

Safety of woodworking machines — Circular 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

ICS 79.120.10

National foreword

This British Standard is the UK implementation of EN 1870-6:2002+A1:2009. It supersedes BS EN 1870-6:2002 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee MTE/23, Woodworking machines.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for their correct application.

Compliance with a British Standard cannot immunity from legal obligations.

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English Version

**Safety of woodworking machines - Circular 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**

Sécurité des machines pour le travail du bois - Machines à
scies circulaires - Partie 6: Scies circulaires à chevalet
et/ou à table pour la coupe du bois de chauffage, avec
chargement et/ou déchargement manuel

Sicherheit von Holzbearbeitungsmaschinen -
Kreissägemaschinen - Teil 6:
Brennholzkreissägemaschinen und kombinierte Brennholz-
und Tischkreissägemaschinen, mit Handbeschickung
und/oder Handentnahme

This European Standard was approved by CEN on 8 November 2001 and includes Amendment 1 approved by CEN on 13 August 2009.

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Foreword

This document (EN 1870-6:2002+A1:2009) has been prepared by Technical Committee 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of an identical text or by endorsement, at the latest by March 2010, and conflicting national standards shall be withdrawn at the latest by March 2010.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 2009-08-13.

This document supersedes EN 1870-6:2002.

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".

Annexes A, B, C, D, E, F and G are normative and **A1** Annexes ZA and ZB **A1** are informative.

The European Standards produced by CEN/TC 142 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).

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)

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.

0 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 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 circular sawing machines for firewood and dual-purpose circular sawing machines for firewood/circular saw benches, 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  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 firewood and dual-purpose circular sawing machines for firewood/circular saw benches, with manual loading and/or unloading, hereinafter referred to as “machines”, designed to cut solid wood. 

On Combined circular sawing machines for firewood - Log splitting machines only the circular sawing machine for firewood is covered by this European Standard. For the requirements for the log splitting part of this machine see EN 609-1: 1999 and EN 609-2: 1999.

 *deleted text* 

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

This European Standard does not apply to:

- log sawing machines where the saw unit moves to cut the workpiece;
- machines where the saw blade is capable of tilting;
-  hand-held motor-operated electric tools or any adaptation permitting their use in a different mode, i.e. bench mounting; 

 NOTE 1 Hand-held motor-operated electric tools and saw benches to form an integrated whole with a hand-held motor-operated electric tools are covered by EN 60745-1:2006 together with EN 60745-2-5:2007. 

- machines driven by an internal combustion engine

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

 NOTE 2  Machines covered by this European Standard are listed under A.1.1 and/or A.1.2 of annex IV of the Machinery Directive

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 **[A1]**, *Tools for woodworking — Safety requirements — Part 1: Milling tools* **[A1]**, **[A1]** *circular saw blades*

[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, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*

EN 983, *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, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

[A1] *deleted text* **[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  (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, *Degrees of protection provided by enclosures (IP code)* (IEC 60529:1989)

 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) 

 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) 

EN ISO 3743-1, *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,  *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, *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, *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 4254-1:2005, *Agricultural machinery — Safety — Part 1: General requirements* (ISO 4254-1:2005) 

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

EN ISO 9614-1, *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 11204:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a workstation and at other specified positions — Method requiring environmental corrections* (ISO 11204:1995)

EN ISO 11688-1, *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) 

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

Ⓐ₁ EN ISO 13850:2008, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)* Ⓐ₁

Ⓐ₁ EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)* Ⓐ₁

Ⓐ₁ *deleted text* Ⓐ₁

ISO 7960:1995, Ⓐ₁ *Airborne noise emitted by machine tools — Operating conditions for woodworking machines* Ⓐ₁

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

Ⓐ₁ 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* Ⓐ₁

Ⓐ₁ 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* Ⓐ₁

3 Terms and definitions

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

3.1 Terms

The different types of circular sawing machines for firewood and dual-purpose circular sawing machines for firewood/circular saw benches and their main parts of the machine are illustrated in the Figures 1, 2, 3 and 4.

