

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 3-9: Particular requirements for transportable mitre saws**

**Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité –
Partie 3-9: Exigences particulières pour les scies à onglets transportables**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS,
TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY –
SAFETY –**

Part 3-9: Particular requirements for transportable mitre saws

FOREWORD

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International Standard IEC 62841-3-9 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

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

FDIS	Report on voting
116/181/FDIS	116/192/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 2.

This Part 3-9 is to be used in conjunction with the IEC 62841-1:2014.

This Part 3-9 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for transportable mitre saws.

Where a particular subclause of Part 1 is not mentioned in this Part 3-9, 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.

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 3 are printed in **bold typeface**.

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

A list of all parts of the IEC 62841 series, under the general title: *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 36 months from the date of publication.

The contents of the corrigendum of October 2015 and August 2016 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 3-9: Particular requirements for transportable mitre saws

1 Scope

This clause of Part 1 is applicable, except as follows:

Addition:

This part of IEC 62841 applies to transportable **mitre saws** intended to be used with a toothed saw blade for cutting wood and analogous materials, plastics and nonferrous metals except magnesium with a saw blade diameter not exceeding 360 mm, which hereinafter might simply be referred to as saw or tool.

This standard does not apply to **mitre saws** intended to cut other metals, such as magnesium, steel and iron. This standard does not apply to **mitre saws** with an automatic feeding device.

NOTE 101 Transportable saws intended to cut ferrous metals will be covered by a future part of IEC 62841-3.

This standard does not apply to saws designed for use with abrasive wheels.

NOTE 102 Transportable tools designed for use with abrasive wheels are covered by IEC 62841-3-10.

This standard does not apply to tools combining the function of a **mitre saw** with the function of a table saw.

NOTE 103 Transportable tools combining the function of a **mitre saw** with the function of a table saw are covered by IEC 62841-3-11.

2 Normative references

This clause of Part 1 is applicable, except as follows:

Addition:

ISO 180, *Plastics – Determination of Izod impact strength*

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

Addition:

3.101

bevel angle

angular displacement of the saw blade plane with respect to the **table top** plane, the position of the saw blade plane that is perpendicular to the **table top** being the 0° bevel position

3.102**compound angle**

angular displacement of the saw blade plane having a **bevel** and **mitre angle** other than 0°

3.103**cutting edge zone**

outer 20 % of the radius of the saw blade

3.104**D**

specified diameter of the saw blade

3.105**fence**

device to position the workpiece and absorb the horizontal forces from the saw blade during the cutting process

3.105.1**centre workpiece support**

device as illustrated in Figure 109 that has a face supporting the workpiece in conjunction with the **fence**

3.106**fully down position**

position of the **saw unit** after adjustment of the saw in accordance with 8.14.2 a) 107) and any depth-of-cut stop as in 8.14.2 a) 108) disengaged or adjusted in order to produce the lowest position of the **saw unit**

3.107**horizontal cutting capacity**

largest dimension perpendicular from the plane of the **fence** (width) of a workpiece with rectangular cross section that can be completely cut through with a single pass of the saw blade

Note 1 to entry: 5.101 provides a measurement procedure for **horizontal cutting capacity**.

3.108**kerf**

distance between two parallel planes that are touching the opposing sides of at least three saw blade tooth tips

3.109**kerf plate**

portion of the **table top** on both sides of the saw blade intersect line with the **table top** for the purpose of minimizing the tearing of the wood fibres by the saw blade

Note 1 to entry: Depending on the design, the **kerf plate** is adjustable, replaceable or an integral part of the **table top**.

3.110**mitre angle**

angular displacement of the plane of the **fence** with respect to the cutting line, the position of the saw blade plane that is perpendicular to the plane of the **fence** being the 0° mitre position

3.111**mitre saw**

saw consisting of a **table top** and a **fence** which support and position the workpiece, and a **saw unit**, projecting over the **table top**

Note 1 to entry: Cutting is achieved by moving the **saw unit** through a plunging action or a combination of plunging and sliding actions. The workpiece does not move with respect to the **table top** or **fence** during cutting. The **saw unit** can be adjustable to cut at a **bevel angle**, a **mitre angle** or both angles to create a **compound angle** cut. See Figure 101

3.112

quadrants (of the saw blade)

with the **saw unit** in the **fully down position**, the saw blade quadrants are defined by two lines intersecting the centre of the saw blade, where one line is parallel to the **table top** and the other line is perpendicular to the first line.

Note 1 to entry: The **quadrants** remain fixed in relation to the **saw unit** as it moves between the **rest position** and the **fully down position** (see Figure 102):

- **quadrant** “A” is above the line parallel to the **table top** and away from the operator’s position;
- **quadrant** “B” is above the line parallel to the **table top** and closer to the operator’s position;
- **quadrant** “C” is below the line parallel to the **table top** and closer to the operator’s position;
- **quadrant** “D” is below the line parallel to the **table top** and away from the operator’s position.

