BRITISH STANDARD

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Float operated valves —

Part 2: Specification for diaphragm type float operated valves (copper alloy body) (excluding floats)

UDC 621.646.618:621.646.38

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Building Services Standards Committee (SEB/-) to Technical Committee SEB/2 upon which the following bodies were represented:

Association of Manufacturers of Domestic Electrical Appliances
Association of Manufacturers of Domestic Unvented Supply Systems Equipment (MODUSSE)
Association of Water Officers Ltd.
British Bath Manufacturers' Association
British Gas Corporation
British Non-ferrous Metals Federation
British Plastics Federation
British Valve Manufacturers' Association Ltd.
Builders Merchants Federation
Consumer Standards Advisory Committee of BSI
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National Association of Plumbing, Heating and Mechanical Services Contractors
National Brassfoundry Association
Royal Institute of British Architects
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Foreword

This Part of BS 1212 has been prepared under the direction of the Building Services Standards Committee and specifies requirements for diaphragm type float operated valves (excluding floats). It supersedes BS 1212-2:1970, which is withdrawn.

The new features in this Part of BS 1212 include the following:

a) the possible production of certain components from plastics materials;

b) a seat numbering system;

c) a bottom entry inlet connection and its associated inlet elbow, with adjustable stay;

d) a recognition of the greater lifting effort of plastics floats over copper floats of equivalent size;

e) a test for plastics backnut strength, in line with BS 1212-3;

f) a recognition of current manufacturing practice by deletion of reference to the use of agate tipped seats;

g) a recognition of methods of attachment of the discharge arrangements currently used in float valves manufactured in accordance with BS 1212-3, and a test to verify their effectiveness;

h) a modification of the method of dimensioning some components to ensure the lever does not rise above the horizontal at valve closure;

j) the dimensional alignment of the body inlet connection with BS 1212-1, which now requires only one seat joint ring for either plastics or metal seats.

Float operated valves complying with BS 1212-2 and carrying the Kitemark are automatically eligible for listing in the Water Research Centre Fittings Scheme Directory of Water Fittings.

This Part of BS 1212 has been revised in metric terms, except for certain thread sizes and pipe thread designations which are retained in imperial sizes to accord with BS 2779.

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 to iv, pages 1 to 20, an inside back cover 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.

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Section 1. General

1 Scope

This Part of BS 1212 specifies materials, dimensions, tolerances and performance requirements for diaphragm type float operated valves (copper alloy body) of nominal sizes ⅜ and ½ with seat numbers 3, 5, 6 and 9 intended for use with floats complying with BS 1968 and BS 2456.

NOTE 1 The nominal sizes correspond with the pipe size of the thread on the inlet shank as specified in BS 2779. The nominal size ⅜ is formed by making a special inlet on the size ½.
NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definition

For the purposes of this Part of BS 1212 the following definition applies.

diaphragm type float operated valve

a float operated valve in which the flow of water is controlled by the flexing of a diaphragm and which incorporates or is fitted with a discharge arrangement to conduct water into the cistern to which the float operated valve is to be fitted

NOTE In operation, flow from the valve reduces as the water level rises towards shut-off water level. The change in water level over which the flow progressively reduces from maximum to zero is at least four times the nominal size of the valve.

3 Designation for ordering

Diaphragm type float operated valves shall be designated by the following:

a) the nominal size;

b) the words “diaphragm type float operated valve”;

c) the seat number;

d) the number of this British Standard in the form of BS 1212-2;

e) bottom entry connection, if required.

Example. “Nominal size ½ diaphragm type float operated valve, no. 6 seat, BS 1212-2”.

4 Marking

4.1 General

A diaphragm type float operated valve shall be permanently and legibly marked in accordance with **4.2** and **4.3** in such a way as not to deform any working part.

4.2 On the body

Rolled, cast or stamped on the body, backplate or backplate coupling nut shall be the following:

a) the number of this British Standard in the form BS 1212-2 [1)];

b) the manufacturer’s name or trade mark.

4.3 On every seat including spares

The flange of the seat shall be marked with the following:

a) the manufacturer’s name or trade mark;

b) the designation of the seat (3, 5, 6 or 9) (see **20.2**).

In the case of plastics seats, the marking shall be either within the recess for embossed marking or on the flat face for engraved marking (see clause **20** and Figure 10).

[1)] Marking BS 1212-2 on or in relation to a product represents a manufacturer’s declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

Section 2. Materials

5 Quality and finish

5.1 General

The materials to be used in the construction of components for diaphragm type float operated valves shall be chosen from those given in Table 1.

5.2 Effect of non-metallic materials on water quality

When used under the conditions for which they are designed, non-metallic materials in contact with or likely to come into contact with potable water shall comply with BS 6920-1.

6 Plastics

6.1 With the exception of seats, backplates and backplate plungers, where no reworked material shall be used (see **6.2** and **6.3**), the plastics parts of diaphragm type float operated valves shall be manufactured from the materials given in Table 1 with, if required, the addition of not more than 15 % of the manufacturer's own clean reworked material complying with this Part of BS 1212. No other reworked material shall be used.

6.2 Seats from plastics shall be manufactured from new nylon, acetal polymer or polypropylene copolymer of a hardness not less than D75 (Shore) when measured in accordance with BS 2782-3:Method 365B.

6.3 Backplates and backplate plungers from plastics shall be manufactured from new acetal polymer with a hardness not less than D80 (Shore) when measured in accordance with BS 2782-3:Method 365B.

7 Castings

Cast components shall be sound and shall comply with BS 6615.

8 Hot stampings

Hot stamped components shall be sound and shall comply with BS 3885.

9 Mouldings

Mouldings shall be sound and free from flash.

10 Machining

All machining shall be carried out so that parts comply with the dimensions specified in this Part of BS 1212 and are correctly aligned when assembled. All machined surfaces shall be free from burrs.

Table 1 — Materials

Component		Material/material specification															
		Castings				Rod for hot pressings, forging and machining						Stainless steel	Rubbers	Fibres	Plastics		
		BS 1400 SCB1 or SCB3 (see note 1)	BS 1400 DCB3	BS 1400 PCB1	BS 1400 LG1 or LG2	BS 2872 CZ122	BS 2872 CZ129	BS 2874 CZ121	BS 2874 CZ132	BS 2874 PB102	BS 1400 G1	BS 970-1 304515	Synthetics of 60 to 70 IRHD (see BS 903-A26)	BS 3964 or BS 5292	Acetal polymer	Nylon	Polypropyfene copolymer
Body		X	X	X	X	X		X	X								
Backplate		X	X	X	X	X			X						X		
Backplate nut		X	X	X	X	X		X	X								
Diaphragm													X				
Lever		X	X	X	X	X	X	X	X								
Backplate plunger (see note 2)		X	X	X	X	X		X	X			X			See **6.3**		
Float adjuster		X	X	X	X	X	X	X	X							X	
Thumb screw		X	X	X	X	X	X	X	X								
Seat										X	X				X	X See **6.2**	X
Joint ring	Inlet shank to seat												X	X	X	X	X
	Inlet adaptor to inlet elbow												X	X	X	X	X
Inlet shank		X	X	X	X	X		X	X								
Body coupling nut		X	X	X	X	X		X	X								
Integral flange backnut type (a)	size ½	X	X	X	X	X		X	X						X	X	
	size ⅜	X	X	X	X	X		X	X								
Spigoted backnut type (b)	size ½	X	X	X	X	X		X	X						X	X	
	size ⅜	X	X	X	X	X		X	X								
Fixed flange backnut type (c)	size ½	X	X	X	X	X		X	X						X	X	
	size ⅜	X	X	X	X	X		X	X								
Inlet elbow		X	X	X	X	X		X	X								
Inlet adaptor		X	X	X	X	X		X	X								
Split cotter pin		See clause **24**															
Discharge arrangement		See **25.6**															

NOTE 1 Copper content may be reduced to 62 % for SCB1 and SCB3.
NOTE 2 Brass backplate plungers may be electroplated with nickel or tin.

Section 3. Design, construction and dimensions

11 General

A diaphragm type float operated valve shall have a general arrangement as shown in Figure 1 and shall have dimensions complying with clauses **12** to **25** with a working tolerance of ± 0.3 mm unless specified in this Part of BS 1212.

12 Screw threads

Unless otherwise specified in this Part of BS 1212, screw threads shall comply with the free fit or normal class requirements of the relevant British Standard.

13 Inlet connection

13.1 General

Every inlet shank shall be screwed externally with parallel fastening thread that complies with class B of BS 2779 and is of the same nominal size as the valve (see Figure 2).

13.2 Side entry valves

For side entry valves, the inlet shank shall have dimensions as given in Figure 2(a).

13.3 Bottom entry valves (size ½ only)

For bottom entry valves, an integral flange shall be provided on the inlet shank with dimensions as given in Figure 2(b), and shall be supplied with a sealing washer to facilitate connection of the cistern.

