

OBSOLESCENT
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Specification for

Cast iron spigot and socket pipes (vertically cast) and spigot and socket fittings —

Part 2: Fittings

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Foreword

This standard makes reference to the following British Standards:

BS 10, *Flanges and bolting for pipes, valves and fittings*.

BS 18, *Methods for tensile testing of metals*.

BS 78, *Cast iron spigot and socket pipes and fittings — Part 1: Pipes*.

BS 1211, *Centrifugally cast (spun) iron pressure pipes for water, gas and sewage*.

BS 1452, *Grey iron castings*.

BS 2035, *Cast iron flanged pipes and flanged fittings*.

This revised British Standard has been authorized by the Iron and Steel Industry Standards Committee and is a companion to BS 2035, “*Cast iron flanged pipes and flanged fittings*” and to BS 1211, “*Centrifugally cast (spun) iron pipes for water, gas and sewage*”.

The standardization of cast iron pipes was first undertaken in 1903 as a result of a request received from the Institution of Water Engineers (then the British Association of Water Engineers) and a British Standard Specification was issued in 1917. The standard was revised in 1938.

The present edition has been divided into two parts. Part 1 deals with cast iron spigot and socket pipes, vertically cast, and Part 2 with cast iron fittings for use with pipes manufactured in accordance with BS 78-1 and BS 1211.

Only two classes of fittings, AB and CD, are specified as against the four for pipes. The specified dimensions and pressures conform to the last letter of the classification code, that is B and D respectively, though the AB fittings are intended for use with Class A or B pipes, and CD fittings with Class C or D pipes.

Some simplification has been achieved in 30 inch diameter and over by eliminating the external diameter applicable to Class AB pipes and fittings in BS 78:1938, and adopting for both classes the external diameter previously used for Class CD only.

The fittings covered by this standard have spigot and socket ends to suit the traditional lead-caulked joint, but increasing use is being made of various forms of mechanical joint in which the seal is achieved by means of a suitably retained gasket. It has not been found possible to include such joints in the present standard without restricting the development of these alternative forms of joint.

The testing procedure now adopted has been somewhat modified from that given in the previous edition of BS 78. The taking of test bars for tensile and transverse tests to represent the day's output has never been considered satisfactory by many users because the test pieces could not be identified with any particular fittings. It has been decided to take advantage of the hydrostatic test applied at the works to prove the strength of the material of each individual fitting by subjecting it to a test pressure higher than that previously specified.

Manufacturers will continue to take tensile tests to check the quality of the metal, and records of these control tests will be available to the purchasers or their representatives.

Certain nominal internal diameters have been omitted from this revision as they are no longer in common use. The diameters now specified have been divided into “preferred” and “non-preferred” sizes. It is hoped, where possible, only “preferred” sizes will be ordered.

NOTE 1 Metric equivalents of British units are not given in this standard. Some of the nominal dimensions of pipes manufactured in metric units and British units overlap and it would, therefore, be very confusing if metric equivalents were given when the equivalent of a British size was only slightly different from the actual metric size. However, to assist a reader more familiar with metric than British units, conversion factors are given in Appendix A.

NOTE 2 In place of the customary, but incorrect, use of the pound or ton as a unit of force, the units called a pound force (abbreviation lbf) and ton force (tonf) have been used in this standard. These are the forces which when acting on a body of mass one pound and one ton respectively, give them an acceleration equal to that of standard gravity.

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 58 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.

Section 1. General

1 Scope

Part 2 of this British Standard covers cast iron spigot and socket fittings for use with pipes to Part 1 of this standard, and to BS 1211, "*Centrifugally cast (spun) iron pipes for water, gas and sewage*".

2 General

The fittings shall be of cast iron and shall conform in every respect to this standard, but in cases of fittings ordered and supplied with some form of mechanical joint, the body only of the fittings shall conform to all the relevant requirements of the standard.

For valve bodies the continued use of the socket form specified in BS 78:1938 is permissible. In Appendix A extracts from Table 4 and Table 5 of BS 78:1938 have been reproduced giving the socket details.

The diagrams appearing in Table 20 and Table 21 show designs of plugs and caps suitable for the specified hydraulic test pressures. Manufacturers may, at their own discretion, supply plugs and caps to alternative designs, provided such castings are suitable for, and have been subjected to, the specified hydrostatic test pressures, and the jointing dimensions are maintained.

3 Lengths and dimensions

The lengths, dimensions and shape of the fittings shall be in accordance with the appropriate drawings and tables in Section 2.

4 Marking

Each fitting shall have cast on it the class letters, the manufacturer's name or identification mark, the last two digits of the year of manufacture and the number of this standard, the markings shall be on or adjacent to the socket. The fittings shall, in addition, have cast on them marks indicating the following:

Bends. The nominal internal diameter in inches and the angle in degrees subtended by the bend.

Tees, crosses and angle branches. The nominal internal diameter in inches of the main body and of the branch or branches.

Hydrant bends and tees. The nominal internal diameter in inches of the main body.

Tapers. The nominal internal diameter in inches at each end.

Other standard fittings. The nominal internal diameter in inches of the corresponding pipe for which they are intended.

NOTE The mark "BS 78" on the product is a claim by the manufacturer that it complies with the requirements of the standard.

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5 Quality of metal used in casting fittings

The metal used for the manufacture of the fittings shall be good quality grey cast iron, having a tensile strength of not less than 10 tonf/in² on a test bar of 1/2 in² cross-sectional area and machined from a 1.2 in diameter parallel bar as cast, to conform to the recommended dimensions for standard proportional round test pieces given in BS 18, "*Methods for tensile testing of metals*".

The metal shall be prepared at the discretion of the manufacturer in a cupola, active mixer or other suitable furnace.

NOTE 1 The tensile strength of 10 tonf/in² is equivalent to cast iron conforming with Grade 10, BS 1452, "*Grey iron castings*".

