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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
16/5338
Product Sheet 1

SINTEC WATERPROOFING SYSTEMS

URDIN MP AND URDIN MP FB ROOF WATERPROOFING SYSTEMS

This Agrément Certificate Product Sheet(1) relates to URDIN MP and URDIN MP FB Roof Waterproofing Systems, reinforced PVC membranes for use mechanically fastened and fully adhered on flat and pitched roofs with limited access in exposed, protected, inverted, roof garden and green roof applications.

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

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

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

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

Resistance to penetration of roots — the URDIN MP 1.5 membrane will adequately resist plant root penetration (see section 10).

Durability — under normal service conditions the systems will provide a durable roof waterproofing with a service life in excess of 35 years (see section 12).

The BBA has awarded this Certificate to the company named above for the systems described herein. These systems have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 14 July 2016

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, URDIN MP and URDIN MP FB Roof Waterproofing Systems, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

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

Requirement:	B4(2)	External fire spread
Comment:		On suitable substructures the use of the systems will enable a roof to be unrestricted under this Requirement. See sections 7.1 to 7.4 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The systems, including joints, will enable a roof to meet this Requirement. See section 6.1 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The systems are acceptable. See section 12 and the *Installation* 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 systems satisfies the requirements of this Regulation. See sections 11 and 12 and the *Installation* part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.8	Spread from neighbouring buildings
Comment:		The membranes, when applied to a suitable substructure, are regarded as having low vulnerability under clause 2.8.1[(1)(2)] of this Standard. See sections 7.1 to 7.4 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The membranes, including joints, will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1[(1)(2)] and 3.10.7[(1)(2)]. See section 6.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The systems 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 these systems 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 systems are acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The membranes, including joints, indicate that use of the systems can enable a roof to satisfy 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 systems will be unrestricted by the requirements of this Regulation. See sections 7.1 to 7.4 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 2016

NHBC accepts the use of URDIN MP and URDIN MP FB Roof Waterproofing Systems, provided they are 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 systems in accordance with harmonised European Standard BS EN 13956 : 2012. 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 membranes included in this Certificate are:

- URDIN MP — a polyester (85 g·m^{-2}) reinforced PVC membrane with hot-air welded joints, mechanically fastened using approved fasteners and plates
- URDIN MP FB — a polyester (50 g·m^{-2}) reinforced, non-woven polyester (200 g·m^{-2}) fleece-backed PVC membrane for fully-bonded systems.

1.2 The membranes are available in a selection of RAL colours and are manufactured to the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Membrane				
	URDIN MP 1.2	URDIN MP 1.5	URDIN MP 2.0	URDIN MP FB 1.2	URDIN MP FB 1.5
Thickness* (mm)	1.2	1.5	2.0	1.2	1.5
Roll width[1] (m)	1.6[2], 2.1[3]	1.6, 2.1	1.6, 2.1	1.6	1.6
Roll length[1] (m)	20, 25	20	20	20	20
Mass per unit area (kg·m^{-2})	1.5	1.8	2.4	1.7	2.0
Standard roll weight[4] (kg)	48	57.6	76.8	54.4	64
Tensile strength* (N per 50 mm)	≥1100	≥1100	≥1100	≥1100	≥1100
Elongation at break* (%)	≥15	≥15	≥15	≥15	≥15
Dimensional stability (%)	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5
Foldability at low temperature* (°C)	≤–25	≤–25	≤–25	≤–25	≤–25
Tear resistance* (N)	≥200	≥200	≥200	≥200	≥200
Static loading* (kg)	≥20	≥20	≥20	≥20	≥20
Resistance to impact* (mm)	≥450	≥800	≥1250	≥450	≥800
Joint peel resistance* (N per 50 mm)	≥200	≥200	≥200	≥200	≥200
Joint shear strength* (N per 50 mm)	≥600	≥600	≥600	≥600	≥600

(1) Other roll lengths and widths are available upon request.
(2) 20 m length membrane.
(3) 25 m length membrane.
(4) Standard roll is 1.6 m wide and 20 m long.