13.4 Connection to 12 mm and 15 mm copper tube

When the end of the inlet shank is required to have dimensions suitable for connecting to 12 mm and 15 mm copper tube, the inlet details shall be as given in Figure 2(c).

13.5 Inlet elbow and inlet adaptor for bottom entry valves (size ½ only)

Inlet elbows and inlet adaptors shall have dimensions as given in Figure 3.

Connection to the float valve shall be by the bottom inlet elbow shown in Figure 3(a) or by the alternative inlet elbow end, joint ring and adaptor shown in Figure 3(b).

NOTE Provision for tightening may be made in the bore of the inlet adaptor provided the flow through the seat is not reduced.

Connection between the bottom inlet shank and the inlet elbow shall be by means of suitably formed copper tube complying with Table X or Table Y of BS 2871-1:1971, the seal being made by a capillary or compression joint complying with BS 864-2 or by any method such that the seal complies with clause **26**.

Each bottom entry valve assembly shall be provided with an adjustable lockable stay at its upper end to act as a stop against the cistern wall.

14 Backnuts

14.1 General

Backnuts shall be of the following types (see Figure 4).

Type (a). With an integral flange used for securing the inlet shank to the cistern when tightened against the outside wall of the cistern.

Type (b). A spigoted backnut for size ½ diaphragm type float operated valves for use in flushing cisterns complying with BS 1125, in which the hole is larger than is required for the inlet shank in order to provide an alternative overflow position.

Type (c). A fixed flange backnut, which acts as a flange on the inner face of the cistern shell.

There shall be means for tightening the nuts, e.g. hexagons. Plastics backnuts shall comply with clause **27**.

14.2 Backnuts for side entry cisterns

Inlet shanks shall be provided with two backnuts. For nominal size ½ float operated valves, one of the following combinations of backnuts shall be supplied:

type (a) and type (b);

type (b) and type (c);

type (b) and type (b).

For size ⅜ float operated valves, type (a) and type (c) shall be supplied.

14.3 Backnuts for bottom entry cisterns

Inlet shanks shall be fitted with a type (a) or type (b) backnut.

15 Bodies

Bodies shall have dimensions as given in Figure 5, with the exception of the attachment of discharge pipe arrangement which shall comply with clause **30**.

16 Body coupling nuts

Body coupling nuts shall be of the types and dimensions given in Figure 6 and shall be free to revolve when the type (c) backnut [see Figure 4(c)] is screwed hard up to the end of the inlet shank thread.

17 Backplate nuts

Backplate nuts shall have dimensions as given in Figure 7.

18 Backplates

Backplate nuts shall have dimensions as given in Figure 8, with a minimum wall thickness of 1.6 mm.

19 Backplate plungers

Backplate plungers shall have dimensions as given in Figure 9.

20 Seats

20.1 General

Seats shall be removable and shall have dimensions as given in Figure 10 and Table 2.

20.2 Seat designation

Seats shall be designated by the bore numbers 3, 5, 6 and 9 (see note). The combination of seat number and size of float to suit the required pressure zone shall be as given in Table 3.

NOTE These seats can be substituted by those specified in BS 1212-1 marked 3 × I, 5 × I, 6 × II or 9 × II.

20.3 Seat colour

Plastics seats shall be of the colour given in Table 2.

20.4 Seat joint ring

Seats shall be provided with a joint ring on the inlet side of the seat. The joint ring shall have dimensions as given in Figure 10(a)

21 Diaphragms

Diaphragms shall have dimensions as given in Figure 11.

22 Levers

22.1 General

Levers shall have dimensions as given in Figure 12.

22.2 Attachment of float

The float end of the lever shall be bent downwards as shown in Figure 12. A float adjuster and thumb screw as shown in Figure 13 shall be supplied on the downturn of the lever, the end of the lever being bent over or otherwise deformed to retain the float adjuster.

22.3 Short arm

The short arm of the lever shall be provided with a heel so shaped as to allow full movement of the backplate plunger but prevent the lever locking in the fully open position (see Figure 12).

22.4 Length of lever arm

The length of the lever shown in Figure 12 shall be shortened when ordered for use in small cisterns and the size of the float shall be adjusted to maintain the same positive closing moment as that obtained with the standard lever and size of float.

NOTE When so ordered by the purchaser the length of the lever may be increased.

23 Float adjusters and thumb screws

Float adjusters and thumb screws shall have dimensions as given in Figure 13(a) and Figure 13(b) respectively.

24 Split cotter pins

Split cotter pins, which attach the lever to the backplate, shall be manufactured from copper alloy and shall have a nominal diameter of 3.2 mm and a nominal length of 19 mm and shall comply with BS 1574.

25 Discharge arrangement

25.1 A diaphragm type float operated valve shall be so constructed as to prevent backsiphonage of water previously discharged by the float operated valve at all water levels up to the horizontal centreline of the float operated valve (see clause **28**).

25.2 If the discharge point is above the horizontal centreline of the valve, it shall be at a level high enough to prevent backsiphonage. The construction shall not facilitate the fitting of any pipe or device to conduct water to a lower level.

25.3 If the discharge point is below the horizontal centreline of the valve, the discharge arrangements shall incorporate one or more constantly open air inlets or other backflow prevention devices of such a design that the complete valve complies with clause **28**.

25.4 The discharge arrangement shall not obstruct the fitting of the valve into a WC flushing cistern complying with BS 1125.

25.5 The discharge arrangement shall be designed such that the complete valve complies with clause **30**.

25.6 Discharge arrangements shall be manufactured from any non-ferrous or plastics material or any combination thereof provided that the arrangement complies with clause **5**.

Section 4. Performance

26 Hydraulic pressure and shut-off

26.1 A diaphragm type float operated valve shall be such that while held in the closed position it withstands a hydraulic pressure of 20 bar[2)] for 15^{+1}_{-0} min without leaking or sweating.

26.2 A diaphragm type float operated valve shall not leak when tested in accordance with Appendix A.

27 Backnut distortion

Size ½ plastics backnuts types (a), (b) and (c) shall not show permanent damage that will affect the efficiency of the assembly when tested in accordance with Appendix B.

28 Backflow prevention

A diaphragm type float operated valve together with its discharge arrangement shall deliver no water into the catchpot when tested in accordance with Appendix C (see Figure 14).

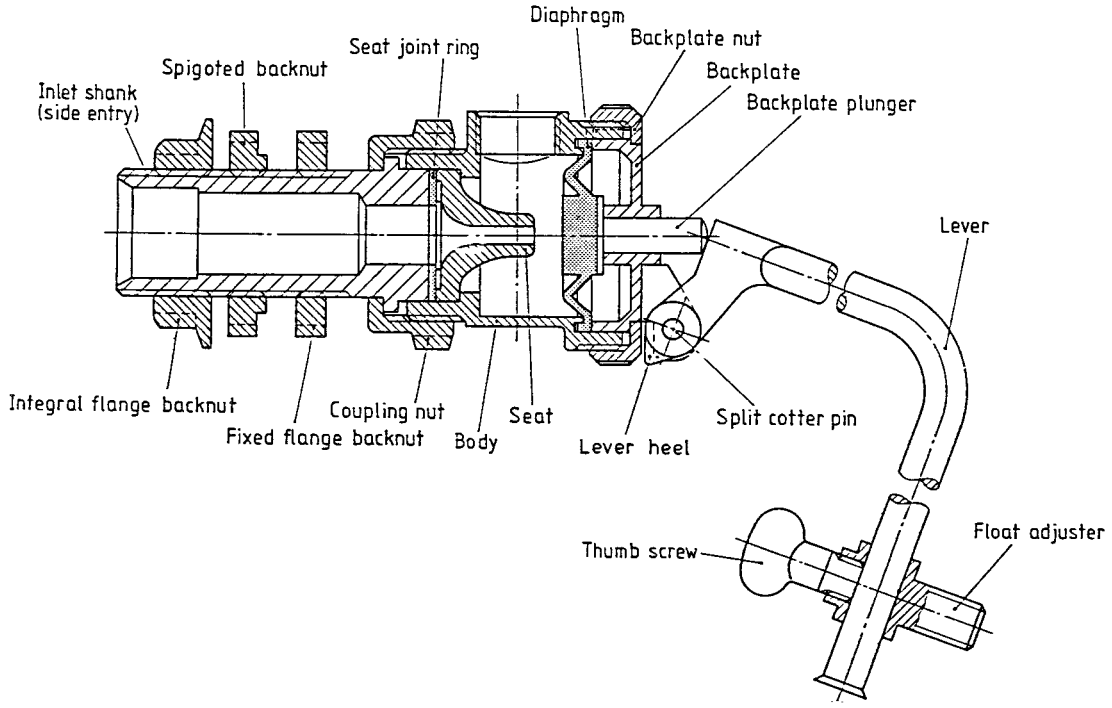
NOTE For bottom entry valves that use the same components for the seat, diaphragm, body assembly and discharge arrangement as a side entry valve, this clause may be complied with by satisfactory tests on a side entry valve.

