SIG Trading Ltd
Harding Way
St Ives
Cambridgeshire PE27 3YJ

Tel: 01480 466 777
e-mail: info@sigroofing.co.uk
website: www.sigroofing.co.uk

Agrément Certificate
18/5524
Product Sheet 1

SIG ROOF WATERPROOFING SYSTEMS

SIGNATURE 25 ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet(1) relates to the SIGnature 25 Roof Waterproofing System, comprising polymer-modified bitumen waterproofing membranes, insulation boards and a vapour control layer (VCL), for use on flat and 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 to the interior of the building (see section 6).

Thermal performance — the system can be used to improve the thermal performance of a roof (see section 7).

Condensation risk — roofs incorporating the system will adequately limit the risk of interstitial and surface condensation (see section 8).

Properties in relation to fire — The system, when used in a suitable specification, can enable a roof to be unrestricted under the national Building Regulations (see section 9).

Resistance to wind uplift — the system will enable a roof to be unrestricted under the national Building Regulations (see section 10).

Resistance to mechanical damage — the system will accept, without damage, the limited foot traffic and loads associated with installation and maintenance (see section 11).

Durability — under normal service conditions, the system will provide a durable waterproof covering with a service life in excess of 25 years (see section 13).

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

Date of First issue: 18 April 2018

John Albon – Head of Approvals Construction Products

Claire Curtis-Thomas
Chief Executive

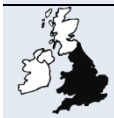
The BBA is a UKAS accredited certification body – Number 113.

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

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.

Regulations

In the opinion of the BBA, the SIGnature 25 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 a suitable substructure, the use of the system will enable a roof to be unrestricted under this Requirement. See section 9 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The system, including joints, will enable a roof to satisfy this Requirement. See section 6.1 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The system can contribute to enabling a roof to satisfy this Requirement. See sections 8.1 and 8.2 of this Certificate.
Requirement:	**L1(a)(i)**	**Conservation of fuel and power**
Comment:		The system can contribute to satisfying this Requirement. See sections 7.2 and 7.3 of this Certificate.
Regulation:	**7**	**Materials and workmanship**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**26**	**CO_2 emission rates for new buildings**
Regulation:	**26A**	**Fabric energy efficiency rates for new dwellings (applicable to England only)**
Regulation:	**26A**	**Primary energy consumption rates for new buildings (applicable to Wales only)**
Regulation:	**26B**	**Fabric performance values for new dwellings (applicable to Wales only)**
Comment:		The system can contribute to satisfying these Regulations; however, compensating fabric/services measures may be required. See sections 7.2 and 7.3 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 12.1 and 13.1 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.8	Spread from neighbouring buildings
Comment:		The system, when applied to a suitable substructure, is regarded as having low vulnerability under clause 2.8.1(1)(2) of this Standard. See section 9 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:	3.15	Condensation
Comment:		The system will enable 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 sections 8.1 and 8.3 of this Certificate.

Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The system can contribute to satisfying the requirements of these Standards, with reference to clauses, or parts of, 6.1.2[(2)], 6.1.6[(1)], 6.2.1[(1)(2)], 6.2.3[(1)], 6.2.4[(2)], 6.2.5[(2)], 6.2.6[(1)], 6.2.7[(1)], 6.2.8[(1)(2)], 6.2.9[(1)(2)], 6.2.10[(1)(2)], 6.2.11[(1)(2)], 6.2.12[(2)] and 6.2.13[(1)(2)]. See sections 7.2 and 7.3 of this Certificate.
Standard:	7.1(a)(b)	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. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4[(1)(2)] [Aspects 1[(1)(2)] and 2[(1)]], 7.1.6[(1)(2)] [Aspects 1[(1)(2)] and 2[(1)]] and 7.1.7[(1)(2)] [Aspect 1[(1)(2)]]. See sections 7.2 and 7.3 of this Certificate.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		Comments in relation to the 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)**	**Fitness of materials and workmanship**
Comment:	**(iii)(b)(i)**	The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The system, including joints, satisfies the requirements of this Regulation. See section 6.1 of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		The system can contribute to a roof satisfying this Regulation. See section 8.1 of this Certificate.
Regulation:	**36(b)**	**External fire**
Comment		On suitable substructures, the use of the system will enable a roof to be unrestricted under the requirements of this Regulation. See section 9 of this Certificate.
Regulation:	**39(a)(i)**	**Conservation measures**
Regulation:	**40(2)**	**Target carbon dioxide Emissions Rate**
Comment:		The system can satisfy or contribute to satisfying these Regulations. See sections 7.2 and 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 1.3) and 3 *Delivery and site handling* (3.6 and 3.7) of this Certificate.

