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Agrément Certificate
01/3812
Product Sheet 1

JABLITE FLAT ROOF INSULATION ROOFBOARDS

FLAT ROOF BOARD B

This Agrément Certificate Product Sheet⁽¹⁾ relates to Flat Roof Board B, a range of expanded polystyrene (EPS) boards in EPS 100E and EPS 150E grades, with a roofing membrane factory-bonded to one or both faces, available in both uniform and tapered board options, for use as insulation in warm flat roofs with limited access. For balconies and terraces subject to regular pedestrian traffic, the EPS 150E grade must be used. The products are used in conjunction with a vapour control layer and a waterproof roof covering on suitably designed concrete, timber or metal structural decks.

(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

Thermal performance — the products can be used to improve the thermal performance of a roof. The EPS core material has a declared thermal conductivity (λ_D)* of 0.036 W·m⁻¹·K⁻¹ for EPS 100E and 0.035 W·m⁻¹·K⁻¹ for EPS 150E (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 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 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 thermal insulation in the roof system described in this Certificate, will have a life at least as long as that of a roof waterproofing 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

A handwritten signature in black ink, appearing to read 'John Albon'.

John Albon — Head of Approvals
Construction Products

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

Claire Curtis-Thomas
Chief Executive

Date of Second issue: 10 March 2015

Originally certificated on 28 March 2001

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Flat Roof Board B, if installed, used and maintained in accordance with this Certificate, can 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 of this Certificate.
Requirement: B4(2)	External fire spread
Comment:	Roofs incorporating the products can satisfy this Requirement. See sections 9.2 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 7.3 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 <i>Installation</i> part of this Certificate.
Regulation: 26	Minimum energy performance requirements for new buildings
Regulation: 26A	Fabric energy efficiency rates for new dwellings (applicable in England only)
Regulation: 26A	Primary energy consumption rates for new buildings (applicable in Wales only)
Regulation: 26B	Fabric performance values for new dwellings (applicable in 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 are acceptable. See sections 10, 11 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards applicable to construction
Standard: 1.1	Structure
Comment:	The products can contribute to satisfying this Standard, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ , 1.1.2 ⁽¹⁾⁽²⁾ , and 1.1.3 ⁽¹⁾⁽²⁾ . See section 8 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 9.2 and 9.3 of this Certificate.
Standard: 3.15	Condensation
Comment:	The products can contribute to 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 7.4 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⁾ , 6.1.3 ⁽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⁾ to 6.2.11 ⁽¹⁾⁽²⁾ , 6.2.12 ⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See section 6 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:	All comments given for 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

Regulation: 23	Fitness of materials and workmanship
Comment:	The products are acceptable. See section 11 and the <i>Installation</i> 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 of this Certificate.
Regulation: 36(b)	External fire spread
Comment:	Roofs incorporating the products can satisfy this Regulation. See sections 9.2 and 9.3 of this Certificate.
Regulation: 39(a)(i)	Conservation measures
Comment:	The products can contribute to satisfying this Regulation. See section 6 of this Certificate.

Construction (Design and Management) Regulations 2007**Construction (Design and Management) Regulations (Northern Ireland) 2007**

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.4) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of Flat Roof Board *B*, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs and balconies*.

CE marking

The Certificate holder has taken the responsibility of CE marking the products, in accordance with harmonised European Standard BS EN 13163 : 2012. An asterisk (*) appearing in this Certificate indicates that data shown is given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 The Flat Roof Board *B* range of products includes Flat Roof Board *B* 3B, *B* HP, *B* HP Torch and *B* Plus which consist of expanded polystyrene (EPS) boards, with a roofing membrane bonded to one or both faces. The EPS board is overlaid with a roofing membrane, either Type 3B or a high performance base sheet SBS factory-bonded to the upper face or both faces of the polystyrene, creating a selvedge on one length and width on the top face. See Table 1 for product variants and suitable roof waterproofing systems applicable.

