
Code of Practice for

Sheet roof and wall coverings

Part 16. Semi-rigid asbestos bitumen sheet
Metric units

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This Code of Practice represents a standard of good practice and takes the form of recommendations; compliance with it does not confer immunity from relevant statutory and legal requirements.

Foreword

This Part of CP 143, which has been designated Part 16, is the metric version of Part 8 which was published in imperial units in 1970.

This Part has been prepared as part of the change to the metric system and, while it is not a complete technical revision, the opportunity has been taken to introduce a new clause dealing with condensation. All reference to BS 3235 : 1964, 'Test methods for bitumen' has now been deleted and in its place reference is made to the following standards:

- BS 4688 Method for determination of flash point (open) and fire point of petroleum products by the Pensky-Martens apparatus
- BS 4690 Method for determination of solubility of bitumen
- BS 4691 Method for determination of penetration of bitumen
- BS 4692 Method for determination of softening point of bitumen (ring and ball)
- BS 4699 Method for determination of specific gravity and density of petroleum products (graduated bicapillary pycnometer method)
- BS 4707 Method for determination of loss on heating of bitumen and flux oil
- BS 4711 Method for determination of fluxing value of flux oil

Wherever it has been necessary to apply dimensional co-ordination, recommendations of Technical Committee B/94, set out in PD 6432, 'Recommendations for the co-ordination of dimensions in building. Arrangement of building components and assemblies within functional groups', have been reflected in this metric version.

For further information on dimensional co-ordination reference should be made to BS 4011, 'Recommendations for the co-ordination of dimensions in building. Basic sizes for building components and assemblies', BS 4330, 'Recommendations for the co-ordination of dimensions in building. Controlling dimensions', and PD 6444, 'Recommendations for the co-ordination of dimensions in building', Part 1, 'Basic spaces for structure, external envelope and internal sub-division'.

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1. General

1.1 Scope

This Part of the Code deals with semi-rigid asbestos bitumen sheet roof coverings (referred to as SRABS) and gives recommendations based on accepted good practice for laying fully supported semi-rigid asbestos bitumen sheet roofs using the roll cap and rib systems.

Recommendations are given for the whole of the roof covering above the upper surface of the constructional base for both flat and pitched roofs.

Flashing and gutters are dealt with in so far as they are integral parts of the roof covering.

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

1.2 Definitions

Generally the terms used throughout this Code have the meaning assigned to them in BS 2717, but for the purposes of this Code the following additional definitions apply:

(1) *Delaminated joint*. A joint made by splitting the thickness of a piece of the SRABS, interleaving it with another piece and sealing the two together to form an impervious joint.

NOTE. See Fig. 6.

(2) *Sealed lap joint*. A joint made by overlapping two pieces of SRABS and sealing them together to form an impervious joint.

NOTE. See Fig. 7.

(3) *Water check*. A wood roll or similar member projecting above the roof level at verges to stop water discharging over the roof edge.

1.3 Exchange of information and time schedule

1.3.1 The working drawings and specification should be prepared in sufficient detail to afford proper guidance in the preparation of estimates and the execution of the work. Where Bills of Quantities form part of the contract, they should be prepared in accordance with the Standard Method of Measurement of Building Works*.

1.3.2 There should be a full exchange of information between all concerned with the roofing and the work adjacent to it, in sufficient time to ensure that the covering can be carried out at the proper time and that all necessary provision for fixings has been made in advance. Roof covering should be completed before internal finishes are begun.

2. Materials and components

2.1 Semi-rigid asbestos bitumen sheet (SRABS)

This sheet is made up of a specified grade of bitumen, tested in accordance with the methods outlined in BS 4688, BS 4690, BS 4691, BS 4692, BS 4699, BS 4707, BS 4711, and asbestos fibre combined to form a dimensionally stable semi-rigid sheet of laminar construction of an approximate thickness of 2 mm.

* Published jointly by the Royal Institution of Chartered Surveyors and the National Federation of Building Trades Employers.