Additional Information

NHBC Standards 2018

In the opinion of the BBA, the SIGnature 25 Roof Waterproofing System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements 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 system in accordance with harmonised European Standards EN 13165 : 2012, EN 13707 : 2013 and EN 13970 : 2011. 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 SIGnature 25 Roof Waterproofing System consists of:

- SIGnature Fire Rated Cap Sheet — a styrene-butadiene-styrene (SBS) modified bitumen, polyester-reinforced, torch-on capsheet with a mineral finish (green and black) and a thermofusible film on the underside
- SIGnature Self-Adhesive Underlay — an SBS modified bitumen, polyester-reinforced, self-adhesive underlay with sand finish on the upper face and a release film on the underside
- IKO Enertherm ALU Insulation Boards — rigid polyisocyanurate (PIR) insulation boards with composite foil-facings on both sides
- SIGnature VCL — a SBS modified bitumen, polyester-reinforced, torch-on VCL with an aluminium foil core and sand finish on the upper face and a thermofusible film on the underside.

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

Table 1 Nominal characteristics — membranes

Characteristics (unit)	Membranes		
	SIGnature Fire Rated Cap Sheet	SIGnature Self-Adhesive Underlay	SIGnature VCL
Standard CE marked against	EN 13707	EN 13707	EN 13970
Length (m)	8	12	12
Width (m)	1	1	1
Mass per unit area ($kg \cdot m^{-2}$)	5.00	3.20	3.04
Roll weight (kg)	40.0	38.4	36.5
Watertightness*	pass	pass	pass
Equivalent air layer thickness* (sd) (m)	NPD(1)	NPD(1)	2436
Tensile strength* (N per 50 mm^{-1})			
longitudinal	500	500	500
transverse	400	400	400
Elongation at break* (%)			
longitudinal	20	20	20
transverse	30	30	30
Nail tear* (N)			
longitudinal	160	200	250
transverse	160	200	300
Static indentation (kg)			
substrate A	10	NPD(1)	NPD(1)
Low temperature flexibility* (°C)			
upper	0	–10	–10
lower	0	–10	–10
External fire performance*	$B_{ROOF}(t4)$(2)	$F_{ROOF}(t4)$	—(3)

(1) No performance determined (NPD).
(2) The build-up specification is given in section 9.1.
(3) External fire performance not declared for VCLs.

1.3 The insulation boards are supplied to site with the nominal characteristics shown in Table 2.

Table 2 Nominal characteristics — insulation boards

Characteristic (unit)	Value
Standard CE marked against	EN 13165
Length (mm)	2400, 1000 and 600
Width (mm)	1200
Thickness (mm)	30, 40, 50, 60, 70, 75, 80, 90, 100, 110, 120 and 140
Compressive strength at 10% compression* (kPa)	175
Density ($kg \cdot m^{-3}$)	32
Thermal conductivity* ($W \cdot m^{-1} \cdot K^{-1}$)	0.022

1.4 Ancillary products for use with the system are:

- Fix-R Quick Dry Primer — for use in preparation of all timber and old bitumen substrates prior to torch application
- IKO Bonding Agent — for use in preparation of substrates prior to application of self-adhesive membranes
- IKOpro Sprayfast IBA (Insulation Bonding Adhesive) — a spray-applied PU adhesive for rapid bonding of the insulation
- Fix-R Universal Torch-On Venting Layer — for use in partial-bond applications as an alternative to the BS 8747 : 2007 Type 3G venting layer
- SIGnature Self-Adhesive VCL — an SBS modified bitumen, polyester-reinforced, self-adhesive VCL, with an aluminium foil core and sand finish on the upper face and a release film on the underside

- SIGnature Underlay 20 — an SBS modified bitumen, polyester-reinforced, torch-on underlay with sand finish on the upper face and a thermofusible film on the underside
- SIGnature 25 Torch-On Underlay — an SBS modified bitumen, polyester-reinforced, torch-on underlay with sand finish on the upper face and a thermofusible film on the underside.