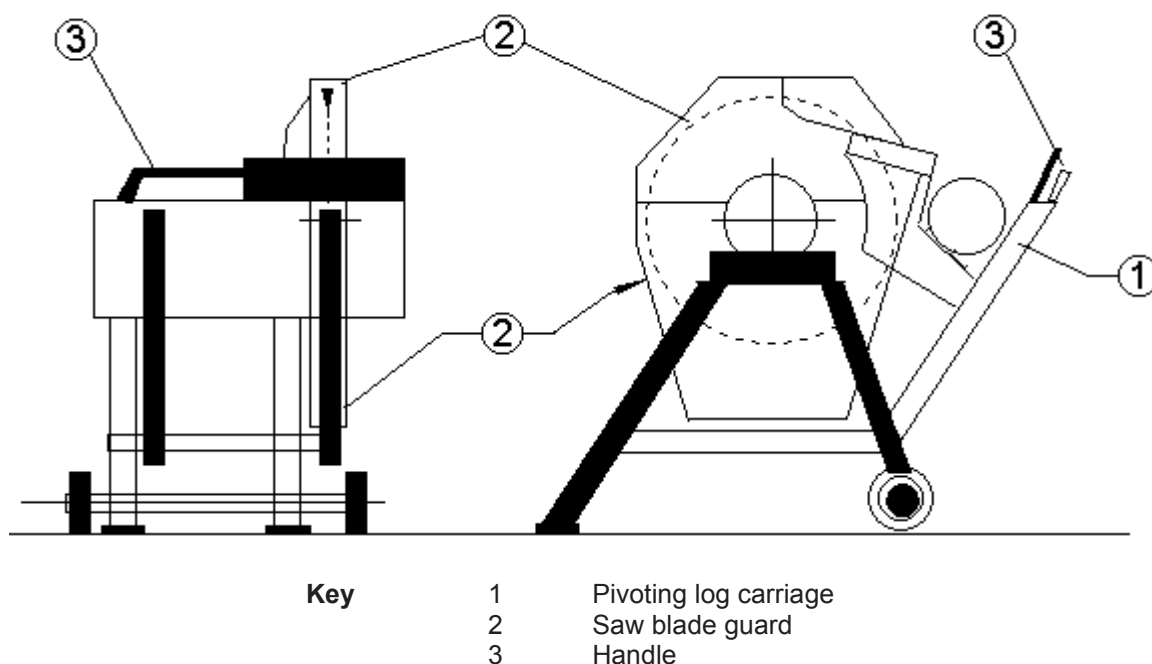
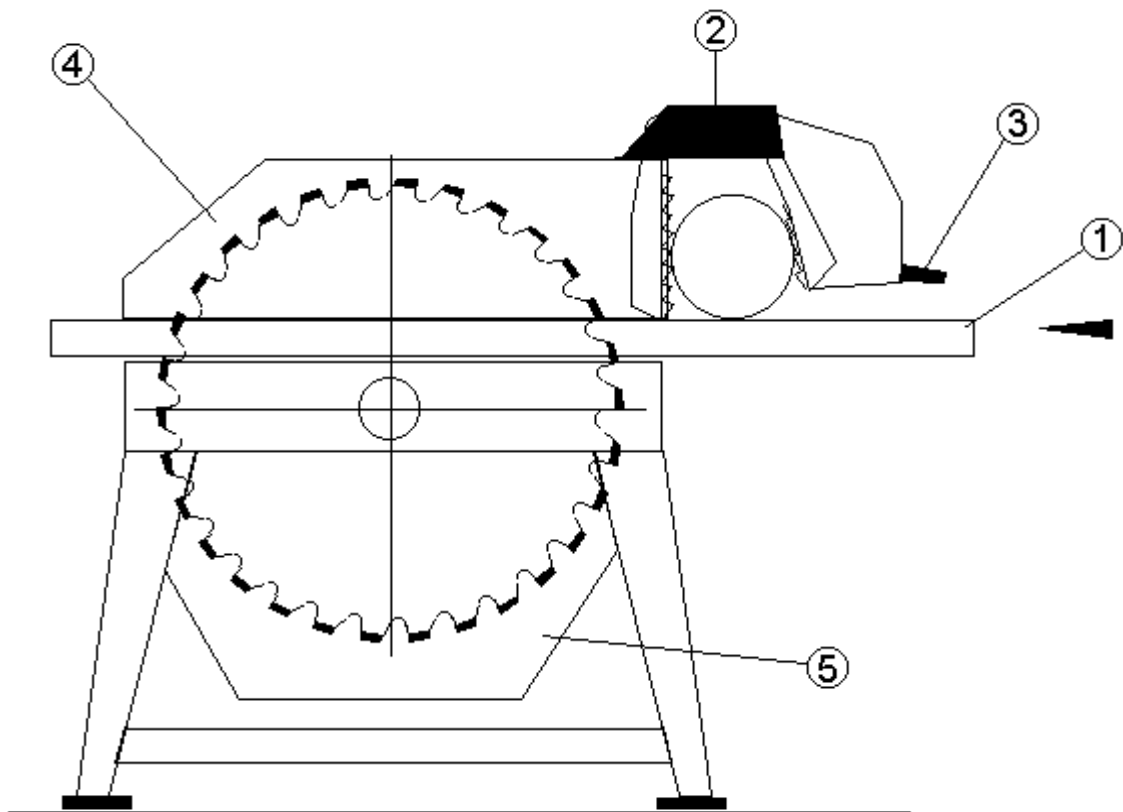
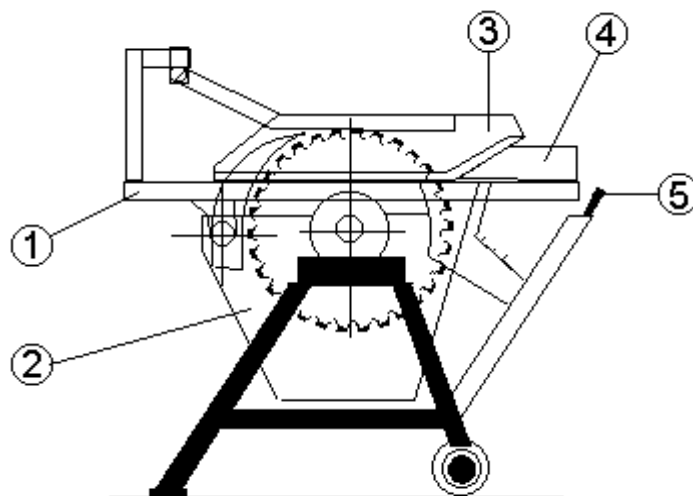


