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Agrément Certificate
15/5238
Product Sheet 1

UPXL WATERPROOFING SYSTEMS

GUARDIAN ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Guardian Roof Waterproofing System using polyester-reinforced, self-adhesive SBS modified bitumen UPXL membranes, for use as a fully-bonded waterproofing system for flat or pitched roofs with limited 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 the Building Regulations (see section 7).

Resistance to wind uplift — the system will resist the effects of any likely wind suction acting on the roof (see section 8).

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

Durability — under normal service conditions the system will provide a durable roof waterproofing with a service life in excess of 35 years (see section 11).

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: 10 December 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

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 Guardian 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)

Requirement: B4(2)	External fire spread
Comment:	On suitable substructures, the use of the system will enable a roof to be unrestricted under this Requirement. See section 7 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	The system, including joints, will enable a roof to meet this Requirement. See section 6.1 of this Certificate.
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)	Durability, workmanship and fitness of materials
Comment:	The use of the system satisfies the requirements of this Regulation. See sections 10.1 and 11.1 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards applicable to construction
Standard: 2.8	Spread from neighbouring buildings
Comment:	The system, when applied to suitable substructures, is regarded as having low vulnerability under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See section 7.2 of this Certificate.
Standard: 3.10	Precipitation
Comment:	The use of the system, including joints, will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 6.1 of this Certificate.
Standard: 7.1(a)	Statement of sustainability
Comment:	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.
Regulation: 12	Building standards applicable to conversions
Comment:	All comments given for this system under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



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

Regulation: 23(a)(i)(iii)(b)(i)	Fitness of materials and workmanship
Comment:	The system is acceptable. See section 11.1 and the <i>Installation</i> part of this Certificate.
Regulation: 28(b)	Resistance to moisture and weather
Comment:	The system, including joints, will enable a roof to meet the requirements of this Regulation. See section 6.1 of this Certificate.
Regulation: 36(b)	External fire spread
Comment:	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 3 *Delivery and site handling* (3.3) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of the Guardian 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 and balconies*.

CE marking

The Certificate holder has taken the responsibility of CE marking the membranes in accordance with harmonised European Standard BS 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 The Guardian Roof Waterproofing System comprises:

- UPXL S-A Underlay — a polyester (with a nominal mass per unit area $175 \text{ g}\cdot\text{m}^{-2}$) reinforced, self-adhesive, SBS modified bitumen with a fine red mineral upper surface finish and a release film on the lower surface. For use as a base sheet
- UPXL T-O Capsheet — a polyester (graphite coated, with a nominal mass per unit area $330 \text{ g}\cdot\text{m}^{-2}$) reinforced, SBS modified bitumen with a granular mineral upper surface finish and a thermofusible film on the lower surface. For use as a cap sheet
- UPXL T-O Detailing Sheet — a polyester/glass (with a nominal mass per unit area $230 \text{ g}\cdot\text{m}^{-2}$) reinforced, SBS modified bitumen with a granular mineral upper surface finish and a thermofusible film on the lower surface. For use in detailing at roof perimeters and penetrations through the roof.

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

Table 1 Nominal characteristics

Characteristic (unit)	Value		
	UPXL S-A Underlay	UPXL T-O Capsheet	UPXL T-O Detailing Sheet
Roll width (m)	1	1	1
Roll length (m)	16	8	8
Roll weight (kg)	40	43	39
Mass per unit area ($\text{kg}\cdot\text{m}^{-2}$)	2.500	5.375	4.875
Tensile strength* ($\text{N}\cdot 50 \text{ mm}^{-1}$)			
longitudinal direction	> 500	> 900	> 800
transverse direction	> 400	> 900	> 800
Elongation at break* (%)			
longitudinal direction	> 25	> 25	> 35
transverse direction	> 40	> 35	> 35
Tear resistance – nail* (N)			
longitudinal direction	> 175	> 300	> 300
transverse direction	> 175	> 300	> 300
Low temperature flexibility* ($^{\circ}\text{C}$)	< -15	< -25	< -25
Surface finish			
upper	red fine mineral	black granules (red made to order)	
lower	release film	thermofusible film	

1.3 IKO Systems T-O and IKO Systems S-A Vapour Control Layers are alternative vapour control layers for use with the system, and are the subject of BBA Certificate 86/1640.

1.4 Ancillary products for use with the system, but outside the scope of the Certificate, are:

- IKOpro Systems Bonding Agent — for use in promoting the adhesion of the self-adhesive membranes
- IKOpro Sprayfast Insulation Adhesive — a two-part, chemically-curing, polyurethane adhesive used for bonding insulation boards
- IKO Enertherm Insulation materials — a range of rigid insulation boards for use as part of a built-up warm roof
- IKO Systems S-A Detailing — an SBS modified bitumen self-adhesive membrane
- IKO Systems T-O Underlay — an SBS modified bitumen torch-on membrane (the subject of BBA Certificate 91/2671).

2 Manufacture

2.1 The membranes are manufactured by saturating the bases with bitumen and an SBS elastomeric coating containing the mineral filler.

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.

2.3 The management system of IKO PLC has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate Q 05233).

3 Delivery and site handling

3.1 The membranes are delivered to site in rolls within paper wrappings bearing the Certificate holder's name and the BBA logo incorporating the number of this Certificate.

3.2 Rolls should be stored on end 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 system components and ancillaries 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 the Guardian Roof Waterproofing System.

Design Considerations

4 General

4.1 The Guardian Roof Waterproofing System is satisfactory for use as a fully-bonded waterproofing system for flat or pitched roofs with limited access.

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

4.3 Flat roofs are defined for the purpose of this Certificate as those 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 and direction of falls, etc.

