

Icopal Limited

Barton Dock Road
Stretford
Manchester M32 0YL

Tel: 0161-865 4444 Fax: 0161-864 8433
e-mail: market.uk@icopal.com
website: www.icopal.co.uk



Agrément Certificate
91/2618
Product Sheet 3

ICOPAL POUR AND ROLL ROOF WATERPROOFING

PROFLEX ROOF WATERPROOFING SYSTEM

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Proflex Roof Waterproofing System, for use 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 system will resist the passage of moisture to the interior of the building (see section 5).

Resistance to water and water vapour — the vapour control layers provide an effective control to the passage of liquid water and water vapour (see section 6).

Properties in relation to fire — in the opinion of the BBA, the system, when used in a suitable specification, will enable a roof to be unrestricted under Building Regulations (see section 7).

Resistance to wind uplift — when correctly specified, the system will resist the effects of any wind suction likely to occur in practice (see section 8).

Resistance to foot traffic — the system will accept the limited foot traffic and loads associated with installation and maintenance of the system without damage (see section 9).

Durability — under normal service conditions the system will provide a durable waterproof covering with a service life of at least 20 years (see section 11).



The BBA has awarded this Agrément 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

Date of First issue: 11 February 2009

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

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
Garston, Watford
Herts WD25 9BA

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tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

Regulations

In the opinion of the BBA, the Proflex Roof Waterproofing System, 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 2000 (as amended) (England and Wales)

Requirement:	B4(2)	External fire spread
Comment:		Test data to BS 476-3 : 1958 indicate that on suitable non-combustible substructures the system will enable a roof to be unrestricted under this Requirement. See sections 7.1 to 7.3 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		Data for water resistance on the system, including joints, indicate that the system meets this Requirement. See section 5.1 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The vapour control layer can contribute to enabling a roof to satisfy the requirements of this Requirement. See section 6 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The system is acceptable. See section 11.1 and the <i>Installation</i> 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 system can satisfy the requirement of this Regulation. See sections 10 and 11.1 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	2.8	Spread from neighbouring buildings
Comment:		Test data to BS 476-3 : 1958 indicate that on suitable non-combustible substructures the use of the system will be regarded as having low vulnerability under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 7.1 and 7.3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Data for water resistance on the system, indicate that the use of the system 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:	3.15	Condensation
Comment:		The system can contribute to enabling a roof to satisfy this Standard, with reference to clauses 3.15.1 ⁽¹⁾ , 3.15.3 ⁽¹⁾ , 3.15.5 ⁽¹⁾ and 3.15.6 ⁽¹⁾ . See section 6 of this Certificate.
Regulation:	12	Building standards – conversions
Comment:		All comments given for this system under Regulation 9, 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 system is acceptable. See section 11.1 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The system is acceptable. See section 10 of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		Data for water resistance on the system indicate that the use of the product will enable a roof to satisfy the requirements of this Regulation. See section 5.1 of this Certificate.
Regulation:	C5	Condensation
Comment:		The system can contribute to enabling a roof to satisfy the requirements of this Regulation. See section 6 of this Certificate.
Regulation:	E5(b)	External fire spread
Comment:		Test data to BS 476-3 : 1958 indicate that on suitable non-combustible substructures the use of the system will be unrestricted by the requirements of this Regulation. See sections 7.1 to 7.3 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* (1.2) and 2 *Delivery and site handling* (2.3 and 2.4).

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of the Proflex Roof Waterproofing System, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.1, *Flat roofs and balconies*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, the Proflex Roof Waterproofing System, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual, Section 4 Superstructure, Sub-section Flat roofs.*

General

This Certificate relates to the Proflex Roof Waterproofing System, for use on flat and pitched roofs with limited access.

