SLOVENSKI STANDARD
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Varnost premičnih električnih orodij - 2-11. del: Posebne zahteve za kombinirane krožne žage z delovno mizo in za zajeralne žage

Safety of transportable motor-operated electric tools - Part 2-11: Particular requirements for combined mitre and bench saws

Sicherheit transportabler motorbetriebener Elektrowerkzeuge - Teil 2-11: Besondere Anforderungen für kombinierte Tischund Gehrungssägen

Sécurité des machines-outils électriques semi-fixes - Partie 2-11: Règles particulières pour les scies d'établi-scies à mortaiser

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Safety of transportable motor-operated electric tools - Part 2-11: Particular requirements for combined mitre and bench saws

(IEC 61029-2-11:2001, modified)

Sécurité des machines-outils électriques semi-fixes - Partie 2-11: Règles particulières pour les scies d'établi-scies à mortaiser (CEI 61029-2-11:2001, modifiée)

Sicherheit transportabler motorbetriebener Elektrowerkzeuge - Teil 2-11: Besondere Anforderungen für kombinierte Tisch- und Gehrungssägen (IEC 61029-2-11:2001, modifiziert)

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CENELEC

European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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Foreword

This document (EN 61029-2-11:2012) consists of the text of IEC 61029-2-11:2001 prepared by IEC/SC 61F (transformed into IEC TC 116 "Safety of hand-held motor-operated electric tools"), together with the common modifications prepared by CLC/TC 116 "Safety of motor-operated electric tools".

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-09-03
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-09-03

This document supersedes EN 61029-2-11:2009.

EN 61029-2-11:2012 includes the following significant technical changes with respect to EN 61029-2-11:2009:

– introduction of 'linked action'

– rewording of some clauses;

– improvement and clarification of Clause 18.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This European Standard is divided into two parts:

Part 1 General requirements, which are common to most transportable motor, operated tools (for the purpose of this European Standard referred to simply as tools) which could come within the scope of this European Standard.

Part 2 Requirements for particular types of tool which either supplement or modify the requirements given in Part 1 to account for the particular hazards and characteristics of these specific tools.

Compliance with the relevant clauses of Part 1 together with a relevant Part 2 of this European Standard provides one means of conforming to the specified essential requirements of the Directive.

This European Standard follows the overall requirements of EN ISO 12100.

For noise and vibration, this European Standard covers the requirements for their measurement, the provisions of information arising from these measurements and the provision of information about the Personal Protective Equipment required. Specific requirements for the reduction of the risk arising from noise and vibration through the design of the tool are not given as this reflects the current state of art.

Warning: Other requirements arising from other EU Directives can be applicable to the products falling within the scope of this European Standard.

CEN has prepared standards for industrial machines, which may extend to transportable machines. Although CEN and CENELEC have where appropriate used common solutions to provide uniform levels of protection, persons using this European Standard should check the scope of both this and CEN standards to ensure that a correct standard is used.

This Part 2-11 is to be used in conjunction with EN 61029-1:2009. This Part 2-11 supplements or modifies the corresponding clauses of EN 61029-1, so as to convert it into the European Standard: “Particular requirements for combined mitre and bench saws”.

Where a particular subclause of Part 1 is not mentioned in this Part 2-11, that subclause applies as far as reasonable. Where this Part 2-11 states "addition" "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

Clauses, subclauses, notes, tables and figures which are additional to those in Part 1 are numbered starting from 101.

Clauses, subclauses, notes, tables and figures which are additional to those in IEC 61029-2-11 are prefixed "Z".

NOTE In this European Standard, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- explanatory matter: in smaller roman type.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive.

For the relationship with EU Directive 2006/42/EC, see informative Annex ZZ, which is an integral part of this document.

Endorsement notice

The text of the International Standard IEC 61029-2-11:2001 was approved by CENELEC as a European Standard with agreed common modifications.

