

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –  
Part 2-6: Particular requirements for hand-held hammers**

**Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité –  
Partie 2-6: Exigences particulières pour les marteaux portatifs**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –****Part 2-6: Particular requirements for hand-held hammers**

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International Standard IEC 62841-2-6 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools

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

FDIS	Report on voting
116/459/FDIS	116/466/RVD

Full information on the voting for the approval of this International 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 2-6 is to be used in conjunction with IEC 62841-1:2014.

This Part 2-6 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for hand-held hammers.

Where a particular subclause of Part 1 is not mentioned in this Part 2-6, that subclause applies as far as relevant. 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 in 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- withdrawn,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.

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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.

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

## Part 2-6: Particular requirements for hand-held hammers

### 1 Scope

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

*Addition:*

This part of IEC 62841 applies to hand-held hammers.

Tools covered by this document include **percussion hammers** and **rotary hammers**, including **rotary hammers** with the capability to rotate only with the percussion system disengaged (drill only mode).

This document does not apply to drills and impact drills.

NOTE 101 Drills and impact drills are covered by IEC 62841-2-1.

This document does not apply to tools that are designed exclusively for driving fasteners, such as palm nailers.

### 2 Normative references

[IEC 62841-2-6:2020](#)

[standards.iteh.ai/catalog/standards/sist/7431fa8-8e04-447c-92fb-2c296b312024/iec-62841-2-6-2020](#)

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

*Addition:*

EN 206:2013, *Concrete. Specification, performance, production and conformity*  
EN 206:2013/AMD1:2016

### 3 Terms and definitions

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

*Addition:*

#### 3.101

##### **percussion hammer**

tool equipped with a built-in percussion system where the impact energy is not dependent on the feed force applied by the operator and has no capability of rotational motion

Note 1 to entry: **Percussion hammers** are also known as chisel hammers, hammers, breakers, concrete breakers and picks.

#### 3.102

##### **rotary hammer**

tool capable of rotational motion and equipped with a built-in percussion system where the impact energy is not dependent on the feed force applied by the operator (**rotary hammer mode**) and additionally, may have one or more of the following modes:



- a) with rotational motion disengaged (percussion only mode)
- b) with the percussion system disengaged (drill only mode)

#### 4 General requirements

This clause of Part 1 is applicable.

#### 5 General conditions for the tests

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

##### 5.17 Addition:

*The mass of the tool includes the auxiliary handle and all parts of an integrated (i.e. non-detachable) dust extraction device, if any. A detachable dust extraction device is not included in the mass of the tool.*

#### 6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

#### 7 Classification

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**(standards.iteh.ai)**

This clause of Part 1 is applicable.

#### 8 Marking and instructions

[IEC 62841-2-6:2020](https://standards.iteh.ai/catalog/standards/sist/7431fa8-8e04-447c-92fb-2c296b12024/iec-62841-2-6-2020)

<https://standards.iteh.ai/catalog/standards/sist/7431fa8-8e04-447c-92fb-2c296b12024/iec-62841-2-6-2020>

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

##### 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 Hammer safety warnings

###### 1) Safety instructions for all operations

- a) **Wear ear protectors.** *Exposure to noise can cause hearing loss.*
- b) **Use auxiliary handle(s), if supplied with the tool.** *Loss of control can cause personal injury.*
- c) **Brace the tool properly before use.** *This tool produces a high output torque and without properly bracing the tool during operation, loss of control may occur resulting in personal injury.*

NOTE 101 The above warning applies only for **rotary hammers** with a maximum output torque greater than 100 Nm measured in accordance with 19.102.

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

NOTE 102 For **rotary hammers** that can also be used as screwdrivers, the words "or fasteners" are added after "cutting accessory".

## 2) Safety instructions when using long drill bits with rotary hammers

NOTE 103 The warnings in this section apply only to **rotary hammers**.

- a) **Always start drilling at low speed and with the bit tip in contact with the workpiece.** *At higher speeds, the bit is likely to bend if allowed to rotate freely without contacting the workpiece, resulting in personal injury.*
- b) **Apply pressure only in direct line with the bit and do not apply excessive pressure.** *Bits can bend, causing breakage or loss of control, resulting in personal injury.*

### 8.14.2 a) Addition:

- 101) For tools with a maximum output torque greater than 100 Nm measured in accordance with 19.102: instructions on how to brace the tool;
- 102) Instructions for assembling any **attachments** that are supplied with the tool;
- 103) For tools provided with a dust extraction device: instruction on how to collect the dust;
- 104) For tools with detachable dust collection device: information on which dust collection device may be used.

