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Agrément Certificate
09/4653
Product Sheet 1 Issue 5

PARAFLEX ROOF WATERPROOFING SYSTEMS

PARAFLEX FD ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet(1) relates to the Paraflex FD Roof Waterproofing System, a flexible unsaturated polyester reinforced roof waterproofing system, for use on flat (including protected zero fall) roofs and pitched roofs, including green, brown and blue roofs, in combination with a storm water attenuation system(2), and on podium decks, balconies and walkways.

(1) Hereinafter referred to as 'Certificate'.
(2) The storm water attenuation system is outside the scope of this 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 Fifth issue: 5 August 2025
Originally certified on 20 April 2009

Hardy Giesler
Chief Executive Officer

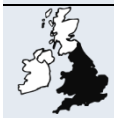
This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.
The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).
Readers MUST check 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.

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 Paraflex FD 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 Building Regulations 2010 (England and Wales) (as amended)

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



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Fitness and durability of materials and workmanship**
Comment:		The use of the system satisfies this Regulation. See sections 8 and 9 of this Certificate.
Regulation:	**8(3)**	**Fitness and durability of materials and workmanship**
Comment:		The use of the system on balconies is restricted by this Regulation. See section 2 of this Certificate.
Regulation:	**9**	**Building standards – construction**
Standard:	2.2	Separation
Standard:	2.7	Spread on external walls
Comment:		The use of the system on balconies is restricted by these Standards, with reference to clauses 2.2.7(1) and 2.7.2(1)(2). See section 2 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		The system, when applied to a suitable substructure, may enable a roof to be unrestricted by this Standard, with reference to clause 2.8.1(1)(2). See section 2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will enable a roof to satisfy this Standard, with reference to clauses 3.10.1(1)(2) and 3.10.7(1)(2). See section 3 of this Certificate.

Standard:	7.1(a)	Statement of sustainability
Comment:		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 – conversion**
Comment:		Comments given for 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) (iii)(iv)(b)(i)**	**Fitness of materials and workmanship**
Comment:		The system is acceptable. See sections 8 and 9 of this Certificate.
Regulation:	**23(2)**	**Fitness of materials and workmanship**
Comment:		The use of the system on balconies is restricted by this Regulation. 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 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 a suitable substructure, the system may enable a roof to be unrestricted by this Regulation. See section 2 of this Certificate.

Additional Information

NHBC Standards 2025

In the opinion of the BBA, the Paraflex 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, 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.

The opinion of the BBA does not amount to any endorsement or approval by NHBC and does not in any way guarantee that NHBC will approve such product / system as compliant with the NHBC Technical Requirements and Standards.

Fulfilment of Requirements

The BBA has judged the Paraflex FD Roof Waterproofing System to be satisfactory for use as described in this Certificate. The system has been assessed for use on flat (including protected zero fall) roofs and pitched roofs, including green, brown and blue roofs, in combination with a storm water attenuation system[(1)], and on podium decks, balconies and walkways.

(1) The storm water attenuation system is outside the scope of this Certificate.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the system under assessment. The Paraflex FD Roof Waterproofing System consists of:

- Paraflex FD — an unsaturated polyester elastomer resin, available in Anthracite and Light Grey
- Reinforcement — a 165 g·m^{-2} non-woven polyester fleece for use in reinforcing the waterproofing layer
- Paraflex Hardener — for use in curing Paraflex FD
- Paraflex Accelerator — for use in curing Paraflex FD with proportions dependent on temperature.

The nominal characteristics for the product are given in Table 1.

Table 1 Characteristics

Characteristic	Value
Specific gravity (g·cm–3)	1.013
Curing with accelerator (mins)	
time to rain-resistant	20
time to foot traffic accessibility	30
Flashpoint (°C)	34
Colour	anthracite and light grey

Ancillary Items

The following ancillary items are essential to use with the system and have been assessed with the system:

- Paraflex Primer — a polyurethane used for preparing substrates prior to the application of the system
- Kiln-dried sand (for primer) — for broadcasting into the wet surface of the applied primer (grain size 0.3 – 0.8 mm)
- Kiln-dried sand (for waterproof layer) — for addition to the waterproof layer as an anti-slip finish (grain size 0.8 – 1.1 mm). Decorative coloured quartz sand can be used as an alternative.

