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Agrément Certificate

19/5664

Product Sheet 1

GCP ROOF WATERPROOFING SYSTEMS

INTEGRITANK SPRAY-APPLIED ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Integritank Spray-Applied Roof Waterproofing System, a two-part, ESSELAC resin-based membrane for use on pitched and flat roofs, including those with zero falls, in protected roof, roof garden and green roof specifications on new or existing roofs with limited access.

(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 a building (see section 6).

Properties in relation to fire — when used with a suitable protection, the system can enable a roof to be unrestricted under the national Building Regulations (see section 7).

Resistance to wind uplift — the system will resist the effects of any likely wind suction acting on the roof (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 penetration by roots — the system will resist penetration by roots and rhizomes (see section 10).

Durability — under normal service conditions, the system will provide a durable roof waterproofing with a service life of at least 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 First issue: 22 July 2019

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

Certificate amended on 23 September 2020 to update zero fall wording.

Certificate amended on 19 January 2021 to update company details.

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 MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

British Board of Agrément

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Regulations

In the opinion of the BBA, the Integritank Spray-Applied Roof 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:	The system, when used with suitable surface protection, can enable a roof to be unrestricted under this Requirement. See sections 7.1, 7.2 and 7.4 of this Certificate.	
Requirement:	C2(b)	Resistance to moisture
Comment:	The system will enable a roof to satisfy this Requirement. See section 6.1 of this Certificate.	
Regulation:	7	Materials and workmanship (applicable to Wales only)
Regulation:	7(1)	Materials and workmanship (applicable to England only)
Comment:	The system is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.	



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:	The system is acceptable and satisfies the requirements of this Regulation. See sections 11 and 12 and the <i>Installation</i> part of this Certificate.	
Regulation:	9	Building standards applicable to construction
Standard:	2.8	Spread from neighbouring buildings
Comment:	The system, when used with suitable surface protection, can be regarded as having a low vulnerability and can enable a roof to be unrestricted, with reference to clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 7.1, 7.2 and 7.4 of this Certificate.	
Standard:	3.10	Precipitation
Comment:	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 6.1 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 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)	Fitness of materials and workmanship
Comment:	(b)(i)	The system is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:	The system will enable a roof to satisfy the requirements of this Regulation. See section 6.1 of this Certificate.	

Regulation:	36(b)	External fire spread
Comment:	The system, when used with suitable surface protection, can enable a roof to be unrestricted under the requirements of this Regulation. On sloping roofs, boundary restrictions will apply. See sections 7.1, 7.2 and 7.4 of this Certificate.	

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

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

Additional Information

NHBC Standards 2019

In the opinion of the BBA, the Integritank Spray-Applied Roof 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 and balconies*.

Technical Specification

1 Description

1.1 The Integritank Spray-Applied Roof Waterproofing System comprises:

- PA1 Primer — a single-component, solvent-based ESSELAC resin solution primer, for use on concrete at temperatures above 5°C. The primer is generally for summer use.
- PAR1 Primer — a two-component, solvent-free, reactive ESSELAC resin, for use on concrete at temperatures up to 30°C
- Zed S94 Primer — a single-component, solvent-based, anti-corrosive metal primer
- Integritank (Spray Grade) Waterproofing — a three-component, solvent-free ESSELAC resin, comprising Parts A and B, pigmented white, yellow or grey
- Integritank Patch Repair HG (Hand Grade) Waterproofing — a two-component, solvent-free ESSELAC resin, for repair work and use in inaccessible areas
- Hardener Powder — for use with PAR1 Primer, Integritank (Spray Grade) Waterproofing Part B and Integritank Patch Repair (HG) Waterproofing.

1.2 Other items or components which may be used with the system, but which are outside the scope of this Certificate, are:

- a range of compatible expansion joint systems
- fast-curing compatible sealants for horizontal and vertical work
- compatible fast-curing methyl methacrylate-based concrete repair materials for horizontal and vertical work
- sealing and levelling compounds
- insulation boards
- protection boards
- paving slab supports
- surface cleaner/HSE approved fungicidal wash
- drainage layers.