2 Manufacture

2.1 The membranes are manufactured by saturating the bases with bitumen and a fire-retardant SBS elastomeric coating containing the mineral filler.

2.2 IKO Enertherm ALU Insulation Boards are manufactured by blending together polyol and MDI in a continuous foaming process aided by a blowing agent, and sandwiched between two composite foil-facings. After formation, the boards are left to cure and are cut to size.

2.3 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 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 boards are delivered to site in packs, wrapped in polythene. Each pack contains a label with the manufacturer's trade name, product description, board dimensions and the BBA logo incorporating the number of this Certificate.

3.4 The boards must be protected from prolonged exposure to sunlight and should be stored under cover or protected with opaque polythene sheeting. Where possible, packs should be stored inside. If stored outside, the products should be stacked flat, raised above ground level and not in contact with ground moisture.

3.5 The boards are light and easy to handle, and care should be exercised to avoid crushing the edges or corners. If damaged, the products should be discarded.

3.6 The boards must not be exposed to open flame or other ignition sources, or to solvents or other chemicals.

3.7 The Certificate holder has taken the responsibility of classifying and labelling the system components 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 SIGnature 25 Roof Waterproofing System.

Design Considerations

4 Use

4.1 The SIGnature 25 Roof Waterproofing System is satisfactory for use on flat and pitched roofs with limited access in fully and partially bonded applications.

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, cleaning of gutters, etc. Where traffic in excess of this is envisaged, such as pedestrian access roofs, additional protection must be provided (see sections 11 and 14.6 of this Certificate and the relevant clauses of the Certificate holder's installation instructions).

4.3 Flat roofs are defined for the purpose of this Certificate as those 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. When designing flat roofs, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available including, for example, overall and local deflection and direction of falls.

4.4 Structural decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and, where appropriate, *NHBC Standards* 2018, Chapter 7.1.

5 Practicability of installation

The system must only be installed by contractors who have been 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 to the inside of the building and so satisfy the requirements of the national Building Regulations.

6.2 The membranes are impervious to water and will give a weathertight roofing capable of accepting minor structural movements without damage.

7 Thermal performance

7.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2006, using the declared thermal conductivity* (λD) of 0.022 $W \cdot m^{-1} \cdot K^{-1}$ for the insulation boards.

7.2 The U value of a completed roof will depend on the thickness of insulation used, the number and type of fixings and the insulating value of other roof components/layers. Example U values of roofs incorporating the system are shown in Table 3.

Table 3 Example U values

U value ($W \cdot m^{-2} \cdot K^{-1}$)	Insulation Thickness (mm)[1]		
	Concrete[2]	Timber[3]	Metal[4]
0.13	—	—	—
0.15	140	140	140
0.16	140	120	140
0.18	120	110	120
0.20	110	100	110
0.25	90	75	90

(1) Nearest available thickness.
(2) 150 mm concrete deck — 1.7 $W \cdot m^{-1} \cdot K^{-1}$, felt VCL, insulation and 10 mm bitumen felt finish.
(3) 12.5 mm plasterboard, VCL, 150 mm timber joists (12.5%)/air cavity (87.5%), 18 mm plywood decking, felt VCL, insulation and 10 mm bitumen felt finish.
(4) Metal deck, felt VCL, insulation and 10 mm bitumen felt finish.

Junctions

7.3 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

8 Condensation risk

Interstitial condensation

8.1 The system will adequately reduce the risk of interstitial condensation when designed and constructed in accordance with BS 5250 : 2011 Appendix D and Appendix H Section H9, and BRE Report BR 262 : 2002, in England and Wales. When carrying out condensation risk analysis calculations to BS 5250 : 2011, the following vapour resistance values should be used:

- VCL 12180 MN·s·g^{-1}
- individual foil layers of the boards 1000 MN·s·g^{-1}
- insulation core of the boards 183 MN·s·g^{-1}
- underlay 750 MN·s·g^{-1}
- capsheet 1000 MN·s·g^{-1}.

Surface condensation

8.2 Roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 0.35 W·m^{-2}·K^{-1} at any point, and the junctions with other elements are designed in accordance with the guidance referred to in section 6.3.

8.3 For buildings in Scotland, constructions will be acceptable where the thermal transmittance (U value) does not exceed 1.2 W·m^{-2}·K^{-1} at any point, and the junctions with other elements are designed in accordance with the guidance referred to in BS 5250 : 2011, Annex H. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 6.3 of this Certificate.

