IEC 62841-2-16

Edition 1.0 2024-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 2-16: Particular requirements for hand-held fastener driving tools

Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité –
Partie 2-16: Exigences particulières pour les machines à enfoncer les fixations portatives

IEC 62841-2-16:2024-06(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 25.140.20

ISBN 978-2-8322-9186-3

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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IEC 62841-2-16 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
116/757/FDIS	116/800/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

This document is to be used in conjunction with IEC 62841-1:2014.

This document supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for hand-held fastener driving tools.

Where a particular subclause of IEC 62841-1 is not mentioned in this document, that subclause applies as far as reasonable. Where this document states "addition", "modification" or "replacement", the relevant text in IEC 62841-1 is to be adapted accordingly.

The following print types are used:

– requirements: in roman type;
– *test specifications: in italic type;*
– terms defined in Clause 3: in **bold** type;
– notes: in small roman type.

Subclauses, notes, tables and figures which are additional to those in IEC 62841-1 are numbered starting from 101.

Subclauses, notes, tables and figures in Annex K and Annex L which are additional to those in the main body of this document are numbered starting from 301.

A list of all parts in the IEC 62841 series, published 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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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

Part 2-16: Particular requirements for hand-held fastener driving tools

1 Scope

IEC 62841-1:2014, Clause 1 is applicable, except as follows:

Addition:

This document applies to hand-held **fastener driving tools**

– intended for driving **fasteners** into or through concrete, fabric, fiberboard, metal, plastic, wood, wood products, cartons, and other materials; and

– whose energy to drive the **fastener** is derived directly or indirectly from an electric motor or magnetic drive.

This document does not apply to pneumatically driven tools where the compressed gas comes from an external source, such as a compressor or a tank.

This document does not apply to tools powered by combustible gases, even if electrically ignited.

NOTE 101 Tools powered by compressed air or combustible gases are covered by ISO 11148-13:2017.

2 Normative references

IEC 62841-1:2014, Clause 2 is applicable, except as follows:

Addition:

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60664-4:2005, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*

IEC 62841-1:2014, *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 1: General requirements*

ISO 630-2:2021, *Structural steels – Part 2: Technical delivery conditions for structural steels for general purposes*

ISO 28927-13:2022, *Hand-held portable power tools – Test methods for evaluation of vibration emission – Part 13: Fastener driving tools*

EN 12549:1999, *Acoustics – Noise test code for fastener driving tools – Engineering method*

EN 15895:2011, *Cartridge operated hand-held tools – Safety requirements – Fixing and hard marking tools*

3 Terms and definitions

IEC 62841-1:2014, Clause 3 is applicable, except as follows:

Addition:

3.101
activate
move or otherwise engage a **trigger** or **workpiece contact** so that it is in a state that allows the **fastener driving tool** to be **actuated** or that satisfies one requirement for the **fastener driving tool** to be **actuated**

3.102
actuate
cause movement of the tool component(s) intended to drive a **fastener**

3.103
actuation mode
sequence by which a fastening operation is performed

3.103.1
contact actuation
actuation mode which allows the tool to operate by **activating** the **workpiece contact** whilst the **trigger** is continually depressed and held

Note 101 to entry: **Contact actuation** is also known as bump mode.

3.103.2
contact actuation with automatic reversion
actuation mode that is capable of **contact actuation** and where the tool cannot **actuate** if the **trigger** is depressed without operation of the **workpiece contact** within the **trigger time-out period**

Note 101 to entry: Additional actuation is possible only after the **trigger** is released and re-**activated**.

3.103.3
dual activation
actuation mode where two devices, such as **triggers**, levers, or switches, work in conjunction with each other such that two sequential dissimilar actions are required to **actuate** the tool

3.103.4
full sequential actuation
actuation mode which allows single driving operations via the **trigger** after the **workpiece contact** has been **activated** and during which additional actuation can occur only when all operating controls are released and re-**activated** in the same sequence

3.103.5
single sequential actuation
actuation mode which allows single driving operations via the **trigger**, after the **workpiece contact** has been **activated**, and during which additional actuation can occur only when the **trigger** has been returned to the non-driving position whilst the **workpiece contact** remains in the **activated** position

3.104
actuation system
trigger or **workpiece contact activated** separately or in some combination or sequence to **actuate** the tool

3.105
coil nailer
fastener driving tool that drives **fasteners** from a collated coil of nails

Note 101 to entry: Roofing nailers are an example of a **coil nailer**.

3.106
fastener
mechanical device used for securing fixings to surfaces or joining materials together, such as nails, staples and pins, for use in **fastener driving tools**

3.107
fastener driving tool
hand-held tool in which energy is transmitted in a linear motion to a **fastener** for the purpose of driving the **fastener** into defined materials

Note 101 to entry: **Fasteners** are typically driven by mechanical or pneumatic means.

