



BS 65 : 1981

UDC 621.643.2 : 666.73 : 691.42-462

Specification for
Vitrified clay pipes, fittings and joints

Spécification des tuyaux, raccords et joints en grès vitrifié

Spezifikation für Steinzeugrohre, -formstücke und -verbindungen

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Foreword

This British Standard is a revision which supersedes BS 65 & 540 : Part 1, BS 65 & 540 : Part 2, BS 539 and BS 1143. This revision comes into effect on 1 June 1981 to provide a period of three months after its publication date to allow for an orderly transition from the testing and certification arrangements applicable to the earlier standards to those applicable to this revision. The two Parts of BS 65 & 540, BS 539 and BS 1143 will accordingly remain in force until 1 June 1981, when they will be withdrawn.

This revision specifies, in a single British Standard, requirements for vitrified clay pipes, fittings and joints formerly covered in the superseded standards referred to above.

Requirements appropriate to each of several types of pipe and fitting are specified for dimensions and tolerances and for performance. These requirements are supported by sampling procedures to facilitate quality control and by

test methods for verification of compliance with the standard.

The sampling procedures are consistent with BS 6000, BS 6001 and BS 6002.

Requirements for extra chemically resistant pipes and fittings are included, but the standard does not apply to joints for this application, since these have to be formulated to be specifically resistant to the chemical effluents to be conveyed.

The attention of users of this standard is drawn to the advantages to be gained from an assurance of compliance afforded by independent schemes of continuing supervision and control and in view of the nature of this standard, use of the certification facilities offered by BSI, as described on the inside back cover, is strongly recommended.



British Standard Specification for Vitrified clay pipes, fittings and joints

Section one. General

1. Scope

'This British Standard specifies requirements for vitrified clay pipes and fittings with or without sockets, for the construction of drains and sewers, operated as gravity pipelines, or for use as ducts.



Normal, surface water, perforated, and extra chemically resistant pipes and fittings are covered by the standard, together with ducts. The standard applies to both glazed and unglazed products.'



'The standard also specifies performance requirements for flexible mechanical joints used with normal clay pipes and fittings.

NOTE. The pipes and fittings specified may be suitable for use with joints other than flexible mechanical joints but such joints are outside the scope of this standard.'

The requirements specified cover certain dimensions and tolerances, physical and performance characteristics, marking and sampling, and testing and inspection procedures to verify compliance and to facilitate quality control.

2. References

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

3. Definitions

For the purposes of this British Standard the following definitions apply.

3.1 Types of pipes and fittings

3.1.1 Normal. Suitable for all drains and sewers, other than where extra chemical resistance is required.

3.1.2 Surface water. Suitable only for the conveyance of surface water.

3.1.3 Perforated. Suitable for French drains and land drains.

3.1.4 Extra chemically resistant. Suitable for drains and sewers where extra chemical resistance is required.



3.1.5 ducts. Suitable for the enclosure and protection of underground cables or other services.'

3.2 Other definitions

3.2.1 curvature. The angle subtended by the length of a curved fitting at the centre of a circle of nominal radius through the centre-line of the fitting.

3.2.2 joint assembly. The adjacent ends of two pipes and the means of joining them.

3.2.3 nominal size (DN). A numerical designation of the size of a unit, which is a convenient round number approximately equal to a manufacturing dimension.

NOTE. For the purposes of this standard, this dimension is the nominal bore of the pipe or fitting.

4. Materials and manufacture

4.1 Pipes and fittings. Pipes and fittings shall be made from suitable clays and when fired shall be sound and free from such defects as would impair their function when in service. Pipes and fittings may be unglazed, or glazed on the interior and/or exterior. When glazed, they need not be glazed on the jointing surfaces of the spigot and socket.

'Pipes and fittings marked as 'Duct' shall not have sharp ends to the internal barrel.'

Fittings may be completed by affixing fired parts together. Fired fittings may be surface treated after firing. They shall be deemed to comply with this standard provided that the completed fittings meet all the appropriate requirements specified in clauses 7 and 8.