29 Flow

In order to ensure adequacy of flow under low head supply conditions, a diaphragm type float operated valve together with its discharge arrangement shall deliver a minimum of 9 L when tested in accordance with Appendix D.

30 Hydraulic pressure on discharge arrangement

A diaphragm type float operated valve together with its discharge arrangement shall withstand a constantly applied pressure without cracking or permanent deformation or separation of any component part when tested in accordance with Appendix E.



NOTE Only two backnuts are used at any one time (see clause **14**).

(a) Side inlet

Figure 1 — Section of typical size ½ diaphragm type float operated valve *(continued)*

[2)] 1 bar = 10^5 N/m^2 = 100 kpa.

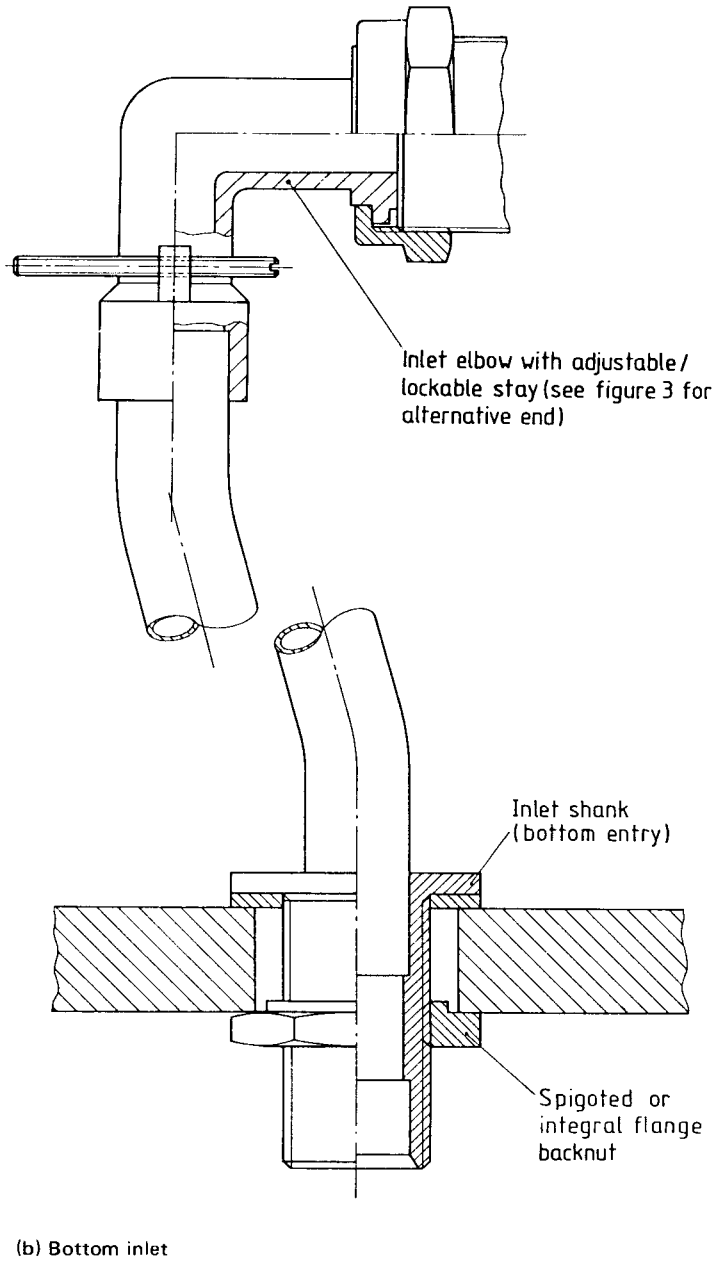
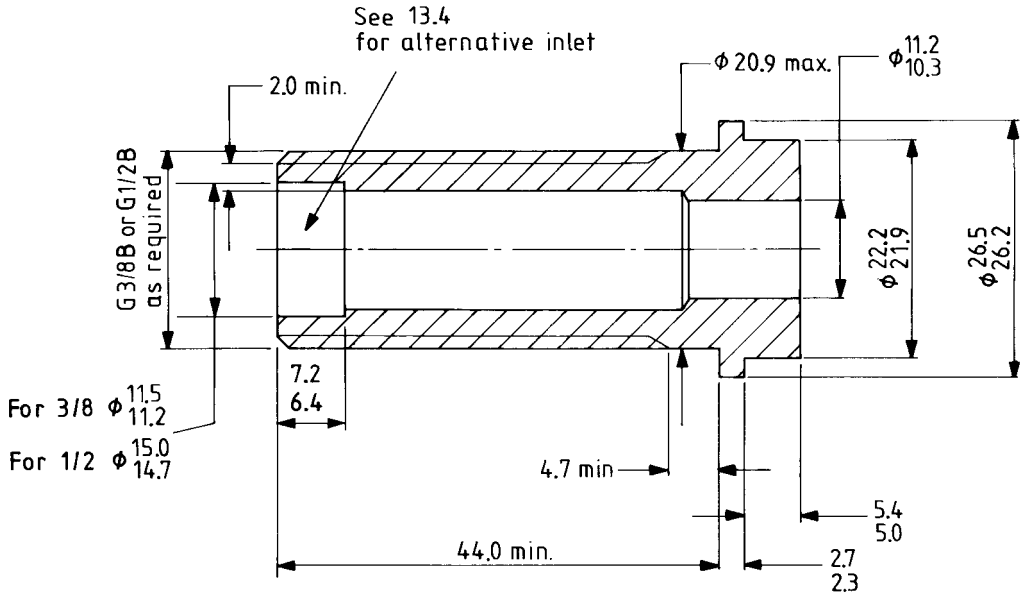
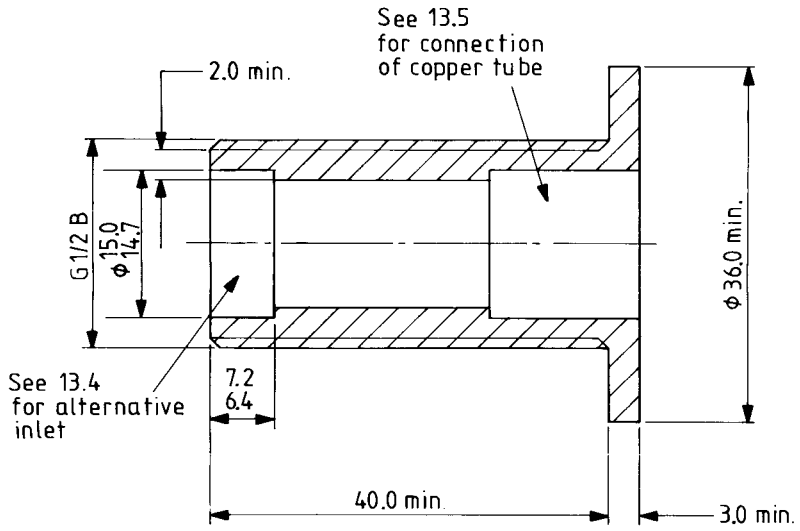


Figure 1 — Section of typical size ½ diaphragm type float operated valve *(concluded)*



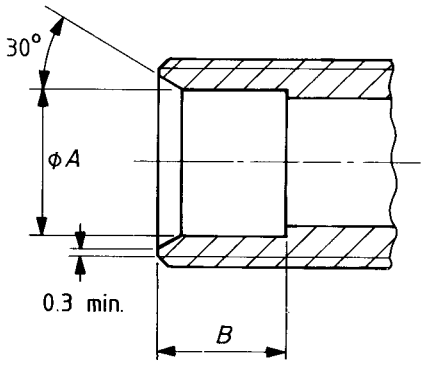
NOTE For G⅜ B and G½ B see BS 2779.

