

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 2-12: Particular requirements for hand-held concrete vibrators**

**Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité –
Partie 2-12 : Exigences particulières pour les vibrateurs à béton portatifs**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –**Part 2-12: Particular requirements for hand-held concrete vibrators**

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IEC 62841-2-12 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
116/692/FDIS	116/733/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 IEC 62841-1:2014.

This document supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for hand-held concrete vibrators.

Where a particular subclause of IEC 62841-1 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 62841-1 is to be adapted accordingly.

The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- **terms defined in Clause 3: in bold type;**
- notes: in small roman type.

Subclauses, notes, tables and figures which are additional to those in IEC 62841-1 are numbered starting from 101.

Subclauses, notes, tables and figures in Annex K and Annex L which are additional to those in the main body of this document are numbered starting from 301.

A list of all parts in the IEC 62841 series, published under the general title *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*, 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.

<https://standards.iteh.ai/> IEC 62841-2-12:2024
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, or
- revised.

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 HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 2-12: Particular requirements for hand-held concrete vibrators

1 Scope

IEC 62841-1:2014, Clause 1 is applicable, except as follows.

Addition:

This document applies to hand-held **concrete vibrators**.

2 Normative references

IEC 62841-1:2014, Clause 2 is applicable, except as follows.

Addition:

IEC 62841-1:2014, *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 1: General requirements*

3 Terms and definitions

IEC 62841-1:2014, Clause 3 is applicable, except as follows.

Addition:

3.101

concrete vibrator

hand-held tool intended for compacting concrete with an active part (vibrator bottle) that performs low-amplitude vibrations into the mass of concrete to be vibrated

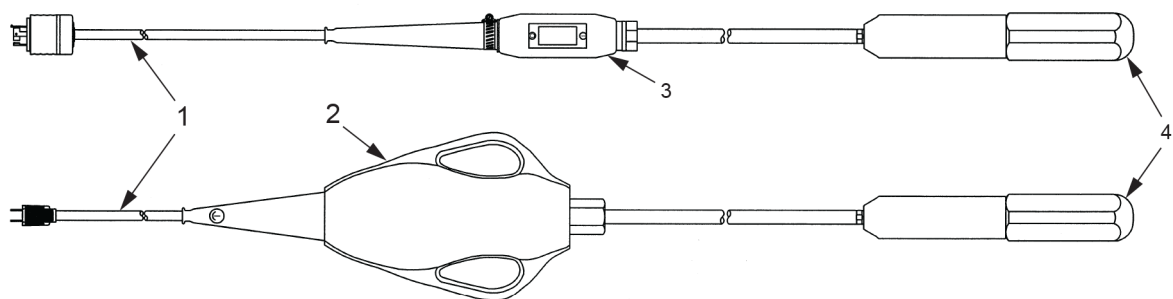
Note 101 to entry: **Concrete vibrators** are typically of one of the following designs:

- a) The motor and the vibrating mechanism are inside the vibrator bottle to which the part containing the **power switch** or a power converter and switch handle assembly is connected by means of a long flexible hose containing the **interconnection cord**. The long flexible hose can 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 **power switch**, is connected by means of a long flexible hose containing a flexible shaft (see Figure 102).

3.102

normal load

load obtained when the tool is operated continuously, the hose and vibrator bottle being attached to the tool as for **normal use**

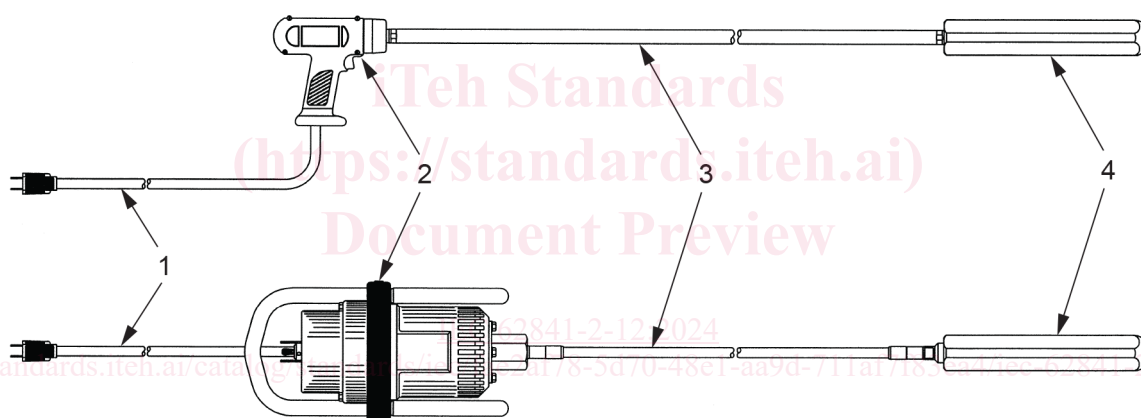


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Key

- 1 supply cord
- 2 power converter and power switch with handle
- 3 part containing the power switch
- 4 vibrator bottle with motor

Figure 101 – Typical design a) of a concrete vibrator



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Key

- 1 supply cord
- 2 motor unit with power switch
- 3 flexible shaft
- 4 vibrator bottle

Figure 102 – Typical design b) of a concrete vibrator

4 General requirements

IEC 62841-1:2014, Clause 4 is applicable.

