

## Icopal Ltd

Barton Dock Road  
Stretford  
Manchester M32 0YL

Tel: 0161 865 4444 Fax: 0161 865 8433

e-mail: [info.uk@icopal.com](mailto:info.uk@icopal.com)

website: [www.icopal.co.uk](http://www.icopal.co.uk)



**Agrément Certificate**

**17/5437**

Product Sheet 2

### ICOPAL UNIVERSAL ROOF WATERPROOFING MEMBRANES

### UNIVERSAL WS AND UNIVERSAL SA MEMBRANES FOR ROOF GARDEN AND GREEN ROOF SYSTEMS

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Universal WS and Universal SA Membranes, polyester/glass reinforced, polyolefin copolymer binder (POCB) membranes for use in green roof waterproofing applications on flat or pitched roofs with limited access, or on roof garden waterproofing on flat roofs.

(1) Hereinafter referred to as 'Certificate'.

#### 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 products will resist the passage of moisture into the building (see section 6).

**Behaviour in relation to fire** — the products can enable a roof to be unrestricted under the national Building Regulations (see section 7).

**Resistance to wind uplift** — resistance to wind uplift is dependent on the top layers of the roof garden or green roof specification (see section 8).

**Resistance to mechanical damage** — the products will accept the limited foot traffic and loads associated with installation and maintenance (see section 9).

**Resistance to penetration of roots** — the membranes will resist the penetration of roots (see section 10).

**Durability** — under normal service conditions, the products will provide a durable roof waterproofing with a service life of in excess of 20 years (see section 12).



The BBA has awarded this Certificate to the company named above for the products described herein. These products 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: 15 September 2017

John Albon – Head of Approvals  
Construction Products

Claire Curtis-Thomas  
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](http://www.bbacerts.co.uk)  
Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

**British Board of Agrément**

Bucknalls Lane  
Watford  
Herts WD25 9BA

tel: 01923 665300

fax: 01923 665301

[clientservices@bbacerts.co.uk](mailto:clientservices@bbacerts.co.uk)

[www.bbacerts.co.uk](http://www.bbacerts.co.uk)

©2017

## Regulations

In the opinion of the BBA, Universal WS and Universal SA Membranes for roof garden and green roof systems, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



### The Building Regulations 2010 (England and Wales) (as amended)

<b>Requirement:</b>	<b>B4(2)</b>	<b>External fire spread</b>
Comment:		When used in irrigated roof gardens or green roofs, the use of the products can enable a roof to be unrestricted under this Requirement. See sections 7.1 to 7.3 of this Certificate.
<b>Requirement:</b>	<b>C2(b)</b>	<b>Resistance to moisture</b>
Comment:		The products, including joints, will enable a roof to satisfy this Requirement. See section 6.1 of this Certificate.
<b>Regulation:</b>	<b>7</b>	<b>Materials and workmanship</b>
Comment:		The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.



### The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b>	<b>8(1)(2)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:		Use of the products satisfies the requirements of this Regulation. See sections 11 and 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	2.8	Spread from neighbouring buildings
Comment:		When used in irrigated roof gardens or green roofs, the membranes are regarded as having low vulnerability, with reference to clause 2.8.1 <sup>(1)(2)</sup> . See sections 7.1 and 7.3 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 <sup>(1)(2)</sup> and 3.10.7 <sup>(1)(2)</sup> . See section 6.1 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The products 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.
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
Comment:		Comments in relation to the products under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



### The Building Regulations (Northern Ireland) 2012 (as amended)

<b>Regulation:</b>	<b>23(a)(i)</b>	<b>Fitness of materials and workmanship</b>
Comment:	<b>(iii)(b)(i)</b>	The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>28(b)</b>	<b>Resistance to moisture and weather</b>
Comment:		The membranes, including joints, can enable a roof to satisfy the requirements of this Regulation. See section 6.1 of this Certificate.

**Regulation:** 34(b) External fire spread

**Comment:** When used in irrigated roof gardens or green roofs, the use of the membranes will be unrestricted under the requirements of this Regulation. See sections 7.1 to 7.3 of this Certificate.