1.4 Ancillary items[1] for use with the membranes include:

- URDIN ADH PU 822 — a polyurethane-based adhesive for bonding URDIN MP FB membranes
- URDIN ADH PB 52 — an adhesive for bonding membranes to the substrate
- URDIN corners — for internal and external corners
- URDIN PLATE — URDIN PVC compound-coated metal sections for use at perimeter details and other detailing areas
- URVAP — a 0.4 mm thick, black polyethylene membrane for use as a vapour control layer
- URTEX — a 200 g·m^{-2} non-woven polyester for use as a separation layer
- URDIN Walkway — a PVC membrane with anti-slip surface for maintenance traffic
- fasteners and plates — approved by the manufacturer for use with the systems
- URDIN Bar — perforated fixing bars for use at perimeters of the roof in combination with a PVC retaining cord
- URDIN Bar End Protectors — for use in capping the ends of URDIN Bar
- URDIN Butyl Tape — for use in sealing vapour control layers.

(1) Outlets, scuppers, vents and pipe collars are also available.

2 Manufacture

2.1 The membranes are manufactured by fusing the reinforcement between sheets of PVC plastisol, passing through a calender and gelling in a hot-air oven.

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 the manufacturer, has been assessed and registered as meeting the requirements of EN ISO 9001 : 2008 by BSI (Certificate FM 566491).

3 Delivery and site handling

3.1 The membranes are delivered to site in rolls wrapped in polythene on pallets, with labels bearing the manufacturer's name and address, product identification, batch number and the BBA logo incorporating the number of this Certificate.

3.2 Rolls should be stored on end on a clean, level surface, and kept under cover.

3.3 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 URDIN MP and URDIN MP FB Roof Waterproofing Systems.

Design Considerations

4 General

4.1 The URDIN MP Roof Waterproofing System is satisfactory for use as mechanically-fastened waterproofing for:

- exposed flat and pitched roofs with limited access
- protected flat roofs with limited access
- inverted flat roofs with limited access
- green roofs and roof gardens (1.5 mm membranes only).

4.2 The URDIN MP FB Roof Waterproofing System is satisfactory for use as fully-bonded waterproofing on flat or pitched roofs with limited access. The bonding medium for URDIN MP FB is URDIN ADH PU 822. The membranes are suitable for the following specifications:

- exposed flat and pitched roofs with limited access
- protected flat roofs with limited access
- inverted flat roofs with limited access
- green roofs and roof gardens (1.5 mm membranes only).

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

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

4.5 Decks to which the systems are to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and, where appropriate, *NHBC Standards* 2016, Chapter 7.1.

4.6 Insulation materials to be used in conjunction with the membranes 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 that Certificate.

4.7 Contact with bituminous and oil-based products must be avoided as the membrane is not compatible with lower grades of bitumen. If contact with such products is likely, a separating layer must be interposed before installing the waterproofing sheet. Where doubt arises, the advice of the Certificate holder must be sought.

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

4.9 For green and inverted roofs and roof gardens, structural decks to which the system is to be applied must be suitable to transmit the dead and imposed loads experienced in service.

4.10 Imposed loads, dead loading and wind loads specifications are calculated in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003, BS EN 1991-1-4 : 2005 and their respective UK National Annexes.

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

4.12 In inverted roof specifications, the ballast requirements should be calculated in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. Additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs — Drainage and U value corrections*.

5 Practicability of installation

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

6 Weathertightness

6.1 The membranes, including joints, when completely sealed and consolidated will adequately resist the passage of moisture into the building and enable a roof to comply with the requirements of the national Building Regulations.

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

7 Properties in relation to fire

7.1 A system comprising a 19 mm thick exterior grade WBP plywood, a high-density polythene vapour barrier, a 50 mm polyurethane insulation board mechanically fixed, and a layer of URDIN MP 1.2 mechanically fixed, will be unrestricted under the national Building Regulations.

7.2 The membranes, when used in protected or inverted roof specifications including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC, can also be considered to be unrestricted.

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

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

7.4 In the opinion of the BBA, in irrigated roof gardens or green roofs the use of the systems will be unrestricted under the national Requirements.