5 General conditions for the tests

IEC 62841-1:2014, Clause 5 is applicable, except as follows.

5.7.3 Replacement:

*For tests that require a value for **rated current** and with tools where there is no marked **rated current**, the value of the **rated current** is determined by measuring the current of the tool when operated and loaded as specified in 12.2 and 12.2.1.*

5.17 Addition:

*The mass of a **concrete vibrator** includes everything except the **supply cord**.*

5.101 *For tests conducted at **normal load**, during 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 height of the container is such that no water can splash out during the test.*

6 Radiation, toxicity and similar hazards

IEC 62841-1:2014, Clause 6 is applicable.

7 Classification

IEC 62841-1:2014, Clause 7 is applicable, except as follows.

7.2 Replacement:

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

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

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

Compliance is checked by inspection and by the relevant tests.

8 Marking and instructions

IEC 62841-1:2014, Clause 8 is applicable, except as follows.

8.14.2 a) Addition:

101) Information on recommended vibrator bottles to be used with the tool.

9 Protection against access to live parts

IEC 62841-1:2014, Clause 9 is applicable.

10 Starting

IEC 62841-1:2014, Clause 10 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

Replacement:

The **rated input** or **rated current** shall be at least the measured power input or current under load.

*Compliance is checked by measuring the power input or current of the tool when operated and loaded as specified in 12.2 and 12.2.1. If the tool is only marked with **rated input**, the current of the tool should also be measured and recorded for the test condition of 5.7.3.*

12 Heating

IEC 62841-1:2014, Clause 12 is applicable, except as follows.

12.2 Replacement:

*For tools with one or more **rated voltages**: The tool is operated at each **rated voltage**, under the load conditions specified in 12.2.1.*

The temperatures are measured at the most unfavourable of the two voltage settings. The temperatures that are measured by means of thermocouples are taken while the tool is operating.

*For tools with a **rated voltage range**: The tool is operated*

- *at the lower limit of the **rated voltage range**; and*
- *at the upper limit of the **rated voltage range**.*

The temperatures are measured at the most unfavourable of the two voltage settings.

12.2.1 Replacement:

*The tool is fitted with the most unfavourable vibrator bottle recommended by the manufacturer in accordance with 8.14.2 a) 101). The combination of controls, if any, is adjusted so as to achieve maximum input during the periods of operation. The tool is operated at **normal load** for 30 min. The temperature rises are measured at the end of the 30 min.*

13 Resistance to heat and fire

IEC 62841-1:2014, Clause 13 is applicable.

14 Moisture resistance

IEC 62841-1:2014, Clause 14 is applicable, except as follows.

14.2.1 Addition:

*For design a) as defined in 3.101, the part containing the **power 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 is placed in the most unfavourable position occurring during **normal use**.*

15 Resistance to rusting

IEC 62841-1:2014, Clause 15 is applicable.

16 Overload protection of transformers and associated circuits

IEC 62841-1:2014, Clause 16 is applicable.

17 Endurance

IEC 62841-1:2014, Clause 17 is applicable, except as follows.

17.2 Replacement:

*The tool is fitted with the most unfavourable vibrator bottle recommended by the manufacturer in accordance with 8.14.2 a) 101). The tool is operated under the conditions specified for **normal load** for two periods of 12 h at 1,1 times **rated voltage** or 1,1 times the upper limit of the **rated voltage range** and for two periods of 12 h at 0,9 times **rated voltage** or 0,9 times the lower limit of the **rated voltage range**. 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

IEC 62841-1:2014, Clause 18 is applicable, except as follows.

18.5 This subclause of IEC 62841-1:2014 is not applicable.

18.8.1 *Replacement of Table 4:*

Table 4 – Required performance levels

Type and purpose of SCF	Minimum performance level (PL)
Power switch – prevent unwanted switch-on	Not an SCF
Power switch – provide desired switch-off	Not an SCF
Any electronic control to pass the test of 18.3	a
Prevent exceeding thermal limits as in 18.4	a
Any protective device relied upon to comply with 18.101	a
Any speed limiting device	Not an SCF

18.101 Concrete vibrators shall minimize the risk of electric shock when operated in a manner where the vibrator bottle is not contacting concrete.

Compliance is checked by the following test.

*The **concrete vibrator** is assembled as in **normal use** and is operated at **rated voltage** or at the upper limit of the **rated voltage range** with 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 **momentary power switch** with no provision for being locked in the "on" position; or*

*15 min for other **concrete vibrators**.*

*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 within 5 K of the ambient temperature, it shall withstand an electric strength test as specified in IEC 62841-1:2014, Annex D. 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 **class III tools**.*

19 Mechanical hazards

IEC 62841-1:2014, Clause 19 is applicable, except as follows.

19.6 This subclause of IEC 62841-1:2014 is not applicable.