

Specification for

WC flushing cisterns (including dual flush cisterns and flush pipes)

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Committees responsible for this British Standard

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 Clay Pipe Development Association Limited
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Foreword

This revision of BS 1125 has been prepared under the direction of the Building Services Standards Committee.

BS 1125 was revised in 1969 to accommodate dual flush cisterns and to incorporate more detailed specifications for plastics WC flushing cisterns. It was again revised in 1973 to incorporate metric terms and include various amendments made in the interim period.

Because of the need for further amendments and the time lapse since the last full publication, it was necessary that a full revision be carried out accommodating the many changes incorporated into the standard since 1973.

Attention should be drawn to the fact that dual flush is now a general requirement for cisterns in domestic dwellings in use with washdown WC pans and the new model water byelaws give requirements on water economies relative to flushing cistern discharge. However, this revision of BS 1125 covers the requirements for replacement of existing installations.

Also the use of plastics materials is now established as suitable for cisterns and the use of possible new plastics materials is adequately covered by the physical test requirements which have proved effective in ensuring a satisfactory performance.

The standard no longer covers requirements for pressed steel, lead lined or copper lined wood-cased cisterns.

Reference in this standard to Water Authority listed float operated valves will be considered for deletion on the publication of BS 1212-4, which is in preparation.

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 and ii, pages 1 to 12, 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

BS 1125 specifies requirements for WC flushing cisterns with valveless siphons, nominally 9 L (litres), for high level, low level and close coupled positions, together with the necessary flush pipes.

The cisterns specified are of the type which flushes 9 L only, (i.e. the single flush type), or of the type which flushes, as selected, either 4.5 L or 9 L, (i.e. the dual flush type).

Float operated valves and methods of fixing are not covered by BS 1125.

NOTE 1 Dual flush type cisterns are intended for use with washdown pans in domestic premises only.

NOTE 2 The titles of the publications 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.

2.1

spill-over level

the level at which water in the flushing cisterns will first spill over if the rate of inflow exceeds the rate of outflow through the warning pipe

2.2

warning pipe

an overflow pipe so connected that its outlet, whether inside or outside a building, is in a conspicuous position where the discharge of any water from it can be readily seen

2.3

water line

a line marked inside the cistern to indicate the highest water level at which the float operated valve should be adjusted to shut off

3 Marking

Each cistern shall be marked with the following:

- a) the manufacturer's name or identification mark;
- b) the number of this British Standard, i.e. BS 1125¹⁾;
- c) the wording specified in 17.2 on dual flush type cisterns.

The marks required in a) and b) shall be capable of being seen after the installation of the cistern and before any cover is fitted.

NOTE The mark "BS 1125" on a cistern, with or without the certification mark, in no way refers to the suitability or otherwise of any float operated valve or float fitted in the cistern.

¹⁾ Marking BS 1125 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 should be addressed to the appropriate certification body.

Section 2. Materials and design

4 General requirements

Cistern shells, siphons and associated components shall be made from materials which under the conditions of use are one of the following:

- a) non-corroding e.g. plastics;
- b) protected against the types of corrosion caused by the action on them of the water with which the cistern is to be used;
- c) highly resistant to corrosion by the action of the water with which the cistern is to be used, i.e. they corrode only at a rate which is insufficient to affect adversely the durability or efficiency of the cistern.

Before dissimilar metals are used in the construction of a cistern, the manufacturer shall ensure avoidance of the possibility of electrolytic action.

5 Requirements for particular materials

5.1 Ceramic ware cisterns

(see also clauses 14, 15 and 16)

5.1.1 The shell thickness of ceramic ware cisterns shall comply with either **5.1.2**, **5.1.3** or **5.1.4**. In addition vitreous china cisterns shall comply with BS 3402.

5.1.2 All ceramic ware cisterns, except vitreous china, shall have a minimum thickness of 12 mm.

5.1.3 Vitreous china cisterns shall have a minimum thickness of 10 mm, except as described in **5.1.4**.

5.1.4 Vitreous china cisterns with an internal width of less than 365 mm, designed for use with Water Authority listed float operated valves other than as specified in BS 1212, shall have a minimum thickness of 6 mm.

5.2 Rubber compound and plastics cisterns

5.2.1 General. Plastics materials and rubber compounds shall be such that, when assembled, the cistern shall comply with **5.2.2** to **5.2.8**.

5.2.2 Appearance. The cistern shall be free from blisters and delamination and reasonably free from flow lines, contamination, streaking or unintended colour variations on surfaces visible after installation.

