BRITISH STANDARD

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Shower units —

Part 4: Specification for shower heads and related equipment

UDC 696.144.2

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Building Services Standards Committee (SEB/-) to Technical Committee SEB/37 upon which the following bodies were represented:

Association of Manufacturers of Domestic Electrical Appliances
Association of Manufacturers of Domestic Unvented Supply Systems Equipment
British Bath Manufacturers' Association
British Ceramic Tile Council
British Gas Corporation
British Plastics Federation
Chartered Institution of Building Services
Consumer Standards Advisory Committee of BSI
Consumers' Association
Council of British Ceramic Sanitaryware Manufacturers
Department of Health and Social Security
Department of the Environment (Building Research Establishment)
Department of the Environment (Property Services Agency)
Disabled Living Foundation
Flat Glass Manufacturers' Association
Institute of Plumbing
Institution of Gas Engineers
National Brassfoundry Association
National Federation of Building Trades Employers
National House-Building Council
Plastic Bath Manufacturers Association
Royal Institute of British Architects
STC Water Regulations and Fittings Scheme

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The following BSI references relate to the work on this standard:
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Contents

Foreword

This Part of BS 6340 has been prepared under the direction of the Building Services Standards Committee and was initiated by the Consumer Standards Advisory Committee of BSI, a need for such a standard having been indicated by various interested organizations.

The standard is being published in the following Parts:

— *Part 1: Guide on choice of shower units and their components for use in private dwellings;*

— *Part 2: Specification for the installation of shower units;*

— *Part 3: Specification for prefabricated shower enclosures*[1)];

— *Part 4: Specification for shower heads and related equipment;*

— *Part 5: Specification for prefabricated shower trays made from acrylic material;*

— *Part 6: Specification for prefabricated shower trays made from porcelain enamelled cast iron;*

— *Part 7: Specification for prefabricated shower trays made from vitreous enamelled sheet steel;*

— *Part 8: Specification for prefabricated shower trays made from glazed ceramic*[1)].

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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.

[1)] In course of preparation.

Section 1. General

1 Scope

This Part of BS 6340 specifies the requirements for the materials, dimensions and functional testing of domestic shower heads and related equipment to be used in conjunction with shower controls complying with the requirements of BS 1415-1, BS 1010-2, BS 5412 and BS 5413.

Details of the information to be supplied by the purchaser are given in Appendix A.

NOTE The titles of the publications referred to in this Part of BS 6340 are listed on the inside of the back cover.

2 Definitions

For the purposes of this Part of BS 6340, the following definitions apply.

2.1
fixed shower head

a fixed height outlet fitting through which water passes and is emitted as either a number of separate, jets or as water droplets

2.2
swivel shower head

a fixed height outlet fitting through which water is emitted as either a number of separate jets or water droplets. This shower head incorporates a universal joint enabling it to be swivelled through a limited angular arc, thereby permitting the water spray trajectory to be adjusted

2.3
shower handset

a mobile shower head with an integral handle which, when used in conjunction with a flexible hose, permits the user to direct the water trajectory as required

2.4
spray plate

a plate containing holes or slots through which water passes and thereby forms a spray of water with separate, definable jets or water droplets

2.5
flexible hose

a flexible tube, which connects the outlet of the mixing valve to the shower handset

2.6
handset holder

a device for holding a shower handset in a fixed height position such that the hands of the user are free and that the water spray emitted can be used for ablutionary purposes. Some handset holders incorporate a degree of angular movement which enables the water spray trajectory to be adjusted

2.7
slide bar

a fixture mounted in the shower enclosure consisting of a vertically mounted tube or bar and a clampable handset holder which allows the height of a shower handset to be varied to the user's particular needs

2.8
shower arm

a pipe or casting which connects the concealed and/or exposed rigid riser to the shower head

2.9
rigid riser

a pipe connecting the outlet of the mixing valve to the shower arm or head

2.10
spray pattern formation

the spray pattern of a shower head or handset is deemed to be formed when the water issuing from the spray plate holes does so in single, definable jets or water droplets, after the water has been flowing for a period of one minute

2.11
atomizer

a pressure dependent device which disperses water into very fine droplets or mist

2.12
shower equipment

a generic term covering all the above component parts

3 Materials

The materials used for the metallic parts of the shower equipment shall comply with clause **9** of BS 5412-5:1976.