3.108
heavy duty brad nailer
fastener driving tool capable of driving nails of 1,2 mm (18 gauge) or larger nominal diameter wire

3.109
heavy duty stapler
fastener driving tool capable of driving staples with a **staple leg width** of 1,6 mm or larger and a nominal **staple leg thickness** of 1,4 mm or larger

3.110
horizontal-down
tool orientation where the tool nose is normal to a horizontal work surface and pointed downwards

3.111
horizontal-up
tool orientation where the tool nose is normal to a horizontal work surface and pointed upwards

3.112
light duty tool
fastener driving tool that is only capable of driving **fasteners** where

– the mass of the **fastener** is less than 0,5 g and the length of the **fastener** does not exceed 26 mm; or
– the mass of the **fastener** is less than 0,4 g and the length of the **fastener** does not exceed 36 mm

Note 101 to entry: **Heavy duty brad nailers**, **heavy duty staplers** and **pinners** are considered not to be **light duty tools**.

3.113
multi-blow tool
fastener driving tool that drives **fasteners** through multiple impacts on the head of the **fastener** and not through the forcible ejection of the **fastener**

Note 101 to entry: An example of a **multi-blow tool**, also known as a percussion nailer, is a palm nailer.

3.114
pinner
fastener driving tool capable of driving headless **fasteners** up to 51 mm in length and a maximum diameter of 0,64 mm (23 gauge)

3.115
staple leg thickness
maximum dimension of staple leg cross-section measured parallel to the staple crown axis

3.116
staple leg width
maximum dimension of staple leg cross-section measured perpendicular to the staple crown axis

3.117
trigger
control element **activated** manually by a tool operator

3.118
trigger time-out period
for tools with **contact actuation with automatic reversion actuation mode**, the duration of time a **trigger** can be depressed without operation of the **workpiece contact** before the tool becomes inoperable

3.119
workpiece contact
control element or assembly on the **fastener driving tool** intended to be **activated** by the workpiece

Note 101 to entry: This includes retractable **workpiece contacts** that are normally retracted and extend when the **trigger** is **activated**.

3.119.1
protected workpiece contact
workpiece contact that is recessed such that it cannot be **activated** by pressing against a flat surface

Note 101 to entry: **Protected workpiece contacts** are found on tools that are designed to affix cable, tubing and the like with staples where the **workpiece contact** presses against the material being affixed.

4 General requirements

IEC 62841-1:2014, Clause 4 is applicable.

5 General conditions for the tests

IEC 62841-1:2014, Clause 5 is applicable, except as follows:

5.17 *Addition:*

*The mass of the tool includes the heaviest **fastener** magazine in accordance with 8.14.2 b) 102), but excludes any **fasteners**.*

5.101 *For tests that are conducted without **fasteners**, the test may be conducted using a test fixture that simulates a **fastener** in order to avoid abnormal stresses that may occur in the tool.*

5.102 *For tools that employ a function that does not permit the tool to **actuate** without **fasteners**, tests that require the tool to **actuate** shall be conducted with **fasteners** or the function shall be disabled. If required, special hardware or software (or both) may be used in order to disable the function.*

6 Radiation, toxicity and similar hazards

IEC 62841-1:2014, Clause 6 is applicable.

7 Classification

IEC 62841-1:2014, Clause 7 is applicable.

8 Marking and instructions

IEC 62841-1:2014, Clause 8 is applicable, except as follows:

8.1 *Replacement of the third dash:*

– **rated input**, in watts or **rated current**, in amperes;

8.2 *Addition:*

Fastener driving tools shall be marked with safety information which shall be written in one of the official languages of the country in which the machine is to be sold or marked with the appropriate symbol:

– "Wear eye protection" or symbol M004 of ISO 7010;
– "Wear ear protection", or symbol M003 of ISO 7010. This marking may be omitted if the measured sound pressure level at the operator's ear in accordance with Annex I does not exceed 85 dB(A).

A combination of product safety labels, such as eye, ear, dust and head protection, is allowed.

8.11 *Addition:*

For tools with the ability to select different **actuation modes**, markings indicating which **actuation mode** is enabled.

8.14.1 *Addition:*

The additional safety instructions as specified in 8.14.1.101 or 8.14.1.102 (as applicable) shall be given. The term "tool" in these warnings may be replaced by a specific tool designation, such as **fastener driving tool**, nailer, **pinner**, stapler, tacker, etc. This part may be printed separately from the "General Power Tool Safety Warnings".

8.14.1.101 Fastener driving tool safety warnings (except for multi-blow tools)

a) **Always assume that the tool contains fasteners**. *Careless handling of the tool may result in unexpected firing of fasteners and personal injury.*

b) **Disconnect the tool from the power source when loading and unloading fasteners, making adjustments or changing accessories**. *The tool may be accidentally activated if it is connected to the power source, which may result in personal injury.*

c) **Be careful when handling fasteners, especially when loading and unloading**. *The fasteners have sharp points which may result in personal injury.*

d) **Do not point the tool towards yourself or anyone nearby**. *Unexpected triggering will discharge a fastener, which may result in personal injury.*

e) **Keep fingers away from the trigger when not operating the tool and when moving from one operating position to another**. *Unexpected triggering will discharge a fastener, which may result in personal injury.*