Technical Specification

1 Description

1.1 The Proflex Roof Waterproofing System consists of the following membranes:

- Proflex 180 High Performance Underlay – a polyester reinforced SBS modified bitumen membrane with a sand finish for use as a base/preparation layer, or intermediate layer
- Proflex 250 High Performance Underlay – a polyester reinforced SBS modified bitumen membrane with a sand finish for use as a base/preparation layer, intermediate layer or cap sheet with additional protection
- Proflex Pour and Roll Cap Sheet – a polyester reinforced SBS modified bitumen membrane with a mineral finish on the upper surface and a sand finish on the lower surface for use as cap sheet or in detail work.
- Proflex Vapour Control Layer – a polyester reinforced bitumen membrane with an aluminium core
- Proflex Perforated Preparation Layer – a glassfibre reinforced perforated bitumen membrane for use where appropriate for partially bonded systems
- Proflex Sanded Preparation Layer – a glassfibre reinforced bitumen membrane for use where appropriate for fully-bonded systems.

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

Table 1 Nominal characteristics of membrane

Characteristic (unit)	180 Underlay	250 Underlay	Cap sheet	VCL	Perforated Layer	Preparation Layer
Roll width (m)	1.0	1.0	1.0	1.0	1.0	1.0
Roll length (m)	16.0	16.0	8.0	20.0	10.0	20.0
Roll weight (kg)	36	40	38	40.0	26.0	36.0
Mass per unit area (kgm ⁻²)	2.3	2.5	4.8	2.0	2.6	1.8

1.3 The Proflex Pour and Roll Cap Sheet is also available in a Firesmart version with enhanced fire performance.

1.4 Other materials for use with the system include:

- Xtra-Seal SF Bitumen Primer, Xtra-Seal QD Bitumen Primer and Xtra-Seal Bitumen Primer — for use in preparation of masonry and roof substrates prior to the application of the waterproofing system
- Thermazone Insulation
- other materials, such as nails, of a quality used in established roofing practice.

1.5 The membranes are manufactured using conventional continuous bitumen coating techniques.

1.6 Quality control checks are carried out on the raw materials, coating mass and the final product. Checks on the final product include:

- weight
- length
- bitumen/polymer content
- weight of washed-out base
- filler content
- tensile strength
- elongation at break
- resistance to tear
- burst resistance.

2 Delivery and site handling

2.1 The membranes are delivered to site in rolls in printed wrappers bearing the product name, manufacturer's name and BBA identification mark incorporating the number of this Certificate.

2.2 Rolls should be stored upright on a clean, level surface, kept dry, away from excessive heat and kept under cover.

2.3 Xtra-Seal QD Bitumen Primer and Xtra-Seal Bitumen Primer have flashpoints of 25°C and 40°C respectively and must be stored away from ignition sources and extremes of temperature must also be avoided. These products are classified as 'flammable' and 'harmful' under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP3)* and should be handled accordingly.

2.4 Xtra-Seal SF Bitumen Primer is a solvent-free bitumen emulsion. The recommended storage temperature range is between 5°C and 35°C and must not be stored under 0°C.

Assessment and Technical Investigations

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

Design Considerations

3 General

3.1 The Proflex Roof Waterproofing System is suitable as 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 reinforced bitumen membranes to BS 8747 : 2007.

3.2 The mineral finished membranes are suitable for use, where appropriate, as cap sheets or in detail work.

3.3 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80. Pitched roofs are defined for the purpose of this Certificate as those having falls greater than 1:6.

3.4 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 and direction of falls.

3.5 Decks to which the system 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 Flat roofs and balconies* or the *Zurich Building Guarantee Technical Manual, Section 4, Superstructure, Sub-section Flat roofs* pages 268 to 270.


3.6 Insulation systems or materials used in conjunction with the product must be approved by the Certificate holder and must be either:

- supplied by the Certificate holder.
- 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 Practicability of installation

Installation of the Proflex Roof Waterproofing System must be carried out only by competent roofing contractors.

5 Weathertightness

 5.1 Data confirm that the membrane and joints in the system, 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 (see section 15, Tables for *Physical properties — general* and *Physical properties — directional*):

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

Scotland — Mandatory Standard 3.10, clauses 3.10.1⁽¹⁾⁽²⁾ and 3.10.7⁽¹⁾⁽²⁾


(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).


Northern Ireland — Regulation C4(b).

5.2 The membranes are impervious to water and when used in the systems described will give a weathertight roofing capable of accepting minor structural movements without damage. See section 15 (Table for *Physical properties — general*).


