Alwitra GmbH & Co Klaus Göbel
P O Box 3950
D-54229 Trier
Germany
Tel: 00 49 651 91020 Fax: 00 49 651 9102500
e-mail: alwitra@alwitra.de
website: www.alwitra.de

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
96/3293
Product Sheet 1

ALWITRA ROOFING MEMBRANES

EVALON AND EVALON V ROOFING SHEETS

This Agrément Certificate Product Sheet[1] relates to Evalon and Evalon V Roofing Sheets, for use as roof waterproofing membranes in mechanically-fastened, fully-adhered, loose-laid and ballasted specifications on flat and pitched roofs with limited access, and in roof gardens 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 products will resist the passage of moisture into the building (see section 6).

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

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

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

Resistance to penetration of roots — the products will resist the penetration of roots (see section 10).

Durability — under normal service conditions the products will provide a durable roof waterproofing with a service life of at least 30 years (see section 12).

The BBA has awarded this Certificate to the company named above for the products described herein. These products 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 Fifth issue: 4 September 2015

Originally certificated on 28 October 1996

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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA
tel: 01923 665300
fax: 01923 665301
clientservices@bba.star.co.uk
www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Evalon and Evalon V Roofing Sheets, 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 products 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 products, including joints, will enable a roof to meet this Requirement. See section 6.1 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The products 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 products satisfies the requirements of this Regulation. See sections 11.1 to 11.4 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 products, 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 use of the products, including joints, will enable a roof to meet 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 products 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:		Comments made in relation to the membranes 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 products are acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The products, 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 a suitable substructure, the use of the products will enable a roof to be unrestricted under 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 2014

NHBC accepts the use of Evalon and Evalon V Roofing Sheets, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapters 7.1 *Flat roofs and balconies* and 7.2 *Pitched roofs*.

CE marking

The Certificate holder has taken the responsibility of CE marking the products 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 Evalon and Evalon V Roofing Sheets are manufactured from polyvinyl chloride (PVC)/modified ethylene vinyl acetate (EVA). Evalon V is backed with a polyester fleece (nominal weight 160 g·m^{-2}) and includes an unbacked selvedge with a minimum width of 50 mm on one side for overlapping and homogeneous heat or solvent welding.

1.2 The sheets have the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Evalon		Evalon V	
Thickness* (mm)	1.2	1.5	2.2/1.2[1]	2.5/1.5[1]
Mass per unit area* (kg·m^{-2})	1.5	1.8	1.6	2.0
Roll length* (m)	25	25	25	25
Roll width* (m)	1.05, 1.55, 2.00[2]	1.05, 1.55, 2.00[2]	1.05, 1.55, 2.05[2]	1.05, 1.55, 2.05[2]
Roll weight[3] (kg·m^{-2})	41, 61, 79	51, 76, 98	44, 65, 86	54, 80, 106
Tensile strength* (N·mm^{-2})	≥12.5		–	
Tensile force (N·50 mm^{-1})	–		≥500	
Elongation* (%)	≥ 300		≥60	
Tear resistance* (N)	≥80		≥80	
Dimensional stability* (%)	≤2		≤1	
Foldability at low temperatures* (°C)	≤ –25		≤ –25	
Watertightness* (Method B)	pass		pass	
Impact resistance* (mm)	≥ 300		≥ 300	
Static load* (kg)	≥ 20		≥ 20	

(1) Selvedge thicknesses of approximately 2.2 mm and 2.5 mm with backing (1.2 mm and 1.5 mm without backing).
(2) Other sizes are available.
(3) Gross (including packing).

