

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electric motor-operated tools – Dust measurement procedure –
Part 2-6: Particular requirements for hand-held hammers**

**Outils électroportatifs à moteur – Procédure de mesure de la poussière –
Partie 2-6: Exigences particulières pour les marteaux portatifs**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRIC MOTOR-OPERATED TOOLS –
DUST MEASUREMENT PROCEDURE –****Part 2-6: Particular requirements for hand-held hammers**

FOREWORD

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IEC 63241-2-6 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
116/654/FDIS	116/667/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 is to be used in conjunction with the first edition of IEC 63241-1 (IEC 63241-1:2023).

This document supplements or modifies the corresponding clauses in IEC 63241-1, so as to convert it into the IEC Standard: *Electric motor-operated tools – Dust measurement procedure – Particular requirements for hand-held hammers*.

Where a particular subclause of IEC 63241-1 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 63241-1 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, tables and figures which are additional to those in IEC 63241-1 are numbered starting from 101.

A list of all parts of the IEC 63241 series, under the general title: *Electric motor-operated tools – Dust measurement procedure*, can be found on the IEC website.

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/standardsdev/publications.

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,
- 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.

ELECTRIC MOTOR-OPERATED TOOLS – DUST MEASUREMENT PROCEDURE –

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

1 Scope

IEC 63241-1:2023, Clause 1 is applicable, except as follows:

Addition:

This part of IEC 63241 applies to hand-held hammers.

2 Normative references

IEC 63241-1:2023, Clause 2 is applicable, except as follows:

Addition:

EN 10080:2005, *Steel for the reinforcement of concrete – Weldable reinforcing steel – General*

IEC 63241-1:2023, *Electric motor-operated tools – Dust measurement procedure – Part 1: General requirements*

3 Terms and definitions

IEC 63241-1:2023, Clause 3 is applicable, except as follows:

Addition:

3.101

percussion hammer

tool equipped with a built-in percussion system which is not influenced 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 which is not influenced 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 Test procedure

IEC 63241-1:2023, Clause 4 is applicable, except as follows:

4.3 Operating conditions

Addition:

Rotary hammers are tested under load observing the conditions shown in Table 101. This test is not performed in percussion only mode or drill only mode (if applicable).

NOTE 101 **Rotary hammers** in percussion only mode are tested in accordance with Table 105.

For battery operated tools, the tests are conducted with a battery recommended by the manufacturer for the tool with a sufficient capacity to complete the tests.

Table 101 – Operating conditions for rotary hammers

Material and set-up	<p>Concrete block without a reinforcement having the formulation specified in Table 102 and having the minimum dimensions 500 mm × 500 mm and 200 mm in height.</p> <p>After the 28 days as specified in Table 102, the concrete block shall be stored for another three weeks under dry conditions.</p> <p>For rotary hammers with a mass less than or equal to 5 kg (excluding the supply cord, detachable battery pack or separable battery pack, as applicable), the concrete block is placed on an A-support, see Figure 101, with 15° inclination, the lower workpiece support being (1 000 ± 50) mm above the floor. To prevent damage to the A-support, additional supporting material such as plywood or fibreboard may be used between the block and the A-support.</p> <p>For rotary hammers with a mass above 5 kg (excluding the supply cord, detachable battery pack or separable battery pack, as applicable), the concrete block is placed on the floor. The blocks may be supported by pallets or the like.</p>
Orientation and operation	<p>Drilling holes into the concrete block perpendicular to the surface of the 500 mm × 500 mm area. The holes shall have a depth in accordance with Table 104.</p> <p>The distance between the holes and the distance of the holes to the edge of the block shall be large enough so that the dust collection device of the hammer does not cover any adjacent holes or overhang the edge of the block.</p>
Tool bit/settings	<p>New drill bit as specified by the manufacturer for drilling into concrete at the beginning of each of the three tests. The diameter of the drill bit shall be in accordance with Table 104, where the mass of the tool is determined without the supply cord, detachable battery pack or separable battery pack attached to the tool, if any, and without tool bits or accessories, but with all attachments needed for normal use. Details of the required attachments are specified in the manufacturer's instructions.</p> <p>If the tool is supplied with more than one attachment, the heaviest configuration shall be used to determine the mass.</p> <p>All mass measurements shall be made with an accuracy of ±5 %.</p> <p>Speed setting devices, if any, shall be adjusted to the setting specified for the drill bit size and for drilling into concrete.</p>
Feed force	<p>The feed force applied to the tool shall be sufficient to ensure stable operation with good performance.</p>
Test	<p>During each test cycle of 10 min, a number of holes as specified in Table 104 are drilled into the concrete block, equally distributed over the test cycle.</p> <p>If the above cannot be achieved within 10 min, the time is extended to allow the required number of holes to be drilled.</p>