## Construction (Design and Management) Regulations 2015 Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.2) and 3 *Delivery and site handling* (3.3) of this Certificate.

### Additional Information

#### NHBC Standards 2017

In the opinion of the BBA, Universal WS and Universal SA Membranes for roof garden and green roof systems, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 7.1 *Flat roofs and balconies* and 7.2 *Pitched roofs*.

#### CE marking

The Certificate holder has taken the responsibility of CE marking the products, in accordance with harmonised European Standard EN 13707 : 2013. An asterisk (\*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

### Technical Specification

#### 1 Description

1.1 Universal WS and Universal SA Membranes for roof garden and green roof systems comprise:

- Universal WS membrane — a polyolefin bitumen binder (POCB) membrane with root retardant additives, reinforced with polyester/glass scrim (250 gm<sup>-2</sup>) finished with polypropylene fleece finish to the upper and lower surfaces
- Universal SA membrane — a POCB membrane, reinforced with polyester/glass scrim (250 gm<sup>-2</sup>) with a polypropylene fleece finishing on the top and heat activated self-adhesive bitumen with a polypropylene release film on the underside. For use as a cap sheet in detailing at roof perimeters and penetrations through the roof.

1.2 The membranes are manufactured to the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Universal WS	Universal SA
Roll width (m)	1	1
Roll length (m)	10	10
Roll weight (kg)	32	35
Mass per unit area (kg·m <sup>-2</sup> )	3.2	3.5
Tensile strength* (N per 50 mm)		
longitudinal direction	≥1000	≥1000
transverse direction	≥1000	≥1000
Elongation at break* (%)		
longitudinal direction	≥20	≥20
transverse direction	≥20	≥20
Tear resistance – nail (N)		
longitudinal direction	≥300	≥300
transverse direction	≥300	≥300
Resistance to cold bend* (C°)	≤20	≤20
Watertightness	Pass	Pass
Peel resistance of joints (N per 50mm)*	≥50	≥50
Shear resistance of joints (N per 50mm)*	≥800	≥800
Resistance to static loading (kg)*	>20	>20
Resistance to impact (mm)*	≥1250	≥1250
Surface finish		
upper	PP fleece	PP fleece
lower	PP fleece	PP film

1.3 Ancillary items necessary for installation of the membranes and included in this assessment are:

- Icopal TPM Membrane Adhesive — for use in bonding applications
- Icopal SA Primer — for priming to substrates
- Icopal Hose and Gun Cleaner — for cleaning spray equipment and to remove adhesive spillages from surfaces.

## 2 Manufacture

2.1 The membranes are manufactured by impregnating the reinforcement with a modified POCB coating. Both or one side are provided with a spunbonded PP fleece or removable PP film.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control being operated by the manufacturer are being maintained.

2.3 The management system of Icopal BV has been assessed and registered as meeting the requirements of EN ISO 9001 : 2008 by Kiwa NV (Certificate K74027/01).

## 3 Delivery and site handling

3.1 The membranes are delivered to site in roll form stood on end on pallets and covered by shrink-wrap bearing the Certificate holder's name and the BBA logo incorporating the number of this Certificate.

3.2 Rolls should be stored on end, upright on a clean level surface and not exposed to excessive heat.

3.3 The Certificate holder has taken the responsibility of classifying and labelling the products under the *CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheet(s).

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Universal WS and Universal SA Membranes for roof garden and green roof systems.

## Design Considerations

### 4 Use

4.1 Universal WS membrane is satisfactory for use as fully-bonded roof waterproofing applications in fully-adhered, loose-laid and ballasted, and inverted green roof applications including:

- pitched and flat green roofs (extensive planting)
- flat roofs in roof gardens (intensive planting).

4.2 Universal SA membrane is for use in completing detailing.

4.3 Limited access roofs are defined for the purpose of this Certificate as those subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters etc. Where traffic in excess of this is envisaged, special precautions, such as additional protection to the membrane, must be provided (see Section 9).