Table 1 The Flat Roof Board B product range

Flat Roof Board <i>B</i> Product	Factory-bonded roofing membrane	Suitable waterproofing systems
Flat Roof Board <i>B</i> 3B	Type 3B, upper side	High performance bituminous membranes, on overlay of bitumen-impregnated fibreboard, cork or perlite. Single ply membranes for use over bitumen membrane
Flat Roof Board <i>B</i> HP	SBS, upper side	High performance single or double layer bituminous membrane — pour and roll. Single ply membranes for use over bituminous membrane
Flat Roof Board <i>B</i> HP Torch	SBS, upper side	High performance single or double layer bituminous membrane — torch-on
Flat Roof Board <i>B</i> Plus	Type 3B, both sides	Mastic asphalt applied on sheathing membrane, over cork or perlite roofboards

Other waterproofing systems may be utilised — contact the Certificate holder for further information.

1.2 The products are available as EPS 100E or EPS 150E grades, containing a flame-retardant additive giving a Class E* Reaction to Fire Classification to BS EN 13501-1 : 2007.

1.3 The Flat Roof Board *B* insulation products are available in flat or tapered form, with plain edges, having the characteristics given in Table 2.

Table 2 Product characteristics

Characteristic	Dimension (mm)	
	Flat board	Tapered board
Length	1200 ⁽¹⁾	1200, 600
Width	900 ⁽¹⁾	900
Thickness	20 to 600 in 5 mm increments	20 to 600 in 5 mm increments

(1) The factory-bonded roofing membrane overlaps the insulation by 100 mm on one side of each length and width.

1.4 Physical properties of the EPS component are given in Table 3.

Table 3 Physical properties of EPS component

	EPS 100 E	EPS 150 E
Nominal density (kg·m ⁻³)	20	25
Minimum compressive strength at 10% compression (kN·m ⁻²)*	100	150
Water vapour resistivity (MN·s·g ⁻¹ ·m ⁻¹)	200	238

2 Manufacture

2.1 Jablite insulation products are manufactured from EPS. The material comprises expandable beads of polystyrene pre-foamed and fused together in a steam-heated mould under pressure. This produces a block of material. After cutting to size, the material is faced with membranes to suit its application.

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 Jablite Limited has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 and/or BS EN ISO 14001 : 2004 by British Standards Institute (Certificates FM/O1260 and EMS/559414).

3 Delivery and site handling

3.1 The products are delivered wrapped in polythene. Each pack shows the manufacturer's name, grade, type marking, and the BBA logo incorporating the number of this Certificate.

3.2 The products must be protected from prolonged exposure to sunlight and should be stored under cover or protected with opaque light-coloured polythene sheeting.

3.3 The products must be stored fully supported and flat on a firm, level, dry base, protected from the weather and raised above damp surfaces. The products must be discarded if damaged, and if accidentally allowed to become wet, they must either be replaced or allowed to dry fully before application of the waterproof layer.

3.4 The products must not be exposed to open flame or other ignition sources. Care must be taken to avoid contact with solvents and materials containing organic components.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Flat Roof Board B.

Design Considerations

4 Use

4.1 Flat Roof Board B is for use as a thermal insulation layer on warm flat roofs with limited access, comprising suitably designed concrete, timber or metal structural decks, in conjunction with suitable waterproofing systems. For specific application of both grades EPS 100E and EPS 150E and their strength and stability see sections 4.6 and 8 of this Certificate.

4.2 The Flat Roof Board B range of EPS insulation roofboards includes Flat Roof Board B 3B, B HP, B HP Torch and B Plus which have different factory-bonded roofing membranes, dependent upon the proposed roof covering and its application method. See Table 1 for clarification.

4.3 Flat roof decks should be designed in accordance with the relevant Clauses of BS 8217 : 2005, BS 8218 : 1998, BS 6229 : 2003 and, where appropriate, NHBC Standards 2013, Chapter 7.1, Section 4.

4.4 Roofs should incorporate an effective vapour control layer (VCL) below the insulation boards.

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

- built-up specifications including Reinforced Bitumen Membranes to BS 8747 in accordance with the recommendations of Table 5, and installed to the relevant clauses of BS 8217 : 2005
- mastic asphalt laid in accordance with BS 8218 : 1998
- single ply membranes, which are the subject of a current Agrément Certificate, laid in accordance with the requirements of that Certificate, and the manufacturer's recommendations
- other waterproofing systems, including liquid-applied waterproofing, which are the subject of a current Agrément Certificate, laid in accordance with, and within the limitations imposed by, that Certificate.

4.6 Both grades EPS 100E and EPS 150E may be used in warm flat roofs with limited access. Limited access roofs are defined for the purpose of this Certificate as those roofs subject only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc. Where traffic in excess of this is envisaged, ie balconies and terraces, EPS 150E grade insulation must be used and additional protection provided to the waterproofing membrane. See section 8.1 of this Certificate.

4.7 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall between 1:80 and 1:6.


4.8 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.

4.9 Tapered insulation 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.

5 Practicability of installation

The products are designed to be installed by a competent general builder, or a 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 declared thermal conductivity (λ_D)* of 0.036 W·m⁻¹·K⁻¹ for EPS 100E and 0.035 W·m⁻¹·K⁻¹ for EPS 150E, for the EPS foam component of the boards.

6.2 The U value of a completed roof will depend on the insulation thickness, number and type of fixings, the insulating value of the roof deck substrate and its internal finish. Calculated U values for example constructions are given in Table 4.

Table 4 Example U values — Flat roofs using Flat Roof Board B


U Value required (W·m ⁻² ·K ⁻¹)	Flat Roof Board B insulation thickness (mm)					
	Fully bonded to timber deck ⁽¹⁾		Fully bonded to concrete deck ⁽²⁾		Fully bonded to metal deck ⁽³⁾	
	EPS 100	EPS 150	EPS 100	EPS 150	EPS 100	EPS 150
0.13	250	245	260	255	255	250
0.16	200	195	215	205	215	205
0.18	180	175	190	185	185	180
0.20	160	155	170	165	165	160
0.25	125	120	135	130	130	130

(1) Built-up roofing, Flat Roof Board B with factory-bonded roofing membrane, VCL, 18 mm plywood deck $\lambda = 0.17$ W·m⁻¹·K⁻¹, 150 mm cavity between timber joists (11.7%) 0.16 m²·K·W⁻¹, 12.5 mm plasterboard $\lambda = 0.21$ W·m⁻¹·K⁻¹.

(2) Built-up roofing, Flat Roof Board B with factory-bonded roofing membrane, VCL, 150 mm concrete deck $\lambda = 1.701$ W·m⁻¹·K⁻¹.


(3) Built-up roofing, Flat Roof Board B with factory-bonded roofing membrane, VCL, profiled metal deck with unsealed lapped joints, 50 mm cavity below metal deck 0.16 m²·K·W⁻¹, 12.5 mm plasterboard $\lambda = 0.21$ W·m⁻¹·K⁻¹.

Junctions

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


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 the relevant parts of BS 5250 : 2011, Annexes D and H. Further guidance may be obtained from BRE Report BR 262 : 2002.

7.2 For the purposes of assessing the risk of interstitial condensation, the insulation core vapour resistivity may be taken as 200 MN·s·g⁻¹·m⁻¹ for EPS 100E and 238 MN·s·g⁻¹·m⁻¹ for EPS 150E, and a resistance value of 450 MN·s·g⁻¹ for the factory-bonded roofing membrane.

Surface condensation

 7.3 Roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 0.35 W·m⁻²·K⁻¹ at any point and the junctions with other elements are designed in accordance with section 6.3 of this Certificate.

 7.4 Roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 W·m⁻²·K⁻¹ at any point. Guidance may be obtained from BS 5250 : 2011, Annexes D and H. Further guidance may be obtained from BRE Report BR 262 : 2002.

8 Strength and stability



8.1 The EPS 100E grade of the product has adequate resistance to the loads associated with light maintenance traffic on built-up bitumen roofs and minimal pedestrian traffic on protected built-up bitumen or asphalt roofs. If there is a likelihood of more severe traffic, eg balconies and terraces, the EPS 150E grade must be used.

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

9 Behaviour in relation to fire

9.1 The EPS boards contain a flame-retardant additive giving a Class E* Reaction to Fire Classification to BS EN 13501-1 : 2007. The fire rating of any roof containing the boards will depend on the type of deck and the nature of the roof waterproof covering.



9.2 The designation of the roof covering must meet or satisfy the requirements of the national Building Regulations, thus:

England and Wales — Section 10 of Approved Document B volume 1, and Section 14 of Approved Document B volume 2. Notional designations of some common roof coverings are given in Appendix A, Table A5, of the Approved Documents.

Scotland — Mandatory Standards 2.8, clause 2.8.1⁽¹⁾⁽²⁾; Annex 2.C⁽¹⁾ and Annex 2.F⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Regulation 36(b). If, on flat roofs, the waterproof covering is protected by one of the surface finishes defined in Table 5.6 of Technical Booklet E, the roof is deemed to be of designation AA (National class) or B_{ROOF}(t4) (European Class).

9.3 The designation of other specifications for example, when used on combustible substrates, should be confirmed by:

England and Wales — Test or assessment in accordance with Clause 6 of Appendix A of Approved Document B volumes 1 and 2.

Scotland — Test to conform to Annex 2.C⁽¹⁾ and 2.F⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

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

10 Maintenance

No maintenance of the insulation layer will be required provided the roof waterproof covering remains intact.

11 Durability



The products are rot-resistant and durable and will have a life at least as long as the roof waterproof covering. When the waterproof covering is renewed at a later date, the insulation will remain suitable for continued use, provided it is undamaged by replacement of the waterproof covering.

12 Reuse and recyclability

Jablite expanded polystyrene (EPS) insulation is fully recyclable.

Installation

13 General

13.1 Flat Roof Board B must be installed in accordance with the Certificate holder's instructions and BS 8217 : 2005, BS 8218 : 1998, BS 6229 : 2003, or the relevant BBA Certificate, depending on the waterproofing to be applied. Bitumen and cold adhesive bonding may be augmented by mechanical fixing where appropriate.

13.2 The deck surface to which the VCL is to be applied must be level, clean, dry, sound, and free from dust, grease and other defects which may prevent adhesion. All deck joints should be taped and the deck coated in primer where necessary. If necessary a levelling screed can be applied to concrete decks.

13.3 For refurbishment work the existing weatherproofing should be stripped back to the structure and any defects made good. In some circumstances it may be acceptable to retain the existing weatherproofing by removing loose chippings and cutting and sealing any blisters to provide a sound surface. However, the advice of the Certificate holder should be sought.

13.4 A suitable VCL should be loose-laid on the deck, or bonded to a suitably primed deck, depending on the specified installation method. The membrane should be turned up at all perimeters and upstands and care taken to ensure integrity at all joints, upstands and roof penetrations.

13.5 Insulation boards are laid with their edges tightly butted. Uniform thickness boards should be laid with staggered joints. Tapered boards should be laid in accordance with the Certificate holder's layout drawing provided. For detail work, boards can be handled and cut easily.

13.6 To prevent condensation, the insulation boards should be applied only when the ambient temperature is above 5°C.

13.7 Boards must be kept dry at all times, and those accidentally wetted must be replaced or allowed to dry fully before application of the waterproofing layer.

13.8 It is important to seal any exposed edges of the expanded polystyrene, for example, at roof vents and upstands, with waterproofing or bituminous roofing membrane laid in hot bitumen in accordance with normal practice as defined in BS 8217 : 2005.

13.9 Where mechanical fixings are required, the fixing rate and pattern should be predetermined in accordance with the engineer's instructions and the relevant clauses of BS EN 1991-1-4 : 2005.

13.10 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.

14 Procedure

14.1 The products must be installed in accordance with the relevant requirements of BS 8217 : 2005, BS 8218 : 1998 and the Certificate holder's instructions (see Figures 1 and 2).

Figure 1 Built-up reinforced bitumen roofing membrane system

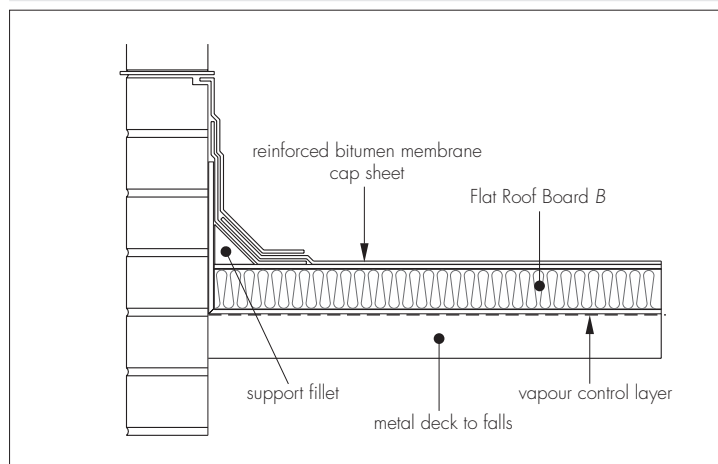
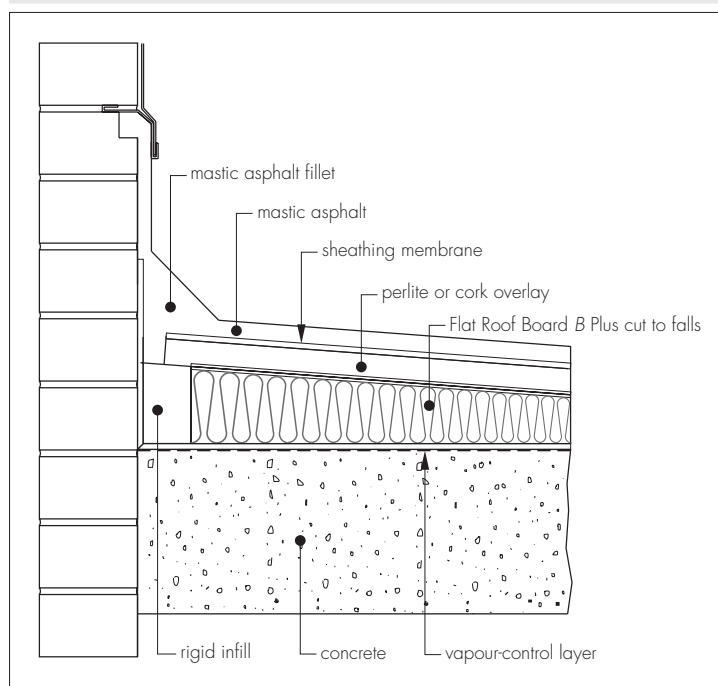


Figure 2 Mastic asphalt finish



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

14.2 A 0.25 mm thick polythene VCL should be laid, with 150 mm sealed laps. It is to be nailed, loose-laid or bonded to the deck, depending on the specified membrane and roof waterproofing system, and turned up at all perimeters and upstands.

Flat Roof Board B 3B

14.3 Hot bitumen adhesive or other suitable adhesive is mopped over the VCL to cover the area of one board at a time and allowed to cool until tacky before the insulation board is laid, with the factory-bonded roofing membrane selvedge surface uppermost.

14.4 Precautions must be taken during installation to avoid heat damage to the underside of insulation boards from liquid bitumen. The factory-bonded roofing membrane on the upper surface of the insulation board protects it from hot bitumen but containers of hot bitumen should not be placed directly on this membrane.

14.5 Insulation boards are laid butted together with staggered joints or, for tapered boards, as described in section 14.20. Joints are sealed by bonding the overlap of the factory-bonded roofing membrane on each board as work progresses. This provides a weatherproof surface.

14.6 For built-up specifications using reinforced bitumen membranes, a minimum 13 mm thick overlay of bitumen impregnated fibreboard, cork or perlite board is bonded to the factory-bonded roofing membrane by mopping a coat of hot bitumen on the surface of the overlay. For more detailed information contact the Certificate holder.

