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UDC 621.643.22 : 669.13-462 : 691.713-462

Specification for

**Cast iron spigot and socket soil,
waste and ventilating pipes
(sand cast and spun) and fittings**

British Standards Institution

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Committee reference HIB/3

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- | | |
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- | | |
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| British Cast Iron Research Association | Institution of Public Health Engineers |
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Foreword

This is a metric edition of the 1967 revision of this standard, which it now supersedes. It is issued under the authority of the Hardware and Ironmongery Standards Committee and, as part of BSI's programme of metrication, the values in this standard are expressed in metric terms. Nominal bores are in accordance with the recommendations prepared under Technical Committee B/94, Modular Co-ordination in Building, for the metrication of pipe diameters.

For further information on the values given in SI units, reference should be made to BS 3763, 'The International System of units (SI)'.

The metric diameters given in this standard fall within the limits of tolerance given in the 1967 standard. These limits have been retained herein, expressed in whole millimetres. For the purposes of replacement, the pipes and fittings are thus interchangeable with those manufactured to the 1967 standard.

The 1967 revision was undertaken in order to simplify further the relationship between spun and sand cast pipes. This involved changes in the dimensional tables and the incorporation of an optional pressure test.

As hitherto, the pipes and fittings covered in this standard are intended for use above ground. For cast iron pipes and fittings suitable for use underground, reference should be made to BS 78*, BS 437†, BS 1130‡ and BS 1211§.

This standard covers pipes and fittings of one grade only, the 'heavy' and 'extra heavy' grades having been deleted. The option of omitting certain features, such as the spigot bead, and one socket bead on either sand cast or spun pipes, still remains (Types A and B sockets).

Dimensions given in the tables are such that the pipes covered in the standard, manufactured by either process, are interchangeable and can be used with the fittings included. Double socket lengths of pipe have been included and these comply with requirements and tests laid down for the corresponding spigot and socket pipes.

In order to rationalize production and stocking, the range of angles for bends and branches was reduced in the 1967 edition to five (namely $92\frac{1}{2}^\circ$, 104° , $112\frac{1}{2}^\circ$, 135° and $157\frac{1}{2}^\circ$).

* BS 78 Cast iron spigot and socket pipes (vertically cast) and spigot and socket fittings

† BS 437 Cast iron spigot and socket drain pipes and fittings

‡ BS 1130 Schedule of cast iron drain fittings, spigot and socket type, for use with drain pipes to BS 437

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

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British Standard Specification for

Cast iron spigot and socket soil, waste and ventilating pipes (sand cast and spun) and fittings

1. Scope

This British Standard specifies requirements for cast iron pipes, manufactured by the sand cast or spun process, with either Type A or Type B sockets, together with requirements for sand cast fittings. These pipes and fittings are designed for use above ground for soil, waste and ventilating purposes in all types of building.

The pipes and fittings covered by the standard are illustrated and dimensioned in Tables 1 to 30. The full range of fittings is available with Type A sockets but only a limited range is available with Type B sockets in 75 mm, 90 mm and 100 mm nominal bores.

Where pipes and fittings are ordered and supplied with some form of flexible joint, the requirements of this standard apply only to the body.

NOTE 1. These pipes may be used as rainwater pipes when a heavier grade of pipe than that specified in BS 460 is required.

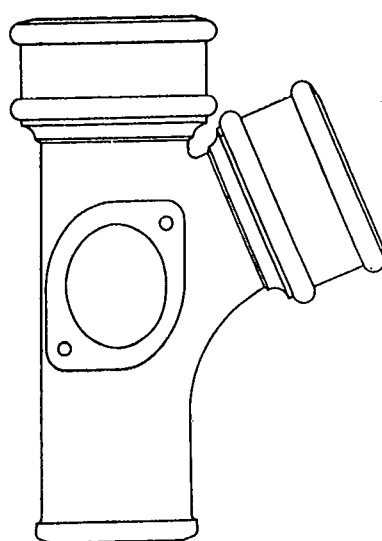
NOTE 2. The titles of the British Standards referred to in this standard are listed on the inside back cover.

