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Agrément Certificate
06/4359
Product Sheet 1

SIKA LTD WATERPROOFING SYSTEMS

DECOTHANE ROOT RESISTANT WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet(1) relates to the Decothane Root Resistant Waterproofing System, comprising one-component, reinforced aliphatic polyurethane, liquid-applied roof waterproofing membranes. The system is for use in flat warm ballasted roof, inverted roof, green roof and roof garden specifications with limited or pedestrian access, for new or existing roofs.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Weathertightness — the system will resist the passage of moisture into the interior of a building (see section 6).

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

Adhesion —the adhesion of the system is sufficient to resist the effects of any likely wind suction and the effects of thermal or other minor movement likely to occur in practice (see section 8).

Resistance to mechanical damage — the system will accept, without damage, the foot traffic and loads associated with installation and maintenance (see section 9).

Resistance to root penetration — the system will adequately resist plant root penetration in green roof and roof garden specifications (see section 10).

Durability — under normal service conditions, the system will provide a durable roof waterproofing with a service life in excess of 25 years (see section 12).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

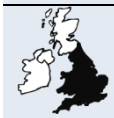
Date of Seventh issue: 29 July 2021

Originally certificated on 24 August 2006

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, the Decothane Root Resistant Waterproofing System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



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

Requirement: **B4(2)** **External fire spread**
Comment: Roofs incorporating the system, when used with suitable surface protection, may be unrestricted under this Requirement. See sections 7.1 to 7.3 of this Certificate.

Requirement: **C2(b)** **Resistance to moisture**
Comment: The system will enable a roof to satisfy this Requirement. See section 6 of this Certificate.

Regulation: **7(1)** **Materials and workmanship**
Comment: The system is acceptable. See section 12.1 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation: **8(1)(2)** **Durability, workmanship and fitness of materials**
Comment: The use of the system satisfies the requirements of this Regulation. See sections 11.1 and 12.1 and the *Installation* part of this Certificate.

Regulation: **9** **Building standards applicable to construction**
Standard: 2.8 Spread from neighbouring buildings
Comment: Roofs incorporating the system, when used with suitable surface protection, can be regarded as having a low vulnerability and may be unrestricted under this Standard, with reference to clause 2.8.1[(1)(2)]. See sections 7.1 and 7.3 of this Certificate.

Standard: 3.10 Precipitation
Comment: The use of the system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1[(1)(2)] and 3.10.7[(1)(2)]. See section 6 of this Certificate.

Standard: 7.1(a) Statement of sustainability
Comment: The system can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.

Regulation: **12** **Building standards applicable to conversions**
Comment: Comments made in relation to the system under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1[(1)(2)] and Schedule 6[(1)(2)].

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

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation: **23(a)(i) (iii)(b)(i)** **Fitness of materials and workmanship**
Comment: The system is acceptable. See section 12.1 and the *Installation* part of this Certificate.

Regulation: **28(b)** **Resistance to moisture and weather**
Comment: The use of the system will enable a roof to satisfy the requirements of this Regulation. See section 6 of this Certificate.

Regulation:	**36(b)**	**External fire spread**
Comment:		Roofs incorporating the system, when used with suitable surface protection, may be unrestricted under the requirements of this Regulation. See sections 7.1 to 7.3 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 sections: 3 *Delivery and site handling* of this Certificate.

Additional Information

NHBC Standards 2021

In the opinion of the BBA, the Decothane Root Resistant Waterproofing System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs, terraces and balconies*.

In addition, in the opinion of the BBA, the system when installed and used in accordance with this Certificate can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards for Conversions and Renovations*, taking account of other relevant guidance within the chapter and the suitability of the substrate to receive the system.

The NHBC Standards do not cover the use of the products in the refurbishment of existing roofs.

CE marking

The Certificate holder has taken the responsibility of CE marking the system components in accordance with European Technical Approval (ETA) 20/1024, issued by ETA Danmark A/S, on the basis of EAD 030350-00-0402 Parts 1 and 6.