## 9 Protection against access to live parts

This clause of Part 1 is applicable.

## 10 Starting

This clause of Part 1 is applicable. [IEC 62841-2-6:2020  
https://standards.iteh.ai/catalog/standards/sist/7431faf8-8e04-447c-92fb-2c296b312024/iec-62841-2-6-2020](https://standards.iteh.ai/catalog/standards/sist/7431faf8-8e04-447c-92fb-2c296b312024/iec-62841-2-6-2020)

## 11 Input and current

This clause of Part 1 is applicable.

## 12 Heating

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

### 12.2.1 Replacement:

*The tool is operated intermittently for 30 cycles or until thermal equilibrium is reached, whichever is achieved first, each cycle comprising a period of continuous operation of 30 s and a rest period of 90 s with the tool switched off, the tool loaded during the periods of operation by means of a brake adjusted so as to attain **rated input** or **rated current**.*

*During the test, the hammer mechanism is disengaged or removed.*

### 12.5 Addition:

*The temperature-rise limit specified for the external enclosure does not apply to the enclosure of the impact mechanism.*

### 13 Resistance to heat and fire

This clause of Part 1 is applicable.

### 14 Moisture resistance

This clause of Part 1 is applicable.

### 15 Resistance to rusting

This clause of Part 1 is applicable.

### 16 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

### 17 Endurance

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

#### 17.2 Replacement:

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*Rotary hammers with drill only mode are operated intermittently at no-load with the impact mechanism disengaged for 12 h at a supply voltage equal to 1,1 times the highest **rated voltage** or 1,1 times the upper limit of the **rated voltage range**, and then for 12 h at a supply voltage equal to 0,9 times the lowest **rated voltage** or 0,9 times the lower limit of the **rated voltage range**. The 12 h of operation need not be continuous. The speed is adjusted to the highest value of the highest range.*

*Each cycle of operation comprises an "on" period of 100 s and an "off" period of 20 s, the "off" periods being included in the specified operating time.*

*During the test, the tool is placed in three different positions, the operating time, at each voltage, being approximately 4 h for each position.*

NOTE 1 The change of position is made to prevent abnormal accumulation of carbon dust in any particular place. Examples of the three positions are horizontal, vertically up and vertically down.

*Following the above test (if applicable), all hammers, including **rotary hammers** with drill only mode, are mounted vertically down in a test apparatus designed to apply an axial force ensuring steady operation of the impact mechanism to the hammer through a resilient medium. An example of a test apparatus is shown in Figure 101.*

*The hammers are then operated at **rated voltage**, for four periods of 6 h each, the interval between these periods being at least 30 min. For **rotary hammers** with drill only mode, the impact mechanism is engaged.*

*The tool is operated intermittently, each cycle comprising a period of operation of 30 s and a rest period of 90 s during which the tool remains switched off.*

*The tool may be switched on and off by means of a switch other than that incorporated in the tool.*

*During these tests, replacement of the carbon brushes is allowed, and the tool is oiled and greased as in **normal use**. If the impact mechanism fails mechanically during the test without causing an **accessible part** to become live, it may be replaced by a new one.*

*If the temperature rise of any part of the tool exceeds the temperature rise determined during the test of 12.1, forced cooling or rest periods may be applied, the rest periods being excluded from the specified operating time. If forced cooling is applied, it shall not alter the air flow of the tool or redistribute carbon deposits.*

*During these tests, overload protection devices incorporated in the tool shall not activate.*

