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Agrément Certificate
08/4529
Product Sheet 1

SPRINGVALE EPS INSULATION BOARDS

SPRINGVALE ROOFSHIELD, ROOFSHIELD V AND ROOFSHIELD S INSULATION

This Agrément Certificate Product Sheet(1) relates to Springvale Roofshield, Roofshield V and Roofshield S Insulation, expanded polystyrene (EPS) boards factory-bonded to perlite(2), for use on limited access flat roofs with suitably designed timber, concrete and metal structural decks in conjunction with a suitable, fully-supported, waterproofing system.

(1) Hereinafter referred to as 'Certificate'.
(2) Springvale Roofshield is EPS only; V and S are perlite-bonded.

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

Thermal performance — the products have thermal conductivities (λ_D) of 0.035 $W \cdot m^{-1} \cdot K^{-1}$, 0.034 $W \cdot m^{-1} \cdot K^{-1}$ and 0.033 $W \cdot m^{-1} \cdot K^{-1}$ for the EPS 100E, 150E and 200E boards respectively (see section 6).
Condensation risk — the products can contribute to limiting the risk of condensation (see section 7).
Strength and stability — when installed on suitable substrates using appropriate adhesive and/or mechanical fixing methods, the products can adequately transfer maintenance traffic loads and wind loads to the roof deck (see section 8).
Behaviour in relation to fire — the overall fire rating of any roof containing the products will depend on the type of deck and the nature of the roof waterproof covering (see section 9).
Durability — the products, when used as a thermal insulation in the roof system described in the Certificate, will have a life at least as long as that of the roof waterproof covering (see section 11).

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 Third issue: 31 July 2017

John Albon – Head of Approvals Construction Products

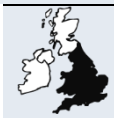
Claire Curtis-Thomas
Chief Executive

Originally certificated on 29 February 2008

This Certificate was amended on 22 May 2024 as part of a transition of The BBA Agrément Certificate scheme delivered under the BBA's ISO/IEC 17020 accreditation. This Certificate was issued originally under accreditation to ISO/ IEC 17065. Sections marked with the symbol † are not issued under accreditation. Full conversion to the ISO/IEC 17020 format will take place at the next Certificate review. The BBA is a UKAS accredited Inspection Body (No.4345). ***Readers MUST check the validity of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*** *Any photographs are for illustrative purposes only, do not constitute advice and must not be relied upon.*

Regulations

In the opinion of the BBA, Springvale Roofshield, Roofshield V and Roofshield S Insulation, 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:	**A1**	**Loading**
Comment:		The products can contribute to satisfying this Requirement. See section 8.1 of this Certificate.
Requirement:	**B4(2)**	**External fire spread**
Comment:		Roofs incorporating the products can satisfy this Requirement. See sections 9.1 and 9.3 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The products can contribute to satisfying this Requirement. See sections 7.1 and 7.2 of this Certificate.
Requirement:	**L1(a)(i)**	**Conservation of fuel and power**
Comment:		The products can contribute to satisfying this Requirement. See section 6 of this Certificate.
Regulation:	**7**	**Materials and workmanship**
Comment:		The products are acceptable. See section 11 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 energy efficiency rates for new dwellings (applicable to Wales only)**
Comment:		The products can contribute to satisfying these Regulations. See section 6 of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Durability, workmanship and fitness of materials**
Comment:		The products can contribute to a construction satisfying this Regulation. See section 11 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	1.1	Structure The products are acceptable, with reference to clauses 1.1.1[(1)(2)], 1.1.2[(1)(2)] and 1.1.3[(1)(2)]. See section 8.1 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		Roofs incorporating the products can satisfy this Standard, with reference to clause 2.8.1[(1)(2)]. See sections 9.1 and 9.3 of this Certificate.
Standard:	3.15	Condensation
Comment:		The products can contribute to a roof satisfying this Standard, with reference to clauses 3.15.1[(1)(2)], 3.15.3[(1)(2)], 3.15.4[(1)(2)], 3.15.5[(1)(2)] and 3.15.6[(1)(2)]. See sections 7.1 and 7.3 of this Certificate.

Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The products can contribute to satisfying these Standards, with reference to clauses, or parts of, 6.1.1(1), 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 6.1 and 6.2 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The products can contribute to satisfying 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 products 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 section 6 of this Certificate.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		Comments made in relation to the products 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**	**Fitness of materials and workmanship**
Comment:		The products are acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		The products can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	**30**	**Stability**
Comment:		The products can contribute to satisfying this Regulation. See section 8.1 of this Certificate.
Regulation:	**36(b)**	**External fire spread**
Comment:		Roofs incorporating the products can satisfy this Regulation. See sections 9.1 and 9.3 of this Certificate.
Regulation:	**39(a)(i)**	**Conservation measures**
Regulation:	**40(2)**	**Target carbon dioxide emission rate**
Comment:		Roofs incorporating the products can satisfy these Regulations. See section 6 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 section: 3 *Delivery and site handling* (3.3) of this Certificate.

Additional Information

NHBC Standards 2017

NHBC accepts the use of Springvale Roofshield, Roofshield V and Roofshield S Insulation, 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 products in accordance with harmonised European Standard BS EN 13163 : 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 products consist of white (EPS) manufactured to the requirements of BS EN 13163 : 2012 and are for use as a thermal insulation layer and are available in a taped profile to create a fall of the roof, if required. Three versions are available:

- Roofshield – white EPS only
- Roofshield V – white EPS bonded to perlite
- Roofshield S – white EPS bonded to perlite with a bitumen coating on the upper face.

1.2 The EPS board component is produced by a steam-moulding process and is available in three grades (see Table 1) and two types, either with or without fire retardant. The products without fire retardant are classified as No Performance Determined (NPD) by the Certificate holder. An 'E' suffix is used to indicate EPS with fire retardant, which achieves classification* E when tested in accordance with BS EN 13501-1 : 2007. The product has an Ozone Depletion Potential (ODP) of zero and a Global Warming Potential of less than 5 (GWP <5).

Table 1 Physical properties of EPS component

Nominal characteristics	**Grade**		
	EPS 100	**EPS 150**	**EPS 200**
Minimum compressive strength* at 10% compression (kPa)	100	150	200
Minimum bending strength* (kPa)	150	200	250
Water vapour permeability* [Mg·(Pa·h·m)$^{-1}$]	0.010 to 0.024	0.010 to 0.024	0.007 to 0.018
Length* (mm)	1200	1200	1200
Width* (mm)	600	600	600
Thickness* (mm)(1)	50 to 200	50 to 200	50 to 200

(1) Thicker sizes are available to order.

1.3 The perlite component is available in thicknesses of 13 or 15 mm and is factory-bonded to the polystyrene upper face with adhesive.

1.4 The products are installed as part of a roof system in conjunction with the following items (outside the scope of this Certificate):

- timber, concrete and metal deck
- waterproof membrane
- mechanical fixings.

2 Manufacture

2.1 The products are manufactured from raw beads which are expanded through a controlled process into blocks of different densities. The blocks are then cut into finished products on pre-programmed automatic hot wire/serrated blade cutting machines.

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 Springvale EPS Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI and BS EN ISO 14001 : 2004 by QMS (Certificates FM13871 and 14130944 respectively).

3 Delivery and site handling

3.1 The products are delivered to site shrink wrapped on wooden pallets, or on disposable polystyrene skids. The products are marked with a coloured stripe to indicate the grade. A label is attached to each stack of products, detailing the product name, board size, grade, date of manufacture and Certificate holder's reference.

3.2 The products must be protected from prolonged exposure to sunlight and should be stored under cover or protected with light-coloured, opaque polythene sheets. They must be stored flat and off the ground on a clean, level surface.

3.3 The products must not be exposed to naked flame or other ignition sources, or to solvents or other chemicals.

3.4 Damaged boards must not be used.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Springvale Roofshield, Roofshield V and Roofshield S Insulation.

Design Considerations

4 General

4.1 Springvale Roofshield, Roofshield V and Roofshield S Insulation are for use as thermal insulation layers on limited access flat roofs with timber, concrete or metal structural decks.

4.2 Decks should be designed in accordance with the relevant clauses of either BS 6229 : 2003 or BS EN 13956 : 2012 and, where appropriate, *NHBC Standards* 2017, Chapter 7.1.

4.3 Roofs should incorporate a vapour control layer (VCL) below the product that is compatible both with the product and the waterproofing system. Advice should be sought from the Certificate holder.