NOTE 2 The tensile strength obtained on the test bar represents the quality of the metal from which the fittings are cast and is not necessarily an indication of the tensile strength of the castings themselves.

6 Quality control

The manufacturer shall undertake to cast each day, as required for metallurgical control, tensile test bars from the same metal as is used for the casting of the fittings.

The manufacturer shall keep records of the tensile tests made and these records shall be available for inspection by the purchaser or his representative.

7 Mode of casting

All fittings shall be cast in sand moulds in such a manner as to ensure their soundness. Any head of metal shall afterwards be removed and the finished casting shall conform to the dimensions and shape required.

8 Removal from moulds

The fittings shall not be removed from their sand moulds until cooling has proceeded sufficiently to avoid casting strains, cracking or other injury.

9 Freedom from defects

The finished fittings shall be sound, free from defects, smooth and readily machineable. All lumps or rough places shall be removed from the surfaces. By agreement between the manufacturer and the purchaser or his representative, defects may be rectified.

10 Gauging

The manufacturer shall provide suitable gauges to ensure that the dimensions of the fittings are kept within the tolerances specified in Clause 11.

11 Tolerances on thickness and diameter of fittings

The dimensions of the fittings shall be as specified in the appropriate table in Section 2 subject to the tolerances given below:

- a) *Thickness of body.* The wall thickness of the castings shall at no point be less than $87\frac{1}{2}$ per cent of the thickness given in the appropriate table.

- b) *Diameters and thicknesses of spigots and sockets.* The external diameters of the bodies of fittings for a distance of 6 inches from the spigot end, and the internal diameter of plain sockets of fittings, shall not depart from the dimensions specified in Section 2 by more than the appropriate amounts in Table 1.

12 Hydrostatic test

Before being coated, each fitting shall be hydrostatically tested by approved means at the foundry to the satisfaction of the purchaser or his representative.

- a) *Test procedure.* The hydrostatic pressure shall be steadily applied and maintained sufficiently long for adequate inspection, but in no case less than 15 seconds. The internal pressure imposed on the fitting shall be measured by an accurate pressure gauge and means shall be provided for attaching the gauge of the purchaser or his representative.

While under the test pressure, each fitting shall be smartly struck with a suitable hand hammer weighing approximately $1\frac{1}{2}$ lb. All testing shall be carried out under cover wherever possible.

- b) *Test requirements.* The fittings, except condensate receivers, shall withstand the hydrostatic test pressure at works shown in Table 2, without showing any leakage, sweating or other defects.

Table 1 — Tolerances on thickness and diameter of fittings

Dimension	Tolerance on specified dimensions
Diameter of body for a distance of 6 inches from the spigot end for fittings of nominal internal diameter:	
Up to and including 15 inches	± 0.13 in
Over 15 inches up to and including 48 inches	$+ 0.19$ in $- 0.13$ in
Internal diameter of socket for fittings of nominal internal diameter:	
Up to and including 15 inches	$+ 0.19$ in $- 0.13$ in
Over 15 inches up to and including 48 inches	$+ 0.25$ in $- 0.19$ in
Thickness dimensions specified in Table 3 and Table 4,	
Thickness of socket face <i>C</i> } Thickness of socket body <i>V</i> }	$- 12\frac{1}{2}$ per cent
Thickness of bead <i>P</i> = 0.19 in	± 0.04 in
Outside diameter of beaded spigot (<i>Y</i> + 2 <i>P</i>)	± 0.16 in
Internal diameter of socket <i>X</i>	± 0.13 in

Table 2 — Hydrostatic test pressures

Class	Hydrostatic test pressure at works		Maximum hydrostatic test pressure after installation	
	ft head	lbf/in ²	ft head	lbf/in ²
AB	500	217	400	173
CD	900	390	800	347

Condensate receivers, which are supplied for pipelines used in the transmission of gas, shall withstand a hydrostatic test pressure of 100 lbf/in² followed by an air test pressure of 60 lbf/in².

NOTE 1 The maximum hydrostatic test pressures for fittings with flanges shall not exceed those specified in BS 10, "*Flanges and bolting for pipes, valves and fittings*", for the relevant flange except where tested at works between fixed test ends.

NOTE 2 If spigot and socket hatchboxes are provided with flat covers (see Table 22), the hydrostatic test pressure imposed on these fittings shall not exceed 50 lbf/in².

13 Coating

Coating shall not be applied to any fitting unless its surfaces are clean, dry and free from rust.

Except when otherwise agreed between the purchaser and the manufacturer, all fittings shall be coated externally and internally with the same material, the fitting being pre-heated prior to total immersion in a bath containing a uniformly heated composition having a tar or other suitable base.

In the case of fittings (wholly or partially coated) which are imperfectly coated or where the coating does not set or conform to the quality specified, the coating shall be removed, and the fittings recoated.

The coating material shall set rapidly with good adherence and shall not scale off

In all instances where the coating material has a tar or similar base, it shall be smooth and tenacious and hard enough not to flow when exposed to a temperature of 62 °C¹⁾ (145 °F) but not so brittle at a temperature of 0 °C (32 °F) as to chip off when scribed lightly with a penknife.

The inside coating shall not contain any constituent soluble in water or any ingredient which could impart any taste or odour whatsoever to potable water after sterilization and suitable washing out of the mains, unless it is specifically stated that the pipes are not to be used for conveying potable water.

All machined faces shall be thoroughly cleaned of any coating and, before they have become affected by rust, shall be protected by an approved protective composition.

14 Weighing and marking weights

Each fitting of 6 inches nominal internal diameter and over shall be weighed, and its weight distinctly marked on it by stamping on the socket face or painting with durable paint; this painting shall be on the inside of the socket wherever practicable. Fittings under 6 inches nominal internal diameter may, unless otherwise specified, be weighed in batches of approximately 1 680 lb.

15 Tolerances on standard weights

The weights of the fittings shall be as specified in the appropriate table in Section 2 subject to the tolerances given below:

- a) Bends, angle branches, crosses, condensate receivers and hatchboxes: ± 10 per cent.
- b) All other fittings: ± 8 per cent.