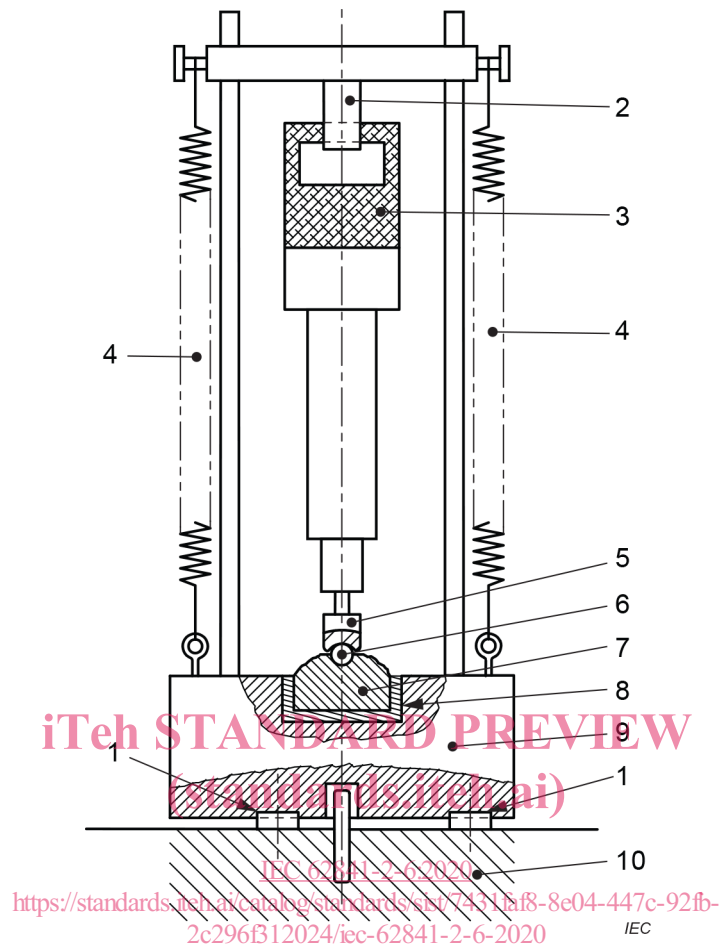
NOTE 2 Monitoring of external temperatures will help avoid mechanical failures.

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[IEC 62841-2-6:2020](https://standards.iteh.ai/catalog/standards/sist/7431faf8-8e04-447c-92fb-2c296b12024/iec-62841-2-6-2020)

<https://standards.iteh.ai/catalog/standards/sist/7431faf8-8e04-447c-92fb-2c296b12024/iec-62841-2-6-2020>

Dimensions in millimetres

**Key**

- 1 resilient material to absorb vibration and prevent resonance
- 2 yoke, adapted to suit the grip of the tool
- 3 sample
- 4 mechanical or pneumatical springs applying a force to the sample
- 5 punch
- 6 hardened steel ball with diameter 38 mm
- 7 hardened steel transfer plate of mass  $M_2$  and diameter  $D$
- 8 synthetic rubber disk or material having similar properties, Shore hardness 70° to 80°, thickness 6 mm to 7 mm, fitting closely in cavity
- 9 steel base at mass  $M_1$ , with circular cavity having a diameter 1 mm greater than that of the transfer plate
- 10 ground support such as a concrete block being large and solid enough to ensure the stability of the test apparatus during the test

Rated input of tool	$D$ Diameter of transfer plate	$M_1$ Minimum mass of steel base	$M_2$ Mass of transfer plate	$M_3$ Total mass of punch and shank
W	mm	kg	kg	kg
Up to and including 700	100	90	1,0 to 1,25	0,7
Over 700 up to and including 1 200	140	180	2,25 to 2,81	1,4
Over 1 200 up to and including 1 800	180	270	3,8 to 4,75	2,3
Over 1 800 up to and including 2 500	220	360	6,0 to 7,5	3,4