Applications

The system is suitable for use on the following substrates:

- concrete
- plastic
- wood
- metal
- reinforced bitumen membranes (including mineral-surfaced)
- Polyurethane (PUR) or polyisocyanurate (PIR) insulation boards
- mineral wool insulation batts.

The system is satisfactory for use as waterproofing layers in:

- warm or cold exposed roofs on flat and pitched roofs with limited access
- inverted roof specifications using aggregate ballast on flat roofs, including zero fall roofs, with limited access
- protected inverted roof specifications using pavers or other suitable protection on flat roofs, including zero fall roofs, with limited or pedestrian access
- green roof (extensive) specifications on flat roofs, including zero fall roofs, with limited or pedestrian access, or pitched roofs with limited access
- roof garden specifications on flat roofs, including zero fall roofs, with limited or pedestrian access
- brown roof specifications on flat roofs, including zero fall roofs, with limited or pedestrian access
- blue roof specifications on flat roofs, including zero fall roofs
- podium decks
- balconies with pedestrian access
- walkways.

Definitions for product 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
- zero fall roof — a roof having a finished fall which can vary between 0 and 1:80(1)
- flat roof — a roof having a minimum finished fall of 1:80(1)
- pitched roof — a roof having a fall in excess of 1:6
- roof garden — a roof with a substantial layer of growing medium with planting that can include shrubs and trees generally accessible to pedestrians
- green roof — a roof with a shallow layer of growing medium planted with low-maintenance plants such as mosses, sedums, grasses and some wild flower species
- brown roofs — a roof with a growing medium selected to allow indigenous plant species to inhabit the roof over time; no deliberate planting is undertaken
- blue roof — a flat roof designed to allow controlled attenuation of rain fall during storm events as part of a sustainable urban drainage system (SUDS)(2)
- invasive plant species — vegetation species having vigorous and/or invasive root systems likely to cause damage to components of the inverted roof insulation system and roof waterproofing.

(1) *NHBC Standards* 2025 require a minimum fall of 1:60 for green roofs and roof gardens
(2) The storm water attenuation system is outside the scope of this Certificate.

Product assessment – key factors

The system was assessed for the following key factors, and the outcome of the assessment 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 to CEN/TS 1187 : 2012, Test 4, and classified to EN 13501-5 : 2016, the construction given in Table 1, 2 and 3 of this Certificate achieved B_{ROOF}(t4) for slopes below 10°.

Table2 Tested construction – system 1

Substrate	Primer	First waterproofing layer	Reinforcement	Second waterproofing layer
18 mm plywood(1)	Paraflex Primer	Paraflex FD	165 g·m^{-2} Reinforcement	Paraflex FD

(1) This component is outside the scope of this Certificate.

Table 3 Tested construction – system 2

Substrate(1)	22 mm OSB, density 600 kg·m^{-3}
Vapour Barrier(1)	0.6 mm self-adhesive vapour barrier
Adhesive(1)	Insulation adhesive, applied at 50 g·m^{-2}
Insulation(1)	50 to 150 mm PIR insulation board with mineral fleece backing, adhered
Carrier membrane(1)	0.6 mm self-adhesive vapour barrier
Primer	Paraflex Primer, applied at 320 g·m^{-2}
Base layer	Paraflex FD, roller applied, 2.4 mm total thickness of base and top layers and reinforcement
Reinforcement	0.9 to 1.1 mm polyester fleece 165 g·m^{-2} reinforcement
Top layer	Paraflex FD, roller applied

(1) This component is outside the scope of this Certificate.

Table 4 Tested construction – systems 3, 4 and 5

Layer	System 3(1)	System 4(2)	System 5(3)
Substrate(4)	18 mm plywood	19 mm plywood	19 mm plywood
AVCL(4)	0.6 mm foil faced self-adhesive VCL	-	-
Waterproofing layer	-	2.3mm thick Paraflex FD resin	2.3mm thick Paraflex FD resin
Insulation(4)	120 mm foil faced PIR insulation board	80 mm VIP insulation board and XPS insulation board, loose laid	80 mm VIP insulation board and XPS insulation board, loose laid
Carrier(4)	0.6 mm foil faced self-adhesive membrane	-	-
Waterproofing layer	2.3mm thick Paraflex FD resin with sanded surface	-	-
WFRL(4)	-	0.2 mm water flow reducing layer, loose laid	0.2 mm water flow reducing layer, loose laid
Ballast layer(4)	-	100 mm of 20/40 mm rounded gravel ballast	50 mm concrete paving, loose laid on paving supports
Decking(4)	-	32 mm Dura Deck Resist Composite timber deck	-

(1) Fire test and classification reports, reference P110631-1001 Issue 1 and P110631-1002 Issue 1 respectively, conducted by BRE Global. Reports available from the Certificate holder on request.
(2) Fire Test and Classification, references Q100192-1002 Issue 2 and Q100192-1003 Issue 2, respectively, conducted by Warrington fire. Reports available from the Certificate holder on request.
(3) Fire test and classification reports, references Q100192-1018 issue 1 and Q100192-1019 Issue 1, respectively, conducted by BRE Global. Report available from the Certificate holder on request.
(4) This component is outside the scope of this Certificate.

2.1.3 On the basis of data assessed, the constructions listed in Tables 1, 2 and 3 of this Certificate will be unrestricted by the documents supporting the national Building Regulations with respect to proximity to a relevant boundary.

2.1.4 A roof incorporating the system will be similarly unrestricted under the national Building Regulations with respect to proximity to a relevant boundary in the following circumstances:

- when protected by 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 gardens and green roofs.

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

2.1.6 If allowed to dry, plants used in a roof garden may allow flame spread 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 results of a reaction to fire test are given in Table 5.

Table 5 Result of a reaction to fire test

System assessed	Assessment method	Requirement	Result
Paraflex FD Waterproofing System	Classified to BS EN 13501-1 : 2007	Classification achieved	E

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, must not be used less than 1 m from a relevant 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 must also be included in calculations of unprotected area.

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

2.2.5 In Scotland, with the exception of use on balconies (see section 2.2.9) the system may be used without restriction in terms of height and proximity to a relevant boundary. However, restrictions on the overall construction may apply, depending on the reaction to fire classification achieved by the complete system, which must be established on a case-by-case basis.

2.2.6 In England, unless covered with a protection with a reaction to fire of class A1 or A2-s1, d0, for example 40 mm thick cast stone slabs, the system must not be used on balconies of residential buildings with a storey 11 m or more in height or balconies of buildings that have a storey at least 18 m above ground level, and contain one or more dwellings, an institution, a room for residential purposes, student accommodation, care homes, sheltered housing, hospitals, dormitories in boarding schools, hotels, hostels or boarding houses.

2.2.7 In Wales, unless covered with a protection with a reaction to fire of class A1 or A2-s1, d0, for example 40 mm thick cast stone slabs, the system must not be used on balconies of buildings that have a storey at least 18 m above ground level, and contain one or more dwellings, an institution, a room for residential purposes, student accommodation, care homes, sheltered housing, hospitals, dormitories or boarding schools.

2.2.8 In Northern Ireland, unless covered with a protection with a reaction to fire of class A1 or A2-s1, d0, for example 40 mm thick cast stone slabs, the system must not be used on balconies of buildings that have a storey at least 18 m above ground level, and contain one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals, dormitories in boarding schools, nursing homes and places of lawful detention.

2.2.9 In Scotland, the system must not be used on balconies of buildings with a storey at a height of 11 m or more above the ground.

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 6.

Table 6 Weathertightness

Product assessed	Assessment method	Requirement	Result
Paraflex FD Waterproofing System	Watertightness under 60 kPa pressure to BS EN 1928 : 2000	No leakage	Pass
Paraflex FD Waterproofing System	Water vapour diffusion equivalent air layer thickness (S_d) to DIN EN 1931 : 2000 (23°C / 75% RH)	Value achieved	11.1 m
Paraflex FD Waterproofing System	Resistance to delamination to EOTA TR-004 : 2004	≥ 50 kPa	
- on concrete			Pass
- on steel			Pass
- on bitumen membrane			Pass
- on timber			Pass
- on plastic			Pass

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

3.1.3 The adhesion of the system is sufficient to resist the effects of wind suction, elevated temperature and thermal shock conditions likely to occur in practice and remain weathertight.

3.1.4 The resistance to wind uplift for warm roofs will be dependent on the cohesive strength of the insulation and the method by which it is secured to the roof deck. This must be taken into account when selecting a suitable insulation material.

3.2 Resistance to mechanical damage

3.2.1 Results of resistance to mechanical damage tests are given in Table 7.

Table 7 Resistance to mechanical damage

Product assessed	Assessment method	Requirement	Result
Paraflex FD Waterproofing System	Tensile strength to DIN EN ISO 527-3 : 1999	Value achieved	
	Control		
	Longitudinal direction		12.2 MPa
	Transverse direction		15.9 MPa
	Cured at -5°C		18.4 MPa
	Cured at 40°C		19.8 MPa
Paraflex FD Waterproofing System	Elongation to DIN EN ISO 527-3 : 1999	Value achieved	
	Control		
	Longitudinal direction		22.6%
	Transverse direction		22.0%
	Cured at -5°C		24.9%
	Cured at 40°C		24.4%
Paraflex FD Waterproofing System	Dynamic indentation to EOTA TR-006 : 2004	Value achieved	
- on concrete	Control, tested at 23°C		I_4
	Control, tested at –20°C		I_4
	Cured at -5°C, tested at 23°C		I_4
	Cured at 40°C, tested at 23°C		I_4
- on mineral wool insulation	Control, tested at 23°C		I_4

Table 7 Resistance to mechanical damage

Product assessed	Assessment method	Requirement	Result
Paraflex FD Waterproofing System - on concrete - on mineral wool insulation	Static indentation to EOTA TR-007 : 2004 Tested at 23°C	Value achieved	 L_4 L_4
Paraflex FD Waterproofing System	Fatigue cycling to EOTA TR-008 : 2004 Tested at –10°C, 1000 cycles	Watertight and less than 75 mm delamination from the substrate	Pass

3.2.2 On the basis of data assessed, the system can accept, without damage, the limited foot traffic and light concentrated loads associated with installation, maintenance and pedestrian traffic on defined walkways and the effects of minor structural movement while remaining weathertight.

3.2.3 Where traffic in excess of the examples given in section 3.2.2 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.

3.3 Resistance to root penetration

3.3.1 The result of a resistance to root penetration test is given in Table 8.

Table 8 Resistance to root penetration

Product assessed	Assessment method	Requirement	Result
Paraflex FD Waterproofing System	Resistance to root penetration to DIN 4062 : 1978	No root penetration	Pass

3.3.2 On the basis of data assessed, the system, when used in green roof and roof garden applications, will resist penetration by plant roots and remain weathertight.

3.3.3 For green roofs in inverted roof specifications, when installed in accordance with this Certificate, the inverted roof insulation and water-flow-reducing layer (WFRL) will be adequately protected against root damage, subject to routine maintenance being carried out in accordance with this Certificate and as recommended by the Green Roof Organisation (GRO) *Code of Best Practice.*

3.3.4 For roof gardens in inverted roof specifications, when installed in accordance with this Certificate, the inverted roof insulation and water-flow-reducing layer (WFRL) must be protected from damage from invasive plant roots, for example, by using root resistant planter boxed or tree pits lined with an effective root barrier.

4 Safety and accessibility in use

Data were assessed for the following characteristic.

4.1 Safety in use

4.1.1 Results of slip resistance tests are given in Table 9.

Table 9 Slip resistance

Product assessed	Assessment method	Requirement	Result
Paraflex FD Waterproofing System	Coefficient of friction (μ) to BBA Method T1/10 Dry Wet	Pendulum test value (PTV) of ≥ 36	 67 63

4.1.2 On the basis of data assessed, the system with a kiln-dried sand finish, have satisfactory skid resistance in both dry and wet conditions, and may be used in pedestrian access areas.

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 the system were assessed.

8.2 Specific test data were assessed as given in Table 10.

Table 10 Durability

Product assessed	Assessment method	Requirement	Result
Paraflex FD Waterproofing System - on concrete	Resistance to delamination to EOTA TR-004 : 2004 Water exposure to EOTA TR-012 : 2004 at 60°C for180 days	≥ 50 kPa	Pass
Paraflex FD Waterproofing System	Tensile strength to BS EN ISO 527-3 : 1999 Heat aged to EOTA TR-011 : 2004 at 80°C for 200 days	Value achieved	16.4 MPa
	UV aged to EOTA TR-010 : 2004 for 1000 $MJ \cdot m^{-2}$		20.8 MPa
Paraflex FD Waterproofing System	Elongation to BS EN ISO 527-3 : 1999 Heat aged to EOTA TR-011 : 2004 at 80°C for 200 days	Value achieved	19.2%
	UV aged to EOTA TR-010 : 2004 for 1000 $MJ \cdot m^{-2}$		18.8%
Paraflex FD Waterproofing System - on concrete	Dynamic indentation to EOTA TR-006 : 2004 Heat aged to EOTA TR-012 : 2004 at 80°C for 200 days, tested at -20°C	Value achieved	I_4
	UV aged for 1000 $MJ \cdot m^{-2}$, tested at -10°C		I_4
Paraflex FD Waterproofing System - on concrete	Static indentation to EOTA TR-007 : 2004 Water exposure to EOTA TR-012 : 2004 at 60°C for 180 days, tested at 80°C	Value achieved	L_4
Paraflex FD Waterproofing System	Fatigue cycling to EOTA TR-008 : 2004 Heat aged to EOTA TR-012 : 2004 at 80°C for 200 days, tested at -10°C, 50 cycles	Watertight and less than 75 mm delamination from the substrate	Pass

8.3 Service life

8.3.1 Under normal service conditions, the system will have a life in excess of 35 years provided it is designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

8.3.2 When fully protected and subjected to normal service conditions in an inverted roof specification with an open covering (eg aggregate pavers), the system will provide an effective barrier to the transmission of liquid water and water vapour for the life of the roof in which they are incorporated.

PROCESS ASSESSMENT

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 and, where appropriate, *NHBC Standards* 2025, Chapter 7.1.

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

9.1.4 Terraces and balconies to which the system is to be applied, must be designed in accordance with BS 8579 : 2020.

9.1.5 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.

9.1.6 Imposed loads, dead loads and wind loadings 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.

9.1.7 The ballast requirements for inverted roof specifications must be calculated by a suitably experienced and competent individual in accordance with the principles of BS EN 1991-1-4 : 2005 and its UK National Annex. The system must be ballasted with a minimum depth of 50 mm of aggregate. In areas of high wind exposure, the Certificate holder's advice must be sought, but such advice is outside the scope of this Certificate. Alternatively, concrete slabs on suitable supports can be used.

9.1.8 When the system is used in gravel-ballasted protected roof or inverted roof specifications, a suitable filter layer/water-reducing layer must be used between the ballast and the rest of the specification.

9.1.9 The ballast on protected roofs or growing medium used in green roofs and roof gardens must not be of a type that will be removed or become delocalised owing to wind scour experienced on the roof.

9.1.10 It must be recognised that the type of plants used in green roofs and roof gardens could significantly affect the expected wind loads experienced in service. Appropriate mitigation measures must be taken; the advice of the Certificate holder and / or the Green Roof Organisation (GRO) may be sought, but such advice is outside the scope of this Certificate.

9.1.11 For green roofs and roof gardens, invasive non-native alien plant species as defined by UK Government guidance must not be used.

9.1.12 For green roofs and roof garden finishes, to protect the roof waterproofing and any system components above the waterproofing, such as insulation or water flow reducing layer, invasive plant species must not be used. In particular, the following species must be excluded:

- invasive weeds including buddleia
- plants and grasses with aggressive rhizomes such as bamboo
- self-setting woody weeds such as sycamore and ash seedlings must be removed at early germination stage
- other woody plants which spread aggressively including rhododendron.

9.1.13 The Green Roof Organisation (GRO) can provide guidance on species not included in section 9.1.12 but such advice is outside the scope of this Certificate.

9.1.14 The drainage system for zero fall roofs, green roofs or roof gardens must be correctly designed, and the following points must be addressed:

- provision made for access for maintenance purposes
- for protected zero fall roofs, it is particularly important to identify the correct drainage points, to ensure that drainage is sufficient and effective
- the attenuation system and drainage for blue roofs must be designed by a suitably competent and experienced individual to allow the short-term storage and discharge at a set flow rate of storm water to alleviate the risk of localised flooding
- dead loads for green roofs, roof gardens and blue roofs can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.

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

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

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate, the Certificate holder's instructions, the relevant clauses of BS 6229 : 2018, BS 8000-0 : 2014 and BS 8000-4 : 1989 and the *Liquid Roofing and Waterproofing Association (LRWA) Note 7 – Specifier Guidance for Flat Roof Falls*.

9.2.3 Substrates to which the system is to be applied must be properly prepared in accordance with the Certificate holder's instructions.