16 Inspection

The purchaser or his representative shall have access at all reasonable times to those parts of the works engaged on the manufacture and testing of the fittings which he has ordered.

17 Manufacturer's certificate

The manufacturer shall, on request, supply to the purchaser a signed certificate stating, at the purchaser's option,

either a) that the fittings comply in all respects with the provisions of this specification,

or b) the results of all the specified test.

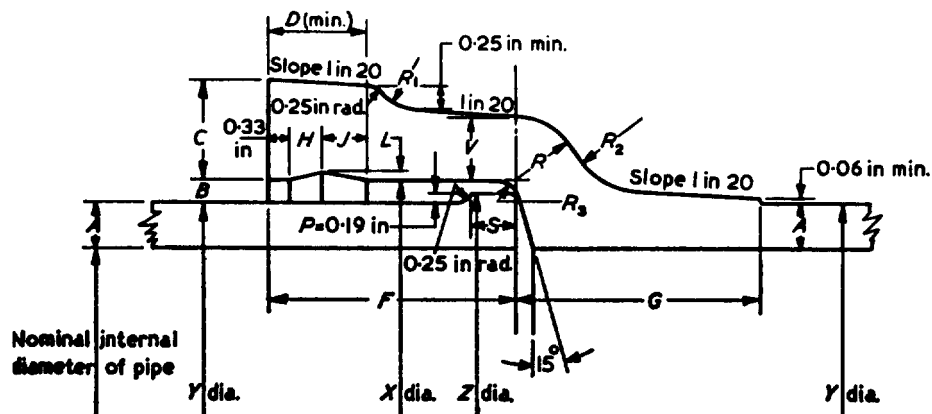
18 Testing facilities

The manufacturer shall supply, furnish and prepare the necessary test pieces, and supply the labour and appliances for such testing as may be carried out on his premises in accordance with this British Standard. If there are no facilities at his own works for making the prescribed tests the manufacturer shall arrange for the tests to be carried out elsewhere.

¹⁾ For fittings for use in, or transport through, a tropical country, a temperature of 77 °C (170 °F) shall apply.

Section 2. Specific requirements

Table 3 — Dimensions of spigots and sockets, class AB



Preferred sizes shown in bold type. All Dimensions are in inches.

Nominal internal diameter of fitting	3	4	5	6	7	8	9	10	12	14
A	0.38	0.39	0.41	0.43	0.45	0.47	0.49	0.52	0.57	0.61
B	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
C	1.12	1.16	1.20	1.23	1.28	1.31	1.36	1.39	1.47	1.55
D (min)	1.25	1.25	1.25	1.38	1.38	1.50	1.50	1.56	1.56	1.63
F & G	3.50	3.50	3.50	3.50	3.50	4.00	4.00	4.00	4.00	4.50
H	0.36	0.36	0.36	0.42	0.42	0.48	0.48	0.51	0.51	0.55
J	0.56	0.56	0.56	0.63	0.63	0.69	0.69	0.72	0.72	0.75
L	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
R_1	1.00	1.00	1.00	1.00	1.00	1.13	1.13	1.13	1.13	1.19
R_2	0.75	0.88	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.13
R_3	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.38
S	0.69	0.69	0.69	0.75	0.75	0.75	0.75	0.75	0.75	0.88
V & R	0.66	0.71	0.73	0.77	0.80	0.83	0.85	0.88	0.93	0.97
X dia.	4.52	5.56	6.66	7.74	8.82	9.90	10.96	12.02	13.90	15.98
Y dia.	3.76	4.80	5.90	6.98	8.06	9.14	10.20	11.26	13.14	15.22
Z dia.	4.14	5.18	6.28	7.36	8.44	9.52	10.58	11.64	13.52	15.60

Table 3 — Dimensions of spigots and sockets, class AB

NOTE 1 Fittings of 30 in to 48 in inclusive nominal internal diameter, in Classes AB and CD will have one common external diameter for each size, identical with the external diameter previously shown for Classes C and D in BS 78:1938.

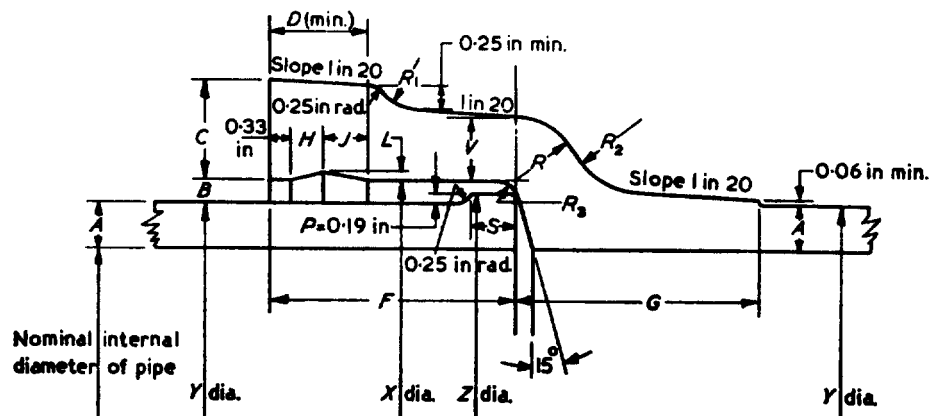
NOTE 2 For Class AB fittings, the following external diameter *Y* may be specified, although they are non-preferred, Diameters *X* and *Z* will consequently vary. The dimensions shown in Table 3A would then apply.

