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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
95/3098
Product Sheet 1

FLAG-SOPREMA SBS MODIFIED BITUMEN MEMBRANES

SOPRALENE FLAM ROOF COVERING SYSTEMS

This Certificate relates to Sopralene FLAM Roof Covering Systems, for use as a loose-laid and ballasted, two-layer roof waterproofing system on flat roofs or a fully or partially bonded two-layer built-up roof waterproofing system on flat and pitched roofs with limited access.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Weathertightness — the membranes will resist the passage of moisture into the building (see section 5).

Properties in relation to fire — the membranes will enable a roof to be unrestricted under the Building Regulations (see section 6).

Resistance to wind uplift — the system will resist the effects of any likely wind suction acting on the roof (see section 7).

Resistance to foot traffic — the membranes will accept the limited foot traffic and loads associated with installation and maintenance (see section 8).

Durability — under normal service conditions the systems will provide a durable roof waterproofing with a service life in excess of 30 years (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the systems described herein. These systems have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 4 August 2011
Originally certificated on 28 March 1995

Simon Wroe
Head of Approvals — Materials

Greg Cooper
Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Sopralene FLAM Roof Covering Systems, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:

The Building Regulations 2010 (England and Wales)

Requirement:	**B4(2)**	**External fire spread**
Comment:		On suitable substructures the use of the systems will enable a roof to be unrestricted under the requirements of this Regulation. See sections 6.1 to 6.4 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The membranes, including joints, indicate that the systems meet this Requirement. See section 5.1 of this Certificate.
Requirement:	**Regulation 7**	**Materials and workmanship**
Comment:		The systems are acceptable. See section 10.1 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Fitness and durability of materials and workmanship**
Comment:		The use of the systems satisfies the requirement of this Regulation. See sections 9.1 to 9.3 and 10.1 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards — construction**
Standard:	2.8	Spread from neighbouring buildings
Comment:		The membranes when applied to a suitable substructure, are regarded as having low vulnerability under clause 2.8.1[(1)(2)] of this Standard. See sections 6.1, 6.2 and 6.4 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The membranes, including joints will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1[(1)(2)] and 3.10.7[(1)(2)]. See section 5.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The membranes can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	**12**	**Building standards — conversions**
Comment:		Comments made in relation to these systems under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1[(1)(2)] and Schedule 6[(1)(2)]. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	**B2**	**Fitness of materials and workmanship**
Comment:		The systems are acceptable. See section 10.1 and the *Installation* part of this Certificate.
Regulation:	**B3(2)**	**Suitability of certain materials**
Comment:		The systems are acceptable materials. See sections 9.1 to 9.3 of this Certificate.
Regulation:	**C4(b)**	**Resistance to ground moisture and weather**
Comment:		The membranes, including joints, indicate that the use of the systems can enable a roof to satisfy the requirements of this Regulation. See section 5.1 of this Certificate.
Regulation:	**E5(b)**	**External fire spread**
Comment:		On suitable substructures the use of the systems will be unrestricted by the requirements of this Regulation. See sections 6.1 to 6.4 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 *Description* (1.3) and 2 *Delivery and site handling* (2.3) of this Certificate.

Non-regulatory Information

NHBC Standards 2011

NHBC accepts the use of Sopralene FLAM Roof Covering Systems, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs and balconies*.

General

This Certificate is a Confirmation of French Avis Technique issued by Centre Scientifique et Technique du Bâtiment (CSTB) to Sopréma SAS, 14 rue Saint Nazaire, BP 121, FR-67025, Strasbourg, Cedex 1, France.

Technical Specification

1 Description

1.1 Sopralene FLAM Roof Covering Systems comprise:

- Sopralene FLAM 180 — a polyester (180 g·m^{-2}) reinforced, SBS modified bitumen sheet, finished on both surfaces with a thermofusible polyethylene film for torching, for use as a first layer or intermediate layer
- Sopralene FLAM S180-40 — a polyester (180 g·m^{-2}) reinforced, SBS modified bitumen sheet, finished with a sand upper surface and a thermofusible polyethylene film, for torching, on the underside, for use as a first layer, intermediate layer or as a top layer with additional protection
- Sopralene FLAM 180 A — a polyester (180 g·m^{-2}) reinforced SBS modified bitumen sheet, finished with a slate upper surface and a thermofusible polyethylene film, for torching, on the underside, for use as a cap sheet
- Sopralene FLAM 250 A — a polyester (250 g·m^{-2}), SBS modified bitumen sheet, finished with a slate upper surface and a thermofusible polyethylene film, for torching, on the underside, for use as a cap sheet.

1.2 The membranes are manufactured by saturating the reinforcement and coating with SBS modified bitumen. The finished products are surfaced with thermofusible polyethylene film, sand or slate as appropriate. The sheets are then cooled, trimmed and reeled.