4.4 The products are for use with one of the following waterproofing specifications:

(a) built-up reinforced bitumen membrane to BS 8747 : 2007, laid in accordance with BS 8217 : 2005
(b) mastic asphalt laid in accordance with BS 8218 : 1998
(c) single-ply membranes laid in accordance with BS 6229 : 2003 and the Certificate holder's advice.

4.5 Limited access roofs are defined for the purpose of this Certificate as those subject only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc.

4.6 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80 and a maximum of 1:6, as defined in BS 6229 : 2003.

4.7 For design purposes on flat roofs, 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.

4.8 Tapered boards may be used, where appropriate, to achieve the minimum finished falls required. Any existing irregularities in the roof should be overcome before a tapered system is laid.

4.9 Where applicable, roof drainage should be designed in accordance with BS EN 12056-3 : 2000.

5 Practicability of installation

The products are designed to be installed by a competent general builder, or contractor, experienced with these types of products.

6 Thermal performance

6.1 Calculations of the thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006, using the appropriate declared thermal conductivities* (λ_D) for the insulation given in column 1, Table 2 of this Certificate.

6.2 The U value of a completed roof will depend on the thickness of insulation used, the type of fixing and the insulating value of other roof components/layers. Example U values of roofs incorporating the products are shown in Table 2.

Table 2 Example U values for flat roof

Insulation type	**U values in $W \cdot m^{-2} \cdot K^{-1}$ for different decks**	**Thickness (mm)**		
		timber	**concrete**	**metal**
White EPS 100E $\lambda_D = 0.035\ W \cdot m^{-1} \cdot K^{-1}$	0.13	240	240	250
	0.15	200	210	220
	0.18	170	170	180
	0.20	160	160	160
	0.25	120	120	125
White EPS 150E $\lambda_D = 0.034\ W \cdot m^{-1} \cdot K^{-1}$	0.13	240	240	240
	0.15	200	200	210
	0.18	170	170	170
	0.20	150	150	155
	0.25	115	120	120
White EPS 200E $\lambda_D = 0.033\ W \cdot m^{-1} \cdot K^{-1}$	0.13	240	240	240
	0.15	200	200	200
	0.18	165	170	170
	0.20	145	145	150
	0.25	115	115	120

Notes
Perlite: $\lambda = 0.052\ W \cdot m^{-1} \cdot K^{-1}$, BS EN 12524 : 2000)
Reinforced bitumen membrane: $\lambda = 0.23\ W \cdot m^{-1} \cdot K^{-1}$, BS EN 12524 : 2000.

Junctions

6.3 The product can contribute to maintaining continuity of thermal insulation at junctions with other elements and minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations. Advice can also be sought from the Certificate holder.

7 Condensation risk

Interstitial condensation

7.1 Roofs will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, Annexes D and H, and the relevant guidance.

Surface condensation

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

7.3 For buildings in Scotland, constructions will be acceptable where the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ 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.

8 Strength and stability

8.1 When installed on suitable flat roof decks, using appropriate adhesive, the products can adequately transfer maintenance traffic loads and negative and positive (suction and pressure) wind loads to the roof deck.

8.2 For adhesive application of the products, the substrate must be dry and free from dust, and installation should be in accordance with the instructions of the adhesive manufacturer. The surface of the substrate must have sufficient cohesive strength to resist the calculated wind load acting upon the structure.

8.3 Adhesion between the insulation product and VCL, and between the product and overlay, must be adequate to resist the effects of wind suction and thermal cycling likely to be experienced under normal conditions. In areas where high wind speeds can be expected, mechanical fixings should be considered to supplement the adhesive. The advice of a suitably qualified and experienced individual should be sought as to the method of fixing, as defined in the relevant clauses of BS EN 1991-1-4 : 2005 and its UK National Annex.

8.4 Roof waterproofing systems (see section 4.4 for suitable types) must be applied in accordance with the relevant Agrément Certificates and the Certificate holder's instructions.

8.5 The products have not been assessed for use with permanent distributed or concentrated loads, such as air conditioning units, mechanical plants, water tanks, etc. Such loads should be supported directly on the roof construction. The products are not suitable for use if permanent roof access is required.

