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Agrément Certificate  
**15/5229**  
Product Sheet 1

## ICOPAL POLYURETHANE LIQUID-APPLIED ROOF WATERPROOFING SYSTEMS

### ENVIROFLEX ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the Enviroflex Roof Waterproofing System, a single-part, liquid-applied modified polyurethane, for use in new and refurbishment works on flat and pitched roofs with limited and pedestrian access.

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

**Properties in relation to fire** — the system will enable a roof to be unrestricted under Building Regulations (see section 7).

**Adhesion** — the adhesion of the system is sufficient to resist the effects of any likely wind suction and the effects of thermal or other minor movement likely to occur in practice (see section 8).

**Slip resistance** — the system, when incorporating the anti-skid additive, has a satisfactory co-efficient of friction in wet and dry conditions to enable its use in pedestrian areas (see section 9).

**Resistance to mechanical damage** — the system will accept without damage the pedestrian traffic and loads associated with installation and maintenance (see section 10).

**Durability** — under normal service conditions, the system will provide a durable waterproof covering with a service life of at least 10 years (see section 12).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'John Albon'.

Date of First issue: 26 August 2015

John Albon — Head of Approvals  
Construction Products

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

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.*

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# Regulations

In the opinion of the BBA, the Enviroflex Roof Waterproofing System, 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> B4(2)	<b>External fire spread</b>
<b>Comment:</b>	On suitable substructures the use of the system will enable a roof to be unrestricted under this Requirement. See section 7 of this Certificate.
<b>Requirement:</b> C2(b)	<b>Resistance to moisture</b>
<b>Comment:</b>	The system will enable a roof to meet this Requirement. See section 6.1 of this Certificate.
<b>Regulation:</b> 7	<b>Materials and workmanship</b>
<b>Comment:</b>	The system is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.



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

<b>Regulation:</b> 8(1)(2)	<b>Durability, workmanship and fitness of materials</b>
<b>Comment:</b>	The system can contribute to a construction meeting this Regulation. See sections 11.1 and 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 9	<b>Building standards applicable to construction</b>
<b>Standard:</b> 2.8	<b>Spread from neighbouring buildings</b>
<b>Comment:</b>	The system, when applied to a suitable substrate, is regarded as having low vulnerability and will enable a roof to be unrestricted under this Standard, with reference to clause 2.8.1 <sup>(1)(2)</sup> . See section 7 of this Certificate.
<b>Standard:</b> 3.10	<b>Precipitation</b>
<b>Comment:</b>	The system 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.
<b>Standard:</b> 7.1(a)	<b>Statement of sustainability</b>
<b>Comment:</b>	The system 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> 12	<b>Building standards applicable to conversions</b>
<b>Comment:</b>	All comments given for the system 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> 23(a)(b)(i)	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>	The system is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 28(b)	<b>Resistance to moisture and weather</b>
<b>Comment:</b>	The system will enable a roof to satisfy the requirements of this Regulation. See section 6.1 of this Certificate.
<b>Regulation:</b> 36(b)	<b>External fire spread</b>
<b>Comment:</b>	On suitable substructures the use of the system will enable a roof to be unrestricted under the requirements of this Regulation. See section 7 of this Certificate.

## Construction (Design and Management) Regulations 2015

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

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

See sections: 1 *Description* (1.2 and 1.3), 3 *Delivery and site handling* (3.2, 3.3 and 3.4) and 14 *Precautions of* this Certificate.

# Additional Information

## NHBC Standards 2014

NHBC accepts the use of the Enviroflex Roof Waterproofing System, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Chapter 7.1 Flat roofs*.

## 1 Description

1.1 Enviroflex is a modified polyurethane liquid-applied roof waterproofing system which comprises the following components:

- Enviroflex Waterproof Coating — a single-part, moisture-triggered polyurethane waterproofing coating
- Sealoflex Reinforcing Fabric — a fine polyester mesh for system reinforcement
- Enviroflex Acrylic Primer — for the preparation of bitumen membranes and asphalt prior to the application of the system
- Enviroflex EP1 Primer — for the preparation of timber substrates prior to the application of the system
- Pyrobar Underlay — a heat-activated, polyester-reinforced, SBS modified bitumen membrane for use as a carrier membrane over insulation boards
- Enviroflex Standard Quartz — anti-skid additive for use in areas of pedestrian traffic.