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

8 Resistance to wind uplift

8.1 The resistance to wind uplift of a mechanically-fastened waterproofing layer is provided by the fixing bar and fasteners passing through the membrane into the substrate. The number and position of fixings will depend on a number of factors including:

- wind uplift forces to be restrained
- pull-out strength of the fasteners
- tensile properties of the membrane
- appropriate calculation of safety factors.

8.2 The wind uplift forces are calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. On this basis, the number of fixings required should be established using a maximum permissible load of 0.4 kN per fixing.

8.3 Wind uplift load results from testing on installed systems, mechanically fastened by the Lap Fixing Method and OMG Fixing Method, are given in Table 2.

Table 2 Wind uplift results from testing

	Lap Fixing Method	OMG Fixing Method
Load per fixing (N)	1000	1500
Admissible load per fixing (N)	461	900

8.4 When URDIN MP FB is bonded to a decking or to bituminous felt, it is sufficient to resist the effect of wind suction, thermal cycling or other minor structural movements likely to occur in service.

8.5 When URDIN MP FB is bonded to insulation boards, the resistance to wind uplift will be dependent on the cohesive strength of the insulation and the method by which it is secured to the roof deck. This must be taken into account when selecting suitable insulation material.

8.6 The Certificate holder provides a design service which takes into account all the relevant information supplied and gives assistance for the preparation of drawings for the positioning of fastening bars or washers, and the number of fixings required. The Certificate holder assumes liability for the calculations of the design of the mechanically fastened system.

8.7 The ballast requirements for inverted roof systems must be calculated in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. When using gravel ballast, the system must always be loaded with a minimum depth of 50 mm of aggregate. In areas of high-wind exposure, the Certificate holder's advice should be sought. Alternatively, concrete slabs on suitable supports can be used.

8.8 The soil used in roof gardens and ballast on inverted/protected roofs must not be of a type that will be removed or become delocalised owing to wind scour experienced on the roof.

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

9 Resistance to foot traffic

The systems 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, a walkway should be provided: for example, using concrete slabs supported on bearing pads or URDIN Walkway.

10 Resistance to penetration of roots

Results of tests on the 1.5 mm membranes indicate that they are resistant to root penetration. These and the 2.0 mm membrane can be used in a roof waterproofing system for roof gardens and green roofs.

11 Maintenance

11.1 Systems must be the subject of annual inspections and maintenance to ensure continued performance.

11.2 Maintenance should include checks and operations to ensure the following where applicable:

- adequate ballast is in place and evenly distributed over the membrane
- protection layers are in good condition
- exposed membrane is free from the build-up of silt and other debris and unwanted vegetation are cleared.

11.3 Where damage has occurred, it should be repaired in accordance with section 17 and the Certificate holder's instructions.

11.4 Green roofs and roof gardens must be the subject of regular inspections, particularly in autumn after leaf fall and in spring, to ensure that unwanted vegetation and other debris are cleared from the roof and drainage outlets. Guidance is available within the latest edition of *The GRO Green Roof Guide — Green Roof Code of Best Practice for the UK*.

12 Durability

Under normal conditions, the systems will have a service life in excess of 35 years.

13 Reuse and recyclability

The membranes comprise polyvinyl chloride and polyester or glass, which can be recycled.

Installation

14 General

14.1 Installation of URDIN MP and URDIN MP FB Roof Waterproofing Systems must be carried out by installers trained and approved by the Certificate holder in accordance with the relevant clauses of BS EN 1997-1 : 2004, BS 8217 : 2005, the Certificate holder's instructions and this Certificate.

14.2 Substrates to which the membranes are to be applied must be sound, dry, clean and free from sharp projections such as nail heads and concrete nibs. When used over a rough substrate, a suitable protection layer must be placed over the substrate.

14.3 Installation should not be carried out during inclement weather (eg rain, fog or snow). When the temperature is below 0°C suitable precautions against surface condensation must be taken.

14.4 In all cases, a vapour control layer is used directly over the deck. When internal temperatures and humidity conditions will exceed 22°C/50% relative humidity, special precautions should be taken and the Certificate holder consulted.

14.5 Insulation boards must be fixed to the substrate in such a way as not to impair the performance of the waterproofing membrane.