4.2 Flexible mechanical joints

4.2.1 Each component shall be fabricated having regard to its individual function in such a way that the physical performance of the joint assembly in service will be maintained.

4.2.2 Elastomeric joint rings shall be either of type 2 (drainage), as specified in BS 2494 or, if the elastomeric material is not included in BS 2494, it shall satisfy the physical property requirements specified in that standard for styrene-butadiene rubber of the same hardness.

Section two. Pipes

5. Dimensions and tolerances

5.1 Bore. The bore of the barrel of a pipe shall not deviate from the nominal size given in the first column of table 1(a) or table 1(b) beyond the limits of minimum and maximum shown.

5.2 Length. Preferred nominal lengths are not specified in this standard, but the limits of tolerance on the manufacturer's stated nominal length shall be:

(a) for normal pipes, extra chemically resistant pipes and ducts, -1 % +4 % subject to a minimum value of ± 5 mm.

(b) for surface water and perforated pipes, -2 % +5 % subject to a minimum value of ± 10 mm.

5.3 Straightness. When tested in accordance with appendix A, the permissible deviation from straightness of the barrel of a pipe of any nominal bore shall not exceed that specified in table 2.

For intermediate lengths the permissible deviation from straightness shall be interpolated linearly.

Table 1. Dimensions of barrels

(a) Preferred nominal sizes

Nominal size (DN)	Limits of bore			
	Normal and extra chemically resistant pipes		Surface water and perforated pipes	
	min.	max.	min.	max.
	mm	mm	mm	mm
190	87	96		
100	96	105	95	107
150	146	158	145	160
225	221	236	219	239
300	295	313	292	317
400	394	414	392	420
500	494	514	492	520
600	591	615	590	629
700	689	719	679	739
800	788	822	777	850
900	886	926	876	953
1000	984	1030	970	1050

† This size is for ducts only.

(b) Non-preferred nominal sizes

Nominal size (DN)	Limits of bore			
	Normal pipes, extra chemically resistant pipes and ducts		Surface water and perforated pipes	
	min.	max.	min.	max.
	mm	mm	mm	mm
75	72	80	71	81
125	122	132	119	135
200	196	210	193	213
250	246	262	242	266
375	371	391	366	396
450	444	464	442	472

Table 2. Maximum permissible deviation from straightness (D_s)

Nominal length of pipe L_N	Normal pipes, extra chemically resistant pipes and ducts	Surface water and perforated pipes
	D_s	D_s
m	mm	mm
0.3	2	4
0.6	4	7
0.9	5	10
1.0	6	11
1.2	7	13
1.5	8	16
2.0	10	1.0 % of nominal length
2.5	11	
3.0	12	
3.5	13	
4.0	14	

* 1 kPa = 10 mbar = 1 kN/m² $\approx$ 0.1 m head of water (conventional).

5.4 Perforations. The holes in perforated pipes shall be cleanly cut and not less than 3 mm or greater than 15 mm in diameter. They shall be positioned in one 180° segment of the barrel in one or more rows parallel to the longitudinal axis of the pipe, the holes in each row being spaced equidistantly. The permissible deviation of the spacing between the holes in any row shall not exceed ± 20 mm. The total area of holes shall be not less than 3 mm² per millimetre bore per metre length of pipe.

6. Performance requirements

6.1 General. Pipes shall comply with the relevant test requirements as given in table 8.

6.2 Crushing strength. The pipe or pipe section shall withstand the intensity of loading appropriate to its size and class, as specified in table 3(a) or table 3(b), when tested in accordance with B.1 using bearers described in either B.2 or B.3.

The sampling procedures are set out in section five and they enable crushing strength values given in table 3(a) and table 3(b) to be used in structural design.

6.3 Bending moment resistance (BMR). Normal and extra chemically resistant pipes shall resist the bending moment appropriate to their size and class, as specified in table 4(a) or table 4(b), when tested in accordance with C.1 using apparatus described in either C.2 or C.3.