Registered office

The registered office of the Certificate holder is Sika Ltd, Watchmead, Welwyn Garden City, Hertfordshire AL7 1BQ. Registered in England: 226822.

Technical Specification

1 Description

1.1 The Decothane Root Resistant Waterproofing System comprises:

- Decothane Root Resistant Base Coat and Top Coat — a root-resistant, single-component, liquid-applied, moisture-triggered, aliphatic polyurethane membrane for use in the main waterproofing layer
- Decothane Detail Coat — a root-resistant, single-component, liquid-applied, moisture-triggered, aliphatic polyurethane for use as a top coat in exposed areas of the system (eg upstands)
- Sika Reemat Premium Reinforcing Mat — a non-woven, glass fibre reinforcing mat for use as a reinforcement embedded in the polyurethane layer while still wet, and available for use in strips to cover individual cracks, joints or details.

1.2 The liquid-applied components have the nominal characteristics given in Table 1.

Table 1 Nominal characteristics of liquid-applied components

Characteristic (unit)	Grade		
	Decothane Root Resistant Base Coat	Decothane Root Resistant Top Coat	Decothane Detail Coat
Dry time at 20°C/50% RH (hours)			
touch dry	2	2	2
through cure	4–6	4–6	4–6
Standard colour	red	black	white, slate grey, shale grey, dove grey

1.3 The waterproofing components of the system are the subject of ETA-20/1024, issued by ETA Danmark A/S. The levels of Use Categories in accordance with EAD 030350-00-0402 are:

External fire performance	NPD(1)
Reaction to fire	Euroclass F(2)
Categorisation by working life	W3 (25 years)
Categorisation by climatic zones	M (moderate) and S (severe)(3)
Categorisation by imposed loads	P4
Categorisation by roof slope	S1 (<5%)
Categorisation by surface temperature	
Lowest	TL1 (5°C)
Highest	TH2 (60°C)
Resistance to roots(4)	Satisfactory.

(1) When the kit is fully covered by the inorganic coverings listed in the Annex of Commission Decision 2000/553/EC it can be considered to satisfy the requirements regarding external fire performance without the need for testing in accordance with the Commission Decision 2000/553/EC.
(2) Classified to BS EN 13501-1 : 2018.
(3) The kit is always under protection.
(4) Tested to DIN 4062 : 1978.

1.4 Ancillary items for use with the system are:

- Reemat Flexitape — a nylon mesh available in light- and heavy-duty grades for use in reinforcing over cracks or joints in substrate
- Decotrim Roof Trims — a range of prefabricated edge and corner details.

1.5 Ancillary items for use with the system, but outside the scope of this Certificate, are:

Warm Ballasted Roof

- S-Vap 5000E SA — a multi-layer self-adhesive vapour control layer and carrier membrane
- Sikatherm GT — a tissue-faced PIR thermal insulation
- S-Felt VS140 — a white/UV stable filter layer for use under ballast
- Primer 600 — for use in preparing substrates prior to installation of self-adhesive membranes
- SikaRoof Adhesive-200 — a humidity-hardening, one-pack polyurethane adhesive used to bond insulation boards to existing waterproofing and S-Vap 5000E SA

Inverted Roof

- Sikatherm EPX — an extruded polystyrene (XPS) insulation board
- Min fx Separation Layer — a spun-bonded polyethylene geotextile for use in reducing the rainwater cooling effect and preventing fines washing from the ballast onto the waterproofing layer
- Liquid Plastics Carrier Membrane — a reinforced bituminous membrane for the prevention of substrate outgassing
- Decostik — a twin-pack polyurethane adhesive for bonding of Liquid Plastics Carrier Membrane
- Deco-Drainage Composite Mat — a polyethylene, three-dimensional net structure faced on both sides with geotexile bonded together by thermal lamination

General

- Decopad — for use in supporting paving above the membrane.

1.6 Ancillary items for green roofs and roof gardens are determined by the individual project specification.

2 Manufacture

2.1 The liquid components of the system are manufactured by a batch-blending process.

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 Sika Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by BSI (Certificates CH15/1206 and CH15/1207 respectively).

