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Specification for

Asbestos-cement rainwater goods

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The Asbestos and Asbestos-Cement Building Products Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- Asbestos Cement Manufacturers' Association*
- Concrete Society
- Department of the Environment*
- Department of the Environment — Building Research Establishment
- Incorporated Association of Architects and Surveyors
- Institution of Civil Engineers
- Institution of Municipal Engineers*
- Institution of Structural Engineers
- Modular Society
- National Federation of Builders' and Plumbers' Merchants*
- National Federation of Building Trades Employers
- National Federation of Roofing Contractors
- Royal Institute of British Architects*
- Royal Institution of Chartered Surveyors
- Royal Society of Health

The Government department and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- Association of Consulting Engineers
- Institution of Public Health Engineers
- Greater London Council

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Foreword

This British Standard has been prepared under the authority of the Asbestos and Asbestos-Cement Building Products Industry Standards Committee. It was first published in 1939 and revised in 1945, 1948, 1949, 1956 and 1967.

This revision is now issued in SI units in accordance with the change to the metric system in the construction industry. For further information on SI units reference should be made to BS 3763, *"The International System of units (SI)"* and PD 5686, *"The use of SI Units"*.

The recommendations prepared under technical committee B/94, "Modular Co-ordination in Building", for the metrication of pipe diameters have been embodied in this standard and, where appropriate, the terminology is in accordance with the definitions in BS 6100-1.5.1.

Asbestos-cement rainwater pipes are intended for external use only on industrial, agricultural and domestic buildings.

Gutter dimensions and jointing details refer to products using standard mastic jointing methods only. When supplied for use with synthetic rubber jointing systems, shape and dimensions may vary and manufacturers' catalogues should be consulted.

The test methods for rainwater pipes and fittings are in accordance with the recommendations contained in ISO Recommendations R 391, *"Building and sanitary pipes in asbestos-cement"* and R 392, *"Asbestos-cement pipe fittings for building and sanitary purposes"*. The methods for sampling and inspection contained in Appendix A are based on ISO Recommendation R 390, *"Sampling and inspection of asbestos-cement products"*.

The description of apparatus and procedures for the test of rainwater goods have been omitted from the standard as these are given in the appropriate sections of BS 4624, *"Methods of test for asbestos and asbestos-cement building products"*.

Ogee gutters have been discontinued and are not therefore included in this standard. In addition, the range of industrial gutters has been rationalized and sections other than those shown in the standard will only be available by arrangement with individual manufacturers. Demand having ceased for pipe "Y" pieces these have also been omitted as have double junctions which are no longer manufactured.

Designation of pipe bends and junctions and gutter angle pieces has been brought into line with that now being applied to pipes for drainage purposes in all British Standards.

Appendix B gives recommended methods of making joints and fixing.

The manufacture of all asbestos based products is covered by the requirements of the Asbestos Regulations 1969. Advice on how to comply with these regulations can be obtained from the manufacturers of the material, from the Asbestos Information Centre, St. Andrew's House, 22-28 High Street, Epsom, Surrey KT19 8AH or from the local area office of the Health and Safety Executive.

WARNING. Breathing asbestos dust is dangerous to health and precautions have to be taken during the manufacture and use of these products.

Particular note has to be taken of the Asbestos Products (Safety) Regulations 1985, made under the Consumer Safety Act 1978 and of the Asbestos (Prohibitions) Regulations 1985¹⁾ made under the Health and Safety at Work etc. Act 1974, which prohibit the supply of products containing amosite or crocidolite and set out requirements for the labelling of all products containing asbestos.

It is intended that the present Asbestos Regulations 1969 will be replaced by the Control of Asbestos at Work Regulations, made under the Health and Safety at Work etc. Act 1974. These will set out comprehensive provisions covering work activities involving exposure to asbestos.

¹⁾ Parallel regulations for Northern Ireland came into force on 6 March 1986.

Except for the Asbestos Regulations 1969 all the above legislation implements EEC Directives.

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 30, 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 Scope

This British Standard specifies requirements for asbestos-cement rainwater pipes, gutters and fittings for use on domestic, agricultural and industrial buildings, as follows:

- 1) rainwater pipes,
- 2) half-round gutters,
- 3) valley gutters,
- 4) boundary wall gutters,
- 5) box section gutters,

all complete with fittings and accessories.