9 Properties in relation to fire

9.1 When tested and classified in accordance with BS EN 13501-5 : 2005, a system comprising:

- an 18 mm exterior plywood substrate
- a fully torch-bonded layer of SIGnature VCL
- a 120 mm thick Enertherm BGF PIR insulation board bonded with polyurethane adhesive
- a fully torch-bonded layer of SIGnature Underlay 25
- a fully torch-bonded layer of SIGnature Fire Rated Cap Sheet

achieved a B_{ROOF}(t4) rating.

9.2 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 unrestricted:

- 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.

9.3 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, clause 2.8.1
Northern Ireland — test or assessment by a UKAS-accredited laboratory, or an independent consultant with appropriate experience.

10 Resistance to wind uplift

10.1 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.

10.2 Adhesion between the boards and the VCL, and between the boards and overlay, is adequate to resist the effects of wind suction and thermal cycling likely to be experienced under normal conditions. Metal deck profiles should give a bonding area of at least 33% of the total projected surface area. In areas where high wind speeds can be expected, mechanical fixings should be considered, and the advice of the Certificate holder should be sought as to the method of fixing. Reference should be made to BS EN 1991-1-4 : 2005, and a calculation carried out by a suitably experienced and competent individual where required for a specific building project.

11 Resistance to mechanical damage

11.1 The system can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Where traffic in excess of this is envisaged, such as for maintenance of lift equipment, a walkway must be provided (for example, using concrete slabs supported on bearing pads or manufacturer's walkway sheets). Reasonable care must be taken to avoid puncture of the membranes by sharp objects or concentrated loads.

11.2 For design purposes, the boards may be assumed to have an allowable compressive strength of 175 kPa at 10% compression.

11.3 The boards have not been assessed for use with permanent distributed or concentrated loads, such as air conditioning units, mechanical plants, water tanks, etc. Such loads must be supported directly on the roof construction or design support system.

11.4 When profiled decking is used, boards will need to span ribs. Maximum permissible spans between ribs for various board thicknesses are shown in Table 4.

Table 4 Maximum clear span

Maximum clear span (mm)	Minimum board thickness (mm)
< 75	25
> 75 ≤ 100	30
> 100 ≤ 125	35
> 125 ≤ 150	40
> 150 ≤ 175	45
> 175 ≤ 200	50
> 200 ≤ 225	55
> 225 ≤ 250	60

12 Maintenance

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

12.2 Where damage has occurred to the waterproof layer, it should be repaired in accordance with section 16 and the Certificate holder's instructions.

12.3 The other system components, once installed, do not require any regular maintenance and have suitable durability, provided the roof waterproofing layers are maintained as described in section 12.2.

13 Durability

13.1 Under normal conditions of use, the system will have a service life in excess of 25 years.

13.2 When using SIGnature Fire Rated Cap Sheet, 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

14 General

14.1 Installation of the SIGnature 25 Roof Waterproofing System must be carried out by installers trained and approved by the Certificate holder in accordance with the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, BS 8217 : 2005, the Certificate holder's or appointed agent's instructions, and this Certificate.

14.2 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. Wet boards must not be used. For the tapered boards to be effective in providing a uniform fall, it is essential that the structural deck is true and even. Any hollows, depressions or backfalls found in the roof deck must be rectified prior to laying the insulation.

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

14.4 Detailing must be formed in accordance with the Certificate holder's instructions.

14.5 If the roof is likely to be subjected to uncontrolled pedestrian access, the substructure must satisfy 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 Standard must be used.

14.6 At falls in excess of 1:11, the provision for mechanical fixings as required by BS 8217 : 2005 should be observed.

14.7 The membranes may also have a surface finish applied in accordance with BS 8217 : 2005, Clause 8.19, including:

- stone aggregate in dressing compound
- precast concrete paving slabs
- proprietary tiles on bonding compound.

14.8 The boards can be cut to fit around projections through the roof, using either a sharp knife or a fine-toothed saw.

15 Procedure

VCL

Timber boarded decks

15.1 A preparation layer of a high-performance preparation layer is random-nailed to the substrate in accordance with BS 8217 : 2005. The VCL is then fully bonded to the preparation layer. The Certificate holder can advise on suitable materials for this application.

