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**Agrément  
Certificate  
No 04/4089**

Designated by Government  
to issue  
European Technical  
Approvals

## FIRESMART SINGLE PLY ROOF WATERPROOFING MEMBRANE

Revêtement d'étanchéité  
Dachabdichtungen

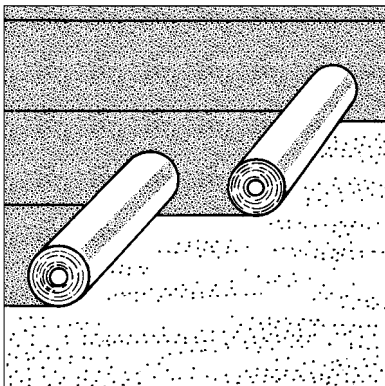
### Product

• THIS CERTIFICATE OF CONFIRMATION RELATES TO THE FIRESMART SINGLE PLY ROOF WATERPROOFING MEMBRANE, AN SBS-MODIFIED BITUMEN MEMBRANE WITH A POLYESTER COMPOSITE REINFORCEMENT WITH A MINERAL SURFACE FINISH FOR USE ON FLAT OR PITCHED ROOFS WITH LIMITED PEDESTRIAN ACCESS.

• The product is suitable on flat and pitched roofs with limited access for use as a mechanically-fixed, single-layer waterproofing system.


• The membrane should only be installed by operatives of approved contractors trained by the Certificate holder.

Confirmation of Avis Technique issued by the Centre Scientifique et Technique du Bâtiment (CSTB) to SiplastIcopal.



### Regulations

#### 1 The Building Regulations 2000 (as amended) (England and Wales)

 The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of roof waterproofing membrane with the Building Regulations. In the opinion of the BBA, the FireSmart Single Ply Roof Waterproofing Membrane, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: **B4(2)**

External fire spread

Comment:

Data obtained from tests to BS 476-3 : 1958 indicates that on suitable non-combustible substrates the use of the product will enable a roof to be unrestricted under this Requirement. See sections 11.1 and 11.2 of this Certificate.

Requirement: **C4**

Resistance to weather and ground moisture

Comment:

Data for water resistance of the membrane, including joints, indicate that the materials meet this Requirement. See section 8.1 of this Certificate.


Requirement: **Regulation 7**

Materials and workmanship

Comment:

The product comprises acceptable materials. See section 13.1 of this Certificate.

#### 2 The Building Standards (Scotland) Regulations 1990 (as amended)

 In the opinion of the BBA, the FireSmart Single Ply Roof Waterproofing Membrane, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

Regulation: **10**

Fitness of materials and workmanship

Standard: **B2.1**

Selection and use of materials, fittings, and components, and workmanship

Comment:

The product can contribute to a construction meeting this Standard. See the *Installation* part of this Certificate.

Standard: **B2.2**

Selection and use of materials, fittings, and components, and workmanship

Comment:

The product is an acceptable material. See section 13.1 of this Certificate.

Regulation: **12**

Structural fire precautions

Standard: **D9.1**

Fire spread from an adjoining building

Comment:

Data to BS 476-3 : 1958 indicate that on suitable substructures the use of the system will be unrestricted by the requirements of this Standard. See sections 11.1 and 11.2 of this Certificate.

Regulation: **17**

Resistance to moisture

Standard: **G3.1**

Resistance to precipitation — Resistance to precipitation

Comment:

Data examined for water resistance on the membrane, including joints, indicate that the use of the product can enable a roof to satisfy the requirements of this Standard. See section 8.1 of this Certificate.

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## 3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, the FireSmart Single Ply Roof Waterproofing Membrane, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The system comprises acceptable materials. See section 13.1 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		Data examined for water resistance of the membrane, including joints, indicate that the use of the system can enable a roof to satisfy the requirements of this Regulation. See section 8.1 of this Certificate.
Regulation:	E5	External fire spread
Comment:		Data obtained from tests to BS 476-3 : 1958 indicate that on suitable substructures the use of the system will enable a roof to be unrestricted under the requirements of this Regulation. See sections 11.1 and 11.2 of this Certificate.

## 4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See section: *5 Description (5.2).*

### 5 Description

5.1 The FireSmart Single Ply Roof Waterproofing Membrane is an SBS-modified bitumen with a polyester composite reinforcement (250 gm<sup>-2</sup>) and a mineral finish.

5.2 The membrane is manufactured with the nominal characteristics of:

thickness (mm)	4.5
width (m)	1.0
length (m)	7.0
roll weight (kg)	43

5.3 The standard product colour is slate grey, with a selection of other colours available to special order.

5.4 Ancillary items for use with the membrane include:

- Icopal Roof Edge Trims — preformed galvanized steel with a factory-applied membrane matching the FireSmart membrane for detailing
- Icopal Antrim Roof Edge Trims — available in GRP or aluminium finish
- Icopal SLM Insulation Board — a HCFC- and CFC-free, rigid polyurethane foam, faced with glass-fibre
- Icopal Foilboard Insulation Board — a HCFC- and CFC-free, rigid polyurethane foam, faced with aluminium foil-kraft
- a range of mechanical fixings and pressure plates for use with the membrane.