Figure 1 — Example of a circular sawing machine for firewood with pivoting log carriage

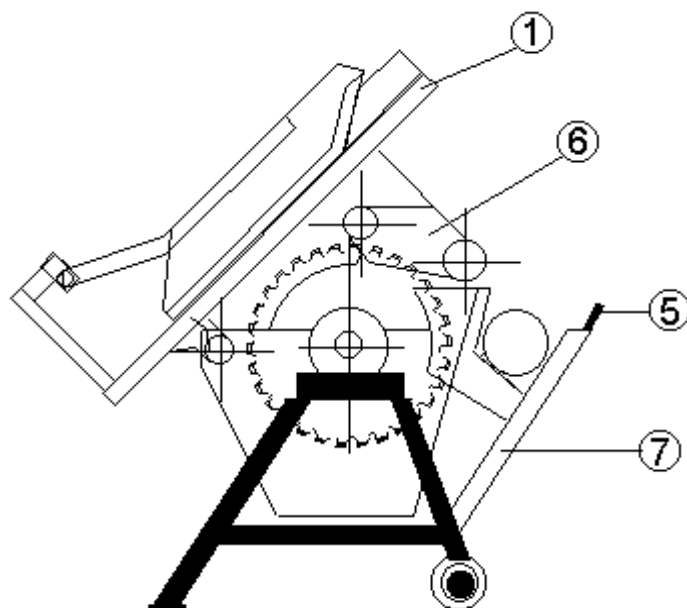


Key	1	Sliding table
	2	Workpiece holding device
	3	Operating handle
	4	Fixed guard above the table
	5	Fixed guard below the table

