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Safety of woodworking machines - Circular sawing machines - Part 9: Double blade circular sawing machines for cross-cutting with integrated feed and with manual loading and/or unloading

Sicherheit von Holzbearbeitungsmaschinen - Kreissägemaschinen - Teil 9: Doppelgehrungskreissägemaschinen mit mechanischem Vorschub und Handbeschickung und/oder Handentnahme

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Sécurité des machines pour le travail du bois - Machines à scier circulaires - Partie 9: Machines à scier à deux lames de scie circulaires, pour tronçonnage, à avance mécanisée et à chargement et/ou déchargement manuels

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ICS:

25.080.60	Strojne žage	Sawing machines
79.120.10	Lesnoobdelovalni stroji	Woodworking machines

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Safety of woodworking machines - Circular sawing machines - Part 9: Double blade circular sawing machines for cross-cutting with integrated feed and with manual loading and/or unloading

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Foreword

This document (EN 1870-9:2000+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of an identical text or by endorsement, at the latest by March 2010, and conflicting national standards shall be withdrawn at the latest by March 2010.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 2009-08-06.

This document supersedes EN 1870-9:2000.

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▌

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

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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)

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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▌

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.

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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 double blade circular sawing machines for cross-cutting with integrated feed and 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 double blade circular sawing machines for cross-cutting with integrated feed and with manual loading and/or unloading, hereinafter referred to as 'machines', designed to cut solid wood, chipboard, fibreboard, plywood and also these materials when covered with plastic edging and/or plastic/light alloy laminate. ⟨A1▐

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This European Standard does not apply to:

— machines for cross cutting logs;

— double blade up-cutting cross-cut sawing machines.

▌A1⟩ *deleted text* ⟨A1▐

For Computer Numerically Controlled (CNC) machines, this European Standard does not cover the 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▐

EN 574:1996, *Safety of machinery — Two hand control devices — Functional aspects — Principles for design*

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

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[A1] EN 847-1:2005 [A1] *Tools for woodworking — Safety requirements — Part 1: Milling tools* [A1] , [A1] *circular sawblades*

[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*

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

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

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

EN 1760-1:1997, *Safety of machinery — Pressure sensitive protective devices — Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors*

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

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, *Low-voltage switchgear and controlgear — Part 4-1: Contactors and motor-starters — Electromechanical contactors and motor-starters (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]

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[A1] CLC/TS 61496-2:2006 [A1], *Safety of machinery — Electro-sensitive protective equipment —* [A1] *Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs) (IEC 61496-2:2006)* [A1]

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: 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 hemi-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)*

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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)*

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[A1] EN ISO 11204:1995 [A1], *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 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 and 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, *Airborne noise emitted by machine tools — 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]

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[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 Definitions

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

3.1
cross-cutting
the operation of cutting across the grain of a wooden workpiece

3.2
double blade circular sawing machine for cross-cutting with integrated feed and with manual loading and/or unloading
a machine fitted with two sawing units for cross-cutting, which has integrated feed and the workpiece is manually loaded and/or unloaded and stationary during cutting. The cutting stroke can be downwards or horizontal.

One or both sawing units can be adjusted horizontally and may be canted or pivoted

3.3
semi-automatic double blade circular sawing machine for cross-cutting
a machine where the saw units have integrated feed which is initiated manually and the workpiece is positioned manually or by means of a positioning mechanism for cutting to length. The cutting stroke can be downwards or horizontal

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3.4
automatic double blade circular sawing machine for cross-cutting
a machine where the saw units have integrated feed which is initiated automatically. The workpiece is manually loaded and/or unloaded and automatically positioned for cutting to pre-selected lengths. The cutting stroke can be downwards or horizontal

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3.5
machine actuator
a power mechanism used to effect motion of the machine

3.6
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 machining operation

3.7
cutting area of the sawblade
the area of the sawblade which can be involved in the cutting process

3.8
non-cutting area of the sawblade
the area of the sawblade where the sawblade is not be involved in the cutting process

3.9
ejection
the unexpected movement of the workpiece or parts of it or part of the machine from the machine during processing

3.10
run-down time
the time elapsed from the actuation of the stop control device up to spindle standstill

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3.11
manual loading of power fed machines
the operation during which 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

3.12
manual unloading of power fed machines
the operation during which 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

3.13
A1 information from the supplier A1
statements, sales literature, leaflets or other, where a manufacturer (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.