1.3 Ancillary items for use with the products include:

- tapes of unbacked Evalon membranes in widths from 100 mm to 1260 mm — for use at parapets and vertical upstands
- Evalon VSKA — a self-adhesive flashing membrane in widths from 330 mm to 750 mm
- Alwitra adhesive type L40 — a solvent-based adhesive for bonding the products to substrates
- ICB HA membrane adhesive — solvent-based adhesive for bonding the products to substrates
- Alwitra solvent-welding agent type THF — for cold welding of lap jointing/welding work
- Evalon Walkway tiles — 800 mm x 600 mm tiles for protection of the waterproofing and to mark the maintenance walkways on the roof
- EVA-metal galvanized steel sheets — laminated with Evalon membrane and used for various applications such as at perimeters
- liquid Evalon paste — for additional protection of joints
- Alwitra Evalon standing seam profiles — decorative profiles for use on pitched/curved roofs
- Alwitra MA, MAG, MAK — wall capping profiles
- Alwitra TA, TAG Art-Line — a range of roof edge trims/fascia profiles and Alwitra rainwater outlets
- Alwitra WA — counter flashing and protective skirting profiles
- prefabricated Evalon sections — including corners, lightning conductor penetrations, sleeves and collars in various dimensions, for use with TA/TAG/WA profiles
- Alwitra rooflight systems
- Alwitra rainwater outlets
- paving slab supports
- fasteners and fastening plates — for use in mechanically-fixed applications
- termination bars — for fixing the membrane at roof perimeters.

2 Manufacture

2.1 Evalon and Evalon V sheets are manufactured from flexible EVA, PVC, fillers, pigments, stabilisers and processing aids. The mixture is homogenised and thermally fused before calendering into sheets. A polyester fleece backing is applied to produce Evalon V sheets.

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 Alwitra GmbH & Co has been assessed and registered as meeting the requirements of EN ISO 9001 : 2008, EN ISO 14001 : 2004 and EN ISO 50001 : 2011 by TÜV Rheinland Industrie Service GmbH (Certificates 01 005463, 01 104 000580 and 01 407 5463 repectively).

2.4 The products are manufactured in Germany by the Certificate holder and marketed/distributed in the UK by ICB (International Construction Bureau) Ltd, Units 9–11, Fleets Industrial Estate, Willis Way, Poole, Dorset BH15 3SU, tel: 01202 785200, fax: 01202 785201, e-mail: info@icb.uk.com, website: www.icb.uk.com

3 Delivery and site handling

3.1 The products are delivered to site in rolls wrapped in polythene film. The wrapper bears the manufacturer's name, product identification, roll width, roll length, colour and the BBA logo incorporating the number of this Certificate.

3.2 Rolls should be stored horizontally undercover and on a clean, level surface in a dry environment.

3.3 The adhesive, Alwitra solvent welding agent and Alwitra liquid Evalon are all classified as 'highly flammable' under the *Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009*. Flashpoints and hazard classifications are given in Table 2. The products bear the appropriate hazard warning.

Table 2 Flashpoint and hazard classification

Material	Flashpoint (°C)	Classification
Alwitra adhesive type L40	–25	Highly flammable
ICB HA Membrane adhesive	–18	Highly flammable/harmful
THF	–20	Highly flammable/irritant
Liquid Evalon	–14	Highly flammable/harmful

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Evalon and Evalon V Roofing Sheets.

Design Considerations

4 Use

4.1 Evalon and Evalon V Roofing Sheets are satisfactory for use as:

- fully-adhered roof waterproofing on flat, pitched and curved roofs with limited access
- mechanically-fixed roof waterproofing on flat, pitched and curved roofs with limited access
- loose-laid roof waterproofing on flat and low-pitched roofs ballasted with gravel or any other material (eg paving slabs or paving supports) approved by the manufacturer. This includes warm roofs, duo roofs, cold roofs, terrace roofs, inverted roofs, roof gardens and green roofs.

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, additional protection to the membrane must be provided (see section 9).

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

4.4 Decks to which the products are 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 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, and within the scope of that Certificate.

4.6 When the products are used over polystyrene-based insulation products, an isolating layer must be used in areas where cold solvent welding is to be performed, or where substrate adhesive may be used. This is to protect the insulation layer, from the solvents present in these products.

4.7 Where contact with solvent-based products (eg wood preservatives) is likely, consideration must be given to the use of an isolating layer, and the advice of the Certificate holder sought.

4.8 The sheets can be applied to vertical surfaces up to 1 m. For other applications, the Certificate holder's advice regarding the fire performance of the system must be sought.

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

4.10 For green 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.

4.11 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 UK National Annexes.

4.12 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. Gravel guards should be used on rainwater outlets and these should be inspected annually.

5 Practicability of installation

Installation must be carried out by trained and approved contractors.