Figure 2 — Example of a circular sawing machine for firewood with sliding table



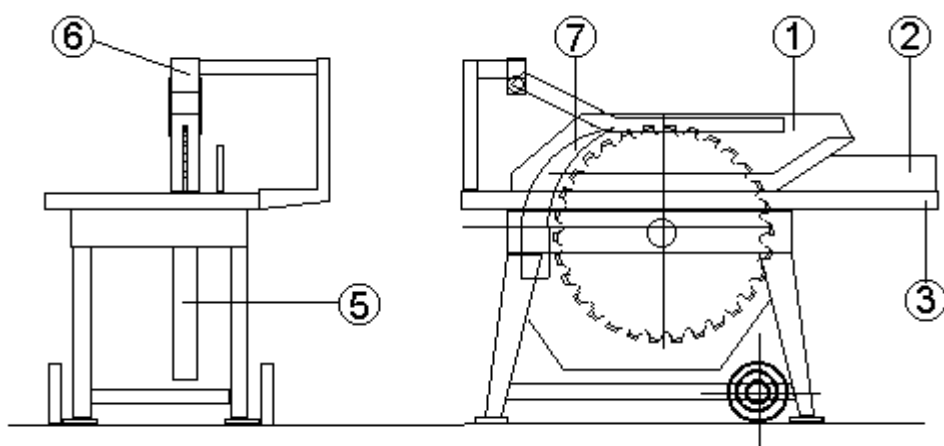
a) — Dual-purpose circular sawing machine for firewood/circular saw bench with pivoting log carriage in saw bench mode



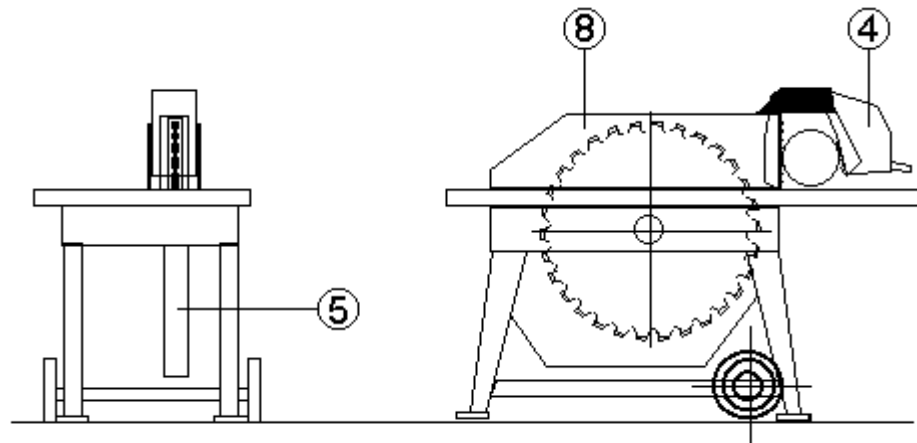
b) — Dual-purpose circular sawing machine for firewood/circular saw bench with pivoting log carriage in firewood sawing mode

Key	1	Tilting saw bench table
	2	Saw blade guard below the table
	3	Adjustable saw blade guard
	4	Rip fence
	5	Handle
	6	Saw blade guard – firewood cutting
	7	Pivoting log carriage

Figure 3 — Example of a dual-purpose circular sawing machine for firewood/circular saw bench with pivoting log carriage



a) — Dual-purpose circular sawing machine for firewood/circular saw bench with sliding table in saw bench mode



b) — Dual-purpose circular sawing machine for firewood/circular saw bench with sliding table in firewood sawing mode

Key	1	Adjustable saw blade guard
	2	Rip fence
	3	Saw bench table
	4	Workpiece holding device
	5	Saw blade guard with chip outlet
	6	Adjustable support for saw blade guard
	7	Riving knife
	8	Fixed saw blade guard – log sawing

Figure 4 — Example of a dual-purpose circular sawing machine for firewood/circular saw bench with sliding table

3.2 Definitions

3.2.1

cross-cutting

the operation of cutting across the grain of a wooden workpiece

3.2.2

circular sawing machine for firewood

a sawing machine for cross-cutting logs for firewood, with a single saw blade driven by either an electric motor or a Power Take Off (PTO) device and which has manual loading and/or unloading. The workpiece is moved manually to the saw blade either by:

- a) a pivoting log carriage (circular sawing machine for firewood with pivoting log carriage - see Figure 1); or
- b) a sliding table with a clamping device (circular sawing machine for firewood with sliding table - see Figure 2)