The standard sheet size for roofing work is 900 mm wide by 2400 mm long; purpose made sheets of other dimensions are obtainable.

2.2 Jointing compounds and adhesives

2.2.1 Jointing compound. There are four jointing compounds, referred to commercially as Nos. 1, 3, 4 and 20, suitable for use with SRABS. 1, 3 and 4 are manufactured from oxidized grades of petroleum bitumen and short asbestos fibre. When tested according to the ring and ball method outlined in BS 4692 the softening points are as given in Table 1.

Table 1. Jointing compounds

Commercial designation	Type	Form	Use
1	Hot melt R & B $127 \pm 4^\circ\text{C}$	Stick	For delaminated joints
3	Hot melt R & B $107 \pm 4^\circ\text{C}$	Block	For sealed lap and rib joints for roofs below 25° pitch
4	Hot melt R & B $118 \pm 4^\circ\text{C}$	Block	For sealed lap and rib joints for roofs at 25° pitch or steeper
20	Cold application R & B not applicable	Contained in tin or tube	For jointing chemically softened material

Jointing compound 20 is a solvent based bitumen jointing compound. It is for use with SRABS where rendered pliable with vapour from a chemical softening agent recommended by the manufacturer (see 3.2.1).

2.2.2 Adhesive. Adhesive 10 is a water based bitumen emulsion specially prepared for application in a prescribed area under each SRABS to reduce the development of sheet oscillation (see Fig. 15). It is supplied in airtight containers ready for immediate use and is applied cold. It should not be used when temperatures drop below 1°C and should be protected from direct rainfall until set.

The setting time of adhesive 10 is controlled by temperature, humidity and the moisture content of the roof deck. For example, the bond strength will not reach its maximum until the water content has dissipated. At a temperature of 18°C and humidity of 70 %r.h. on a dry decking it would be sufficiently set after 6 h to meet the conditions referred to in 3.12.

2.3 Ribbed strips

Shaped ribbed base and cover strips (see Fig. 4) are manufactured from 75 mm wide SRABS and supplied in pairs 2400 mm long in containers.

The base strip has a central upstanding rib and is factory pre-coated on its top surface with jointing compound 3. The cover strip has a central rib to fit over the rib on the base strip and is factory pre-coated on its bottom surface with jointing compound 3.

2.4 Roll capping

Square section roll capping (see Fig. 5) is manufactured from 120 mm wide SRABS and supplied in 900 mm lengths in containers.

2.5 Flashings, anchor strips, gutters, outlets, etc.

Flashings, anchor strips, gutters, outlets, etc. are normally cut and formed on site from the standard 900 mm by 2400 mm SRABS.

2.6 Nails

SRABS should be secured with extra large head galvanized, mild steel, copper or aluminium felt nails complying with BS 1202 and not less than 19 mm long.

2.7 Screws

Screws for fixing wood rolls should be corrosion resistant with countersunk heads and complying with the requirements of BS 1210.

Screws for fixing SRABS should be pan-headed and non-corrodible; if the head is less than 13 mm in diameter a non-corrodible rigid washer should be introduced under the head.

2.8 Tools and equipment

2.8.1 The following special items are required when using SRABS in the roll cap or rib system.

- (1) Knives for cutting and delaminating.
- (2) A propane gas torch for making joints and heating SRABS. For preparing, laying and lap jointing sheets torch a with a possible gas consumption of 3.5 kg/h should be used. A torch with a smaller consumption is more suitable when forming detailed flashings.
- (3) Wooden blocks for forming bends.
- (4) Purpose made irons for making delaminated joints and dotting over mechanical fixings.
- (5) A container for heating jointing compound 3 or 4.
- (6) A brush for applying hot jointing compound 3 or 4.
- (7) A flat iron for consolidating lap or rib joints.
- (8) A scraper for removing excess jointing compound when finishing the joint.
- (9) A small trowel for applying adhesive 10.

