the workpiece conveyor
- d maximum distance between saw blade and fence
- e cutting width of the saw blade
- f cutting width capacity, distance between the inner cutting planes of the outside saw-blades

Figure 2 — Cutting width capacity**3.2.13****manual loading of power fed machines**

where the workpiece is presented by the operator directly to the machine integrated feed, e.g. rotating feed rollers, chain conveyor or chain bed; i.e. for which there is no intermediate loading device to receive and transfer the workpiece from the operator to the integrated feed

3.2.14**manual unloading of power fed machines**

where the workpiece is removed by the operator directly from the machine outfeed, i.e. for which there is no intermediate unloading device to receive and transfer the workpiece from the machine outfeed to the operator

3.2.15**information of the supplier**

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

3.2.16**safety programmable logic controller (PLC)**

programmable logic controller dedicated to safety related application designed in the required PL according to EN ISO 13849-1:2008

3.2.17**safety related part of the control system (SRP/CS)**

part of a control system that responds to safety-related input signals and generate safety-related output signals (EN ISO 13849-1:2008, 3.1.1)

3.2.18**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 13849-1:2008, 3.1.37)

Note 1 to entry Embedded software is usually written in full variability language (FVL) defined in 3.1.35 of EN ISO 13849-1:2008.

Note 2 to entry For example the operating system of a speed monitoring device.

3.2.19**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 13849-1:2008, 3.1.36)

3.2.20**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 13849-1:2008, 3.1.23)

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4 List of significant hazards

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This clause contains all the significant hazards, hazardous situations and events (see EN ISO 12100:2010), 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 Tables 1.