5.2.3 Colour fastness to light. The colour fastness to light of the cistern and cover shall be not less than 5 when determined in accordance with BS 2782:Method 540B.

5.2.4 Opacity. When tested in accordance with BS 2782:Method 530A, the cistern and cover shall not transmit more than 0.2 % of the visible light falling on them.

5.2.5 Distortion resistance. The cistern, when tested in accordance with Appendix A, shall not bulge more than 6 mm and the cover shall not be dislodged.

5.2.6 Dead load test. The complete cistern, when installed and filled as described in Appendix A and tested by the application of a dead load of 23 kg for 30 s, shall not distort to such an extent that any part becomes detached.

5.2.7 Front thrust test for cisterns for use at low levels (including close coupled). The complete cistern, when installed and filled as described in Appendix A and tested by the method described in Appendix B, shall not distort to such an extent that any part becomes detached or inoperable.

5.2.8 Impact test. The complete cistern, when installed and filled as described in Appendix A and tested as described in Appendix C, shall show no defect after one impact, and after being emptied shall show no defect after one more impact.

6 Soft solder

Any soft solder used in the construction of cistern shells, siphons or associated components shall comply with the requirements of BS 219, and shall be of type F or type J as given in Table 1 of BS 219:1977.

7 Hard solder

Any hard solder or filler alloy used in the construction of cistern shells, siphons or associated components shall be of copper-silver-phosphorus or other corrosion resistant alloy, in accordance with type CP 2 or CP 3 of BS 1845.

8 Flushing apparatus

Cisterns shall have an efficient flushing apparatus of the valveless siphonic type which prevents the waste of water. The apparatus shall be capable of flushing directly the mechanism is operated when the water is at the water line, and shall be so constructed that water cannot flow down the flush pipe except while a flush is being properly delivered.

Flushing apparatus shall be detachable from the shell and suitable means shall be provided for ensuring and maintaining a watertight joint.

The underside of the bend in the siphon pipe (the siphon invert) or, in the dome pattern, the top of the straight discharge pipe, shall be at such a height that no water runs down the flush pipe when, after temporarily closing the warning pipe, the water level is raised to the spill-over level.

Any joint in a siphon assembly shall be watertight.

Cisterns of the dual flush type shall be provided with an air inlet device for breaking the siphonic action so as to enable the cistern to discharge a short flush instead of a full flush at the will of the user. The device shall come into action on the release by the user of the operating pull or handle. Where flushing apparatus of the single flush type is provided with means for converting it to dual flush operation, the conversion shall be by the removal of a component.

9 Volume of discharge per flush

When tested in accordance with the procedure described in Appendix D, all cisterns, when required to give a full flush, shall discharge $9^{+0.5}_{-1.0}$ L. Dual flush type cisterns shall discharge alternatively a short flush of $4.5^{+1.0}_{-0.5}$ L.

10 Rate of discharge

10.1 When tested in accordance with the procedure described in Appendix E, cisterns intended for use with WC pans complying with BS 5503 and BS 5504 shall discharge the full flush at the rate of 9 L in not more than 5 s when fitted with a high level type flush pipe, and at the rate of 9 L in not more than 6.5 s when fitted with a low level type flush pipe.

NOTE For dual flush type cisterns there is no specified rate of discharge for the short flush.

10.2 For cisterns intended for use with WC pans other than those complying with BS 5503 and BS 5504, and with pans of the double-trap siphonic type, either:

- a) the cistern shall discharge at the rates specified in **10.1**; or
- b) the cistern shall discharge at some slower rate providing it complies with the requirements of Appendix A of BS 5503-2:1977.

11 Water line

The water line shall be marked permanently inside the cistern in such a position that it is easily visible to a person adjusting the water level.

12 Spill-over level

The spill-over level of the cistern shall be not less than 60 mm above the water line.

13 Warning pipes

13.1 General

Each cistern shall be provided with a warning pipe connection so arranged that the invert of a side connection type or the overflowing level of a bottom connection type is not less than 25 mm or more than 32 mm above the water line.

13.2 Side connection warning pipes

Side connection cisterns shall be supplied with a union, for the connection of a warning pipe, of not less than 19 mm internal diameter, complete with a backnut. The union shall be manufactured from copper, copper alloy or plastics materials.

Cup overflows shall not be fitted.

NOTE For frost precaution recommendations, see 4.5 of CP 99:1972²⁾.

13.3 Bottom connection warning pipes

13.3.1 General. Bottom connection cisterns shall be supplied with a warning pipe of not less than 19 mm internal diameter throughout.

