IEC 60745-2-12

Edition 2.1 2008-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Hand-held motor-operated electric tools – Safety –
Part 2-12: Particular requirements for concrete vibrators

Outils électroportatifs à moteur – Sécurité –
Partie 2-12: Règles particulières pour les vibreurs à béton

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COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS– SAFETY –

Part 2-12: Particular requirements for concrete vibrators

FOREWORD

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International Standard IEC 60745-2-12 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 3: Definitions, moving the description for the tools covered by this standard from Clause 1:Scope to the definitions, Clause 24: Supply connection and external flexible cords, in respect to minimum cable specifications and length. Other requirements have not substantially been changed, but partly reworded and moved to more appropriate clauses.

This consolidated version of IEC 60745-2-12 consists of the second edition (2003) [documents 61F/511/FDIS and 61F/522/RVD] and its amendment 1 (2008) [documents 61F/737/FDIS and 61F/757/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 2.1.

A vertical line in the margin shows where the base publication has been modified by amendment 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 2-12 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 clarifications in Annex K.

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,
- withdrawn,
- replaced by a revised edition, or
- amended.

HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS– SAFETY –

Part 2-12: Particular requirements for concrete vibrators

1 Scope

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

Addition:

This standard applies to concrete vibrators.

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

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

3.2.9 *Replacement:*

normal load

load obtained when the tool is operated continuously, the hose and vibrator bottle being attached to the tool as for normal use. During the operation the vibrator bottle is immersed centrally in a container filled with an amount of water corresponding to at least 50 times the volume of the vibrator bottle.

The dimensions of the container are such that the diameter is about 50 % of the height of the water inside the container.

The height of the container is such that no water can splash out during the test.

Addition:

3.101
concrete vibrator

tool intended for compacting concrete. The active part (vibrator bottle) of the vibrator performs low-amplitude vibrations and is immersed into the mass of concrete to be vibrated. Concrete vibrators may be of one of the following designs:

a) the motor and the vibrating mechanism are inside the vibrator bottle to which the part containing the mains switch or a power converter and switch handle assembly is connected by means of a long flexible hose containing the interconnecting cable. The long flexible hose may be used as the handle (see Figure 101);

b) only the vibrator mechanism is inside the vibrator bottle to which a separate portable unit, comprising the motor, the handle and the mains switch, is connected by means of a long flexible hose containing a flexible shaft (see Figure 102)

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.

9 Protection against access to live parts

This clause of Part 1 is applicable.

10 Starting

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

10.1 *Addition:*

The test is made at an ambient temperature of (10 ± 1) °C after the concrete vibrator has been kept at this temperature for at least 2 h.

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 at normal load for 30 min. The temperature rises are measured at the end of the 30 min.

13 Leakage current

This clause of Part 1 is applicable.

14 Moisture resistance

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

14.1 *Replacement of the first paragraph:*

For design a) as defined in 3.101, the enclosure of all parts and the cable entry shall be IPX7.

During the relevant test of this subclause, the part containing the switch or the power converter and switch handle assembly is placed in the normal position of use, the hose, if any, being attached correctly to it.

For design b) as defined in 3.101, the motor unit shall be IPX4.

During the relevant test of this subclause, the motor unit is placed in the most unfavourable position occurring during normal use.

The isolating transformer or the motor-generator shall be IPX4.

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:*

The tool is operated under the conditions specified for normal load for two periods of 12 h at 1,1 times rated voltage and for two periods of 12 h at 0,9 times rated voltage. The resting time between each of these periods of 12 h shall be at least 2 h.

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

During this test, replacement of the carbon brushes is allowed, and the tool is oiled and greased as in normal use.

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, except as follows:

18.12 This subclause is not applicable.

18.101 *The concrete vibrator is assembled as in normal use and is operated at rated voltage or the at the upper limit of the voltage range, starting from room temperature, the hose and the vibrator bottle being held vertically in free air.*

The period of operation is:

2 min *for concrete vibrators provided with a mains switch such that the motor is switched off automatically as soon the actuating member of the switch is released;*

15 min *for other concrete vibrators, including those with an arrangement to lock the mains switch in the ON position.*

The test is considered to be terminated when a protective device, if any, operates.

After the concrete vibrator has been allowed to cool down to approximately room temperature, it shall withstand an electric strength test as specified in 15.2. For concrete vibrators having the motor in the bottle, the test voltage across basic insulation is, however, reduced to 1 000 V for tools other than those of class III.

19 Mechanical hazards

This clause of Part 1 is applicable.

20 Mechanical strength

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

20.3 *Addition:*

This test is done only with parts containing the motor or the mains switch which are held in the hand or are operated by hand in normal use.

20.5 This subclause is not applicable.

20.101 The mechanical connections between the hose and the part containing the mains switch and those between the hose and the vibrator bottle shall be reliable.

Compliance is checked by applying, on the concrete vibrator assembled as in normal use, between the vibrator bottle and the part containing the mains switch, for 1 min, a pull in newtons (N) equal to 200 times the mass of the vibrator bottle in kilograms, but not exceeding 1 200 N.

During the test, the electrical connections shall not be exposed to mechanical stress. After the test, the hose shall not have moved noticeably at the places where it is fixed to the part containing the mains switch and to the vibrator bottle.

Moreover, the concrete vibrator shall withstand an electric strength test as specified in 15.2. For concrete vibrators having the motor in the bottle, the test voltage across basic insulation is, however, reduced to 1 000 V for tools other than those of class III.

21 Construction

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

21.16 *Addition:*

The circuits supplying motors and other components inside parts which, in normal use, are either immersed in the mixture to be vibrated or held in the hand or operated by hand, shall meet the requirements for tools with water supply.

Instead of an isolating transformer, a motor-generator providing the same degree of isolation from the electric mains as an isolating transformer may be used.

The rated output voltage of an isolating transformer or a motor generator shall not exceed:

– 120 V at frequencies not exceeding 60 Hz
– 250 V at frequencies exceeding 60 Hz.

Compliance is checked by inspection.

21.32 This subclause is not applicable.

22 Internal wiring

This clause of Part 1 is applicable.

23 Components

This clause of Part 1 is applicable.

24 Supply connection and external flexible cords

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

24.4 *Modification:*

Instead of the first paragraph, the following applies:

Supply cords shall be at least heavy polychloroprene sheathed flexible cable (60245 IEC 66).

24.101 The supply cable attached to the part containing the mains switch shall have a length:

– of at least 5 m for designs a) as defined in 3.101;
– of not more than 0,5 m or of at least 5 m for design b) as defined in 3.101.

Compliance is checked by measuring the length of the cable, including any cord guard, between the plug and the point where the cable enters the part containing the mains switch.