(a) Side entry inlet shank



(b) Bottom entry inlet shank (size ½ only)

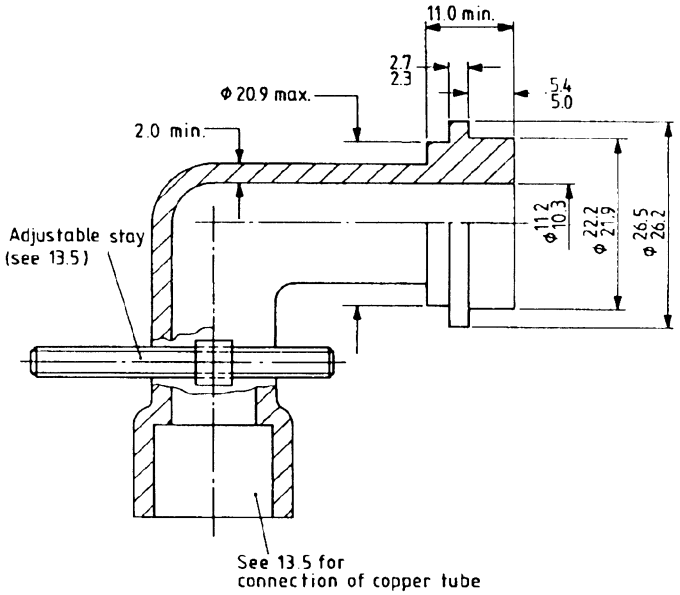
Pipe size	φ A		B
⅜	12.15	12.25	10
½	15.15	15.25	13



(c) Inlet (bottom or side entry) for connection to 12 mm or 15 mm copper tube (see clause **13.4**)

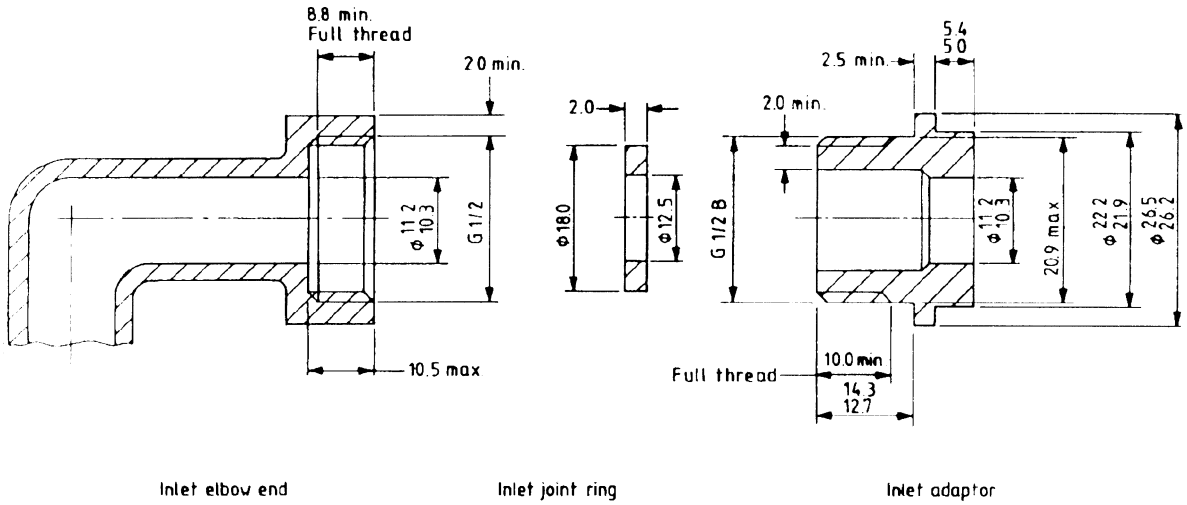
All dimensions are in millimetres.

Figure 2 — Inlet shanks



NOTE 1 Figure shows typical example only.

(a) Bottom inlet elbow (size ½ only)

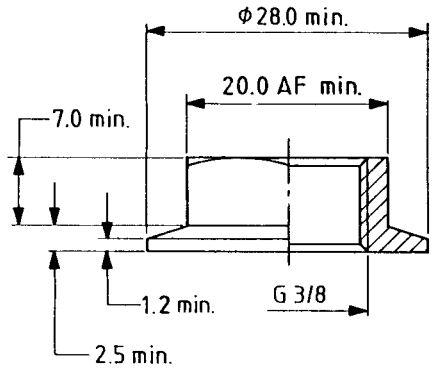


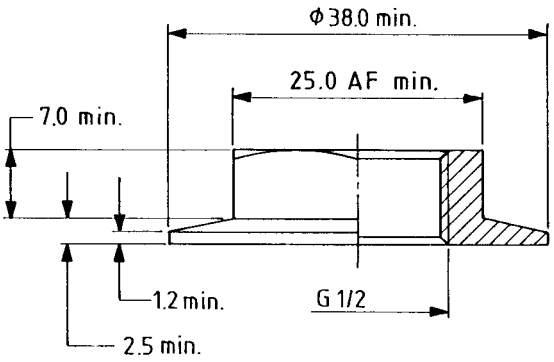
NOTE 2 For G½ and G½ B see BS 2779.

(b) Alternative inlet elbow construction (size ½ only)

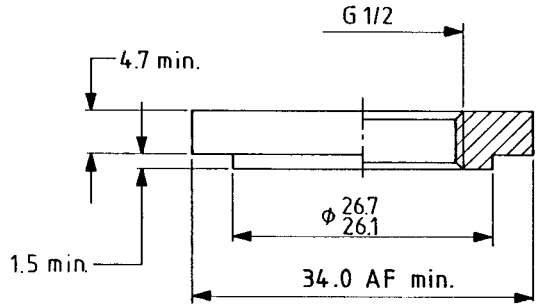
All dimensions are in millimetres.

Figure 3 — Inlet elbows

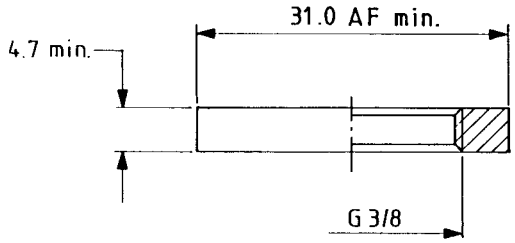


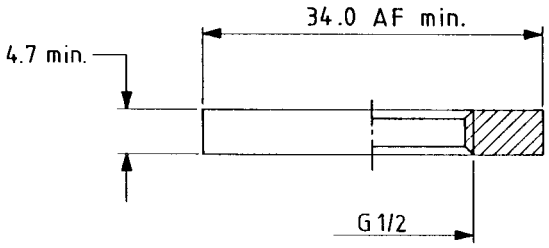


(a) Type (a) size $^{3}/_{8}$ and ½ backnuts (integral flange)



(b) Type (b) size ½ backnut (spigoted)



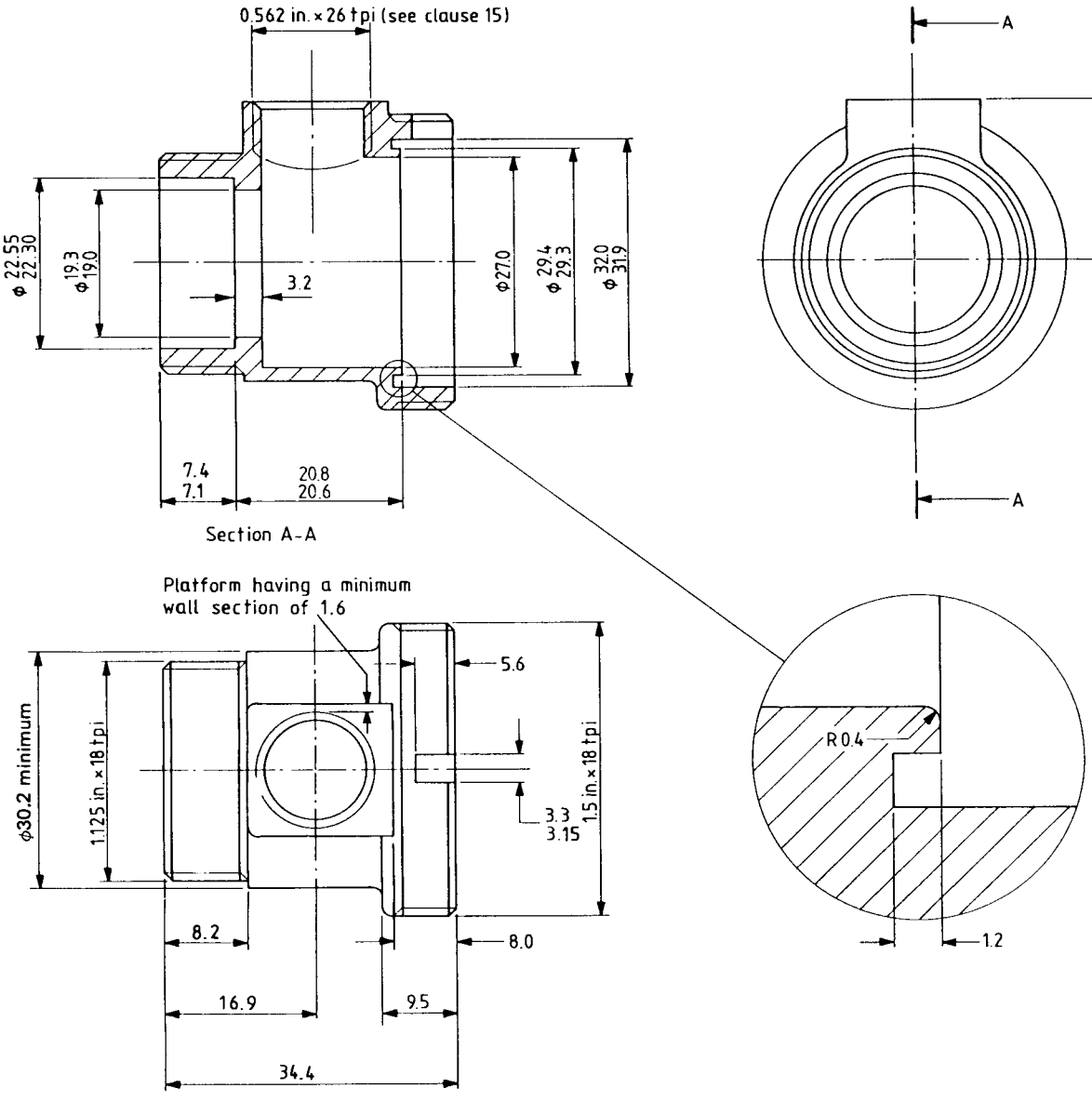


(c) Type (c) size $^{3}/_{8}$ and ½ backnuts (fixed flange)

All dimensions are in millimetres.