13.3.2 Metal warning pipes. Bottom connection warning pipes of metal shall be of either copper or copper alloy. If of copper, they shall comply with Tables X or Z of BS 2871-1:1971. If of copper alloy, they shall have a minimum thickness of 1 mm. They shall be brazed or hard soldered at the lower end into a flanged nipple and shall be provided with a backnut and washer.

13.3.3 Plastics warning pipes. Bottom connection warning pipes of plastics material shall be either integral with or welded to a flanged nipple at the lower end and shall be provided with a backnut and washer. They shall have a minimum thickness of 1.2 mm except at the counterbore at the threaded outlet end of the pipe where the thickness under the root of the thread shall be not less than 0.9 mm.

NOTE The minimum thickness of 0.9 mm is necessary because of the small difference between the outside diameter of 22 mm pipe and the root diameter of the $\frac{3}{4}$ in thread.

13.4 Torque testing

When assembled on the appropriate warning pipe, and fitted into a cistern complying with BS 1125, backnuts shall be such that when a torque of 10 N m is applied in tightening the backnut on the warning pipe, there shall be no sign of distortion of the threads or of the backnut.

14 Float operated valves

14.1 Float operated valves do not form part of BS 1125, but every cistern shall be constructed to comply with **14.2**, **14.3** and **14.4**.

²⁾ Being revised as BS 6700.

14.2 The cistern shall be capable of accommodating a size $\frac{1}{2}$ float operated valve complying with BS 1212 fitted with a float complying with BS 2456, or a Water Authority listed float operated valve and float that is no less efficient in performance.

NOTE It is permissible to have a side inlet or bottom inlet float operated valve.

14.3 When fitted in the cistern, the centre line of the inlet of the float operated valve shall not be lower than the horizontal centre line of a side connection warning pipe or not less than 10 mm higher than the overflowing level of a bottom connection warning pipe.

14.4 When the float operated valve is fitted in the cistern, it shall be possible to adjust it to close when the water reaches the water line.

NOTE Float operated valves are required to comply with the byelaw requirements of the local water undertaking.

15 Covers

Cisterns shall be provided with a removable cover. The cover and any screws, bolts or other component parts for fixing it, shall comply, whether fitted internally or externally, with the corrosion resistance requirements given in clause 4.

Section 3. Construction

16 Shell

16.1 The minimum internal width at the top of the cistern shell shall be 425 mm except as specified in **16.2**.

NOTE It should be noted that this measurement for the cistern shell will not permit the use of spherical floats larger than 127 mm diameter with size $\frac{1}{2}$ float operated valves as specified in BS 1212-1, BS 1212-2 and BS 1212-3.

Any internal taper towards the base of the shell shall not prevent free movement of the float during the operation of the float operated valve after the adjustment of the lever arm to its normal working position. The front to back dimensions of the cistern shall be such as to allow:

- a) a float operated valve as specified in BS 1212 fitted with a spherical float of type 127S, complying with BS 2456, to be installed; or
- b) a float operated valve as specified in BS 1212 fitted with a non-spherical float of type 127NS, complying with BS 2456, to be installed; or
- c) a Water Authority listed float operated valve and float, other than as specified in BS 1212 and BS 2456, that is no less efficient in performance, to be installed.

16.2 For cisterns complying with **5.1.4** where Water Authority listed float operated valves other than as specified in BS 1212 are intended to be used, the minimum internal width shall be as specified in **16.1**, or less than 425 mm measured at either:

- a) the centre line of the inlet hole for the side connection type; or
- b) 10 mm above the overflow level of the warning pipe for the bottom connection type.

16.3 Each shell shall be provided with holes to accommodate a warning pipe connection and float operated valve. The holes shall be positioned to comply with the requirements of clauses **13** and **14**.

For side connection cisterns, the centres of the holes shall be on the same level, and of the same diameter, namely 28^{+2}_{-1} mm.

NOTE Provision is made in BS 1212 for interchangeability by a means of a special backnut to suit this arrangement.

17 Operating lever and pull

17.1 Flushing mechanisms

The flushing mechanism shall be operated by a lever or handle of metal or plastics. When the lever or the handle for operating the flushing mechanism projects from the end of the cistern it shall not extend more than 380 mm from the centre of the cistern (see Appendix F).

The length of the lever arm between the fulcrum and the piston rod shall be such that there is no permanent distortion of the flushing apparatus when the lever is operated.

When the operating mechanism incorporates a chain pull, the assembled pull, chain and fixing links shall be capable of withstanding a dead load of 50 kg for 30 s, without so distorting that any of the parts become detachable, when tested as described in Appendix A.