All non-metallic material used for the shower equipment shall comply with the tests described in all sections of this British Standard.

When tested in accordance with DD 82 the materials of construction shall not, under the expected usual conditions of use for which the shower head is designed, impart to the water with which they will come into contact unpleasant taste or odour, any cloudiness or discoloration, or any toxic or undesirable substances.

4 Marking

Shower equipment, or its packaging, shall be legibly marked with the following information:

a) the manufacturer's name or identification mark;

b) the number of this British Standard, i.e. BS 6340-4[2)];

c) where applicable, the nominal size of the fitting.

NOTE Additional markings are not precluded.

5 Instructions

Installation, use and maintenance instructions shall be provided with each shower head.

Section 2. Dimensions, design and construction

6 General

The design and construction of shower equipment shall be such that it is suitable for use when installed with the shower enclosures specified in BS 6340-3 and shower trays specified in BS 6340-5 to BS 6340-8.

The spray plate, where fitted, shall be removable in accordance with the manufacturer's instructions by the use of simple tools (e.g. screwdriver) for cleaning purposes at least 50 times and still be replaceable without renewal of parts.

7 Shower types

The shower head shall be one of the following types:

a) fixed shower head;

b) swivel shower head;

c) shower handset fed via a flexible hose and of one of the following variations:

1) fixed height handset for use with a wall handset holder;

2) variable height handset for use with a slide bar;

3) hand held handset for use with a simple holder attached to a bath/shower mixer.

8 Connections

Threads used on shower equipment for connection purposes shall comply with BS 2779. Compression fittings used on shower equipment for connection purposes shall be suitable for use with metallic tube, the outside dimensions of which comply with BS 2871-1.

9 Plating

9.1 Nickel and chromium plating on shower equipment made from copper alloys, shall comply with the requirements of BS 1224:1970, service condition No. 2, classification Cu/Ni 10b Cr r.

9.2 Nickel and chromium plating on shower equipment made from plastics materials shall comply with the requirements of BS 4601:1970, service condition No. 2A, classification PL/Ni 8b Cr r.

10 Flexible hoses

NOTE The preferred lengths of hose are 1.2 m and 1.5 m, but this does not preclude other lengths from being used.

Thread connections at the ends of the flexible hose shall be G½ or G¾ to BS 2779 and shall be in the following combinations:

½ × ½; ½ × ¾

Section 3. Performance characteristics

11 Flow rates

When tested in accordance with Appendix B, using the test circuit shown in Figure 1, the flow rates through a shower head/handset and its associated water feed pipe, (i.e. rigid riser or flexible hose) shall be as given in Table 1.

12 Spray form

When tested in accordance with Appendix C, the distribution of the water droplets shall be such that the amount of water collected by each section of the annular gauge expressed as a percentage of the total volume collected shall be as follows:

a) centre cylinder: 0 % to 35 %;
b) inner annulus: 10 % to 70 %;
c) outer annulus: 25 % to 85 %.

[2)] Marking BS 6340-4 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 in the case of certification marks administered by BSI or to the appropriate authority for other certification marks.

NOTE The form of the spray issuing from the shower head may be determined by the manufacturer.

13 Spray trajectories

13.1 When a shower head or shower handset is mounted in accordance with the manufacturer's instructions such that its spray plate is horizontal or in the nearest available position, the water spray trajectory emitted therefrom shall be as shown in Figure 4.

13.2 In the case of shower heads and shower handsets which are to be subsequently mounted at the side of a shower enclosure, the degree of adjustability of the spray trajectory shall be as shown in Figure 5 when the shower head is set perpendicular to the wall.

For shower heads for type 40 and type 70 showers the flow rate shall be 0.10 L/s and 0.20 L/s respectively.

Section 4. Mechanical, hydraulic and endurance characteristics

14 Mechanical tests for flexible hoses

14.1 The flexible hose shall be mounted as shown in Figure 6(a) and a tensile load of 400 N applied in the direction shown.

There shall be no evidence of rupture of the armouring, or failure of the end connections or plastics hose. After this test the hose shall also meet the requirements of the tests specified in **16.1**.

