

British Standard

Hand-held electric motor-operated tools

Part 2. Particular requirements

Section 2.3 Specification for grinders, polishers and disc-type sanders

Outillage électrique portatif

Partie 2. Caractéristiques particulières

Section 2.3 Meules de rectification, et de polissage, ponceuses à disque — Spécifications

Handgeführte Elektrowerkzeuge

Teil 2. Besondere Anforderungen

Abschnitt 2.3 Schleifmaschinen, Poliergeräte und Schmirgelschleifmaschinen (Scheibentyp)

IMPORTANT NOTE. Before reading this Section it is essential to read BS 2769 : Section 2.0 'General introduction and list of Sections' published separately.

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Certification. Attention is drawn to the certification facilities offered by BSI described on the inside back page of this standard.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

1. Scope

This Section of BS 2769, together with those requirements of Part 1 to which reference is made, specifies requirements, including safety requirements, for hand-held electric motor-operated grinders, polishers and disc-type sanders.

NOTE. The titles of the publications referred to in this standard are listed on the inside back page.

2. Definitions

The definitions given in BS 2769 : Part 1 : 1984 apply subject to the following modification to 2.20 and the addition of 2.33 to 2.39.

Modification

2.20 normal load. The load obtained when the tool is operated continuously for a period of 30 min, the torque applied to the spindle being:

$1.5 D^{1.5} L 10^{-5} \text{ N}\cdot\text{m}$	For peripheral grinders and peripheral polishers with a wheel diameter not exceeding 55 mm in the new condition.
$2.5 D^{1.5} L 10^{-5} \text{ N}\cdot\text{m}$	For other peripheral grinders and peripheral polishers.
$1.3 D^3 10^{-7} \text{ N}\cdot\text{m}$	For facial grinders, facial polishers and disc-type sanders.
$1.5 D^{1.5} 10^{-4} \text{ N}\cdot\text{m}$	For valve-seat grinders.

where

D is the diameter, in millimetres, of the grinding wheel or disc;

L is the width, in millimetres, of the grinding or polishing wheel in the new condition.

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

Additions

2.33 disc-type sander. An abrading tool in which the abrasive material is fixed to the surface of a rotating disc.

2.34 machine spindle. The shaft of the grinding machine which supports and drives the abrasive wheel.

2.35 flange assembly. All means provided to clamp the abrasive wheel to the machine spindle.

2.36 flanges (clamping). A set of flanges between which an unthreaded hole abrasive wheel is clamped to mount it on the machine spindle.

2.37 flange (backing). A flange fixed to the machine spindle having an unrecessed flat surface against which a threaded hole wheel, cone or plug is screwed.

2.38 flange outside diameter. The outside diameter of the bearing surface of a flange.

2.39 guard (wheel). A device which partially encloses the abrasive wheel in order to protect against accidental contact with the wheel and against ejection of fragments of the wheel in case of breakage.

3. General requirement

Clause 3 of BS 2769 : Part 1 : 1984 shall apply.

4. General conditions for the tests

Clause 4 of BS 2769 : Part 1 : 1984 shall apply.

5. Rating

Clause 5 of BS 2769 : Part 1 : 1984 shall apply.

6. Classification

Clause 6 of BS 2769 : Part 1 : 1984 shall apply.

7. Marking

Clause 7 of BS 2769 : Part 1 : 1984 shall apply subject to the following additions to 7.1 and 7.13.

7.1

Grinders shall be marked with:

- (l) the maximum no-load speed in revolutions per minute (see 18.4);
- (m) indication of direction of rotation.

Grinders designed for operation at more than one speed shall be marked with the maximum no-load speed for each of the speed settings in such a way that it is clear which speed corresponds with each of the settings.

Amendment No. 1
published and effective from 1 May 1992
to BS 2769 : Section 2.3 : 1984

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disc-type sanders

NOTE. The English language version of Harmonization Document HD 400.2C S1 was implemented in the United Kingdom by the publication of BS 2769 : Section 2.3 : 1984. This amendment implements Amendment A1 to HD 400.2C S1.

Revised text

AMD 6924
May 1992

Clause 7 Marking

At the end of the existing text of **7.13**, insert the following.

‘Disc-type sanders exclusively intended for sanding wooden floors shall be accompanied by an instruction sheet stating how to connect the external collection equipment where applicable.’

AMD 6924
May 1992

Clause 20 Construction

At the end of the existing text of **20.22**, insert the following.

‘Disc-type sanders exclusively intended for sanding wooden floors shall have either integral suction devices or a device which allows the connection of external collection equipment.

Compliance is checked by inspection.’

Polishers and disc-type sanders shall be marked with:

- (n) the rated no-load speed in revolutions per minute;
- (o) indication of direction of rotation.

The direction of rotation of the wheel or disc shall be clearly indicated by an arrow, raised or sunk, or by any other means no less visible and indelible.

7.13

Grinders with water supply, other than those of class III, shall be accompanied by an instruction sheet stating that the grinder must be supplied from an isolating transformer and indicating the type of transformer to be used.

An instruction sheet shall be provided giving instructions on the safe use of the tool and, in the case of grinders, the types of wheel to be used.

Where taper-sided flanges are provided by the manufacturer the instruction sheet shall specify that where the use of a guard is impractical, only taper-sided wheels shall be used.

8. Protection against electric shock

Clause 8 of BS 2769 : Part 1 : 1984 shall apply.