1.2 The coating has the following nominal characteristics:

Specific gravity ( $\text{g}\cdot\text{cm}^{-3}$ ) 1.44

Flashpoint ( $^{\circ}\text{C}$ ) 39

Colour mid grey.

1.3 Pyrobar Underlay has the following nominal characteristics:

Thickness (mm) 4.0

Width (m) 1

Length (m) 10

Roll weight (kg) 0.

1.4 Also used with the system, and covered by BBA Certificate 09/4645, are:

- Micoral SK VCL — a heat-activated, self-adhesive, bitumen vapour control layer with a glass reinforcement and a PET/aluminium core
- Xtra-Seal SF Bitumen Primer — for priming the substrate prior to installation of the vapour control layer.

1.5 Enviroflex Wearcoat Clear is used as an encapsulation layer applied above the Enviroflex Standard Quartz anti-skid surface finish.

1.6 Also used with the system but outside the scope of this Certificate are:

- Thermazone Elastoboard F
- Thermazone Elastoboard H
- Thermazone Roofboard
- PUR Adhesive
- Joint Reinforcement.

## 2 Manufacture

2.1 The liquid components of the system are manufactured by a batch blending process.

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 operated by the manufacturer are being maintained.

## 3 Delivery and site handling

3.1 The resins are delivered to site in containers bearing the Certificate holder's details, product name, hazard labelling, transportation information, batch number and the BBA logo incorporating the number of this Certificate.

3.2 The components are delivered to site in the following forms:

Enviroflex Waterproof Coating 15 litre container

Sealoflex Reinforcing Fabric 1 m x 30 m, 0.3 m x 91.4 m, or 0.15 m x 91.4 m rolls

Enviroflex Acrylic Primer 4 or 20 litre container

Enviroflex EP1 Primer 4 or 20 litre container

Pyrobar Underlay 10 m roll

Enviroflex Standard Quartz 25 kg bag.

3.3 The resin and primer containers must be kept tightly sealed and must be stored in a cool, ventilated place, away from ignition sources and other chemicals. The resins will have a shelf life of 12 months when stored at temperatures between 0°C and 25°C. At higher temperatures the shelf-life will reduce progressively.

3.4 Enviroflex Waterproof Coating is classified under the *Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009* as 'harmful to aquatic life with long lasting effects', and bears the appropriate hazard warning labels.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Enviroflex Roof Waterproofing System.

### Design Considerations

#### 4 General

4.1 The Enviroflex Roof Waterproofing System is satisfactory for use as a roof waterproofing membrane on new and existing flat and pitched roofs with limited access.

4.2 The system, when used in combination with Enviroflex Standard Quartz and Enviroflex Wearcoat Clear, is satisfactory for use as a waterproofing membrane on balconies with pedestrian access and walkway areas on flat roofs.

4.3 The system is for use on the following substrates:

- concrete
- mastic asphalt
- metal
- reinforced bitumen membranes (including mineral surfaced)
- wood
- Thermazone Elastoboard F and Thermazone Elastoboard H
- insulation boards in conjunction with a carrier membrane.

4.4 Limited access roofs are defined for the purposes 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 or installation of Enviroflex Standard Quartz anti-skid surfacing, must be taken.

4.5 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 falls in excess of 1:6.

4.6 When designing flat roofs, 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.

4.7 Decks to which the product is to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and, where appropriate, *NHBC Standards 2014, Chapter 7.1 Flat roofs and balconies and 7.2 Pitched roofs.*

4.8 Insulation systems or materials used in conjunction with the system must be suitable for the specification and be either:

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

#### 5 Practicability of installation

The system should only be installed by contractors who have been trained and approved by the Certificate holder.

#### 6 Weathertightness



6.1 The system 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 system is impervious to water and, when used as described, will give a weathertight roofing capable of accepting minor movement without damage.

6.3 To achieve a weathertight coating it is essential that the application rate is as quoted in the Certificate holder's literature for the relevant system.

## 7 Properties in relation to fire

7.1 In the opinion of the BBA, a system comprising a 18 mm plywood substrate primed with Icopal SA Primer, Micoral SK VCL, a polyurethane adhesive, 120 mm thick polyisocyanurate insulation board, Pyrobar Underlay primed with Enviroflex Acrylic Primer, and the Enviroflex Waterproofing System reinforced with a 165 g·m<sup>-2</sup> polyester fleece can be classified as B<sub>ROOF</sub>(t4) in accordance with BS EN 13501-5 : 2005.