2. Definitions

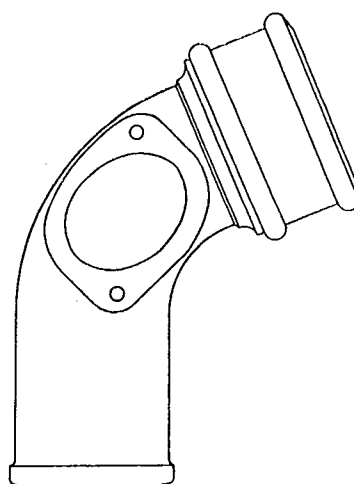
For the purposes of this British Standard, the following definitions apply:

(1) *Right hand fitting.* A bend or branch which is so constructed that, when it is viewed with the spigot downwards and with the access door facing the observer, the socket of the bend or the arm of the branch projects to the right (see Fig. 1)

(2) *Left hand fitting.* A bend or branch which is so constructed that, when it is viewed as described in 2(1), the socket or the arm projects to the left.



Right hand branch



Right hand bend

Fig. 1. Right hand fittings

3. Quality of material

The metal used for the manufacture of cast iron soil, waste and ventilating pipes and fittings, shall be suitable for the method of manufacture, and shall be of a quality not less than that specified in BS 1452, for Grade 10.

Screws, bolts and washers for access fittings shall comply with the requirements specified in Tables 14 and 15.

4. Freedom from defects

Castings shall be sound and free from defects which render them unsuitable for their purpose.

Every pipe and fitting shall ring clearly when tested for soundness by being struck with a light hammer.

5. Dimensions, weights and tolerances

5.1 Straight pipes shall comply with dimensions shown in Table 1. They shall have an overall length of 1800 mm or such shorter lengths as may be specified, and shall be subject to the following permissible deviations.

Weight:	— 10 %
Thickness:	— 1.0 mm
Length:	± 13 mm

5.2 Fittings and their sockets and spigots shall conform to the thickness and other dimensions specified for the corresponding parts of straight pipes and the appropriate detailed dimensions in Tables 2 to 30, subject to the following permissible deviations.

Thickness:	— 1.0 mm
Length:	± 3.0 mm

6. Ears

Pipes and fittings may be supplied with or without ears as ordered by the purchaser.

If ears are required they shall be supplied as follows:

- (1) With sand cast pipes: cast during the manufacture of the pipe
- (2) With spun pipes: as loose bands, or rigidly attached to the socket of the pipe, or cast integrally with the pipe during the spinning operation.

If projecting ears are required they shall comply with the dimensions given in Table 1 and have the following projections.

For pipes up to 75 mm nominal bore: 32 mm (from back of ear to back of pipe)

For pipes over 75 mm nominal bore: 38 mm (from back of ear to back of pipe)

7. Hydrostatic testing

7.1 Pipes and fittings shall be capable of withstanding a hydrostatic pressure of 0.07 N/mm² without showing any signs of leakage.

7.2 If required by the purchaser, at his extra cost, each pipe and fitting shall be tested hydrostatically as described below at the manufacturer's works and shall withstand a pressure of 0.105 N/mm² without showing any sign of leakage.

The pressure shall be applied internally and shall be steadily maintained for not less than 15 seconds and for as much longer as may be required for proper proof and inspection, up to a maximum of 1 minute.

The test shall be carried out after any internal or external coating, as defined in Clause 9, is applied and all pipes and fittings satisfactorily passing the test shall be marked 'T' in accordance with the requirements of 11.3.

8. Finish

Normally pipes and fittings, unless specially ordered, shall be supplied coated, as specified in Clause 9.

If a chemical resistant lining is specified, the lining shall be carried at least over the shoulder of the inside of the socket.