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

7 Performance in relation to fire

7.1 In the opinion of the BBA, a system comprising :

- a 12 mm thick chipboard deck, one layer of bitumen bonded (95/25 grade bitumen) felt vapour barrier, and one bitumen bonded (95/25 grade) 35 mm polyisocyanurate insulation layer covered by Evalon V bonded using L40 adhesive, will be unrestricted
- a 12 mm thick chipboard deck, one layer of torched-on bitumen felt vapour barrier, and one bitumen bonded (95/25 grade) 50 mm polyisocyanuarate insulation layer covered by Evalon V bonded using L40 adhesive, will be unrestricted.

7.2 The products, when used in protected or loose-laid and ballasted specifications, including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC, can be considered to be unrestricted under the national Requirements.

7.3 In the opinion of the BBA, when used in irrigated roof gardens or green roofs, the use of the membranes will be unrestricted under the national Requirements.

7.4 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.

7.5 If green roofs and roof gardens are 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 installation. Appropriate planting irrigation and/or protection should be applied to ensure that the overall fire rating of the roof is not compromised.

7.6 The products are classified as Class E* in accordance with BS EN 13501-1 : 2007.

7.7 The products have been tested to DD ENV 1187 : 2002, Tests 1, 3 and 4 and classified to BS EN 13501-5 : 2005 as $B_{ROOF}(t1)$, $B_{ROOF}(t3)$ and $B_{ROOF}(t4)$.

8 Resistance to wind uplift

8.1 The adhesion of fully-bonded sheets to the substrate is governed by the cohesive strength of the substrate. On substrates of high-cohesive strength, the adhesion of the products is sufficient to resist the effects of wind suction, thermal cycling or other minor structural movements likely to occur in service. However, in areas of high wind exposure, consideration should be given to the use of additional fixings, especially on porous substrates.

8.2 The resistance to wind uplift of a mechanically-fastened waterproofing layer is provided by the 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.

8.3 The number of fixings used should be established by reference to the wind uplift forces (calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex), based on maximum permissible loads of 0.40 kN per fixing.

8.4 The ballast requirements for loose-laid systems must be calculated in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. The membrane should always be ballasted with a minimum depth of 50 mm of aggregate (20 to 40 grade gravel). In areas of high wind exposure, the Certificate holder's advice should be sought. Alternatively, concrete slabs on suitable supports can be used.

8.5 The soil used in roof gardens must not be of a type that will be removed, or become delocalised owing to wind scour experienced on the roof.

8.6 The type of plants used in roof gardens could significantly affect the expected wind loads experienced in service.

9 Resistance to foot traffic

9.1 The membranes can accept, without damage, 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 should be provided, for example using concrete slabs supported on bearing pads, eg Evalon Walkway tiles or rubber/plastic tiles. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads.

9.2 An installed green roof or roof garden can be regarded as suitable protection for the products in use.

10 Resistance to penetration of roots

Results of tests in accordance with BS EN 13948 : 2007 indicate that the membranes will adequately resist penetration by plant roots.

11 Maintenance

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

11.2 Maintenance should include checks and operations to ensure that, 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 must 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 the spring, to ensure that unwanted vegetation and other debris are cleared from the roof and drainage outlets (see section 4.12). Guidance is available within the latest edition of *The GRO Green Roof Code — Green Roof Code of Best Practice for the UK*.

12 Durability

Accelerated weathering tests confirm that satisfactory retention of physical properties is achieved. Under normal conditions, the membranes will have a service life of at least 30 years.

13 Reuse and recyclability

The products comprise polyvinyl chloride and ethylene vinyl acetate, which can be recycled.

14 General

14.1 Installation of Evalon and Evalon V Roofing Sheets 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. Typical constructions are given in Figure 1.

14.2 The products may be laid in conditions normal to roofing work and should not be laid in wet or damp weather, nor at temperatures below 5°C, unless suitable precautions are taken.

14.3 Deck surfaces must be clean, dry and free from sharp projections such as nail heads and concrete nibs. When used as a repair medium over a traditional bitumen felt system, the surface dressing must be removed. On rough decks or when used over mineral surfaced bitumen felts, Evalon V must always be used.

14.4 Solvent-based adhesives in adhered specifications or cold solvent welding must not be in direct contact with polystyrene-based products, as the active solvents present are not compatible with them.