NOTE 1 Gutter dimensions and jointing details refer to standard mastic jointing systems only. For details of synthetic rubber jointing systems and dimensions, manufacturers' catalogues should be consulted.

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

2 Composition

Asbestos-cement rainwater goods shall be made from a close and homogeneous mixture consisting essentially of a suitable inorganic hydraulic binder²⁾, asbestos fibre (except fibres of crocidolite and amosite which are not permitted) and water, and shall exclude any materials liable to cause ultimate deterioration in the quality of the pipes and fittings. They shall be left in their natural colour, or colouring matter complying with the requirements of BS 1014 shall be added in the composition.

NOTE They may also receive adherent coloured or uncoloured coatings on their surfaces.

3 Manufacture

The material used in the manufacture of pipes, gutters and fittings shall be intimately mixed by mechanical means. The finished goods shall be smooth and of good appearance. The ends of the pipes, gutters and fittings shall be finished square to their axes. They shall in all respects be sound, homogeneous and free from excrescences or other imperfections. The inner and outer surfaces of pipes and fittings shall be as nearly as practicable concentric.

4 Dimensions and tolerances

4.1 Nominal bores and work sizes. The nominal bore of a pipe or fitting shall be measured in terms of its internal diameter. The work size of a half-round gutter or gutter fitting shall be the measurement between internal edges on the top of the gutter or gutter fitting. The work size of valley, boundary and box gutters shall be the internal measurements shown in the appropriate figures.

4.2 Pipes

4.2.1 Spigots and sockets. The spigots and sockets of pipes shall conform to the dimensions given in Table 4 and be subject to the tolerances given in Table 1 with the exception that dimension *C* in Table 4 shall be the minimum permitted.

4.2.2 Effective length. The effective length of the pipe shall be its length exclusive of the internal depth of the socket. Unless otherwise specified, the standard lengths and tolerances shall be in accordance with Table 1.

4.3 Gutters

4.3.1 Spigots and sockets. The spigots and sockets of gutters shall conform to the dimensions given in the appropriate tables and figures and be subject to the tolerances in thickness and external dimensions given in Table 2.

4.3.2 Position of gutter sockets. All gutters having unequal sides shall be supplied with the socket at the lefthand end as seen when facing the moulded or the wider of the splayed sides.

4.3.3 Effective length. The effective length of the gutter shall be its length exclusive of the socket. Unless otherwise specified the standard length and tolerances shall be in accordance with Table 2.

4.4 Pipe and gutter fittings. The cross-sectional dimensions of pipe and gutter fittings shall conform to the dimensions of the corresponding parts of pipes and gutters and be subject to the tolerances given in Table 1 and Table 2.

²⁾ Cement complying with BS 12 satisfies this requirement.

Table 1 — Dimensional tolerances: pipes and pipe fittings

Nominal bore of pipe and fitting	Internal diameter permissible deviation (plus or minus) from nominal bore	Thickness of pipe and fitting	Permissible deviation (plus or minus) from thickness of pipes and fittings	Outside diameter (see Note)	Permissible deviation (plus or minus) from outside diameter	Length of pipe only	Permissible deviation from length of pipes only
mm	mm	mm	mm	mm	mm	mm	mm
50	3.0	6.0	1.0	62.0	3.0	1 800 2 400 and 3 000	+ 0 – 12
65		6.0	1.0	77.0			
75		7.5	1.0	90.0			
100		7.5	1.0	115.0			
150		9.0	1.5	168.0			

NOTE The sum of the permissible deviations on the nominal bore and on the thickness shall not exceed the limits of the outside diameter.