Any aperture in the shell for the operating lever or pull shall be not less than 10 mm above the overflow level of the warning pipe.

17.2 Operating instructions

17.2.1 General. With every cistern of the dual flush type, a self-adhesive label in accordance with BS 4781-1 shall be supplied, stating in legible lettering the operating instructions specified in **17.2.2** or **17.2.3**, for use in association with the operating handle when the cistern is installed.

17.2.2 Cisterns used at high level. The instructions shall read:

“Short flush, pull and let go
Full flush, pull and hold”

and shall appear on or near the lower edge of the front of the cistern shell.

17.2.3 Cisterns used at low level or close coupled. The instructions shall read:

“Short flush, press and let go
Full flush, press and hold”

and shall appear on the upper half of the front of the cistern shell.

18 Flush pipe connection

18.1 Where the cistern is to be used at low level, the connection for attachment of the flush pipe shall be screwed with a Whitworth thread of nominal internal dimension not less than G1½ as specified in BS 2779.

18.2 Where the cistern is to be used at high level, the connection for attachment of the flush pipe shall be screwed with a Whitworth thread of nominal internal dimension not less than G1¼ as specified in BS 2779.

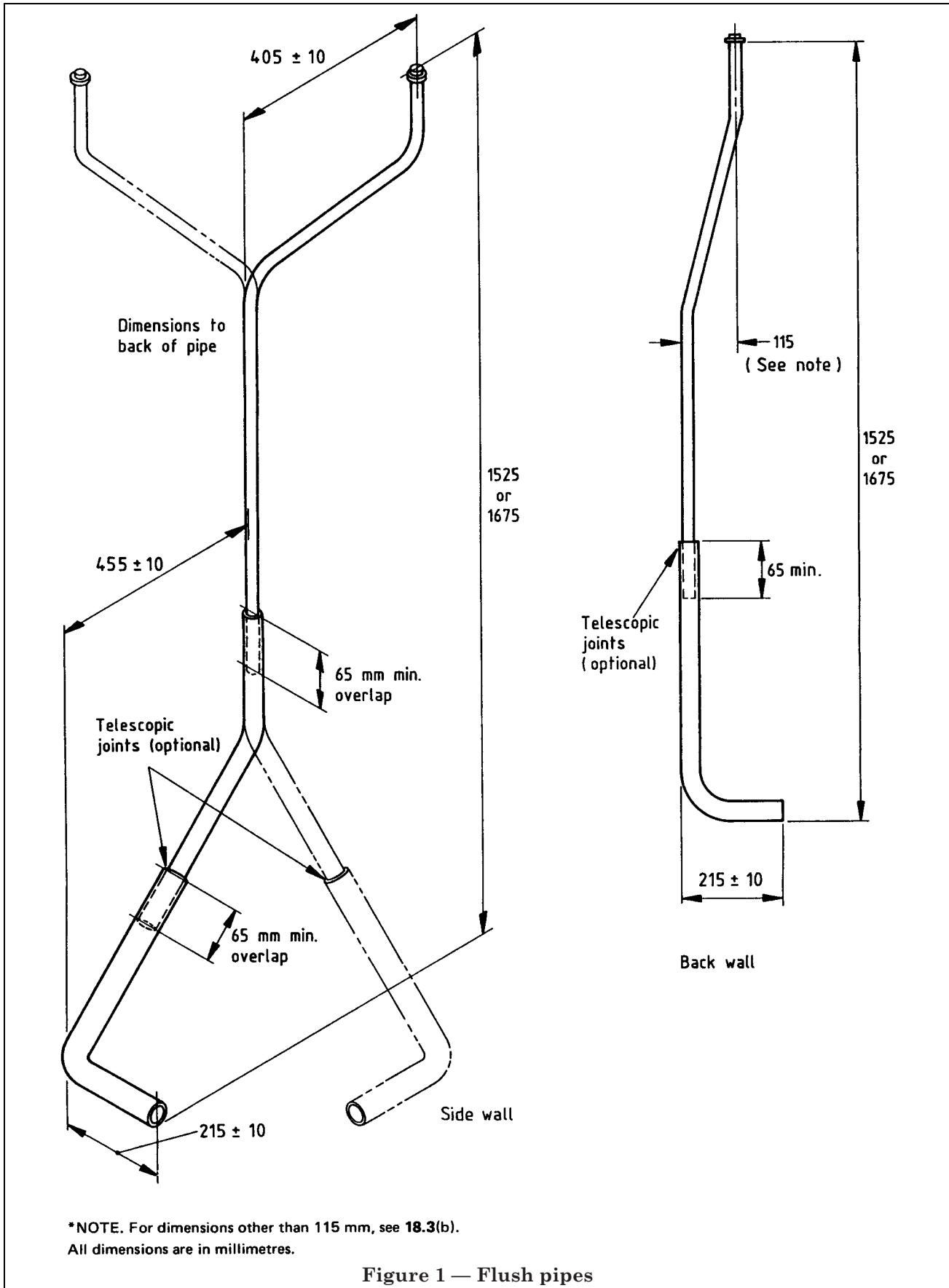


Figure 1 — Flush pipes

18.3 The centre of the outlet shall be central in the width and, except for cisterns intended solely for low-level use, shall be either:

- a) 120 mm from the extreme back of the cistern, or
- b) any other dimension, provided that the cistern manufacturer supplies or recommends a suitable off-set flush pipe assembly (see Figure 1).

The outlet shall be fitted with a connection to suit the type of flush pipe required (see section 4).

19 Bottom connection cisterns

19.1 General

When so requested by the purchaser at the time of enquiry or order (see Appendix F), a cistern shall be so arranged that either the inlet pipe or the warning pipe, or both, enter into the cistern through the bottom.

19.2 Bottom connection inlet pipe assemblies

19.2.1 General. Bottom connection inlet pipes shall be of such a height that the position of the float operated valve complies with clause 14.

The bottom connection inlet pipe assembly shall terminate at the bottom end below the cistern with an externally screwed shank. The external shank shall have a G $\frac{1}{2}$ B thread as specified in BS 2779. The length of effective thread available, after the assembly has been fixed to the cistern shell, shall be not less than 12 mm.

The shank dimensions for the inlet connection relating to the counterbore and thickness shall comply with BS 1212-1, BS 1212-2 or BS 1212-3.