14.2 The flexible hose shall be mounted as shown in Figure 6(b) and subjected to a force of 100 N in the direction shown. There shall be no evidence of rupture of the armouring, or failure of the end connections or plastics hose. After this test the hose shall also meet the requirements of the tests specified in **16.1**.

15 Mechanical test for shower arm

The fixed shower arm shall be capable of withstanding a load of 100 N applied at the centreline of the shower head as shown in Figure 7 without permanent deformation or damage.

16 Hydraulic tests

16.1 Flexible hoses. The flexible hose shall be capable of withstanding the following hydraulic tests without subsequent leakage:

a) an internally applied hydraulic pressure of 4 bar[3)] for a duration of 60 s with water at ambient temperature;

b) an internally applied pneumatic pressure of 2 bar for a duration of 20 s with the hose immersed in water.

16.2 Hose and handsets. When tested at an inlet running pressure of 0.5 bar with hot water at 60^{+5}_{-0} °C for a duration of 5 min using the test circuit as shown in Figure 1, the manometer being replaced by a suitable pressure gauge, shower heads and handsets shall show no visible reduction in spray pattern efficiency, brought about by permanent deformation of the head or its spray plates.

NOTE Appropriate safeguards to protect the person conducting this test must be made.

17 Endurance test for swivel joints

17.1 The following test applies to all swivel joints in shower equipment, i.e. shower head ball swivel joints, slide bar swivel joints, handset swivel joints, etc.

17.2 Swivel joints when installed in accordance with the manufacturer's instructions shall be capable of withstanding the following endurance test.

Table 1 — Flow rates

Shower head/handset	Minimum flow rate which generates spray pattern (spray plate horizontal)	Minimum flow at 0.1 bar
	L/s	L/s
For use with type 70 shower[a]	0.065	0.070
For use with type 40 shower[a]	0.035	0.040

NOTE The above figures are specified for type testing shower heads/handsets only and should not be confused with the figures stated in clause **10** of BS 6340-1:1983 which relate to the overall flow rate figures of a shower valve and shower head/handset combination at the minimum pressure head conditions specified by the manufacturer.

[a] See clause **10** of BS 6340-1:1983.

[3)] 1 bar = 10^5 N/m^2 = 100 kPa.

Each swivel joint shall be subjected to 30 000 reversals, each one of which shall be a minimum of 80 % of its available movement. For hydraulic joints the test shall be carried out with water passing through the shower head at 40 ± 10 °C[4)]. At the end of this test, frictional adjustment may be made to the joint, if it is provided, before the acceptance test is applied. The acceptance test shall be that the shower head/handset shall remain in any set position and if applicable, not leak to atmosphere when subjected to water passing through it at 40 ± 10 °C at an inlet running pressure of 1 bar.

[4)] For lubrication purposes.

Appendix A Information to be supplied by the purchaser

A.1 Whether the shower equipment is to be used in conjunction with an instantaneous electric water heater or a control valve supplied by a conventional gravity fed water supply system.

A.2 The type of shower outlet required, i.e.:

a) fixed;

b) swivel;

c) shower handset:

1) fixed height;

2) variable height;

3) hand held.

A.3 If a shower handset configuration is required, the length of flexible hose to be supplied, together with the size of the inlet thread connection.

Appendix B Methods of measuring flow rates

B.1 Principle

The principle of the tests is to measure the flow rate performance of the shower head/handset and its associated feed pipe under the conditions specified in Table 1.

B.2 Apparatus

B.2.1 *A cold water supply system,* consisting of a water supply capable of delivering a flow of water at least 50 % in excess of the maximum flow rate of the shower head under test. The test apparatus shall be as shown in Figure 1 with the shower head venting directly to the atmosphere.

15 mm copper tube shall be used in the test apparatus and shall be in accordance with Table X of BS 2871-1:1971.

The radius of curvature to the centreline in bend R shall be 60 ± 10 mm.

B.3 Procedure for determination of minimum flow rate for spray pattern formation

B.3.1 Connect the test apparatus to the cold water supply.

B.3.2 Connect the shower head to be tested to the test apparatus and mount it so that the spray plate is horizontal. When blanking plates are provided these shall not be used in the test.

B.3.3 Open the stop valve and increase the flow rate through the shower head until the spray pattern formation is just established (see **2.10**).