9. Starting

Clause 9 of BS 2769 : Part 1 : 1984 shall apply.

10. Input and current

Clause 10 of BS 2769 : Part 1 : 1984 shall apply.

11. Heating

Clause 11 of BS 2769 : Part 1 : 1984 shall apply subject to the following modification to paragraph 8 (including items (a), (b) and (c)) of 11.1.

11.1, paragraph 8

The tool is operated for a period equal to the rated operating time or, in the absence of the relevant marking, for 30 min, the torque applied to the spindle being equal to that specified for normal load or to that corresponding with the load necessary to attain rated input, whichever is the higher. The temperature rise is determined at the end of the specified period of operation.

12. Leakage current

Clause 12 of BS 2769 : Part 1 : 1984 shall apply.

13. Radio interference suppression

Clause 13 of BS 2769 : Part 1 : 1984 shall apply.

14. Moisture resistance

Clause 14 of BS 2769 : Part 1 : 1984 shall apply.

15. Insulation resistance and electric strength

Clause 15 of BS 2769 : Part 1 : 1984 shall apply.

16. Endurance

Clause 16 of BS 2769 : Part 1 : 1984 shall apply.

17. Abnormal operation

Clause 17 of BS 2769 : Part 1 : 1984 shall apply.

18. Mechanical hazards

Clause 18 of BS 2769 : Part 1 : 1984 shall apply subject to the following addition to 18.1 and the addition of 18.2 to 18.14.

18.1

The requirements of 18.2 to 18.14 do not apply to:

- (a) wheels driven with a peripheral speed more than 85 m/s;
- (b) mounted disc wheels with a diameter over 200 mm.

18.2 Except for mounted wheels and points with a diameter less than or equal to 50 mm, cup-type brushes and disc-type sanders for use with abrasive papers, tools designed for operation with abrasive wheels, scratch brushes or the like, shall be provided with a fixed guard having sufficient mechanical strength to prevent parts of the wheel or brush being thrown out in the event of breakage. The opening in the guard shall not be larger than necessary for the intended use of the tool.

18.3 The no-load speed of the spindle without a wheel or disc shall, at 1.06 times the rated voltage, not exceed the maximum no-load speed marked on the tool.

TEST. Compliance shall be checked by inspection and by measuring the speed of the spindle after the tool has been operating for a period of 15 min with no load.

18.4 Grinders which may be readily fitted with wheels having a diameter exceeding 55 mm shall have only one maximum no-load speed.

TEST. Compliance shall be checked by inspection and by measurement.

18.5 The machine spindle shall be made of steel resistant to impact. It shall be free from cracks and shall not have sharp changes of section.

In designing the spindle the dimensions and the mass of the grinding wheels to be used shall be taken into consideration.

The spindle shall have a suitable means for applying a tachometer.

The direction of the spindle thread shall be such that any clamping device, collet or threaded-hole wheel shall tend to tighten during grinding.

In order to prevent mis-matching with $\frac{5}{8}$ in and $\frac{3}{4}$ in UNC threads, metric threads M16 and M20 shall not be used on spindles intended for mounting threaded-hole grinding wheels.

TEST. Compliance shall be checked by inspection and by measurement.

18.6 Flanges between which a wheel is mounted shall be of the same outside diameter and shall have equal bearing surfaces, with the exception of the assembly shown in figure 3.10.

The inner (driving) flange shall be keyed, screwed, shrunk or otherwise secured to prevent rotation relative to the spindle. The inner flange bearing surface shall run true with a tolerance giving a total indicator reading not greater than 0.3 % of the diameter at the position of the indicator.

The flanges shall be made of steel grade 43B complying with BS 4360 to dimensions specified below, or of other material and dimensions to give adequate strength, in which case the following test shall be made.

The clamping nut for retaining depressed-centre and cutting-off wheels shall always be of steel to the above specification.

TEST. Where thickness, shape or material of flanges are other than those specified the following test shall be made.

(a) The abrasive wheel shall be replaced on the machine by a steel disc having similar thickness and shape as the wheel.

(b) The clamping nut shall be tightened with a first test torque in accordance with table 3.1, and a feeler gauge 0.05 mm thick used to test whether the flanges are in contact with the disc all round their circumference. The test is complied with if the feeler gauge at no place can be pushed underneath the flanges.

(c) The clamping nut shall then be tightened with a second test torque in accordance with table 3.1, and a feeler gauge 0.05 mm thick used to test the deflection of the flanges. The test is complied with if the feeler gauge at no place can be pushed underneath the flanges by more than 1 mm.

Table 3.1 Torques for testing flanges

Thread		First test torque	Second test torque
mm	inch	N·m	N·m
M8	—	2	8
M10	$\frac{3}{8}$	4	15
M12	$\frac{1}{2}$	7.5	30
M14	—	11	45
	$\frac{5}{8}$	17.5	70
	$\frac{3}{4}$	35	140

18.7 Dimensions of flanges for straight-sided and unthreaded-hole cup wheels of diameters greater than or equal to 50 mm, shall be as given in table 3.2 (see note) in connection with figure 3.1. Their external diameter shall be not less than $\frac{1}{3}$ of the diameter of the wheel, but the outer form of the flange is left to the discretion of the manufacturer.

NOTE. Flanges of other designs, but having the same outside diameter and radial width of bearing surface as in table 3.2 and of equivalent strength, may be used.