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Edition 1.0 2014-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 3-6: Particular requirements for transportable diamond drills with liquid system

Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité – Partie 3-6: Exigences particulières pour les forets diamantés transportables avec système liquide

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 3-6: Particular requirements for transportable diamond drills with liquid system

FOREWORD

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This part of International Standard IEC 62841 has been prepared by technical committee 116: Safety of motor-operated electric tools.

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

FDIS	Report on voting
116/165/FDIS	116/179/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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

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This Part 3-6 is to be used in conjunction with IEC 62841-1:2014.

This Part 3-6 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: *Particular requirements for transportable diamond drills with liquid system*.

Where a particular subclause of Part 1 is not mentioned in this Part 3-6, that subclause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

The following print types are used:

– requirements: in roman type;
– *test specifications: in italic type*;
– notes: in small roman type.

The terms defined in Clause 3 are printed in **bold typeface**.

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

A list of all parts of the IEC 62841 series, 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.

The committee has decided that the contents of this publication will remain unchanged until the stability 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.

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.

The contents of the corrigendum of May 2015 have been included in this copy.

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

Part 3-6: Particular requirements for transportable diamond drills with liquid system

1 Scope

This clause of Part 1 is applicable except as follows:

Addition:

This part of IEC 62841 applies to transportable **diamond drills**, intended to be connected to a liquid system. Liquid system may include liquid from a pipe or container.

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

Addition:

3.101
diamond drill
manually fed tool with liquid system designed to drill stone and concrete by means of diamond core bits. The tool at least consists of a **drill unit** and a **drill stand** to which it is fixed. The **drill stand** is either attached to the workpiece to be drilled by means of fasteners, vacuum or other suitable devices (see Figure 101) or the **drill stand** is secured to an appropriate support such as a scaffolding

3.102
drill unit
device consisting of a motor and a fitting for the drill bit

3.103
drill stand
device for supporting the **drill unit** in its operating position

3.104
liquid collection device
device to collect liquid and slurry when drilling

4 General requirements

This clause of Part 1 is applicable.

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5 General conditions for the tests

This clause of Part 1 is applicable except as follows:

5.17 *Addition:*

An auxiliary handle, if provided, and the ***drill stand*** *are regarded as needed for normal use.*

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

This clause of Part 1 is applicable except as follows:

8.1 *Addition:*

Diamond drills shall be marked with:

– rated no-load speed.

8.14.1.1 *Addition:*

101) Diamond drill safety warnings

a) **When performing drilling that requires the use of water, route the water away from the operator's work area or use a liquid collection device.** *Such precautionary measures keep the operator's work area dry and reduce the risk of electrical shock.*

b) **Operate power tool by insulated grasping surfaces, when performing an operation where the cutting accessory may contact hidden wiring or its own cord.** *Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.*

c) **Wear hearing protection when diamond drilling.** *Exposure to noise can cause hearing loss.*

d) **When the bit is jammed, stop applying downward pressure and turn off the tool.** *Investigate and take corrective actions to eliminate the cause of the bit jamming.*

e) **When restarting a diamond drill in the workpiece check that the bit rotates freely before starting.** *If the bit is jammed, it may not start, may overload the tool, or may cause the diamond drill to release from the workpiece.*

f) **When securing the drill stand with anchors and fasteners to the workpiece, ensure that the anchoring used is capable of holding and restraining the machine during use.** *If the workpiece is weak or porous, the anchor may pull out causing the drill stand to release from the workpiece.*

g) **When securing the drill stand with a vacuum pad to the workpiece, install the pad on a smooth, clean, non-porous surface. Do not secure to laminated surfaces such as tiles and composite coating.** *If the workpiece is not smooth, flat or well affixed, the pad may pull away from the workpiece.*

NOTE The above warning applies only if the tool is intended to be used with a vacuum pad.

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h) **Ensure there is sufficient vacuum before and during drilling.** *If the vacuum is insufficient, the pad may release from the workpiece.*

NOTE The above warning applies only if the tool is intended to be used with a vacuum pad

i) **Never perform drilling with the machine secured by the vacuum pad only, except when drilling downwards.** *If the vacuum is lost, the pad will release from the workpiece.*

NOTE The above warning applies only if the tool is intended to be used with a vacuum pad.

j) **When drilling through walls or ceilings, ensure to protect persons and the work area on the other side.** *The bit may extend through the hole or the core may fall out on the other side.*

k) **Do not use this tool for overhead drilling with water supply.** *Water entering the power tool will increase the risk of electric shock.*

NOTE The above warning is only needed for tools that cannot be used for drilling overhead.

l) **When drilling overhead, always use the liquid collection device specified in the instructions. Do not allow water to flow into the tool.** *Water entering the power tool will increase the risk of electric shock.*

NOTE The above warning is only needed for tools that can be used for drilling overhead.

8.14.2 a) *Addition:*

101) Information about which diamond core bits can be used with the machine;

102) Instruction to and information about how to mount the tool to the **drill stand**;

103) Information about how to install the diamond core bit to the tool and, if applicable, information about diamond core bit assembly;

104) Instruction to and information about how to anchor the **drill stand** in all applicable positions;

105) For tools using vacuum fixing devices:

- Instruction to and information about how to check the surface where the **drill stand** shall be fixed;
- Instruction to additionally secure the **drill stand** when drilling in orientations other than vertically down, by using appropriate accessories or means and information how to achieve this;
- Information regarding minimum vacuum level necessary for safe operation and how to control it during the drilling operation;
- Information regarding the maximum core bit diameter suitable for use with vacuum fixing;

106) For tools that can be used for drilling overhead with a **liquid collection device**:

- Information about the minimum and maximum diamond core bit diameter that can be used with the **liquid collection device**.