14.6 All flashings must be formed in accordance with the Certificate holder's instructions.

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

15 Procedure

Fully bonded (adhered)

15.1 The bonding agent (URDIN ADH PU 822) is applied to the substrate at the prescribed rate using the appropriate method.

15.2 The URDIN MP FB membrane is unrolled into the bonding agent, taking care not to stretch the material and ensuring adequate overlaps for jointing (see section 16).

15.3 When bonding URDIN MP (in vertical applications) URDIN ADH PB 52 must be used.

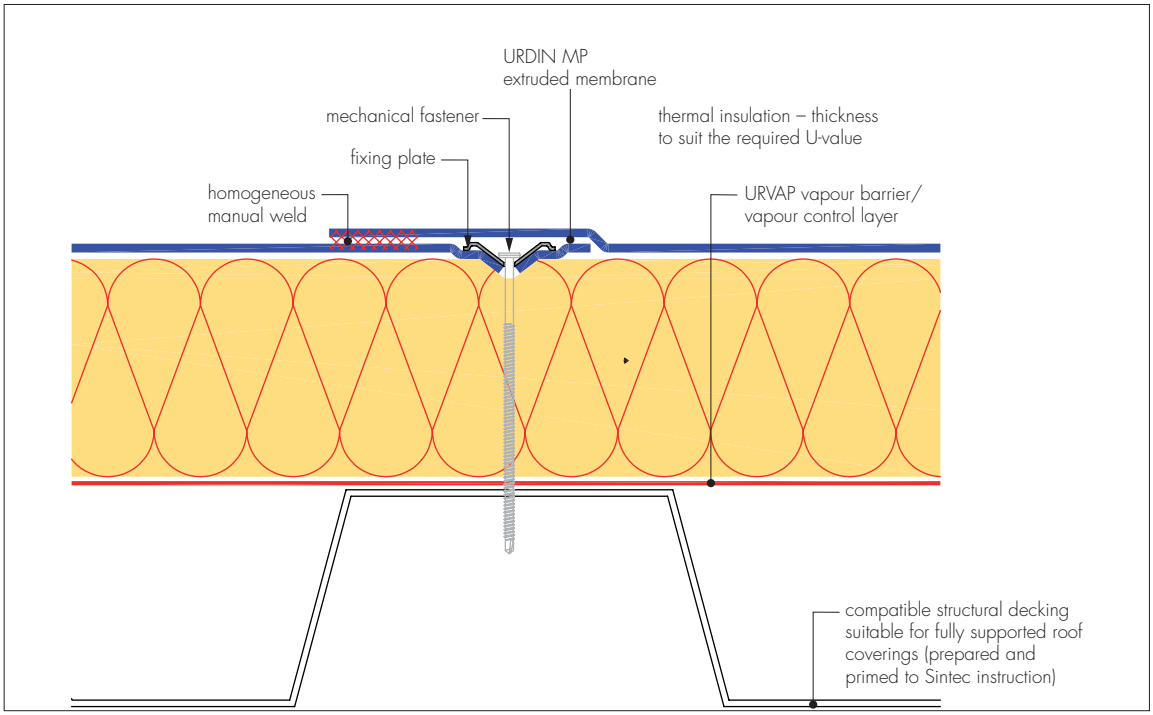
15.4 Details at perimeter upstands must be either fully adhered or mechanically fixed.

Mechanically fastened

Lap Fixing Method

15.5 The URDIN MP membrane is laid flat onto the substrate without folds or ripples, and fixed to the deck by fasteners and plates through the overlap of the membrane (see Figure 1).

Figure 1 Application to steel decks — Lap Fixing Method



15.6 The position of the number of fasteners required must be in accordance with the fixing specifications provided by the Certificate holder.

OMG Fixing Method

15.7 The appropriate number of fasteners are installed in the position required in accordance with the fixing specifications provided by the Certificate holder.

15.8 The membrane is laid flat onto the substrate without folds or ripples, and fixed to the deck using an appropriate tool to induction-weld the membrane to all of the plates (see Figure 2).