Table 3A

Nominal internal diameter of fitting	30	33	36	42	48
<i>X</i> dia.	32.66	35.76	38.84	45.00	51.14
<i>Y</i> dia.	31.78	34.88	37.96	44.12	50.26
<i>Z</i> dia.	32.16	35.26	38.34	44.50	50.64

15	16	18	20	21	24	27	30	33	36	42	48
0.63	0.65	0.69	0.73	0.75	0.80	0.85	0.89	0.94	0.98	1.06	1.13
0.38	0.38	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
1.59	1.62	1.70	1.78	1.82	1.94	2.06	2.14	2.24	2.33	2.53	2.71
1.75	1.75	1.88	2.00	2.00	2.13	2.25	2.38	2.38	2.50	2.63	2.75
4.50	4.50	4.50	4.50	4.50	5.00	5.00	5.00	5.00	5.00	5.00	5.00
0.61	0.61	0.67	0.73	0.73	0.80	0.86	0.92	0.92	0.98	1.05	1.11
0.81	0.81	0.88	0.94	0.94	1.00	1.06	1.13	1.13	1.19	1.25	1.31
0.13	0.13	0.13	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
1.19	1.19	1.19	1.25	1.25	1.25	1.38	1.38	1.38	1.50	1.50	1.63
1.13	1.13	1.13	1.25	1.25	1.25	1.38	1.38	1.38	1.50	1.50	1.63
0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
0.88	0.88	0.88	1.00	1.00	1.00	1.13	1.25	1.25	1.38	1.50	1.63
0.99	1.01	1.05	1.09	1.11	1.17	1.21	1.25	1.30	1.34	1.42	1.49
17.02	18.06	20.26	22.34	23.38	26.48	29.58	33.40	36.54	39.64	45.88	52.08
16.26	17.30	19.38	21.46	22.50	25.60	28.70	32.52	35.66	38.76	45.00	51.20
16.64	17.68	19.76	21.84	22.88	25.98	29.08	32.90	36.04	39.14	45.38	51.58

Table 4 — Dimensions of spigots and sockets, class CD



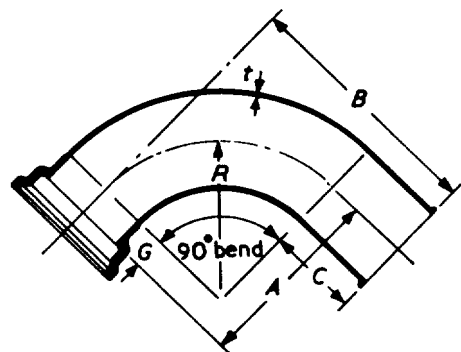
Preferred sizes shown in bold type. All Dimensions are in inches.

Nominal internal diameter of fitting	3	4	5	6	7	8	9	10	12	14
A	0.40	0.46	0.52	0.57	0.61	0.65	0.69	0.73	0.80	0.86
B	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
C	1.12	1.16	1.20	1.23	1.28	1.31	1.36	1.39	1.68	1.81
D (min)	1.25	1.25	1.25	1.38	1.38	1.50	1.50	1.56	1.56	1.63
F & G	3.50	3.50	3.50	3.50	3.50	4.00	4.00	4.00	4.00	4.50
H	0.36	0.36	0.36	0.42	0.42	0.48	0.48	0.51	0.51	0.55
J	0.56	0.56	0.56	0.63	0.63	0.69	0.69	0.72	0.72	0.75
L	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
R ₁	1.00	1.00	1.00	1.00	1.00	1.13	1.13	1.13	1.13	1.19
R ₂	0.75	0.88	0.88	0.88	0.88	1.00	1.00	1.00	1.38	1.38
R ₃	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.38
S	0.69	0.69	0.69	0.75	0.75	0.75	0.75	0.75	0.75	0.88
V & R	0.66	0.71	0.73	0.77	0.80	0.83	0.85	0.88	1.17	1.22
X dia.	4.52	5.56	6.66	7.74	8.82	9.90	10.96	12.02	14.36	16.48
Y dia.	3.76	4.80	5.90	6.98	8.06	9.14	10.20	11.26	13.60	15.72
Z dia.	4.14	5.18	6.28	7.36	8.44	9.52	10.58	11.64	13.98	16.10

Table 4 — Dimensions of spigots and sockets, class CD

15	16	18	20	21	24	27	30	33	36	42	48
0.89	0.92	0.98	1.03	1.06	1.13	1.20	1.26	1.33	1.38	1.50	1.60
0.38	0.38	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
1.85	1.91	2.00	2.08	2.13	2.29	2.41	2.51	2.64	2.74	2.97	3.19
1.75	1.75	1.88	2.00	2.00	2.13	2.25	2.38	2.38	2.50	2.63	2.75
4.50	4.50	4.50	4.50	4.50	5.00	5.00	5.00	5.00	5.00	5.00	5.00
0.61	0.61	0.67	0.73	0.73	0.80	0.86	0.92	0.92	0.98	1.05	1.11
0.81	0.81	0.88	0.94	0.94	1.00	1.06	1.13	1.13	1.19	1.25	1.31
0.13	0.13	0.13	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
1.19	1.19	1.19	1.25	1.25	1.25	1.38	1.38	1.38	1.50	1.50	1.63
1.38	1.38	1.38	1.63	1.63	1.63	1.63	1.75	1.75	1.75	2.00	2.00
0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
0.88	0.88	0.88	1.00	1.00	1.00	1.13	1.25	1.25	1.38	1.50	1.63
1.25	1.28	1.34	1.39	1.42	1.49	1.57	1.62	1.69	1.74	1.86	1.97
17.54	18.60	20.84	22.94	24.00	27.14	30.28	33.40	36.54	39.64	45.88	52.08
16.78	17.84	19.96	22.06	23.12	26.26	29.40	32.52	35.66	38.76	45.00	51.20
17.16	18.22	20.34	22.44	23.50	26.64	29.78	32.90	36.04	39.14	45.38	51.58

Table 5 — Dimensions and weights of 90° bends



NOTE 1 Fittings 30 in to 48 in inclusive nominal internal diameter, in Classes AB and CD, will have one common external diameter for each size, identical with the external diameter previously shown for Classes C and D in BS 78:1938.

NOTE 2 For Class AB fittings within this range, external diameters previously shown for Classes A and B in BS 78:1938 may be specified although they are non-preferred. The weights given in Table 5A would then apply.

