

INTERNATIONAL STANDARD

IEC
61029-2-11

First edition
2001-07

Safety of transportable motor-operated electric tools –

Part 2-11: Particular requirements for mitre-bench saws

Sécurité des machines-outils électriques semi-fixes –

*Partie 2-11:
Règles particulières pour les scies d'établi-scies à mortaiser*



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF TRANSPORTABLE MOTOR-OPERATED ELECTRIC TOOLS –

Part 2-11: Particular requirements for mitre-bench saws

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61029-2-11 has been prepared by subcommittee 61F: Safety of hand-held motor-operated electric tools, of IEC technical committee 61: Safety of household and similar electric appliances.

The text of this standard is based on the following documents:

FDIS	Report on voting
61F/384/FDIS	61F/406/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The part 2-11 is to be used in conjunction with the first edition of IEC 61029-1 (1990).

This part 2-11 supplements or modifies the corresponding clauses in IEC 61029-1, so as to convert it into the IEC Standard: Safety requirements for mitre-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 standard states "addition", "modification" or "replacement", the relevant text in part 1 is to be adapted accordingly.

NOTE 1 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

The terms defined in clause 2 are printed in **bold typeface**.

NOTE 2 Subclauses, notes and figures which are additional to those in part 1 are numbered starting from 101.

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this standard may be issued at a later date.

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SAFETY OF TRANSPORTABLE MOTOR-OPERATED ELECTRIC TOOLS –

Part 2-11: Particular requirements for mitre-bench saws

1 Scope

This clause of part 1 is applicable except as follows:

1.1 *Replace the first paragraph by:*

This standard applies to **combined mitre-bench saws** intended for cutting non-ferrous metals such as aluminium, wood or similar materials with a blade diameter not exceeding 350 mm, as defined in 2.101.

2 Definitions

This clause of part 1 is applicable except as follows:

2.21 *Replacement:*

normal load

load obtained when the tool is operated continuously at a voltage equal to rated voltage or at the upper limit of the rated voltage range, the torque applied to the spindle being such that the input, in watts, is equal to the rated input

Addition:

2.101

combined mitre-bench saw

tool designed to cut non-ferrous metals such as aluminium, wood or similar materials by means of a rotating toothed blade. The combined saw is equipped with two tables: a lower table, which supports and positions the workpiece against a fence during the mitre action and an upper table provided with a slot through which the saw blade projects, supporting the workpiece which is fed by hand towards the saw blade

The saw blade is fitted on an arm suspended over the table; such arm is generally pivoted to the saw support frame or directly to the saw table. In some cases, the chop action of the saw blade is followed by a sliding movement (see figures 108, 109, 110)

2.102

lower table

table used to perform mitre operations

2.103

upper table

table used to perform bench operations

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

This clause of part 1 is applicable except as follows:

7.1 Addition:

Combined mitre-bench saws shall be marked with

- rated saw blade diameter;
- rated no-load speed;
- indication of direction of rotation of the saw blade;
- maximum cutting depth capacity in bench saw operation.

Combined mitre-bench saws which may be changed to different no-load speeds shall be marked, close to the means of adjustment, with the details of the method of changing the speed and the resultant no-load speed obtained. This may be by means of sketches, etc.

7.6 Addition:

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

7.13 Addition:

In the handbook or information sheet the following instructions shall be given:

- do not use saw blades which are damaged or deformed;
- do not use the saw without the guards in position;
- replace table insert when worn;
- the specification of the material that can be cut;
- do not use the saw to cut materials other than those recommended;
- use only saw blades recommended by the manufacturer;
- connect the saw to a dust collection device when sawing;
- select saw blades in relation to the material to be cut;
- maximum depth of cut;

- how to support long pieces;
- additional safety instruction if double bevel-cutting is possible;
- use push-sticks to feed the workpiece past the saw-blade in bench saw operation;
- use and correct adjustment of the riving knife;
- use and correct adjustment of the upper saw guard;
- take care when slotting in bench saw operation;
- make sure that the upper portion of the blades is completely enclosed in mitre mode;
- make sure that the arm is securely fixed in the working position in bench mode;
- make sure that the arm is securely fixed when bevelled;
- make sure that the upper table is securely fixed in the chosen height.

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 Radio and television interference suppression

This clause of part 1 is 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-bench saws are considered to be machines in which moving parts are liable to be jammed.

18 Stability and mechanical hazards

This clause of part 1 is applicable except as follows:

18.1 Addition:

Combined mitre-bench saws shall be equipped with an adequate guarding system, which cannot be removed without the aid of a tool.

The guarding system shall comply with the requirements of 18.1.1.