Table 2 — Dimensional tolerances: gutters and gutter fittings

Type of gutter	Work size of gutter or fitting	Thickness of gutter or fitting	Permissible deviation (plus or minus) from thickness	Permissible deviation (plus or minus) from internal dimensions	Effective length of gutter	Permissible deviation from length
	mm	mm	mm	mm	mm	mm
Half round	75	7.5	1.5	2.0	1 800	+ 0 − 12
	100	9.0		3.0		
	115	9.0				
	125	9.0				
	150	9.0				
	200	9.0				
Valley No. 1 pattern	406 × 127 × 254	12.0		5.0		
	457 × 127 × 152	12.0				
	610 × 152 × 229	12.0				
North light valley	457 × 152 × 102	12.0		5.0		
Boundary wall No. 1 pattern	279 × 127 × 178	9.0		3.0		
	305 × 152 × 229	12.0		5.0		
	457 × 152 × 305	12.0		5.0		
Boundary wall No. 2 pattern	559 × 152 × 406	12.0		5.0		
Box	127 × 152	9.0		3.0		
	305 × 203	12.0		5.0		
	381 × 127	12.0		5.0		

5 Bituminous coating

Pipes, gutters and fittings to be bituminous coated shall be dry, thoroughly cleaned, and then coated by being dipped in a bath containing a cold solution of bitumens in solvents with a suitable hardener.

Any pipe, gutter or fitting which is imperfectly coated or the coating of which does not set to give an elastic coating when dry, shall be recoated.

6 Test requirements

6.1 Straightness, regularity of thickness and diameter. The deviation of pipes and gutters from straightness shall be not more than 3 mm in any 600 mm and not more than 6 mm in any 1 800 mm or more than 10 mm in 3 000 mm when determined in accordance with the requirements of BS 4624. For permissible deviations in thickness and deviations from outside diameter and external dimensions, see Table 1 and Table 2.

6.2 Water-tightness. Pipes and fittings, when subjected to a soundness test of 40 kN/m² internal hydraulic pressure by the method described in BS 4624, shall not show any defects.

6.3 Bursting strength. The strength of the pipes shall be such that, when tested in the manner described in BS 4624, they shall have a minimum bursting strength of 2 500 kN/m².

6.4 Water absorption. The mean water absorption of pipes, gutters and fittings, when specimens are tested in the manner described in BS 4624, shall not exceed 30 % of the dry weight of the material.

6.5 Chemical resistance. The mean amount of acetic acid neutralized, when specimens selected from pipes, gutters and fittings are tested in the manner described in BS 4624, shall not exceed 0.115 g/cm².

7 Sampling and testing

7.1 The items in a consignment shall meet the requirements of Clauses 3, 4, 5 and 6. Specimens for testing for compliance with these requirements shall be selected by sampling in accordance with Appendix A.

7.2 If the purchaser requires the manufacturer to test the products in a particular consignment in accordance with Clause 6, this shall be stated in the enquiry and order. If tests are to be made in the presence of the purchaser or his representative this also shall be stated.

7.3 When the number of specimens required to be tested exceeds the numbers given in Table 3 the costs of such additional tests, unless otherwise specified, shall be borne:

- 1) by the manufacturer if the results show that the material does not comply with the requirements of this standard; or
- 2) by the purchaser if the results show that the material complies with the requirements of this standard. Independent tests may be carried out by agreement between the manufacturer and the purchaser.

8 Manufacturer's certificate

If requested by the purchaser the manufacturer shall provide a certificate of compliance with the standard.

9 Marking

Every pipe, gutter and fitting manufactured in compliance with this British Standard shall be marked legibly with the following:

- 1) the manufacturer's name or trade mark;
- 2) the number of this British Standard, i.e. BS 569.

Appendix A Method of sampling

A.1 Division of a consignment into inspection lots

A.1.1 Homogeneous consignments

- 1) Any homogeneous consignment (or sub-consignment, see A.1.2) shall be divided by the manufacturer into inspection lots, the maximum size of which is given under Table 3.
- 2) Any fraction of a consignment remaining after taking out the highest possible number of maximum inspection lots and any homogeneous consignment (or sub-consignment) smaller than the maximum lot size, form an inspection lot if larger than the minimum lot size, given under Table 3.
- 3) Consignments or fractions of consignments smaller than the minimum lot size given under Table 3 shall not be submitted to sampling and testing.

A.1.2 Non-homogeneous consignments. Any consignment which is known to be or is expected to be non-homogeneous as regards any of the properties to be tested by sampling shall be divided by the manufacturer into assumed homogeneous sub-consignments prior to the division into inspection lots as in A.1.1.

A.2 Sampling

A.2.1 From each inspection lot A.1.1 1) and A.1.1 2) the purchaser shall draw a sample, the size of which is indicated in Table 3 (A.2.2 and A.2.3).

