SLOVENSKI STANDARD
SIST EN 1870-4:2002+A1:2009

01-oktober-2009

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

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

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

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

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ICS:

25.080.60	Strojne žage	Sawing machines
79.120.10	Lesnoobdelovalni stroji	Woodworking machines

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English Version

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

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This European Standard was approved by CEN on 19 January 2001 and includes Amendment 1 approved by CEN on 23 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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 1870-4:2001+A1:2009) 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of an identical text or by endorsement, at the latest by February 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.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 includes Amendment 1, approved by CEN on 2009-07-23.

This document supersedes EN 1870-4:2001.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟨A1⟩ ⟨A1⟩.

⟨A1⟩ 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(s), see informative Annexes ZA and ZB, which are integral parts of this document. ⟨A1⟩

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

Annex A is normative, the ⟨A1⟩ Annexes ZA and ZB ⟨A1⟩ are informative.

⟨A1⟩ 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) ⟨A1⟩

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 ⟨A1⟩ EN ISO 12100-1:2003 ⟨A1⟩ 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 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 ⟩A1⟨ EN ISO 12100-1:2003 ⟩A1⟨.

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

The requirements of this European Standard concern designers, manufacturers, suppliers and importers of multiblade rip sawing machines with manual loading and/or unloading.

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

Common requirements for tooling are given in ⟩A1⟨ EN 847-1:2005 ⟩A1⟨.

1 Scope

⟩A1⟨ This document deals with all significant hazards, hazardous situations and events as listed in Clause 4 which are relevant to multi-blade rip sawing machines as defined, herein after referred to as “machines”, designed to cut solid wood, chipboard, fibreboard, plywood and also these materials where they are covered with plastic edging and/or plastic/light alloy laminates. ⟩A1⟨

⟩A1⟨ *deleted text* ⟩A1⟨

This European Standard 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.

For Computer Numerically Controlled machines (CNC) this European Standard does not cover hazards related to electromagnetic compatibility (EMC).

This European Standard is primarily directed at machines which are manufactured after the date of issue of this European Standard.

2 Normative references

⟩A1⟨ 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. ⟩A1⟨

⟩A1⟨ *deleted text* ⟩A1⟨

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

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

⟩A1⟨ 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* A1

A1 *deleted text* A1

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*

A1 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* A1

EN 1088:1995, A1 *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection* A1

A1 EN 1760-2:2001, *Safety of machinery — Pressure sensitive protection devices — Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars* A1

A1 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* A1

A1 EN 60204-1:2006 A1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements* A1 *(IEC 60204-1:2005, modified)* A1

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

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code)* A1 *(IEC 60529:1989)* A1

A1 EN 60825-1:2007, *Safety of laser products — Part 1: Equipment classification and requirements (IEC 60825-1:2007)* A1

A1 EN 60947-4-1:2001 A1, *Low voltage switchgear and control gear — Part 4: Contactors and motor starters – Section 1: Electromechanical contactors and motor starters* A1 *(IEC 60947-4-1:2000)* A1

A1 EN 60947-5-1:2004 A1, *Low voltage switchgear and control gear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices* A1 *(IEC 60947-5-1:2003)* A1

A1 EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)* A1

EN ISO 3743-1:1995, *Acoustics — Determination of sound power levels of noise sources – 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 using sound pressure — Engineering methods for small, moveable sources in reverberant fields — Part 2: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)*

〚A1〛 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)* 〚A1〛

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 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 workstation 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)*

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)*

〚A1〛 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)* 〚A1〛

〚A1〛 EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)* 〚A1〛

〚A1〛 EN ISO 13850:2008, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)* 〚A1〛

〚A1〛 EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)* 〚A1〛

〚A1〛 *deleted text* 〚A1〛

ISO 7960:1995, 〚A1〛 *Airborne noise emitted by machine tools* 〚A1〛 *— Operating conditions for woodworking machines*

〚A1〛 HD 21.1 S4:2002, *Cables of rated voltages up to and including 450/750 V and having thermoplastic insulation — Part 1: General requirements* 〚A1〛