3.113

rest position

position of a **saw unit** in its uppermost position from the **table top** and, for **mitre saws** with a sliding action, at the maximum sliding position towards the **fence**

3.114

saw unit

device with an affixed saw blade, capable of performing a cutting action

3.115

table top

horizontal surface that is in contact with and supports the workpiece and typically consists of a **turn table**, a table base on each side of the **turn table** and workpiece support extension(s)

Note 1 to entry: See Figure 101.

3.116

turn table

workpiece supporting device that facilitates the **mitre angle** adjustment

3.117

vertical cutting capacity

largest height dimension above the **table top** (thickness) of a workpiece with rectangular cross section having a width dimension equal to the **horizontal cutting capacity**, that can be completely cut through, with a single pass of the saw blade

4 General requirements

This clause of Part 1 is applicable, except as follows:

Addition:

4.101 Throughout the remaining part of this document, unless otherwise explicitly stated, whenever a requirement or a reference is made to

- “saw blade”:
this shall equally apply to any “saw blade” as specified in accordance with 8.14.2 a);
- “force” as a multiple of **D**:
the force shall be expressed in newtons (N) and the saw blade diameter **D** shall be expressed in millimetres (mm).

5 General conditions for the tests

This clause of Part 1 is applicable, except as follows:

5.17 Addition:

The mass of the tool shall include the fences and required workpiece clamp(s) in accordance with 21.104. Further parts such as carrying means that are required in accordance with the instructions for the safe use of the tool shall be included in the mass.

5.101 Procedure to determine the horizontal cutting capacity

The mitre saw is fitted with a 2 mm thick steel disc of diameter D in place of the saw blade and is set to 0° bevel angle. The saw unit is at its fully down position and, for a mitre saw with a sliding function, the saw unit is at its maximum extended horizontal position from the fence. The mitre saw is set for the mitre angle for which the horizontal cutting capacity measurement is desired.

Horizontal cutting capacity:

The horizontal cutting capacity is the perpendicular distance measured in the plane of the table top from the fence to the intersect point of the steel disc periphery in quadrant "C" with the plane of the table top.

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

This clause of Part 1 is applicable, except as follows:

8.1 Addition:

Mitre saws shall be marked with:

- rated no-load speed of the output spindle.

8.3 Addition:

Mitre saws shall be marked with the saw blade diameter(s). The marked value(s) shall not be larger than D and shall not be less than $0,96 D$.

Mitre saws shall be marked with the direction of rotation of the spindle, indicated in a visible location on the tool in the vicinity of the saw blade, such as on the saw blade guard, by an arrow raised or recessed or by any other means no less visible and indelible.

The **table top** on each side of the saw blade shall be marked with a sign as follows:



This symbol needs not be in accordance with the colour requirements of ISO 3864-2.

8.14.1 Addition:

The additional safety instructions as specified in 8.14.1.101 shall be given. This part may be printed separately from the “General Power Tool Safety Warnings”.

8.14.1.101 Safety instructions for mitre saws

- a) **Mitre saws are intended to cut wood or wood-like products, they cannot be used with abrasive cut-off wheels for cutting ferrous material such as bars, rods, studs, etc. Abrasive dust causes moving parts such as the lower guard to jam. Sparks from abrasive cutting will burn the lower guard, the kerf insert and other plastic parts.**
- b) **Use clamps to support the workpiece whenever possible. If supporting the workpiece by hand, you must always keep your hand at least 100 mm from either side of the saw blade. Do not use this saw to cut pieces that are too small to be securely clamped or held by hand. If your hand is placed too close to the saw blade, there is an increased risk of injury from blade contact.**
- c) **The workpiece must be stationary and clamped or held against both the fence and the table. Do not feed the workpiece into the blade or cut “freehand” in any way. Unrestrained or moving workpieces could be thrown at high speeds, causing injury.**
- d) **Push the saw through the workpiece. Do not pull the saw through the workpiece. To make a cut, raise the saw head and pull it out over the workpiece without cutting, start the motor, press the saw head down and push the saw through the workpiece. Cutting on the pull stroke is likely to cause the saw blade to climb on top of the workpiece and violently throw the blade assembly towards the operator.**

NOTE The above warning is omitted for a simple pivoting arm mitre saw.

- e) **Never cross your hand over the intended line of cutting either in front or behind the saw blade. Supporting the workpiece “cross handed” i.e. holding the workpiece to the right of the saw blade with your left hand or vice versa is very dangerous.**
- f) **Do not reach behind the fence with either hand closer than 100 mm from either side of the saw blade, to remove wood scraps, or for any other reason while the blade is spinning. The proximity of the spinning saw blade to your hand may not be obvious and you may be seriously injured.**
- g) **Inspect your workpiece before cutting. If the workpiece is bowed or warped, clamp it with the outside bowed face toward the fence. Always make certain that there is no gap between the workpiece, fence and table along the line of the cut. Bent or warped workpieces can twist or shift and may cause binding on the spinning saw blade while cutting. There should be no nails or foreign objects in the workpiece.**
- h) **Do not use the saw until the table is clear of all tools, wood scraps, etc., except for the workpiece. Small debris or loose pieces of wood or other objects that contact the revolving blade can be thrown with high speed.**
- i) **Cut only one workpiece at a time. Stacked multiple workpieces cannot be adequately clamped or braced and may bind on the blade or shift during cutting.**
- j) **Ensure the mitre saw is mounted or placed on a level, firm work surface before use. A level and firm work surface reduces the risk of the mitre saw becoming unstable.**
- k) **Plan your work. Every time you change the bevel or mitre angle setting, make sure the adjustable fence is set correctly to support the workpiece and will not interfere**

with the blade or the guarding system. *Without turning the tool “ON” and with no workpiece on the table, move the saw blade through a complete simulated cut to assure there will be no interference or danger of cutting the fence.*

NOTE The phrase “bevel or” does not apply for saws without bevel adjustment.