f) **Hold the tool by insulated gripping surfaces, when performing an operation where the fastener may contact hidden wiring or its own cord**. *A fastener contacting a "live" wire may make exposed metal parts of the tool "live" and could give the operator an electric shock.*

g) **Hold the tool with a firm grasp during operation**. *Uncontrolled recoil of the tool may result in unintended activation, which may result in personal injury.*

h) **Keep all body parts such as hands and legs, etc. away from the firing direction of the tool**. *The fastener may penetrate the workpiece as well as any object behind it, which may result in personal injury.*

i) **When using the tool, keep all body parts such as hands and legs, etc. away from the area where the fastener is driven into the workpiece**. *The fastener could deflect and exit the workpiece, which may result in personal injury.*

j) **Do not actuate the tool unless the tool is placed firmly against the workpiece**. *If the tool is not in contact with the workpiece, the fastener may be deflected away from the workpiece, which may result in personal injury.*

k) **When fastening electrical cables, make sure the cables are not energized. Hold the tool only by insulated gripping surfaces. Use only fasteners designed for electrical cable installations. Inspect that the fastener has not damaged the insulation of the electrical cables**. *A fastener that damages the insulation of electric cables can lead to electric shock and fire hazards.*

NOTE 101 The warning in item k) above is omitted for tools that are not intended to fasten electrical cables.

l) **Do not use this tool for fastening electrical cables**. *It is not designed for electric cable installation and may damage the insulation of electric cables, thereby causing electric shock or fire hazards.*

NOTE 102 The warning in item l) above is omitted for tools intended to fasten electric cables in accordance with 8.14.2 b) 106).

m) **Disconnect the tool from the power source if a fastener jams in the tool**. *While removing a jammed fastener, the tool may be accidentally activated if it is connected to the power source, which may result in personal injury.*

n) **Use caution while removing a jammed fastener**. *The mechanism may be under compression and the fastener may be forcefully discharged, which may result in personal injury.*

NOTE 103 The warning in item n) above is omitted for tools that do not utilize a stored potential energy to drive the **fasteners**.

8.14.1.102 Multi-blow tool safety warnings

a) **Hold the tool by insulated gripping surfaces, when performing an operation where the fastener may contact hidden wiring or its own cord**. *A fastener contacting a "live" wire may make exposed metal parts of the tool "live" and could give the operator an electric shock.*

b) **Keep all body parts such as hands and legs, etc. away from the driving direction of the fastener**. *The fastener may penetrate the workpiece as well as any object behind it, which may result in personal injury.*

c) **When fastening electrical cables, make sure the cables are not energized. Hold the tool only by insulated gripping surfaces. Use only fasteners designed for electrical cable installations. Inspect that the fastener has not damaged the insulation of the electrical cables**. *A fastener that damages the insulation of electric cables can lead to electric shock and fire hazards.*

NOTE 101 The warning in item c) above is omitted for tools that are not intended to fasten electrical cables.

d) **Do not use this tool for fastening electrical cables**. *It is not designed for electric cable installation and may damage the insulation of electric cables, thereby causing electric shock or fire hazards.*

NOTE 102 The warning in item d) above is omitted for tools intended to fasten electric cables in accordance with 8.14.2 b) 106).

8.14.2 b) *Addition:*

101) Information on suitable **fasteners** to be used with the tool;

102) Information on suitable **accessories** to be used with the tool, such as **fastener** magazines or **workpiece contact** tip protectors;

103) Information on the correct operation of all control elements of the tool (e.g. **trigger**, **workpiece contact**, **actuation mode** selector);

104) Information stating what materials the tool is designed to drive **fasteners** into;

105) Information indicating if the tool is intended to be used on hard materials such as steel and concrete, including information regarding the additional downforce required to operate the tool;

106) Information that the tool is intended to fasten electrical cables, if applicable;

107) Information on the **fasteners** to be used for fixing electric cables, if applicable;

108) Instructions for removing a jammed **fastener** in the tool;

109) Information on **actuation modes** of the tool;

110) Information on the method to change the **fastener** magazine, if any.

9 Protection against access to live parts

IEC 62841-1:2014, Clause 9 is applicable.

10 Starting

IEC 62841-1:2014, Clause 10 is applicable.

11 Input and current

IEC 62841-1:2014, Clause 11 is applicable.

12 Heating

IEC 62841-1:2014, Clause 12 is applicable, except as follows:

12.2 *Replacement:*

*For tools with one or more **rated voltages**: The tool is operated at each **rated voltage**, under the load conditions specified in 12.2.1. The voltage is then adjusted to 0,94 times the **rated voltage** and 1,06 times the **rated voltage**.*

The temperatures are measured at the most unfavourable of the two voltage settings. The temperatures that are measured by means of thermocouples are taken while the tool is operating.

*For tools with a **rated voltage range**: The tool is operated*

– *at the lower limit of the **rated voltage range**, under the load conditions specified in 12.2.1. The voltage is then adjusted to 0,94 times the lower limit of the **rated voltage range**; and*

– *at the upper limit of the **rated voltage range**, under the load conditions specified in 12.2.1. The voltage is then adjusted to 1,06 times the upper limit of the **rated voltage range**.*