Figure 2 Application to steel decks — OMG Fixing Method

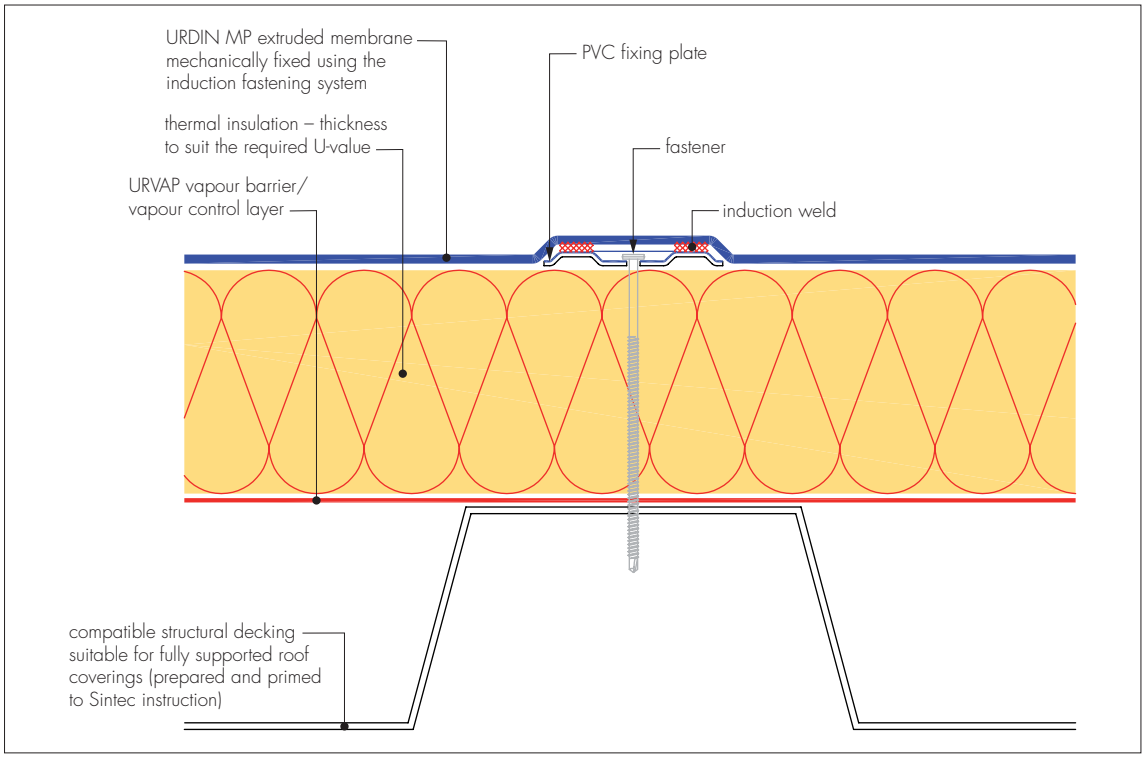
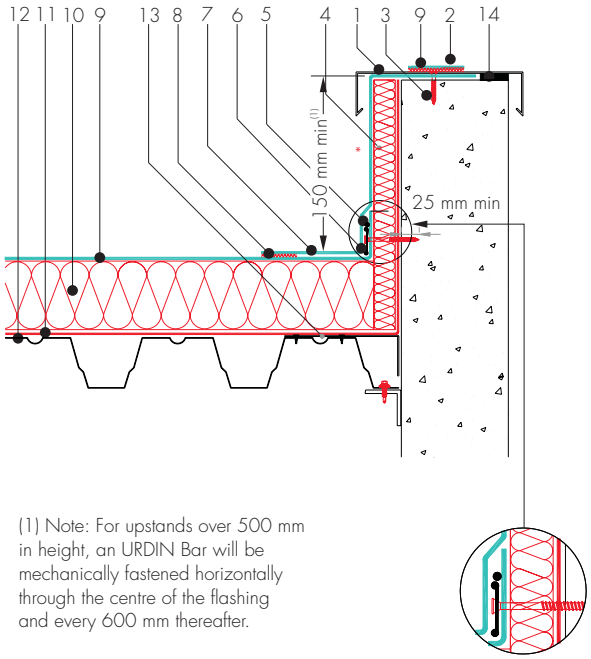
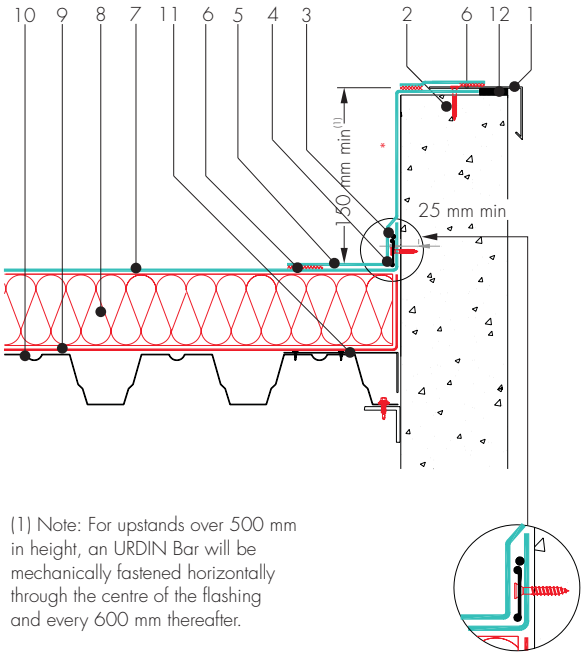