1 Scope

This clause of Part 1 is applicable except as follows:

1.1 *Addition:*

This European Standard applies to transportable combined mitre and bench saws with a saw blade diameter not exceeding 315 mm and intended for cutting wood and analogous materials, plastics and non-ferrous metals except magnesium.

1.2 *Addition:*

This European Standard does not apply to transportable mitre and bench saws intended to be used to cut ferrous metals, magnesium or food.

This standard does not apply to

– single function bench saws;
– single function mitre saws;
– combined mitre and bench saws other than transportable.

NOTE Z101 Transportable single function bench saws are covered by EN 61029-2-1.

NOTE Z102 Transportable single function mitre saws are covered by EN 61029-2-9.

NOTE Z103 EN 1870-3 gives requirements for combined mitre and bench saws for cutting wood other than transportable.

2 Definitions

This clause of Part 1 is applicable except as follows:

2.21 *Replacement:*

2.21
normal load
load to obtain rated input

Addition:

2.101
combined mitre and bench saw
saw intended to be used:
a) as a down-cutting cross cut saw;
b) as a circular bench saw

Note 1 to entry The saw may be of type “A” or type “B” as defined in 2.Z101 and 2.Z102.

2.Z101
type “A” saw
combined mitre and bench saw equipped with two tables: a mitre saw table having a fence to support the material to be cut as the saw blade is brought down and a bench table which supports the material to be cut as it is fed by hand towards to the saw blade. In mitre saw mode the saw blade is suspended over the mitre saw table from an arm, normally from a point located at the table or on a part of the frame of the machine. A sliding cutting movement may follow a downward cutting action or vice-versa. In bench saw mode, the saw blade projects through a slot in the bench saw table (see Figure Z101)

2.Z102
type “B” saw
combined mitre and bench saw equipped with a single table which supports and positions the workpiece during mitre and bench sawing operations. The saw blade is capable of being located either above or below the table. In the bench saw mode the saw blade projects through a slot in the table. In the mitre saw mode the saw blade is suspended over the table from an arm, normally from a point located at the table or on a part of the frame of the machine. In some cases, a sliding movement follows a downward cutting action or vice-versa (see Figure Z102)

2.Z103
linked action
action of opening and closing of the guard is related to the corresponding up and down movement of the saw unit. This linked action need not be a rigid connection

3 General requirement

This clause of Part 1 is applicable.

4 General notes on tests

This clause of Part 1 is applicable.

5 Rating

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable.

7 Marking and information for use

This clause of Part 1 is applicable except as follows:

7.1 *Addition:*

Combined mitre and bench saws shall be marked with

- maximum and minimum saw blade diameter;
- rated no-load speed;
- indication of direction of rotation of the saw blade;
- the maximum cutting capacity for bench sawing operation;
- saw blade bore diameter;
- thickness of riving knife.

If the top guard in bench saw mode is made of non-transparent material, an indication of the cutting line in alignment with the plane of the saw blade shall be marked on the top guard.

7.6 *Addition:*

The direction of rotation of the saw blade shall be indicated on a fixed part of the saw in the vicinity of the spindle axis by an arrow raised or sunk, which is visible when changing the saw blade, or by any other means not less visible and indelible.

Where the machine is designed to operate at more than one spindle speed, the following requirements shall apply:

– on machines where a speed change is achieved by changing the position of the drive belts on the drive pulleys, the selected speed shall be indicated on the same side of the machine as the start control by a diagram showing the relevant speed selected for each combination of pulleys;

– on machines where a speed change is achieved by an electronic control circuit, the selected speed shall be indicated on the machine at the selecting device (e.g. variable speed control dial provided with numerical speed settings).