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9. Coating

Pipes and fittings shall be thoroughly cleaned and then hot or cold coated by one of the following methods.

(1) Dipping in a bath containing a composition having a tar basis and maintained at a suitable temperature, the preparation of the ingredients of the composition being regulated so as to produce a coating of the quality described below. Pipes and fittings on removal from the bath shall be properly drained.

(2) Dipping in a bath containing a cold solution consisting of a mixture of natural bitumens with a suitable hardener and natural asphalt to give an elastic coat when applied, in solution, in shale naphtha. The melting point of the mixture shall be approximately 93 °C and the solution shall contain approximately 45 % naphtha and 55 % bitumen. Pipes and fittings shall be thoroughly dry before coating.

The coating by either method shall be smooth and tenacious, sufficiently hard not to flow when exposed to a temperature of 63 °C and not so brittle at a temperature of 0 °C that it chips off when scribed lightly with the point of a penknife.

Any pipe or fitting which is imperfectly coated by either method, or the coating of which does not set or conform to the quality herein specified, shall be recoated.

NOTE. If coated pipes or fittings are to be painted after installation, a suitable barrier coat should be applied by the purchaser.

10. Inspection

The representative of the purchaser shall have access to the works of the manufacturer at all reasonable times; he shall be at liberty to inspect the manufacture at any stage and to reject any material, finished pipe or fitting that does not conform to the terms of this specification.

The manufacturer shall, at his own cost, supply labour and appliances for such inspection as may be carried out on his premises, except hydrostatic testing as specified in 7.2.

Should the metal used in the manufacture of pipes and fittings included in this British Standard not comply with the requirements laid down, or should any of the products not conform to the dimensions or other requirements, the product or products so failing shall be deemed not to comply with this British Standard and any marking indicating compliance shall be obliterated.

11. Marking

11.1 Every cast pipe or fitting shall, where practicable, have cast upon it in a legible manner a figure indicating the nominal bore, together with the manufacturer's name or trade mark, and the number of this British Standard, e.g.

100

Manufacturer's name or trade mark

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11.2 Every spun pipe shall be marked as required in 11.1 above, except that the letter 'S' shall be added to the designation.

Pipes manufactured by the spinning process shall be deemed to comply with the marking requirements if the particulars required in this clause are legibly marked on each pipe instead of being cast on.

11.3 When pipes and fittings have been subject to the hydraulic test specified in 7.2 and have satisfactorily passed that test they shall also be stencilled with the letter 'T'.

NOTE. Attention is drawn to the certification facilities offered by BSI; see the inside back cover of this standard.

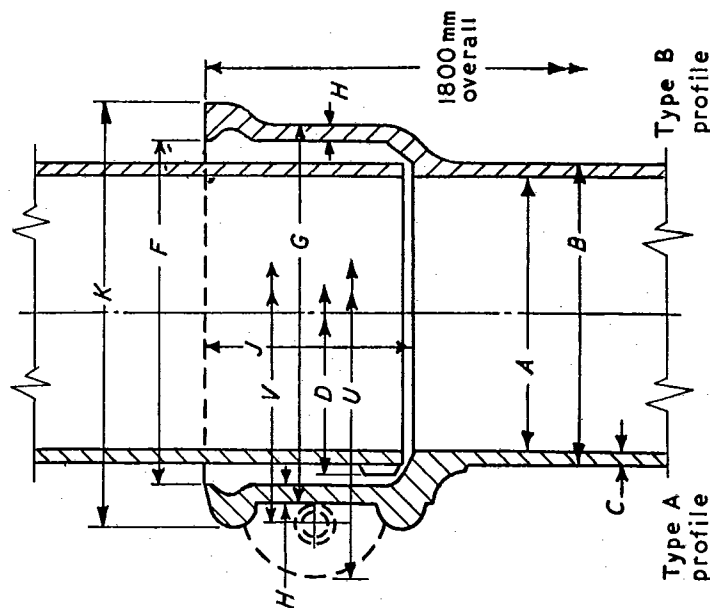
Table 1. Straight pipes, sockets (Types A and B) and spigots

All dimensions in mm.