3.2.3

dual-purpose circular sawing machine for firewood/circular saw bench

a dual-purpose machine which is either:

- a) a circular sawing machine for cross-cutting logs for firewood with a pivoting log carriage (see Figure 3b)); and a circular saw bench. When used as a circular sawing machine for firewood the saw bench table is tilted toward the rear of the machine (see Figure 3a)); or
- b) a circular sawing machine for cross-cutting logs for firewood with sliding table (see Figure 4b)) and a circular saw bench. When used as a saw bench the sliding table is locked in position (see Figure 4a))

3.2.4

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

3.2.5

A₁) displaceable machine A₁)

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

3.2.6

machine actuator

a power mechanism used to effect motion of the machine

3.2.7

hand feed

the manual holding and/or manual guiding of the workpiece (or of a machine element incorporating a tool). Hand feed includes the use of a hand operated carriage on which the workpiece is placed manually or clamped, (and the use of a demountable power feed unit)

NOTE The words in brackets are not applicable to this machine.

3.2.8

safety appliance

an additional device which is not an integral part of the machine but which assists the operator in the safe feeding of the workpiece, e.g. see Figure 5

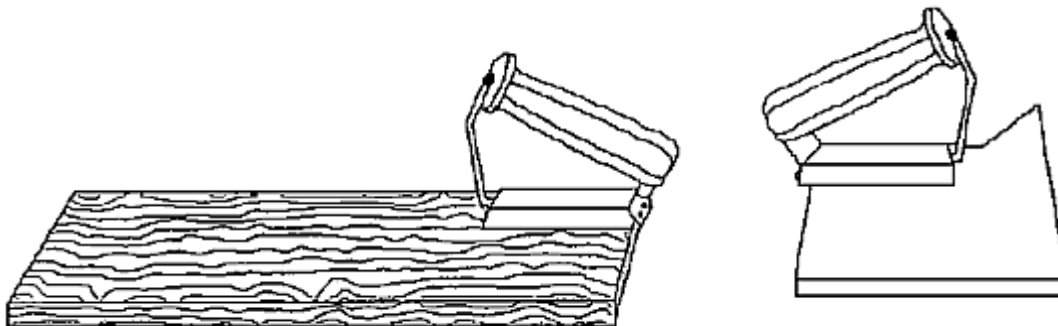


Figure 5b): Example of push block

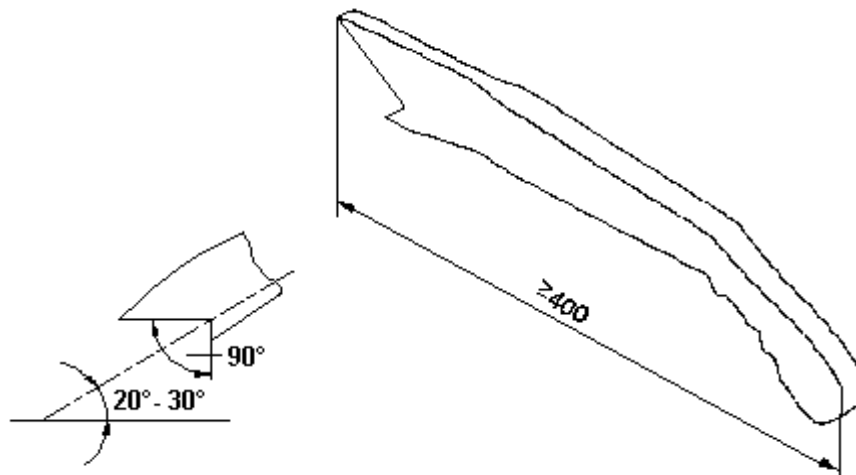


Figure 5a): Example of push stick

Figure 5 — Examples of a push stick and push block

3.2.9

ejection

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

3.2.10

run-down time

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

3.2.11

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 List of significant hazards

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, 5.2.6, 5.2.7, 5.2.9
	b) relative location;			5.1.2, 5.2.5, 5.2.6, 5.2.7, 5.2.8
	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);			5.2.6, 5.2.7
	e) mechanical strength.			5.2.1, 5.2.2, 5.2.3, 5.2.5, 5.2.6, 5.2.7, Annex A
	- 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
1.3	Cutting or severing hazard			5.2.2, 5.2.3, 5.2.4, 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, 5.3.16
2.2	Contact of persons with parts which have become live under faulty conditions (indirect contact)	4.3	4.9	5.3.4, 5.3.16
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