NOTE Other means of achieving the necessary degree of mechanical safety are allowed, provided these are as effective and reliable as those specified.

18.1.101 Blade guards

18.1.101.1 Mitre mode

A blade guard shall be provided as part of a saw.

The portion of the blade not performing chopping action shall be completely enclosed by the guarding system (i.e. bench saw guard, rip fence).

The remaining portion of the blade shall be fitted with a movable guard which covers the blade teeth on both sides of the blade and shall return automatically to its rest position when the blade is withdrawn from the workpiece.

The guard shall comply with the above at any mitre and bevel position in which the saw can be used.

The movable guard shall be

- of a U-shaped construction, which completely encloses the blade (figure 101);
- of an open construction, which so protects both sides of the saw blade teeth (figure 102).

Compliance is checked by applying in any possible position the rigid test probe of figure 103.

In both cases, the movable guard shall protect at least the portion of the blade in front of the fence F (figures 101 and 102). It shall not be possible to lift the guard by hand when the saw is in the rest position.

Compliance is checked by the following test. The movable guard shall be loaded by a force of 100 N perpendicular to the lower table and through the axis of the blade. Access to the blade teeth shall not be possible using the test probe of figure 103.

18.1.101.2 Bench mode

Saws shall have a guard above the upper table for the crown and the front of the saw blade which may be an adjustable guard, an automatic guard or a combination of these.

This guard shall be designed to encompass the saw blade when it is set in its highest position in the table (figure 110).

The guard shall be constructed of material (for example, aluminium, wood, plastic) which will minimize damage to the saw blade should contact occur.

The guard shall be so constructed and fixed that contact with the saw blade is avoided as much as possible.

When the guard is made of a non-transparent material, a cutting line indicator in alignment with the plane of the saw-blade shall be provided.

When the guard is not directly supported by a riving knife, such support can be in line with the riving knife provided its thickness is less than, or equal to, the thickness of the riving knife.

An adjustable guard shall be adjustable without the use of a tool but shall be lockable in any position necessary to give the required protection.

An automatic guard shall automatically

- a) open by contact with the workpiece to be cut as it is moved toward the saw blade: this is achieved by a lead-in at the in-feed end of the base of the guard;
- b) remain in contact with the upper surface of the workpiece as it is cut, to screen both sides of the saw blade at least down the root of the teeth and at least between the upper surface of the workpiece and the riving knife;
- c) return to the closed position after the workpiece has moved past the guard.

Access to the blade teeth under the upper table shall not be possible at any depth of the cut.

Compliance is checked using the test finger defined in figure 1 of part 1.

18.1.102 Saw tables

The slot in the table for the saw blade should be as small as practicable (see figure 104) and the area surrounding the saw blade where it passes through the table shall be of soft material such as plastic, wood or aluminium.

Compliance is checked by inspection and measurement.

18.1.102.1 Lower table

The lower table shall be designed so that the workpiece is supported in the area immediately near the slot.

Compliance is checked by inspection.

A lower table fence shall be provided (see F in figures 101 and 102).

The fence shall extend over the total length of the table and shall have a height at least equal to 0,5 times the maximum depth of cut in mitre mode.

18.1.102.2 Upper saw table

The table for supporting the workpiece in bench mode shall comply with figure 105 and shall be designed in such a way that, if adjustable, it must be securely fixed in the chosen position.

Compliance is checked by measurement

18.1.103 Riving knife

Saws shall be equipped with a riving knife in bench mode.

The riving knife shall be rigidly fixed and be in alignment with the plane of the saw blade and disposed to it as to pass freely through the cutting groove.

The position of the riving knife shall not change relative to the saw blade when the depth of the cut is adjusted.

The riving knife and its holder shall be so designed as to allow the adjustment of the riving knife, for all the saw-blade diameters resulting in cutting depths between 100 % and 90 % of the rated cutting depth, to comply with the following conditions:

- a) above the upper saw table, the radial distance between the riving knife and the toothed rim of the saw blade shall not at any point exceed 5 mm at the depth of the cut set;
- b) the tip of the riving knife shall not be lower than 5 mm from the tooth peak, as shown in figure 106. 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 blade.

The riving knife shall have a hardness of 43 HRC $\pm$ 5 HRC.

Compliance is checked by inspection and measurement.

18.1.104 Rip fence

Saws shall be provided with a rip fence in bench mode.

Minimum height of the guide surface of the rip fence shall be at least equal to the maximum depth of the cut.

The rip fence shall extend from the front of the table to a point beyond the saw blade, see figure 110.

Compliance is checked by inspection and measurement.