8.6 When profiled decking is used, the products will need to span across the ribs — see Table 3.

Table 3 Maximum permissible spans

	Minimum board[1] thickness (mm)		
	53	**63**	**78**
Maximum span (mm)	110	125	210

(1) Based on test results for the lowest grade.

9 Behaviour in relation to fire

9.1 The products have a reaction to fire classification* of Class E to BS EN 13501-1 : 2007.

9.2 The fire rating of any roof containing the products will depend on the type of deck and the nature of the roof waterproofing covering.

9.3 When used for flat roofs incorporating the specification described in section 4.4(a) and with one of the surface finishes listed below, as defined in the national Building Regulations, the roof is deemed to be of designation AA/Low Vulnerability.

Surface finishes:

- bitumen-bedded stone chippings covering the whole surface to a depth of not less than 12.5 mm
- bitumen-bedded tiles of a non-combustible material
- sand and cement screed
- macadam.

9.4 The designation of other specifications should be confirmed by:

England and Wales — test or assessment in accordance with Approved Document B, Volume 1 and 2, Appendix A, Clause 6

Scotland — test to conform to Mandatory Standard 2.C[1] and 2.F[2]

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

Northern Ireland — test to conform to clauses 5.21 and 5.22.

10 Maintenance

The products, once installed, do not require any maintenance and have suitable durability provided the roof waterproofing is inspected and maintained at regular intervals (see section 11).

11 Durability

The products are rot-resistant and durable, and will have a life at least as long as the roof waterproofing covering.

12 General

12.1 Springvale Roofshield, Roofshield V and Roofshield S Insulation must be installed in accordance with the Certificate holder's instructions, BS 6229 : 2003, BS 8217 : 2005, BS 8218 : 1998 and BS EN 13956 : 2012, depending on the waterproofing to be applied. Bitumen and cold adhesive bonding may be augmented by mechanical fixing where appropriate (outside the scope of this Certificate).

12.2 The deck to which the VCL is to be applied must be even, dry, sound and free from dust, grease and other defects which may impair the bond. All deck joints should be taped.

12.3 Boards can be cut and handled easily, and have a suitable surface for hot bitumen bonding provided the precautions given in this Certificate are observed. Care should be taken to spread bitumen evenly to prevent burning of the underside of the boards.

12.4 To prevent moisture being trapped on, or in, the insulation it is essential to:

- protect the products during laying, before the application of the roof waterproofing, or lay the roof covering at the same time as laying the products. If the products are accidentally wetted, they must be replaced
- install the products only when the ambient temperature is above 5°C, to prevent condensation.

12.5 Flat boards should be laid in parallel courses, with staggered longitudinal joints (ie broken bond). All boards should be closely butted and taped to avoid gaps.

12.6 Any exposed edges of the EPS must be sealed (for example, at roof vents and upstands) with waterproofing or bituminous felt laid in hot bitumen, in accordance with normal practice (as defined in BS 8217 : 2005).

12.7 The roof waterproofing layer should be applied as soon as possible after the insulation has been laid to prevent moisture entrapment on, or in, the insulation. If work is interrupted (for example, overnight), the exposed products should be covered.

12.8 The boards will not be damaged by hot bitumen used in the application of subsequent roof finishes but the EPS will melt on contact with high temperature heat sources (eg bitumen boilers), droplets of hot bitumen and solvent-based adhesives. Care should be taken during installation of the roof covering in this respect.

12.9 Where mechanical fixings are required, the fixing rate and pattern should be predetermined in accordance with the relevant clauses of BS 6399-2 : 1997.

12.10 On tall buildings or in areas subject to high wind loads, additional mechanical fixings (at the ratio per board specified by the Certificate holder and the roof waterproofing membrane manufacturer's instructions) may be required.

Tapered boards

12.11 Pre-cut tapered boards to the required falls are marked to the requirements of specific buildings by the Certificate holder's roof layout plan.

12.12 If tapered boards are to be effective in providing a uniform fall, it is essential that the structural deck is true and even. Any hollows, such as depressions or backfalls, found in the roof deck must be rectified prior to laying the boards.

12.13 Boards are laid sequentially in accordance with the position code number on the detailed layout supplied. Laying for the main area should commence at the apex line(s) of the roof. To minimise any errors, it is advisable to temporarily position each board prior to bonding.