2 Manufacture

2.1 The system components are manufactured by batch-blending processes.

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 the Certificate holder has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by Alcumus ISOQAR (Certificate 15174-QMS-001).

3 Delivery and site handling

3.1 The system components are delivered as detailed in Table 1. When unopened, all system components will have a shelf life of 12 months.

<i>Table 1 Weights and packaging</i>		
Component	Weight	Container
PA1 Primer	5, 20, 190, 950 kg	Metal containers
PAR 1 Primer		
5 kg kit:		
primer	5 kg	Metal containers
hardener powder	1-3 x 100 g	Plastic bags
20 kg kit:		
primer	20 kg	Metal containers
hardener powder	1-3 x 400 g	Plastic bags
Zed S94 Primer	5, 20, 200 kg	Metal containers
Integritank (Spray Grade) Waterproofing		
48 kg kit:		
Part A	24 kg	
Part B	23.04 kg	Metal containers
hardener powder	960 g	Metal containers
400 kg kit:		Plastic bags
Part A	200 kg	
Part B	192 kg	Metal containers
hardener powder	8 kg	Metal containers
		Plastic bags
Integritank Patch Repair (HG) Waterproofing		
5 kg kit:		
resin	4.85 kg	Metal containers
hardener powder	150 g	Plastic bags
20 kg kit		
Resin	19.4 kg	Metal containers
Hardener powder	600 g	Plastic bags

3.2 The Certificate holder has taken the responsibility of classifying and labelling the system components under the *CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures*. Users 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 Integritank Spray-Applied Roof Waterproofing System.

4 General

4.1 The Integritank Spray-Applied Roof Waterproofing System is satisfactory for use as a waterproofing layer on new and existing pitched, flat, including protected zero falls roofs, in:

- inverted roof specifications using aggregate ballast on flat roofs with limited access
- protected roof specifications using pavers or other suitable protection on flat roofs with limited or pedestrian access
- 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
- roof garden (intensive) — a roof with a substantial layer of growing medium with planting that can include shrubs and trees, and generally accessible to pedestrians
- biodiverse specifications (similar in composition to an extensive roof but designed specifically to create a habitat) on flat roofs with limited or pedestrian access or pitched roofs with limited access.

4.2 Limited access roofs are defined for the purpose of this Certificate as those subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc. Where traffic in excess of this is envisaged, additional protection to the waterproofing membrane must be provided.

4.3 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80. For design purposes, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc. Pitched roofs are defined for the purpose of this Certificate as those having a fall greater than 1:6. Zero fall roofs are defined for the purpose of this Certificate as those having a finished fall of between 0 and 0.7 degrees. Recommendations for the design of roof falls are available in the Liquid Roofing and Waterproofing Association (LRWA) Note 7 — *Specifier Guidance for Flat Roof Falls*.

4.4 The system is suitable for use on primed concrete and metal substrates.

4.5 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* 2019, Chapter 7.1.

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

4.9 For drainage systems on zero fall roofs it is particularly important to identify the correct drainage points to ensure that the drainage provided is effective.

4.10 The drainage system for green roofs or roof gardens must be correctly designed, and provision made for access for maintenance purposes. Dead loads for green roofs and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.

4.11 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*, issued by The Green Roof Organisation (GRO).

4.12 In inverted roof specifications, the ballast requirements should be calculated by a suitably experienced and competent individual in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. Additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs — Drainage and U value corrections*.

4.13 Insulation materials used in conjunction with the system must be in accordance with the manufacturer's instructions and be either:

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

5 Practicability of installation

The system must only be installed by contractors who have been trained and authorised by the Certificate holder.

6 Weathertightness



6.1 The system will adequately resist the passage of moisture into the building and enable a roof to comply with the requirements of the national Building Regulations.

6.2 The system is impervious to water and, when used as described, will give a weathertight roofing capable of accepting minor movement without damage.

7 Properties in relation to fire



7.1 The system, when used in protected or inverted roof specifications, including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC, can be considered to be unrestricted under the national Building Regulations.