B.3.4 Measure the flow rate.

B.3.5 Close the stop valve.

B.4 Procedure for determination of minimum flow at 0.1 bar

B.4.1 Open the stop valve and adjust the inlet pressure as registered on the manometer to 0.1 bar.

B.4.2 Measure the flow rate.

B.4.3 Close the stop valve.

Appendix C Method of measuring spray form

C.1 Principle

The principle of the test is to determine whether or not the shower head will deliver a spray of water to the specified requirements.

NOTE This test does not apply to fixed showers.

C.2 Apparatus

C.2.1 *A cold water supply system,* consisting of a water supply capable of delivering a flow of water at least 50 % in excess of the maximum flow rate of the shower head under test. The test apparatus shall be as shown in Figure 1 with the shower head venting directly to the atmosphere.

15 mm copper tube shall be used in the test apparatus and shall be in accordance with Table X of BS 2871-1:1971.

The radius of curvature to the centreline in bend R shall be 60 ± 10 mm.

C.2.2 *Annular gauge,* as shown in Figure 3.

C.3 Procedure

C.3.1 Connect the test apparatus to the cold water supply.

C.3.2 Connect the shower head to be tested to the test apparatus and mount it so that the spray plate is horizontal. When blanking plates are provided these shall not be used in the test.

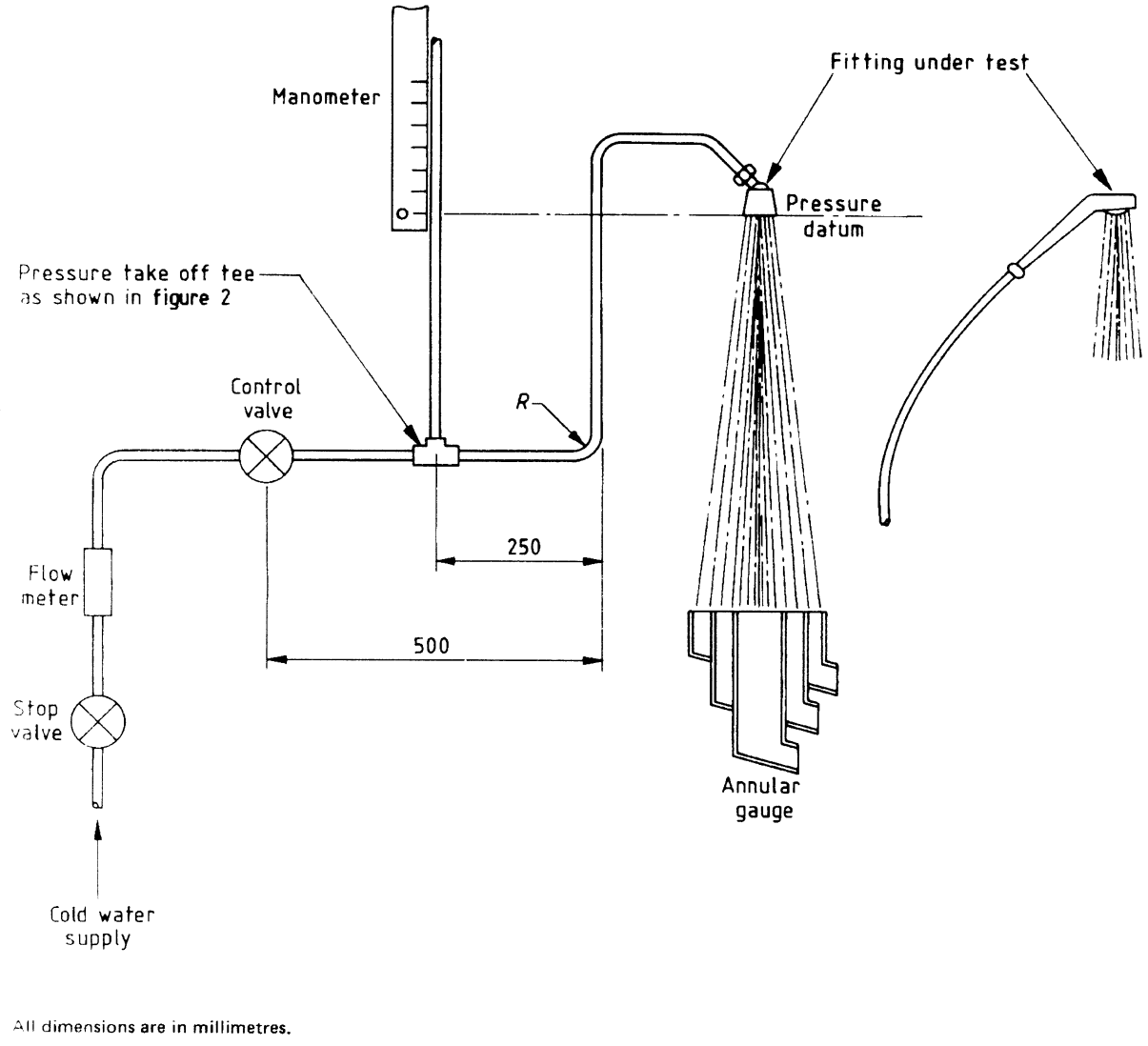
C.3.3 Place the annular gauge underneath the spray head so that the centreline of the spray plate and the centre cylinder are in vertical alignment.