6 Resistance to water and water vapour

 The vapour control layer provides an effective control to the passage of liquid water and water vapour. See section 15 (Table for *Physical properties — general*).

7 Properties in relation to fire

 7.1 When tested in accordance with BS 476-3 : 1958, a system comprising:

- an 18 mm chipboard substrate, a layer of a 125 gm⁻² polyester reinforced SBS modified bitumen sheet and a layer of Proflex Pour and Roll Cap Sheet, both fully bonded in bitumen achieved an EXT.F.AC rating
- a 19 mm exterior grade plywood substrate, a layer of polyester reinforced SBS modified bitumen vapour control layer fully bitumen bonded, a 50 mm thick polyisocyanurate insulation board fully bitumen bonded, a layer of Proflex Perforated Underlay, a layer of Proflex Sanded Preparation Layer and a layer of Firesmart Proflex Pour and Roll Cap Sheet, both fully bonded in bitumen achieved an EXT.F.AA rating.

 7.2 When used for 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.



7.3 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 — Tests to confirm compliance with Mandatory Standard 2.8, with reference to 2.8.1⁽¹⁾⁽²⁾

(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 Resistance to wind uplift

The adhesion of the bonded membranes is sufficient to resist the effects of wind suction, elevated temperature and thermal shock conditions likely to occur in practice. See section 15.2.

9 Resistance to foot traffic

Tests indicate that the system can accept, without damage, the limited foot traffic associated with installation and maintenance operations. Reasonable care should be taken to avoid sharp objects or concentrated loads. Where regular traffic is envisaged, ie maintenance of lift equipment, a walkway should be provided using concrete slabs supported on bearing pads. See section 15 (Table for *Physical properties — general*).

10 Maintenance



The membranes should be subjected to regular annual inspections and roof drains kept clear as is good practice with all roofing membranes.

11 Durability



11.1 The membranes, when subjected to normal conditions of use in a roof, will retain their integrity for a period in excess of 20 years. See section 15 (Tables for *Physical properties — directional* and *Physical properties — general*).

11.2 It is possible that some localised loss of the mineral surfacing may occur, after some years, in areas where complex detailing of the roof design is incorporated.

Installation

12 General

12.1 Installation of the Proflex Roof Waterproofing System is carried out, using traditional methods for laying reinforced bitumen membranes, in accordance with the Certificate holder's instructions and the relevant Clauses of BS 8000-4 : 1989 and BS 8217 : 2005.

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

12.3 The membrane may be laid in conditions normal to roofing work and must not be laid in rain, snow or heavy fog. When installing the membranes below 5°C precautions should be taken against the formation of condensation on the substrate.

12.4 At falls in excess of 5° (1:11) precautions against slippage, and requirements for mechanical fixing as required by BS 8217 : 2005, should be observed.

12.5 If the roof is likely to be subjected to uncontrolled pedestrian access, the substructure must meet the requirements of BS 8217 : 2005, Clauses 6.12 and 6.13 and to prevent damage to the roof covering one of the surface finishes described in 8.19.3 and 8.19.4 of the Code must be used.

12.6 On completion of the roof, the sanded top layers must have a surface finish applied in accordance with BS 8217 : 2005, Clauses 6.12 and 8.19. Surface finishes in the Code include:

- stone aggregate bonded in dressing compound
- precast concrete paving flags
- propriety tiles in bonding compound.

13 Procedure

Partially-bonded applications

13.1 A layer of Proflex Perforated Preparation Layer should be loose-laid over the substrate with 75 mm side laps and 100 mm end laps.

13.2 The intermediate layer should be fully bonded in hot bitumen onto the perforated layer, ensuring that the bitumen seeps regularly into the perforations. Side laps of at least 75 mm and end laps of at least 150 mm are required.

13.3 The top layer/cap sheet should then be fully bonded in hot bitumen onto the base sheet. Side laps of at least 75 mm and end laps of at least 150 mm are required.

Fully-bonded applications

13.4 The base layer should be fully bonded in hot bitumen to the substrate. Side laps of at least 75 mm and end laps of at least 150 mm are required.

13.5 The top layer should then be fully bonded in hot bitumen onto the base sheet. Side laps of at least 75 mm and end laps of at least 150 mm are required.