Testing for bending moment resistance is applicable only to pipes up to and including 225 DN with nominal lengths 'equal to or greater than 1.1 m'

6.4 Impermeability. When subjected to the water pressure test described in appendix D the barrels of normal and extra chemically resistant pipes 'or pipe sections' shall withstand an internal water pressure of 60 kPa* for 5 min without leakage.

6.5 Internal pressure test. When subjected to the water pressure test described in appendix D, normal and extra chemically resistant pipes 'or pipe sections' shall withstand an internal pressure of 140 kPa* for 5 s without failure.

6.6 Chemical resistance. When subjected to the chemical resistance test described in appendix E, the mass loss of any specimen shall not exceed 0.25 %.

NOTE. Normal pipes, surface water pipes, perforated pipes and ducts are required to be resistant to attack by chemicals likely to be found in waste water, surface water or ground water.

6.7 Tests for extra chemical resistance. When subjected to the tests described in appendix F, extra chemically resistant pipes shall comply with the requirements specified in 6.7.1 and 6.7.2.

6.7.1 Water absorption. The percentage gain in mass of the test piece when tested in accordance with F.2 shall not exceed the values given in table 5.

6.7.2 Acid resistance. The percentage loss in mass as determined by the method described in F.3 shall not exceed 3 %.

Table 3. Crushing strength

(a) Preferred nominal sizes

Nominal size (DN)	Strength class		
	Standard strength	Extra strength	Super strength
	kN/m	kN/m	kN/m
90	20	22	28
100	20	22	28
150	20	22	28
225	20	28	—
300	22	34	—
400	34	44	52
500	40	48	60
600	40	57	70
700	40	67	81
800	40	72	86
900	40	84	106
1000	40	94	120

(b) Non-preferred nominal sizes

Nominal size (DN)	Strength class	
	Standard strength	Extra strength
	kN/m	kN/m
75	16	20
125	20	22
200	20	26
250	22	30
375	34	38
450	34	44

Table 4. Bending moment resistance

(a) Preferred nominal sizes

Nominal size (DN)	Strength class		
	Standard strength	Extra strength	Super strength
	kN m	kN m	kN m
100	0.90	1.00	1.30
150	2.40	2.80	4.00
225	6.50	9.00	—

(b) Non-preferred nominal sizes

Nominal size (DN)	Strength class	
	Standard strength	Extra strength
	kN m	kN m
200	4.00	6.00

* 1 kPa = 10 mbar = 1 kN/m² $\approx$ 0.1 m head of water (conventional).

Table 5. Maximum water absorption

Wall thickness of test piece	Maximum water absorption
	%
up to and including 20 mm	4
greater than 20 mm	6

Section three. Fittings

7. Dimensions and tolerances

7.1 Bore. The bore of the inlet or outlet of a fitting shall not deviate from the nominal size beyond the limits given in table 1(a) or 1(b).

7.2 Length. The limits of tolerance on the nominal length of a straight fitting shall be as given in 5.2 for pipes.

7.3 Water seal. Trapped fittings shall provide a minimum water seal depth of 50 mm.

7.4 Curvature and radius. Preferred nominal values for curvature and radius are not specified in this standard, but the tolerance on curvature shall be $\pm 5^\circ$ on the manufacturer's stated nominal value. The radius shall have a tolerance of $\pm 10\%$ on the manufacturer's stated value.

7.5 Branch angle. The tolerance on branch angle of a junction shall be $\pm 5^\circ$ on the manufacturer's stated nominal value.

NOTE: Variations in the design of inlets and outlets are permissible depending on their specific functions and the manufacturer's type of joint.

8. Performance requirements

8.1 General. Fittings shall comply with the relevant test requirements as given in table 6.

8.2 Impermeability. When subjected to the water pressure test described in appendix D, the barrels of normal and extra chemically resistant fittings or sections shall withstand an internal water pressure of 40 kPa* for 5 min without leakage.