C.3.4 Adjust the control valve to give a steady flow of 0.07 L/s for type 70 shower heads and 0.04 L/s for type 40 shower heads.

C.3.5 Adjust the vertical distance between the shower head and the annular gauge such that no water falls outside the outer ring.

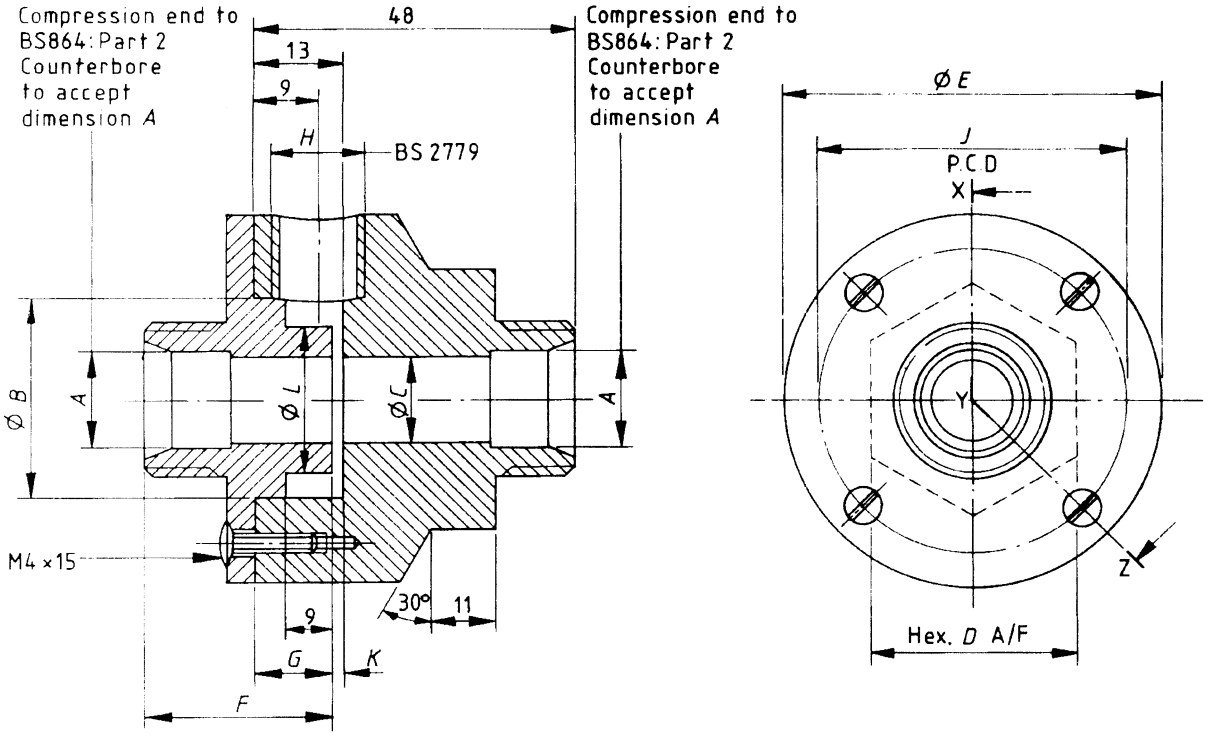
C.3.6 When the apparatus is set up as above, allow the water to run for a period of 60 s and collect the water flowing into the gauge. Then stop the flow as quickly as possible, preventing any excess water from pouring into the gauge.