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

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

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

5 Practicability of installation

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

6 Weathertightness



6.1 The system, 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 system is impervious to water and will give a weathertight roof waterproofing capable of accepting minor structural movement.

7 Properties in relation to fire



7.1 In the opinion of the BBA, a system comprising a flat 18 mm thick plywood deck, a 2 mm bitumen vapour control layer, a 120 mm foil faced polyisocyanurate insulation board bonded with a polyurethane adhesive (5 m²·l application rate), a SBS modified bitumen underlay and a layer of UPXL T-O Capsheet can be classified as B_{ROOF}(t4) in accordance with BS EN 13501-5 : 2005.



7.2 When used on flat roofs with one of the surface finishes defined in Part iii of Table A5 of Appendix A of The Building Regulations (England and Wales), or Technical Booklet E, Table 5.6, Part IV of The Building Regulations (Northern Ireland) (and listed below), the roof is deemed to be of designation B_{ROOF}(t4):

- 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
- macadam.



7.3 The designation of other specifications should be confirmed by:

England and Wales — test or assessment in accordance with Approved Document B, Appendix A, clause 1

Scotland — test to conform to Mandatory Standard 2.8, clause 2.8.1⁽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 system is sufficient to resist the effects of wind suction, thermal cycling or other minor structural movements likely to occur in service.

9 Resistance to foot traffic

The system 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, additional protection to the system in accordance with the Certificate holder's instructions must be provided.

10 Maintenance



10.1 The system must be the subject of annual inspections and maintenance to ensure continued performance.

10.2 Where damage has occurred it must be repaired in accordance with section 14 and the Certificate holder's instructions.

11 Durability



11.1 Accelerated weathering tests confirm that satisfactory retention of physical properties is achieved. Under normal conditions, the system will have a service life in excess of 35 years.

11.2 When using the mineral-finished membrane, it is possible that some localised loss of 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 Guardian Roof Waterproofing System must be carried out by installers trained and approved by the Certificate holder in accordance with the relevant clauses of BS 8000-4 : 1989 and BS 8217 : 2005, the Certificate holder's instructions and this Certificate.

12.2 Substrates to which the system is to be applied must be sound, dry, clean and free from sharp projections such as nail heads and concrete nibs.

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

12.4 At falls in excess of 5° (1:11), precautions against slippage and the requirements for mechanical fixings 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, and, to prevent damage to the roof covering, one of the appropriate surface finishes referred to in clause 6.12 of this Code must be used.

12.6 When the system is used for remedial work, existing surface finishes (eg surface dressing) must be removed, and existing waterproofing layers must be made sound and then primed.

12.7 Where applicable, details are carried out in accordance with traditional methods using UPXL T-O Detailing Sheet.

12.8 The finished membrane requires no further surface protection.

12.9 Suitable roofing specifications are given in Table 2.

Table 2 Roofing specifications

Substrate	Vapour control layer ⁽¹⁾	Insulation ⁽¹⁾	Underlay ⁽¹⁾	Top layer ⁽¹⁾
Concrete ⁽²⁾				
Screeds ⁽²⁾				
Plywood ⁽³⁾				
OSB/3 ⁽³⁾	Systems T-O VCL Systems S-A VCL	Enertherm ALU	UPXL S-A Underlay	UPXL T-O Capsheet
Metal ⁽²⁾				
Woodwool				
Timber boards ⁽⁴⁾				

- (1) All materials are suitable for listed substrates.
- (2) Concrete, screeds and metal decks to be primed with IKOpro Quick Dry Bitumen Primer.
- (3) Board joints to be taped with suitable materials.
- (4) Challenger 180 preparation layer is nailed to timber boards prior to the installation of the vapour control layer.

13 Procedure

13.1 The first strip of UPXL S-A Underlay is laid out in the correct position on the roof deck. The underlay is rolled back towards the centre revealing the release paper underneath. At a point close to the centre of the roll, the release paper is carefully cut across the width of the roll without cutting through the underlay.

13.2 IKO UPXL S-A underlay is fully bonded to the substrate in accordance with the Certificate holder’s instructions.

13.3 Overlaps for the underlay must be a minimum of 75 mm, both for side laps and end laps.

13.4 UPXL T-O Capsheet is fully bonded to the underlay by torch bonding. Care must be taken not to overheat the coating. When torching the membranes, a bead of the coating must exude from the joint. Side laps are a minimum of 75 mm and end laps are 100 mm.

14 Repair

In the event of damage, the membranes can be effectively repaired, after cleaning, with a patch of membrane bonded over the damaged area.

Technical Investigations

15 Tests

An assessment was made on test data in relation to:

- thickness
- mass per unit area
- tensile strength
- elongation at break
- dynamic indentation for system build-up
- static indentation for system build-up
- low temperature flexibility
- heat resistance
- dimensional stability
- resistance to sliding at a 45° slope at 80°C for UPXL S-A Underlay
- joint tensile strength
- resistance to peel from substrate for UPXL S-A Underlay
- low temperature flexibility, heat resistance, joint tensile strength and resistance to peel from substrate for UPXL S-A Underlay after heat ageing for 280 days at 70°C.

16 Investigations

16.1 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.

16.2 Data on fire performance were evaluated.

16.3 Resistance to wind loading for UPXL S-A Underlay was evaluated, using resistance to peel from substrate test data and wind load testing on other IKO self-adhesive membranes.

Bibliography

- 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 EN 13501-5 : 2005 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roof tests*
- BS EN 13707 : 2013 *Flexible sheets for waterproofing — Reinforced bitumen sheets for roof waterproofing — Definitions and characteristics*
- BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

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 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.