7.13 *Addition:*

The substance of the following instructions shall also be given.

c) Safety precautions

Z101) warning not to use saw blades which are damaged or deformed;

Z102) warning not to use the saw without the guards in position, especially after a mode change, and instruction to keep guards in good working order and properly maintained;

Z103) instruction to replace the table insert when worn;

Z104) instruction to use only saw blades specified by the manufacturer, with a warning that the riving knife shall not be thicker than the width of the groove cut by the saw blade and not thinner than the body of the saw blade; specified saw blades for wood working shall comply with EN 847-1;

Z105) warning not to use saw blades manufactured from high speed steel;

Z106) instruction to wear suitable personal protective equipment, this could include:

i) hearing protection to reduce the risk of induced hearing loss;

ii) eye protection;

iii) respiratory protection to reduce the risk of inhalation of harmful dust;

iv) gloves for handling saw blades and rough material (recommendation that saw blades should be carried in a holder wherever practicable);

Z107) instruction to connect the saw to a dust-collecting device when sawing wood;

Z108) instruction to always put the push-stick into storage when is not in use.

e) Safe operation

Z101) instruction where to lift and support the saw and when necessary a warning not to use guards for this purpose;

Z102) instruction to keep the floor area free of loose material e.g. chips and cut-offs;

Z103) instruction how to correctly replace and reposition the saw blade, including details for correct guard repositioning in mitre saw and bench saw mode;

Z104) instruction to use push-sticks or a push-block handle to avoid working with the hands close to the saw blade when using in the bench saw mode;

Z105) recommendation that the operator shall be adequately trained in the use, adjustment and operation of the machine;

Z106) instruction to ensure that the arm is securely fixed when bevelling;

Z107) instruction to ensure that the arm is securely fixed in the working position in the bench saw mode;

Z108) instruction to stop the saw when unattended;

Z109) instruction to ensure that the bench saw table is securely fixed at the chosen height (for type “A” saws only);

Z110) instruction to use sharp saw blades;

Z111) instruction to ensure the speed marked on the saw blade is at least equal to the speed marked on the saw;

Z112) instruction to ensure that any spacers and spindle rings used are suitable for the purpose as stated by the manufacturer;

Z113) when fitted with a laser or LED: warning not to exchange the laser or LED with a different type. Instruction that repairs shall only be carried out by the manufacturer or an authorized agent;

Z114) instruction to ensure that the upper portion of the saw blade is completely enclosed in the mitre saw mode;

Z115) warning to refrain from removing any cut-offs or other parts of the workpiece from the cutting area whilst the machine is running with an unguarded saw blade;

Z116) instruction how to use and correct adjustment of riving knife in the bench saw mode;

Z117) for bench saw mode: instruction whether and how rebating or grooving should be carried out, e.g. guarding requirements;

Z118) warning that the saw shall not be used for slotting (stopped groove);

Z119) for tools with variable speed: a table giving guidance on spindle speed selection for different materials to be sawn;

Z120) instruction that during transportation the upper part of the saw blade shall be covered, for example by the top guard or the saw blade is adjusted to the lowest position;

Z121) instruction how to use and correct adjustment of the lower saw guard in bench saw mode;

Z122) instruction how to perform cuts correctly and safely:

i) in mitre saw mode, always to clamp workpieces to the saw table;

ii) to ensure before each cut that the machine is stable;

iii) if needed, to fix the machine to a work bench or the like;

iv) if needed, to support long workpieces with appropriate additional supports;

Z123) instruction how to clamp workpieces to the mitre table;

Z124) instruction how to fix the machine to a workbench or the like;

Z125) information about the minimum size of the workpiece;

Z126) information about the maximum cross-section size of the workpiece for cross-cutting;

Z127) information about the maximum and minimum diameters, thickness and bore diameter of saw blade which may be used;

Z128) for Type “B” saws: instruction how to correctly locate the saw in either the mitre or bench saw mode;

Z129) for mitre saw mode: information about the possible mitre and bevel angles and combinations thereof.

NOTE Sketches may be used to illustrate the modes of operation.

8 Protection against electric shock

This clause of Part 1 is applicable.