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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, 5.2.7, 5.2.8
	b) relative location;			5.1.2, 5.1.3, 5.2.6, 5.2.7, 5.2.8
	d) mass and velocity (kinetic energy of elements in controlled or uncontrolled motion);			5.2.7
	e) mechanical strength.			5.2.2, 5.2.3, 5.2.6
	- 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		5.2.7, 5.2.8
1.2	Shearing hazard			5.2.7, 5.2.8

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1.3	Cutting or severing hazard			5.2.2, 5.2.3, 5.2.7,
1.4	Entanglement hazard			5.2.7
1.5	Drawing-in or trapping hazard			5.2.7
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, 5.3.15, 5.3.16
2.2	Contact of persons with parts which have become live under faulty conditions (indirect contact)	4.3	4.9	5.3.4, 5.3.15, 5.3.16
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
6	**Hazards generated by radiation**			
6.5	Lasers	4.7		5.3.12
7	**Hazards generated by materials and substances** (and their constituent elements) processed or used by the machinery			
7.1	Hazards from contact with or inhalation of harmful fluids and dusts	4.8	4.3b, 4.4	5.3.3
7.2	Fire hazard	4.8	4.4	5.3.1, 5.3.3
8	**Hazards generated by neglecting ergonomic principles in machinery design** related to:			
8.1	Unhealthy postures or excessive effort	4.9	4.7, 4.8.2, 4.11.12, 5.5.5, 5.5.6	5.1.2
8.2	Hand-arm or foot-leg anatomy	4.9	4.8.3	5.1.2
8.4	Local lighting		4.8.6	6.3
8.6	Human error, human behaviour		4.8, 4.11.8, 4.11.10, 5.5.2, 6	6.3
8.7	Design, location or identification of manual controls		4.8.7, 4.11.8	5.1.2
8.8	Design or location of visual display units		4.8.8, 6.2	5.1.2
9	**Combination of hazards**	4.11		5.1.7
10	**Unexpected start up, unexpected overrun/overspeed** (or any similar malfunction) from:			
10.1	Failure/disorder of the control system		4.11, 5.5.4	5.1.1
10.2	Restoration of energy supply after an interruption		4.11.4	5.1.8, 5.1.9, 5.3.7, 5.3.8

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10.3	External influences on electrical equipment		4.11.11	5.1.1, 5.3.4
10.6	Errors made by the operator (due to mismatch of machinery with human characteristics and abilities, see 8.6)	4.9	4.8, 4.11.8, 4.11.10, 5.5.2, 6	5.1.1, 5.3.5, 6.3
11	**Impossibility of stopping the machine in the best possible conditions**		4.11.1, 4.11.3, 5.5.2	5.1.2, 5.1.4, 5.1.5
13	**Failure of the power supply**		4.11.1, 4.11.4	5.1.8
14	**Failure of the control circuit**		4.11, 5.5.4	5.1.1
15	**Errors of fitting**	4.9	4.7, 6.5	5.2.3
16	**Break-up during operation**	4.2.2	4.3	5.2.2
17	**Falling or ejected objects or fluids**	4.2.2	4.3, 4.10	5.2.2, 5.2.3, 5.2.5, 5.2.6, 5.2.8
18	**Loss of stability / overturning of machinery**	4.2.2	5.2.6	5.2.1

A1

5 Safety requirements and/or measures

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For guidance in connection with risk reduction by design, see A1 4.1 of EN ISO 12100-2:2003 A1, and in addition:

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5.1 Controls

5.1.1 Safety and reliability of control systems

For the purposes of this European Standard a safety related control system is one from and including the initial manual control or position detector 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 5.1.3, 5.2.7.2, 5.2.7.6),

— interlocking with guard locking (see 5.2.7.1, 5.2.7.2, 5.2.7.4, 5.2.7.6),

— clamping (see 5.2.8),

— the braking system (see 5.2.4),

— two-hand control (see 5.2.7.1),

— hold to run control (see 5.2.7.3),