

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Hand-held motor-operated electric tools – Safety –
Part 2-2: Particular requirements for screwdrivers and impact wrenches**

**Outils électroportatifs à moteur – Sécurité –
Partie 2-2: Règles particulières pour les visseuses et les clés à chocs**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS –
SAFETY –****Part 2-2: Particular requirements for screwdrivers
and impact wrenches**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 60745-2-2 edition 2.1 contains the second edition (2003) [documents 61F/461/FDIS and 61F/485/RVD] and its amendment 1 (2008) [documents 61F/732/FDIS and 61F/752/RVD].

A vertical line in the margin shows where the base publication has been modified by amendment 1.

International Standard IEC 60745-2-2 has been prepared by subcommittee 61F: Safety of hand-held motor-operated electric tools, of IEC technical committee 61: Safety of household and similar electrical appliances.

Main changes include Clause 12: Heating, introducing slightly different test cycles, Clause 17: Endurance, introducing both a no-load test and a practical test, and Clause 14: Supply connection and external flexible cords, in respect to minimum cable specifications. Subclause 2.2.23 has been removed, as the definitions of “normal load” are now generally covered by Part 1.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 2-2 is to be used in conjunction with the third edition of IEC 60745-1: Safety of hand-held motor-operated electric tools – Part 1: General requirements. When this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

With amendment 1, this Part 2 is established on the basis of the fourth edition (2006) of IEC 60745-1, *Hand-held motor-operated electric tools – Safety – Part 1: General requirements*.

Main changes include editorial modifications to match with the fourth edition of IEC 60745-1 and the addition of a new safety warning to Clause 8: Marking and instructions.

NOTE In this standard, the following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in smaller roman type.

Subclauses, tables and figures which are additional to those in Part 1 are numbered starting from 101; additional annexes are lettered AA, BB, etc.

IEC 60745 consists of the following parts, under the general title *Hand-held motor-operated electric tools – Safety*:

- Part 1: General requirements
- Part 2-1: Particular requirements for drills and impact drills
- Part 2-2: Particular requirements for screwdrivers and impact wrenches
- Part 2-3: Particular requirements for grinders, polishers and disk-type sanders
- Part 2-4: Particular requirements for sanders and polishers other than disk type
- Part 2-5: Particular requirements for circular saws and circular knives
- Part 2-6: Particular requirements for hammers
- Part 2-7: Particular requirements for spray guns for non-flammable liquids
- Part 2-8: Particular requirements for shears and nibblers
- Part 2-9: Particular requirements for tappers
- Part 2-11: Particular requirements for reciprocating saws (jig and sabre saws)
- Part 2-12: Particular requirements for concrete vibrators
- Part 2-13: Particular requirements for chain saws
- Part 2-14: Particular requirements for planers
- Part 2-15: Particular requirements for hedge trimmers
- Part 2-16: Particular requirements for tackers
- Part 2-17: Particular requirements for routers and trimmers
- Part 2-18: Particular requirements for strapping tools
- Part 2-19: Particular requirements for jointers
- Part 2-20: Particular requirements for band saws
- Part 2-21: Particular requirements for drain cleaners

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the maintenance result 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,
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HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS – SAFETY –

Part 2-2: Particular requirements for screwdrivers and impact wrenches

1 Scope

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

Addition:

This standard applies to screwdrivers and impact wrenches.

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

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

Additional definitions:

3.101

screwdriver

tool intended for tightening and loosening screws, nuts, and the like and not equipped with an impact mechanism but which may have a device for depth setting or setting the torque or means for switching off the rotation

3.102

impact wrench

tool intended for tightening and loosening screws, nuts, and the like and equipped with a rotary impact mechanism. Some impact wrenches are equipped with a means for depth setting and may have a means for setting the torque or switching off the rotation

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

6 Void

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

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

8.12.1.1 Addition

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

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, except as follows:

12.4 Replacement:

The tool is operated intermittently for 30 cycles or until temperatures stabilise, 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. The temperature rises are measured at the end of the "on" period. At the manufacturer's option the tool may be operated continuously until thermal stabilisation.

The impact mechanism may be disabled during the test to prevent damage to the brake.

13 Leakage current

This clause of Part 1 is applicable.

14 Moisture resistance

This clause of Part 1 is applicable.

15 Electric strength

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:

For screwdrivers, the test of Part 1 is applicable.

For impact wrenches, replace the test of Part 1 as follows:

Impact wrenches are operated intermittently for 12 h at a supply voltage equal to 1,1 times rated voltage and then for 12 h at a supply voltage equal to 0,9 times rated voltage.

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

Each cycle of operation comprises an "on" period of 100 s at no load and a resting period of 20 s with the tool switched "off", the "off" periods being included in the specified operating time.

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

After this, the impact wrenches are operated intermittently for 12 h at a supply voltage equal to 1,1 times rated voltage, then for 12 h at a supply voltage equal to 0,9 times rated voltage.

Each cycle of operation comprises a tool impacting for a period of 1 s and a resting period of 9 s with the tool switched "off", the "off" periods being included in the specified operating time.

During this test, 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 are applied, the rest periods being excluded from the specified operating time.

During these tests, overload protection devices shall not operate.

18 Abnormal operation

This clause of Part 1 is applicable.

19 Mechanical hazards

This clause of Part 1 is applicable.

20 Mechanical strength

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

20.5 This subclause is not applicable for impact wrenches.

21 Construction

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

21.32 This subclause is not applicable for impact wrenches.

22 Internal wiring

This clause of Part 1 is applicable.

23 Components

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

23.3 *Replacement:*

Overload protection devices shall be of the non-self-resetting type unless the tool is equipped with a momentary switch with no provision for being locked in the “on” position.

Compliance is checked by inspection.

24 Supply connection and external flexible cords

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

24.4 *Replacement of paragraphs 1 and 2:*

For impact wrenches, the lightest cable which can be used is:

- heavy polychloroprene sheathed flexible cable (60245 IEC 66) or equivalent.

25 Terminals for external conductors

This clause of Part 1 is applicable.

26 Provision for earthing

This clause of Part 1 is applicable.

27 Screws and connections

This clause of Part 1 is applicable.