The connection of the inlet pipe assembly to the cistern shell shall be by means of a flange of not less than 36 mm diameter inside the cistern, integral with or jointed to the shank or to the inlet pipe, and a washer. If the inlet hole is made to suit a 19 mm connection, then provision shall be made for locating the inlet pipe centrally in the inlet hole. Below the cistern, a backnut and washer, or other suitable means, to ensure and maintain a watertight joint shall be provided.

The bottom connection inlet pipe assembly shall either:

- a) terminate at the top end with a horizontal outlet designed to accommodate a nominal size $\frac{1}{2}$ float operated valve with an inlet shank complying with BS 1212; or
- b) be supplied with a float operated valve integral with or jointed to the inlet pipe.

NOTE To facilitate the fitting of a BS 1212 float operated valve in the bottom connection cistern, the purchaser may order the inlet shank of the float operated valve to be only 12_{-0}^{+2} mm in length.

Any joint in the bottom connection inlet pipe assembly which is inside the cistern, shall be sealed in a manner which complies with 19.3.

All bottom connection inlet pipe assemblies shall be provided with a stay at the upper end to prevent distortion.

19.2.2 Metal bottom connection inlet pipe assemblies. Metal bottom connection inlet pipes shall be of copper tube complying with Table X of BS 2871-1:1971, or be of copper alloy tube not less than 1 mm thick. Backnuts for metal bottom connection inlet pipes shall be of metal in accordance with Table 1 of BS 1212-1:1953.

19.2.3 Plastics bottom connection inlet pipe assemblies. Plastics bottom connection inlet pipes and backnuts shall be moulded from acetal resin or a rigid plastics material having equivalent physical properties. Backnuts of plastics materials shall be such that, when a torque of 15 N m is applied in tightening the backnut of the inlet, there shall be no sign of distortion of the threads of the backnut.

19.3 Hydraulic test

All bottom connection inlet pipe assemblies with float operated valves connected thereto shall be capable of withstanding a pressure of 20 bar without leaking or sweating while held in the closed position.

Section 4. Flush pipes

20 General requirements

20.1 Flush pipes shall be constructed in accordance with **20.2**, **20.3** and **20.4** and also with either clause **21** or **22**.

20.2 Materials

Flush pipes shall be made of one of the following materials:

- a) steel;
- b) unplasticized PVC or a suitable copolymer.

20.3 Construction

20.3.1 *Steel flush pipes.* Steel flush pipes shall be manufactured from seamless or welded tube of a minimum thickness of 1 mm and shall be completely protected inside and outside by either vitreous enamelling or hot dip galvanizing. If vitreous enamelled, flush pipes shall comply with BS 3830. If hot dip galvanized, they shall comply with BS 729.