15 Procedure

Fully bonded

15.1 Where necessary, a first layer of bitumen felt conforming to BS 8747 : 2007, Type 5U, is bonded to the substrate using traditional pour and roll bitumen bonding techniques. Alternatively, a first layer of bitumen felt, containing a glass reinforcing core of at least 100 $g \cdot m^{-2}$, may be used, provided it is covered by, and used within the terms of, a current BBA Certificate.

15.2 The first layer of bitumen felt must be allowed to cool prior to the application of the products, and then be coated with either Alwitra L40 or ICB HA membrane adhesive at a rate of between 0.25 $kg \cdot m^{-2}$ and 0.60 $kg \cdot m^{-2}$, depending on the condition of the substructure.

15.3 The roofing sheets are unrolled into the adhesive taking care not to stretch the material, with adjacent sheets overlapped by a minimum of 40 mm. Roll ends must overlap a minimum of 40 mm for Evalon, and be butt jointed for Evalon V. The Evalon joints must be waterproofed using strips of Evalon, at least 160 mm wide, and centrally welded over the joint.

15.4 Surplus adhesive must be removed from the joint areas prior to welding. Lap welding techniques are described in section 16.

15.5 When used as a repair medium over traditional built-up bitumen roofing systems, the existing covering must be made good. Surface dressings, such as mineral chippings, must be removed. The membrane is then bonded directly to the existing roof covering in the manner described in sections 15.2 to 15.4.

Mechanically fixed

15.6 The products may be used in mechanically-fixed systems either as a single layer or over a bonded bitumen layer (as described in section 15.1).

15.7 The roofing sheets are unrolled over the substrate, taking care to avoid any folds or ripples, with adjacent sheets overlapped by a minimum of 100 mm. Roll ends must overlap a minimum of 40 mm for Evalon, and be butt-jointed for Evalon V. The Evalon joints must be waterproofed using strips of Evalon, at least 160 mm wide, and centrally welded over the joint.

15.8 The position of the fixings, and the number required, will depend upon the type used, the type of deck and the wind uplift forces to be resisted.

15.9 The first sheet is fixed to the substrate with the fixing plates positioned 10 mm from the sheet edge. The adjacent sheet is laid over the first sheet and lap jointed along the final 40 mm as described in section 16.

15.10 Perimeter fixings at sheet edges must be waterproofed using 100 mm wide strips of Evalon welded to the membrane using the techniques described in section 16.

15.11 A range of prefabricated accessories is available from the Certificate holder. Advice on the selection of accessories can be sought from the Certificate holder.

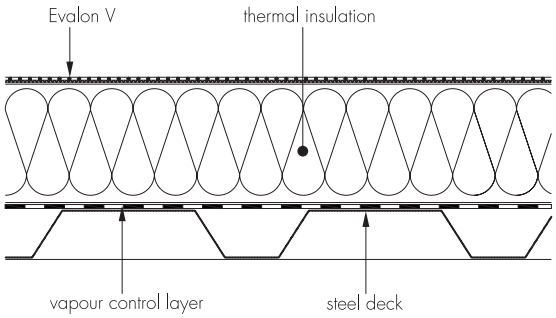
Loose-laid and ballasted

15.12 The sheets are unrolled and loose-laid with 40 mm side laps, welded using hot-air or solvent welding as described in section 16. The ends of rolls are butt jointed and taped with a 100 mm wide unbacked Evalon tape in accordance with the Certificate holder's instructions.

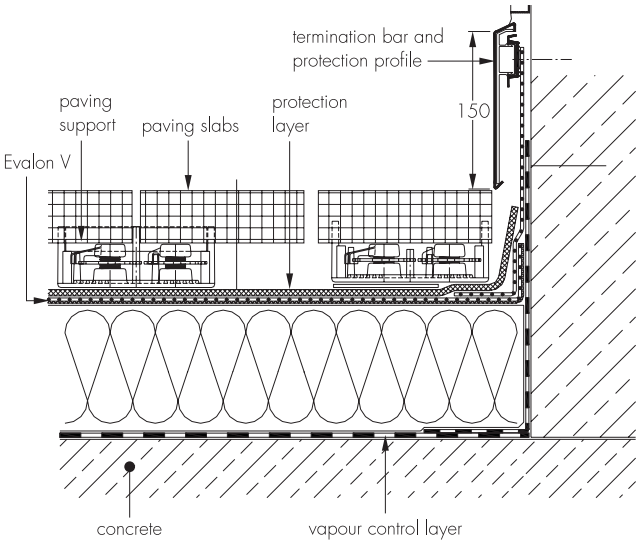
15.13 The sheets are covered with at least 50 mm of washed, rounded shingle between 20 mm and 40 mm in diameter. In areas of high wind exposure, paving slabs may be considered for use.