4.4 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80. Pitched roofs are defined as those having a fall in excess of 1:6. 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 and direction of falls.

4.5 Decks to which the membranes are to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and, where appropriate, *NHBC Standards 2017*, Chapter 7.1.

4.6 Insulation systems or materials used in conjunction with the membranes must be in accordance with the Certificate holder's instructions and be:

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

4.7 Recommendations for the design of green roofs and roof garden specifications are available within the latest edition of *The GRO Green Roof Code — Green Roof Code of Best Practice for the UK*.

4.8 The structural decks to which the membranes are to be applied must be suitable to transmit the dead and imposed loads experienced in service.

4.9 Imposed loads, dead loading and wind load specifications are to be calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003, BS EN 1991-1-4 : 2005 and their respective UK National Annexes.

4.10 The drainage system for both green roofs and roof gardens must be correctly designed, and provision made for access for maintenance purposes. Dead loads for green roofs and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.

### 5 Practicability of installation

Installation must be carried out only by installers trained and approved by the Certificate holder.

## 6 Weathertightness



6.1 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.

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

## 7 Behaviour in relation to fire



7.1 A roof incorporating the membranes will be unrestricted under the national Building Regulations in the following applications:

- a roof garden covered with a drainage layer of gravel 100 mm thick and a soil layer 300 mm thick
- an irrigated roof garden or green roof
- when protected by an inorganic covering (eg gravel or paving slabs) listed in the Annex of Commission Decision 2000/553/EC.



7.2 Exposed areas of the cap sheet, when used with one of the surface finishes detailed in Approved Document B, Appendix A, Table A5, part iii (England and Wales) and Technical Booklet E, Table 4.6, part iv (Northern Ireland) (listed below), would also be deemed to be unrestricted:

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



7.3 The designation of exposed areas of the cap sheet installed to 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.

7.4 If allowed to dry, plants used in a roof garden may allow flame spread across the roof. This should be taken into consideration when selecting suitable plants. Appropriate planting irrigation and/or protection must be applied to ensure that the overall fire-rating of the roof is not compromised.

## 8 Resistance to wind uplift

8.1 The membranes, when used in a suitable roof garden or green roof specification, will adequately resist the effects of wind uplift likely to occur in practice.

8.2 The soil used in intensive plantings should not be of a type that will be removed or become localised, owing to wind scour experienced on site.

8.3 It should be recognised that the type of plants used could significantly affect the expected wind loads experienced in service.

## 9 Resistance to mechanical damage

9.1 The membranes can accept the limited foot traffic and light concentrated loads associated with 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 for maintenance of lift equipment or pedestrian access, suitable protection must be provided, eg using concrete slabs supported on bearing pads.

9.2 Once the green roof or roof garden is installed, it can be regarded as a suitable protection for the membranes in use.

## 10 Resistance to penetration of roots

Results of root penetration resistance tests on the products, including joints, indicate that they are resistant to root penetration and can be used in a roof waterproofing system for roof gardens and green roofs.

## 11 Maintenance



Roofs should be inspected twice-yearly, in autumn after leaf fall and in spring to ensure that vegetation and other debris are cleared from the roof and drainage outlets are cleared. Guidance is available within the latest edition of *The GRO Green Roof Code — Green Roof Code of Best Practice for the UK*.

## 12 Durability



Exposed membranes will have a life in excess of 20 years. When fully protected and subjected to normal service conditions in roof garden and green roof specifications, the products can provide an effective barrier to the transmission of liquid water and water vapour for the design life of the roof in which they are incorporated.

## Installation

### 13 General

13.1 Installation of the membranes is carried out in accordance with the Certificate holder's instructions and the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989 and BS 8217 : 2005.

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

13.4 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.

13.5 The membranes must be installed with overlaps in the direction of the falls and in such a manner that water flows over the overlaps in the direction of the outlets and sealed using electric hot air equipment. A continuous 5 mm bead of bitumen must extrude from all overlaps and must be checked for security as work proceeds.