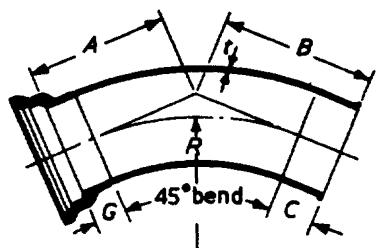
Table 5A

Nominal internal diameter	Weight
in	lb
30	2 032
33	2 476
36	2 812
42	3 705
48	4 726

Preferred sizes shown in bold type.

Nominal internal diameter	A	B	C	G	R	Thickness <i>t</i>		Weight	
						Class AB	Class CD	Class AB	Class CD
in	in	in	in	in	in	in	in	lb	lb
3	12½	15	6	3½	9	0.38	0.40	42	43
4	15½	18	6	3½	12	0.39	0.46	62	68
5	15½	18	6	3½	12	0.41	0.52	78	90
6	18½	21	6	3½	15	0.43	0.57	106	128
7	18½	22	7	3½	15	0.45	0.61	131	162
8	22	26	8	4	18	0.47	0.65	182	228
9	22	27	9	4	18	0.49	0.69	214	273
10	25	31	10	4	21	0.52	0.73	273	352
12	25	33	12	4	21	0.57	0.80	359	499
14	25½	33	12	4½	21	0.61	0.86	457	638
15	28½	36	12	4½	24	0.63	0.89	540	756
16	28½	36	12	4½	24	0.65	0.92	593	831
18	28½	36	12	4½	24	0.69	0.98	702	991
20	31½	39	12	4½	27	0.73	1.03	876	1 231
21	34½	42	12	4½	30	0.75	1.06	1 004	1 415
24	41	48	12	5	36	0.80	1.13	1 396	1 962
27	44	51	12	5	39	0.85	1.20	1 748	2 466
30	44	51	12	5	39	0.89	1.26	2 080	2 864
33	47	54	12	5	42	0.94	1.33	2 531	3 491
36	47	54	12	5	42	0.98	1.38	2 870	3 944
42	50	57	12	5	45	1.06	1.50	3 791	5 230
48	53	60	12	5	48	1.13	1.60	4 818	6 673

Table 6 — Dimensions and weights of 45° bends



NOTE 1 Fittings 30 in to 48 in inclusive nominal internal diameter, in Classes AB and CD, will have one common external diameter for each size, identical with the external diameter previously shown for Classes C and D in BS 78:1938.

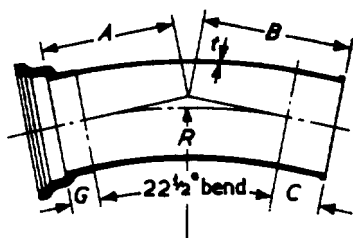
NOTE 2 For Class AB fittings within this range, external diameters previously shown for Classes A and B in BS 78:1938 may be specified although they are non-preferred. The weights given in Table 6A would then apply.

Table 6A

Nominal internal diameter	Weight
in	lb
30	1 627
33	2 039
36	2 315
42	3 133
48	4 062

Preferred sizes shown in bold type.

Nominal internal diameter	A	B	C	G	R	Thickness t		Weight	
						Class AB	Class CD	Class AB	Class CD
in	in	in	in	in	in	in	in	lb	lb
3	13 $\frac{1}{2}$	16 $\frac{1}{8}$	6 $\frac{1}{8}$	3 $\frac{1}{2}$	24	0.38	0.40	47	48
4	13 $\frac{1}{2}$	16 $\frac{1}{8}$	6 $\frac{1}{8}$	3 $\frac{1}{2}$	24	0.39	0.46	62	68
5	14 $\frac{3}{4}$	17 $\frac{5}{8}$	6 $\frac{3}{8}$	3 $\frac{1}{2}$	27	0.41	0.52	83	96
6	14 $\frac{3}{4}$	17 $\frac{5}{8}$	6 $\frac{3}{8}$	3 $\frac{1}{2}$	27	0.43	0.57	102	123
7	16	18 $\frac{1}{2}$	6	3 $\frac{1}{2}$	30	0.45	0.61	129	158
8	16 $\frac{1}{2}$	19	6 $\frac{1}{2}$	4	30	0.47	0.65	161	201
9	17 $\frac{3}{4}$	19 $\frac{7}{8}$	6 $\frac{1}{8}$	4	33	0.49	0.69	194	245
10	17 $\frac{3}{4}$	19 $\frac{7}{8}$	6 $\frac{1}{8}$	4	33	0.52	0.73	224	284
12	19	21 $\frac{5}{8}$	6 $\frac{3}{4}$	4	36	0.57	0.80	302	418
14	20 $\frac{3}{4}$	23 $\frac{1}{8}$	6 $\frac{7}{8}$	4 $\frac{1}{2}$	39	0.61	0.86	403	560
15	22	24	6 $\frac{1}{2}$	4 $\frac{1}{2}$	42	0.63	0.89	459	640
16	22	24	6 $\frac{1}{2}$	4 $\frac{1}{2}$	42	0.65	0.92	504	703
18	23 $\frac{1}{4}$	24 $\frac{7}{8}$	6 $\frac{1}{8}$	4 $\frac{1}{2}$	45	0.69	0.98	617	868
20	24 $\frac{3}{8}$	26 $\frac{3}{4}$	6 $\frac{7}{8}$	4 $\frac{1}{2}$	48	0.73	1.03	756	1 060
21	25 $\frac{5}{8}$	27 $\frac{5}{8}$	6 $\frac{1}{2}$	4 $\frac{1}{2}$	51	0.75	1.06	840	1 180
24	27 $\frac{3}{8}$	29	6 $\frac{5}{8}$	5	54	0.80	1.13	1 086	1 518
27	29 $\frac{7}{8}$	32 $\frac{5}{8}$	7 $\frac{3}{4}$	5	60	0.85	1.20	1 400	1 967
30	29 $\frac{7}{8}$	32 $\frac{5}{8}$	7 $\frac{3}{4}$	5	60	0.89	1.26	1 666	2 284
33	33 $\frac{5}{8}$	35 $\frac{3}{8}$	6 $\frac{3}{4}$	5	69	0.94	1.33	2 086	2 868
36	33 $\frac{5}{8}$	35 $\frac{3}{8}$	6 $\frac{3}{4}$	5	69	0.98	1.38	2 366	3 240
42	37 $\frac{3}{8}$	38 $\frac{1}{8}$	5 $\frac{3}{4}$	5	78	1.06	1.50	3 207	4 410
48	39 $\frac{7}{8}$	41 $\frac{3}{8}$	6 $\frac{1}{2}$	5	84	1.13	1.60	4 143	5 724

