



SLOVENSKI STANDARD

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Safety of hand-held electric motor operated tools - Part 2-1: Particular requirements for drills

Safety of hand-held electric motor operated tools -- Part 2-1: Particular requirements for drills

Sicherheit handgeführter motorbetriebener Elektrowerkzeuge -- Teil 2-1: Besondere Anforderungen an Bohrmaschinen

Sécurité des outils électroportatifs à moteur -- Partie 2-1: Règles particulières pour les perceuses

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ICS:

25.080.40	Vrtalniki	Drilling machines
25.140.20	Električna orodja	Electric tools

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50144-2-1

November 1999

ICS 25.140.20; 25.080.40

Supersedes EN 50144-2-1:1995

English version

**Safety of hand-held electric motor operated tools
Part 2-1: Particular requirements for drills**

Sécurité des outils électroportatifs
à moteur
Partie 2-1: Règles particulières pour
les perceuses

Sicherheit handgeführter
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Teil 2-1: Besondere Anforderungen
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This European Standard was approved by CENELEC on 1998-04-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard has been prepared by Technical Committee TC 61F, Hand-held and transportable electric motor operated tools. The text of the draft was submitted to the Unique Acceptance Procedure (UAP) in December 1993 and was approved by CENELEC as EN 50144-2-1 on 1994-10-04.

A draft for an amendment was submitted to UAP in April 1994 and was approved by CENELEC on 1994-10-04 for inclusion into the European Standard.

Amendments to fulfill the essential requirements of the Machinery Directive were submitted to the formal vote in October 1997 and were approved by CENELEC on 1998-04-01 for inclusion into a second edition of EN 50144-2-1.

This European Standard supersedes EN 50144-2-1:1995 and its corrigendum March 1996.

The following dates were fixed:

- latest date by which the EN has to be implemented at a national level by publication of an identical national standard or by endorsement (dop) 2000-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2001-12-01

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).

Part 2: Requirements for particular types of tool 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/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.

For noise and vibration this standard covers the requirements for their measurement, the provision of information arising from these measurements and the provision of information about the personal protective equipment required. Specific requirements for the reduction of the risk arising from noise and vibration through the design of the tool are not given as this reflects the current state of the art.

As with any standard, technical progress will be kept under review so that any developments can be taken into account.

CEN TC/255 is producing standards for non electrically driven drills.

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.

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

NOTE In this European Standard the following print types are used:

- Requirements proper;
- *Test specifications*;
- Explanatory matter.

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1 Scope

This clause of Part 1 is applicable except as follows:

1.1 Addition:

This European Standard applies to drills and impact drills.

Stands for use with drills are not covered by this standard.

This standard does not give requirements for the design of the tool to reduce the risks arising from noise and vibration.

2 Definitions

This clause of Part 1 is applicable except as follows:

2.2.18 Replacement:

2.2.18 **normal load:** The load obtained when the drill, placed in the horizontal position, is operated continuously, the torque applied to the spindle being such that the output in watts is equal to $15D$, where D is :

- a) For drills delivered with a chuck, the maximum diameter, in millimetres, of the bit marked on the chuck.
- b) For other drills, the maximum diameter, in millimetres, of the bit for drilling in steel marked on the drill.

The normal load is based on the rated voltage or on the upper limit of the rated voltage range.

3 General requirements

This clause of Part 1 is applicable.

4 General conditions for the tests

This clause of Part 1 is applicable except as follows:

4.8 Addition:

In the case of drills having electronic speed changing devices allowing the setting of different speed ranges, the test is made at the maximum speed setting of the lowest speed range.

Mechanical speed changing devices shall be set at the lowest speed.

5 Rating

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable.

7 Marking and information for use

This clause of Part 1 is applicable except as follows:

7.1 Addition:

Drills shall be marked with:

- Rated no load speed in revolutions per minute.
- Maximum diameter, in millimetres, of the bit for drilling in steel having a tensile strength of 390 N/mm².

7.13 Additional subclause:

7.13.101 The instruction sheet shall also include the following: "Hearing protection should be worn".

8 Protection against electric shock

This clause of Part 1 is applicable.