5.5 Quality control checks are carried out on the raw materials, the coating mass and the final product; checks include:

- softening point (ring and ball)
- penetration at 50°C
- dimensions
- filler content
- tensile strength and elongation at break
- low temperature flexibility
- heat resistance.

### 6 Delivery and site handling

6.1 The membrane is delivered to site in rolls with paper wrappings bearing the product name, manufacturing date, factory name and the BBA identification mark incorporating the number of this Certificate. The rolls are packed on pallets, 24 rolls a pallet, and shrunk wrapped in polyethylene.

6.2 Rolls should be stored on end on a clean, level surface, away from excessive heat and kept under cover.

### 7 General

7.1 The FireSmart Single Ply Roof Waterproofing Membrane is satisfactory for use on flat or pitched roofs with limited access as a mechanically-fixed, single-layer waterproofing.

7.2 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, special precautions, such as additional protection to the membrane, must be taken (see section 14.4).

7.3 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 in excess of 1:6.

7.4 Decks to which the membrane is to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 1994 and, where appropriate, NHBC Standards Chapter 7.1 or the Zurich Building Guarantees Technical Standards, page 234.

7.5 Insulation materials used in conjunction with the product must be:

- as described in the relevant clauses of BS 8217 : 1994, or
- the subject of a current BBA Certificate and be used in accordance with and within the limitations of that Certificate
- Icopal SLM or Icopal Foilboard insulation boards.

### 8 Weathertightness

8.1 Test data confirm that the membrane, and joints in the membrane, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of the building and so meet the requirements of the national Building Regulations, thus:

#### England and Wales

Approved Document C, Requirement C4, Section 5.1

#### Scotland

Standard G3.1, Regulation 17

#### Northern Ireland

Regulation C4.

8.2 The membrane is impervious to water and, when used in the system described, will achieve a

weathertight roof capable of accepting minor structural movements without damage.

## 9 Resistance to wind uplift

9.1 When the membrane is mechanically fixed, the number of fixings and their position will depend on:

- wind uplift forces to be resisted
- the pull-out strength of the fixing screws
- elastic limit of the membrane
- appropriate safety factors.

9.2 The number of fixings used should be established by reference to the wind uplift force calculated in accordance with BS 6399-2 : 1997 on the basis of a maximum permissible load per individual fixing of 0.5 kN.

## 10 Resistance to foot traffic

The membrane can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance operations. Where traffic in excess of this is envisaged, additional protection to the membrane in accordance with the Certificate holder's instructions must be provided. However, reasonable care should be taken to avoid puncture by sharp objects or concentrated loads.

## 11 Properties in relation to fire



11.1 When tested in accordance with BS 476-3 : 1958, a system comprising 19 mm thick exterior grade plywood, one layer of loose-laid polyethylene vapour control layer, a 50 mm thick polyisocyanurate insulation board with a mineralised glass tissue on the underside and a bitumenised glass/polypropylene fleece on the upperside loose-laid and the FireSmart Single Ply Roof Waterproofing Membrane, mechanically fastened to the plywood deck, achieved a rating of EXT.F.AA.

11.2 The designation of other specifications (eg on combustible substrates) should be confirmed by:

### *England and Wales*

test or assessment in accordance with Approved Document B, Appendix A, Clause 1

### *Scotland*

test to conform with Standard D9.1

### *Northern Ireland*

test or assessment by a UKAS accredited laboratory, or an independent consultant with appropriate experience.

11.3 The system described in section 11.1, when tested to prEN 1187 Test 1 achieved a zero spread of flame and penetration. Classification cannot be given as the interpretation document, at

time of issue of this Certificate, has not been published.

## 12 Maintenance

12.1 Roofs covered with the membrane should be the subject of annual inspections, as is good practice with waterproofing systems, to ensure continued security and product performance.

12.2 In the event of damage, the sheets can be effectively repaired after cleaning the surrounding area, with pieces of the membrane hot-air welded to the damaged area.

## 13 Durability



13.1 The FireSmart Single Ply Roof Waterproofing Membrane, when subjected to normal conditions of exposure and use, will retain its integrity for a period of at least 20 years.

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

## Installation

## 14 General

14.1 Deck surfaces must be dry, clean and free from sharp projections such as nail heads and concrete nibs.

14.2 Installation of the system is carried out in accordance with the manufacturer's instructions and the relevant clauses of BS 8000-4 : 1989, BS 8217 : 1994.

14.3 The membrane may be laid in conditions normal to roofing work and must not be laid in rain, snow or heavy fog, nor if the temperature falls below 5°C, unless precautions against condensation have been taken.