8.3 Internal pressure test. When subjected to the water pressure test described in appendix D, the barrels of normal and extra chemically resistant or sections shall withstand an internal pressure of 70 kPa* for 5 s without failure.

8.4 Chemical resistance. When subjected to the chemical resistance test described in appendix E, the mass loss of any test piece shall not exceed 0.25 %.

NOTE: Normal, surface water and duct fittings are required to be resistant to attack by chemicals likely to be found in waste water, surface water or ground water.

8.5 Test for extra chemical resistance. When subjected to the test described in appendix F, extra chemically resistant fittings shall comply with the requirements specified in 6.7.1 and 6.7.2.

8.6 Crushing strength. Where bends, junctions, taper pipes or bell mouths are fired in a plant alongside pipes, using the same materials and firing process, the crushing strength of these fittings is deemed to be that of the pipes when tested to 6.2. If pipes are not normally fired alongside these fittings, straight fittings or short lengths of pipes made for test purposes, using the same materials and firing process as for these fittings, should be type-tested for compliance with the requirements of 6.2.

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Table 6. Applicable dimensional and performance requirements for fittings

Fittings group	Internal size			Curvature or branch angle (7.4 or 7.5)	Impermeability or internal pressure (8.2 or 8.3)	Chemical resistance or extra chemical resistance (8.4 or 8.5)
	Bore (7.1)*	Length (7.2)	Water seal (7.3)			
 Taper pipes, splay pipes and bell mouths	X	X			X	X
Access and inspection pipes and chambers Channels and taper channels	X	X				X
Bends, cleaning arm, taper, rest, round elbow and mitred	X			X	X	X
Channel bends, access and inspection bends, saddles and oblique saddles	X			X		X
Junctions	X	X		X	X	X
Channel junctions, access junctions, taper channel bends	X	X		X		X
Trapped gullies, low back traps, syphons and interceptors	X		X			X
Trapless gullies, rainwater shoes, connectors, drain chutes, hoppers and raising pieces	X					X
Junction blocks				X		X
Dished tops, loose collars and double sockets						X

*Applies to pipeline connections only.

NOTE. The symbol 'X' denotes the subclause applicable.

Section four. Flexible mechanical joints

9. Performance requirements

9.1 General. This section specifies the performance requirements for flexible mechanical joints suitable for normal clay pipes and their fittings.

Joint assemblies shall satisfy the test requirements of 9.2 to 9.5.

A component shall not be tested in more than one assembly.



'If it is not practicable to apply precisely the deflection, pressure, load or separation specified, a joint assembly shall be deemed to satisfy the test requirements provided that the levels applied are greater than those specified.'

NOTE. Different jointing systems and similar systems by different manufacturers, while individually complying with the requirements of this standard, may not necessarily be interchangeable.

9.2 Deflection. One pipe in a joint assembly shall be deflected by the method described in G.2 by the amount specified in table 7 for its relevant nominal size and when so deflected shall withstand a constant internal pressure of 60 kPa* for 5 min without visible leakage.

Deflection is defined as the distance from the extended longitudinal axis of one pipe to the longitudinal axis of the other pipe at its free end.

Table 7. Deflections

Nominal size (DN)	Deflection per metre of deflected pipe length	Approximate equivalent angular deflection
	mm	
100 — 200	50	3 °
225 — 500	30	1 1/4 °
600 — 1000	20	1 1/4 °

9.3 Straight draw. The pipes within a joint assembly shall be separated by 10 mm using the method described in G.3 and when separated shall withstand a constant internal pressure of 60 kPa* for 5 min without visible leakage.

9.4 Shear resistance. When tested by the methods described in G.4 and a load of 25 N per millimetre of nominal size of pipe is applied, a joint assembly shall withstand a constant internal pressure of 60 kPa* for 5 min with no visible leakage.

9.5 Test for chemical and physical resistance to effluent. A joint assembly shall be tested by the methods described in H.2 using all the test solutions specified in H.1. A separate joint assembly shall be used for each test solution. Each joint assembly which has been exposed to one of the test solutions specified in H.1 shall withstand a constant internal pressure of 60 kPa* for 5 min with no visible leakage.