Table 7 — Dimensions and weights of $22\frac{1}{2}^\circ$ bends

NOTE 1 Fittings 30 in to 48 in inclusive nominal internal diameter, in Classes AB and CD, will have one common external diameter for each size, identical with the external diameter previously shown for Classes C and D in BS 78:1938.

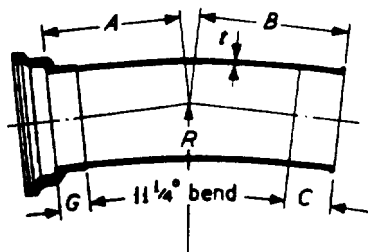
NOTE 2 For Class AB fittings within this range, external diameters previously shown for Class A and B in BS 78:1938 may be specified although they are non-preferred. The weights given in Table 7A would then apply.

Table 7A

Nominal internal diameter	Weight
in	lb
30	1 627
33	2 039
36	2 315
42	3 133
48	4 062

Preferred sizes shown in bold type.

Nominal internal diameter	A	B	C	G	R	Thickness <i>t</i>		Weight	
						Class AB	Class CD	Class AB	Class CD
in	in	in	in	in	in	in	in	lb	lb
3	$13\frac{1}{8}$	$15\frac{3}{4}$	$6\frac{1}{8}$	$3\frac{1}{2}$	48	0.38	0.40	47	48
4	$13\frac{1}{8}$	$15\frac{3}{4}$	$6\frac{1}{8}$	$3\frac{1}{2}$	48	0.39	0.46	62	68
5	$14\frac{1}{4}$	$17\frac{1}{8}$	$6\frac{3}{8}$	$3\frac{1}{2}$	54	0.41	0.52	83	96
6	$14\frac{1}{4}$	$17\frac{1}{8}$	$6\frac{3}{8}$	$3\frac{1}{2}$	54	0.43	0.57	106	123
7	$15\frac{1}{2}$	18	6	$3\frac{1}{2}$	60	0.45	0.61	129	158
8	16	$18\frac{1}{2}$	$6\frac{1}{2}$	4	60	0.47	0.65	161	201
9	$17\frac{1}{4}$	$19\frac{3}{8}$	$6\frac{1}{8}$	4	66	0.49	0.69	194	245
10	$17\frac{1}{4}$	$19\frac{3}{8}$	$6\frac{1}{8}$	4	66	0.52	0.73	224	284
12	$18\frac{3}{8}$	21	$6\frac{3}{4}$	4	72	0.57	0.80	302	418
14	$20\frac{1}{8}$	$22\frac{1}{2}$	$6\frac{7}{8}$	$4\frac{1}{2}$	78	0.61	0.86	403	560
15	$21\frac{3}{8}$	$23\frac{3}{8}$	$6\frac{1}{2}$	$4\frac{1}{2}$	84	0.63	0.89	459	640
16	$21\frac{3}{8}$	$23\frac{3}{8}$	$6\frac{1}{2}$	$4\frac{1}{2}$	84	0.65	0.92	504	703
18	$22\frac{1}{2}$	$24\frac{1}{8}$	$6\frac{1}{8}$	$4\frac{1}{2}$	90	0.69	0.98	617	868
20	$23\frac{5}{8}$	26	$6\frac{7}{8}$	$4\frac{1}{2}$	96	0.73	1.03	756	1 060
21	$24\frac{7}{8}$	$26\frac{7}{8}$	$6\frac{1}{2}$	$4\frac{1}{2}$	102	0.75	1.06	840	1 180
24	$26\frac{1}{2}$	$28\frac{1}{8}$	$6\frac{5}{8}$	5	108	0.80	1.13	1 086	1 518
27	$28\frac{7}{8}$	$31\frac{5}{8}$	$7\frac{3}{4}$	5	120	0.85	1.20	1 400	1 967
30	$28\frac{7}{8}$	$31\frac{5}{8}$	$7\frac{3}{4}$	5	120	0.89	1.26	1 666	2 234
33	$32\frac{1}{2}$	$34\frac{1}{4}$	$6\frac{3}{4}$	5	138	0.94	1.33	2 086	2 868
36	$32\frac{1}{2}$	$34\frac{1}{4}$	$6\frac{3}{4}$	5	138	0.98	1.38	2 366	3 240
42	$36\frac{1}{8}$	$36\frac{7}{8}$	$5\frac{3}{4}$	5	156	1.06	1.50	3 207	4 410
48	$38\frac{1}{2}$	40	$6\frac{1}{2}$	5	168	1.13	1.60	4 143	5 724

Table 8 — Dimensions and weights of $11\frac{1}{4}^\circ$ bends

NOTE 1 Fittings of 30 in to 48 in inclusive nominal internal diameter, in Classes AB and CD, will have one common external diameter for each size, identical with the external diameter previously shown for Classes C and D in BS 78:1938.

NOTE 2 For Class AB fittings within this range, external diameters previously shown for Classes A and B in BS 78:1938 may be specified although they are non-preferred. The weights given in Table 8A would then apply.