9 Starting

This clause of Part 1 is applicable.

10 Input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable.

12 Leakage current

This clause of Part 1 is applicable.

13 Environmental requirements

This clause of Part 1 is applicable except as follows:

13.2.1 *Addition:*

The major sound sources of tools are:

– the workpiece;
– the saw blade;
– gears;
– the motor/fan.

NOTE For general information concerning the reduction of noise, see EN ISO 11688-1.

13.2.4 *Replacement of Paragraphs 1, 2 and 3:*

Combined mitre and bench saws are tested in the bench saw mode under the conditions shown in Table Z101.

Table Z101 – Noise test conditions for combined mitre and bench saws

Material	Cutting a horizontal piece of chipboard 800 mm × 400 mm × 19 mm.
Feed speed	(3 ± 1) m/min.
Width of cut-off	Approximately 10 mm wide strips (set by rip fence) across the 400 mm width of the chipboard.
Depth of cut	Saw blade adjusted to cut 22 mm.
Test time	Five cuts quickly following each other, measurement starting 100 mm behind front edge up to end of the workpiece. The sound pressure is averaged over the test work cycle.
Tool bit	New saw blade at the start of the test, tungsten carbide tipped for cross-cutting and having the maximum diameter as recommended by the manufacturer.
Test position	Saws supplied with an own stand are to be used standing on a reflecting plane. Other saws to be used on a bench above reflecting plane as shown in Figure 12 of Part 1.

13.3 This subclause is not applicable.

14 Protection against ingress of foreign bodies and moisture resistance

This clause of Part 1 is applicable.

15 Insulation resistance and electric strength

This clause of Part 1 is applicable.

16 Endurance

This clause of Part 1 is applicable.

17 Abnormal operation

This clause of Part 1 is applicable except as follows:

17.1 *Addition:*

Combined mitre and bench saws are considered to be saws in which moving parts are liable to be jammed, if equipped with an induction motor.

18 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows:

18.1 *Replacement:*

Combined mitre and bench saws shall be equipped with a guarding system, which cannot be removed without the aid of a tool, except for the top guard.

The guarding system shall comply with the requirements of 18.1.101, 18.1.102 and 18.1.103.

18.1.101 Saw blade guards

18.1.101.1 Mitre saw mode

Combined mitre and bench saws shall be provided with a combination of fixed and self-closing guards (see Figure Z104).

The areas 1 and 2 of the machine are as shown in Figure Z104.

The machine shall have a fixed guard to guard the area 1. This guard shall, as a minimum, cover the periphery of the saw blade within the area 1 and both sides of the saw blade within area 1 at least down to the root of the teeth, irrespective of the position of the saw unit. When the flange / clamping nut is not circular, it shall be covered by a fixed guard. The top guard of bench saw mode shall be lockable in the mitre saw mode, or the bench saw table shall completely protect the saw blade when the top table is adjusted in the highest position (type “A” saw).

In the upper position, the machine shall have a combination of fixed and self-closing guards which guard the area 2. These guards shall, as a minimum, cover the periphery of the saw blade within the area 2 and both sides of the saw blade within area 2 at least down to the root of the teeth. See Figure Z104 for illustration.

The guard shall comply with this requirement at any mitre and bevel position which is possible.

The self-closing saw guard shall comply with either a) or b):

a) The guard shall be of a U-shaped construction (see Figure Z101 a)). The guard shall enclose the teeth of the saw blade.

For saws with linked action and with the saw unit in its upper position, the guard shall be in its completely closed position and both the guard and saw unit shall be locked.

Compliance is checked by inspection and the following test.

The saw unit in the upper position at 90° to the table is subjected to a load of 100 N vertically downwards at the highest point of the operating handle. It shall not be possible to touch the teeth of the saw blade with the test probe of Figure Z108, taking into account any free movement of the guard.