18.1.105 Cross-cutting fence

Saws may be provided with a cross-cutting fence. The fixing arrangement shall ensure that the fence cannot rise or swing out of position.

The distance between the cross-cutting fence and the saw blade shall not exceed 12 mm.

If contact between the cross-cutting fence and the saw blade is not avoided, the part close to the saw blade shall be made of material which will not disintegrate, or cause the saw blade to disintegrate, should it come into contact with the moving saw blade.

Compliance is checked by inspection and measurement.

18.1.106 Flanges

The diameter of the blade clamping flanges shall be at least 0,20 times the blade diameter.

18.1.107 The construction of the chip ejection opening shall be such that ejected particles will not restrict the operator's vision or be likely to cause injury.

18.1.108 Saws shall be designed so that, after the cutting operation in mitre mode, the blade comes back automatically to the rest position and shall be automatically locked in this position. During this movement the saw shall not overturn.

NOTE The unlocking device shall be actuated by the hand gripping the handle.

In bench mode the arm shall be provided with a locking system in working position.

Compliance is checked by inspection.

18.1.109 Saws shall have positions so that the saw blade cannot be touched from under the lower table.

Compliance is checked by inspection.

18.1.110 A push stick may be provided. In this case, it shall be constructed from shatter-proof materials capable of withstanding the pressure necessary to feed the workpiece. The material shall not give rise to danger in the event of contact between the saw blade and the push stick, for example, wood or plastic.

The minimum dimension for push sticks shall be 400 mm (see figure 107).

Compliance is checked by inspection and measurement.

19 Mechanical strength

This clause of part 1 is applicable.

20 Construction

This clause of part 1 is applicable except as follows:

20.18 *Addition:*

The actuation of the mains switch or control device shall not be affected by, nor access to the switch or control device be restricted by, adjustment of the table.

20.20 *Addition:*

After voltage recovery following a voltage failure, saws shall not start automatically. Saws shall be equipped with a mains switch which can be locked in the ON position.

20.101 For saws where the saw blade is not automatically protected by the guards, the saw blade shall stop within 10 s from switching OFF of the tool.

20.102 Saws shall have either integral suction devices or devices which allow the mounting of external suction devices for wood, dust and chips.

21 Internal wiring

This clause of part 1 is applicable.

22 Components

This clause of part 1 is applicable.

23 Supply connection and external flexible cables and cords

This clause of part 1 is applicable.

24 Terminals for external conductors

This clause of part 1 is applicable.

25 Provision for earthing

This clause of part 1 is applicable.

26 Screws and connections

This clause of part 1 is applicable.

27 Creepage distances, clearances and distances through insulation

This clause of part 1 is applicable.

28 Resistance to heat, fire and tracking

This clause of part 1 is applicable.

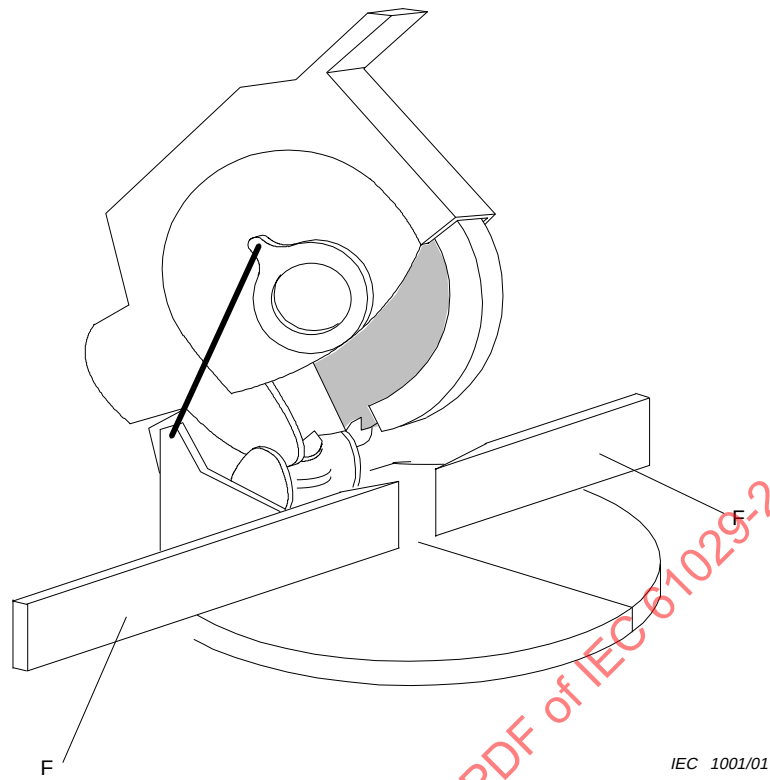
29 Resistance to rusting

This clause of part 1 is applicable.