C.3.7 Determine the amount of water supplied by the apparatus and the amount collected by each section of the gauge. The totals of the latter shall not differ by more than 5 % from the supplied volume.



All dimensions are in millimetres.

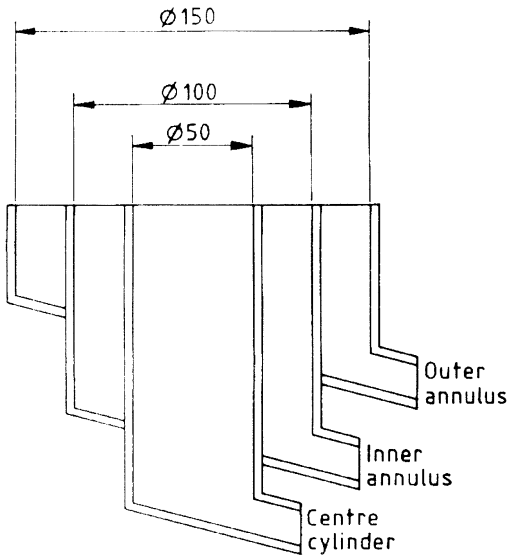
Figure 1 — Spray form test apparatus



NOTE The drawing is diagrammatic only.
All dimensions are in millimetres.

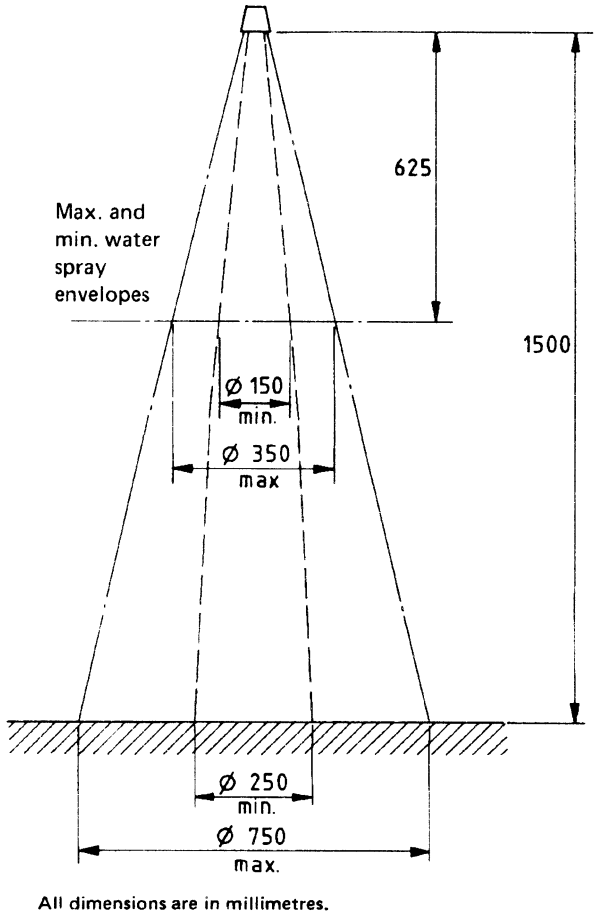
Size	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*J*	*K*	*L*
½	15	31	12.7	33	55	27	12.5	G¼	43	0.5	21