Figure 3 Perimeter upstands



(1) Note: For upstands over 500 mm in height, an URDIN Bar will be mechanically fastened horizontally through the centre of the flashing and every 600 mm thereafter.

1 Profiled metal capping, 1.4 mm thick
2 URDIN MP membrane strip welded to URDIN metal capping to cover fixings
3 Fixing at 250 mm centres
4 Insulation to upstand
5 PVC cord welded to field sheet direct behind URDIN Bar
6 URDIN Bar fixed through all perimeter edges as per wind uplift calculation
7 URDIN PVC Flashing membrane
8 Homogeneous manual welded lap
9 URDIN MP field sheet membrane, mechanically fastened to wind uplift schedules
10 Insulation – thickness to suit U-value
11 URVAP vapour control layer, sealed at all laps with URDIN Butyl Tape
12 Profiled metal decking to engineers' specifications
13 End profile
14 URDIN Butyl Tape



(1) Note: For upstands over 500 mm in height, an URDIN Bar will be mechanically fastened horizontally through the centre of the flashing and every 600 mm thereafter.

1 Profiled metal drip edge, 1.4 mm thick
2 Fixing at 250 mm centres
3 PVC cord welded to field sheet direct behind URDIN Bar
4 URDIN Bar fixed through all perimeter edges as per wind uplift calculation
5 URDIN PVC membrane
6 Homogeneous manual welding
7 URDIN MP field sheet membrane, mechanically fastened to wind uplift schedules
8 Insulation – thickness to suit U-value
9 URVAP vapour control layer, sealed at all laps with URDIN Butyl Tape
10 Profiled metal decking to engineers' specifications
11 End profile
12 URDIN Butyl Tape

15.10 For continuous fixing, the fixing bars are positioned with a 10 mm gap to allow for expansion. Ends of the bars are fixed with screws and URDIN Bar End Protectors.

Steel decks

15.11 Steel decks must be manufactured from galvanized steel with a minimum thickness of 0.7 mm.

15.12 Self-drilling and self-tapping screws should be selected in accordance with the Certificate holder's instructions.

Reinforced concrete decks

15.13 Concrete decks will require pre-drilling. The diameter of the holes should not be less than 6 mm, and nylon dowels or self-drilling anchors are recommended.

15.14 When re-roofing on concrete decks, dowels must be anchored for their full length in solid concrete. This should be noted particularly when using cement screeds or intermediate layers.

Timber decks

15.15 Fixing bars should be positioned above and fixed to beams or joists. If this is not possible, fastening bars must be positioned across the direction of timber planks, provided the planks are sufficiently fastened to withstand the imposed wind loads.

15.16 Fixing bars must be fixed by screws (nails are not suitable for this purpose). Acceptable loads on each screw and corresponding space between screws in each case are calculated before installation.