**Figure 101 – Example of a testing apparatus**

## 18 Abnormal operation

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

### 18.8 Replacement of Table 4 by the following:

**Table 4 – Required performance levels**

Type and purpose of SCF	Minimum performance level (PL)
<b>Power switch</b> – provide desired switch-off for <b>rotary hammers</b> in <b>rotary hammer</b> mode and drill only mode that require bracing in accordance with 8.14.1.101	<i>Shall be evaluated using the fault conditions of 18.6.1 without the loss of this SCF</i>
<b>Power switch</b> – provide desired switch off for <b>percussion hammers</b> or for <b>rotary hammers</b> in percussion only mode	Not an <b>SCF</b>
Provide desired direction of rotation for tools that do not require bracing in accordance with 8.14.1.101	Not an <b>SCF</b>
Provide desired direction of rotation for <b>rotary hammers</b> that require bracing in accordance with 8.14.1.101	c
Any electronic control to pass the test of 18.3	a
Any speed limiting device	Not an <b>SCF</b>
Prevent exceeding thermal limits as in 18.4	a
Limit the torque to comply with 19.102	c
<b>Power switch</b> – prevent unwanted switch-on for <b>rotary hammers</b> in <b>rotary hammer</b> mode and drill only mode with $M_R \leq 25$ Nm in accordance with 19.102	a
<b>Power switch</b> – prevent unwanted switch-on for <b>rotary hammers</b> in <b>rotary hammer</b> mode and drill only mode with $M_R > 25$ Nm in accordance with 19.102	b
<b>Power switch</b> – prevent unwanted switch-on for <b>percussion hammers</b> or for <b>rotary hammers</b> in percussion only mode	Not an <b>SCF</b>
<b>Power switch</b> – provide desired switch-off for <b>rotary hammers</b> in <b>rotary hammer</b> mode and drill only mode with $M_R \leq 25$ Nm in accordance with 19.102	b
<b>Power switch</b> – provide desired switch-off for <b>rotary hammers</b> in <b>rotary hammer</b> mode and drill only mode with $M_R > 25$ Nm in accordance with 19.102	c
Prevent unwanted lock-on of the <b>power switch</b> function for <b>rotary hammers</b> in <b>rotary hammer</b> mode and drill only mode with $M_R \leq 25$ Nm in accordance with 19.102	b
Prevent unwanted lock-on of the <b>power switch</b> function for <b>rotary hammers</b> in <b>rotary hammer</b> mode and drill only mode with $M_R > 25$ Nm in accordance with 19.102	c
Prevent unwanted lock-on of the <b>power switch</b> function for <b>percussion hammers</b> or for <b>rotary hammers</b> in percussion only mode	Not an <b>SCF</b>
Prevent self-resetting as required in 23.3 for <b>rotary hammers</b> in <b>rotary hammer</b> mode and drill only mode with $M_R \leq 25$ Nm in accordance with 19.102	a
Prevent self-resetting as required in 23.3 for <b>rotary hammers</b> in <b>rotary hammer</b> mode and drill only mode with $M_R > 25$ Nm in accordance with 19.102	b

## 19 Mechanical hazards

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

### 19.1 Addition:

*The test with probe B of IEC 61032:1997 does not apply to the chuck and any accessory that may be inserted.*

**19.6** This subclause of Part 1 is not applicable.

**19.101** Chuck keys shall be so designed that they drop easily out of position when released.

This requirement does not exclude the provision of clips for holding the key in place when not in use; metal clips fixed to the flexible cable or cord are not allowed.

*Compliance is checked by inspection and manual test.*

*The key is inserted in the chuck and, without tightening, the tool is turned such that the key is facing down. The key shall fall out within 2 s.*

### 19.102 Handles on rotary hammers

#### 19.102.1 General

The design of the handle(s) on **rotary hammers** shall be such that the operator can control the static stalling torque during the operation of the tool. Depending on the handle design, the stalling torque shall not exceed the relevant maximum values as indicated in Figures 102 to 105.

<https://standards.iteh.ai/catalog/standards/sist/7431faf8-8e04-447c-92fb-2c296b312024/iec-62841-2-6-2020>

Figure 106 illustrates for various handle designs the location "S" where the operator naturally grasps the **power switch**. For **power switch** designs without a natural grasping location, "S" shall indicate the least favourable position on the **power switch** for the reactionary torque measurement. This location "S" is used in Figure 102 to Figure 105 to determine the moment arm for the torque calculation.

Figure 107 illustrates for various auxiliary handle with flange designs the location "F" where the operator naturally grasps the handle at the flange. This location "F" is used in Figure 104 and Figure 105 to determine the moment arm for the torque calculation.

For **rotary hammers** with the ability to operate in percussion only mode and provided with a stick-type auxiliary handle without flange, the determination of the relevant length "a" for the moment arm is illustrated in Figure 108.

NOTE 101 Stick type auxiliary handles on **rotary hammers** that can operate in percussion only mode are typically designed without a flange barrier. A flange could prevent ergonomic use in the chiselling application where the flange would interfere with the hand of the operator. The measurement of "a" in Figure 108 accommodates this type of tool.

*Compliance is checked by the tests specified in 19.102.2 and 19.102.4 and by the calculations in Figure 102 to Figure 105 and Figure 108.*