

Hand-held motor-operated electric tools — Safety

Part 2-12: Particular requirements for concrete vibrators

The European Standard EN 60745-2-12:2003 has the status of a
British Standard

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National foreword

This British Standard is the official English language version of EN 60745-2-12:2003. It is identical with IEC 60745-2-12:2003. It supersedes BS 2769.2.11:1984 which will be withdrawn on 2006-10-01.

The UK participation in its preparation was entrusted by Technical Committee CPL/61, Safety of household electrical appliances, to Subcommittee CPL/61/6, Portable motor operated tools, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
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Summary of pages

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English version

**Hand-held motor-operated electric tools –
Safety**
Part 2-12: Particular requirements for concrete vibrators
(IEC 60745-2-12:2003)

Outils électroportatifs à moteur –
Sécurité
Partie 2-12: Règles particulières
pour les vibreurs à béton
(CEI 60745-2-12:2003)

Handgeführte motorbetriebene
Elektrowerkzeuge –
Sicherheit
Teil 2-12: Besondere Anforderungen
für Innenrüttler
(IEC 60745-2-12:2003)

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Foreword

The text of document 61F/511/FDIS, future edition 2 of IEC 60745-2-12, prepared by SC 61F, Safety of hand-held motor-operated electric tools, of IEC TC 61, Safety of household and similar electrical appliances, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60745-2-12 on 2003-09-23.

This European Standard supersedes HD 400.3K S1:1981.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-10-01

Other standards referred to in this European standard are listed in Clause 2. Clause 2 lists the valid edition of those documents at the time of issue of this EN.

This standard is divided into two parts:

Part 1: General requirements which are common to most hand-held electric motor operated tools (for the purpose of this standard referred to simply as tools) which could come within the scope of this standard;

Part 2: Requirements for particular types of tools which either supplement or modify the requirements given in Part 1 to account for the particular hazards and characteristics of these specific tools.

This European Standard has been prepared under a mandate given to CEN and CENELEC by the European Commission and the European Free Trade Association and supports the essential health and safety requirements of the Machinery Directive.

Compliance with the clauses of Part 1 together with this Part 2 provides one means of conforming with the essential health and safety requirements of the Directive concerned.

Warning: Other requirements and other EC Directives can be applicable to the products falling within the scope of this standard.

This standard follows the overall requirements of EN 292-1 and EN 292-2.

This Part 2-12 is to be used in conjunction with EN 60745-1:2003. When this standard states "addition", "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

Subclauses, tables and figures which are additional to those in Part 1 are numbered starting from 101.

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

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

Endorsement notice

The text of the International Standard IEC 60745-2-12:2003 was approved by CENELEC as a European Standard without any modification.

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:

1.1 Addition:

This standard applies to concrete vibrators.

2 Normative references

This clause of Part 1 is applicable.

3 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:

- the motor and the vibrating mechanism are inside the vibrator bottle to which the part containing the mains switch is connected by means of a long flexible hose containing the interconnecting cable;
- the motor and the vibrating mechanism are inside the vibrator bottle to which a handle, comprising the part containing the mains switch, is fixed by means of a short rigid tube, these parts forming a constructional unit;
- the vibrator mechanism is only inside the vibrator bottle to which a separate portable unit, comprising the motor and the part containing the mains switch, is connected by means of a long flexible hose containing a flexible shaft

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:

The enclosure of the part containing the mains switch and the cable entry shall be IPX7, unless this part is intended to be used as a handle, in which case the enclosure shall be IPX4.

The vibrator bottle and flexible parts, such as the hose, shall be IPX7.

Separate portable units comprising the motor, the isolating transformer or the motor-generator, shall be IPX4.

If the part containing the mains switch and the cable entry is intended to be used as a handle, this part is placed in the normal position of use, the hose, if any, being attached correctly to it, during the relevant test of this subclause.

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 test is not applicable for concrete vibrators.

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 15.3. 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.

20.101 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 15.3. 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.

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 not lighter than heavy polychloroprene sheathed flexible cable (IEC 60245 cable type 66).

24.101 The supply cable between the isolating transformer or the motor-generator and the hand-held or hand-operated part of the concrete vibrator or a separate unit comprising the motor of the concrete vibrator shall have a length of at least 5 m.

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 of the concrete vibrator which is held in the hand, in normal use, or where it enters the separate motor unit.

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.

28 Creepage distances, clearances and distances through insulation

This clause of Part 1 is applicable.

29 Resistance to heat, fire and tracking

This clause of Part 1 is applicable.

30 Resistance to rusting

This clause of Part 1 is applicable.

31 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

Annexes

The annexes of Part 1 are applicable except as follows.

Annex K (normative)

Battery tools and battery packs

This annex of Part 1 is applicable except as follows:

K.1.1 Addition:

All clauses of this Part 2 apply unless otherwise specified in this annex.

Annex L (normative)

Battery tools and battery packs provided with mains connection or non-isolated sources

This annex of Part 1 is applicable except as follows:

L.1.1 Addition:

All clauses of this Part 2 apply unless otherwise specified in this annex.

Bibliography

The bibliography of Part 1 is applicable.

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