14.4 If the roof is likely to be subjected to uncontrolled pedestrian access, the substructure must meet the requirements of clause 8.3 of BS 8217 : 1994, and to prevent damage to the roof covering one of the appropriate surface finishes referred to in clauses 8.11 and 8.13 of the code must be used.

14.5 The membrane has a mineral surface finish, and when used on roofs with limited access, does not require further surface protection.

14.6 The roofing layers must always be installed with staggered overlaps and in such a manner that no counter-seams in the direction of outlets are made.

## 15 Procedure

15.1 Mechanical fasteners should be installed 40 mm from the edge of the membrane, within the

lap, along the line marked on the selvedge. The fasteners should be at centres suited to the wind uplift requirements, with a minimum requirement of fasteners at 300 mm centres.

15.2 Side and end laps should be a minimum of 120 mm. Laps are sealed by FireSmart flame-free hot-gas welding. An uninterrupted bitumen bead should exude from all laps to indicate a satisfactory seal.

15.3 Hot-gas welding can be used as an alternative to mechanically fastened membrane, however, this method of installation is outside the scope of this Certificate.

15.4 The type of mechanical fixings used will vary according to the type of deck and insulation used. Further advice is provided by the Certificate holder.

## Technical Investigations

The following is a summary of the technical investigations carried out on the FireSmart Single Ply Roof Waterproofing Membrane.

### 16 Tests

16.1 Samples of the membrane were obtained from the manufacturer for testing. The results of the tests carried out by or on behalf of CSTB and the BBA, which are typical values of the material, are given in Table 1.

Table 1 Service performance

Test (units)	Method <sup>(1)</sup>	Mean result
Water vapour permeability (gm <sup>-2</sup> day <sup>-1</sup> )	BS 3177 (25°C/75% RH)	0.239
Water vapour resistance (MNsg <sup>-1</sup> )	BS 3177 (25°C/75% RH)	859
Wind uplift load per fixing (N) <sup>(2)</sup>	MOAT No 55 : 4.22	1000
Corrected load per fixing (N)	MOAT No 55 : 5.1	540
Low temperature flexibility (°C)	MOAT No 27 : 5.4.2	-20
Heat resistance (°C)	MOAT No 31 : 6E	≥100
Dimensional stability (%)	MOAT No 27 : 5.1.6	≤0.3
Static loading perlite EPS	NFP 84 352 <sup>(3)</sup>	L <sub>4</sub> L <sub>4</sub>

- (1) The test documents are detailed in the *Bibliography*. The numbers/letters after the reference to MOAT Nos 27, 31 and 55 are referring to the specific section within that document.
- (2) FireSmart and 100 mm of mineral wool insulation mechanically fastened to a profiled steel roofing deck.
- (3) The ratings in NFP 84 352 : 1988 are equivalent to ratings given by the UEAtc static loading test in MOAT No 27.

16.2 Additional tests were carried out on FireSmart and other similar Icopal materials, by or on behalf of CSTB, including:

- dimensions
- tensile strength
- elongation
- tear strength.

### 17 Investigations

17.1 A factory visit was made to examine the manufacturing process and quality control procedures.

17.2 An examination was made of reports of fire tests carried out to BS 476-3 : 1958 and prEN 1187 Test 1.

17.3 A site in progress visit was made to examine detailing procedures.

## Bibliography

BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*

BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

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

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

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

BS 8217 : 1994 *Code of practice for built-up felt roofing*

prEN 1187 *Test methods for external fire exposure to roofs*

MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*

MOAT No 31 : 1984 *Special Directives for the Assessment of Reinforced Homogeneous Waterproof Coverings of Styrene-Butadiene-Styrene (SBS) Elastomer Bitumen*

MOAT No 55 : 1991 *UEAtc Supplementary guide for the assessment of mechanically fastened roof waterproofing*

NFP 84 352 : 1988 *Étanchéité — Revêtements d'étanchéité — Essai de poinçonnement statique*

## Conditions of Certification

### 18 Conditions

18.1 This Certificate:

- (a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;
- (b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;
- (c) is valid only within the UK;
- (d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (e) is copyright of the BBA;
- (f) is subject to English law.

18.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

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

- (a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) remain covered by a valid French Agrément; and

(c) are reviewed by the BBA as and when it considers appropriate.

18.4 In granting this Certificate, the BBA is not responsible for:

- (a) the presence or absence of any patent or similar rights subsisting in the product or any other product;
- (b) the right of the Certificate holder to market, supply, install or maintain the product; and
- (c) the nature or standard of individual installations of the product or any maintenance thereto, including methods and workmanship.

18.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.



In the opinion of the British Board of Agrément, the FireSmart Single Ply Roof Waterproofing Membrane is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 04/4089 is accordingly awarded to Icopal (UK) Ltd.

On behalf of the British Board of Agrément

Date of issue: 15th March 2004

Chief Executive

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**British Board of Agrément**

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Certificate, including validity and  
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