Dimensions		Nominal bore							
		50	65	75	90	100	125	150	
Pipe	Internal diameter, min.	50	65	75	90	100	125	150	
	Outside diameter, max.	A	48	63	74	88	99	126	
	Thickness	C	5	5	5	5	5	5	
	Diameter over spigot bead*, max.	D	70	84	97	109	122	149	
	Internal diameter, min.	F	73	87	100	114	127	156	
Socket	Outside diameter, max.	G	89	103	116	130	143	172	
	Thickness	H	6.5	6.5	6.5	6.5	6.5	6.5	
	Internal depth, nominal	J	64	70	70	76	76	83	
	Outside diameter over beads, min.	K	100	114	129	145	157	186	
	Nom. weight of 1800 mm pipe, no ears (kg)		11.3	14.1	16.8	19.1	21.8	26.8	
Ears*	Length of flange, nominal	U	146	162	178	194	213	241	
	Centre to centre of holes	V	114	130	146	162	181	210	
	Caulking clearance, min		5	5.5	5.5	6.5	6.5	8	

NOTE. Double socket pipes in 1800 mm length overall, complying with the above dimensions can be supplied on demand.

* Optional



Optional features:
 (1) Alternative socket profile
 (2) Spigot bead
 (3) Ears

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Table 2. Short radius bends with or without access doors

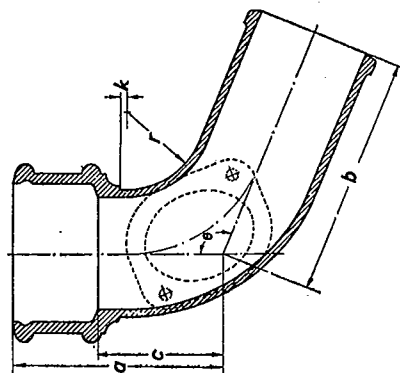
All dimensions in mm.

Dimensions		Nominal bore						
		50	65	75	90	100	125	150
$\theta = 92\frac{1}{2}^\circ$	<i>a</i>	152	165	175	186	194	214	232
	<i>b</i>	140	156	162	178	181	208	206
	<i>c</i>	89	95	105	110	118	127	143
	<i>k</i>	8	8	9.5	6.5	9.5	6.5	9.5
	<i>r</i>	38	38	38	38	38	38	38
$\theta = 104^\circ$	<i>a</i>				170	175		
	<i>b</i>				178	181		
	<i>c</i>	—	—	—	94	98	—	—
	<i>k</i>				6.5	6.5		
	<i>r</i>				38	38		
$\theta = 112\frac{1}{2}^\circ$	<i>a</i>	133	143	149	181	187	216	218
	<i>b</i>	143	159	168	165	168	187	200
	<i>c</i>	70	73	79	105	111	140	129
	<i>k</i>	8	8	8	6.5	9.5	6.5	9.5
	<i>r</i>	38	38	38	70	70	70	70
$\theta = 135^\circ$	<i>a</i>	127	137	143	171	178	189	198
	<i>b</i>	143	159	162	162	165	187	194
	<i>c</i>	64	67	73	95	102	106	110
	<i>k</i>	6.5	8	8	6.5	9.5	6.5	8
	<i>r</i>	70	70	70	121	121	121	121
$\theta = 157\frac{1}{2}^\circ$	<i>a</i>	137	149	156	167	168	178	192
	<i>b</i>	129	140	146	152	159	187	184
	<i>c</i>	73	79	86	91	92	95	103
	<i>k</i>	6.5	6.5	6.5	6.5	6.5	6.5	6.5
	<i>r</i>	227	248	262	275	286	171	319

NOTE 1. For details of oval access doors, see Table 14. Bends may be supplied with doors R.H., L.H., or on the heel. The centre of an access door, when fitted, should be approximately symmetrical with the centre line of the fitting.