Figure 2 — Dimensions of pressure take-off tee



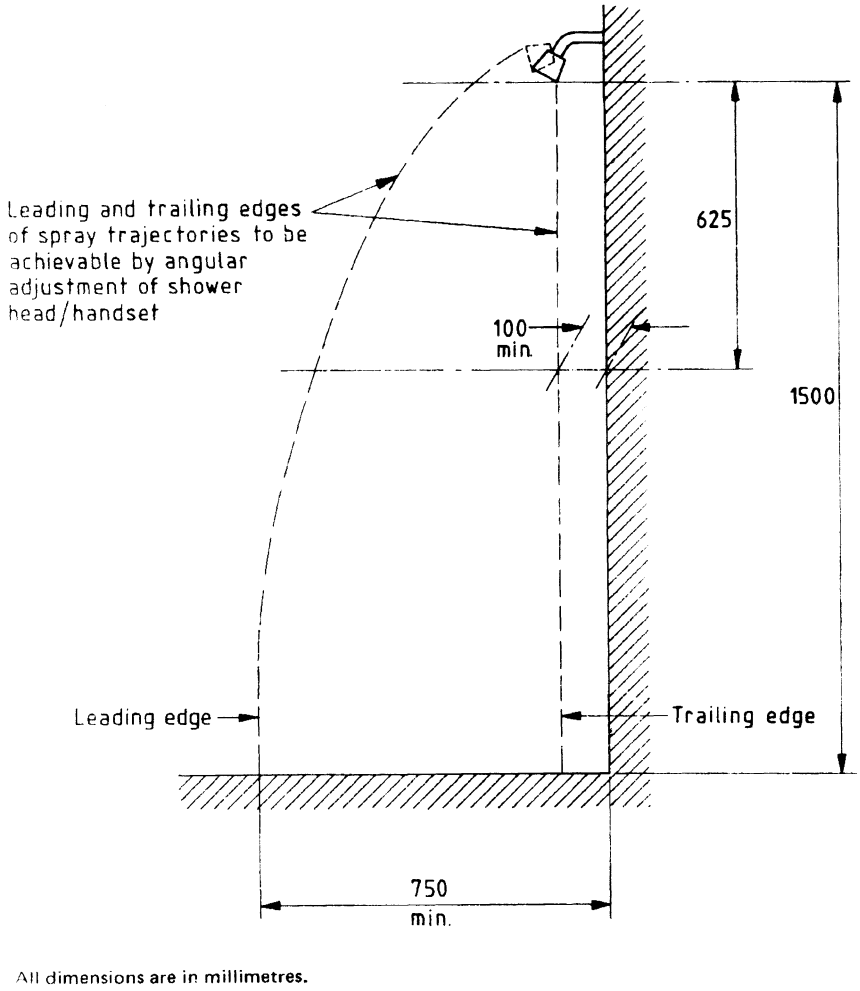
NOTE Walls of annular gauge to be not more than 1 mm thick.
All dimensions are in millimetres.

Figure 3 — Annular gauge



All dimensions are in millimetres.

Figure 4 — Shower head/handset spray trajectories



All dimensions are in millimetres.