13.6 Proflex Sanded Preparation Layer can be used in fully-bonded applications to produce a three layer system.

Both applications

13.7 Laps between subsequent layers should be offset by at least 300 mm. The roofing layers must always be installed with staggered overlaps and in such a manner that no counter-seams in the direction of the outlets are made.

13.8 To ensure that the laps are satisfactorily sealed, for both application methods, a bead of molten bonding bitumen must exude.

13.9 The Proflex Pour and Roll Cap Sheet under normal conditions requires no additional surface protection.

14 Repair

In the event of damage, the membranes can be effectively repaired, after cleaning, using traditional methods for bonding bituminous felts.

Technical Investigations

15 Tests

15.1 Samples of the Proflex Roof Waterproofing System were obtained from the Certificate holder for testing. The results of the tests carried out by the BBA are summarised in Tables 2 and 3.

15.2 The following tests were also carried out:

- thickness
- width
- mass per unit area
- peel strength unaged and aged.

Table 2 Physical properties – directional

Tests (units)	Mean results		Method ⁽¹⁾
	Longitudinal	Transverse	
Tensile strength (N per 50 mm)			MOAT 31 : 6C (100 mm min ⁻¹)
180	664	504	
250	822	785	
PRCS ⁽²⁾	1485	1064	
VCL	634	656	
Elongation at break (%)			MOAT 31 : 6C (100 mm min ⁻¹)
180	30	32	
250	41	52	
PRCS ⁽²⁾	60	62	
VCL	37	29	
Dimensional stability (free) (%)			MOAT 27 : 5.1.6.1
180	0.62	+0.25	
250	-0.40	+0.21	
PRCS ⁽²⁾	-0.30	+0.13	
VCL	-0.20	+0.02	
Nail tear (N)			MOAT 27 : 5.4.1
180	124	129	
250	188	220	
PRCS ⁽²⁾	361	392	
Low temperature Flexibility (°C)			MOAT 31 : 6D
unaged			
180	≤ -20 ⁽³⁾	-	
250	≤ -20 ⁽³⁾	-	
heat aged ⁽⁴⁾			
180	≤ -5	-	
250	≤ -5	-	
water soak ⁽⁵⁾			
180	≤ -20 ⁽³⁾	-	
250	≤ -20 ⁽³⁾	-	

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the various documents.

(2) Pour and roll cap sheet.

(3) Lowest temperature tested -20°C.

(4) Heat aged 180 days at 70°C.

(5) Water soak 7 days at 23°C.

- Not tested.

Table 3 Physical properties – general

Tests (units)	Mean results				Method ⁽¹⁾
	180	250	PRCS ⁽²⁾	VCL	
Water vapour transmission (gm ⁻² day ⁻¹)	0.54	0.28	0.22	0.16	BS 3177 (25°C/75% RH)
Water vapour resistance (MNs ^g -1)	380	733	933	1324	BS 3177 (25°C/75% RH)
6 m head of water	-	pass	pass	-	MOAT 27 : 5.1.4
Static indentation					MOAT 27 : 5.1.9
substrate					
concrete	L ₃	L ₄	-	-	
EPS	L ₃	L ₄	-	-	
Dynamic indentation					MOAT 27 : 5.1.10
substrate					
perlite	I ₁	I ₃	-	-	
EPS	I ₁	I ₃	-	-	
Heat resistance (°C)					MOAT 31 : 6E
unaged	100	110	-	-	
heat aged ⁽³⁾	90	90	-	-	
Unrolling at low temperatures	-	pass ⁽⁴⁾	pass	-	MOAT 27 : 5.4.3

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the various documents.

(2) Pour and roll cap sheet.

(3) Heat aged 180 days at 70°C.

(4) Mineral finish tested.

- Not tested.

16 Investigations

16.1 A re-examination was made of the data and investigations on which the previous Certificate was based.

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

16.3 A survey of users/specifiers was carried out to assess the performance in use of the membranes.

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 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*
- 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*

Conditions of Certification

17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

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

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

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

- 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 the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

17.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does 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; 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. 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 manufacture, supply, installation, use and maintenance of this product/system.