Table 102 – Concrete specifications

Minimum compressive strength (after 28 days)	Largest particle size of aggregate ^a
40 N/mm ²	32 mm to 40 mm
^a The aggregate fraction distribution shall be aligned to the largest particle size of the aggregate. Very hard aggregates such as flint or granite and very soft aggregates such as limestone shall not be used.	

NOTE 102 A more detailed example of a concrete formulation that fulfils the requirements of Table 102 is shown in Table 103.

Table 103 – Detailed example of a concrete formulation that fulfils the requirements of Table 102

Cement	Water	Aggregate ^b	
330 kg ^a	183 l ^a	1 844 kg	
		Particle size mm	Fraction %
		0 to 2	38 ± 3
		0 to 8	50 ± 5
		0 to 16	80 ± 5
		0 to 32	100
Compressive strength after 28 days shall be 40 N/mm ² .			
^a The water/cement mass ratio shall be (0,55 ± 0,02) (the mass tolerance of cement and water is +10 % to enable the concrete manufacturer to ensure compressive strength with local cement).			
^b Very hard aggregates such as flint or granite and very soft aggregates such as limestone shall not be used.			

Table 104 – Drilling specification

Tool mass <i>m</i> kg	Diameter of drill bit mm	Number of holes per test cycle	Depth of hole mm
$m \leq 3,5$	10	24	50
$3,5 < m \leq 5$	16	24	
$5 < m \leq 7$	20	12	100
$7 < m \leq 10$	25	12	
$10 < m \leq 18$	32	12	
$m > 18$	40	12	

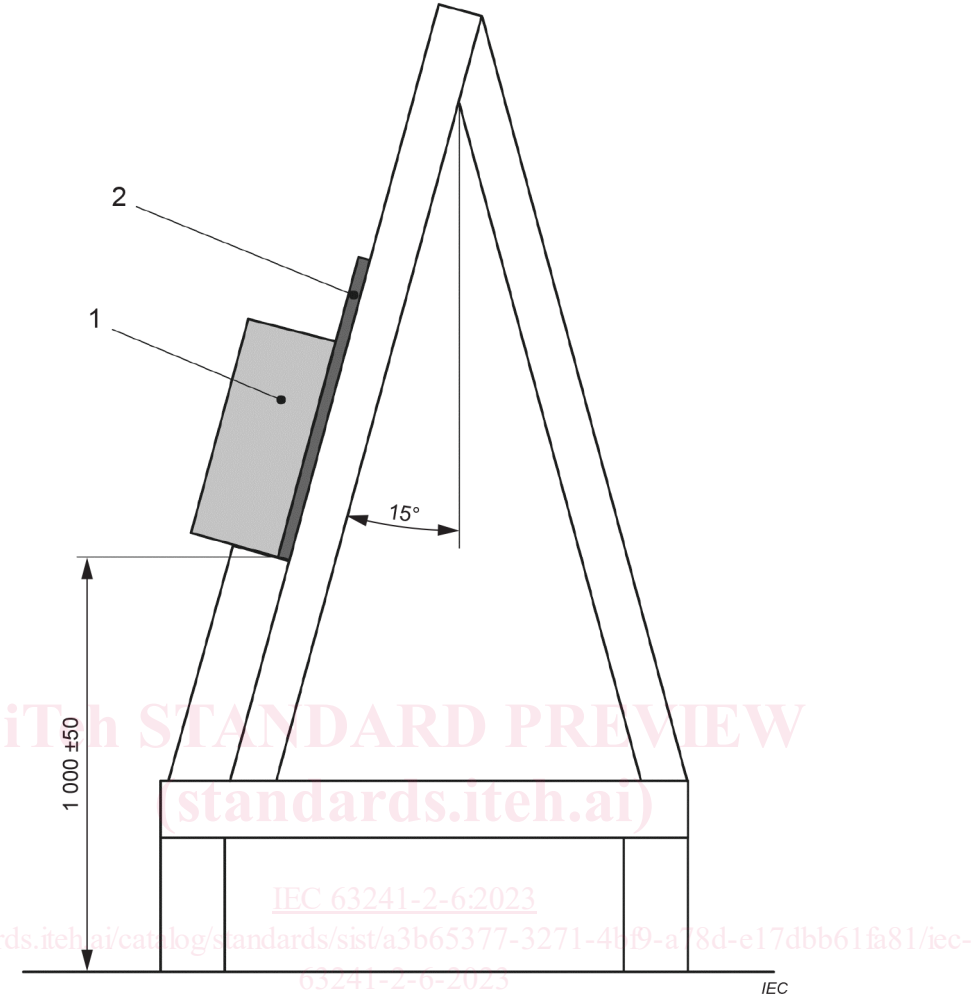
Percussion hammers and rotary hammers in percussion only mode (if applicable) are tested under load observing the conditions shown in Table 105.