2.8.2 If the chemical softening process (see 3.2.1) is used, the following take the place of (2), (4), (5), (6), (7) and (8) in 2.8.1:

- (1) an airtight drum with a special dispenser in the lid to contain the chemical softening agent;
- (2) an applicator with a toothed edge for spreading jointing compound 20.

3. Design considerations

3.1 SRABS roofing systems

3.1.1 These systems are suitable for providing a weathertight covering to fully supported non-trafficked roof areas at any pitch above the recommended minimum (see 3.5 and 3.6), using either the roll cap or the rib system.

3.1.2 In the roll cap system the sheet sides are turned up against wood rolls, spaced to suit the sheet width. The rolls are covered with an independent capping which completes the joint. Weathering between ends of sheets is made either by means of drips or by sealed lap joints (see Figs. 1 and 2).

3.1.3 In the rib system the sheet sides are coated on the underneath with jointing compound and sealed to pre-coated ribbed base strips, spaced to suit the sheet width. The joint thus formed is completed by coating the top surface of sheet sides with jointing compound, and covering with pre-coated cover strips sealed to the sheets (see Fig. 3). Joints between ends of sheets are made by means of sealed lap joints.

3.2 Characteristics of semi-rigid asbestos bitumen sheet

3.2.1 At normal air temperatures SRABS is slightly flexible and when heated (optimum moulding temperature 180°C) or exposed to the vapours of a chemical softening agent it is rendered pliable for forming. The chemical softening process is regarded as more suitable for flashing work as it is not generally economical for the roll cap or rib systems of roofing.

3.2.2 Because of its comparatively light weight SRABS should be adequately secured. Along free edges it should be strengthened by a bead or welted edge.

3.2.3 One surface of SRABS is smooth and the other rough. It is advisable to expose the smooth surface to the weather due to its superior water shedding properties. It is initially black in colour, but on prolonged exposure to the atmosphere the surface bitumen becomes eroded exposing the uppermost asbestos fibres in the top lamination. The colour is thus changed to a stable matt grey.

3.3 Durability

3.3.1 SRABS roofs laid in accordance with the recommendations of this Code will provide a weathering equal to the life of the associated building materials. There is negligible effect from industrial or marine atmospheres under normal exposure conditions. Bitumen solvents, e.g. petroleum (wood preservatives containing coal tar derivatives), should not be allowed to remain in contact with SRABS surfaces.

3.4 Properties affecting design

3.4.1 Contact with substructure and other roofing materials. SRABS is not chemically affected by timber or concrete substructures or by water discharging from structures weathered with metal or wood.

3.4.2 Contact with wood preservatives. SRABS is not affected by wood preservatives when laid on pre-treated timber.

3.4.3 Provision for thermal movement. SRABS is slightly extensible and has a thermal expansion of 2.5 mm in 3 m for a temperature difference of 33 °C.

The roll cap system of laying allows for unrestricted differential movement at wood rolls, drips and abutments. The rib system is designed to confine differential movement within the boundaries of each individual sheet.

3.5 Roof pitch

Fully supported SRABS roofs should be pitched to provide adequate fall to ensure complete drainage; the fall should be not less than 40 mm in 2400 mm (1 in 64) on roofs in the roll cap system and 40 mm in 3000 mm (1 in 80) on roofs in the rib system.

There is no limitation to pitch above the minimum in either system providing variations in fixing techniques are adopted for steeper pitches (see 4.5 and 4.6).

3.6 Gutter fall

3.6.1 Fully supported SRABS gutters should provide adequate fall and outlets to ensure complete drainage. The fall should be not less than 40 mm in 2400 mm (1 in 64) where cross joints are formed as drips.

3.6.2 A gutter integral with a roll cap roof should be not less than 50 mm deep and of adequate width to accept water discharged into it without the risk of overflow.

3.7 Roof decks

3.7.1 General. The substructure should be designed in accordance with CP 3, Chapter V, Part 1, allowing for structural expansion, and be capable of supporting men working on it without permanent distortion or indentation under normal foot traffic.