7.2 In the opinion of the BBA, when used in irrigated green roof or roof gardens the system will also be unrestricted.

7.3 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 that the overall fire-rating of the roof is not compromised.



7.4 The designation of other specifications should be confirmed by:

England and Wales — test or assessment in accordance with Approved Document B, Appendix A, clause 1

Scotland — test to conform to Mandatory Standard 2.8, clause 2.8.1⁽¹⁾⁽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.

8 Resistance to wind uplift

General

8.1 The adhesion of the system to the substrates listed in section 4.4 is sufficient to resist the effects of wind suction, elevated temperatures, thermal shock or minor movement likely to occur in practice.

8.2 The ballast requirements for the insulation in inverted roof specifications should be calculated by a suitably experienced and competent individual in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. The insulation 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 must be sought.

Roof gardens

8.3 The soil used in roof gardens must not be of the type that will be removed, or become localised, due 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

The system can accept, without damage, the foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads. Resistance to damage from static indentation and dynamic impact are given in Table 2.

Table 2 Resistance to dynamic impact and static indentation

Test	Result	Method
Dynamic impact (tested at 23°C)		EOTA TR 006
Unaged	I ₄	
Heat aged ⁽¹⁾	I ₄	
Static indentation		EOTA TR 007
Unaged (tested at 60°C)	L ₄	
Water exposed ⁽²⁾ (tested at 35°C)	L ₄	
Water exposed ⁽²⁾ (tested at 60°C)	L ₂	

(1) 200 days at 70°C.

(2) 180 days surface water exposure at 60°C.

10 Resistance to penetration by roots

The system will resist penetration by plant roots and rhizomes without a protection layer and can be used as a waterproofing system in green roof and roof garden specifications.

11 Maintenance



11.1 Maintenance should include checks and operations to ensure that, where applicable:

- adequate ballast is in place and evenly distributed over the membrane
- protection layers are in good condition.

11.2 Green roofs 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 4.10). Guidance is available within the latest edition of *The GRO Green Roof Code — Green Roof Code of Best Practice for the UK*.

12 Durability



Under normal conditions, the system will have a service life of at least 25 years. Where the system is used in a fully protected specification and is subjected 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.

Installation

13 General

13.1 The Integritank Spray-Applied Roof Waterproofing System must be installed in accordance with the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, BS 6229 : 2003, the Certificate holder's instructions and this Certificate.

13.2 Installation must not be carried out during inclement weather, eg rain, fog or snow, and the ambient temperature at the time of laying must be between 0 and 30°C.

13.3 Substrates to which the system is to be applied must be sound, clean, frost free, dry, free from fatty/oily residues, contaminants and from sharp projections such as nail heads and concrete nibs. The substrate must be above the dew point temperature before and during installation.. The Certificate holder's advice must be sought for the suitability of the substrate to receive the system and for suitable cleaning procedures, including the use of a proprietary surface cleaner/HSE approved fungicidal wash, where required.

13.4 Previously coated areas must be checked for integrity and adequate adhesion to the substrate. Defects such as cracks and blisters must be repaired prior to application of the system in accordance with the Certificate holder's instructions.

13.5 Before application, adhesion checks must be carried out to ensure that the system is compatible with the existing surfaces. This should be carried out in accordance with BS EN ISO 4624 : 2003. The bond strength should be a minimum of 0.3 N·mm⁻² on concrete substrate and 2.0 N·mm⁻² on steel.

13.6 Site control checks are made by the Certificate holder's authorised trained contractors in accordance with their instructions.

14 Site and surface preparation

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

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

14.3 New concrete must be well compacted and finished, preferably by power floating and power trowelling to a dense, smooth finish, free from defects. The substrate must be prepared by captive blasting, hydroblasting or other methods approved by the Certificate holder. Concrete toppings and screeds must be properly formulated, applied and compacted. They must be bonded to the substrate and have a floated finish with minimum laitance.

14.4 Surfaces must be dry, and free from laitance and other contaminants likely to affect the adhesion of the system. Any existing coatings must be removed. The substrates must be prepared by shot blasting, hydro-blasting or other approved methods. All loose material must be removed by vacuum cleaning or sweeping the surface.