20.3.2 *PVC flush pipes.* PVC flush pipes shall be unplasticized and the wall thickness before forming shall be not less than 1.5 mm.

20.4 Ends

The upper end of the flush pipes shall be provided with means of making a watertight and airtight joint to the flushing cistern and the flush pipes shall be detachable from the flushing cistern. The lower end of the flush pipes shall be finished with a plain end.

21 Special requirements for flush pipes for use with cisterns at high level

Flush pipes for use with cisterns at high level shall have an internal diameter, before forming and the application of any finish, of not less than 32 mm. Their other dimensions shall be shown in Figure 1. They shall be either of one piece construction or made of sections, and shall be watertight throughout their length. Where the upper end of the flush pipe has a flange, it shall be integral to assist in making it a watertight and airtight joint.

22 Special requirements for flush pipes for use with cisterns at low level

Flush pipes for use with cisterns at low level shall have an internal diameter, before forming and the application of any finish, of not less than 35 mm.

Appendix A Distortion and dead load tests

Fasten the cistern, complete with its fitments and cover, by its normal fixing devices to a solid background. Fill the cistern with water to the marked water line. Apply the dead load 6 mm from the end of the operating lever arm for 30 s.

Appendix B Front thrust test

Apply horizontally a front thrust of 110 N through a 150 mm diameter disk as high up as possible to the front of the cistern on its centre line. Face the disk with a soft material such that the face will conform to the contour of the cistern shell. Ensure that the cistern cover is in position during the test.

A convenient method of applying this thrust is shown in Figure 2.

Appendix C Impact test

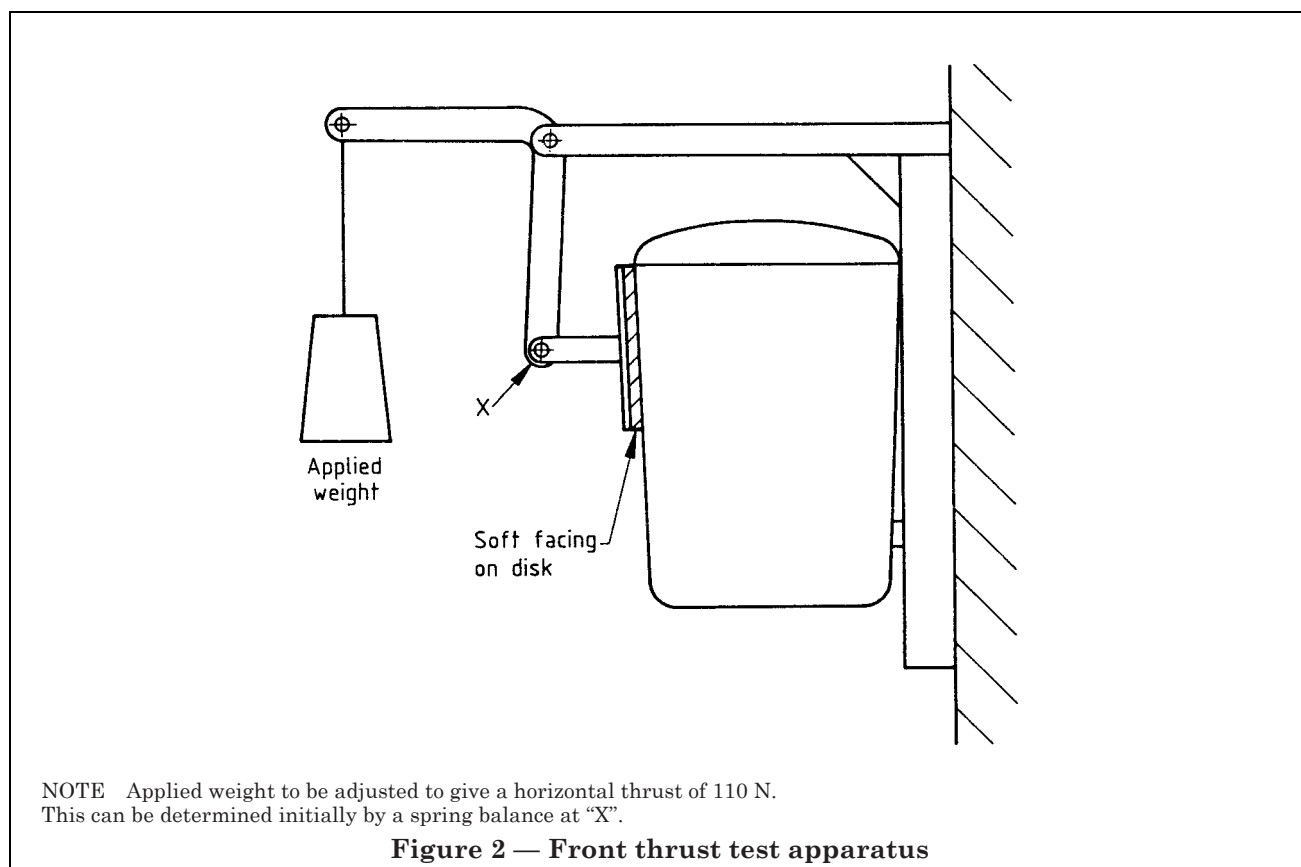
Suspend a 1 kg steel ball by a fine wire 2.5 m long, the point of suspension being located vertically over the point of impact. Release the ball from a point directly in front of the cistern at a horizontal distance of 1 m away from the point of impact, the point of impact being 75 mm from the bottom and on the centre line of the cistern. Carry out the test at ambient temperature or, in case of dispute, at 20 ± 2 °C. Ensure that the cistern cover is in position during the test.