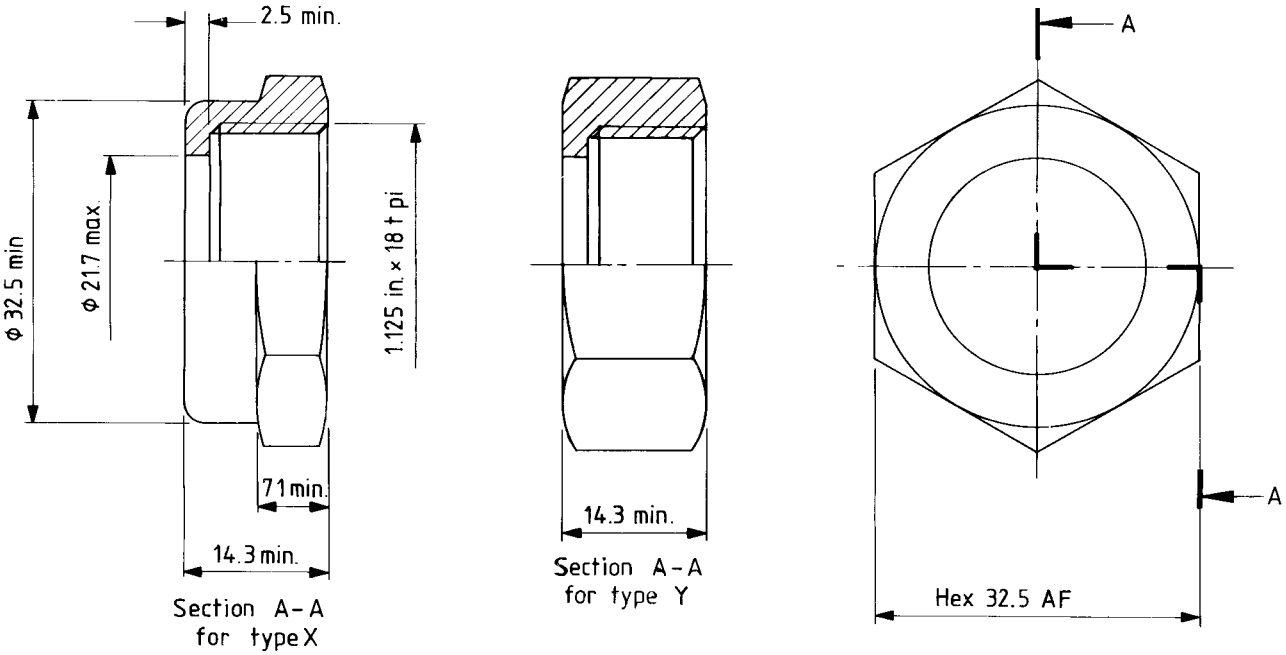
NOTE For G½ and G⅜ see BS 2779.

Figure 4 — Backnuts



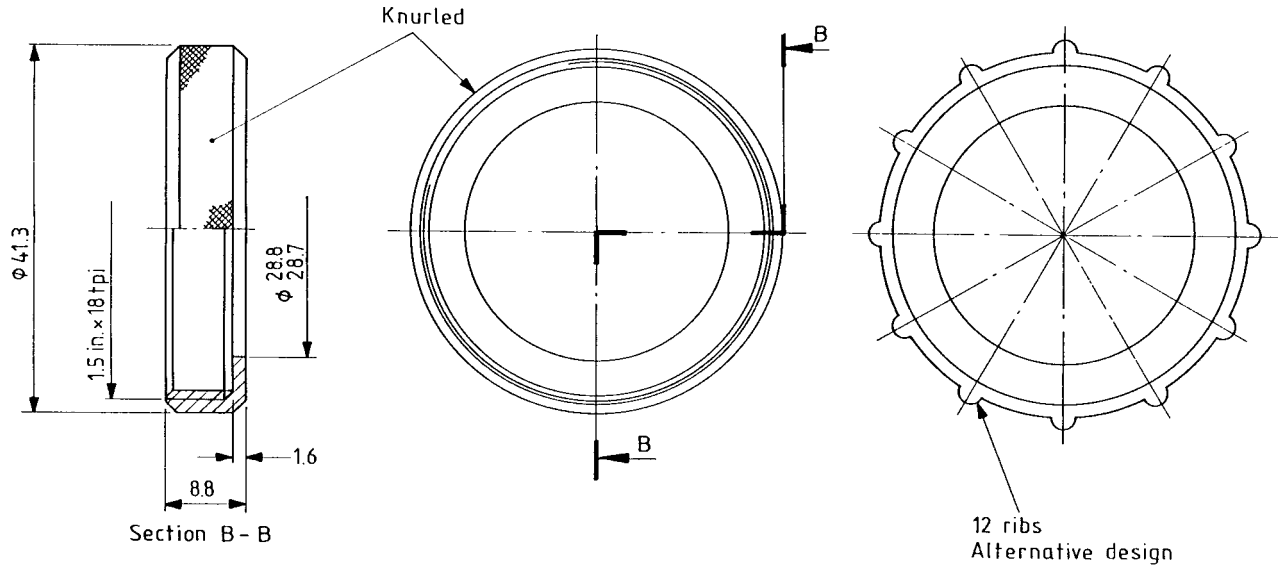
All dimensions are in millimetres except those for threads, which are in inches.

Figure 5 — Body



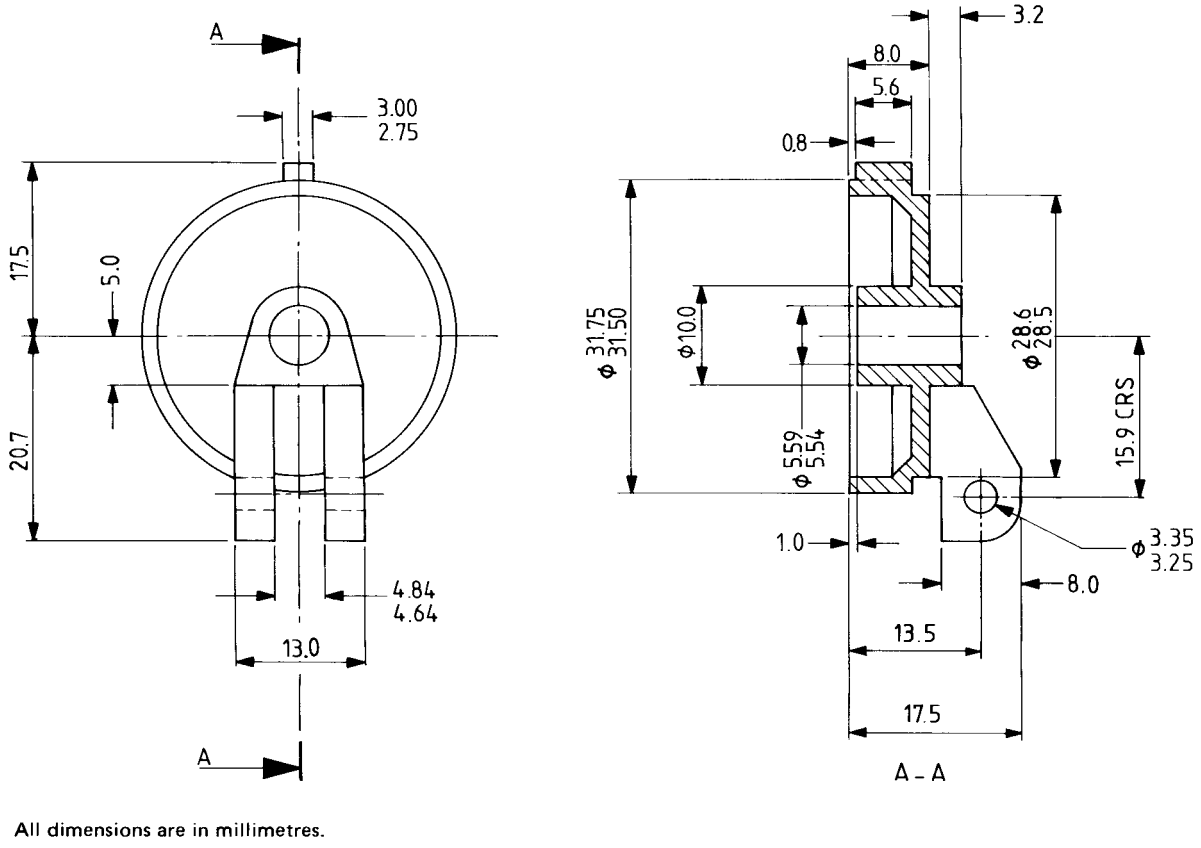
All dimensions are in millimetres except those for threads, which are in inches.