13 Procedure

Timber decks (eg tongue-and-groove boards, plywood)

13.1 The VCL is applied in accordance with the manufacturer's instructions.

13.2 Either hot bitumen adhesive is mopped over the VCL or a non-solvent-based adhesive is applied in a controlled pattern in accordance with the manufacturer's instructions. The roofing boards are fully embedded into the adhesive as work proceeds.

13.3 At perimeters, the VCL must overlap at the edges of the insulation boards and be finished in accordance with the respective waterproofing requirements (see Figures 1 and 2). Only sufficient boards should be laid as can be waterproofed in the same working period.

Figure 1 Built – up reinforced bitumen membrane system

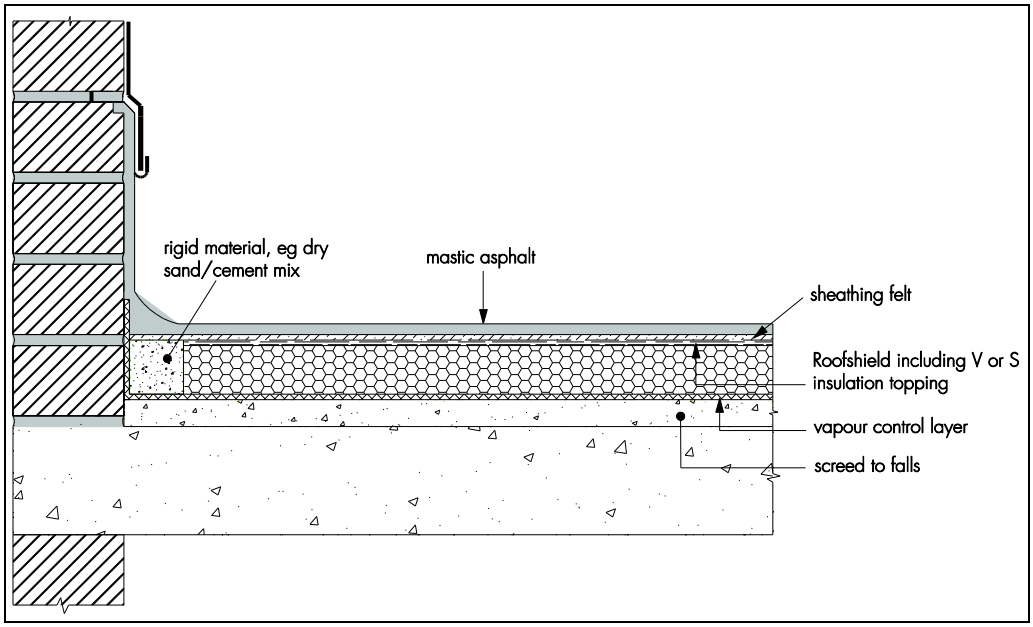
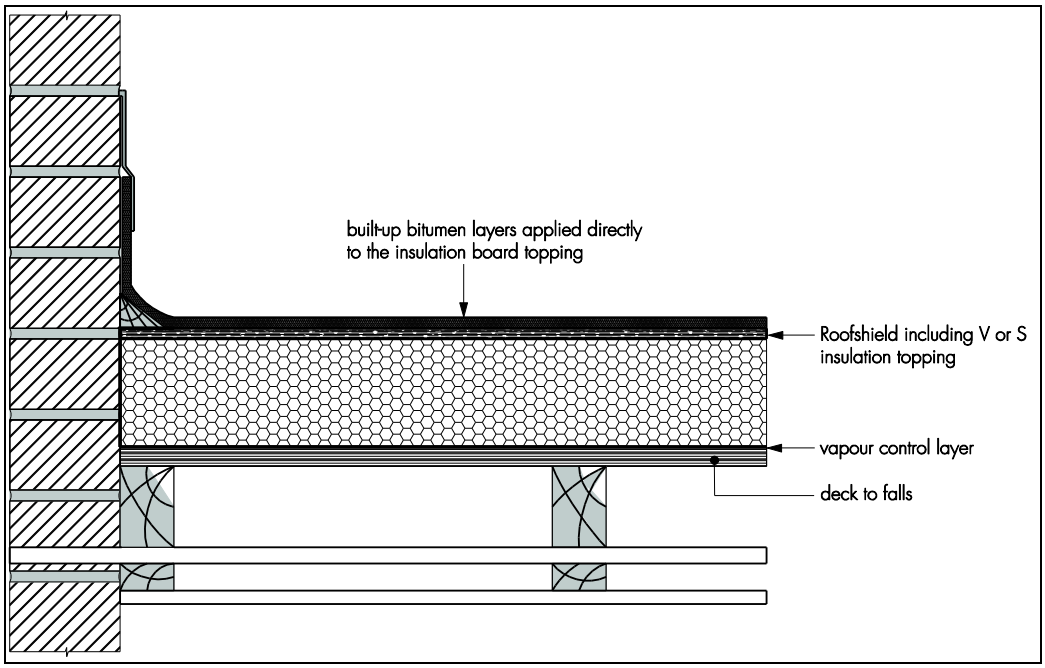