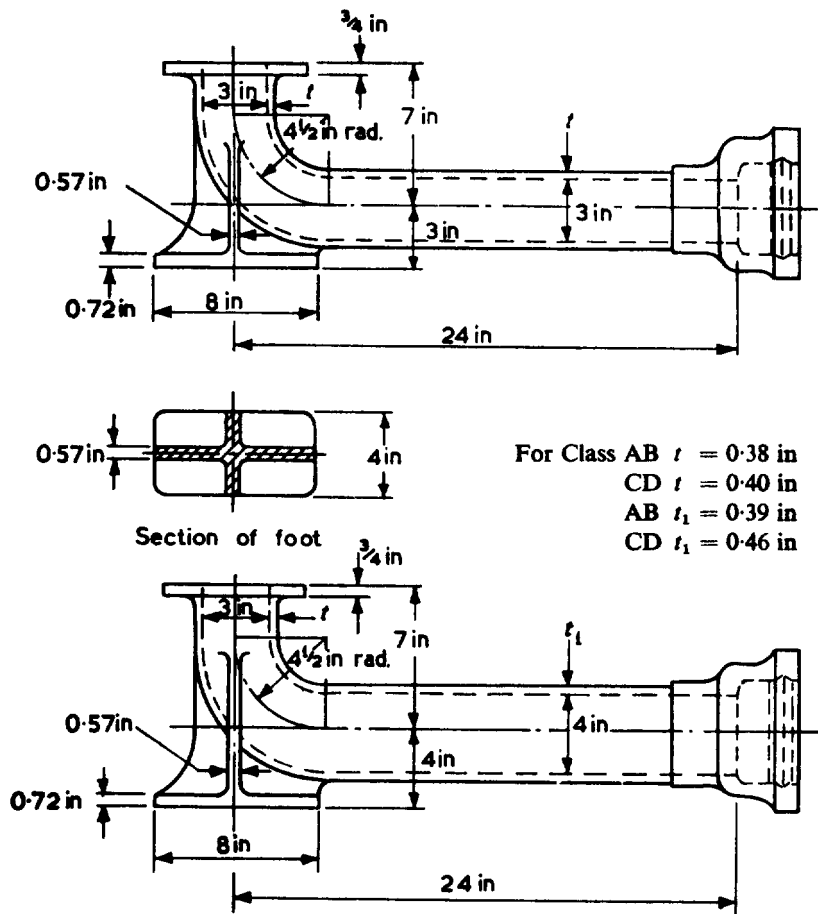
Table 8A

Nominal internal diameter	Weight
in	lb
30	1 627
33	2 039
36	2 315
42	3 133
48	4 062

Preferred sizes shown in bold type.

Nominal internal diameter	A	B	C	G	R	Thickness <i>t</i>		Weight	
						Class AB	Class CD	Class AB	Class CD
in	in	in	in	in	in	in	in	lb	lb
3	13	15 ⁵ / ₈	6 ¹ / ₈	3 ¹ / ₂	96	0.38	0.40	47	48
4	13	15 ⁵ / ₈	6 ¹ / ₈	3 ¹ / ₂	96	0.39	0.46	62	68
5	14 ¹ / ₈	17	6 ³ / ₈	3 ¹ / ₂	108	0.41	0.52	83	96
6	14 ¹ / ₈	17	6 ³ / ₈	3 ¹ / ₂	108	0.43	0.57	106	123
7	15 ³ / ₈	17 ⁷ / ₈	6	3 ¹ / ₂	120	0.45	0.61	129	158
8	15 ⁷ / ₈	18 ³ / ₈	6 ¹ / ₂	4	120	0.47	0.65	161	201
9	17	19 ¹ / ₈	6 ¹ / ₈	4	132	0.49	0.69	194	245
10	17	19 ¹ / ₈	6 ¹ / ₈	4	132	0.52	0.73	224	284
12	18 ¹ / ₄	20 ⁷ / ₈	6 ³ / ₄	4	144	0.57	0.80	302	418
14	19 ⁷ / ₈	22 ¹ / ₄	6 ⁷ / ₈	4 ¹ / ₂	156	0.61	0.86	403	560
15	21 ¹ / ₈	23 ¹ / ₈	6 ¹ / ₂	4 ¹ / ₂	168	0.63	0.89	459	640
16	21 ¹ / ₈	23 ¹ / ₈	6 ¹ / ₂	4 ¹ / ₂	168	0.65	0.92	504	703
18	22 ¹ / ₄	23 ⁷ / ₈	6 ¹ / ₈	4 ¹ / ₂	180	0.69	0.98	617	868
20	23 ¹ / ₂	25 ⁷ / ₈	6 ⁷ / ₈	4 ¹ / ₂	192	0.73	1.03	756	1 060
21	24 ⁵ / ₈	26 ⁵ / ₈	6 ¹ / ₂	4 ¹ / ₂	204	0.75	1.06	840	1 180
24	26 ³ / ₈	28	6 ⁵ / ₈	5	216	0.80	1.13	1 086	1 518
27	28 ³ / ₄	31 ¹ / ₂	7 ³ / ₄	5	240	0.85	1.20	1 400	1 967
30	28 ³ / ₄	31 ¹ / ₂	7 ³ / ₄	5	240	0.89	1.26	1 666	2 284
33	32 ¹ / ₄	34	6 ³ / ₄	5	276	0.94	1.33	2 086	2 868
36	32 ¹ / ₄	34	6 ³ / ₄	5	276	0.98	1.38	2 366	3 240
42	35 ³ / ₄	36 ¹ / ₂	5 ³ / ₄	5	312	1.06	1.50	3 207	4 410
48	38 ¹ / ₈	39 ⁵ / ₈	6 ¹ / ₂	5	336	1.13	1.60	4 143	5 724

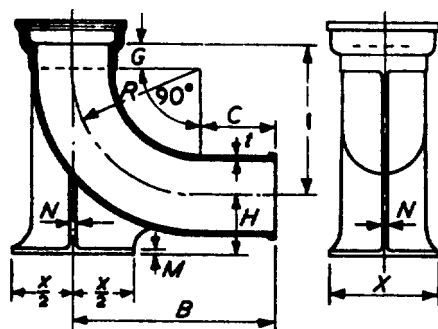
Table 9 — Dimensions and weights of 3 in and 4 in hydrant bends



Unless otherwise specified, hydrant bends will be supplied with flanges $7\frac{1}{4}$ in diameter having four $\frac{3}{4}$ in diameter holes drilled on a $5\frac{3}{4}$ in diameter pitch circle off centres (Tables D and E of BS 10).