Table 1 — List of significant hazards (*continued*)

6	Hazards generated by radiation			
6.5	Lasers	4.7		5.3.13
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, 5.3.4, 6.3
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	4.9	4.11.4	5.1.6, 5.3.7, 5.3.8
10.3	External influences on electrical equipment		4.11.11	5.1.1, 5.3.4, 5.3.12
10.6	Errors made by the operator (due to mismatch of machinery with human characteristics and abilities, see 8.6)		4.8, 4.11.8, 4.11.10, 5.5.2, 6	5.1.1, 5.1.2, 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, 5.2.4
13	Failure of the power supply		4.11.1, 4.11.4	5.1.6
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, 5.3.15
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

For guidance in connection with risk reduction by design, see [\[A1\]](#) 4.1 of EN ISO 12100-2:2003 [\[A1\]](#), and in addition:

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 (see [\[A1\]](#) EN ISO 13849-1:2008 [\[A1\]](#)) are those for:

- starting (see 5.1.3);
- normal stopping (see 5.1.4);
- emergency stopping (see 5.1.5);
- interlocking (see 5.1.3);
- clamping (see 5.2.8);
- the braking system (see 5.1.4, 5.1.5 and 5.2.4).

Unless otherwise stated in this European Standard these control systems shall, as a minimum be designed and constructed in accordance with category 1 as defined in [\[A1\]](#) EN ISO 13849-1:2008 [\[A1\]](#).

For the purposes of this European Standard "well tried components and principles" means:

- a) electrical components if they comply with relevant standards including the following as:
 - i) [\[A1\]](#) EN 60947-5-1:2004 [\[A1\]](#), section 3 for control switches with positive opening operation used as mechanical actuated position detectors for interlocking guards and for relays used in auxiliary circuits;
 - ii) [\[A1\]](#) EN 60947-4-1:2001 [\[A1\]](#) for electromechanical contactors and motor-starters used in main circuits;
 - iii) [\[A1\]](#) HD 22.1 S4:2002 [\[A1\]](#) for rubber-insulated cable;
 - iv) [\[A1\]](#) HD 21.1 S4:2002 [\[A1\]](#) for polyvinyl chloride cable if this cable is additionally protected against mechanical damage by positioning (e.g. inside frames);
- b) electrical principles if they comply with the first four measures listed in 9.4.2.1 of [\[A1\]](#) EN 60204-1:2006 [\[A1\]](#). The circuits shall be either "hardwired", or if electronic components are used in safety related control systems "well tried" is fulfilled if they are in accordance with 9.4.2.2 (i.e. redundancy with cross-monitoring) or 9.4.2.3 (i.e. diversity) of [\[A1\]](#) EN 60204-1:2006 [\[A1\]](#);
- c) mechanical components if, for example they operate in the positive mode in accordance with the description given in [\[A1\]](#) 4.5 of EN ISO 12100-2:2003 [\[A1\]](#);

- d) mechanically actuated position detectors for guards if they are actuated in the positive mode and their arrangement/fastening and cam design/mounting comply with the requirements of 5.2 and 5.3 of EN 1088:1995;
- e) pneumatic and hydraulic components and systems if they comply with EN 983 and EN 982 respectively.

Time delay devices used in hardwired safety related control circuits can be of category B in accordance with the requirements of ^{A1} EN ISO 13849-1:2008 ^{A1} if the time delay device is designed for at least one million actuations.