13.6 Soil or other bulk material should not be stored on one area of the roof prior to installation, to ensure that localised overloading does not occur.

### 14 Procedure

14.1 If required, the substrate is primed with Icopal SA Primer in accordance with the application instructions and allowed to dry thoroughly.

14.2 Bonding the Universal WS membrane is by Icopal T.P.M Membrane Adhesive applied in accordance with the Certificate holder's instructions.

14.3 The membrane must be set out as required and rolled back half way, ensuring the roll does not move.

14.4 Icopal T.P.M Membrane Adhesive is applied in 12 mm beads at 250 mm centres for roofs with normal exposure to wind uplift, or at 150 mm centres for roof perimeters or critical areas, or in accordance with the specific wind uplift calculations for the project.

14.5 The membrane must be turned up at upstands a minimum of 65 mm and sealed to the upstand using electric hot air equipment, creating a temporary seal, pending the final detail application.

14.6 Side overlaps must be a minimum of 130 mm and should follow the printed solid overlap guideline, end laps must be a minimum of 150 mm. All overlaps must be sealed using electric hot air equipment. A continuous 5 mm bead of bitumen must extrude from all overlaps and must be checked for security as work proceeds.

14.7 All end laps in adjacent sheets must be offset by a minimum of 500 mm to avoid a build-up of overlaps.

14.8 The specification above the waterproofing system should be of a suitable design, including a filter layer and drainage where required. In cases of doubt, the Certificate holder's advice should be sought.

### **Detailing**

14.9 Substrates such as masonry, concrete, plywood/OSB and metal must be primed with Icopal SA Bitumen Primer.

14.10 Universal SA membrane is used to complete detailing areas by gently heating the underside of the membrane using electric hot air equipment to activate the self-adhesive bitumen, having first removed the release film.

14.11 Universal SA membrane must be dressed at all upstands to a minimum of 150 mm above the finished roof level including any ballast, paving or soil applications. Side overlaps must be a minimum of 130 mm and should follow the printed solid overlap line on the membrane. A continuous 5 mm bead of bitumen must extrude from all overlaps and must be checked for security as work proceeds.

14.12 Universal SA membrane must be dressed onto the field area membrane a minimum of 150 mm and heat-welded to the field area membrane using electric hot air equipment. A continuous 5 mm bead of bitumen must extrude from all overlaps and must be checked for security as work proceeds. Terminations should be completed in accordance with the Certificate holder's instructions, and membranes installed over 200 mm should also be mechanically fixed.

## **15 Repair**

In the event of damage, repairs can be carried out by cleaning the area around the damage and applying a patch of the membrane in accordance with the Certificate holder's instructions.

## **Technical Investigations**

### **16 Tests**

16.1 An assessment was made on data to EN 13707 : 2013 in relation to:

- dimensions
- mass per unit area
- tensile strength and elongation at break
- foldability at low temperature
- effect of heat ageing
- effect of artificially ageing
- flow resistance at elevated temperature
- watertightness
- tear resistance
- dimensional stability
- resistance to root penetration.

16.2 Tests were carried out and the results assessed to determine:

- foldability at low temperatures on control and UV aged samples
- resistance to slippage
- de-lamination from the insulation board
- water vapour permeability
- peel resistance of joints
- shear resistance of joints
- resistance to dynamic and static indentation.



## 17 Investigations

The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

### Bibliography

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

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*

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 EN 1991-1-1 : 2002 *Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*

NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*

BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*

NA + A1 : 15 to BS EN 1991-1-3 : 2003 + A1 : 2015 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Snow loads*

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*

EN 13707: 2013 *Flexible sheets for waterproofing — Reinforced bitumen sheets for roof waterproofing — Definitions and characteristics*

EN ISO 9001: 2008 *Quality management systems — Requirements*

### 18 Conditions

18.1 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 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.

18.2 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.

18.3 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
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

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

18.5 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
- actual 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
- any claims by the manufacturer relating to CE marking.

18.6 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.