1.3 The products are manufactured to the nominal dimensions given in Table 1.

Table 1 Nominal dimensions

Dimensions	Sopralene FLAM 180	Sopralene FLAM S180-40	Sopralene FLAM 180 A	Sopralene FLAM 250 A
Thickness (mm)	3.0	4.0	4.0	4.0
Width (m)	1.0	1.0	1.0[1]	1.0[1]
Length (m)	10.0	8.0	8.0	8.0
Mass per unit area (kg·m^{-2})	3.5	4.8	4.8	5.7
Roll weight (kg)	35	38	38	45

(1) Including selvedge.

1.4 The coating mass nominal characteristic properties are given in Table 2.

Table 2 Coating mass nominal characteristics

Property	Nominal value	
	Unaged	Heat aged[1]
Softening point (°C)	≥110	≥100
Low temperature flexibility (°C)	≤–20	≤–5
Elastic recovery (%)	≥200	≥25

(1) Heat aged for 180 days at 70°C.

1.5 The nominal physical characteristics of Sopralene FLAM 180 are given in Table 3.

Table 3 Nominal physical properties

Characteristic (units)	
Tensile strength (N per 50 mm)	
longitudinal	800
transverse	650
Elongation at break (%)	
longitudinal	40.0
transverse	50.0
Low temperature flexibility (°C)	–20

1.6 The slate chipping finish colours are:

- Matisse dark brown
- Veronese green
- Chagall light grey
- grey
- Gauguin red
- Cézanne light brown
- Van Gogh light ochre
- black.

1.7 Other products used with Sopralene FLAM systems include:

- Sopralene FLAM 180 ALU — a torch-on polyester (180 g·m^{-2}) reinforced, SBS modified bitumen sheet with an aluminium protected upper surface, for use as a flashing detail material or cap sheet
- Elastophene FLAM 70-25 — a glassfibre (50 g·m^{-2}) and polyester (70 g·m^{-2}) reinforced, SBS modified bitumen membrane, for use as a first layer
- Soprastick SAVB — a glassfibre/polyester composite reinforced, self-adhesive, SBS modified bitumen membrane, for use as a first layer
- Sopralast 50TV Alu or Copper — metal-faced/glass cloth reinforced bitumen membranes with aluminium or copper upper surface, for use for flashings or cap sheet
- Soprastick PVCL — a glassfibre/polyester composite reinforced, self-adhesive, SBS modified bitumen membrane, for use as a vapour control layer
- Sopravap Stick C15 — a self-adhesive, SBS modified bitumen membrane with an aluminium composite film, for use as a vapour control layer
- Sopravap Activa 1 — a SBS modified bitumen membrane with an aluminium composite film, with easy to activate strips alternating with non-stick lanes on the underside and a sand/talc upperside, for use as a vapour control layer in partially bonded systems
- Sopravap Activa 2 — a SBS modified bitumen membrane with an aluminium composite film, with easy to activate strips alternating with non-stick lanes on the underside and an upperside with strips for adhering insulation boards, for use as a vapour control layer in partially bonded systems
- Ventirock — a polyester fleece reinforced, bitumen torch membrane with easy to activate strips alternating with non-stick lanes on the underside for use in partially bonded systems
- Ventiglass — a glass fleece reinforced, bitumen torch membrane with easy to activate strips alternating with non-stick lanes on the underside for use in partially bonded systems
- Soprastick SI — a polyester fleece reinforced, bitumen self-adhesive membrane with self-adhesive strips alternating with non-stick lanes on the underside for use in partially bonded systems
- Sopradere Quick — a solvent-based bitumen primer for preparing substrates prior to application of waterproofing layer
- Aquadere — a solvent-free primer for preparing substrates prior to application of waterproofing layer
- Elastocol 500 Primer — a primer comprising an elastomeric bitumen in solvent for preparing substrates prior to application of waterproofing layer
- Elastocol 600 Primer — a primer comprising a elastomeric bitumen and resins in solvent for preparing substrates prior to application of waterproofing layer.

1.8 Quality control checks are carried out on the raw materials, during production and on the final product.

2 Delivery and site handling

2.1 The products are delivered to site in rolls wrapped in polythene and on pallets. The roll labels bear the product name, manufacturing company name and the BBA identification mark incorporating the number of this Certificate.

2.2 Individual rolls must be stored upright on the selvedge end, on a clean, smooth, level surface and kept under cover.

2.3 The ancillary items given in Table 4 are classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009* (CHIP4)/*Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009*. The products should be stored in accordance with *The Dangerous Substances and Explosive Atmospheres Regulations* 2002.