Verification: By checking the relevant drawings and/or circuit diagrams and inspection of the machine.
^{A1} ~~deleted text~~ ^{A1}

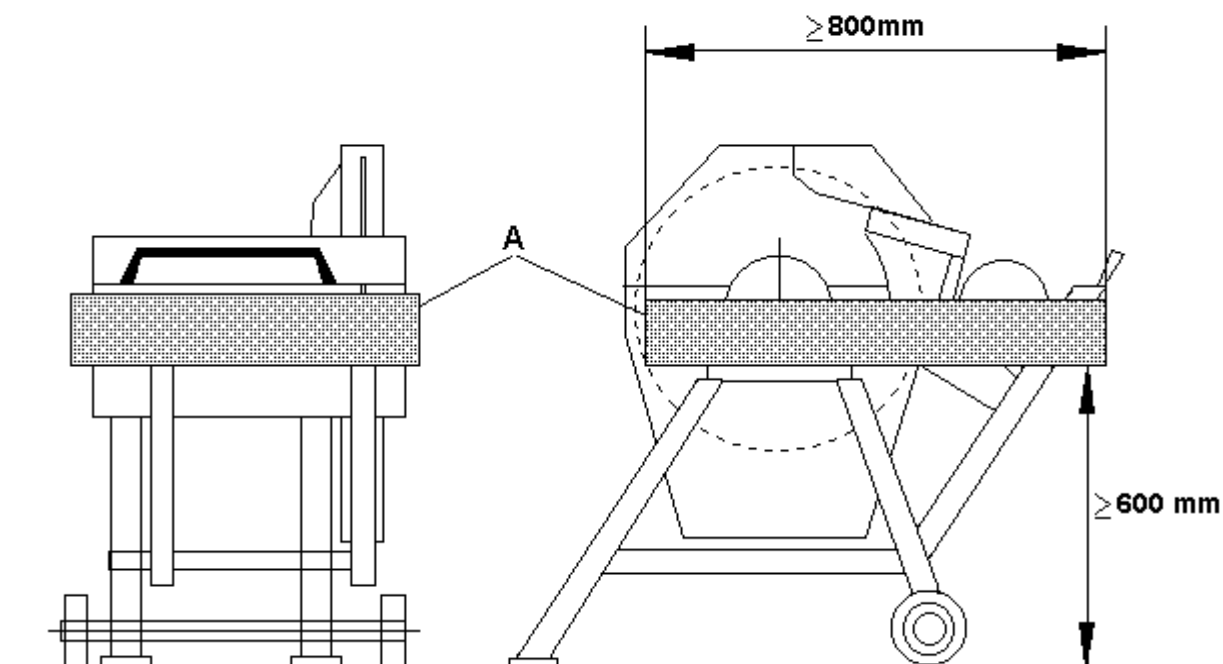
^{A1} NOTE For components characteristics the information from the component supplier can be useful. ^{A1}

5.1.2 Position of controls

The start control and the stop control required by 5.1.3 and 5.1.4 of this European Standard shall be situated as follows:

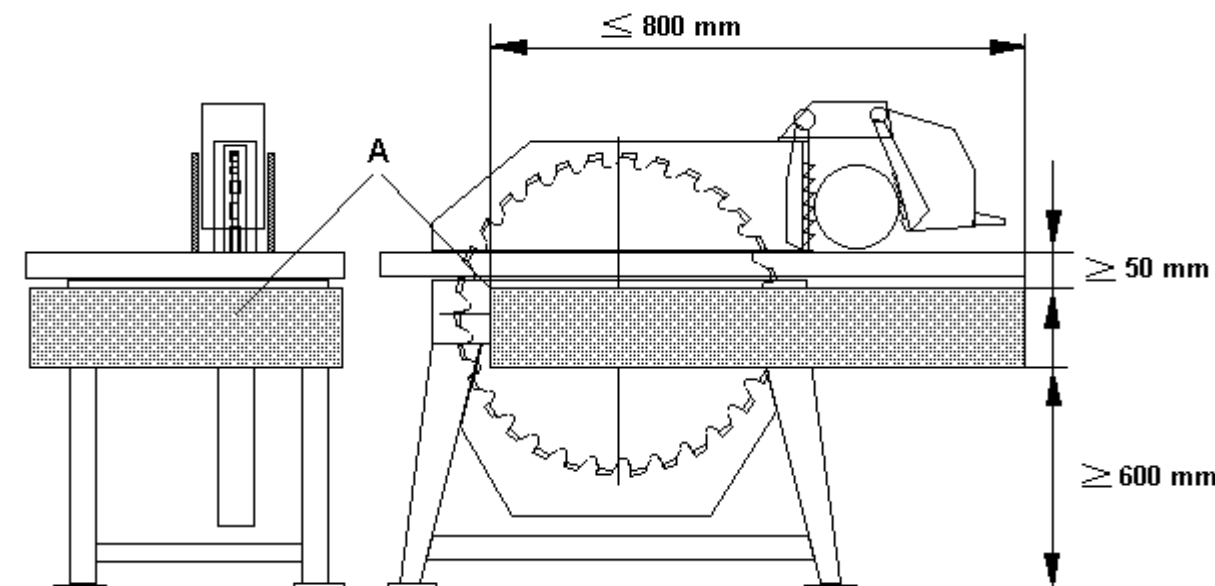
- a) on firewood sawing machines with pivoting log carriage, at the machine frame within a maximum distance of 800 mm, measured from the front edge of the pivoting log carriage in its rest position and not less than 600 mm from the floor (see Figure 6);
- b) on firewood sawing machines with sliding table, at the front of the machine frame (rest position) or at the longitudinal sides within a distance of 800 mm from the front edge of the sliding table in its start position and at least 50 mm below the table edge and not less than 600 mm from the floor (see Figure 7);
- c) on PTO driven machines the start and stop control for the machine actuator (e.g. tractor) may be regarded as the start and stop control of the machine;
- d) on dual-purpose circular sawing machines for firewood/circular saw benches, driven a PTO device, a normal stop control shall be provided at the saw bench operator position.