A.2.2 The entry to Table 3 is the number of units of product in the inspection lot (column 1), the sample size being indicated in column 2.

A.2.3 For products where all units undergo a compulsory non-destructive test during the manufacture, the reduced sample size obtained by entering Table 3 at column 7 may be applied.

A.2.4 The reduction in sample size mentioned in A.2.3 is also permissible when the manufacturer guarantees or has his production guaranteed by an independent control organization.

A.2.5 When test pieces are cut from the units of the sample, the cutting shall be carried out by the manufacturer in the presence of the purchaser.

A.2.6 When more than one property is to be tested the sample size shall be appropriately multiplied so as to secure for each test a number of test pieces equal to the sample size A.2.2 and A.2.3. From one unit of a sample one test piece only shall be cut for a particular test, but for different tests the necessary test pieces may be cut from the same unit of the sample.

A.3 Determination of acceptability of inspection lots: inspection by attributes

A.3.1 When the number of non-conforming units found in the sample is equal to the acceptance number Ac_1 indicated in column 3 of Table 3, the inspection lot from which the sample was drawn should be considered acceptable.

A.3.2 When the number of non-conforming units found in the sample is equal to or greater than the rejection number Re_1 indicated in column 4 of Table 3, this justifies rejection of the inspection lot.

A.3.3 When the number of non-conforming units found in the sample lies between the acceptance number and the rejection number (columns 3 and 4 of Table 3), a second sample of the same size as the initial sample (A.2.2, A.2.3 and A.2.4) shall be drawn and examined.

A.3.4 The second sample shall be inspected as indicated in A.2.5 and A.2.6.

A.3.5 The number of non-conforming units found in the initial and in the second samples shall be totalled.

Table 3 — Sampling

1	2	3	4	5	6	7
Size of inspection lot	Sample size	Initial sample		Initial + second samples		Size of inspection lot for products tested during manufacture
		Acceptance number Ac_1	Rejection number Re_1	Acceptance number Ac_2	Rejection number Re_2	
400	4	0	2	1	2	400
401– 800	5	0	2	1	2	401– 800
801–1 500	7	0	2	1	2	801–1 500
1 501–3 000	10	0	2	2	3	1 501–3 000
	15	0	3	3	4	

NOTE Minimum inspection lot size = 400.
Maximum inspection lot size = 3 000.

A.3.6 If the total number of non-conforming units is equal to or less than the acceptance number Ac_2 indicated in column 5 of Table 3, the inspection lot should be considered acceptable.

A.3.7 If the total number of non-conforming units is equal to or greater than the second rejection number Re_2 indicated in column 6 of Table 3, this justifies rejection of the inspection lot.

A.3.8 When more than one property is to be tested, the second sample taken (**A.3.3**) shall only be inspected in accordance with those tests which at the inspection of the initial sample gave numbers of non-conforming units between the acceptance number Ac_1 and the rejection number Re_1 .

Appendix B Recommended methods of making joints and of fixing

B.1 Making joints

B.1.1 Pipes. It is not normal practice to seal joints of rainwater pipes fixed externally to buildings.

B.1.2 Gutters. Gutter joints should be made between spigot ends and sockets as shown in Figure 32. Where an alternative form of jointing is adopted utilizing a synthetic rubber jointing pad the recommendations of the manufacturers should be followed.