*1 kPa = 10 mbar = 1 kN/m² $\approx$ 0.1 m head of water (conventional).

Section five. Sampling for tests

10. Sampling for pipes and fittings

10.1 Sampling for quality control at the manufacturer's works. Sampling and testing procedures in respect of any batch shall be completed prior to removal from the works and shall be in accordance with either:

- (a) tables 10, 11 and 13 of appendix J and their switching rules, which are consistent with BS 6001 at an AQL of 6.5 % and inspection level S.3, or
- (b) BS 6002 at an AQL of 6.5 % and inspection level S.3.

'Isolated batches of units shall be assessed in accordance with table 14 of appendix J with a maximum batch size of 1200.'



NOTE. For sampling after delivery from the manufacturer's works, sampling should be in accordance only with table 10 of appendix J, except where the batch is resubmitted after rejection, when 10.2 should then apply. The relevant tests are the same as those listed under 10.1 in table 8.

10.2 Sampling for resubmitted rejected batches. Batches rejected under the sampling procedure specified in 10.1, or after delivery from the manufacturer's works, may be resubmitted once, after removal of pipes with previously undetected visible defects, under the tightened inspection procedures given in table 14 of appendix J, in respect only of the defect that caused initial rejection.

'For the purposes of 8.6, straight fittings or short lengths of pipes shall be tested at a frequency of at least one sample per month.'



10.3 Type tests. Type testing shall be carried out at least annually, at the rate of one pipe or fitting from each nominal size manufactured.

10.4 Sampling and testing. The relevant sampling procedures and test clauses are as given in table 8.

Table 8. Relevant sampling procedures and test clauses for pipes and fittings

Item	Relevant test clauses		
	Sampling procedure 10.1	Sampling procedure 10.2	Sampling procedure 10.3
Normal pipes	6.2, 6.3, 6.4*	In respect only of the defect that caused initial rejection	6.5, 6.6
Surface water pipes	6.2		6.6
Perforated pipes	6.2		6.6
Extra chemically resistant pipes	6.2, 6.3, 6.4*, 6.7*		6.5
Ducts	6.2		6.6
Fittings	8.2*, 8.5* as applicable		8.3, 8.4, 8.6
Duct fittings			8.4, 8.6



*Sampling to BS 6002 is not appropriate to these attribute tests.'

11. Sampling of joints

11.1 Sampling for quality control of joint assemblies at the manufacturer's works. The sampling procedures specified in 11.1.1 to 11.1.3 shall be used.

NOTE. For sampling after delivery from the manufacturer's works, sampling should be in accordance with the procedures specified in 11.1.1 to 11.1.3.

11.1.1 Testing in accordance with 9.2 to 9.4 shall be carried out at the rate of one joint assembly from each nominal size and each type of joint manufactured for batches up to and including 1000 and two joint assemblies from each nominal size and each type of joint manufactured for batches greater than 1000.

11.1.2 Where a joint assembly fails to pass any of the tests in 11.1.1, three additional joint assemblies shall be taken from the same batch for each failure and subjected to the same test. If all these additional joint assemblies pass the test, the batch shall be accepted. If one further failure occurs, the batch shall be rejected.

11.1.3 For resubmitted rejected batches, any batch which has been rejected under the procedures specified in 11.1.2 may, after removal of items with previously undetected visible defects, be resubmitted once, in respect only of the defect which caused initial rejection. Three joint assemblies per batch for batches up to and including 1000 and six joint assemblies per batch for batches greater than 1000 shall be tested. If any failure occurs, the batch shall be rejected.

11.2 Type tests. Type tests shall be carried out at least annually, in accordance with the procedures specified in 9.5, at the rate of one joint assembly from each type of joint manufactured. Additional type tests shall be carried out at any change of component materials.

12. Limitations

The requirements specified in section five shall not be taken to imply that the manufacturer has the right to supply knowingly any defective unit of product.