The saws unit and guard shall only be unlocked by manually operating the release device(s) and the guard shall open by moving the saw unit down. It shall be possible to operate the release device(s) without releasing the grip on the handle.

Compliance is checked by inspection and by manual test.

For saw units without linked action and with the saw unit in its upper position, the guard shall be locked. When moving down the saw unit from its upper position, the guard shall remain locked and closed in all positions of the saw unit and only be unlocked and opened by manually operating the release device.

Compliance is checked by inspection and by applying the test probe of Figure Z108 in all positions of the saw unit. It shall not be possible to touch the teeth of the saw blade taking into account any free movement of the guard.

After manually operating the release device, the guard shall open by further pressing of the release device for an angle of maximum 60°.

Compliance is checked by inspection and by manual test.

b) The guard shall be of an open guard construction (see Figure Z101 b)) which covers both sides of the saw blade teeth as shown in Figure Z106 and which opens when it makes contact with the workpiece or the fence. The guard shall lie on the workpiece or on the fence during cutting to afford maximum protection.

Compliance is checked by inspection and by manual test.

The guard shall be in its completely closed position and locked when the saw unit is in its upper position.

Compliance is checked by inspection and the following test.

The saw unit in the upper position at 90° to the table is subjected to a load of 100 N vertically downwards at the highest point of the operating handle. The guard shall remain locked and not open.

It shall be possible for an operator to unlock the guard without releasing the grip on the handle.

Compliance is checked by manual test.

18.1.101.2 In cutting mode, the front of the saw blade shall be guarded against inadvertent contact.

Compliance is checked while the saw unit is at its lowest vertical position, its maximum extended horizontal position and no workpiece present. A test rod with 12 mm diameter and 50 mm length is applied at all bevel and mitre angles. The longitudinal axis of the test probe shall be parallel to the table surface and be perpendicular to the cutting line. The test probe shall be equally shared about the cutting line. When the test probe is moved towards the saw blade, it shall not be able to touch its toothed rim.

18.1.101.Z1 For saws in mitre saw mode and without linked action provided with a spring loaded guard, the closing time of the self-closing guard from the fully open position to the fully closed position shall not exceed 0,3 s.

Compliance is checked by the following test. During the test, the saw unit is set to cut at 90° to the table. Without any lubrication, the self-closing guard is retracted fully and then allowed to close for 20 000 cycles. The closing time from the fully open position to the fully closed position shall not exceed the time specified above at the first and at the last of the 20 000 cycles.

18.1.101.Z2 All types of guard shall allow changing of the saw blade without removing the guard from the machine.

Compliance is checked by inspection.

18.1.101.Z3 When set for transportation the self-closing guard shall cover the teeth of the saw blade to the front of the machine.

Compliance is checked by inspection and by applying the test probe according to Figure Z108.

18.1.101.Z4 Saws shall be so guarded that the saw blade cannot be touched from below the table. For type “B” saws, this requirement may be met by a removable guard without interlocking.

Compliance is checked by the following test.

For type “A” saws:

Below the mitre saw mode table and with the saw unit in its lowest position, the test probe of Figure Z108 is applied in all possible positions, it shall not be possible to touch the teeth of the saw blade. Above the mitre saw mode table, the guarding shall still comply with the requirements of 18.1.101.1 and 18.1.101.2.

For type “B” saws:

With the saw unit in its lowest position the test probe of Figure Z108 is applied in all possible positions. It shall not be possible to touch the teeth of the saw blade.

18.1.102 Bench saw mode

18.1.102.1 Combined mitre and bench saws shall have a top guard for the crown and the front of the saw blade which may be an adjustable guard, a self closing guard or a combination of these and may be removable. If adjustable, it shall be possible to do so without the aid of a tool and when adjusted, it shall remain in any position necessary to give the required protection.

The top guard shall be constructed from soft material (e.g. aluminium or plastic) which will minimize damage to the saw blade should contact occur.