



SLOVENSKI STANDARD

SIST EN 1870-11:2004+A1:2009

01-november-2009

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Safety of woodworking machines - Circular sawing machines - Part 11: Semi-automatic and automatic horizontal cross-cut sawing machines with one saw unit (radial arm saws)

Sicherheit von Holzbearbeitungsmaschinen - Kreissägemaschinen - Teil 11:
Halbautomatische und automatische waagrecht schneidende
Auslegerkreissägemaschinen mit einem Sägeaggregat (Radialsägen)

Sécurité des machines pour le travail du bois - Machines à scier circulaires - Partie 11:
Tronçonneuses automatiques et semi-automatiques à coupe horizontale (scies
circulaires radiales)

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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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September 2009

ICS 79.120.10

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English Version

**Safety of woodworking machines - Circular sawing machines -
Part 11: Semi-automatic and automatic horizontal cross-cut
sawing machines with one saw unit (radial arm saws)**

Sécurité des machines pour le travail du bois - Machines à
scier circulaires - Partie 11: Tronçonneuses automatiques
et semi-automatiques à coupe horizontale (scies circulaires
radiales)

Sicherheit von Holzbearbeitungsmaschinen -
Kreissägemaschinen - Teil 11: Halbautomatische und
automatische waagrecht schneidende
Auslegerkreissägemaschinen mit einem Sägeaggregat
(Radialsägen)

This European Standard was approved by CEN on 12 June 2003 and includes Corrigendum 1 issued by CEN on 20 December 2006 and Amendment 1 approved by CEN on 6 August 2009.

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 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 Management Centre has the same status as the official versions.

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EN 1870-11:2003+A1:2009 (E)

Foreword

This document (EN 1870-11:2003+A1:2009) has been prepared by Technical Committee CEN/TC 142, "Woodworking machines - Safety", the secretariat of which is held by UNI.

A1 deleted text **A1**

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 and includes Corrigendum 1 issued by CEN on 2006-12-20.

This document supersedes EN 1870-11:2003.

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

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags **AC** **AC**.

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 the European Committee of Woodworking Machinery Manufacturer's Association "EUMABOIS".

Annex B is normative and **A1** Annexes A, 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).

^{AC} deleted text ^{AC}

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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.

EN 1870-11:2003+A1:2009 (E)

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  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 European Standard are directed to manufacturers and their authorised representatives of semi-automatic and automatic horizontal cutting cross-cut sawing machines with one saw unit (radial arm saws). It is also useful for designers.

This European Standard also includes examples of information which can be provided by the manufacturer to the user.

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

1 Scope



 This document deals with all significant hazards, hazardous situations and events as listed in Clause 4 which are relevant to semi-automatic and automatic horizontal cutting cross-cut sawing machines with one saw unit (radial arm saws), 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 laminates. 

Any work-piece positioning equipment fitted to the machine is included in this European Standard.



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This European Standard does not apply to machines:

- a) with manual feed of the saw unit; or
- b) for cross cutting logs; or
- c) specifically designed for sawing and/or milling roof timber frames; or
- d) fitted with hydraulic braking systems.

 NOTE 1  Radial arm saws with manual feed of the saw unit (the saw unit is moved by hand) are dealt with in prEN 1870-17 and prEN 61029-2-2.

For Computer Numerically Controlled (CNC) machines this European Standard does not cover hazards related to Electro-Magnetic Compatibility (EMC).

 NOTE 2  The requirements of this European Standard apply to all machines whatever their method of control e.g. electromechanical and/or electronic.

This European Standard is primarily directed to machines which are manufactured after the date of issue of publication by CEN.

NOTE 3 Machines covered by this European Standard are listed under A.1.4 of Annex IV of the Machinery Directive.

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.

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

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

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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*

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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*

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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*

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

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

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

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

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)

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 — Determination 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 work station 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 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)*

 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)* 



 EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control 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)* 

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



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

 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* 

 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 European Standard the definitions given in  EN ISO 12100-1:2003  apply. Additional definitions specifically needed for this European Standard are shown in Clause 3.2.