15.14 Concrete paving slabs may be used as an alternative to shingle but a protective sheet must be laid between the Evalon sheet and the supports.

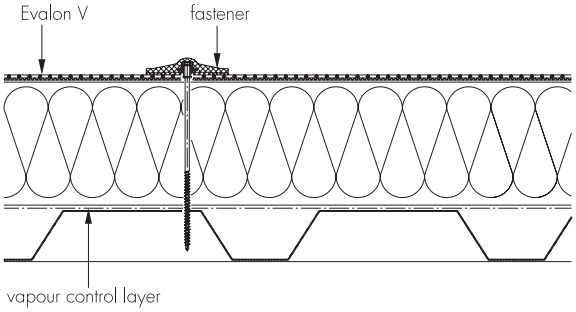
Figure 1 Typical construction detail (all dimensions in mm)



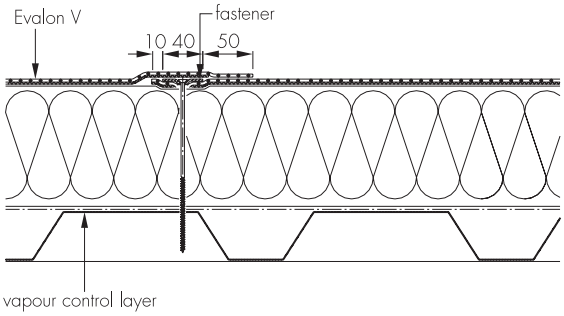
Evalon – fully adhered



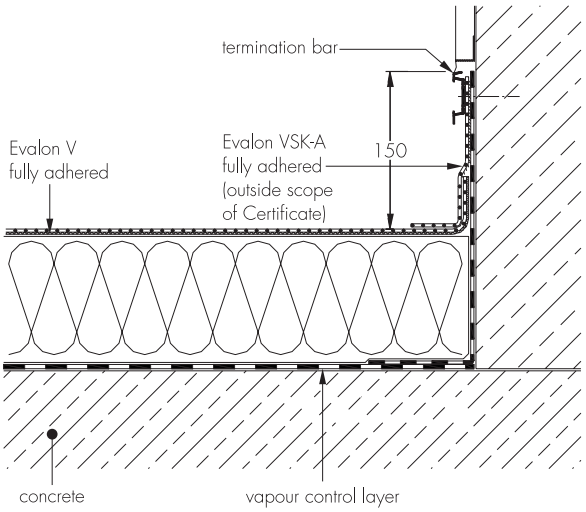
Evalon – loose-laid with paving slabs



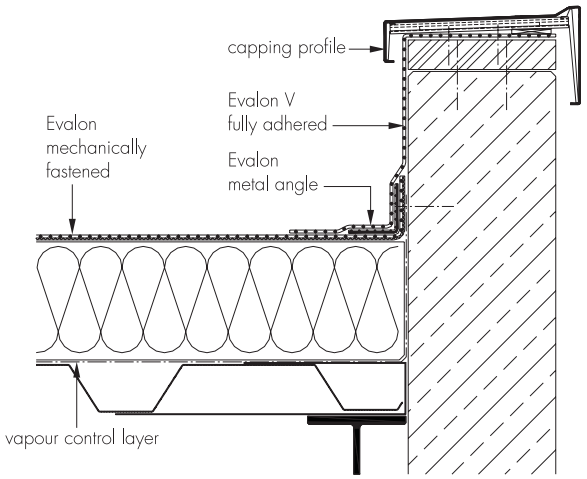
Evalon – mechanically–fastened



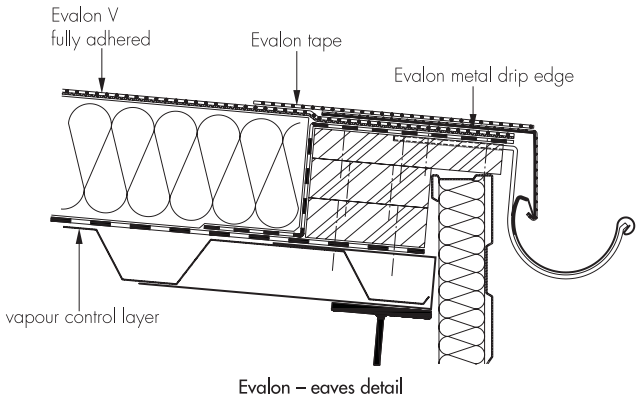
Evalon – mechanically–fastened lap detail



Evalon – edge detail



Evalon – capping/edge detail



Evalon – eaves detail

15.15 When the sheet is laid directly onto a concrete deck, a protective layer of PE-foam or polyester fleece (minimum 200 g·m^{-2}) must be laid. When used as a waterproofing layer in a roof designed to the inverted roof specification, a protective sheet must be laid between the concrete deck and the Evalon sheet.

15.16 For green roof or roof garden applications, the Certificate holder's instructions must be strictly followed.

16 Lap joints

Hot-air welding

16.1 Welding may be achieved by automatic or hand-operated welding machines in accordance with the Certificate holder's instructions.

16.2 Lap joint areas on both sheets must be cleaned to a minimum width of 50 mm and then dried.

16.3 The weld joint must be a minimum width of 20 mm. When using a hand-held welding machine, the seam must be rolled immediately using a silicone rubber or steel seam roller, to ensure an even bond.

16.4 On completion of the weld, the seam is tested by running a metal probe down the junction to check for continuity.

Solvent welding

16.5 Welding is achieved using Alwitra solvent-welding agent type THF in accordance with the Certificate holder's instructions.

16.6 The lap joint areas on both sheets must be cleaned to a minimum width of 50 mm and then dried.

16.7 Both surfaces are coated with solvent to a minimum width of 30 mm, and brought together. The joints are rolled immediately using a silicone rubber or a steel seam roller to ensure an even bond.

16.8 Seams are tested in the manner described in section 16.4.

17 Repair