Section six. Marking

13. Marking

13.1 A company trade mark or the name of the manufacturer, and a means of identifying the date of manufacture shall preferably be impressed before firing, or, if this is not possible, shall be indelibly marked after firing on each pipe and fitting. The marking shall include identification of factory location if the manufacturer has more than one works.

Where, in the production of fabricated units using fired components, the original marking cannot be retained, a marking shall be applied by the same methods as those used to comply with 13.2 to 13.5, showing a company trade mark or the name of the manufacturer and a means of identifying the date of fabrication.

13.2 All pipes and fittings shall be clearly and indelibly marked before despatch with the number of this British Standard, i.e. 'BS 65 : 1981'.*

NOTE. Marking BS 65 on or in relation to a product is a claim by the manufacturer that the product has been manufactured in accordance with the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, British Standards Institution, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ in the case of certification marks administered by BSI or to the appropriate authority for other certification marks.

In addition, surface water pipes and fittings shall be marked 'surface water' or 'SW', and extra chemically resistant pipes and fittings shall be marked 'ECR'.

Ducts and duct fittings shall be marked 'Duct'.

13.3 In addition to the above marking, all pipes claimed to comply with the higher strength requirements specified in both 6.2 and 6.3 shall be marked with the words 'Extra Strength' or 'Super Strength', as appropriate.

13.4 All pipes and fittings that have individually passed the internal pressure test specified in 6.5 when instigated by the manufacturer, shall also be marked with the letters 'IPT'.

13.5 All pipes and fittings intended to be suitable for and supplied together with a flexible mechanical joint complying with the requirements specified in section four shall be marked with the letter 'J'.

13.6 A flexible mechanical joint supplied separately for use with a specific system of pipes or fittings marked 'BS 65 : J' shall be marked similarly only if supplied by the manufacturer of the pipes or fittings.

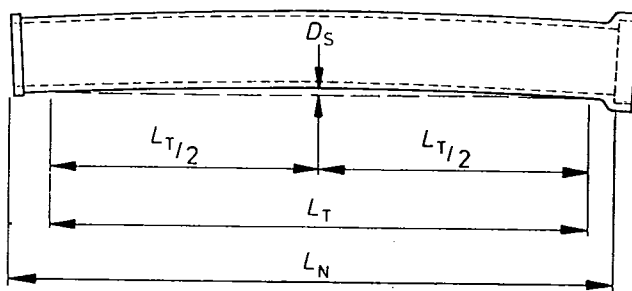
*Marking BS 65 : 1981 on or in relation to a product is a claim by the manufacturer that the product has been manufactured to the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, Quality Assurance Division, BSI, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ for certification marks administered by BSI or to the appropriate authority for other certification marks.

Appendix A*

Straightness test

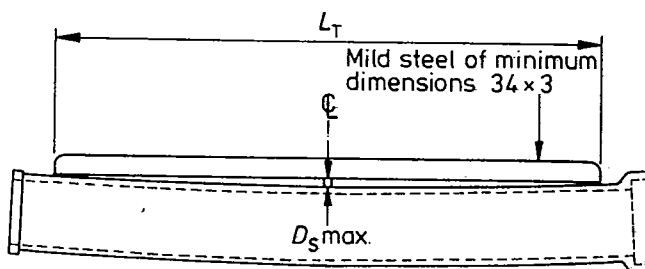
The deviation from straightness of a pipe barrel is the least distance from the centre of a straight line equal to the test length spanning any concave curve on the outside of a pipe barrel to the pipe surface (D_s) as shown in figure 1. It is permissible to test for straightness using any suitable apparatus. An example is drawn in figure 2.

The test length shall be 150 mm less than the nominal length of the pipe to allow for clearance at the shoulder of any socket and at any jointing material at the spigot end.



L_N is the nominal length of the pipe
 L_T is the test length
 D_s is the deviation from straightness
 $L_N - L_T = 150 \text{ mm}$

Figure 1. Terminology for straightness test method



If both ends of this testing apparatus come into contact simultaneously with the pipe barrel, then the permissible deviation from straightness is exceeded.