3 Delivery and site handling

3.1 Decothane Root Resistant Base Coat and Top Coat, and Decothane Detail Coat, are delivered to site in 15 litre tins bearing the product name, batch number and the BBA logo incorporating the number of this Certificate.

3.2 The Decothane components should be stored in a dry, shaded area, above freezing point and away from ignition sources. Storage temperatures of 10 to 20°C will give the components a shelf-life of 12 months. At higher temperatures the shelf-life will reduce progressively. Once opened, tins should be used within two days.

3.3 The Certificate holder has taken the responsibility of classifying and labelling the system components under the *CLP Regulation (EC) No 1272 / 2008 on classification, labelling and packaging of substances and mixtures.* User must refer to the relevant Safety Data Sheet(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Decothane Root Resistant Waterproofing System.

Design Considerations

4 General

4.1 The Decothane Root Resistant Waterproofing System is satisfactory for use in flat:

- warm ballasted roofs
- inverted roofs
- protected inverted roofs
- green roofs
- roof gardens
- biodiverse specifications.

4.2 Concrete decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018, BS 8217 : 2005 and, where appropriate, *NHBC Standards* 2021, Chapter 7.1. Attention is drawn to the requirements of these Standards to ensure that reinforced concrete roof slabs are finished to an acceptable standard, allow free

drainage of water and are allowed to dry prior to the installation of the waterproofing. When these conditions are not satisfied, appropriate remedial treatment is essential.

4.3 The following terms are defined for the purpose of this Certificate as:

- roof garden (intensive) — a roof with a substantial layer of growing medium with planting that can include shrubs and trees, generally accessible to pedestrians
- green roof (extensive) — a roof with a shallow layer of growing medium planted with low-maintenance plants such as mosses, sedums, grasses and some wild-flower species
- biodiverse living roof — a roof with a growing medium selected to allow indigenous plant species to inhabit the roof over time.

4.4 Limited access roofs are defined for the purpose of this Certificate as those subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc. Where traffic in excess of this is envisaged, additional protection to the membrane, in the form of Decopad supported paving, must be provided as specified by the Certificate holder.

4.5 Flat roofs are defined for the purpose of this Certificate as those with a minimum finished fall of 1:80(1). For design purposes, twice the minimum fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc. Reference should also be made to the appropriate clauses in Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roofs.*

(1) *NHBC Standards* 2021 require a minimum fall of 1:60 for green roofs and roof gardens.

4.6 Structural decks to which the system is to be applied must be suitable to transmit the dead and imposed loads experienced in service. Allowance needs to be made for loading deflections to ensure that the free drainage of water is maintained.

4.7 Imposed loads, dead loading and wind loads are calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003 and BS EN 1991-1-4 : 2005, and their UK National Annexes.

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

4.9 The drainage systems for inverted roofs, green roofs or roof gardens must be correctly designed, and the following points should be addressed:

- provision made for access for maintenance purposes
- dead loads for green roofs and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer
- additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs — Drainage and U value corrections*.

4.10 Insulation used in conjunction with the system must be an XPS insulation board, must be in accordance with the Certificate holder's instructions and must be either:

- as described in the relevant clauses of BS 8217 : 2005, or
- the subject of a current BBA Certificate and used in accordance with, and within the limitations of, that Certificate.

4.11 The NHBC requires that the waterproofing membranes, once installed, be inspected in accordance with of NHBC Standards 2021, Chapter 7.1, Clause 7.1.12, including the use of an appropriate integrity test, where required. Any damage to the membrane is repaired in accordance with section 17 of this Certificate and reinspected.

5 Practicability of installation

The system should only be installed by specialist roofing contractors who have been trained and approved by the Certificate holder.

6 Weathertightness

The system will adequately resist the passage of moisture to the interior of a building and so satisfy the relevant requirements of the national Building Regulations.

7 Properties in relation to fire

7.1 In the opinion of the BBA, a roof incorporating the system will be unrestricted under the national Building Regulations in the following circumstances:

- protected or inverted roof specifications, including an inorganic covering (eg gravel or paving slabs) listed in the Annex of Commission Decision 2000/553/EC,
- a roof garden covered with a drainage layer of gravel 100 mm thick and a soil layer 300 mm thick,
- irrigated roof garden and green roofs.