9 Starting

This clause of Part 1 is applicable.

10 Input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable except as follows:

11.2 Replacement:

The drill is operated continuously in still air at a voltage equal to 0,94 times rated voltage, rated voltage or 1,06 times rated voltage, whichever is the most unfavourable. The torque applied to the spindle being such that the output, in watts, is equal to 12D, where D is:

- for drills delivered with a chuck, the maximum diameter, in millimetres, of the bit for drilling in steel marked on the chuck;
- for other drills, the maximum diameter, in millimetres, of the bit for drilling in steel marked on the drill.

If, however, the rated input exceeds the input measured during the test of 10.1, the test is made with a torque equal to 0,8 times the torque necessary to attain rated input.

The voltage is then adjusted to the value specified, the torque being kept constant while the voltage is adjusted.

12 Leakage current

This clause of Part 1 is applicable.

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13 Environmental requirements

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

13.2.2 Replacement of paragraph 2:

For drills without an impact mechanism all speed setting devices shall be adjusted to the highest value.

For impact drills the speed setting shall be that recommended by the manufacturer for an 8 mm bit drilling into concrete.

13.2.3 Replacement of paragraphs 1, 2 and 3:

Drills without an impact mechanism are tested at no load.

Impact drills are tested under load as shown in Figure 101 and in accordance with the conditions shown in Tables 101 and 102.

Table 101 — Test conditions

Orientation	Drilling vertically down into a concrete block having the dimensions 500 mm x 500 mm and 200 mm in height and supported on resilient material
Tool bit	8 mm drill bit for drilling in concrete with a usable length of approximately 100 mm
Feed force	150 N ± 30 N
Test cycle	Measurement starts when the drill bit has reached a depth of approximately 10 mm and stops when the depth has reached approximately 80 mm

Table 102 — Concrete formulation (per cubic metre)

Cement	Water	Aggregate	
		Particle size	Fraction (%)
450 kg	220 kg	1450 kg	
		0 to 0,25 mm	12 ± 3
		0 to 0,50 mm	50 ± 5
		0 to 1,00 mm	80 ± 5
		0 to 4,00 mm	100
Compressive strength after 28 days to be 40 N/mm ² .			

13.3.4 Replacement of paragraph 2:

The speed setting shall be that recommended by the manufacturer for an 8 mm bit drilling into concrete.

13.3.7 Replacement of paragraph 1:

Drills and impact drills are tested under load as shown in Figure 101 and in accordance with the conditions shown in Tables 101 and 102.

Paragraph 3 is not applicable.

14 Moisture resistance

This clause of Part 1 is applicable.

15 Insulation resistance and electric strength

This clause of Part 1 is applicable.

16 Endurance

This clause of Part 1 is applicable except as follows:

16.2 Replacement:

Impact drills are operated continuously with no load and, if the impact mechanism can be engaged and disengaged at will, with the impact mechanism not engaged for 12 h at a voltage equal to 1,1 times rated voltage and then for 12 h at a voltage equal to 0,9 times rated voltage. The speed is adjusted to the highest value of the highest range.

The drill is then mounted in the vertical position in an apparatus as shown in Figure 102, and is operated at rated voltage or at the mean value of the rated voltage range, for four periods of 6 h each, the interval between these periods being at least 30 min and, if the impact mechanism can be engaged and disengaged at will, with the impact mechanism engaged.

During these periods, the drill is operated intermittently, each cycle comprising a period of operation of 30 s and a rest period of 90 s with the drill switched off.

During the test in the apparatus, an axial force just sufficient to ensure steady operation of the impact mechanism is applied to the drill through a resilient medium.

17 Abnormal operation

This clause of Part 1 is applicable.

18 Mechanical hazards

This clause of Part 1 is applicable except as follows:

Additional subclause:

18.101 Chuck keys shall be so designed that they drop easily out of position when released; they shall not be fixed to the drill by means of a chain, a string or similar means. This requirement does not exclude the provision of clips for holding the key in place when not in use; metal clips fixed to the flexible cable or cord are, however, not allowed.

Compliance is checked by inspection and by manual test.