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.

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12 Heating

This clause of Part 1 is applicable.

13 Resistance to heat and fire

This clause of Part 1 is applicable.

14 Moisture resistance

This clause of Part 1 is applicable except as follows:

14.3.101 **Diamond drills** which are intended to be used for drilling overhead in accordance with 8.14.2 a) 104) and using a **liquid collection device** shall prevent electric shock due to excessive liquid spillage.

Compliance is checked by the following test.

*The **drill unit** runs vertically upwards at rated voltage under no-load condition with the **liquid collection device** installed. If the **liquid collection device** is designed to be connected to a liquid vacuum device, then such a device shall be attached. The test is conducted twice, the drill being fitted once with the minimum and once with the maximum diameter of the diamond core bit as specified for the **liquid collection device** in accordance with 8.14.2 a) 106).*

The test arrangement is shown in Figure 102.

The liquid flow of approximately 1,0 % NaCl solution shall be in the range of 1 l/min to 1,5 l/min. The running time shall be 15 min. The measuring time starts when the core bit is filled with liquid.

During the test the leakage current as in Clause C.3 is monitored. The leakage current shall not exceed:

- *2 mA for a class II tool;*
- *5 mA for a class I tool.*

Following this test, the tool shall meet the electric strength test of Clause D.2 between live parts and accessible parts after being allowed to dry for 24 h at ambient temperature.

15 Resistance to rusting

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 of the fifth paragraph:*

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Diamond drills *are operated for 12 h at a voltage equal to 1,1 times rated voltage or the upper limit of the rated voltage range, and then for 12 h at a supply voltage equal to 0,9 times rated voltage or the lower limit of the rated voltage range. The 12 h of operation need not be continuous. During the test, the tool is placed in three different positions, the operating time, at each test voltage, being approximately 4 h for each position.*

18 Abnormal operation

This clause of Part 1 is applicable except as follows:

18.8 Table 4 *Replacement:*

Table 4 – Required performance levels

Type and purpose of SCF	Minimum Performance Level (PL)
Power switch - prevent unwanted switch-on	a
Power switch - provide desired switch-off	b
Provide desired direction of rotation	Not a **SCF**
Any electronic control to pass the test of 18.3	a
Overspeed prevention to prevent output speed above 130 % of rated (no-load) speed	a
Prevent exceeding thermal limits as in Clause 18	a
Limiting device to comply with 19.103	c

19 Mechanical hazards

This clause of Part 1 is applicable except as follows:

19.1 *Addition:*

Rotating elements such as clutches, spindles, extensions, etc., except core bits, shall be:

– without projecting parts and be of round or hexagonal shape;

  Compliance is checked by inspection.

  or

– protected with a fixed or self-adjusting guard.

  Compliance is checked by applying test probe B of IEC 61032:1997 with a force not exceeding 5 N to any guard fitted. It shall not be possible to contact rotating elements with the test probe.

19.7 This subclause of Part 1 is not applicable.

19.8 This subclause of Part 1 is not applicable.

19.101 Diamond drills shall be provided with a **drill stand** and a **drill unit**.

The **drill stand** shall have provisions for mounting the **drill stand** to the workpiece to be drilled or to an appropriate support.

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The **drill unit** shall have provisions for attaching it to the **drill stand** in all working positions. The machine shall be so designed that unintentional loosening of the **drill unit** from the **drill stand** is prevented.

Compliance is checked by inspection.

19.102 Vacuum devices for fixing the **diamond drill** shall be provided with a means that informs the user of the actual vacuum.

Compliance is checked by inspection.

19.103 Vacuum devices for fixing the **diamond drill** shall be able to withstand the forces during the drilling process including the situation of a jammed drill bit.

Compliance is checked by the following test which simulates the bit becoming jammed in the work piece.

*The **diamond drill** shall be fixed with the vacuum device to a 12 mm steel plate. The vacuum shall be adjusted to the minimum level specified in accordance with 8.14.2 a) 105).The output spindle of the **diamond drill** is coupled to a stalling device. If the tool is equipped with a gear selection, the gear resulting in the highest torque shall be chosen. If the tool is equipped with an adjustable clutch, this shall be adjusted to the highest torque setting. The tool shall come to full speed and then stopped by the stalling device within 45° to 90° of spindle rotation. The stall is maintained for 3 s. Following this test, the tool is maintained in the stalled position and the power switch is then operated on and off 3 times.*

During the test, the operator(s) shall be outside the radius of the tool in case the vacuum system comes loose.

*During the test, the **drill stand** shall not come loose and shall not rotate by more than 10°.*

20 Mechanical strength

This clause of Part 1 is applicable except as follows:

20.5 This subclause of Part 1 is not applicable.

21 Construction

This clause of Part 1 is applicable except as follows:

21.18.2.1 This subclause of Part 1 is not applicable.

21.30 *Replacement:*

If handles or grasping surfaces as specified in the instruction manual are provided for manual feeding, they shall be insulated between the grasping areas used in normal use and the accessible parts that become live due to contact with the output shaft.

Compliance is checked by inspection and a test in accordance with 20.3.2 on the handles and grasping surfaces, followed by an electric strength test in accordance with Clause D.2 using 1 250 V a.c. between the handles and grasping surfaces in contact with foil and the output shaft of the tool.

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