Verification: By checking the relevant drawings, measurement and inspection of the machine.



Key A Shaded areas indicate control positions

Figure 6 — Position of controls on a circular sawing machine for firewood with pivoting log carriage



Key A Shaded areas indicate control positions

Figure 7 — Position of controls on a circular sawing machine for firewood with sliding table

5.1.3 Starting

For electrically driven machines see 9.2.5.2 of [A1](#) EN 60204-1:2006 [A1](#) and in addition:

For the purpose of this European Standard "all of the safeguards in place and functional" is achieved by the interlocking arrangements described in 5.2.7 and "operation" means rotation of the saw spindle.

The exceptions described in 9.2.5.2 of  EN 60204-1:2006  are not relevant.

Verification: By checking the relevant drawings and/or circuit diagrams, inspection and relevant functional testing of the machine.

5.1.4 Normal stopping

Electrically driven machines shall be fitted with a stop control which, when actuated, shall disconnect power from all the machine actuators and actuate the brake (if provided).

If the machine is fitted with a mechanical brake this stop control shall be of category 0 in accordance with the requirements of 9.2.2 of  EN 60204-1:2006 .

If the machine is fitted with an electrical brake, this stop control shall be of a category 1 in accordance with the requirements of 9.2.2 of  EN 60204-1:2006 . When initiated the stopping sequence shall be:

- a) cut power to all machine actuators and actuate the brake;
- b) cut power to the brake after the braking sequence is complete.

The stopping sequence shall be satisfied at the level of the control circuits. If a time delay device is used, the time delay shall be at least the maximum run-down time. Either the time delay shall be fixed, or the time delay adjustment device shall be sealed.

NOTE A separate stop control as referred to in the first paragraph of this sub-clause is not required where the machine is fitted with an emergency stop which performs the same function.

Verification: By checking relevant drawings and/or circuit diagrams, inspection and relevant functional testing of the machine.

5.1.5 Emergency stop

See  EN ISO 13850:2008  in addition:

Electrically driven machines with more than one machine actuator, or where provision is made for use with more than one actuator, shall be fitted with an emergency stop control system which shall conform to the requirements of 9.2.5.4 and 10.7 of  EN 60204-1:2006 .

If the machine is fitted with a mechanical brake this stop control shall be of category 0 in accordance with the requirements of 9.2.2 of  EN 60204-1:2006 .

If the machine is fitted with an electrical brake this stop control shall be of category 1 in accordance with the requirements of 9.2.2 of  EN 60204-1:2006 . When initiated the stopping sequence shall be:

- a) cut power to all machine actuators and actuate the brake;
- b) cut power to the brake after the braking sequence is complete.

The stopping sequence shall be satisfied at the level of the control circuits. If a time delay device is used, the time delay shall be at least the maximum run-down time. Either the time delay shall be fixed, or the time delay adjustment device shall be sealed.

Verification: By checking the relevant drawings and/or circuit diagrams, inspection and relevant functional testing of the machine.