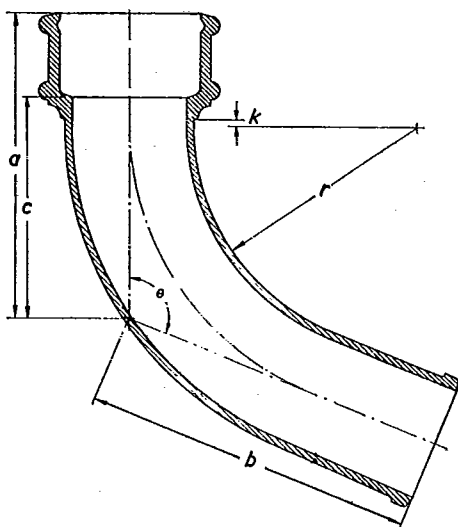
NOTE 2. Bends in other degrees (for example 95° , 100° and 120°) may be supplied on demand. Such bends shall not be considered 'non-standard' if they comply with the relevant requirements.

NOTE 3. Spigots and sockets of short radius bends to be the same as for straight pipes of corresponding nominal bores.



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Table 3. Large radius bends



All dimensions in mm.

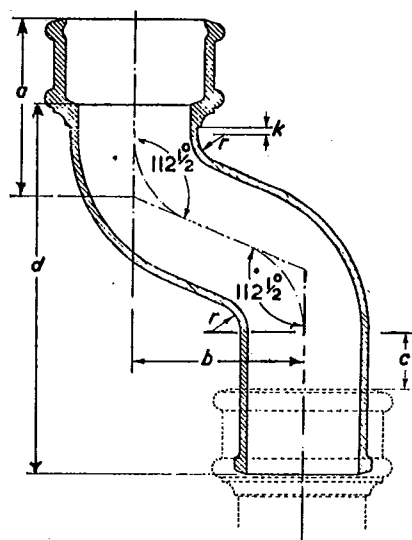
Dimensions		Nominal bore			
		75	90	100	150
$\theta = 92\frac{1}{2}^\circ$	a	279	292	299	337
	b	292	299	305	330
	c	210	216	222	248
	k	5	5	5	6.5
	r	152	152	152	152
$\theta = 112\frac{1}{2}^\circ$	a	254	267	267	299
	b	279	286	292	316
	c	184	191	191	210
	k	1.5	3	3	5
	r	203	203	197	197
$\theta = 135^\circ$	a	229	235	235	248
	b	260	267	273	299
	c	159	159	159	159
	k	5	5	5	5
	r	286	279	273	248

NOTE 1. Spigots and sockets of large radius bends to be the same as for straight pipes of corresponding nominal bore.

NOTE 2. Bends with rectangular access doors are available in a limited range (see Table 15).

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Table 4. Offsets



All dimensions in mm.

Nominal bore			50	65	75	90	100	125	150
Dimensions	<i>a</i>		124	133	140	152	157	173	189
	<i>r</i>		25	25	25	25	25	25	25
	<i>c</i>		51	51	51	51	51	51	51
	<i>k</i>		6.5	6.5	6.5	6.5	6.5	6.5	6.5
Projection <i>b</i>	76	<i>d</i>	241	257	267	283	289	311	327
	114	<i>d</i>	259	273	284	299	308	333	352
	152	<i>d</i>	275	289	300	314	324	349	370
	229	<i>d</i>	305	321	330	346	356	381	402
	305	<i>d</i>	337	352	362	378	387	413	433

NOTE 1. In the case of fittings in which the offset $b = 76$ mm, the two radii at the centre of the pipe will be tangential to each other at a point slightly above the sloping centre line of the fitting, owing to the small projection.

NOTE 2. Spigots and sockets of offsets to be the same as for straight pipes of corresponding nominal bore.