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Agrément Certificate

18/5569

Product Sheet 1 Issue 2

RUBBERSEAL LIQUID WATERPROOFING SYSTEMS

LIQUIFLEX LIQUID WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Liquiflex Liquid Waterproofing System, a single component, cold liquid-applied polyurethane roof waterproofing membrane for use on pitched and flat roofs with limited access and pedestrian access, including green roofs and roof gardens.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

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 Second issue: 11 August 2023
Originally certified on 5 September 2018

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

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

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SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that the Liquiflex Liquid 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 Building Regulations 2010 (England and Wales) (as amended)

Requirement: Comment:	B4(1)	External fire spread The system is restricted by this Requirement in some circumstances. See section 2 of this Certificate.
Requirement: Comment:	B4(2)	External fire spread On a suitable substructure, the system may enable a roof to be unrestricted under this Requirement. See section 2 of this Certificate.
Requirement: Comment:	C2(b)	Resistance to moisture The system will enable a roof to satisfy this Requirement. See section 3 of this Certificate.
Regulation: Comment:	7(1)	Materials and workmanship The system is acceptable. See sections 8 and 9 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation: Comment:	8(1)(2)	Fitness and durability of materials and workmanship The system satisfies the requirements of this Regulation. See sections 8 and 9 of this Certificate.
Regulation: Standard: Comment:	9 2.6	Building standards - construction Spread to neighbouring buildings The system is restricted in some cases by this Standard, under clause 2.6.4 ⁽¹⁾⁽²⁾ . See section 2 of this Certificate.
Standard: Comment:	2.7	Spread on external walls Use of the system is restricted under clauses 2.7.1 ⁽¹⁾⁽²⁾ and 2.7.2 ⁽¹⁾⁽²⁾ of this Standard, in some circumstances. See section 2 of this Certificate.
Standard: Comment:	2.8	Spread from neighbouring buildings The system, when applied to a suitable structure, may be unrestricted under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See section 2 of this Certificate.
Standard: Comment:	3.10	Precipitation 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 3 of this Certificate.
Standard: Comment:	7.1(a)	Statement of sustainability The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.

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(1)(a)(i)(ii)	Fitness of materials and workmanship
Comment:	(iii)(iv)(b)(i)	The system is acceptable. See sections 8 and 9 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 3 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The system is restricted by this Regulation in some circumstances. See section 2 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		On suitable substructures, the system may enable a roof to be unrestricted under this Regulation. See section 2 of this Certificate.

Additional Information

NHBC Standards 2023

In the opinion of the BBA, the Liquiflex Liquid 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 roof, 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 refurbishment of existing roofs.

Fulfilment of Requirements

The BBA has judged the Liquiflex Liquid Waterproofing System to be satisfactory for use as described in this Certificate. The system has been assessed as a waterproofing layer on new and existing pitched and flat roofs with pedestrian and limited access, including green roofs and roof gardens.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the system under assessment. The Liquiflex Liquid Waterproofing System consists of:

- Liquiflex Primer — a two-component, polyurethane-based primer for use over concrete substrates
- Liquiflex EPw Primer — a two-component, epoxy water-based primer for use over metal and polyurethane (PU) insulation substrates
- Liquiflex Pro — a one-component waterproofing based on polyurethane resin

- Liquitop — a two-component polyurethane resin UV-protection finishing layer
- Liquiflex Grip — plastic beads mixed in to Liquitop to provide a rough surface.

The waterproofing components and primers have the nominal characteristics given in Tables 1 and 2 respectively.

Table 1 Nominal characteristics of the waterproofing components

Characteristic (unit)	Component	
	Liquiflex Pro	Liquitop
Colour	grey, red tile, white	Component A: grey, black, red tile, white Component B: orange
Percentage solids (%)	90	70-75
Viscosity at 23°C (cps)	2500-4000	Component A: 4000 ± 1000 Component B: 275 ± 50
Specific gravity (g·cm ⁻³)	1.4–1.5	1.20

Table 2 Nominal characteristics of the primers

Characteristic (unit)	Component	
	Liquiflex Primer	Liquiflex EPw Primer
Colour	Component A: brown Component B: yellow	Component A: orange Component B: blue
Percentage solids (%)	Component A: 0 Component B: 0	Component A: 60 Component B: 75
Viscosity at 23°C (MPa·s)	Component A: 450 Component B: 900	Component A: 8000–15000 Component B: 800–1100
Specific gravity (g·cm ⁻³)	1.11	1.00

Applications

The Liquiflex Liquid Waterproofing System is satisfactory for use on pitched, flat and protected zero fall roofs with limited access, on:

- concrete
- PU insulation
- metal (steel).

When used over insulation, the system is only suitable for non-accessible areas. The system is also satisfactory for use on protected zero-fall roofs with limited access, on concrete substrates.

Definitions for products and applications inspected.

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

- limited access roof — a roof subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc
- flat roof — a roof having a minimum finished fall of 1:80⁽¹⁾
- zero fall roof — a roof having a finished fall which can vary between 0 and 1:80⁽¹⁾
- pitched roof — a roof having a fall in excess of 1:6
- 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 wildflower species.

(1) NHBC Standards 2023 require a minimum fall of 1:60 for green roofs and roof gardens.

Product assessment – key factors

The system was assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

Not applicable.

2 Safety in case of fire

Data were assessed for the following characteristics.

2.1 External fire spread

2.1.1 When tested⁽¹⁾ to DD CEN/TS 1187 : 2012, Test 4, a system comprising 12 mm calcium silicate board, a coat of Liquiflex Pro and an overcoat of Liquitop, achieved a classification of B_{ROOF}(t4) under BS EN 13501-5 : 2005.

2.1.2 On the basis of data assessed, the system listed in section 2.1.1 will be unrestricted by the documents supporting the national Building Regulations with respect to proximity to a boundary. Restrictions may apply at junctions with compartment walls.

2.1.3 A roof incorporating the system will also be unrestricted under the national Building Regulations in the following circumstances:

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

2.1.4 The designation and permissible areas of use of other specifications must be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

2.1.5 On the basis of data assessed, the system may be restricted by the documents supporting the national Building Regulations with respect to proximity to a boundary in some cases.

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

2.2 Reaction to fire

2.2.1 The Certificate holder has not declared a reaction to fire classification to BS EN 13501-1 : 2018 for the Liquiflex Liquid Waterproofing System.

2.2.2 On the basis of data assessed, the system will be restricted in use under the documents supporting the national Building Regulations in some cases.

2.2.3 In England, the system, when used in pitches greater than 70°, excluding upstands, should not be used less than 1 m from a boundary, or on residential buildings more than 11 m in height or on other buildings more than 18 m in height. Restrictions apply on assembly and recreation buildings. These constructions should also be included in calculations of unprotected area.

2.2.4 In Wales, the system, when used in pitches greater than 70°, excluding upstands, should not be used less than 1 m from a boundary, or on buildings more than 18 m in height. Restrictions apply on assembly and recreation buildings. These constructions should also be included in calculations of unprotected area.

2.2.5 In Scotland and Northern Ireland, for systems used in pitches greater than 70°, excluding upstands, that do not achieve the minimum Class E reaction to fire classification to BS EN 13501-1 : 2018, designers should seek guidance on the proposed use of the system from the relevant Building Control Body.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Weathertightness

3.1.1 Results of weathertightness tests are given in Table 3.

Table 3 Weathertightness results

Product assessed	Assessment method	Requirement	Result (Mean)
Liquiflex Pro	Watertightness to EOTA TR 003 : 2004	No evidence of water leakage	Pass
	Water vapour transmission to BS EN 1931 : 2000	Value achieved	μ=2455
	Delamination to EOTA TR 004 : 2004 (substrate)	≥50 kPa	
	Concrete		Pass
	Steel		Pass
	PU		Pass
	Day joint		Pass

3.1.2 The weathertightness of the system was assessed using test data from a representative related system applied at the same application rate and met the requirement of remaining watertight when subjected to a one-metre head of water for 24 hours.

3.1.3 On the basis of data assessed, the system will adequately resist the passage of moisture to the inside of a building and so satisfy the requirements of the national Building Regulations.

3.1.4 The adhesion of the system to the substrates given in the *Product description and intended use* section of this Certificate is sufficient to resist the effects of wind suction, thermal cycling or other minor structural movements likely to occur in service.