- l) **Provide adequate support such as table extensions, saw horses, etc. for a workpiece that is wider or longer than the table top.** *Workpieces longer or wider than the mitre saw table can tip if not securely supported. If the cut-off piece or workpiece tips, it can lift the lower guard or be thrown by the spinning blade.*
- m) **Do not use another person as a substitute for a table extension or as additional support.** *Unstable support for the workpiece can cause the blade to bind or the workpiece to shift during the cutting operation pulling you and the helper into the spinning blade.*
- n) **The cut-off piece must not be jammed or pressed by any means against the spinning saw blade.** *If confined, i.e. using length stops, the cut-off piece could get wedged against the blade and thrown violently.*
- o) **Always use a clamp or a fixture designed to properly support round material such as rods or tubing.** *Rods have a tendency to roll while being cut, causing the blade to “bite” and pull the work with your hand into the blade.*
- p) **Let the blade reach full speed before contacting the workpiece.** *This will reduce the risk of the workpiece being thrown.*
- q) **If the workpiece or blade becomes jammed, turn the mitre saw off. Wait for all moving parts to stop and disconnect the plug from the power source and/or remove the battery pack. Then work to free the jammed material.** *Continued sawing with a jammed workpiece could cause loss of control or damage to the mitre saw.*
- r) **After finishing the cut, release the switch, hold the saw head down and wait for the blade to stop before removing the cut-off piece.** *Reaching with your hand near the coasting blade is dangerous.*
- s) **Hold the handle firmly when making an incomplete cut or when releasing the switch before the saw head is completely in the down position.** *The braking action of the saw may cause the saw head to be suddenly pulled downward, causing a risk of injury.*

NOTE The above warning applies only for **mitre saws** with a brake system.

8.14.2 a)

Addition:

- 101) Instruction to identify the correct saw blade to be used for the material to be cut;
- 102) Information about cutting capacities;
- 103) Information about maximum **bevel angle** and **mitre angle** settings, as applicable;
- 104) Instruction to use only a saw blade diameter in accordance with the markings on the saw and information about the bore diameter and the maximum **kerf** of the saw blade;
- 105) Instruction to use only saw blades that are marked with a speed equal or higher than the speed marked on the tool;
- 106) Instructions for the saw blade changing procedure including proper saw blade direction installation;
- 107) Instructions for adjusting the saw for proper cutting capacity, if applicable;
- 108) Instruction how to properly use the setting device(s) and the locking device(s) for the saw blade depth-of-cut stop, **mitre angle** and **bevel angle**, as applicable;
- 109) Instruction how to align the **fence**, if applicable;
- 110) Instruction how to check that the saw blade guards are functioning correctly;
- 111) Instruction how to connect dust extraction systems;
- 112) For **mitre saws** with sliding function: Instruction for the cutting sequence;

- 113) Instructions on how to set the depth of cut of the saw blade for non-through cuts, as applicable;
- 114) Instruction to ensure that the **mitre saw** is always stable and secure (e.g. fixed to a bench) and instruction how to fix the machine to a workbench or the like;
- 115) If adjustable and/or removable workpiece support extension(s) are provided to comply with 21.102.1, instruction to always fix and use these extension(s) during operation;
- 116) Instruction to use additional supports if needed to ensure the stability of the workpiece.

8.14.2 b)

Addition:

- 101) Instruction on correct cutting operations, including cross cutting, **mitre angle** and **bevel angle** cutting procedures, as applicable;
- 102) Instruction on simple non-through cutting operations such as grooving/slotting;
- 103) Information about which materials can be cut. Instructions to avoid overheating the saw blade tips and, if cutting plastics is permitted, to avoid melting the plastic;
- 104) Instruction for proper use of the workpiece clamping device;
- 105) If the saw is provided with an interchangeable **kerf plate**, instructions how to remove and install the **kerf plate** and how to adjust the **kerf plate** height with respect to the **table top**, if applicable. Instruction to replace a worn **kerf plate**;
- 106) Instruction and the procedure to cut a slot in a zero clearance **kerf plate**, if applicable;
- 107) Instruction where to lift and support the **mitre saw** during transportation.

8.14.2 c)

Addition:

- 101) Instruction how to properly clean the tool and the guarding system.

9 Protection against access to live parts

This clause of Part 1 is applicable.

10 Starting

This clause of Part 1 is applicable.

11 Input and current

This clause of Part 1 is applicable.

12 Heating

This clause of Part 1 is applicable.

13 Resistance to heat and fire

This clause of Part 1 is applicable.