Plywood, OSB particle board and wood wool decks

15.2 The membranes are not suitable for use with a wood wool deck.

15.3 Joints in the boards are taped with loose-laid strips of polyester reinforceded membranes.

15.4 The VCL is fully bonded to the substrate using the appropriate bonding method recommended by the Certificate holder.

Concrete and screeded concrete decks

15.5 Surfaces are primed with IKO Bonding Agent, and the VCL is fully bonded to the primed deck using the recommended bonding method.

Metal decks

15.6 The upper profile of the decking is primed with the appropriate Fix-R Quick Dry Primer, and the VCL fully bonded to the primed upper profile of the metal deck using the recommended bonding method.

Insulation

15.7 The boards are installed in a close-butted break-bonded pattern.

15.8 On metal decks, the boards are laid either with the long axis at right angles to the corrugations of the metal deck or diagonally across the corrugations of the deck, ensuring that all end joints and corners are sufficiently supported on the crown flats of the decking. The thickness of the board to be used is dependent on the width of the trough openings of the metal deck as indicated in Table 4.

15.9 The boards are bonded to the VCL using IKOpro Sprayfast IBA. A bead of adhesive is applied in a snaking pattern, using a 30 mm bead width at 200 to 300 mm centres.

Membrane

Partially bonded

15.10 A layer of Fix-R Universal Torch-On Venting Layer is loose-laid over the boards in accordance with BS 8217 : 2005 Sections 8.15.2 and 8.15.3.

15.11 SIGnature Self-Adhesive Underlay is fully bonded to the venting layer in accordance with the Certificate holder's instructions.

15.12 SIGnature Fire Rated Cap Sheet is fully bonded to the underlay by torch bonding by pressing the membrane down. Care must be taken not to overheat the coating. When torching the membrane, a bead of coating must exude from all lap joints. Side and end laps for the cap sheet are 75 mm.

15.13 The perimeter areas must be fully bonded in bitumen.

Fully bonded

15.14 SIGnature Self-Adhesive Underlay is fully bonded to the boards in accordance with the Certificate holder's instructions.

15.15 SIGnature Fire Rated Cap Sheet is fully bonded to the underlay by torch bonding by pressing the membrane down. Care must be taken not to overheat the coating. When torching the membrane, a bead of coating must exude from all lap joints. Side and end laps for the cap sheet are 75 mm.

16 Repair

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

Technical Investigations

17 Tests

17.1 Tests were carried out on SIGnature VCL and the results assessed to determine:

Coating mass

- softening point (ring and ball)
- penetration
- fines content
- heat ageing at 70°C for 84 days

Membrane

- mass per unit area
- tensile strength
- elongation at break
- dimensional stability
- water vapour properties
- static indentation — hard substrate
- dynamic indentation — hard substrate.

17.2 An examination was made of data on IKO Enertherm ALU Insulation Boards relating to:

- fire rating
- thermal conductivity
- compressive stress at 10% deformation
- dimensional accuracy
- diffusion tight property of facings
- water vapour resistance
- wind uplift.

17.3 An examination was made of data on membranes using the same coating mass and reinforcements as SIGnature Fire Rated Cap Sheet and SIGnature Self-Adhesive Underlay relating to:

- resistance to head of water
- tensile strength
- elongation at break
- nail tear
- dimensional stability
- low temperature flexibility
- heat resistance
- static indentation
- dynamic indentation — soft substrate
- heat ageing.

18 Investigations

18.1 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.

18.2 A visit was made to a site in progress for SIGnature VCL to assess the practicability of installation.

18.3 A condensation risk analysis was carried out.

18.4 A series of U value calculations were carried out.

18.5 Existing data on fire performance were assessed.

18.6 An assessment of the methods of application were made.

Bibliography

BRE Report BR 262 : 2002 *Thermal insulation : avoiding risks*

BRE Report BR 443 : 2006 *Conventions for U-value calculations*

BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*

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 8747 : 2007 *Reinforced bitumen membranes (RBMs) for roofing — Guide to selection and specification*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions — Wind actions*

BS EN 13501-5 : 2005 + A1 : 2009 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roof tests*

BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

EN 13165 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification*

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

EN 13970 : 2011 *Flexible sheets for waterproofing — Determination of emissivity*

19 Conditions

19.1 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.

19.2 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.

19.3 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.

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

19.5 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.

19.6 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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk