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BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Designated by Government to issue European Technical Approvals

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Agrément Certificate No 01/3812

VR FLAT ROOF INSULATION SYSTEMS

Isolant d'étanchéité
Warmedämmung des Daches

Product

Typical installation

- *THIS CERTIFICATE RELATES TO VR FLAT ROOF INSULATION SYSTEMS, COMPRISING JABLITE EXPANDED POLYSTYRENE BOARDS WITH A RANGE OF FACINGS.*
- *The products are for use as thermal insulation layers on suitably designed concrete, timber or metal structural decks in conjunction with suitable waterproofing systems.*
- *Jablite HD grade products are for use on flat roofs subject to light pedestrian traffic for maintenance.*
- *Jablite EHD grade products are for use on roofs subject to repeated foot traffic.*

continued

Regulations — Detail Sheet 1

1 The Building Regulations 2000 (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of roof insulation with the Building Regulations. In the opinion of the BBA, VR Flat Roof Insulation Systems, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement:	B4(2)	External fire spread
Comment:		When used in conjunction with appropriate roof decks and roof finishes, the product is unrestricted under this Requirement. See section 9.3 of these Front Sheets.
Requirement:	L1	Conservation of fuel and power
Comment:		The product will enable or contribute to enabling a roof to meet this Requirement. See sections 10.2 and 10.3 of these Front Sheets.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 13 of these Front Sheets.

continued

• *The products must always be used with a suitable vapour control layer below them.*

These Front Sheets must be read in conjunction with the relevant accompanying Detail Sheets, which provide information specific to insulation systems.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

In the opinion of the BBA, VR Flat Roof Insulation Systems, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

Regulation:	**10**	Fitness of materials
Standard:	B2.1	Selection and use of materials and components
Comment:		The product is acceptable. See section 13 of these Front Sheets.
Regulation:	**12**	Structural fire precautions
Standard:	D3.5	Junctions between separating or compartment walls and roofs
Standard:	D6.7	Roofs and rooflights
Comment:		When used in conjunction with appropriate roof decks and roof finishes, the product is unrestricted under these Standards. See section 9.3 of these Front Sheets.
Regulation:	**18**	Resistance to condensation
Standard:	G4.1	Interstitial condensation
Comment:		When used in conjunction with an appropriate vapour control layer, the product will be unrestricted under this Standard. See sections 11.1 and 11.2 of these Front Sheets.
Regulation:	**22**	Conservation of fuel and power
Standard:	J2.1	Standards for buildings in purpose group 1
Standard:	J3.1	Standards for buildings in purpose groups 2 to 7
Comment:		The product will enable or contribute to enabling a roof to satisfy these Standards. See sections 10.2 and 10.3 of these Front Sheets.

3 The Building Regulations (Northern Ireland) 1994 (as amended)

In the opinion of the BBA, VR Flat Roof Insulation Systems, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations as listed below.

Regulation:	**B2**	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 13 of these Front Sheets.
Regulation:	**C7**	Condensation
Comment:		When used in conjunction with an appropriate vapour control layer, the product will be unrestricted under this Regulation. See sections 11.1 and 11.2 of these Front Sheets.
Regulation:	**E8**	External fire spread
Comment:		When used in conjunction with appropriate roof decks and roof finishes, the product is unrestricted under this Regulation. See section 9.3 of these Front Sheets.
Regulation:	**F2**	Conservation of fuel and power — Building fabric
Comment:		The product will enable or contribute to enabling a roof to satisfy the requirements of this Regulation. See sections 10.2 and 10.3 of these Front Sheets.

4 Construction (Design and Management) Regulations 1994

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See section: *5 Delivery, site handling and storage* of these Front Sheets.

Technical Specification

5 Delivery, site handling and storage

5.1 Jablite boards used with VR Flat Roof Insulation Systems are delivered to site suitably wrapped in polythene. Each pack shows the manufacturer's name, grade, type markings, and the BBA identification mark incorporating the number of this Certificate.

5.2 Boards must be protected from prolonged exposure to sunlight and should be stored under cover or protected with light-coloured opaque polyethylene. Care must be taken to avoid contact with solvents or materials containing volatile organic components such as coal tar, pitch, timber newly treated with creosote, etc.

5.3 Boards must be stored flat, off the ground, on a clean, level surface and under cover to protect them from precipitation, high winds and direct sunlight. Boards or slabs at the bottom of the stack should be fully supported, without cross-bearers. They must not be exposed to open flame or other ignition sources.

Design Data

6 General

6.1 HD and EHD grade boards in VR Flat Roof Insulation Systems are for use as a thermal insulation layer on flat roofs with concrete, timber or metal structural decks.

6.2 Decks should be designed in accordance with the relevant clauses of BS 8217 : 1994, BS 8218 : 1998, BS 6229 : 1982 and, where appropriate, NHBC Standards, Chapter 7.1, and Zurich Building Guarantees Technical Standards, Volume 2.

6.3 The roofs should incorporate an effective vapour control layer.

6.4 Boards are for use with the waterproofing specifications described in the accompanying Detail Sheets.

6.5 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, eg balconies and terraces, special precautions, such as the use of Grade EHD boards and additional protection to the waterproofing membrane, must be taken.

6.6 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80, and pitched roofs those with falls in excess of 1:6.

6.7 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.

6.8 Tapered boards may be used where appropriate to achieve the minimum finished falls required.

7 Adhesion

When bitumen bonded, adhesion between the insulation boards and the vapour control layer (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 Vencel Resil Limited should be sought as to the method of fixing. Reference should be made to BS 6399-2 : 1997 where a calculation is required for a specific building project.

8 Resistance to loading

Grade HD boards have adequate resistance to the loads associated with light maintenance traffic on felted roofs and minimal pedestrian traffic on protected felt or asphalt roofs. If there is a likelihood of more severe traffic, then the use of Grade EHD should be considered.

9 Properties in relation to fire

9.1 The fire rating of any roof containing the boards will depend heavily on the type and nature of deck, and on the roof waterproofing layer and/or the surface finish used. Provided the boards are installed correctly in accordance with the manufacturer's instructions and BS 6203 : 1991(1996), they will not present any undue fire hazard.

9.2 The polystyrene components of the boards melt when exposed to excessive heat. The boards are classified Type A or N in accordance with BS 3837-1 : 1986(1996).

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

England and Wales

Approved Document B, Section 14. Notional designations of some common roof coverings are given in Appendix A, Table A5 of the Approved Document

Scotland

Provisions deemed to satisfy the Technical Standards D3.5, D6.7 and Appendix to Part D

Northern Ireland

Regulation E8, Technical Booklet E. On flat roofs, the waterproof covering is protected by one of the surface finishes defined in Part iv of Table 4.6 of

Technical Booklet E, the roof is deemed to be of designation AA.

9.4 The designation of other specifications should be confirmed by test or assessment.

10 Thermal insulation

10.1 For the purpose of U value calculations to determine if the requirements of the Building (or other statutory) Regulations are met, the thermal conductivity (λ value) of the foam component of the boards may be taken as 0.034 $Wm^{-1}K^{-1}$ for Grade HD, and 0.033 $Wm^{-1}K^{-1}$ for Grade EHD.

10.2 The requirement for limiting heat loss through the building fabric can be satisfied if the U values of the building elements including thermal bridging do not exceed the maximum values in the relevant Elemental Method given in the national Building Regulations thus:

England and Wales
Approved Document L

Scotland
Technical Standards, Part J

Northern Ireland
Technical Booklet F.

10.3 These documents also give guidance on selecting the thickness of insulation required to enable a roof to achieve the desired U value. Alternative approaches to the Elemental Method are described which allow for some flexibility in design of U values for individual constructional elements.

11 Condensation risk

11.1 Boards used in conjunction with an effective vapour control layer are unlikely to be affected by interstitial condensation.

11.2 Where an effective vapour control layer is difficult to ensure (eg where the boards have additional mechanical fixings), the risk of condensation should be assessed in accordance with Appendix A of BS 6229 : 1982.

12 Maintenance

Maintenance of the insulation layer will not be required provided the roof waterproof covering remains intact.

13 Durability

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

Installation

14 General

14.1 VR Flat Roof Insulation Systems should be installed in accordance with the relevant requirements of BS 6229 : 1982, Vencel Resil Limited's instructions, these Front Sheets and the procedure in the relevant Detail Sheet.

14.2 Roof decks must be level and even, and any joints taped. If necessary a levelling screed can be applied to concrete decks.

14.3 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 Vencel Resil Limited should be sought.

14.4 A suitable vapour control layer 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.

14.5 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 Vencel Resil layout drawing provided. For detail work, boards can be handled and cut easily.

14.6 To prevent moisture entrapment, boards should not be laid when the ambient temperature is below 5°C and should be protected from precipitation.

14.7 Where mechanical fixings form part of the waterproofing specification, or are required to augment adhesive bonding, Vencel Resil Limited should be consulted (see section 7 of these Front Sheets).

14.8 Weatherproofing is installed in accordance with the procedure given in the relevant Detail Sheet and subsequent access restricted in accordance with section 6.5 of these Front Sheets.

Technical Investigations

The following is a summary of the technical investigations carried out on VR Flat Roof Insulation Systems.

15 Tests

Tests were carried out to determine maintenance of properties and included checks on:

dimensional stability (pour-and-roll)
resistance to peel
  control
  water soak
  heat aged at 70°C
resistance to wind uplift
dimensional stability (–20°C to +80°C)
bowing under a thermal gradient
behaviour under distributed load and elevated temperature
behaviour under concentrated loads in the middle of a free span.

16 Other investigations

16.1 An examination was made of data relating to:

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

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.

16.3 A review was made of data on existing Agrément approvals for similar products (held by the Certificate holder).

Additional Information

The quality management system of Vencel Resil Limited has been assessed and registered as meeting the requirements of BS EN ISO 9002 : 1994 by the British Standards Institution Quality Assurance Certificate No FM 01260 and appendices.

Bibliography

BS 3837 *Expanded polystyrene boards*
BS 3837-1 : 1986(1996) *Specification for boards manufactured from expandable beads*

BS 6203 : 1991(1996) *Guide to fire characteristics and fire performance of expanded polystyrene materials used in building applications*

BS 6229 : 1982 *Code of practice for flat roofs with continuously supported coverings*

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

BS 8217 : 1994 *Code of practice for built-up felt roofing*

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

BS EN ISO 9002 : 1994 *Quality Systems. Model for quality assurance in production, installation and servicing*

Conditions of Certification

17 Conditions

17.1 This Certificate:

(a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;

(b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;

(c) has to be read, considered and used as a whole document, as it may be misleading and/or incomplete to be selective;

(d) is copyright of the BBA.

17.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

17.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) thereof:

(a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked by the BBA or its agents; and

(c) are reviewed by the BBA as and when it considers appropriate.

17.4 In granting this Certificate, the BBA makes no representation as to:

(a) the presence or absence of any patent or similar rights subsisting in the product or any other product;

(b) the right of the Certificate holder to market, supply, install or maintain the product; and

(c) the nature of individual installations of the product, including methods and workmanship.

17.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, VR Flat Roof Insulation Systems are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 01/3812 is accordingly awarded to Vencel Resil Limited.

On behalf of the British Board of Agrément

Date of issue: 28th March 2001

Chief Executive

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BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

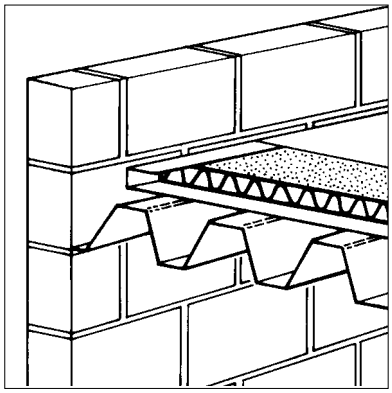
Vencel Resil Limited

Certificate No 01/3812

DETAIL SHEET 2

JABTHERM ROOFBOARD

Product



- *THIS DETAIL SHEET RELATES TO JABTHERM ROOFBOARD, EXPANDED POLYSTYRENE BOARD WITH A GLASS FIBRE-REINFORCED BITUMEN FELT BONDED TO ITS UPPER FACE.*
- *The product is available in two grades and a number of thicknesses to suit different design requirements.*
- *The product is for use as a thermal insulation layer in warm roofs on suitably designed concrete, timber or metal structural decks in conjunction with suitable waterproofing systems.*
- *The product must always be used with a suitable vapour control layer below it.*
- *It is essential that the system is installed and maintained in accordance with the conditions set out in the* Design Data *and* Installation *parts of the Front Sheets and this Detail Sheet.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the system's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification.

Technical Specification

1 Description

1.1 Jabtherm Roofboard consists of Jablite expanded polystyrene boards produced by the steam moulding process to BS 3837-1 : 1986(1996). Heavy-duty glass fibre-reinforced roofing felt, is factory-bonded to the polystyrene boards upper face, creating a selvedge along one length and width.

1.2 The expanded polystyrene (EPS) is available in Grade HD (high duty) or EHD (extra high duty) with optional flame-retardant additive.

1.3 The boards are available with the characteristics given in Table 1.

Table 1 Board characteristics

Characteristic	Dimensions (mm)
Length	1200[1]
Width	900[1]
Thickness	50, 65, 85 and 125

(1) The felt overlaps the insulation by 100 mm on one side of each length and width.

1.4 Nominal physical properties of the EPS component are given in Table 2.

Table 2 Physical properties of EPS components

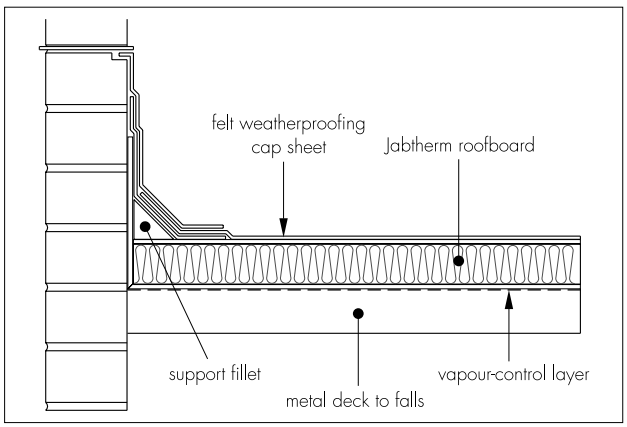
	Grade HD	Grade EHD
Nominal density (kgm^{-3})	20	25
Minimum compressive strength at 10% compression (kNm^{-2})	110	150
Water vapour resistivity $MNs(gm)^{-1}$	200	238

Installation

2 Procedure

2.1 Jabtherm Roofboards are installed in accordance with the relevant requirements of BS 8217: 1994, and Vencel Resil Limited's instructions (see also section 14 of the Front Sheets of this Certificate) (see Figure 1).

Figure 1 Built-up bitumen felt system



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

2.2 The vapour control layer is nailed to the deck, or bonded using an appropriate adhesive, and turned up at all perimeters and upstands.

2.3 Hot bitumen adhesive is mopped over the vapour control layer to cover the area of one board at a time and allowed to cool until tacky before the board is laid, with the felt uppermost.

2.4 Precautions must be taken during installation to avoid heat damage to the underside of boards from liquid bitumen. The felt layer on the board's upper surface protects it from hot bitumen but containers of hot bitumen should not be placed directly on the felt.

2.5 Boards are butted together with staggered joints which are sealed by bonding the felt overlap on each board as work progresses. This provides a weatherproof surface and prevents the ingress of hot bitumen when bonding a cap sheet.

2.6 The vapour control layer is turned down and bonded to the felt layer at perimeters and upstands.

2.7 One of the following waterproofing cap sheets is applied using pour-and-roll or torch-on methods in accordance with the manufacturer's instructions:

(a) oxidised SBS-modified or APP-modified high performance cap sheets

(b) mineral surfaced cap sheet to BS 747 : 2000.

Concrete and screeded concrete decks

2.8 A vapour control layer is fully bonded in hot bitumen to a suitably level and primed deck and turned up at all perimeters and upstands.

2.9 Installation proceeds as described in sections 2.3 to 2.7.

Profiled metal deck

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

2.11 Installation proceeds as described in sections 2.3 to 2.5 with 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. Boards should not exceed the maximum spans given in Table 3.

Table 3 Minimum board thickness on corrugated metal deck

	Maximum span between corrugations (mm)		
	110	125	145
Jabtherm	50	65	85

2.12 Installation proceeds as described in sections 2.6 to 2.7 (see also section 14.7 of the Front Sheets).

Bibliography

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

BS 3837 *Expanded polystyrene boards*
BS 3837-1 : 1986(1996) *Specification for boards manufactured from expandable beads*

BS 8217 : 1994 *Code of practice for built-up felt roofing*

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

On behalf of the British Board of Agrément

Date of issue: 28th March 2001

Chief Executive

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TECHNICAL APPROVALS FOR CONSTRUCTION

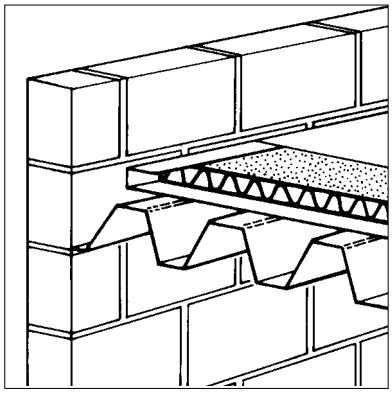
Vencel Resil Limited

THERMODEK – STANDARD, HP, HP TORCH AND PLUS

Certificate No 01/3812

DETAIL SHEET 3

Product



- *THIS DETAIL SHEET RELATES TO THERMODEK — STANDARD, HP, HP TORCH AND PLUS, EXPANDED POLYSTYRENE BOARD WITH A BITUMEN FELT BONDED TO ONE OR BOTH FACES.*
- *Thermodek Standard is available with a Type 3B felt bonded to the upper surface and Thermodek Plus is available with a Type 3B felt bonded to both surfaces, and are suitable for pour-and-roll built-up felt and mastic asphalt waterproofing specifications respectively.*
- *Thermodek HP and Thermodek HP Torch are each available with a high-performance SBS felt layer bonded to the upper surface, and are suitable for pour-and-roll and torch-on built-up felt waterproofing specifications respectively.*
- *The polystyrene is available in two grades and a range of thicknesses and as flat or tapered boards to suit different design requirements.*
- *The product is for use as a thermal insulation layer in warm roofs on suitably designed concrete, timber or metal structural decks in conjunction with suitable waterproofing systems.*
- *The product must always be used with a suitable vapour control layer below it.*
- *It is essential that the system is installed and maintained in accordance with the conditions set out in the* Design Data *and* Installation *parts of the Front Sheets and this Detail Sheet.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the system's position regarding the Building Regulations, general information relating to the product and the Conditions of Certification.

Technical Specification

1 Description

1.1 Thermodek — Standard, HP, HP Torch and Plus consists of Jablite expanded polystyrene boards produced by the steam moulding process to BS 3837-1 : 1986(1996). Roofing felt overlay, either Type 3B or a high performance base sheet, is factory-bonded to the upper face or both faces of the polystyrene, creating a selvedge on one length and width on the top face.

1.2 The expanded polystyrene is available in Grade HD (high duty) or EHD (extra high duty) and with optional flame-retardant additive.

1.3 The boards are available in flat or tapered form, with plain edges, to the characteristics given in Table 1.

Table 1 Board characteristics

Characteristic	Dimensions (mm)	
	Flat board	Tapered board
Length	1200[1]	1200, 600
Width	900[1]	900
Thickness	from 20	from 20

(1) The felt overlays the insulation by 100 mm on one side of each length and width.

1.4 Nominal physical properties of the EPS component are given in Table 2.

Table 2 Physical properties of EPS components

	Grade HD	Grade EHD
Nominal density (kgm^{-3})	20	25
Minimum compressive strength at 10% compression (kNm^{-2})	110	150
Water vapour resistivity $MNs(gm)^{-1}$	200	238

Installation

2 Procedure

2.1 Thermodek — Standard, HP, HP Torch and Plus are installed in accordance with the relevant requirements of BS 8217 : 1994, BS 8218 : 1998 and Vencel Resil Limited's instructions (see also section 14 of the Front Sheets of this Certificate) (see Figures 1 and 2).

Figure 1 Built-up bitumen felt system

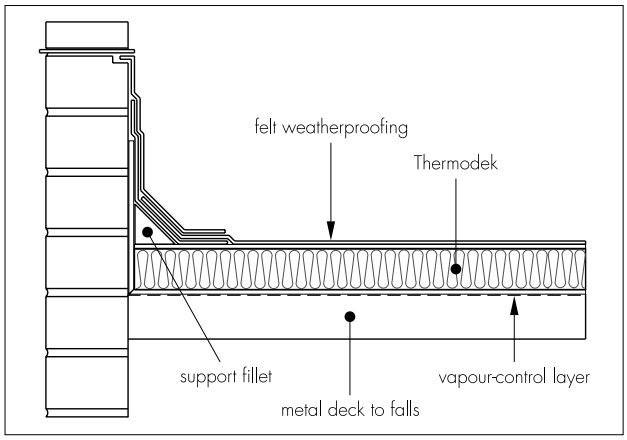
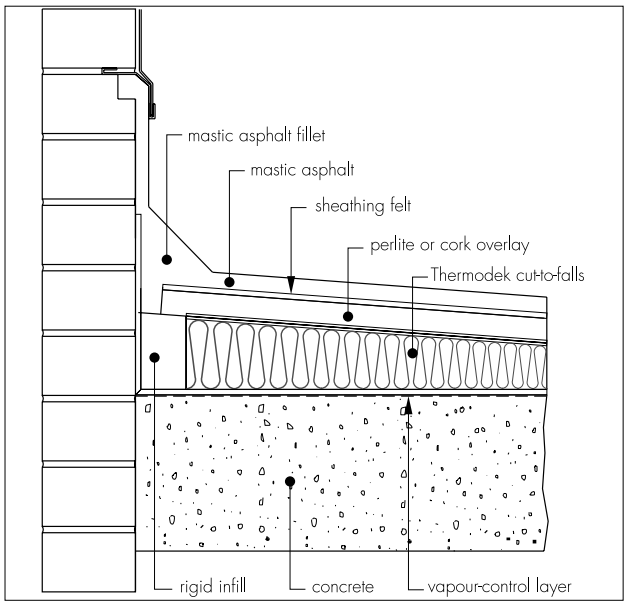


Figure 2 Mastic asphalt finish



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

2.2 A vapour control layer is 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.

Thermodek Standard

2.3 Hot bitumen adhesive is mopped over the vapour control layer to cover the area of one board at a time and allowed to cool until tacky before the board is laid, with the felt selvedge surface uppermost.

2.4 Precautions must be taken during installation to avoid heat damage to the underside of boards from liquid bitumen. The felt layer on the upper surface of the board protects it from hot bitumen but containers of hot bitumen should not be placed directly on the felt.

2.5 Boards are laid butted together with staggered joints or, for tapered boards, as described in section 2.20. Joints are sealed by bonding the felt overlap on each board as work progresses. This provides a weatherproof surface.

2.6 A minimum 13 mm thick overlay of bitumen impregnated fibreboard, cork or perlite board is bonded to the felt by mopping a coat of hot bitumen on the surface of the overlay.

2.7 The vapour control layer is turned down and bonded to the overlay at perimeters and upstands.

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

(a) oxidised SBS-modified or APP-modified high performance cap sheets

(b) mineral surfaced cap sheets to BS 747 : 2000.

Thermodek Plus

2.9 A vapour control layer is loose-laid or bonded to the deck and turned up at all perimeters and upstands. 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.

2.10 A minimum 20 mm thick overlay of bitumen impregnated fibreboard, cork or perlite board is placed over the boards and a Type 4A(i) sheathing felt to BS 747 : 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.

Thermodek HP and HP Torch

2.11 Boards are installed as described in sections 2.3 to 2.5 and the vapour control layer turned down and bonded to the felt layer at perimeters and upstands.

2.12 One of the following waterproofing cap sheets is applied using the pour-and-roll method for Thermodek HP and the torch-on method for Thermodek HP Torch, in accordance with the manufacturers instructions:

(a) oxidised SBS-modified or APP-modified high performance cap sheets

(b) mineral surfaced cap sheets to BS 747 : 2000.

Concrete and concrete screeded decks

2.13 A vapour control layer is loose-laid or, depending on the specification, bonded to the deck and turned up at all perimeters and upstands.

2.14 Installation proceeds as described in sections 2.3 to 2.5 and the relevant sections of 2.6 to 2.12.

Profiled metal deck

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

2.16 Installation proceeds as described in sections 2.3 to 2.15 with 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. Boards should not exceed the maximum spans given in Table 3.

Table 3 Minimum board thickness on corrugated metal deck

	Maximum span between corrugations (mm)			
	105	110	120	135
Thermodek Plus	45	50	60	75

2.17 Installation proceeds as described in the relevant sections of 2.6 to 2.12.

Tapered boards (all deck and board types)

2.18 Pre-cut Thermodek — Standard, HP, HP Torch and Plus boards tapered to required falls are pre-labelled to the requirements of the specific building by Vencel Resil Limited's roof layout drawing.

2.19 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 boards.

2.20 Boards are laid sequentially in accordance with the position code number on the roof layout drawing. Laying for the main area should commence at the apex line(s) of the roof. To avoid error it is advisable to temporarily position each board prior to bonding.

2.21 Installation of tapered boards is otherwise as described in sections 2.1 to 2.17.

Bibliography

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

BS 3837 *Expanded polystyrene boards*
BS 3837-1 : 1986(1996) *Specification for boards manufactured from expandable beads*

BS 8217 : 1994 *Code of practice for built-up felt roofing*

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

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

On behalf of the British Board of Agrément

Date of issue: 28th March 2001

Chief Executive

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BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

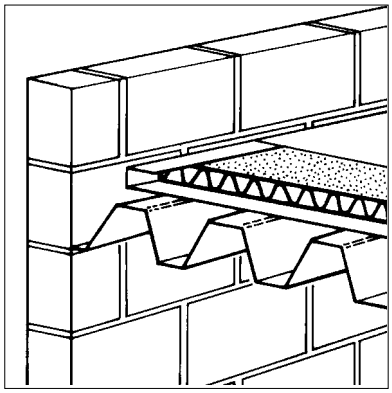
Vencel Resil Limited

Certificate No 01/3812

DETAIL SHEET 4

JABLITE ROOFBOARD

Product



- *THIS DETAIL SHEET RELATES TO JABLITE ROOFBOARD, EXPANDED POLYSTYRENE BOARD.*
- *Jablite board is available without facings, with foil on one side (PF1) or with foil on both sides (PF2).*
- *The expanded polystyrene is available in two grades and a range of thicknesses as flat or tapered boards to suit different design requirements.*
- *The product is for use as a thermal insulation layer in warm roofs on suitably designed concrete, timber or metal structural decks in conjunction with suitable waterproofing systems.*
- *The product must always be used with a suitable vapour control layer below it.*
- *It is essential that the system is installed and maintained in accordance with conditions set out in the* Design Data *and* Installation *parts of the Front Sheets and this Detail Sheet.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the system's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification.

Technical Specification

1 Description

1.1 Jablite Roofboard consists of Jablite expanded polystyrene boards produced by the steam moulding process to BS 3837-1 : 1986(1996). An optional aluminium foil layer is factory-bonded to the polystyrene.

1.2 PF1 has foil facing on the upper side, PF2 has foil facing on both sides.

1.3 The expanded polystyrene is available in Grade HD (high duty) or EHD (extra high duty) Type A (flame-retardant additive).

1.4 Uniform boards are available with tongue-and-groove edges or with plain edges, to the characteristics given in Table 1.

Table 1 Board characteristics

Characteristic	Dimensions (mm)	
	Flat board	Tapered board
Length	1200	1200, 600
Width	900, 1200	900
Thickness	from 20 in 5 mm increments	from 20

1.5 Nominal physical properties of the EPS component are given in Table 2.

Table 2 Physical properties of EPS components

	Grade HD	Grade EHD
Nominal density (kgm^{-3})	20	25
Minimum compressive strength at 10% compression (kNm^{-2})	110	150
Water vapour resistivity $MNs(gm)^{-1}$	200	238

Installation

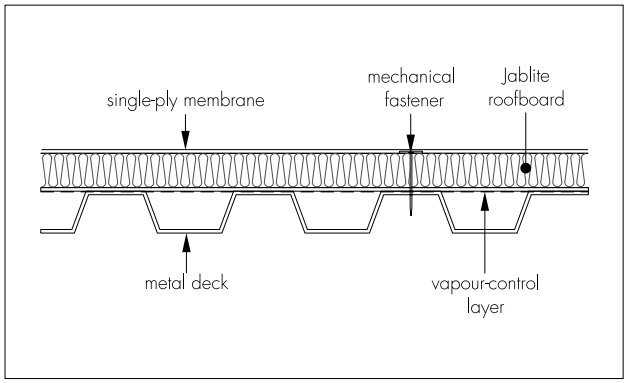
2 Procedure

2.1 Jablite Roofboards are installed in accordance with Vencel Resil Limited's instructions and the relevant requirements of the single-ply roof waterproofing membrane manufacturer (see also section 14 of the Front Sheets of this Certificate (see Figure 1).

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

2.2 A vapour control layer is loose-laid or bonded to the deck, depending on the specified membrane and roof waterproofing system, and turned up at all perimeters and upstands.

Figure 1 Single-ply roof waterproofing system



2.3 Boards are butted together with staggered joints, or for tapered boards as described in section 2.11. Where a PVC membrane without an integral fleece backing, is specified, a foil faced board should be used to prevent plasticiser migration to the EPS.

2.4 The vapour control layer is turned down over the boards at perimeters and upstands.

2.5 One of the following single-ply waterproofing membranes is applied in accordance with the manufacturer's instructions:

(a) PVC

(b) EPDM

(c) TPO.

Concrete and concrete screeded decks

2.6 Installation proceeds as described in sections 2.2 to 2.5.

Profiled metal deck

2.7 Installation proceeds as described in sections 2.2 and 2.3 with boards laid with the long axis at right angles to the deck corrugations. Board ends are cut as necessary so that they are fully supported on the crown of the profile. Boards should not exceed the maximum spans given in Table 3.

Table 3 Minimum board thickness on corrugated metal deck

	Maximum span between corrugations (mm)			
	105	110	120	135
Jablite	45	50	60	75

2.8 Installation proceeds as described in sections 2.4 and 2.5.

Tapered boards (all deck and board types)

2.9 Pre-cut boards tapered to required falls are pre-labelled to the requirements of the specific building by Vencel Resil Limited's roof layout drawing.

2.10 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 boards.

2.11. Boards are laid sequentially in accordance with the position code number on the roof layout drawing. Laying for the main area should commence at the apex line(s) of the roof. To avoid error it is advisable to temporarily position each board prior to bonding.

2.12 Installation of tapered boards is otherwise as described in sections 2.1 to 2.8.

Bibliography

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

BS 3837 *Expanded polystyrene boards*
BS 3837-1 : 1986(1996) *Specification for boards manufactured from expandable beads*

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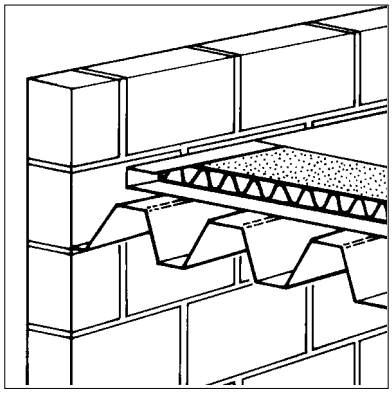
DETAIL SHEET 5

JABROLL ROOF INSULATION

Product



- *THIS DETAIL SHEET RELATES TO JABROLL ROOF INSULATION, A ROLL-FORM SHEET OF INTERLOCKING EXPANDED POLYSTYRENE STRIPS WITH SBS-MODIFIED ROOF MEMBRANE BONDED TO THE UPPER FACE.*
- *The expanded polystyrene is available in two grades and a number of thicknesses to suit different design requirements.*
- *The product is for use as a thermal insulation layer in warm roofs on suitably designed concrete, timber or metal structural decks in conjunction with suitable waterproofing systems.*
- *The product is for use on flat and curved roofs.*
- *The product must always be used with a suitable vapour control layer below it.*
- *It is essential that the system is installed and maintained in accordance with the conditions set out in the* Design Data *and* Installation *parts of the Front Sheets and this Detail Sheet.*

This Detail Sheet must be read in conjunction with the Front sheets, which give the system's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification.

Technical Specification

1 Description

1.1 Jabroll Roof Insulation consists of Jablite expanded polystyrene interlocking strips produced by the steam moulding process to BS 3837-1 : 1986(1996). High-performance 180 gm^{-2} SBS-polymer-modified first-layer waterproof roof membrane with a fine-sanded finish is factory-bonded to the upper face of the polystyrene strip, creating a selvedge along one length and width.

1.2 The expanded polystyrene is available in Grade HD (high duty) or EHD (extra high duty) Type A (flame-retardant additive).

1.3 Joints between adjacent strips of insulation, including the end joint, have an interlocking tongue-and-groove profile and the characteristics given in Table 1.

Table 1 Board characteristics

Characteristic	Dimensions (mm)
Length	5000[1], 4000[1]
Width	900[1]
Thickness[2]	50, 65, 85, 125

(1) The membrane overlaps the insulation by 100 mm on one side of each length and width.
(2) Other thicknesses are available to order.

1.4 Physical properties of the EPS component are given in Table 2.

Table 2 Physical properties of EPS components

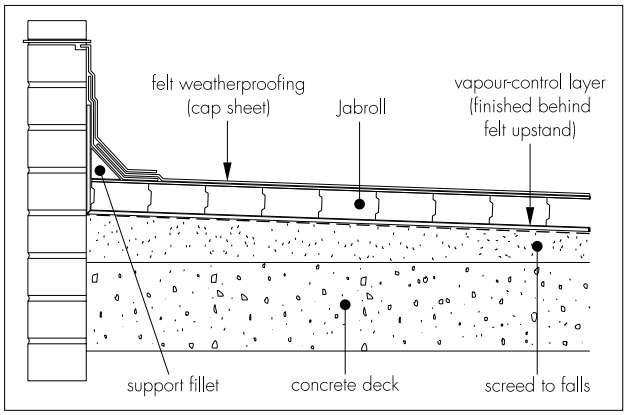
	Grade HD	Grade EHD
Nominal density (kgm^{-3})	20	25
Minimum compressive strength at 10% compression (kNm^{-2})	110	150
Water vapour resistivity $MNs(gm)^{-1}$	200	238

Installation

2 Procedure

2.1 Jabroll is installed in accordance with the relevant requirements of BS 8217 : 1994 and Vencel Resil Limited's instructions on flat and curved decks (see also section 14 of the Front Sheets of this Certificate) (see Figure 1).

Figure 1 High performance felt system



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

2.2 The vapour control layer is nailed to the deck or bonded using an appropriate adhesive.

2.3 For ease of alignment, rolls can be applied in a similar manner to membranes rolls, ie unroll (with felt uppermost) and check alignment, then re-roll half the material and mop hot bitumen adhesive over the vapour control layer to cover the area of half of the roll, allow to cool until tacky before unrolling and repeating the process for the other half of the roll.

2.4 Precautions must be taken during installation to avoid heat damage to the underside of rolls from liquid bitumen. The felt layer on the roll's upper surface protects it from hot bitumen but containers of hot bitumen should not be placed directly on the felt.

2.5 Rolls are butted together and are sealed by bonding the felt overlap on each roll as work progresses. This provides a weatherproof surface and prevents the ingress of hot bitumen when bonding a cap sheet.

2.6 The vapour control layer is turned down and bonded to the felt layer at perimeters and upstands.

2.7 One of the following waterproofing cap sheets is applied using pour-and-roll or torch-on methods in accordance with the manufacturer's instructions:

(a) oxidised SBS-modified or APP-modified high-performance cap sheets

(b) mineral surfaced cap sheets to BS 747 : 2000.

Concrete and concrete screeded decks

2.8 A vapour control layer is fully bonded in hot bitumen to a suitably level and primed deck.

2.9 Installation then proceeds as described in sections 2.3 to 2.7.

Profiled metal deck

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

2.11 Rolls are laid along the deck corrugations so that their edges are fully supported on the crown of the profile. Rolls should not exceed the maximum spans given in Table 3.

Table 3 Minimum roll thickness on corrugated metal deck

	Maximum span between corrugations (mm)		
	110	125	145
Jabroll	50	65	85

2.12 Installation proceeds as described in sections 2.3 to 2.7.

Bibliography

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

BS 3837 *Expanded polystyrene boards*
BS 3837-1 : 1986(1996) *Specification for boards manufactured from expandable beads*

BS 8217 : 1994 *Code of practice for built-up felt roofing*

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