9.2.4 The substrate must be free from sharp projections such as nail heads and concrete nibs. Power-floated concrete, cement slurry, dirt and grease must be shot blasted or mechanically abraded to help ensure the primer can penetrate into the surface. The advice of the Certificate holder must be sought as to 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 and products outside the scope of this Certificate.

9.2.5 Rough substrates must be made good using the appropriate levelling compound in accordance with the Certificate holder's instructions.

9.2.6 Defects such as large cracks must be repaired prior to application of the system in accordance with the Certificate holder's instructions.

9.2.7 The system must be applied when the air and substrate temperatures are greater than -5°C. Special precautions may be necessary when temperatures exceed 35°C. The advice of the Certificate holder may be sought, but such advice is outside the scope of this Certificate.

9.2.8 Previously coated areas must be checked for integrity and adequate adhesion to the substrate. Adhesion checks must be carried out to ensure that the system is compatible with the existing surface. 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. If the substrate requires preparing after bond testing, the appropriate methods (such as high pressure washing, captive shot blasting or other mechanical abrasive methods) can be used. Advice must be sought from the Certificate holder, but such advice is outside the scope of this Certificate.

9.2.9 The substrate must be primed with Paraflex Primer, prior to application of the system, at a coverage rate of 300 to 500 $g \cdot m^{-2}$. Kiln-dried quartz sand, with a grain size of 0.3 – 0.8 mm, is broadcast into the wet primer.

9.2.10 The other system components are mixed on site by adding the hardener to the resin in the correct proportion.

9.2.11 The activator proportion for Paraflex FD is given in Table 11 with respect of the surface/air temperature, and stirred in accordance with the mixing instructions.

Table 11 Activator proportion

Surface and/or air temperature (°C)	Approximate amount of Paraflex Accelerator (g) per kg of Paraflex FD	Pot life (mins)
-5 – 0	30	30 – 40
1 – 5	25	25 – 35
6 – 10	20	20 – 30
11 – 15	15	20 – 25
16 – 20	10	15 – 20
21 – 35	5	10 – 20

9.2.12 The first coat of Paraflex resin is applied using a lambswool roller and spread evenly. The polyester reinforcement is rolled into the wet resin and pressed free of trapped air using the roller. The reinforcement must have an overlap of at least 50 mm and sufficient resin must be beneath the reinforcement to maintain the system's bond.

9.2.13 A second layer of Paraflex FD resin is applied and evenly spread.

9.2.14 The total coverage of the system must be between 2.4 and 3 $kg \cdot m^{-2}$, giving a finished cured thickness of 2.3 mm.

9.2.15 An anti-slip finish is applied, where necessary, for use on balconies, walkways or other areas of pedestrian access, in accordance with the Certificate holder's instructions.

9.2.16 Following installation, the treated surface must be tested using a non-destructive test, eg holiday test, where required. Damaged areas must be repaired in accordance with section 9.4.

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

9.2.18 The NHBC requires that the system, once installed, is inspected in accordance with *NHBC Standards* 2025, Chapter 7, Clause 7.1.11, including undergoing 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 and on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the system must be carried out by installers 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 they are 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 visual six-monthly inspections and maintenance in accordance with the recommendations in BS 6229 : 2018, Chapter 7, and the Certificate holder's own maintenance requirements. For green roof, roof garden and drainage systems, these six-monthly inspections must be carried out by a suitably experienced and competent individual (with horticultural knowledge) to ensure continued satisfactory performance. This must include an examination of the overall condition of the roof, ensure that drain outlets and gutters are kept clear and unblocked and, for green roofs and roof gardens, the removal of any self-propagated plants and invasive plant species found. See section 9.1.12.

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 is cleared from the roof and drainage outlets. Guidance is available within the latest edition of *The GRO Green Roof Code of Best Practice*.

9.4.2.3 For green roofs, to protect the roof waterproofing and any system components above the waterproofing, such as insulation or water flow reducing layer, invasive plant species (see sections 9.1.12 and 9.1.13 of this Certificate) must be eliminated through maintenance.

9.4.2.4 The control and removal of invasive plant species is carried out by hand. Where this is not possible, any chemicals used must be checked for compatibility with the roof waterproofing layer. The Certificate holder can advise on the suitability of a particular product, but such advice is outside the scope of this Certificate. Note, if using chemicals on a green roof or roof garden rainwater outlets may need to be disconnected from the main drainage system to prevent contamination of the local water system and/or harm to flora and fauna.