Figure 6 — Body coupling nuts



All dimensions are in millimetres except those for threads, which are in inches.

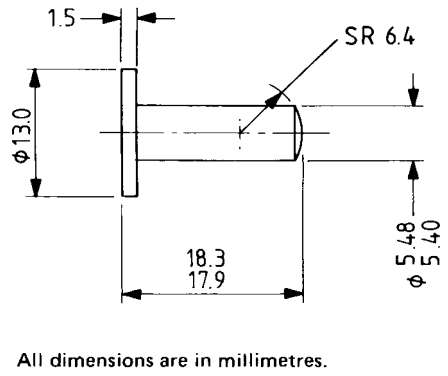
Figure 7 — Backplate nuts



All dimensions are in millimetres.

NOTE Minimum wall thickness is 1.6 mm (see clause **18**).

Figure 8 — Backplate



All dimensions are in millimetres.

Figure 9 — Backplate plunger

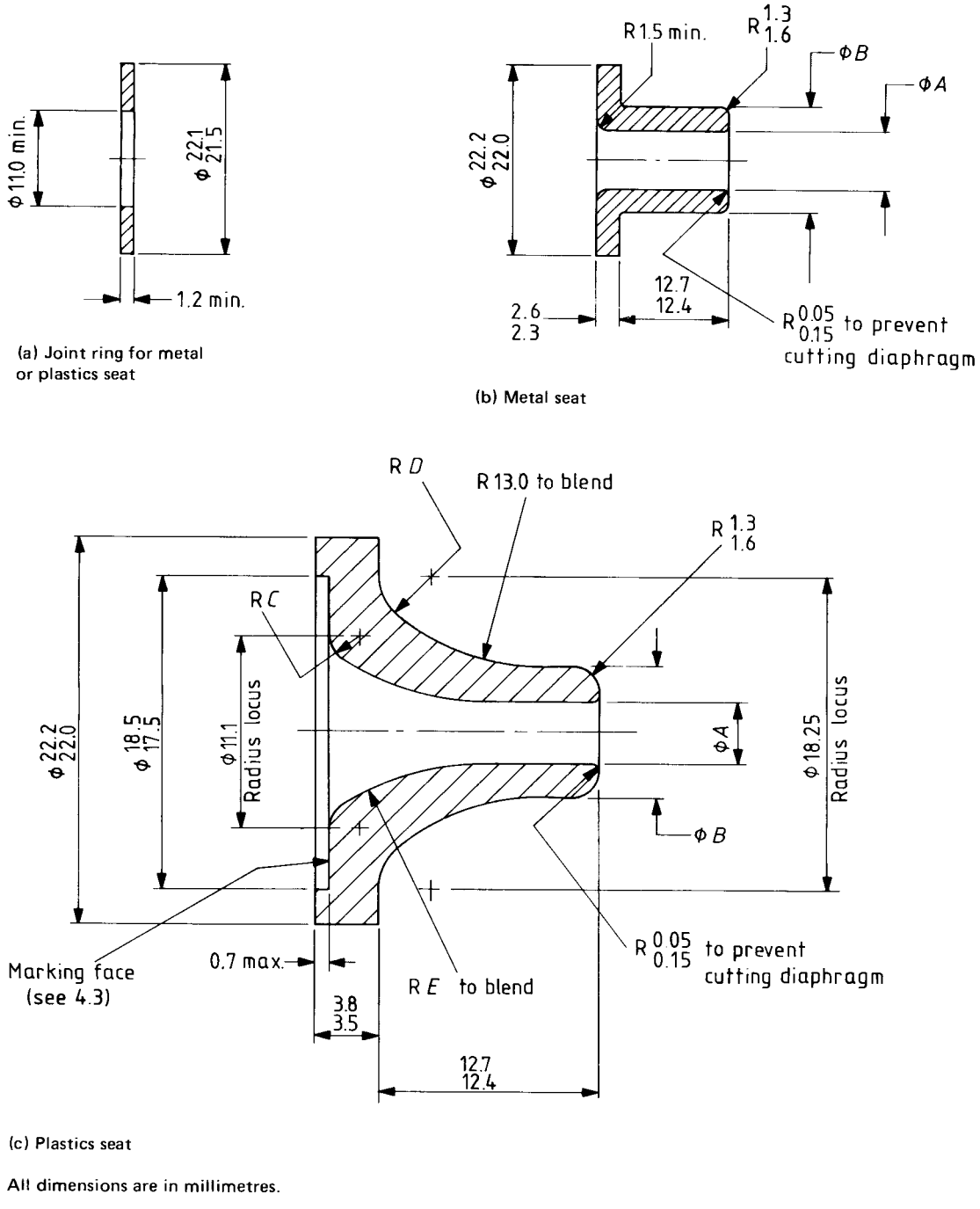
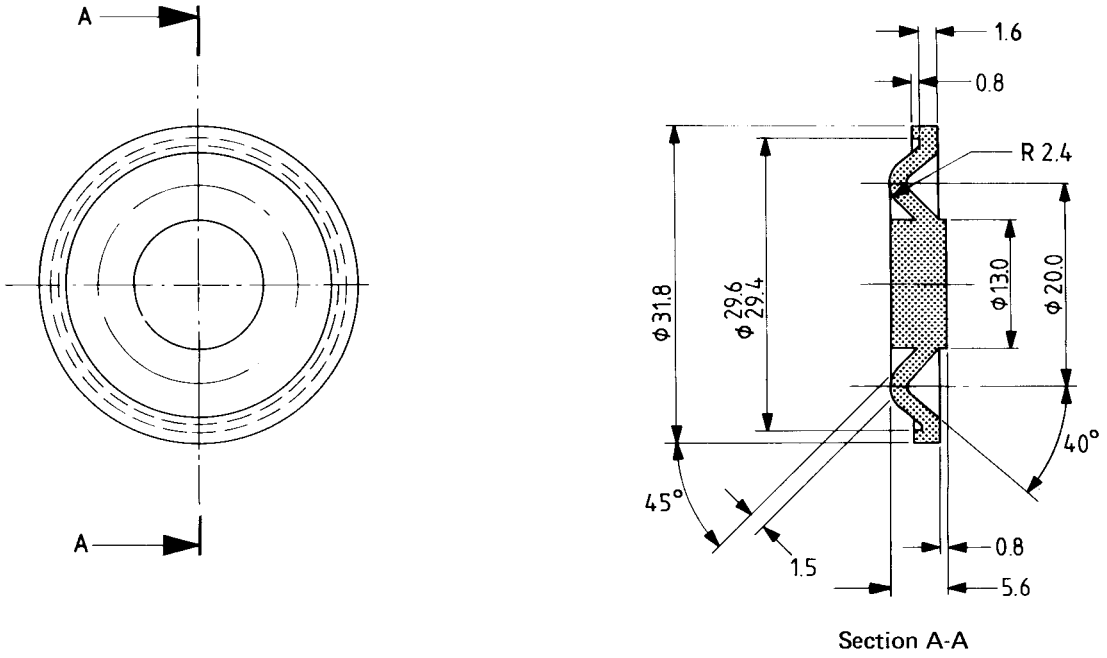


Figure 10 — Seats and joint ring for seats (see Table 2)