All dimensions are in millimetres.

Figure 2. Example of use of suitable straightness test apparatus

Appendix B

Crushing strength test

B.1 General

B.1.1 Testing machine. The testing machine shall be substantial and rigid throughout, so that the distribution of the load will not be affected appreciably by the deformation or yielding of any part. The method of support and loading for the pipe shall be as specified in either B.2 or B.3 and the load shall be applied to the pipe without vibration or sudden shock. The machine and bearers shall be designed to transmit the load in a

vertical plane through the longitudinal centre lines of the bearers and pipe. The testing machine load shall be verified by the means detailed in BS 1610.

B.1.2 Loading. Load the pipe or pipe section at a uniform rate between 0.40 kN per metre of pipe per second and 0.60 kN per metre of pipe per second, or in increments of not more than 0.50 kN per metre at the same rate.

Calculate the intensity of loading in kN per linear metre by dividing the total applied load by the inside length of the barrel.

B.2 Three edge bearing test

B.2.1 Supports. The supports on which the bearers are disposed shall be structural steel beams having moments of inertia about the vertical and horizontal axes of the cross section not less than $6.3 \times 10^6 \text{ mm}^4$ and $4.75 \times 10^7 \text{ mm}^4$ respectively.

B.2.2 Bearers. The bearers shall have a lower member on which two bearing strips are symmetrically disposed parallel to a vertical plane passing through the longitudinal axis of the pipe, and an upper member on which one bearing strip is centred and disposed so that it lies in the vertical plane passing through the longitudinal axis of the pipe (see figure 3).

The bearers shall consist of metal, teak or similar hard wood, and shall be straight and free of warping or twisting and shall be centrally located on the flange of the beam. The bearers shall be either of minimum rectangular section 220 mm x 25 mm or of the alternative shape shown in figure 3.

B.2.3 Bearing strips. The bearing strips shall consist of elastomeric material having a hardness of $50 \pm 5 \text{ IRHD}$. Where, before publication of Amendment No. 1, testing machines have already been fitted with material of hardness $55 \pm 5 \text{ IRHD}$, this may continue to be used until replacement is needed, when material of $50 \pm 5 \text{ IRHD}$ shall be substituted.

The strips shall be of rectangular cross section having a width of $50 \pm 5 \text{ mm}$ and a thickness of not less than 25 mm or more than 40 mm. The two bottom strips shall be of equal thickness. The bearing strips shall be used with the 50 mm dimension in contact with the pipe.

The two lower bearing strips shall be parallel and spaced a distance apart of approximately 1 mm per 10 mm of the nominal bore but in no case less than 25 mm. When used with the alternative shape of bearer the gap between the bearing strips shall be 25 mm and the slope of the upper face shall be 1 in 12.

The length of the bearing strips (in mm) shall be A , as shown in figure 3, except that where a socket is present, it shall be the nominal length of the pipes less 50 mm and the shoulder thickness, i.e. $L_N - (x + 50) \text{ mm}$ (see figure 3).

B.2.4 Loading. Support the pipe, or pipe section not less than 0.3 m long cut from a whole pipe, in a horizontal position on the two lower bearing strips parallel to its axis. Place the pipe or pipe section between the bearing strips so that the plane of any permitted longitudinal curvature is approximately horizontal. Apply the test load along the length of the barrel through the upper support beam, bearer and bearing strip. Apply the load to the support beam at a point distant from the spigot end of the pipe or pipe section equal to one half of the overall length of the pipe including the socket if any. Apply the test load to the upper support beam in such a way that the combination of support beam, bearer and bearing strip is free to rotate in a vertical plane through the longitudinal centre lines of the top and bottom bearers.

* Throughout the appendices in this standard, reference to 'pipes' includes pipe sections where these are suitable for the tests.

† International rubber hardness degrees (see BS 903 : Part A26).