IEC 62841-2-6

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

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

IEC 62841-2-6:2020-07/AMD1:2024-02(en-fr)

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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

AMENDMENT 1

FOREWORD

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Amendment 1 to IEC 62841-2-6:2020 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

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

Draft	Report on voting
116/691/FDIS	116/732/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 Amendment 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/.

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- reconfirmed,
- withdrawn, or
- revised.

2 Normative references

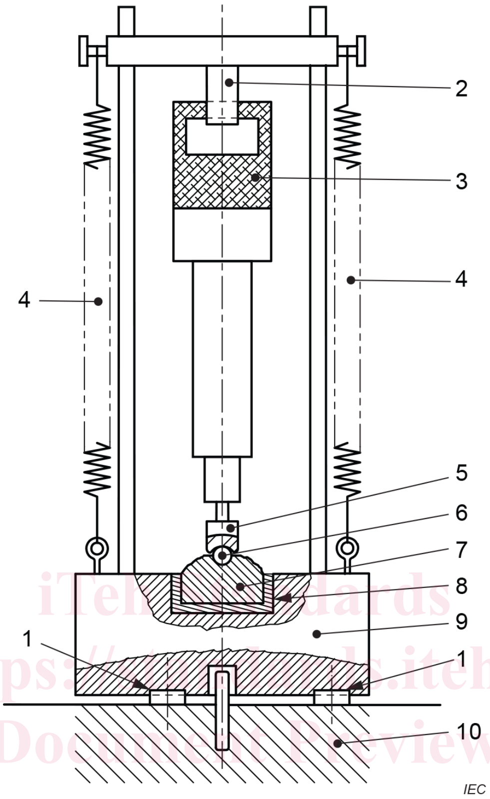
Replace the existing normative reference with the following new normative reference:

EN 206:2013, *Concrete – Specification, performance, production and conformity*
EN 206:2013/AMD2:2021

17 Endurance

Replace the existing Figure 101 with the following new figure:

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

Figure 101 – Example of a testing apparatus

19 Mechanical hazards

Replace the existing text of 19.102.3 with the following new text:

19.102.3 Assessment to determine tool configuration

This assessment is only applicable for tools that employ (an) ***electronic circuit(s)*** *that affect(s) the output torque in the test of 19.102.4.*

Prior to each measurement, the sample is operated for at least 5 min at no-load. After each 5 min operation period, the measurement shall be started within 20 min.

All measurements are made with the tool sample running in the forward position.

The sample is connected to the measurement fixture and is fixed during the test.

For tools with a soft start function, the test of 19.102.4 through steps 1) and 2) is conducted on the sample with the soft start function enabled and then repeated with the soft start function disabled. If analysis shows that the tool will not operate with the soft start function disabled, then the test with the soft start function disabled is not conducted. For tools employing electronically commutated motors, the configuration that results in the greatest output torque shall be used for the test of 19.102.4. For tools other than those employing electronically commutated motors, the configuration that results in the greatest output torque shall be used for the following test.

For tools other than those employing electronically commutated motors, when all functions affecting the test value of the output torque, except for any soft start function, are not evaluated as ***SCF****s according to 18.8 (e.g. current limit and stall detection), the tool configuration for the test of 19.102.4 shall be the configuration that results in the greatest output torque for one trial of the test of 19.102.4 through steps 1) and 2) as specified below:*

– *all functions affecting the output torque enabled; or*

– *each function not evaluated as an* ***SCF*** *affecting the output torque disabled one at a time.*

Replace the existing text of 19.102.4 with the following new text:

19.102.4 Test procedure

If applicable, the sample is configured as specified in 19.102.3.

Prior to the test, the sample is operated for at least 5 min at no-load. After the 5 min operation period, the test shall be started within 20 min.

All measurements are made with the tool sample running in the forward position.

The sample is connected to the measurement fixture and is fixed during the test. The measurement is conducted by using seven trial measurements of the same sample, each trial conducted as follows:

1) *Energize the tool to the full "on" position as quickly as possible and allow the joint to be tightened until it comes to a complete stop.*

2) Record the measured output torque.

a) For tools without a mechanical overload clutch, the output torque is determined by either i) or ii):

i) For signals that are stable for a minimum of 2 ms after the initial peak (if present), the output torque value is determined by measuring over the stable region for an interval T not exceeding 100 ms. If there is variation during this interval, the average value shall be used. See Figure 109.

ii) For signals that are not stable for a minimum of 2 ms after the initial peak, the output torque value shall be the RMS value of the signal over the rotation from off until peak torque is achieved. See Figure 110.

NOTE 101 Torque signals can exhibit a transient peak with a relatively stable signal following the peak. The stable signal can exhibit relatively slow change due to, for example, heating of the windings. The stable signal can also exhibit periodic signal variation due to torque ripple. Averaging over this stable period provides a meaningful torque value. The transient peak and the stable region are not always present.

b) For tools with a mechanical overload clutch:

The output torque is determined by the peak value of the first peak that occurs after starting the trial. Later peaks, even if they appear to have greater values, are not taken into account. See Figure 111.

3) Before the next trial, disconnect the spindle from the test fixture and operate the tool under no-load for a minimum of 3 s. Allow the tool to cool for a minimum of 2 min before the next trial.

M_R is computed as the average of five of the measurements from each of the seven trials, with the highest and lowest measurement eliminated. The standard deviation of the five measurements shall also be computed and shall be less than 5 %. If it is not, then the fixture shall be adjusted to achieve the required repeatability.

NOTE 102 It is recognized that disabling functions that affect the torque can result in a test where the tool is permanently impaired after the test.