Table 2 — Seats

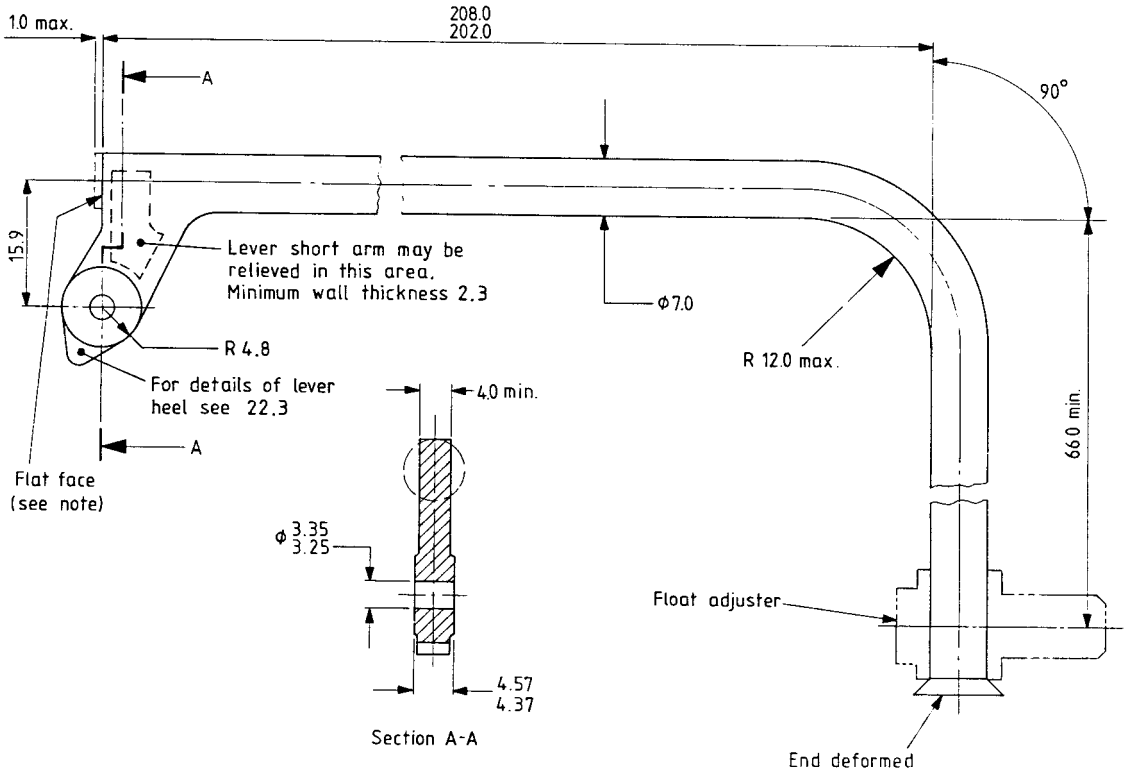
Seat number	Bore of seat, *A*		Outside diameter of barrel, *B*		Radius of seat inlet, R*C*	Radius at Flange, R*D*	Blend radius R*E* (to blend with *A* and R*C*)	Seat colour (plastics)
	max.	min.	max.	min.	min.	min.	min.	
	mm	mm	mm	mm	mm	mm	mm	
3 (see note)	3.2	3.0	7.2	6.9	1.5	3.2	19.0	White
5	4.8	4.6	8.8	8.5	1.5	3.2	19.0	Black
6	6.4	6.2	10.4	10.1	1.5	1.6	19.0	Red
9	9.6	9.4	13.5	13.2	—	1.6	—	Green

NOTE Where the water pressure is higher than is given in Table 3, the bore of the seat may be reduced provided the flow is not consequently restricted to less than 0.15 L/s.



All dimensions are in millimetres.

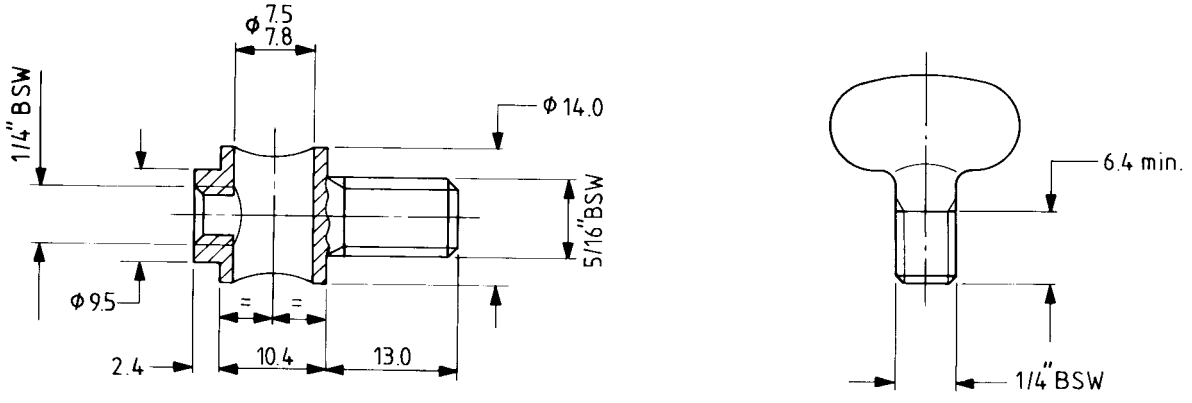
Figure 11 — Diaphragm



All dimensions are in millimetres.

NOTE A flat pad ϕ7.0 mm may be added to the front of this face.

Figure 12 — Lever



(a) Float adjuster

Figure shows typical example only.

(b) Thumb screw

All dimensions are in millimetres except those for threads which are in inches.

Figure 13 — Float adjuster and thumb screw

Appendix A Method of test for shut-off when assembled with appropriate float

A.1 Apparatus

A.1.1 *Cistern*, which allows the attached float to be half immersed in water and in which the float valve can be installed.

A.1.2 *Means of supplying water,* to provide the required pressure.

A.1.3 *Pressure gauge,* to indicate test pressure.

A.2 Procedure

Install the float valve, assembled with the required combination of seat and float indicated in Table 3, in the cistern (**A.1.1**) but with the discharge arrangement removed. Fill the cistern with water until the float is immersed to half its volume. Gradually apply the pressure indicated in Table 3 for the appropriate combination of seat and float. Record any leakage from the float valve outlet.

Appendix B Method of test for distortion of size ½ plastics backnuts

B.1 Apparatus

B.1.1 *Test plate,* which is a stainless steel spacer manufactured from material complying with grade 416S21 of BS 970-4:1970 that has a minimum outside dimension of 50 mm × 12 mm and a centralized circular hole of 27.5 mm. The spacer shall have both flat surfaces prepared to a finish of 0.8 µm to 1.0 µm (R_a) (see BS 1134) when measured in all directions and shall have been hardened in oil or air at 950 °C to 1 020 °C and tempered at 150 °C to 250 °C.

B.1.2 *Open ended spanner,* which is a snug fit on the flats or ribs of the backnut.

B.2 Procedure

Screw a type (b) backnut on to the inlet shank, insert the assembly through the test plate (**B.1.1**) and attach the backnut that is to be tested. Apply a torque of 15 N m to the backnut with the open ended spanner (**B.1.2**).

Appendix C Method of test for backflow prevention

C.1 Apparatus

NOTE See Figure 14.

C.1.1 *Means for producing and maintaining an absolute pressure within a vacuum vessel of* 0.2 bar (e.g. pump or injector) (a).

C.1.2 *Full-way gate valve,* 50 mm, to BS 5154 (b).

C.1.3 *Vacuum vessel* (c), comprising a galvanized mild steel cylinder, type reference Y58 complying with BS 417-2 with modified connection on the side to take G2 (to BS 21) pipe with other connections for vacuum line, pressure gauge and drain valve if fitted.

C.1.4 *Calibrated pressure gauge* (d), to measure absolute pressures from 0 bar to 1.0 bar.

C.1.5 *Full-way quick action valve,* 50 mm (e).

C.1.6 *Water trap* (f), with catchpot and drain valve.

C.1.7 *Pipework* (g), of 50 mm nominal bore and not exceeding 2 m in the total length connecting the vacuum vessel, full-way quick action valve, water trap and connecting pipe to the float operated valve under test.

C.1.8 *Copper pipe,* 15 mm, (h) to Table X of BS 2871-1:1971 no longer than 200 mm in length, connecting the float operated valve under test to the 50 mm pipework (g).

Table 3 — Seat and float combination

Nominal size of valve	Seat number	Nominal diameter of suitable standard float					
		For high pressure up to 14 bar		For medium pressure up to 7 bar		For low pressure up to 3 bar	
		Copper BS 1968	Plastics BS 2456	Copper BS 1968	Plastics BS 2456	Copper BS 1968	Plastics BS 2456
		in	mm	in	mm	in	mm
⅜ and ½	3	5	114	4½	102	4½	102
⅜ and ½	5	6	127	4½	114	4½	102
⅜ and ½	6	6	152	5	114	4½	102
⅜ and ½	9	7	—	6	127	5	114

NOTE Non-spherical floats should have a lifting effort (calculated as required by BS 1968 or BS 2456) not less than that of the spherical float.

C.1.9 *Galvanized mild steel cistern* (j), of sufficient depth to allow the procedure described in **C.2.10** to be carried out.

C.1.10 *Water supply*

C.1.11 *Nylon thread,* of 0.75 mm nominal diameter.

C.2 Procedure

C.2.1 Foul the waterway of the float operated valve under test over the whole passage, from inlet shank to discharge arrangement outlet, by inserting the nylon thread (**C.1.11**).

C.2.2 Install the float operated valve complete with its appropriate float in the cistern (**C.1.9**).

C.2.3 Connect the float operated valve to the pipework and associated equipment as shown in Figure 14 ensuring that there is no residual water in the system.

C.2.4 Set the float so as to produce the maximum water level when the float operated valve shuts off. Run water into the cistern (**C.1.9**) until the water level is at the horizontal centreline of the float operated valve.

C.2.5 Close the full-way quick action valve (**C.1.5**) and the water trap drainage valve (**C.1.6**) and open the full-way gate valve (**C.1.2**).

