

Specification for

Portable pneumatic grinding machines

Co-operating organizations

The Mechanical Engineering Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Associated Offices' Technical Committee	Institution of Civil Engineers
Association of Consulting Engineers	Institution of Gas Engineers
Association of Mining Electrical and Mechanical Engineers	Institution of Heating and Ventilating Engineers
Board of Trade	Institution of Mechanical Engineers
British Chemical Plant Manufacturers' Association	Institution of Mechanical Engineers (Automobile Division)
British Compressed Air Society*	Institution of Production Engineers*
British Electrical and Allied Manufacturers' Association	Locomotive and Allied Manufacturers' Association of Great Britain
British Gear Manufacturers' Association	London Transport Board
British Internal Combustion Engine Manufacturers' Association	Machine Tool Trades Association
British Mechanical Engineering Confederation	Ministry of Defence
British Pump Manufacturers' Association	Ministry of Defence, Army Department*
British Steel Industry	Ministry of Power
Crown Agents for Oversea Governments and Administrations	Ministry of Public Building and Works
Department of Employment and Productivity (H.M. Factory Inspectorate)*	Ministry of Technology (Aviation)
Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales	Ministry of Technology — National Engineering Laboratory
Engineering Equipment Users' Association	Ministry of Transport
Gas Council	National Coal Board
Institute of Marine Engineers	National Physical Laboratory (Ministry of Technology)
	Radio Industry Council
	Royal Institute of British Architects

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this standard:

Abrasive Industries Association	National Federation of Building Trade Employers
Association of Bronze and Brass Founders	Portable Electric Tool Manufacturers' Association
British Railways Board	
Institute of British Foundrymen	

Amendments issued since publication

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Foreword

This British Standard, which was prepared at the request of the Builders' Plant and Equipment Industry Standards Committee, under the authority of the Mechanical Engineering Industry Standards Committee, applies to portable pneumatic grinding machines used mainly in the engineering and building industries.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies dimensions, principal fittings and safety requirements for portable pneumatic grinding machines for nominal diameter ranges of cutting-off and depressed centre abrasive wheels 50 mm to 250 mm (2 in to 10 in) and 50 mm to 200 mm (2 in to 8 in) for other types of abrasive wheels, having maximum permissible speeds as given in Clause 3.

This standard excludes grinding machines for use with a collet.

NOTE This standard is basically in metric units, except for the threading of the spindles, and the equivalents in imperial units are approximate.

2 Definition

For the purposes of this British Standard, the following definition applies:

portable grinding machine

a grinding machine which is designed to be held in the operator's hands (see Figure 1 and Figure 2)

3 Types of abrasive wheels

Only reinforced resin-bonded or resin-bonded (resinoid) abrasive wheels shall be supplied with portable grinding machines. Suitable types of wheels are illustrated in Figure 3 to Figure 10.

3.1 Maximum permissible peripheral speeds

3.1.1 Reinforced resin-bonded wheels of Type 1 shall be supplied to the following dimensions and for the following speeds:

Maximum diameter		Thickness		Maximum speed	
mm	in	mm	in	m/s	ft/min
50 to 200	2 to 8	6.5 max.	$\frac{1}{4}$ max.	90	18 000
50 to 200	2 to 8	over 6.5	over $\frac{1}{4}$	80	16 000

3.1.2 Reinforced resin-bonded depressed centre wheels and cutting-off wheels shall be supplied for a maximum speed of 80 m/s (16 000 ft/min).

3.1.3 Resin-bonded (resinoid) wheels of all types, including taper-sided and cup wheels, shall be supplied for a maximum speed of 48 m/s (9 500 ft/min).

4 Speed control

Grinding machines shall be so designed as to prevent the spindle exceeding its maximum running speed at its maximum working inlet¹⁾ air pressure (see Clause 12).

4.1 **Mechanical governors.** Mechanical governors shall be so designed as to prevent incorrect assembly.