Figure 5 — Angular adjustment of wetting area

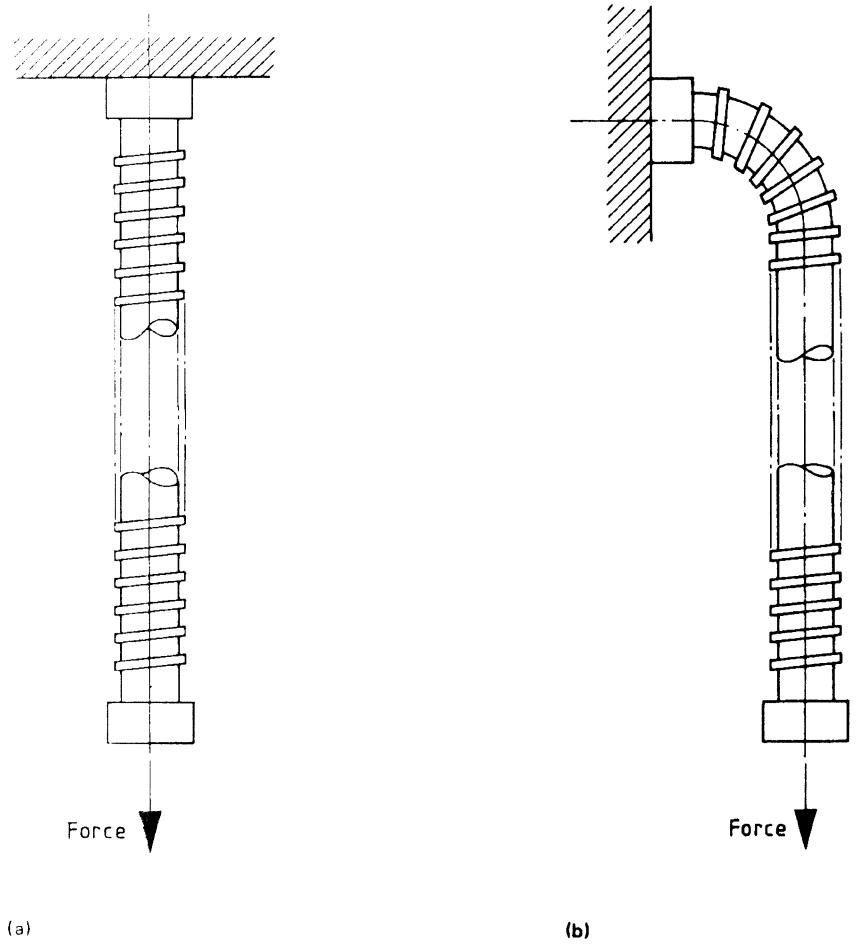


Figure 6 — Mechanical tests on flexible hoses

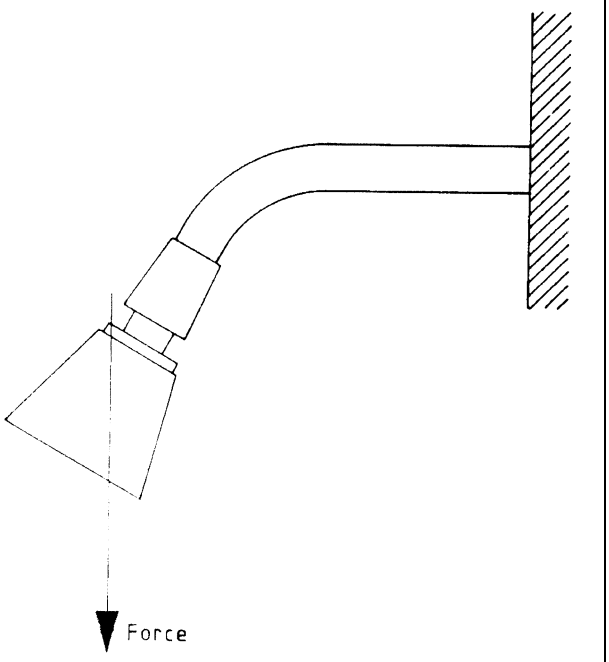


Figure 7 — Mechanical test on shower arms

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Publications referred to

BS 864, *Capillary and compression tube fittings of copper and copper alloy.*
BS 864-2, *Metric units.*
BS 1010, *Draw-off taps and stopvalves for water services (screwdown pattern).*
BS 1010-2, *Draw-off taps and above-ground stopvalves.*
BS 1224, *Electroplated coatings of nickel and chromium.*
BS 1415, *Mixing valves.*
BS 1415-1, *Non-thermostatic, non-compensating mixing valves.*
BS 2779, *Pipe threads where pressure-tight joints are not made on the threads.*
BS 2871, *Copper and copper alloys. Tubes.*
BS 2871-1, *Copper tubes for water, gas and sanitation.*
BS 4601, *Electroplated coatings of nickel plus chromium on plastics materials.*
BS 5412, *Specification for the performance of draw-off taps with metal bodies for water services.*
BS 5413, *Specification for the performance of draw-off taps with plastics bodies for water services.*
BS 6340, *Shower units.*
BS 6340-1, *Guide on choice of shower units and their components for use in private dwellings.*
BS 6340-2, *Specification for the installation of shower units*[5)].
BS 6340-3, *Specification for prefabricated shower enclosures*[6)].
BS 6340-5, *Specification for prefabricated shower trays made from acrylic material.*
BS 6340-6, *Specification for prefabricated shower trays made from porcelain enamelled cast iron.*
BS 6340-7, *Specification for prefabricated shower trays made from vitreous enamelled sheet steel.*
BS 6340-8, *Specification for prefabricated shower trays made from glazed ceramic*[6)].
DD 82, *Specification of requirements for suitability of materials for use in contact with water for human consumption with regard to their effect on the quality of water.*

[5)] Referred to in the foreword only.
[6)] In course of preparation.

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