In the event of damage, repairs must be carried out in accordance with the Certificate holder's instructions. Repairs are made by applying a patch of the Evalon membrane extending at least 50 mm beyond the defect. The damaged area must be cleaned back to the unweathered material and the patch hot-air or solvent welded to the roofing sheet.

Technical Investigations

18 Tests

18.1 An assessment was made of data to BS EN 13956 : 2005 relating to:

- tensile strength and elongation*
- low temperature foldability*
- dimensional stability*
- static indentation*
- dynamic indentation*
- watertightness*
- tear resistance*
- joint peel and shear resistance*
- root resistance*.

18.2 Tests were carried out to determine:

- water vapour transmission
- wind uplift
- thermal shock
- dynamic indentation (eps and perlite substrates)
- static indentation (eps and concrete substrates)
- tensile strength of joints
- peel resistance from bitumen felt, chipboard, asbestos cement and galvanized steel substrates
- fatigue cycling on unaged material and material heat aged for 28 days at 80°C

in order to assess:

- performance under typical service conditions
- robustness during installation
- properties when installed
- durability of membranes.

19 Investigations

19.1 Existing data on the fire performance of the membranes were assessed.

19.2 Visits were made to existing sites to assess the performance in use.

19.3 Existing data from WSP Aachen on the fixings and wind uplift testing on the mechanically fixed system was evaluated.

19.4 The *Durability* statement was reassessed based on a visit to an existing site in Germany and the results of tests conducted on unaged and naturally-aged material.

19.5 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.

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EN ISO 14001 : 2004 *Environmental management systems — Requirements with guidance for use*

EN ISO 50001 : 2011 *Energy management systems — Requirements with guidance for use*

DD ENV 1187 : 2002 *Test methods for external fire exposure to roofs*

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
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- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
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British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA
tel: 01923 665300
fax: 01923 665301
clientservices@bba.star.co.uk
www.bbacerts.co.uk