3.7.2 Timber. All boarding should be seasoned, dry and of a minimum thickness of 25 mm (nominal) for plain edge boarding and 22 mm (nominal) for tongued and grooved boarding. The latter is to be preferred, as it minimizes cupping and warping. Plain edge boards should be laid either in the direction of slope or diagonally, especially on roofs of a low pitch, as boards laid across the slope may tend, on cupping, to prevent the free run-off of rain water.

3.7.3 Concrete. With the roll cap systems the wood rolls should be secured to the concrete by means of screws or nails driven into wooden dovetailed battens or plugs set into the concrete substructure. Alternatively, patent cartridge-fired nails may be used to secure the rolls provided the concrete will accept this form of fixing.

With the rib system, the ribbed base-strip and sheet should be secured to the concrete substructure by means of patent masonry nails with washers or with screws driven into plugs. Alternatively, dovetailed wooden battens set flush with the concrete may be used as a fixing ground.

Dovetailed batten and other wooden inserts should be pressure impregnated with a preservative in accordance with CP 98.

The concrete should be laid to even and correct falls and be provided with a smooth surface free from ridges and hollows. To obtain such a surface it is usually necessary to apply a sand : cement screed at least 25 mm thick. A screed of a minimum thickness of 25 mm should not be laid continuously but in areas not exceeding 9 m². The screed should be laid to falls as required, be finished with a wooden float and be free from ridges and indentation. The formation of cement-sand topping on aerated cement screeds is not recommended.

3.7.4 Alternative materials. Alternative types of material may be used provided they are in accordance with the following requirements.

- (1) The recommendations on roof loading in CP 3, Chapter V.
- (2) Screws and nails driven into the material for securing rolls, ribbed base-strip and sheet should be capable of supporting the permissible loads for Group 2 timbers laid down in CP 112. Alternatively, other forms of fastening may be used which provide equivalent anchorage.

Certain composition boards or slabs have been found to provide a satisfactory substructure. The methods of laying SRABS should be adopted to suit the properties of the particular type of material specified and collaboration between the roofing contractor and the manufacturer is desirable. The fixing, hot jointing, and dressing operations should be carried out without damaging the substructure.

3.8 Joints

3.8.1 Rolls. Rectangular wood rolls are used in the roll cap system to provide the means of weathering at sheet sides running with the fall of the roof and at hips and ridges.

3.8.2 Ribs. Specially shaped SRABS ribbed strips (see 2.3), are used in the rib system to provide the means of weathering at sheet sides running with the fall of the roof and at hips and ridges.

3.8.3 Cross joints. In the roll cap system, joints between ends of sheets are made by means of drips not less than 50 mm deep on roofs and gutters pitched at 10° or less, or they may be made by sealed lap joints at any pitch. In the rib system, joints between ends of sheets should always be made by means of sealed lap joints.

Sealed lap joints should be made as described in 4.4.2 so that water sheds away from the edge of the overlapping sheet.

3.9 Special features

When a pitched roof discharges directly on to a SRABS roof, this covering should be taken under the adjoining roof covering up the slope to provide an upstand equivalent to a vertical height of 150 mm. When a SRABS roof discharges over other roof surfaces a separate apron should be provided; the upper edge of the apron should be nailed to the fascia and weathered by the drip edge. The lower edge should be carried down the roof slope to provide a cover equivalent to the 150 mm vertical height.

3.10 Thermal insulation

The provision for thermal insulation should be made in the design of the substructure. SRABS readily absorbs solar heat; this absorption is reduced when the surface has changed colour to a matt grey. Where required, provision should be made for a white solar reflective treatment which should be compatible with bitumen.

3.11 Fire protection

When SRABS is used as a roof covering, the performance of the complete system should be determined by subjecting specimens to the test specified in BS 476 : Part 3. The data from the tests indicate that SRABS on combustible decks not less than 6 mm thick and on non-combustible decks would qualify for the designation 'AA'. Under the heating conditions produced in these tests no flow of bitumen occurs.