〚A1〛 HD 22.1 S4:2002, *Cables of rated voltages up to and including 450/750 V and having cross-linked insulation — Part 1: General requirements* 〚A1〛

3 Terms and definitions

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

3.1 multiblade rip sawing machine

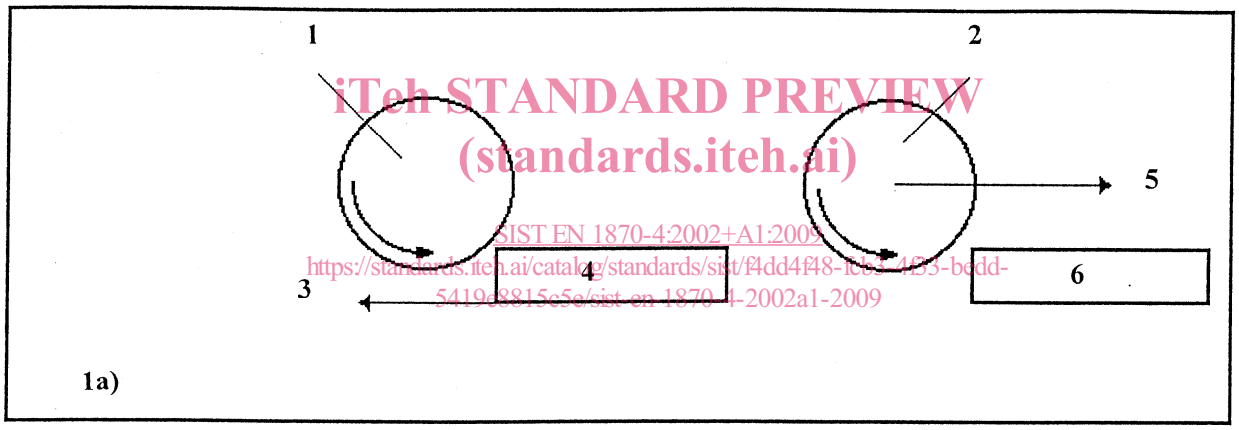
a machine designed to be used with sawblades at different positions on the spindle(s) which are fixed in position during cutting, where the workpiece is fed to the blades by an integrated power feed e.g. rollers, chain conveyor or chain bed, and which has manual loading and/or unloading. The sawblades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

a) all mounted above the workpiece support;

b) all mounted below the workpiece support;

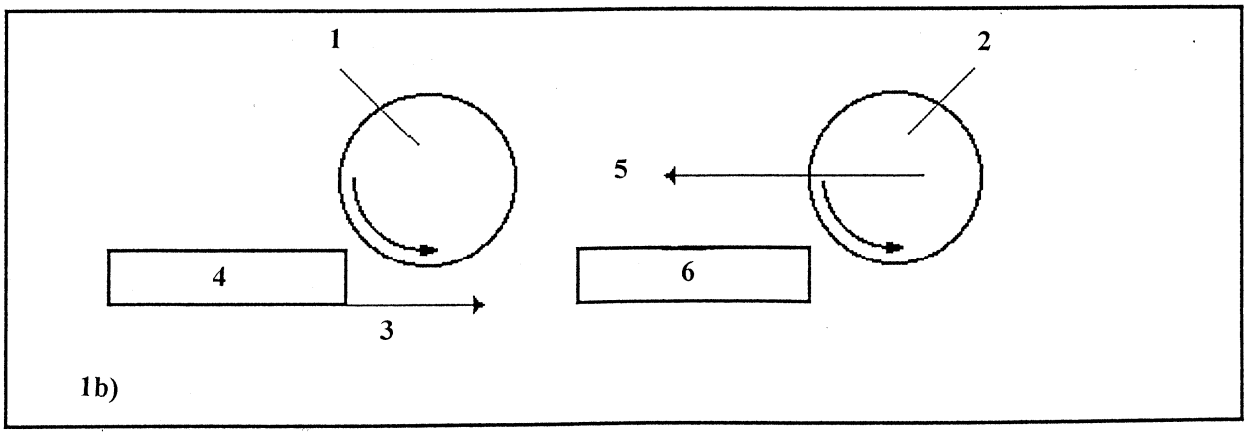
c) mounted both above and below the workpiece support.