3.2 Definitions

3.2.1

cross-cutting

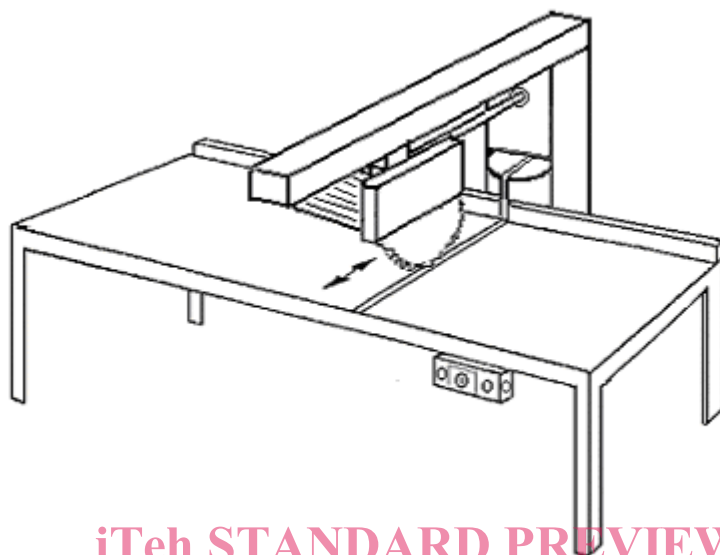
operation of cutting across the grain of a wooden work-piece

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3.2.2

semi-automatic and automatic horizontal cutting cross-cut sawing machine with one saw unit (radial arm saw)

machine where the saw unit has integrated feed and moves horizontally forward on an arm in a straight line during the cutting stroke and then back to its rest position. The arm can rotate relative to the centre line of its vertical support (pivoting) and the saw unit can cant relative to a horizontal line in direction of the arm (see Figure 1)



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Figure 1 — Example of a horizontal cutting cross-cut sawing machine with one saw unit (semi-automatic machine)

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3.2.3

semi-automatic cross-cut sawing machine

machine where the saw unit has integrated feed which is initiated manually and the work-piece is positioned manually or by means of a positioning mechanism for cutting to length

3.2.4

automatic cross-cut sawing machine

machine where the saw unit has integrated feed, the work-piece is manually loaded and/or unloaded, automatically positioned for cutting to pre-selected lengths and where the integrated feed of the saw unit is initiated automatically

3.2.5

machine actuator

power mechanism used to effect motion of the machine

3.2.6

integrated feed on radial arm saws

power operated feed mechanism for the saw-blade and work-piece which is integrated with the machine and where the saw unit with incorporated saw-blade and the work-piece are held and controlled mechanically during the machining operation

3.2.7

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

3.2.8**displaceable machine**

machine which is located on the floor, stationary during use and equipped with a device, normally wheels, which allow it to be moved between locations

3.2.9**cutting area of the saw-blade**

area where the saw-blade can be involved in the cutting process

3.2.10**non-cutting area of the saw-blade**

area of the saw-blade where the saw-blade is not involved in the cutting process

3.2.11**cutting area of a semi-automatic and automatic radial arm saw**

area defined by all possible positions in front of the fence of the saw-blade with the maximum diameter for which the machine is designed, taking into account the saw unit's ability to cant or pivot for angled cutting and the maximum cutting stroke and cutting depth

3.2.12**run-up time**

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

3.2.13**unbraked run-down time**

time elapsed from the actuation of the stop control, but not the braking device (if fitted) up to spindle standstill

3.14**braked run-down time**

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

3.2.15**manual loading of power fed machines**

operation where the work-piece 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 work-piece from the operator to the integrated feed

3.2.16**manual unloading of power fed machines**

operation where the work-piece is removed by the operator directly from the machine out feed; i.e. for which there is no intermediate unloading device to receive and transfer the work-piece from the machine out feed to the operator

3.2.17**information from the supplier**

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

4 List of significant hazards

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.