3.2 Resistance to mechanical damage

3.2.1 Results of resistance to mechanical damage tests are given in Table 4.

Table 4 Results of mechanical damage results

Product assessed	Assessment method	Requirement	Results
Liquiflex Pro	Dynamic indentation to EOTA TR 006 : 2004 (on steel) Control tested at 23°C Tested at -20°C	Value achieved	I ₄ I ₄
	Dynamic indentation to EOTA TR 006 : 2004 (on PU) Control tested at 23°C Tested at -20°C	Value achieved	I ₂ I ₂
	Static indentation to EOTA TR 007 : 2004 (on PU) Control tested at 23°C	Value achieved	L ₁
	Static indentation to EOTA TR 007 : 2004 (on steel) Control tested at 23°C	Value achieved	L ₄
	Static indentation to EOTA TR 007 : 2004 (on PU) tested at 60°C	Value achieved	L ₁
	Static indentation to EOTA TR 007 : 2004 (on steel) tested at 90°C tested at 60°C	Value achieved	L ₄ L ₄
	Maximum tensile strength to BS EN ISO 527-3 : 2018 Control	Value achieved	5 MPa
	Elongation to BS EN ISO 527-3 : 2018 Control	Value achieved	418 %
	Fatigue to EOTA TR 008 : 2004 Control tested at -10°C (1000 cycles)	No evidence of leakage after 24 hours exposure to 100 mm head of water. No debonding or, if any, not exceeding 75 mm in total or 50 mm on one side of the gap	Pass

3.2.2 The mechanical damage testing of the system was assessed using test data from a representative related system applied at the same application rate and met all testing requirements.

3.2.3 On the basis of data assessed, the system can accept, without damage, the foot traffic and light concentrated loads associated with installation, maintenance and the effects of minor movement likely to occur in practice while remaining weathertight.

3.2.4 Where traffic in excess of the examples given in section 3.2.3 is envisaged, such as for maintenance of lift equipment, a walkway must be provided (for example, using concrete slabs supported on bearing pads). Reasonable care must be taken to avoid puncture by sharp objects or concentrated loads.

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

3.3 Resistance to root penetration

3.3.1 Results of root penetration tests are given in Table 5.

Table 5 Root penetration results

Product assessed	Assessment method	Requirement	Result
Liquiflex Pro	Root penetration to EN 13498 : 2007	No penetration	Pass

3.3.2 On the basis of data assessed, the system will resist penetration by plant roots and can be used as a waterproofing system in green roof and roof garden specifications.

3.4 Slip resistance

Table 6 Slip resistance results

Product assessed	Assessment method	Requirement	Result
Liquiflex Pro	Slip resistance to DD ENV 12633 : 2003	Value achieved	Rd=50

On the basis of data assessed, the system, when incorporating Liquiflex Grip, has adequate slip resistance in wet conditions and may be used in pedestrian access areas.

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Not applicable.

7 Sustainable use of natural resources

Not applicable.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in this system were assessed.

8.2 Specific test data were assessed, as given in Table 7.

Table 7 Durability test results

Product assessed	Assessment method	Requirement	Result (mean)
Liquiflex Pro	EOTA TR 004: 2004 Exposed to hot water at 60°C for 180 days. Concrete	≥50kPa	Pass
	Dynamic indentation to EOTA TR 006 :2004 at 80°C for 200 days Tested at -20°C Steel	Declared value	I ₄
			I ₁
	Dynamic indentation to EOTA TR 006 :2004 UV exposed for 5000 hrs Tested at -20°C Steel	Declared value	I ₄
			I ₁
	Static indentation to EOTA TR 007: 2004 Hot water, at 60°C for 60 days (as defined in EOTA TR 012) Steel	Declared value	L ₄
			L ₁
	Static indentation to EOTA TR 007: 2004 Hot water, at 60°C for 180 days (as defined in EOTA TR 012) Steel	Declared value	L ₄
	Static indentation to EOTA TR 007: 2004 Hot water, at 90°C for 60 days (as defined in EOTA TR 012) Steel	Declared value	L ₄
	Static indentation to EOTA TR 007: 2004 Hot water, at 90°C for 180 days (as defined in EOTA TR 012) Steel	Declared value	L ₂
	Tensile strength to BS EN ISO 527-1: 2019 UV exposed for 5000 hrs severe climatic. (as defined in EOTA TR-010)	Value achieved	6 MPa
	Elongation to BS EN ISO 527-3: 2018 UV exposed for 5000 hrs severe climatic. (as defined in EOTA TR-010)	Value achieved	82 %
	Tensile strength to BS EN ISO 527-1: 2019 Heat ageing exposed for 200 days at 80 °C (as defined in EOTA TR 011)	Value achieved	6 MPa
	Elongation to BS EN ISO 527-3: 2018 Heat ageing exposed for 200 days at 80 °C (as defined in EOTA TR 011)	Value achieved	115 %
	Fatigue to EOTA TR 008: 2004 -10°, 50 cycles. Heat aged for 200 days at 80 °C	No evidence of leakage after 24 hours of exposure to 100 mm head of water. No debonding or, if any, not exceeding 75 mm in total or 50 mm on one side of the gap	Pass