5 Machine spindle

The spindle or mounting shall be designed to enable the speed at which it is running to be measured. The direction of rotation, when looking at the end of the threaded spindle, shall be anticlockwise.

5.1 **Threading of spindles.** Threading of spindles shall be as follows:

$\frac{3}{8}$ in — 24 UNF-2A

$\frac{1}{2}$ in — 13 UNC-2A

$\frac{5}{8}$ in — 11 UNC-2A

$\frac{3}{4}$ in — 10 UNC-2A

1 in — 8 UNC-2A

NOTE Until there is an international metric standard for the spindles of portable grinding machines, these threads will continue to be used.

¹⁾ A reducing valve should be used if necessary

The threads shall be right-handed. The tolerance on the unthreaded portion of the spindle shall be $d8^{(2)}$. Where abrasive wheels with inserted bushings are screwed directly on to the machine spindles, the spindles shall be threaded $\frac{5}{8}$ in — 11 UNC–2A.

6 Driving flange

The driving flange shall be keyed, screwed, shrunk, or otherwise secured to the spindle, and the flange bearing surface shall run true with the spindle with a tolerance giving a total indicator reading not greater than 0.13 mm (0.005 in), measured on the bearing surface.

7 Wheel mountings

7.1 Flanges. All flange plates shall be of mild steel or other material of equal or greater strength and rigidity.

Flange plates for straight wheels of nominal diameters over 50 mm (2 in) shall be as given in Table 1, and shall be not less than one-third of the diameter of the abrasive wheels. A recessed back flange shall not be supplied with wheels shown in Figure 3 and Figure 4, or with other wheels having threaded inserts.

Flange plates for taper-sided wheels shall be as given in Table 2.

NOTE Depressed-centre wheels are designed and reinforced for use with a special large-back flange and a smaller outer flange nut (see Figure 11). It is recommended that the large-back flange should be made of mild steel, aluminium alloy or other metal of equal or greater impact strength.

8 Wheel guarding

Typical guards are shown in Figure 12 to Figure 16. Guards shall be securely attached to the body of the machine. For straight-sided wheels, the maximum angular exposure of the abrasive wheel periphery and sides shall not exceed 180° .

Guards for straight grinding machines shall be provided with a front curtain, which shall be securely fastened to the body of the guard. For cup wheels, the back face and the periphery shall be enclosed, and the guard shall be adjustable to compensate for the wear of the wheel.

For depressed centre grinding wheels, the wheel shall have a maximum angular exposure of 180° , and the guard shall be located so as to be between the operator and the wheel during use. The clearance between the inside of the guard and the periphery of an unused wheel shall be not greater than 5 % of the nominal wheel diameter.

8.1 Thickness of peripheral and side members of guards. The recommended minimum thickness of peripheral and side members of guards is given in Table 3 and Table 4, but guards of equivalent strength but of different materials may be used.

8.2 Guards for depressed-centre and cutting-off wheels. The guard shall be of unit construction and securely attached to the body of the machine. Split clamps are not permitted. (See Figure 16.)

8.3 Guards for wheels other than depressed-centre, cup and cutting-off wheels.

(See Figure 15 and Table 3.) The connecting hub by which the guard is attached to the machine shall be of unit construction. Clamping shall be by means of a high-tensile bolt, with a nut. The clamp shall be an interference fit on the machine before the bolt and nut are tightened.

9 Air control

ON-OFF air valves on the machine shall be so designed, placed and protected as to prevent accidental starting of the machine when it is placed on a flat surface. The ON and OFF positions shall be readily identifiable.

10 Hose couplings

Hose couplings shall comply with BS 1906³⁾.

²⁾ BS 1916, "Limits and fits for engineering, Part 1: "Limits and tolerances".

³⁾ BS 1906, "Hose couplings (air and water) $\frac{1}{8}$ in to $1\frac{1}{4}$ in nominal sizes".