Annex I – Measurement of noise and vibration emissions

I.2.5.101 Percussion hammers

Replace the existing text of the third paragraph of I.2.5.101 with the following new text:

The quality of the concrete shall correspond to C 50/60 of EN 206:2013 and EN 206:2013/AMD2:2021.

Replace the existing Table I.102 with the following new table:

Table I.102 – Noise test conditions for rotary hammers

Orientation	Drilling vertically down into a concrete block having the formulation specified in Table I.103 and having the minimum dimensions 500 mm × 500 mm and 200 mm in height and supported on resilient material. The concrete block, its support and the tool shall be so oriented that – the geometric centre of the tool is 1 m above the reflecting plane; – the centre of the concrete block is located under the top microphone "5"; as shown in Figure I.101; and – the sides of the concrete block are parallel to the square formed by the microphones "1" to "4" as shown in Figure I.101. For consistency of results the drilled holes are blind holes. If the drill bit breaks through, reducing the depth of the hole slightly is a method to avoid this.
Tool bit	New drill bit as recommended by the manufacturer for hammer drilling in concrete and of the size defined in Table I.105. For battery tools, the mass of the tool to select the drill bit is the mass without any **detachable battery pack** or **separable battery pack** attached to the tool.
Feed force	The feed force applied to the tool shall be sufficient to ensure stable operation with good performance.
Test cycle	Measurement starts when the drill bit has reached a depth equal to its diameter, and stops when the depth of hole according to Table I.105 has been reached and before the drill bit is removed from the hole.

Annex K – Battery tools and battery packs

Replace the existing text of K.19.102.3 with the following new text:

K.19.102.3 Assessment to determine tool configuration

This assessment is only applicable for tools that employ (an) ***electronic circuit(s)*** *that affect(s) the output torque in the test of K.19.102.4.*

Prior to each measurement, the sample is operated for at least 5 min at no-load using any suitable battery. After each 5 min operation period, the measurement shall be started within 20 min.

The sample is tested together with its intended ***battery****. If more than one* ***battery*** *is specified for use with the tool, the battery with the highest short-circuit current shall be used.*

At the beginning of the test, the ***battery*** *shall be* ***fully charged****.*

All measurements are made with the tool sample running in the forward position.

The sample is connected to the measurement fixture and is fixed during the test.

For tools with a soft start function, the test of K.19.102.4 through steps 1) and 2) is conducted on the sample with the soft start function enabled and then repeated with the soft start function disabled. If analysis shows that the tool will not operate with the soft start function disabled, then the test with the soft start function disabled is not conducted. For tools employing electronically commutated motors, the configuration that results in the greatest output torque shall be used for the test of K.19.102.4. For tools other than those employing electronically commutated motors, the configuration that results in the greatest output torque shall be used for the following test.

For tools other than those employing electronically commutated motors, when all functions affecting the test value of the output torque, except for any soft start function, are not evaluated as SCFs according to K.18.8 (e.g. current limit and stall detection), the tool configuration for the test of K.19.102.4 shall be the configuration that results in the greatest output torque for one trial of the test of K.19.102.4 through steps 1) and 2) as specified below:

– *all functions affecting the output torque enabled; or*

– *each function not evaluated as an **SCF** affecting the output torque disabled one at a time.*

Replace the existing text of K.19.102.4 with the following new text:

K.19.102.4 Test procedure

If applicable, the sample is configured as specified in K.19.102.3.

*Prior to the test, the sample is operated for at least 5 min at no-load, using any suitable **battery**. After the 5 min operation period, the test shall be started within 20 min.*

*The sample is tested together with its intended **battery**. If more than one **battery** is specified for use with the tool, the **battery** with the highest short-circuit current shall be used.*

*At the beginning of the test, the battery shall be **fully charged**.*

All measurements are made with the tool sample running in the forward position.

The sample is connected to the measurement fixture and is fixed during the test. The measurement is conducted by using seven trial measurements of the same sample, each trial conducted as follows:

1) *Energize the tool to the full "on" position as quickly as possible and allow the joint to be tightened until it comes to a complete stop.*
2) *Record the measured output torque.*
   a) *For tools without a mechanical overload clutch, the output torque is determined by either i) or ii):*
      i) *For signals that are stable for a minimum of 2 ms after the initial peak (if present), the output torque value is determined by measuring over the stable region for an interval T not exceeding 100 ms. If there is variation during this interval, the average value shall be used. See Figure 109.*
      ii) *For signals that are not stable for a minimum of 2 ms after the initial peak, the output torque value shall be the RMS value of the signal over the rotation from off until peak torque is achieved. See Figure 110.*

      NOTE 301 Torque signals can exhibit a transient peak with a relatively stable signal following the peak. The stable signal can exhibit relatively slow change due to, for example, heating of the windings. The stable signal can also exhibit periodic signal variation due to torque ripple. Averaging over this stable period provides a meaningful torque value. The transient peak and the stable region are not always present.

   b) *For tools with a mechanical overload clutch:*

      The output torque is determined by the peak value of the first peak that occurs after starting the trial. Later peaks, even if they appear to have greater values, are not taken into account. See Figure 111.
3) *Before the next trial, disconnect the spindle from the test fixture and operate the tool under no-load for a minimum of 3 s. Allow the tool to cool for a minimum of 2 min before the next trial.*

M_R is computed as the average of five of the measurements from each of the seven trials, with the highest and lowest measurement eliminated. The standard deviation of the five measurements shall also be computed and shall be less than 5 %. If it is not, then the fixture shall be adjusted to achieve the required repeatability.