Class	Nominal internal diameter	Weight
	in	lb
AB	3	62
AB	4	76
CD	3	63
CD	4	80

Table 10 — Dimensions and weights of duckfoot bends



Preferred sizes shown in bold type.

Nominal internal diameter	A	B	C	G	R	H	X
in	in	in	in	in	in	in	in
3	12 ¹ / ₂	15	6	3 ¹ / ₂	9	4 ¹ / ₂	7 ¹ / ₂
4	15 ¹ / ₂	18	6	3 ¹ / ₂	12	5 ¹ / ₄	8 ¹ / ₂
5	15 ¹ / ₂	18	6	3 ¹ / ₂	12	6	10
6	18 ¹ / ₂	21	6	3 ¹ / ₂	15	6 ¹ / ₂	11
7	18 ¹ / ₂	22	7	3 ¹ / ₂	15	7	12
8	22	26	8	4	18	7 ³ / ₄	13 ¹ / ₂
9	22	27	9	4	18	8 ¹ / ₄	14 ¹ / ₂
10	25	31	10	4	21	9	16
12	25	33	12	4	21	10 ¹ / ₄	18
14	25 ¹ / ₂	33	12	4 ¹ / ₂	21	11 ³ / ₄	21
15	28 ¹ / ₂	36	12	4 ¹ / ₂	24	12 ¹ / ₄	22
16	28 ¹ / ₂	36	12	4 ¹ / ₂	24	12 ³ / ₄	23
18	28 ¹ / ₂	36	12	4 ¹ / ₂	24	14	25 ¹ / ₂
20	31 ¹ / ₂	39	12	4 ¹ / ₂	27	15 ¹ / ₂	28
21	34 ¹ / ₂	42	12	4 ¹ / ₂	30	16	29
24	41	48	12	5	36	18	32 ¹ / ₂
27	44	51	12	5	39	19 ³ / ₄	36
30	44	51	12	5	39	21 ¹ / ₂	39 ¹ / ₂
33	47	54	12	5	42	23 ¹ / ₂	43
36	47	54	12	5	42	25 ¹ / ₄	46 ¹ / ₂
42	50	57	12	5	45	28 ¹ / ₂	52 ¹ / ₂
48	53	60	12	5	48	31 ³ / ₄	59

Table 10 — Dimensions and weights of duckfoot bends

NOTE 1 Fittings of 30 in to 48 in inclusive nominal internal diameter in Classes AB and CD, will have one common external diameter for each size, identical with the external diameter previously shown for Classes C and D in BS 78:1938.

NOTE 2 For Class AB fittings within this range, external diameters previously shown for Classes A and B in BS 78:1938 may be specified although they are non-preferred. The weights given in Table 10A would then apply.

Table 10A

Nominal internal diameter	A	B	C	G	R	H	X	t	M	N	Weight
in	in	in	in	in	in	in	in	in	in	in	lb
30	44	51	12	5	39	21 $\frac{1}{2}$	39 $\frac{1}{2}$	0.89	1.44	1.06	3 032
33	47	54	12	5	42	23 $\frac{1}{3}$	43	0.94	1.50	1.12	3 719
36	47	54	12	5	42	25 $\frac{1}{4}$	46 $\frac{1}{2}$	0.98	1.56	1.19	4 310
42	50	57	12	5	45	28 $\frac{1}{2}$	52 $\frac{1}{2}$	1.06	1.62	1.25	5 621
48	53	60	12	5	48	31 $\frac{3}{4}$	59	1.13	1.75	1.31	7 268

Class AB				Class CD				Nominal internal diameter
t	M	N	Weight	t	M	N	Weight	
in	in	in	lb	in	in	in	lb	in
0.38	0.75	0.56	61	0.40	0.75	0.56	62	3
0.39	0.81	0.62	93	0.46	0.81	0.62	99	4
0.41	0.88	0.62	122	0.52	0.88	0.62	134	5
0.43	0.88	0.69	162	0.57	0.88	0.69	184	6
0.45	0.94	0.75	206	0.61	0.94	0.75	237	7
0.47	1.00	0.75	275	0.65	1.00	0.75	321	8
0.49	1.00	0.75	324	0.69	1.00	0.75	383	9
0.52	1.06	0.81	411	0.73	1.06	0.88	490	10
0.57	1.06	0.81	523	0.80	1.25	1.00	699	12
0.61	1.06	0.81	670	0.86	1.31	1.06	915	14
0.63	1.06	0.81	782	0.89	1.38	1.12	1 076	15
0.65	1.06	0.81	854	0.92	1.38	1.12	1 174	16
0.59	1.12	0.87	1 027	0.98	1.44	1.19	1 414	18
0.73	1.12	0.87	1 276	1.03	1.50	1.25	1 774	20
0.75	1.25	0.94	1 485	1.06	1.50	1.25	2 013	21
0.80	1.31	1.00	2 058	1.13	1.62	1.31	2 300	24
0.85	1.44	1.06	2 615	1.20	1.69	1.38	3 519	27
0.89	1.44	1.06	3 089	1.26	1.81	1.44	4 159	30
0.94	1.50	1.12	3 785	1.33	1.94	1.50	5 093	33
0.98	1.56	1.19	4 380	1.38	2.00	1.56	5 856	36
1.06	1.62	1.25	5 721	1.50	2.19	1.69	7 792	42
1.13	1.75	1.31	7 378	1.60	2.38	1.81	10 097	48