8.3 Service life

Under normal service conditions, the system will have a life of at least 25 years, provided it is designed, installed and maintained in accordance with this Certificate and the Certificate holder’s instructions.

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed by the BBA, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.2 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018, BS 8217 : 2005 Sections 5.1.2 and 6.7 and, where appropriate, *NHBC Standards 2023*, 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 met, appropriate remedial treatment is essential.

9.1.3 For design purposes of flat roofs, twice the minimum finished fall must be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, and direction of falls.

9.1.4 Imposed loads, dead loading and wind loads must be 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.

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

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

9.1.7 For roof garden (intensive) specifications, the following species must be excluded or managed:

- Invasive weeds including buddleia
- Plants and grasses with aggressive rhizomes such as bamboo
- Self-setting woody weeds such as sycamore and ash seedlings should be removed at early germination stage
- Other woody plants which spread aggressively including rhododendron.

9.1.8 The Green Roof Organisation (GRO) can provide guidance on species not included in section 9.1.7, but such advice is outside the scope of this Certificate.

9.1.9 The green systems for zero fall roofs, green roofs or roof gardens must be correctly designed, and the following points should be addressed:

- provision made for access for maintenance purposes
- for zero fall roofs, it is particularly important to identify the correct drainage points, to ensure that drainage is sufficient and effective
- dead loads for green roofs and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.

9.1.10 Insulation materials to be used in conjunction with the system must be in accordance with the Certificate holder's instructions and either:

- as described in the relevant clauses of BS 6229 : 2018 and BS 8217 : 2005, or
- the subject of a current BBA Certificate and used in accordance with, and within the limitations of, that Certificate.

9.1.11 Where the system is installed over insulation boards, the resistance to wind uplift will be dependent on the cohesive strength of the insulation and the method by which the boards are secured to the roof deck. This must be taken into account when selecting a suitable insulation material.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate and visits were carried out to sites in progress to assess the practicability of installation.

9.2.2 Installation of the system must be in accordance with the relevant clauses of BS 8000-0 : 2014 and BS 8000-4 : 1989, the Certificate holder's instructions and this Certificate. A summary of instructions and guidance is provided in Annex A.

9.2.3 All of the components must be applied when the air and substrate temperatures are greater than 5°C. Special precautions may be necessary when temperatures exceed 30°C; advice can be obtained from the Certificate holder but such advice is outside the scope of this Certificate.

9.2.4 Substrates to which the system is to be applied must be sound, clean, frost free and dry, and free from fatty/oily residues, contaminants (eg moss or algae) and sharp projections such as nail heads and concrete nibs. Substrates are high-pressure washed and rinsed to remove loose or flaking materials, but must be visibly dry before application of the system. Concrete surfaces must have a moisture content of less than 5%. 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, but such advice is outside the scope of this Certificate.

9.2.5 All points of potential weakness such as splits, cracks, joints and crazed surfaces must be reinforced in accordance with the Certificate holder's instructions prior to application of the system.

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

9.2.7 Adhesion checks must be carried out to ensure that the system is compatible with the existing surfaces. The Certificate holder must be consulted for details of suitable test methods and requirements before use, but such advice is outside the scope of this Certificate.

9.2.8 Expansion or construction joints must be additionally reinforced prior to the application of the main waterproofing layer, in accordance with the Certificate holder's instructions.

9.2.9 Primer components Parts A and B must be thoroughly mixed for two minutes using a rod stirrer.

9.2.10 The mixed primer is applied to the substrate, with a typical application rate of 0.2 kg·m⁻². The primer must be completely dry before the waterproofing layer is applied.

9.2.11 Liquiflex Pro is applied to the roof at a coverage rate of 1.8 kg·m⁻², using a roller.

9.2.12 On completion, the surface must be inspected for any pinholes, and a second layer of Liquiflex Pro applied if required.