Table 105 – Operating conditions for percussion hammers and rotary hammers in percussion only mode (if applicable)

Material and set-up	<p>Reinforced concrete block(s) having the formulation specified in Table 102 and having the minimum dimensions 500 mm × 800 mm and 200 mm in height. The concrete block shall be reinforced with two layers of six rebars each, Ø 12 mm, B500B in accordance with EN 10080:2005 longitudinally (800 mm direction). The distance from rebar to rebar and rebar to block edge shall be (70 ± 30) mm.</p> <p>After the 28 days as specified in Table 102, the concrete block shall be stored for another three weeks under dry conditions.</p> <p>For percussion hammers with a mass less than or equal to 5 kg, the concrete block(s) is (are) placed on an A-support, see Figure 101, with 15° inclination, the lower workpiece support being (1 000 ± 50) mm above the floor. To prevent damage to the A-support, additional supporting material such as plywood or fibreboard may be used between the block(s) and the A-support. In addition, the concrete block(s) may be fastened to the A-support during the test.</p> <p>For percussion hammers with a mass above 5 kg, a sufficient number of concrete blocks are placed side by side on the floor. The blocks may be supported by pallets or the like.</p>
Orientation and operation	<p>Chisel on concrete blocks.</p> <p>For percussion hammers with a mass less than or equal to 5 kg, the work starts on either side of the block, working from top to bottom of the block.</p> <p>For percussion hammers with a mass above 5 kg, chisel on concrete blocks vertically downwards.</p> <p>The concrete block shall be destroyed in the length direction as shown in Figure 102. The work process is finished when all rebars have been separated.</p>
Tool bit/settings	<p>New or re-sharpened pointed chisel as specified by the manufacturer for chiselling concrete.</p> <p>Speed setting devices, if any, shall be adjusted to the setting specified by the manufacturer for chiselling concrete.</p>
Feed force	<p>The forces applied to the tool shall be sufficient to chisel with good performance without overloading the tool.</p>
Test	<p>One test consists of four test cycles of 10 min working time and 5 min rest time each.</p> <p>For percussion hammers with a mass of less than or equal to 5 kg, each test cycle is started on a new half of a block.</p> <p>For percussion hammers with a mass above 5 kg, the work is started on the first block, and after destroying one block, is continued on a new block.</p>

*For all hammers, the mass of the tool is measured without **accessories** and flexible cable or cord and **detachable battery pack** or **separable battery pack**, but including an auxiliary handle, if provided with the tool. The mass of the tool includes all parts of an integrated **dust extraction unit**, if any. Any separate **dust extraction unit** that can be attached to the tool is not included in the mass of the tool.*

Dimensions in millimetres



Key

- 1 workpiece
- 2 additional supporting material

Figure 101 – A-support