14.7 The VCL is turned down and bonded to the factory-bonded roofing membrane at perimeters and upstands.

14.8 A base and cap sheet is applied using pour-and-roll methods in accordance with the manufacturer's instructions as follows:

- oxidised SBS-modified or APP-modified high performance cap sheets
- mineral surfaced cap sheets.

Flat Roof Board B Plus

14.9 A 0.25 mm thick polythene VCL with 150 mm sealed laps, should be loose-laid or bonded to the deck and turned up at all perimeters and upstands. Insulation boards are set back by 50 mm at perimeters and upstands and a suitable infill in accordance with the Mastic Asphalt Council (MAC) recommendations is used to fill the gap and provide a rigid support for the mastic asphalt angle.

14.10 A minimum 20 mm thick overlay of cork or perlite board is placed over the insulation boards and a Type 4A(i) sheathing membrane to BS 8747 : 2000 loose-laid over. A minimum of two layers of 10 mm thick mastic asphalt is applied in accordance with BS 8218 : 1998 and MAC recommendations.

Flat Roof Board B HP and Flat Roof Board B HP Torch

14.11 Insulation boards are installed as described in sections 14.3 to 14.5 and the VCL turned down and bonded to the factory-bonded roofing membrane at perimeters and upstands.

14.12 One of the following waterproofing cap sheets is applied using the pour-and-roll method for Flat Roof Board B HP and the torch-on method for Flat Roof Board B HP Torch, in accordance with the manufacturer's instructions:

- oxidised SBS-modified or APP-modified high performance cap sheets
- mineral surfaced cap sheets to BS 747 : 2000

Concrete and concrete screeded decks

14.13 A 0.25 mm polythene VCL with 150 mm sealed laps, is loose-laid or, depending on the specification, bonded to the deck and turned up at all perimeters and upstands.

14.14 Installation proceeds as described in sections 14.3 to 14.5 and the relevant sections of 14.6 to 14.12.

Profiled metal deck

14.15 A reinforced VCL, minimum Type 1F to BS 747 : 2000 is fully bonded in hot bitumen to a primed deck and laps sealed.

14.16 Installation proceeds as described in sections 13.3 to 13.10 with insulation boards laid with the long axis at right angles to the corrugations. Board ends are cut as necessary so that they are fully supported on the crown of the profile. Insulation boards should not exceed the maximum spans given in Table 5.

Table 5 Minimum Flat Roof Board B thickness on corrugated metal deck

	Maximum span between corrugations (mm)			
	105	110	120	135
Flat Roof Board B Minimum thickness (mm)	45	50	60	75

14.17 Installation proceeds as described in the relevant sections of 14.6 to 14.12.

Tapered insulation boards (all deck and insulation board types)

14.18 Pre-cut insulation boards tapered to required falls are pre-labelled to the requirements of the specific building by the Certificate holder's roof layout drawing.

14.19 To provide a uniform fall it is essential that the deck is even and true. Any features such as hollows, backfalls, depressions, must be rectified prior to laying the insulation boards.

14.20 Insulation boards are laid sequentially in accordance with the position code number on the roof layout drawing. Laying for the roof area should commence at points or instructions indicated on the layout drawing. To avoid error it is advisable to temporarily position each board prior to bonding.

14.21 Installation of tapered insulation boards is otherwise as described in sections 14.1 to 14.17.

Technical Investigations

15 Tests

Tests were carried out on Flat Roof Board B to determine maintenance of properties and included checks on:

- dimensional stability (pour-and-roll)
- resistance to wind uplift
- bowing under a thermal gradient
- behaviour under concentrated loads in the middle of a free span.
- resistance to peel
- dimensional stability (-20°C to +80°C)
- behaviour under distributed load and elevated temperature

16 Investigations

16.1 An examination was made of data relating to:

- flatness
- length, width and thickness
- water vapour resistance/resistivity
- compressive strength at 10% compression.
- squareness
- density
- quality of facing bond

16.2 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 747 : 2000 *Reinforced bitumen sheets for roofing — Specification*

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

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

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

17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

17.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

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

17.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

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

17.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.