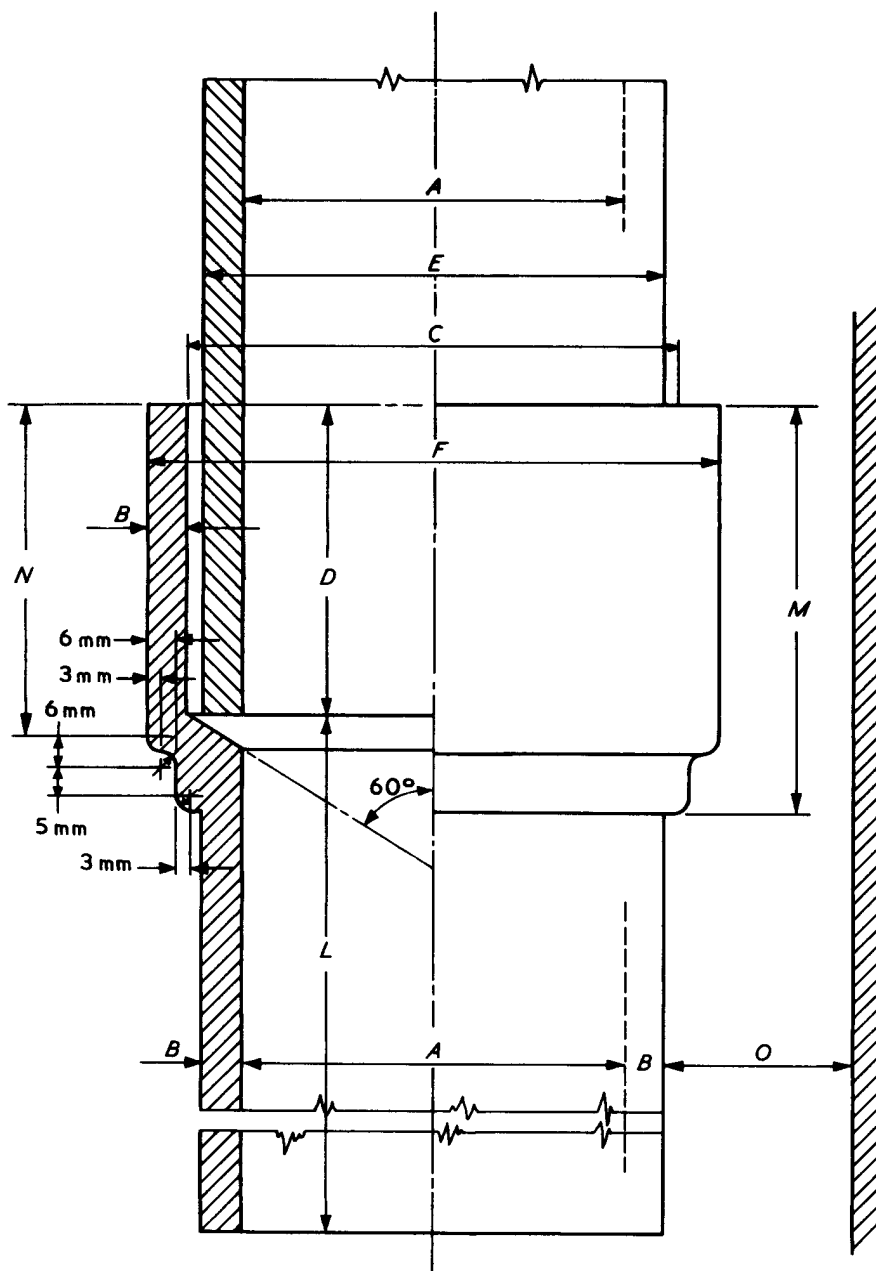
B.2 Fixing

B.2.1 Pipes. Where possible all pipes and fittings should be securely fixed to the walling material with a metal ring clip fitted below each socket to give a 38 mm offset from the wall. The type of fixing will depend on the walling material.

B.2.2 Gutters. Gutters should be supported by brackets fixed at centres not exceeding 900 mm. These should be so positioned that the socket end of each length of gutter is supported not more than 150 mm away from the socket. A fall in the gutter towards the outlet is desirable and a minimum of 1 in 500 is recommended.

NOTE If considerable amounts of cutting are required attention is drawn to the requirements of The Asbestos Regulations 1969 and The Asbestos Regulations (Northern Ireland) 1972.

Table 4 — Straight pipes



			Nominal bore, A				
			mm 50	mm 65	mm 75	mm 100	mm 150
Pipe	Outside diameter	E	62	77	90	115	168
	Thickness	B	6.0	6.0	7.5	7.5	9.0
	Standard length	L	1 800, 2 400 and 3 000 mm				
Socket	Internal depth	D	38	44	51	63	90
	Internal diameter (minimum)	C	70	82	98	124	178
	Outside diameter	F	82	94	113	139	196
	Thickness	B	6.0	6.0	7.5	7.5	9.0
	External depth	M	57	63	70	82	109
	Dimension to moulding	N	43	49	56	68	98
	Offset from wall	O	38	38	38	38	38