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



Key
1 Sawblade not moved
2 Sawblade
3 Feed
4 Workpiece
5 Feed
6 Workpiece not moved

Figure 1 a) — Cutting against the feed:Direction of the workpiece feed in relation to the sawblade rotation



Key
1 Sawblade not moved
2 Sawblade
3 Feed
4 Workpiece
5 Feed
6 Workpiece not moved

Figure 2 b) — Climb cutting:Direction of the workpiece feed in relation to the sawblade rotation

3.2
machine actuator
a power mechanism used to effect motion of the machine

3.3
integrated feed
a 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 In the case of machines covered by this European Standard, 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 European Standard.

3.4
stationary machine
a 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

3.5
loading the machine
the 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

3.6
cutting against the feed
when the relative direction of the tool to the workpiece is as illustrated in Figure 1 a)

3.7
climb cutting
when the relative direction of the tool to the workpiece is as illustrated in Figure 1 b)

3.8
ejection
the unexpected movement of the workpiece, parts of it, or part of the machine from the machine during processing

3.9
kickback
a particular form of ejection describing the unexpected movement of the workpiece or divided parts of it opposite to the direction of feed during processing

3.10
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

3.11
anti-splinter fingers
moveable elements at the infeed of the machine to prevent the ejection of splinters

3.12
run-up time
the time elapsed from the actuation of the start control device until the spindle speed reaches the intended speed

3.13
run-down time
the time elapsed from the actuation of the stop control device up to spindle standstill

3.14
cutting width capacity
the maximum distance between the two outside sawblades, or, where a single sawblade is used, the maximum distance between the sawblade and fence

3.15
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, travelling table or reciprocating carriage; i.e. for which there is no intermediate loading device to receive and transfer the workpiece from the operator to the integrated feed

3.16
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

3.17
A1 information from the supplier A1
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

4 A1 List of significant hazards A1

A1 This clause contains all significant hazards, hazardous situations and events (see EN 1050:1996) as far as they are dealt with in this document, 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 Table 1 in accordance with Annex A of EN 1050:1996.

Table 1 — List of significant hazards

No	Hazards, hazardous situations and hazardous events	EN ISO 12100		Relevant sub-clause of this document
		Part 1: 2003	Part 2: 2003	
1	**Mechanical hazards** related to:			
	- machine parts or workpieces:			
	a) shape;	4.2	4.2.1, 4.2.2, 5	5.2.3, 5.2.5, 5.2.7
	b) relative location;			5.1.2, 5.2.5, 5.2.6
	c) mass and stability (potential energy of elements which may move under the effect of gravity)			5.2.6
	d) mass and velocity (kinetic energy of elements in controlled or uncontrolled motion);			5.2.5, 5.2.6
	e) mechanical strength.			5.2.2, 5.2.5
	- accumulation of energy inside the machinery:			
	g) liquids and gases under pressure;	4.2	4.10, 5.5.4	5.3.7, 5.3.8
1.1	Crushing hazard	4.2.1		5.2.5, 5.2.6, 5.2.7
1.2	Shearing hazard			5.2.5, 5.2.6, 5.2.7
1.3	Cutting or severing hazard			5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.2.6, 5.2.7
1.4	Entanglement hazard			5.2.7
1.5	Drawing-in or trapping hazard			5.2.7
1.6	Impact hazard			5.2.2, 5.2.5
1.7	Stabbing and puncture hazard			5.2.2, 5.2.5
1.9	High pressure fluid injection or ejection hazard			5.3.7, 5.3.8
2	**Electrical hazards** due to:			
2.1	Contact of persons with live parts (direct contact)	4.3	4.9, 5.5.4	5.3.4
2.2	Contact of persons with parts which have become live under faulty conditions (indirect contact)	4.3	4.9	5.3.4
4	**Hazards generated by noise**, resulting in:			
4.1	Hearing loss (deafness), other physiological disorders (loss of balance, loss of awareness)	4.5	4.2.2, 5	5.3.2
4.2	Interference with speech communication, acoustic signals.			5.3.2