14.5 Cracks and other defects in the substrate must be repaired using an approved repair material. The advice of the Certificate holder should be sought for approved products.

15 Application

Primer

15.1 Concrete surfaces are primed using PA1 Primer or PAR1 Primer depending on site conditions, and steel substrate is primed with Zed S94 Primer. The primers may be applied by spray, brush or roller.

15.2 Application rates and drying times for the primers are given in Table 3.

Table 3 Application rates and drying times

Primer	Rate (kg·m ⁻²)	Drying time (minutes at 20°C)
PA1 Primer	0.15 – 0.25	60
PAR1 Primer	0.2 – 0.3	45
Zed S94 Primer	0.2 – 0.25	30

15.3 The primer is over-sprayed with Integritank (Spray Grade) Roof Waterproofing provided the primed surface is clean and dry.

Waterproofing membrane

15.4 Integritank (Spray Grade) Waterproofing is supplied as Parts A and B. Immediately before use, the hardener powder is stirred into Part B (pigmented yellow, white or grey) and mixed thoroughly. Parts A and B are metered and mixed in an airless spray unit at a ratio of 1:1 by volume during application.

15.5 Integritank (Spray Grade) Waterproofing is spray-applied in two coats, with the first coat pigmented yellow and the second coat pigmented white or grey. Each coat must be applied to give a minimum wet film thickness of 1.2 mm, to ensure a dry film thickness of 1.0 mm, giving a total minimum dry film thickness of 2.0 mm, including peaks, arrises and irregularities in the substrate.

15.6 Once the first coat has cured, the second coat is spray-applied directly onto it. Curing will vary with temperature but is typically 40 minutes at 23°C.

15.7 After application, any identified pin/blow holes must be over-coated with Integritank (Spray Grade) Waterproofing or Integritank Patch Repair (HG) Waterproofing at an additional minimum wet film thickness of 1.2 mm per coat.

Lapping

15.8 Where new waterproofing membrane is to be joined to an existing Integritank waterproofing membrane, and at day joints, the new application must be lapped onto the existing membrane by a minimum of 50 mm.

15.9 Where the existing membrane is clean, no additional preparation is necessary.

15.10 Where the existing membrane is dirty or contaminated, the surface should be cleaned using a suitable solvent, eg acetone.

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

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, round washed broken stone of similar size, or similar stone approved by the Certificate holder.

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

16.6 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

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

- standard pressed concrete paving slabs to BS EN 1340 : 2003 on appropriate spacers (see section 16.8)

- 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, or similar material approved by the Certificate holder.

16.8 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.

16.9 The deck must also safely carry the additional static load of approximately 25 kg·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·m⁻² must be taken into account.

16.10 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

16.11 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 Any blisters or otherwise damaged membrane must be made good by cutting back to sound material, preparing the periphery if necessary as described under the relevant clause 15.9, 15.10 to 15.11, and applying a repair coat of Integritank (Spray Grade) Waterproofing or Integritank Patch Repair (HG) Waterproofing as described in sections 15.6 to 15.8, ensuring a minimum peripheral lap of 50 mm around the repair.

17.2 Where the damage is through to the substrate, the exposed surface must be cleaned before re-priming.

Technical Investigations

18 Tests

Tests were carried out and the results assessed to determine:

- water vapour permeability
- tensile strength and elongation
- low temperature flexibility
- dimensional stability
- resistance to chisel impact
- resistance to static indentation
- resistance to dynamic indentation
- resistance to fatigue movement
- resistance to cracking
- tensile bond strength
- effects of heat ageing
- effects of exposure to water
- effects of exposure to UV-B radiation.

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 A visit was made to existing site to assess the system's performance in use.

19.3 Test data on root resistance for the waterproofing membrane were assessed.

Bibliography

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

BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

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

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

EOTA TR 006 *Determination of the resistance to dynamic indentation*

EOTA TR 007 *Determination of the resistance to static indentation*

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.