7.2 When used for flat roofs with the surface finishes listed below, defined in Approved Document B of the Building Regulations, (Wales only), Appendix A, Table 5, Part iii, or the Building Regulations, Northern Ireland, Technical Booklet E, Part IV, Table 5.6, the roof is deemed to be of classification B_{ROOF}(t4):

- 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, or
- macadam.

7.3 The designation of other specifications (eg on combustible substrates), or where the capsheet is exposed, should be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

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

8 Adhesion

General

8.1 The adhesion of the system to the substrates is sufficient to resist the effects of any wind suction, elevated temperatures, thermal shock or minor movements likely to occur in service.

8.2 The ballast requirements for inverted roof specifications should be calculated by a suitably competent and experienced individual in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. The system should always be ballasted with a minimum depth of 50 mm of aggregate or paving. In areas of high-wind exposure, the Certificate holder's advice should be sought.

Roof gardens

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

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

9 Resistance to mechanical damage

9.1 When covered with aggregate, the system can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance operations. However, reasonable care should be

taken to avoid puncture by sharp objects or concentrated loads. Extra care should be taken when walking across the roof if surface water is present. Where pedestrian access is required inverted roof specifications incorporating pavers or other suitable protection can be used.

9.2 The system is capable of accepting minor structural movement while remaining weathertight.

10 Resistance to root penetration

The system, including joints, is resistant to root penetration and can be used in a roof waterproofing system for roof gardens and green roofs.

11 Maintenance

11.1 The system must be the subject of six monthly inspections and maintenance in accordance with BS 6229 : 2018, Chapter 7, to ensure continued satisfactory performance.

11.2 Green roofs and roof gardens must be the subject of regular inspections, particularly in autumn after leaf fall and in spring, to ensure that unwanted vegetation and other debris are cleared from the roof and drainage outlets (see section 4.9). Guidance is available in the latest edition of *The GRO Green Roof Code — Green Roof Code of Best Practice for the UK.*

12 Durability

12.1 Under normal service conditions, the system will provide a durable roof waterproofing with a service life in excess of 25 years. Where the system is used in a fully protected specification and subject to normal service conditions, it will provide an effective barrier to the transmission of liquid water and water vapour for the design life of the roof in which it is incorporated.

12.2 In situations where maintenance or repair of any of the system components in the roof structure is necessary (eg protection layer or insulation), the durability of the membrane may be reduced. In these circumstances, the Certificate holder should be consulted.

12.3 An estimate cannot be given for the life of green roof and roof garden specifications owing to the nature of use. However, under normal circumstances it should be significantly greater than for open coverings.

Installation

13 General

13.1 Installation of the Decothane Root Resistant Waterproofing System must be carried out in accordance with the Certificate holder's instructions and this Certificate.

13.2 Any bulk materials (eg soil for roof gardens, aggregate or slabs), should not be stored on one area of the roof substrate prior to installation, to ensure that localised overloading does not occur.

13.3 Insulation boards may be installed in any weather but, owing to their light weight, care must be taken in high winds. Installers must not carry boards near to parapets or apertures in the deck and, once placed, the boards must be loaded immediately.

14 Site and surface preparation

14.1 Substrates on which the waterproofing component of the system is applied must be properly prepared in accordance with the Certificate holder's instructions.

14.2 Adhesion to substrates will depend on the condition and cleanliness of the substrate. Substrates must be visibly dry, sound and free from loose materials or contamination (eg moss or algae).

14.3 High pressure sand-blasting or water-jetting may be used to remove loose or flaking materials, but the substrate must be visibly dry before the application of the waterproofing.

14.4 Deck surfaces must be free from sharp projections, such as protruding fixing bolts and concrete nibs. All inverted roof applications over concrete decks must incorporate Liquid Plastics Carrier Membrane to prevent any pinholes owing to substrate outgassing.