7.2 The designation of other specifications, eg when used 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 to Mandatory Standard 2.8, clause 2.8.1<sup>(1)(2)</sup>

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

**Northern Ireland** — test or assessment by a UKAS-accredited laboratory, or an independent consultant with appropriate experience.

## 8 Adhesion

8.1 The adhesion of the system to the substrates listed in section 4.3 of this Certificate is sufficient to resist the effects of any wind suction, elevated temperatures, thermal shock or minor movement likely to occur in practice.

8.2 Where the system is installed over carrier membranes on insulation, the resistance to wind uplift is dependent on the cohesive strength of the insulation.

## 9 Slip resistance

The system, when incorporating the anti-skid additive, has an improved slip resistance in wet conditions compared to the standard system and may be used in pedestrian access areas (see Table 2). Both systems are classified as having a low risk of slip, as defined in *The Assessment of Floor Slip Resistance — The UK Slip Resistance Group Guidelines; Issue 4, 2011*, in both dry and wet conditions.

Table 2 Pendulum Test Value (PTV)

System	Pendulum Test Value (PTV)		Coefficient of friction	
	Dry surface	Wet surface	Dry surface	Wet surface
Enviroflex	75	43	0.89	0.45
Enviroflex with Quartz	66	62	0.75	0.69

## 10 Resistance to mechanical damage

The system can accept, without damage, normal foot traffic and light concentrated loads associated with installation and maintenance, and pedestrian traffic. However, reasonable care should be taken to avoid puncture by sharp objects or concentrated loads (see Table 3). In cases of doubt advice is available from the Certificate holder.

Table 3 Dynamic and static indentation

Test	Result	Method
<b>Dynamic indentation</b>		EOTA TR 006
unaged:		
hard substrate <sup>(1)</sup> at 23°C	I <sub>3</sub>	
hard substrate <sup>(1)</sup> at -10°C	I <sub>3</sub>	
soft substrate <sup>(2)</sup> at 20°C	I <sub>3</sub>	
heat aged: <sup>(3)</sup>		
hard substrate <sup>(1)</sup> at -10°C	I <sub>3</sub>	
UV aged: <sup>(4)</sup>		
hard substrate <sup>(1)</sup> at -10°C	I <sub>3</sub>	
low temperature cure (0°C):		
hard substrate <sup>(1)</sup> at -10°C	I <sub>3</sub>	
high temperature cure (40°):		
hard substrate <sup>(1)</sup> at -10°C	I <sub>3</sub>	
<b>Static indentation</b>		EOTA TR 007
unaged:		
hard substrate <sup>(1)</sup> at 20°C	L <sub>4</sub>	
hard substrate <sup>(1)</sup> at 80°C	L <sub>4</sub>	
soft substrate <sup>(2)</sup> at 20°C	L <sub>4</sub>	
water exposure: <sup>(5)</sup>		
hard substrate <sup>(1)</sup>	L <sub>4</sub>	

(1) Steel substrate.

(2) Carrier membrane on PIR insulation.

(3) Heat aged at 70°C for 50 days.

(4) UV aged at 50°C for an exposure of 400 MJ·m<sup>-2</sup>.

(5) Water exposure at 60°C for 90 days.

## 11 Maintenance



11.1 The system should be the subject of annual inspections and roof drains should be kept clear, as is good practice with all membrane and liquid-applied flat roofing systems.

11.2 Any damage should be repaired in accordance with section 17 and the Certificate holder's instructions.

## 12 Durability



The system will achieve an initial life expectancy of at least 10 years.

# Installation

## 13 General

13.1 Installation of the Enviroflex Roof Waterproofing System must be carried out only by specialist roofing contractors trained and approved by the Certificate holder.

13.2 The system must be applied when the air and substrate temperatures are greater than 5°C and the substrate is 3°C above the dew-point. Special precautions may be necessary when temperatures exceed 35°C, as shown in the Certificate holder's Technical Data Sheets.

13.3 Detailing (eg at upstands), must be carried out in accordance with the Certificate holder's instructions.

## 14 Precautions

The Certificate holder's instructions and the relevant safety regulations for working procedures must be adhered to at all times. The following must be observed when disposing of the liquid components:

- the liquid components must not be released into the environment nor allowed to enter the waste drainage system
- content/containers must be disposed of at an approved waste-disposal plant.