9.4.2.5 The chemical fertiliser used on green roofs and roof gardens, must be checked for compatibility with the roof waterproofing layer. The Certificate holder can advise on the suitability of a particular product, but such advice is outside the scope of this Certificate.

9.4.2.6 If a leak occurs in the roof waterproof membrane, it must be repaired following removal of the gravel ballast, paving ballast, green roof or roof garden layer, WFRL and the insulation boards. Correct reinstatement of these layers must be carried out with particular care and the advice of the Certificate holder must be sought, but such advice is outside the scope of this Certificate.

9.4.2.7 Maintenance must include checks and operations to ensure that the system and drainage outlets are free from the build-up of silt and other debris, and that protection layers, eg walkways, are in good condition.

9.4.2.8 In the event of the system being contaminated by oil, grease or other chemicals, the advice of the Certificate holder must be sought, but such advice is outside the scope of this Certificate.

9.4.2.9 Any damage to the system must be repaired as soon as possible to ensure that the integrity of the waterproofing is maintained. The advice of the Certificate holder must be sought, but such advice is outside the scope of this Certificate.

9.4.2.10 Where maintenance or repair of any of the roof components above the waterproofing system is necessary, care must be taken to avoid damage to the membrane. If damage to the membrane occurs, then it must be repaired in accordance with the Certificate holder's instructions.

9.4.2.11 If minor damage occurs, it can be repaired by cleaning back to the unweathered material and recoating the damaged area with the membrane at the appropriate application rate as described in the Certificate holder's instructions.

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 product 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 components are delivered to site in packaging bearing the Certificate holder and component names, health and safety data, and the BBA logo incorporating the number of this Certificate.

11.2 The packaging of the system components is given in Table 12.

Table 12 Details of packaging

Component	Pack sizes
Paraflex FD	10 and 20 kg cans
Reinforcement	1.05 m maximum roll width, weighing 10.65 kg
Paraflex Hardener	0.6 kg plastic bags
Paraflex Accelerator	0.5 kg dosing-bottles
Paraflex Primer	10 and 20 kg plastic canisters
Kiln-dried sand	25 kg plastic bags

11.3 Delivery and site handing must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.3.1 The resin components, accelerator and primer must be kept tightly sealed, and stored in a cool, ventilated location away from sources of ignition and other chemicals.

†ANNEX A – SUPPLEMENTARY INFORMATION

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 system 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 Guidance

A.1 Additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs – Drainage and U value corrections.*

A.2 For zero fall roofs reference must be made to the appropriate clauses in Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*.

A.3 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*.

A.4 Guidance on the design of blue roofs is available in NFRC *Technical Guidance Note for the construction and design of Blue Roofs – Roofs and podiums with controlled temporary water attenuation*.

Bibliography

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

BS 8000-0 : 2014 + A1 : 2024 *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 8579 : 2020 *Guide to the design of balconies and terraces*

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 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 1928 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of watertightness*

BS EN 13501-1 : 2007 +A1 : 2009 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*
EN 13501-5 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roof tests*

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

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

DIN EN 1931 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of water vapour transmission properties*

DIN EN ISO 527-3 : 1999 *Plastics — Determination of tensile properties — Test conditions for films and sheets*

EAD 030350-00-0402 — *Liquid applied roof waterproofing kits*

EOTA TR-004 : 2004 *Determination of the watertightness*
EOTA TR-006 : 2004 *Determination of the resistance to dynamic indentation*
EOTA TR-007 : 2004 *Determination of the resistance to static indentation*
EOTA TR-008 : 2004 *Determination of the resistance to fatigue movement*
EOTA TR-010 : 2004 *Exposure procedure for artificial weathering*
EOTA TR-011 : 2004 *Exposure procedure for accelerated ageing by heat*
EOTA TR-012 : 2004 *Exposure procedure for accelerated ageing by hot water*

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
- 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
- and any matter arising out of or in connection with it or its subject matter (including non-contractual disputes or claims) is governed by and construed in accordance with the law of England and Wales.
- the courts of England and Wales shall have exclusive jurisdiction to settle any matter arising out of or in connection with this Certificate or its subject matter (including non-contractual disputes or claims).

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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