Appendix D Volume of discharge test

D.1 Preparation

Fasten the cistern, complete with its fitments, float operated valve as specified in BS 1212 and type 127 float complying with BS 2456, or Water Authority approved float operated valve, by its normal fixing devices to a solid background.

For high level cisterns, connect a back wall flush pipe of diameter 32 mm and overall length as shown in Figure 1.



For low level cisterns connect a flush pipe diameter 35 mm with other dimensions as shown in Figure 3.

Connect a water supply that is controlled by a stop valve and is fitted, if necessary, with a pressure regulating valve to give a static pressure of 3 ± 0.5 bar at the inlet to the cistern float operated valve. Adjust the float operated valve so that the valve closes when the water level reaches the marked water line of the cistern. Fit the cistern cover with its fastening screws, if provided.

Place a vessel under the open end of the flush pipe.

D.2 Method

Ensure that the water supply stop valve is closed and that no water enters the cistern during the test. Operate the flushing mechanism in accordance with the instructions in 17.2 and on completion of the flush, determine, either by measuring or weighing, that the volume of water discharged meets the requirements of clause 9.

Appendix E Rate of discharge test for full flush

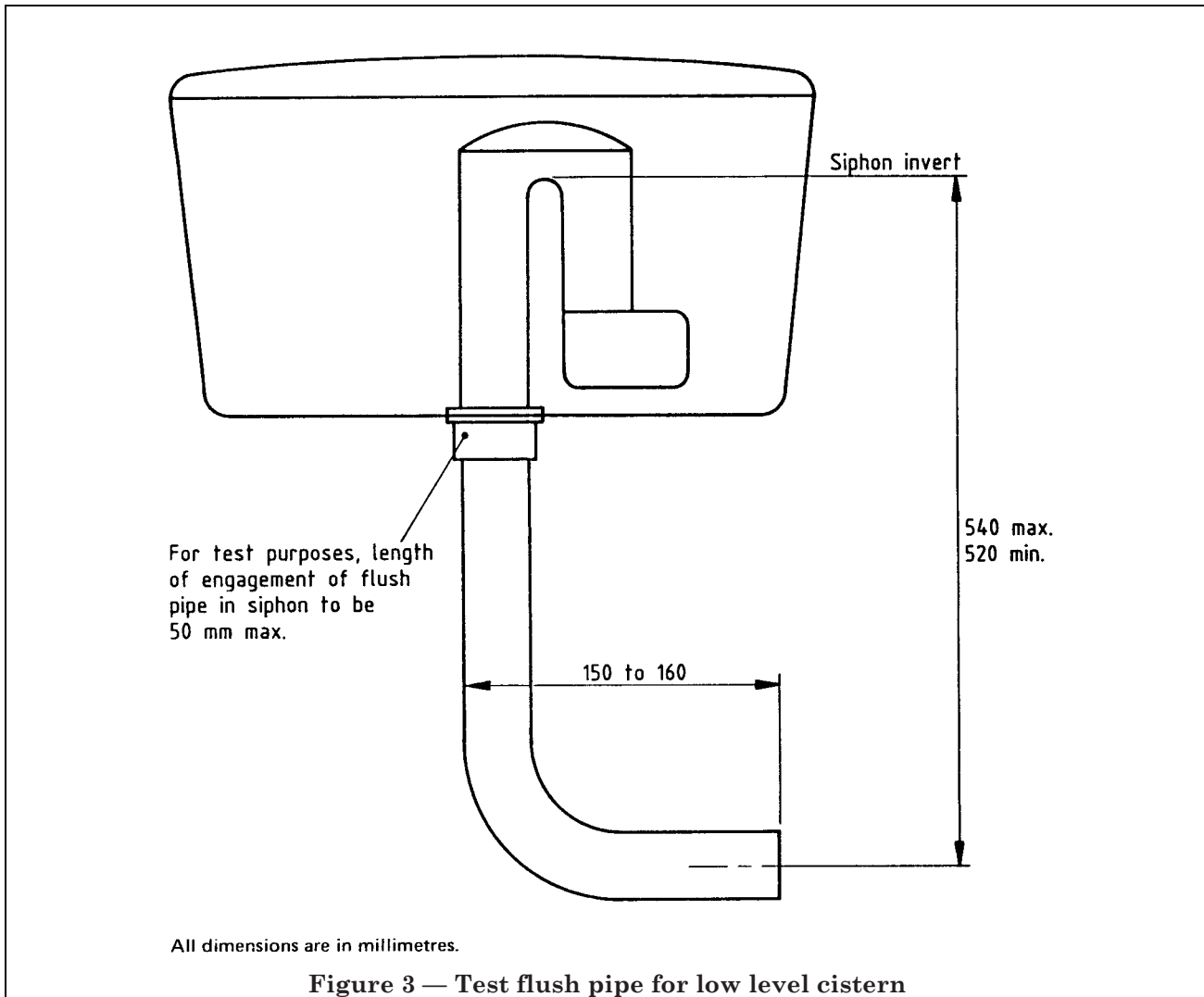
E.1 Preparation

See D.1.

E.2 Method

E.2.1 General. Ensure that the water supply stop valve is closed and that no water enters the cistern during the test. Operate the flushing mechanism in accordance with the instructions in 17.2, and as water appears at the open end of the flush pipe, start a stop watch.

E.2.2 Procedure for high level cisterns. At the end of 5 s, or a computed shorter period if the volume of discharge is less than 9 L, rapidly draw the vessel clear or otherwise divert the flow of water, and ascertain, either by measuring or weighing, the volume of water collected in the vessel (see clause 10).



E.2.3 Procedure for low level cisterns. At the end of 6.5 s, or a computed shorter period if the volume of discharge is less than 9 L, rapidly draw the vessel clear or otherwise divert the flow of water and ascertain, either by measuring or weighing, the volume of water collected in the vessel (see clause 10).