C.2.6 Activate the means of producing a vacuum (**C.1.1**) until the gauge reading (**C.1.4**) on the vacuum vessel (**C.1.3**) is not more than 0.2 bar absolute. Close the full-way gate valve (**C.1.2**).

C.2.7 Quickly open the full-way quick action valve (**C.1.5**) and allow it to remain open for 60 s. Close the full-way quick action valve (**C.1.5**).

C.2.8 Open the water trap drain valve (**C.1.6**) to ascertain if any water was present in the catch pot (see clause **28**).

C.2.9 Lower the water level in the cistern (**C.1.9**) to 20 mm below the horizontal centreline of the float operated valve and repeat procedures **C.2.5** to **C.2.8**.

C.2.10 Repeat **C.2.9** at 20 mm intervals of level until the water level is at least 20 mm below the lowest point of the discharge arrangement.

Appendix D Method of test for flow

D.1 Apparatus

Test rig, capable of maintaining 1 m head of water at the horizontal centreline of the valve, comprising a cistern connected through the necessary 15 mm copper pipework complying with BS 2871-1 and control valves (see Figure 15) to the specimen valve under test.

D.2 Procedure

Fit the float operated valve to be tested with a no. 9 seat and remove the split cotter pin and lever (and any float fitted). Adjust the float operated valve so that it discharges water from the cistern into the container for 90 s while maintaining the water level in the cistern at a height of 1 ± 0.01 m above the horizontal centreline of the valve. At the end of 90 s measure the volume of water in the container.

Appendix E Method of test for effect of hydraulic pressure on discharge arrangement

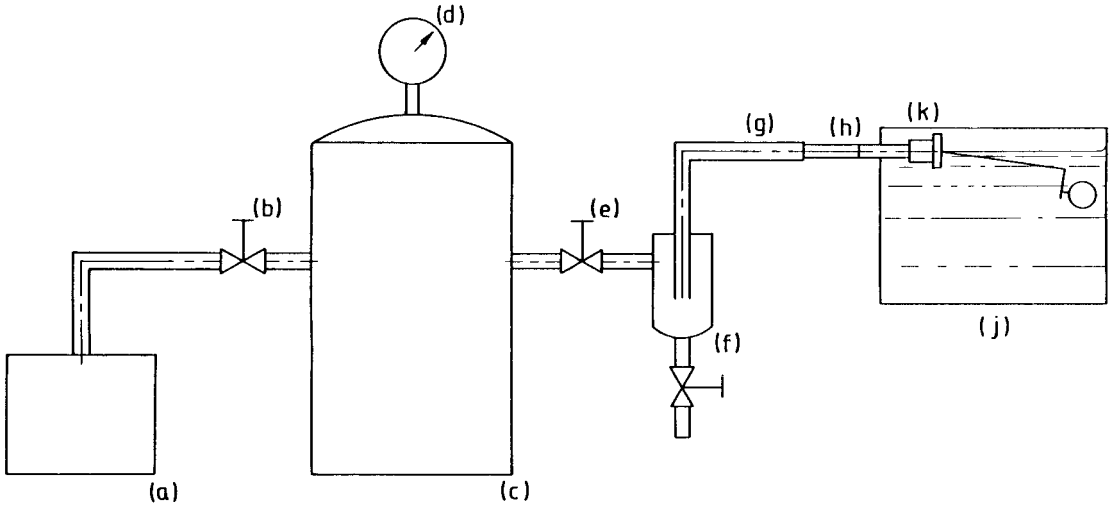
E.1 Apparatus

E.1.1 *Cold water supply,* capable of providing a dynamic pressure of 10 bar.

E.1.2 *Pressure gauge,* installed immediately upstream of the valve to be tested.

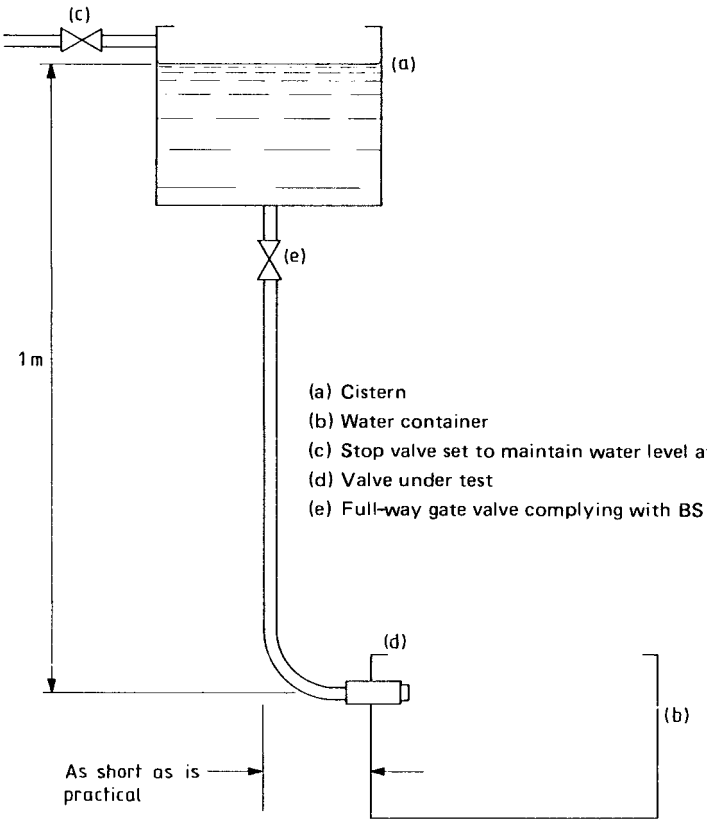
E.2 Procedure

Fit the float operated valve to be tested with a no. 3 seat and its discharge arrangement. Connect to the apparatus. With the valve to be tested held in the fully open position, gradually increase the pressure to 10 bar. Maintain this pressure for 60 s.



(a) Vacuum pump
(b) 50 mm full-way gate valve
(c) Vacuum vessel
(d) Pressure gauge 0 bar to 1.0 bar (absolute)
(e) 50 mm full-way quick action valve
(f) Water trap with catchpot and drain valve
(g) 50 mm pipework
(h) 15 mm copper pipe
(j) Galvanized mild steel cistern
(k) Valve under test

Figure 14 — Typical arrangement of apparatus for backflow prevention test



(a) Cistern
(b) Water container
(c) Stop valve set to maintain water level at 1 m
(d) Valve under test
(e) Full-way gate valve complying with BS 5154

Figure 15 — Typical arrangement of apparatus for flow test

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Publications referred to

BS 417, *Galvanized mild steel cisterns and covers, tanks and cylinders.*

BS 417-2, *Metric units.*

BS 864, *Capillary and compression tube fittings of copper and copper alloy.*

BS 864-2, *Specification for capillary and compression fittings for copper tubes.*

BS 903, *Methods of testing vulcanized rubber.*

BS 903-A26, *Determination of hardness.*

BS 970, *Wrought steels (blooms, billets, bars and forgings).*

BS 970-1, *General inspection and testing procedures and specific requirements for carbon, carbon manganese, alloy and stainless steels.*

BS 970-4, *Stainless, heat resisting and valve steels.*

BS 1125, *WC flushing cisterns (including dual flush, cisterns and flush pipes).*

BS 1134, *Assessment of surface texture.*

BS 1212, *Float operated valves (excluding floats).*

BS 1212-1, *Specification for brass body piston type float operated valves (excluding floats).*

BS 1212-3, *Diaphragm type (plastics body) for cold water services*[3)].

BS 1400, *Copper alloy ingots and copper alloy and high conductivity copper castings.*

BS 1574, *Split cotter pins. Metric and inch series.*

BS 1968, *Floats for ballvalves (copper).*

BS 2456, *Floats (plastics) for ballvalves for hot and cold water.*

BS 2779, *Pipe threads where pressure-tight joints are not made on the threads.*

BS 2782, *Methods of testing plastics.*

BS 2782-3, *Mechanical properties.*

BS 2782:Method 365B, *Determination of indentation hardness by means of a durrometer (Shore hardness).*

BS 2871, *Copper and copper alloys. Tubes.*

BS 2871-1, *Copper tubes for water, gas and sanitation.*

BS 2872, *Copper and copper alloys. Forging stock and forgings.*

BS 2874, *Copper and copper alloys. Rods and sections (other than forging stock).*

BS 3885, *Tolerances for hot brass stampings.*

BS 3964, *Flexible vulcanized fibre sheets.*

BS 5154, *Specification for copper alloy globe, globe stop and check, check and gate valves.*

BS 5292, *Jointing materials and compounds for installations using water, low-pressure steam or 1st, 2nd and 3rd family gases.*

BS 6615, *Specification for dimensional tolerances for metal and metal alloy castings.*

BS 6920, *Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water.*

BS 6920-1, *Specification.*

[3)] Referred to in the foreword only.

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