9.2.13 Liquitop is applied as a topcoat to increase UV stability. Components A and B must be thoroughly mixed and applied at a coverage rate of 250 g·m⁻².

9.2.14 Liquiflex Grip (8% weight) is mixed with Liquitop and applied with a roller onto Liquiflex Pro .

9.2.15 The NHBC requires that the Liquiflex Liquid Waterproofing System, once installed, is inspected in accordance with *NHBC Standards 2023*, Chapter 7.1, Clause 7.1.11, and undergoes an appropriate integrity test, where required. Any damage to the system assessed in this Certificate must be repaired in accordance with section 9.4 of this Certificate and reinspected, in order to maintain system performance.

9.3 Workmanship

Practicability of installation was assessed by the BBA on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, the system must only be installed by contractors who have been trained and approved by the Certificate holder.

9.4 Maintenance and repair

9.4.1 Ongoing satisfactory performance of the system in use requires that it is suitably maintained. The guidance provided by the Certificate holder was assessed by the BBA and found to be appropriate and adequate.

9.4.2 The following requirements apply in order to satisfy the performance assessed in this Certificate:

9.4.2.1 The system must be the subject of six-monthly inspections and maintenance in accordance with the recommendations of BS 6229 : 2018, Chapter 7, and the Certificate holder's own maintenance requirements, where relevant, to ensure continued satisfactory performance.

9.4.2.2 Green roofs and roof gardens must be the subject of regular inspections, particularly in autumn after leaf fall and in spring, to ensure unwanted vegetation and other debris are cleared from the roof and drainage outlets (see the Annex, section A.1 and A.2).

9.4.2.3 Should minor damage occur, it can be repaired by cleaning back to the unweathered material and recoating the damaged area with the membrane at the appropriate application rate.

9.4.2.4 Should a leak occur in the waterproofing layer in green or roof garden specifications, access to it is achieved by removing the layers above the waterproofing and replacing them once the repair has been carried out.

10 Manufacture

10.1 The production processes for the system have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and system testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review 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.

11 Delivery and site handling

11.1 The Certificate holder stated that the system is delivered to the site in packaging bearing the system name, batch number, health and safety data, and the BBA logo incorporating the number of this Certificate. Table 8 gives the packaging types and sizes.

Table 8 Liquid component packaging and size

Component	Packaging	Package weights (kg)
Liquiflex Primer	Clamp top tins	5
Liquiflex EPw Primer	Clamp top tins	5
Liquiflex Pro	Clamp top tins	15
Liquitop	Clamp top tins	5

11.2 Delivery and site handing must be performed in accordance with the Certificate holder's instructions and this Certificate.

11.2.1 The liquid components must be stored in a dry, shaded area and away from ignition sources.

Supporting information in this Annex is relevant to the system but has not formed part of the material assessed for the 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.

CLP Regulations

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

Additional information on installation

A.1 Recommendations for the design of green roof 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*.

A.2 Green roofs and roof gardens should be of a suitable design. In cases of doubt, the Certificate holder's advice should be sought, but such advice is outside the scope of this Certificate.

Bibliography

BS 6229 : 2018 *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 1931 : 2000 *Flexible sheets for waterproofing – Bitumen, plastic and rubber sheets for roof waterproofing – Determination of water vapour transmission properties*

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 +A1 : 15 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 13501-5 : 2005 + A1 : 2009 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roofs tests*

BS EN ISO 527-1 : 2019 *Plastics – Determination of tensile properties – General principles*

BS EN ISO 527-3 : 2018 *Plastics – Determination of tensile properties – Test conditions for films and sheets*

DD CEN/TS 1187 : 2012 *Test methods for external fire exposure to roofs*

DD ENV 12633 : 2003 *Method of determination of unpolished and polished slip/skid resistance value*

EN 13498 : 2007 *Thermal insulation products for building applications - Determination of the resistance to penetration of external thermal insulation composite systems (ETICS)*

EOTA TR 003 *Determination of the watertightness*

EOTA TR 004 *Determination of the resistance to delamination*

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

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

EOTA TR 008 *Determination of the resistance to fatigue movement*

EOTA TR 010 *Exposure procedure for artificial weathering*

EOTA TR 011 *Exposure procedure for accelerated ageing by heat*

EOTA TR 012 *Exposure procedure for accelerated ageing by hot water*

Conditions of Certificate

Conditions

1 This Certificate:

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

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

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

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

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

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

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

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

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