14.5 Gutters and outlets should be checked to ensure that they are, and remain, clear of all debris.

14.6 All points of potential weakness such as splits, cracks, joints and crazed surfaces must be reinforced with additional Sika Reemat Premium Reinforcing Mat or Reemat Flexitape prior to the application of the waterproofing. Sika Reemat Premium Reinforcing Mat must first be embedded in an initial application of Decothane Root Resistant Base Coat applied at a rate of 1.0 litres per m^2.

15 Application

15.1 Prior to the application of the system, checks should be made to ensure the substrate is dry (ie free from rainwater, surface condensation and frost) and that the prevailing weather and site conditions are correct. The following normal limitations apply:

- application must not take place when the relative humidity is in excess of 95%, or in fog. The temperature/humidity should be such that there is no risk of surface condensation occurring before or during application
- air and substrate temperatures must be in excess of 2°C
- Decothane Root Resistant Base Coat and Top Coat, and Decothane Detail Coat, are conditioned at a temperature of 10°C or greater, for use in airless spray applications
- special precautions may be necessary when temperatures exceed 35°C, as described in the Certificate holder's Product Data Sheets
- primer, where used, must be cured
- wind speed should be such that it does not interfere with the application or cause overspray. No attempt to spray should be made if the wind speed exceeds 6.7 $m \cdot s^{-1}$ (15 mph), unless precautions such as the use of wind barriers are taken.

15.2 Application can be by brush, roller or spray, but brush application is typically used only for embedding Sika Reemat Premium Reinforcing Mat in localised detail.

15.3 Only areas that can be sprayed to the full thickness before weather changes occur should be attempted.

15.4 Areas requiring extra Sika Reemat Premium Reinforcing Mat or Reemat Flexitape, eg details and upstands, should be treated as described in section 14.6. The substrate, once dry, will be ready for the main application of Decothane Root Resistant Base Coat.

15.5 The first coat is applied at a rate of 1.5 litres per m^2, into which the Sika Reemat Premium Reinforcing Mat is embedded while the membrane is still wet. Once cured, the topcoat is applied at a rate of 1.0 litres per m^2. The finished dry thickness should not be less than 1.9 mm.

15.6 Random tests may be carried out on the finished coating surface by cutting out small areas to measure finished cure thickness. Test areas must be repaired after the sample is taken (see section 17).

15.7 At exposed areas, such as upstands, Decothane Detail Coat must be substituted for the top coat at the same application rate.

15.8 Detailing (eg upstands) must be carried out in accordance with the Certificate holder's instructions.

Insulation

15.9 The roof waterproof covering must be clean and free from extraneous matter and fully cured.

15.10 During installation of the insulation, the installers must take care not to damage the waterproofing layer.

15.11 Exposure of the waterproofing must be kept to a minimum and installation of the insulation must take place as soon as possible after the curing of the waterproofing.

16 Protective finishes

16.1 The top of the ballast/protective layer must be a minimum of 150 mm from the top of parapets, details and services.

Gravel

16.2 To prevent flotation, wind uplift and UV degradation, inverted insulation boards up to 50 mm thick must be loaded with at least a 50 mm deep covering of river-washed, rounded stones of nominal size 20 to 32 mm, or round washed broken stone of similar size.

16.3 It is essential that the depth and size of gravel are such that the system is completely covered and protected.

16.4 The proportion of fines in the aggregate must be kept to a minimum to prevent the risk of gullies being blocked and to discourage organic growth.

16.5 In a warm ballasted system, S-Felt VS140 must be placed between the waterproof membrane and the ballast, to prevent potential damage to the membrane from fine grit particles and blocking of the rainwater drainage and outlets. For inverted roofs, Min fx Separation Layer must be placed between the aggregate and the insulation boards to reduce the rainwater cooling effect and similarly prevent damage or problems associated with fine grit particles and roof drainage. Additionally, Deco-Drainage Composite Mat is inserted between the inverted roof board and the waterproofing to allow free drainage of the roof assembly.

16.6 The dead load imposed by 50 mm of gravel is approximately 80 $kg \cdot m^{-2}$. The deck must be capable of withstanding this as well as any additional loads, static or imposed.