16 Jointing and flashing procedure

Hot-air welding (automatic welding machine)

16.1 The welding area must be dry and clean. If the membrane in the weld area has become contaminated, it must be cleaned in accordance with the Certificate holder's instructions.

16.2 The overlap width of the membranes must be a minimum of 120 mm and the overlap must be spot welded with a welding machine, every 150 to 200 mm along the length of the joint.

16.3 The temperature for the automatic welding machine must be set in accordance with the Certificate holder's instructions, depending on the thickness of the membrane and the ambient temperature.

16.4 The joint is welded using the machine. Care must be taken to ensure that overheating of the membrane does not occur, as possible impairment of the membrane may result.

16.5 The seam must be tested with a suitable metal probe and any weakness repaired immediately.

Hot-air welding (hand-held welder)

16.6 The welding area must be dry and clean. If the membrane in the weld area has become contaminated, it must be cleaned in accordance with the Certificate holder's instructions.

16.7 The overlap width of the membranes must be a minimum of 120 mm and the overlap must be spot welded approximately every 400 mm along the length of the joint.

16.8 The temperature for the hand-held welder must be set in accordance with the Certificate holder's instructions, depending on the thickness of the membrane and the ambient temperature.

16.9 The joint is pre-welded parallel to, and behind, the main welding line. The pre-weld is tested for delamination prior to the main welding being carried out.

16.10 The main weld is carried out. Care must be taken to ensure that overheating of the membrane does not occur, as possible impairment of the membrane may result.

16.11 The seam must be tested with a suitable metal probe and any weakness repaired immediately.

Flashing

16.12 Flashing and detailing must be formed in accordance with the Certificate holder's instructions.

17 Repair

In the event of damage occurring, repairs are carried out by cleaning the area around the damage and applying a patch as described in the Certificate holder's instructions.

18 Tests

18.1 An assessment was made of test data for URDIN MP and URDIN MP FB membranes to determine:

tests on the reinforcement

- mass per unit area
- tensile strength and elongation
- mesh number

tests on the membrane

- mass per unit area
- tensile strength and elongation at break
- nail tear resistance at 23°C, 40°C and –10°C
- dimensional stability
- low temperature foldability
- static indentation
- weight loss at elevated temperatures at 14 days, 28 days, 84 days and 168 days
- water absorption after 180 days water immersion
- wind uplift load per fixing
- water soak at 180 days immersion followed by dimensional stability
- 168 days heat ageing at 80°C followed by dimensional stability and low temperature foldability
- plasticiser content
- dehydrochlorination
- ash content
- ΔE colour change after UV exposure equal to 4500 $MJ \cdot m^{-2}$ of radiation energy

tests on joints

- joint shear strength for hot-air welded joints and THF welded joints
- T-peel for hot-air welded joints and THF welded joints.

18.2 Samples were taken from an existing site over 20 years old. Comparison testing was carried out on new products from the factory, site samples and site samples following additional UV ageing, and the results assessed:

- thickness
- mass per unit area
- low temperature foldability
- resistance to dynamic impact.

18.3 Results of root resistance tests on URDIN MP 1.5 membranes, conducted by an independent accredited laboratory, were assessed.

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 Existing data on fire performance of the membrane were evaluated.

19.3 Wind uplift data on mechanically fixed systems from an independent accredited laboratory were evaluated.

19.4 Corrosion resistance test data from an independent accredited laboratory on the fixing screws and plates were evaluated in connection with durability.

19.5 Fatigue resistance and creep stress data of the fixing screw's polyamide sleeve were examined in connection with durability.

19.6 An inspection visit was conducted to an existing site at least 20 years old.

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

BS EN 1991-1-3 : 2003 *Eurocode 1 : Actions on structures — General actions — Snow loads*
NA to BS EN 1991-1-3 : 2003 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Snow loads*
BS EN 1991-1-4 : 2005 + Amendment 10 :2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Wind actions*

BS EN 1997-1 : 2004 Eurocode 7: *Geotechnical design — General rules*

BS EN 13956 : 2012 *Flexible sheet for waterproofing — Plastic and rubber sheets for roof waterproofing — Definitions and characteristics*

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

Conditions of Certification

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.

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