

Specification for

**Vitrified clay pipes,
fittings and ducts, also
flexible mechanical
joints for use solely
with surface water
pipes and fittings**

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Committees responsible for this British Standard

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- British Ceramic Research Limited
- Clay Pipe Development Association Limited
- Department of the Environment (Property Services Agency)
- Department of Transport
- Federation of Civil Engineering Contractors
- Institution of Civil Engineers
- Institution of Water and Environmental Management
- Society of British Water Industries
- Water Services Association of England and Wales

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Foreword

This British Standard has been prepared under the direction of the Technical Committee for Waste Water Engineering by the Subcommittee for Vitrified Clay Pipes. It covers those products previously specified in BS 65:1988 “Vitrified clay pipes, fittings, joints and ducts” which are not specified in the European Standard BS EN 295 “Vitrified clay pipes and fittings and pipe joints for drains and sewers Part 1: Requirements or Part 5: Requirements for perforated vitrified clay pipes and fittings”.

This has been accomplished by the deletion of all reference to normal pipes with flexible mechanical joints, which are covered by BS EN 295, and which has necessitated a change of scope of the standard. A previously omitted definition of “pipe section” has been included.

Perforated vitrified clay pipes and fittings may be produced to either BS 65:1991 or BS EN 295-5:1994 until 31 March 1995, after which date BS 65 will cease to apply to perforated pipes.

Requirements appropriate to each of several types of pipe, fitting and duct 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 these products, 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.

Purchasers ordering to this standard are advised to specify in their purchasing contract that the supplier operates a quality system which complies with Part 2 of BS 5750, to assure themselves that products claimed to comply with BS 65 consistently achieve the required level of quality.

This edition introduces technical changes but it does not reflect a full review or revision of the standard, which will be undertaken in due course.

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 18, 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.

Section 1. General

1 Scope

This British Standard specifies requirements for vitrified clay pipes and fittings with or without sockets, and compatible accessories, for the construction of drainage and sewerage systems, operated as gravity pipelines, or for use as ducts.

Normal and extra chemically resistant pipes and fittings are covered by the standard, when supplied without flexible mechanical joints, for example to meet repair situations or for use with special jointing compounds. Surface water pipes and fittings are also 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 surface water 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 drainage and sewerage systems, other than where extra chemical resistance is required

3.1.2

surface water

suitable only for the conveyance of surface water

3.1.3

extra chemically resistant

suitable for drains and sewers where extra chemical resistance is required

3.1.4

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

pipe section

a short length of pipe barrel equal to or greater than 300 mm

3.2.4

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 satisfy the physical property and type test requirements of rings of type D (drainage) specified in BS 2494.

Section 2. 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 pipes, extra chemically resistant pipes and ducts		Surface water and perforated pipes	
	min.	max.	min.	max.
	mm	mm	mm	mm
90 ^a	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
1 000	984	1 030	970	1 050

^a 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	

6 Performance requirements

6.1 General. Pipes or pipe sections shall be sampled and tested in accordance with the requirements of the relevant clauses listed in Table 8.

6.2 Crushing strength. The pipe or pipe section, when tested in accordance with Appendix B, shall with-stand either the intensity of loading appropriate to its size and class, as stated in Table 3(a) or Table 3(b), or such higher intensity as is claimed by the manufacturer.

NOTE The sampling procedures set out in section 5 enable the crushing strength values given in Table 3(a) or Table 3(b) or claimed by the manufacturer to be used in structural design.