Figure 2 Mastic asphalt finish



13.4 When using bitumen adhesive, all board joints should be sealed with tape to avoid the ingress of hot bitumen.

13.5 The roof waterproofing layer is applied as:

- bituminous membranes laid fully bonded directly on the roofing boards with the edge of the VCL turned down and bonded to the overlay in accordance with BS 8217 : 2005 (see Figure 1). Three layers of bitumen felt are applied and finished in accordance with BS 8217 : 2005
- a mastic asphalt finish, with boards installed in accordance with sections 12.1 to 12.10. The edge of the VCL is left vertical at the perimeter upstand to be bonded into the mastic asphalt weatherproofing, and the void between the upstand and boards filled with a rigid material, eg dry sand/cement mix (see Figure 2). The entire surface is then covered with type 4A or 4B black sheathing felt to BS 8747 : 2007 laid loose as an isolating membrane, and the mastic asphalt laid and finished in accordance with the manufacturer's instructions. The number of coats should be appropriate to the waterproofing requirements and traffic conditions of the roof
- a BBA-certificated waterproofing system, laid in accordance with that Certificate (see section 4.4).

Concrete and screeded concrete decks

13.6 Before applying the VCL, an appropriate levelling screed should be applied where necessary. The whole deck should be primed, if necessary, in accordance with the manufacturer's instructions. The advice of the Certificate holder should be sought in respect of a suitable primer.

13.7 The VCL is fully bonded and the laps are sealed. The insulation boards and roof waterproofing membrane are then applied in the manner described for timber decks.

Metal decks

13.8 Before applying the VCL, the deck should be primed, if necessary, in accordance with the manufacturer's instructions. The advice of the Certificate holder should be sought in respect of a suitable primer.

13.9 A reinforced VCL is laid in accordance with the manufacturer's instructions. Boards are laid staggered, butt-jointed with the long axis at right angles to the corrugations and attached to the deck using suitable fixings. See Table 3 for minimum thickness of insulation required.

13.10 The roof waterproofing is then applied as described in section 13.5.

Technical Investigations

14 Tests

14.1 Results of test data conducted on the products were assessed as part of the original assessment relating to:

- dimensional changes with humidity
- tensile strength
- dimensional stability with temperature
- effect of distributed load and increased temperature
- bowing under a thermal gradient
- concentrated load on cantilevered parts
- resistance to peel
- concentrated load in middle free span
- wind uplift behaviour.

14.2 An assessment of condensation risk was undertaken.

15 Investigations

15.1 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.

15.2 A survey of known users was carried out to evaluate performance in use.

15.3 Results of independent test data relating to thermal conductivity and vapour permeability were examined.

15.4 An evaluation was made of the results of existing test data relating to:

- dimensional accuracy
- squareness
- weight
- compressive strength
- density.

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 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*

BS 8218 : 1998 *Code of practice for mastic asphalt roofing*

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*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 — Actions on structures — General actions*

BS EN 12056-3 : 2000 *Gravity drainage systems inside buildings — Roof drainage, layout and calculation*

BS EN 12524 : 2000 *Building materials and products — Hygrothermal properties — Tabulated design values*

BS EN 13163 : 2012 *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*

BS EN 13501-1 : 2007 + A1 : 2009 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

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

BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

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

BS EN ISO 14001 : 2004 *Environmental Management Systems – Requirements*

Conditions

1. This Certificate:

- relates only to the product 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.

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.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product 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.

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

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 or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA, UKNI or CE marking.

6. Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product 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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