Table 4 Hazard information

Product	Hazard	Flashpoint (°C)
Sopradere Quick	Harmful, Flammable Dangerous to the environment	30
Elastocol 500 Primer	Harmful, Flammable	25
Elastocol 600 Primer	Harmful, Flammable	25

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Sopralene FLAM Roof Covering Systems.

Design Considerations

3 General

3.1 Sopralene FLAM Roof Covering Systems, are satisfactory for use as a loose-laid and ballasted two-layer waterproofing system, or a fully or partially bonded waterproofing for flat or pitched roofs with limited access, as part of a built-up specification and where necessary in conjunction with appropriate roofing felts to BS 8747 : 2007.

3.2 The slate finished membrane is suitable for use, where appropriate, as an exposed cap sheet or in detail work.

3.3 Limited access roofs are defined for the purpose of this Certificate as those roofs subjected only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc. Where traffic in excess of this is envisaged, additional protection to the membrane must be provided (see section 11.4).

3.4 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80. For design purposes, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc. Pitched roofs are defined for the purpose of this Certificate as those having a fall greater than 1:6.

3.5 Decks to which the systems are to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and, where appropriate, *NHBC Standards*, Chapter 7.1.

3.6 Insulation materials to be used in conjunction with the membranes must be in accordance with the Certificate holder's instructions and be either:

- as described in the relevant Clauses of BS 8217 : 2005, or
- the subject of a current BBA Certificate and be used in accordance with the scope of that Certificate.

4 Practicability of installation

The product is designed to be installed by a competent roofing contractor experienced with this type of product.

5 Weathertightness

5.1 The membranes, including joints, when completely sealed and consolidated will adequately resist the passage of moisture into the building and enable a roof to comply with the requirements of the national Building Regulations:

England and Wales — Approved Document C, Requirement C2(b), Section 6

Scotland — Mandatory Standard 3.10, clauses 3.10.1 and 3.10.7

Northern Ireland — Regulation C4(b).

5.2 The membranes are impervious to water and will achieve a weathertight roof capable of accepting minor structural movement.

6 Properties in relation to fire

6.1 When tested in accordance with BS 476-3 : 1958, a system comprising 18 mm thick chipboard deck, primed with Elastocol 500, one layer of Sopralene FLAM 180 fully torch bonded, one layer of Elastophene FLAM 25 AR as a fully torch bonded cap sheet, achieved an EXT.F.AB rating.

6.2 When used in a loose-laid and ballasted specification including a minimum surface finish of 50 mm of aggregate, shall be deemed to satisfy BS 476-3 : 2004 designation EXT.F.AA.

6.3 When used on flat roofs with one of the surface finishes defined in Part iii of Table A5 of Appendix A of The Building Regulations (England and Wales), or Technical Booklet E, Table 4.6, Part IV of The Building Regulations (Northern Ireland) (and listed below), the roof is deemed to be of designation AA.

Surface finishes

- bitumen-bedded stone chippings covering the whole surface to a depth of not less than 12.5 mm
- bitumen-bedded tiles of a non-combustible material
- sand and cement screed, or macadam.

6.4 The designation of other specifications should be confirmed by:

- *England and Wales* — Test or assessment in accordance with Approved Document B, Appendix A, Clause 1
- *Scotland* — Test to conform to Mandatory Standard 2.8, Clause 2.8.1
- *Northern Ireland* — Test or assessment by a UKAS accredited laboratory, or an independent consultant with appropriate experience.

7 Resistance to wind uplift

7.1 Results of tests indicate that the adhesion of bonded systems is sufficient to resist the effects of wind suction, thermal cycling or other minor structural movements likely to occur in service.

7.2 Where the membrane is bonded to insulation boards, the resistance to wind uplift will be dependent on the cohesive strength of the insulation and the method by which it is secured to the roof deck. This must be taken into account when selecting a suitable insulation material.

7.3 The ballast requirements for loose-laid systems should be calculated in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and the UK National Annex. The membrane should always be ballasted with a minimum depth of 50 mm of aggregate. In areas of high-wind exposure, the Certificate holder's advice should be sought. Alternatively, concrete slabs on suitable supports can be used.

8 Resistance to foot traffic

Results from tests indicate that the systems can accept the limited foot traffic and light concentrated loads associated with the installation and maintenance. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads. Where traffic in excess of this is envisaged, such as maintenance of lift equipment, additional protection to the membrane in accordance with the Certificate holder's instructions must be provided.

9 Maintenance

9.1 Systems must be the subject of annual inspections and maintenance to ensure continued performance.

9.2 Maintenance should include checks and operations to ensure the following where applicable:

- adequate ballast is in place and evenly distributed over the membrane
- protection layers are in good condition
- exposed membrane is free from the build-up of silt and other debris and unwanted vegetation are cleared.

9.3 Where damage has occurred then it should be repaired in accordance with section 13 and the Certificate holder's instructions.