16.7 The gravel loading specification is used on roofs in sheltered regions or low- to medium-rise buildings up to ten storeys. When laid in moderate exposure zones, or on buildings of up to fifteen storeys, this gravel specification is permitted but the perimeter should be loaded with paving. For severe exposure zones or tall buildings, specialist advice should be sought. BRE Digest 311 should be used when a calculation is required for a specific building project.

Paving slabs

16.8 Depending on access to the roof and wind effects, the following arrangements should be used:

- standard pressed concrete paving slabs to BS EN 1340 : 2003 on appropriate spacers (see section 17.9), or
- standard pressed concrete paving slabs or paving bricks on 20 mm depth of either gravel graded 4 to 8 mm, or sand or small gravel, on a slip sheet of non-woven, synthetic fibre fleece or fine polyethylene mesh, aperture 2 mm or less.

16.9 The paving should have a minimum thickness of 50 mm. Ballast requirements should be calculated in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex.

16.10 The deck must also safely carry the additional static load of approximately 25 $kg \cdot m^{-2}$ for 50 mm thick slabs. When laid in conjunction with an intermediate layer of sand to a depth of 20 mm, a further static load of approximately 40 $kg \cdot m^{-2}$ must be taken into account.

16.11 The method of laying and bedding will depend upon the form of the roof, and the Certificate holder's advice should be sought.

Green roofs and roof gardens

16.12 Green roofs and roof gardens should be of a suitable design. In cases of doubt the Certificate holder's advice should be sought.

17 Repair

17.1 In the event of damage, repairs can be carried out by cleaning the area around the damage and repairing in accordance with section 15 and the Certificate holder's instructions.

17.2 Should a leak occur in the waterproofing layer, access to it is achieved by removing all layers above the waterproofing layer.

Technical Investigations

18 Tests

18.1 Tests were conducted on the Decothane Root Resistant Waterproofing System and the results assessed to determine:

- delamination strength from concrete, asphalt and mineral finished roofing felt
- fatigue movement
- static indentation
- dynamic indentation at -20, 5 and 23°C
- water exposure for 180 days at 60°C followed by delamination strength from concrete and static indentation testing
- heat ageing for 100 days at 80°C followed by fatigue cycling.

18.2 An assessment was carried using the test data from previous assessments of Decothane products to determine:

- fatigue cycling
- water vapour permeability
- low temperature flexibility
- tensile strength.

19 Investigations

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

19.2 Test data on root resistance for the membrane were assessed.

Bibliography

BRE Digest 311 *Wind scour of gravel ballast on roofs*

BS 6229 : 2018 *Flat roofs with continuously supported flexible waterproof coverings — Code of practice*

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

BS EN 1340 : 2003 *Concrete kerb units — Requirements and test methods*

BS EN 1991-1-1 : *2002 Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*
NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*
BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*
NA + A2 : 18 to BS EN 1991-1-3 : 2003 + A1 : 2015 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Snow loads*
BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Wind actions*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

BS EN ISO 14001 : 2015 *Environmental management systems — Requirements with guidance for use*

DIN 4062 : 1978 *Cold processable plastic jointing materials for sewerdrains - Jointing materials for prefabricated parts of concrete, requirements, testing and processing*

EOTA Technical Report TR 012 (May 2004*), Exposure procedure for accelerated ageing by hot water [Liquid Applied Roof Waterproofing Kits (LARWK)]*

ETAG 005 : *2005 Guideline for European Technical Approval of Liquid Applied Roof Waterproofing Kits Part 1 General, Part 6 Specific Stipulations for Kits Based on Polyurethane*

Commission Decision 2000/553/EC *Commission Decision of 6 September implementing Council Directive 89/106/EEC as regards the external fire performance of roof coverings*

BS EN 13501-1:2018 *Fire classification of construction products and building elements. Classification using data from reaction to fire tests*

The GRO Green Roof code – Green Roof Code of Best Practice for the UK

20 Conditions

20.1 This Certificate:

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

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

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

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

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

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

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

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

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