Appendix F Options: Information to be supplied by the purchaser

When ordering WC flushing cisterns complying with BS 1125, the purchaser should state:

- a) the required materials of manufacture (see clauses 6 and 7);
- b) whether the cistern is to be single or dual flush (see clause 9);
- c) whether the warning pipe and the inlet are to have a side or bottom connection (see clauses 13 and 19);
- d) the shell size (see clause 16);
- e) the type of flushing mechanism, i.e. chain pull or lever arm (see clause 17);
- f) whether the attachment to the flush pipe is to be high or low level (see clauses 18 and 20);
- g) the type of protection required for steel flush pipes (see 20.3.1).

Publications referred to

- BS 219, *Specification for soft solders.*
- BS 729, *Hot dip galvanized coatings on iron and steel articles.*
- BS 1212, *Specification for float operated valves (excluding floats).*
- BS 1212-1, *Piston type.*
- BS 1212-2, *Diaphragm type (brass body).*
- BS 1212-3, *Diaphragm type (plastics body) for cold water services.*
- BS 1212-4³⁾.
- BS 1845, *Specification for filler metals for brazing.*
- 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:Method 530A, *Determination of yellowness index⁴⁾.*
- BS 2782:Method 540B, *Methods of exposure to laboratory light sources.*
- BS 2871, *Copper and copper alloys. Tubes.*
- BS 2871-1, *Copper tubes for water, gas and sanitation.*
- BS 3402, *Quality of vitreous china sanitary appliances.*
- BS 3830, *Vitreous enamelled steel building components.*
- BS 4781, *Self-adhesive plastics labels for permanent use.*
- BS 4781-1, *General purpose labels.*
- BS 5503, *Specification for vitreous china washdown WC pans with horizontal outlet.*
- BS 5504, *Specification for wall hung WC pan.*
- CP 99, *Frost precautions for water services (being revised as BS 6700).*

³⁾ Referred to in the foreword only. In preparation.

⁴⁾ Included in BS 2782:Method 530A and Method 530B.

BSI — British Standards Institution

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