10 Durability

10.1 Accelerated weathering tests and evidence from existing installations confirm that satisfactory retention of physical properties is achieved. Under normal conditions, the system will have a service life in excess of 30 years.

10.2 With the slate surfaced product, after some years, some localised loss of the slate surfacing may occur in areas where complex detailing of the roof design is incorporated.

Installation

11 General

11.1 Installation of Sopralene FLAM Roof Covering Systems must be carried out in accordance with the relevant Clauses of BS 8000-4 : 1989 and BS 8217 : 2005, the Certificate holder's instructions and this Certificate.

11.2 Substrates to which the membranes are applied must be sound, dry, clean and free from sharp projections such as nail heads and concrete nibs.

11.3 Installation should not be carried out during inclement weather (eg rain, fog, snow). When the temperature is below 5°C suitable precautions against surface condensation must be taken.

11.4 If the roof is likely to be subject to uncontrolled pedestrian access, the substructure must meet the requirements of BS 8217 : 2005, and to prevent damage to the roof covering one of the appropriate surface finishes referred to in Clause 6.12 of the Code must be used.

11.5 At falls in excess of 1:11, the provision for mechanical fixings as required by BS 8217 : 2005 should be observed.

11.6 On completion of the roof, the sanded finished membrane, when used as a top layer, may have a surface finish applied in accordance with BS 8217 : 2005, Clause 8.19. Surface finishes in the Code of Practice include:

- stone aggregate in dressing compound
- precast concrete paving slabs
- proprietary tiles on bonding compound.

11.7 When using the mineral surface finished membrane, further surface protection is not required when it is used on roofs with limited access.

12 Procedure

Fully-bonded applications

12.1 Bonding is achieved by melting the lower surface by torching and pressing the membrane down. Care must be taken not to overheat the coating.

12.2 Side and edge laps should be a minimum of 60 mm. A bead of molten material must exude from all laps to indicate a satisfactory seal.

12.3 A second layer of waterproofing is then fully torch bonded directly on to the first layer. The laps should be at least 60 mm and offset by at least 100 mm in relation to the joints in the first layer.

Partially-bonded applications

12.4 A layer of type 3G felt to BS 8747 : 2007, Annex C should be loose-laid edge to edge, over the substrate. It should be fully bonded with hot bitumen for a minimum of 500 mm around the perimeter and all upstands.

12.5 The intermediate layer is fully torch welded onto the perforated layer ensuring that the bitumen seeps regularly into the perforations.

12.6 A top layer or cap sheet is then fully torch bonded to the first layer, as described in section 12.3.

Loose-laid and ballasted

12.7 A separating layer should be loose-laid over the substrate, with free overlapping joints of at least 100 mm, and fully secured around the perimeter and upstands for a minimum distance of 450 mm.

12.8 A first layer of waterproofing is then loose-laid, with torch welded laps of 60 mm.

12.9 A top layer or cap sheet of waterproofing is then fully torch bonded directly on to the first layer. The lap should be offset as described in section 12.3.

12.10 A minimum 50 mm depth of aggregate should be loaded onto the roof covering. Where roofs are likely to be subject to uncontrolled pedestrian traffic, a concrete tile finish should be used.

12.11 Where concrete tiles are used, the waterproof system is first covered by a layer of sand into which the tiles are set. A separating layer may be used in place of the sand.

13 Repair

In the event of accidental damage, the sheets can be effectively repaired, after cleaning, with pieces of the membranes, torch welded to the damaged area.

Technical Investigations

14 Tests

The following tests were carried out by CSTB on the membranes, and the results assessed by the BBA:

- dimensional stability
- static indentation
- dynamic indentation
- peel strength from bitumen felt, concrete and wood
- peel strength from bitumen felt, concrete and wood after heat ageing
- wind uplift
- slippage
- tensile strength of joints, control, after heat ageing and after water soak.

15 Investigations

15.1 Factory visits were made to evaluate the manufacturing and quality control procedures employed in the manufacture of Sopralene FLAM Roof Covering Systems.

15.2 An evaluation was made of reports of fire tests to BS 476-3 : 1958.

15.3 Data in Avis Techniques 5/94-1065 and 5/09-2068 and CSTB test data, were evaluated in the context of UK roofing practice and Building Regulations.

15.4 Inspection visits to a number of existing sites at least 20 years old were conducted to assess the durability of the systems.

Bibliography

BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*
BS 476-3 : 2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*

BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*

BS 8747 : 2007 *Reinforced bitumen membranes (RBMs) for roofing — Guide to selection and specification*

BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Wind actions*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

16.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- remain covered by a valid French Agrément
- are reviewed by the BBA as and when it considers appropriate

16.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

16.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal.

16.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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