30 Radiation

This clause of part 1 is applicable.

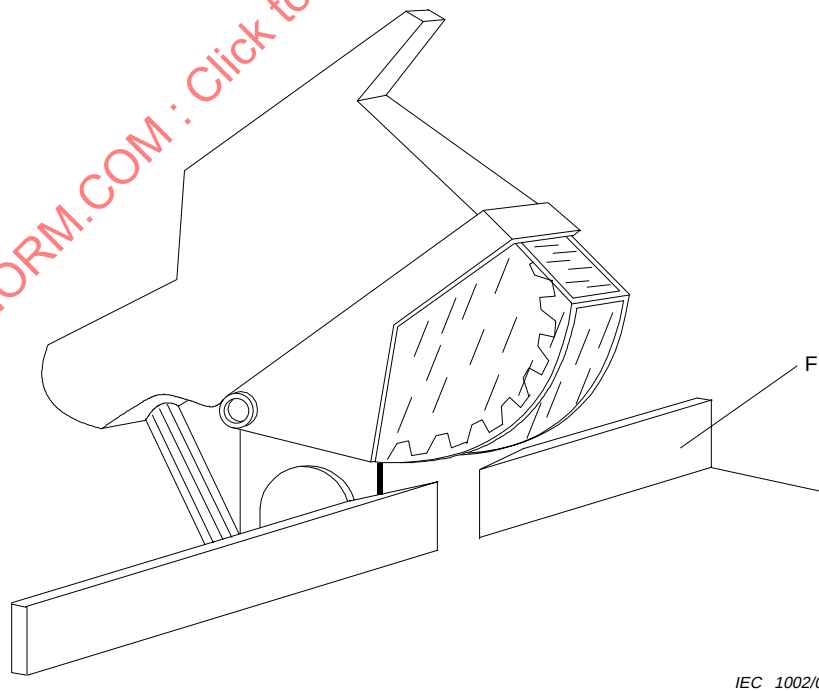
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Key

F Fence

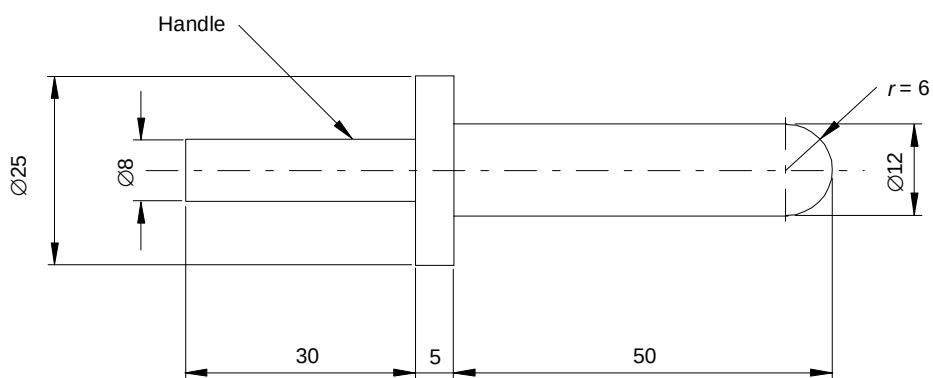
Figure 101 – U-shaped guard



Key

F Fence

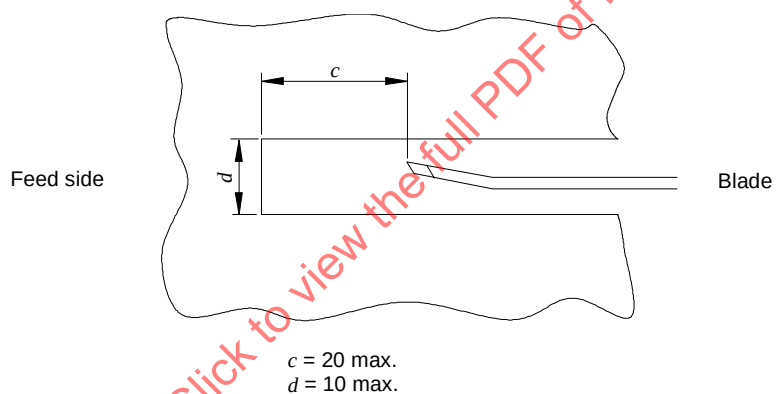
Figure 102 – Open-guard construction



IEC 1003/01

Dimensions in millimetres

Figure 103 – Test probe



IEC 1004/01

Dimensions in millimetres

Figure 104 – Dimensions of slot in table