## 15 Site and surface preparation

15.1 Substrates on which the systems are to be applied must be properly prepared in accordance with the Certificate holder's instructions.

15.2 Adhesion of the system will depend on the condition and cleanliness of the substrate, which must be visibly dry, sound and free from loose materials or contamination (eg moss or algae). Deck surfaces must be free from sharp projections, such as protruding fixing bolts or concrete nibs.

15.3 Damaged areas of substrate (eg broken fibre-cement sheets, blistered bitumen or roofing felt) must be removed, replaced or repaired.

15.4 The majority of contamination is removed from the substrate by scraping and/or sweeping. Any remaining contamination is removed by suitable means such as power washing, grit blasting or mechanical abrasion. The advice of the Certificate holder must be sought on approved detergents to remove oil and grease.

15.5 Any areas of fungal growth, algae, moss etc must be treated with a suitable biocidal wash prior to installation of the system.

15.6 When required, the substrate is primed with the appropriate primer, in accordance with the Certificate holder's instructions, at the coverage rate given in Table 4.

Table 4 Primer application rates

Primer	Substrate	Rate of coverage ( $\ell \cdot m^{-2}$ )
Enviroflex EP1 Primer	timber	0.15
Enviroflex Acrylic Primer	bitumen felt asphalt	0.3 0.3

## 16 Application

16.1 The Enviroflex Waterproof Coating is applied either by roller or brush.

16.2 The first layer of the coating is applied at a minimum coverage rate of 0.6  $kg \cdot m^{-2}$ .

16.3 The Sealoflex Reinforcing Fabric is applied into the wet first layer and the surface rolled to ensure elimination of trapped air and saturation of the mat. The next width of the fleece mat is laid ensuring a side lap of 50 mm over the previous mat.

16.4 Once the mat has been laid into the first layer a second layer of Enviroflex Waterproof Coating is applied at a minimum rate of 1.2  $kg \cdot m^{-2}$ .

16.5 Pot life and cure times will vary with ambient temperature and humidity conditions during installation. At 23°C and 50% RH, the open pot life is 2 to 3 hours; the container may be resealed for future use. The system is rainproof after 30 minutes. In cases of doubt the Certificate holder's advice should be sought.

16.6 For pedestrian access areas the Enviroflex Standard Quartz is applied by hand into the wet second layer. Sufficient granules are applied to ensure full embedment of the granules. Once the waterproofing has cured, the excess granules are swept off the surface.

16.7 Detailing and upstands are carried out in accordance with the Certificate holder's installation instructions.

## 17 Repair

The repair of minor damage to the system can be achieved effectively by cleaning back to the unweathered material and recoating the damaged area with the membrane at the total application rate stated in section 16.

## Technical Investigations

### 18 Tests

18.1 Tests were conducted on the Enviroflex Roof Waterproofing System and the results assessed to determine:

- watertightness
- tensile strength and elongation at break
- tensile bond strength on concrete, mastic asphalt, steel, bitumen felt, plywood and Thermazone Elastoboard F
- dynamic indentation at 23°C and -10°C on steel and at 20°C on PIR insulation with bonded bitumen carrier membrane and steel
- static indentation at 20°C on PIR insulation with bonded bitumen carrier membrane and at 20°C and 80°C on steel
- fatigue cycling
- coefficient of friction
- repeat tensile strength and dynamic indentation at -10°C after UV ageing or 400 MJ·m<sup>-2</sup> at 50°C
- repeat tensile strength, dynamic indentation at -10°C and fatigue cycling after heat ageing for 50 days at 80°C
- repeat tensile bond strength for all substrates and static indentation after water exposure for 90 days at 60°C
- the effect of application temperatures (repeat tensile strength and dynamic indentation at 23°C).

18.2 Infra-red characterisation tests on the resins were carried out for reference purposes.

### 19 Investigations

19.1 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.

19.2 Data on fire performance were evaluated.

## Bibliography

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

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

BS EN 13501-5 : 2005 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roof tests*

EOTA Technical Report TR-006 : May 2004 *Determination of the resistance to dynamic indentation*

EOTA Technical Report TR-007 : June 2003 *Determination of the resistance to static indentation*

## 20 Conditions

20.1 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.

20.2 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.

20.3 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.

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

20.5 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.

20.6 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.