

Polyroof Products Ltd

Furness House
Castle Park Industrial Estate
Flint
Flintshire CH6 5XA

Tel: 01352735135 Fax: 01352735182

e-mail: technical@polyroof.co.uk

website: www.polyroof.co.uk



Agrément Certificate

21/5890

Product Sheet 1 Issue 2

POLYROOF

PROTEC FW-25

This Agrément Certificate Product Sheet⁽¹⁾ relates to Protec FW-25, a liquid-applied roof waterproofing system for use on limited access roofs and, where appropriate, pedestrian access roofs, on warm and cold exposed roofs (flat and pitched), on green roofs (flat, zero fall and pitched) and blue roofs, protected warm and cold roofs and inverted roofs (flat and zero fall), terraces, balconies and walkways across roof areas.

(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

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: 12 December 2023

Originally certificated on 27 April 2021



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

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.

British Board of Agrément

1st Floor Building 3
Croxley Park, Watford
Herts WD18 8YG

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tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

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 Protec FW-25, 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 suitable substructures, the system may enable a roof to be unrestricted under 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 and Annex A 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 can satisfy the requirements of this Regulation. See sections 8 and 9 and Annex A of this Certificate.
Regulation:	9	Building standards - construction
Standard:	2.2	Separation
Standard:	2.6	Spread to neighbouring buildings
Standard:	2.7	Spread on external walls
Comment:		Use of the system is restricted under clause 2.2.7 ⁽¹⁾ , 2.6.4 ⁽¹⁾⁽²⁾ and 2.7.2 ⁽¹⁾⁽²⁾ of these Standards. 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 under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See section 2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The use of the system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 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 - 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 and Annex A 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 use of the system may enable a roof to be unrestricted by this Regulation. See section 2 of this Certificate.

Additional Information

NHBC Standards 2023

In the opinion of the BBA, Protec FW-25, 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 into account other relevant guidance within the chapter and the suitability of the substrate to receive the product.

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

Fulfilment of Requirements

The BBA has judged Protec FW-25, as a liquid-applied roof waterproofing system to be satisfactory for use on limited access roofs and, where appropriate, pedestrian access roofs, on warm and cold exposed roofs (flat and pitched), on green roofs (flat, zero fall and pitched) and blue roofs, protected warm and cold roofs and inverted roofs (flat and zero fall) terraces, balconies and walkways across the roof areas.

Product description and intended use

The Certificate holder provided the following description for the product under assessment. Protec FW-25 is a liquid-applied, glass-reinforced flexible modified polyester system.

The system consists of:

- Protec FW-25 — a pigmented, flexible modified polyester resin
- Polyroof Powder Catalyst — a 50% dibenzoyl peroxide powder
- PolyMat 225 — a 225 g·m⁻² glass reinforcement
- Uni-Primer DP — a primer for preparing bituminous, wood, concrete and other substrates, as specified by the Certificate holder
- Twin Pack Metal Epoxy Primer — a two-part primer for preparing metal substrates and other selected substrates as specified by the Certificate holder
- Anti-slip Additive — an optional surface finish to provide an anti-slip surface if required.
- Metal Detailing Primer — a single pack primer for minor detail work
- Polyroof Quick Dry 2-Pack Epoxy Primer — a two-part primer for preparing metal, concrete, plywood, OSB3 and bituminous substrates.

Ancillary Items

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

- Protec FW-25 Accelerator — an additive for the resin to allow application at lower temperatures
- Protec FW-25 Inhibitor — an additive to enable longer pot-life and working time in high temperatures
- Uni-Primer DP Accelerator — an additive to allow application at lower temperatures
- Taping Mat — a reinforcing tape for use at points of weakness such as detailing, protrusions and over cracks
- Mordant T-Wash — a pre-treatment for new galvanized steel or zinc substrates
- Polyroof Pre-formed GRP Trims — a range of factory-manufactured GRP trims, including upstand fixing trim, drip trim, fillet trim and flat trim
- acetone — for use in cleaning tools.

The Certificate holder recommends the following ancillary items for use with the system, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- quartz sand — an alternative grit for terraces, balconies and walkaways
- mineral slate — an alternative grit for terraces, balconies and walkaways
- PolyFinish — a wear coat for terraces, balconies and walkaways
- Protec Matrix Detail and Repair Compound — a fibre-reinforced resin for detailing inaccessible areas, levelling and minor repairs
- SP Primer 202 — a primer for preparing selected single ply substrates.

Applications

The system is suitable for use on the following substrates:

- concrete
- concrete screeds
- asphalt
- OSB 3 TG4⁽¹⁾
- reinforced bitumen membranes (including sanded and mineral surfaced)
- GRP
- single-ply membranes⁽²⁾
- previously coated surfaces⁽²⁾
- small areas of metal incidental to the roof, eg pipe upstands
- small areas of plastic-coated metal incidental to the roof⁽¹⁾.

(1) Grades approved by the Certificate holder.

(2) The advice of the Certificate holder should be consulted on compatibility with the product, but such advice is outside of the scope of this Certificate.

The system is intended for use in the following situations:

As a liquid-applied roof waterproofing system on new or existing roofs with limited⁽¹⁾ or pedestrian access⁽²⁾ in the following specifications:

- exposed warm and cold flat and pitched roofs⁽¹⁾
- protected warm and cold flat and zero fall roofs (ie covered by pavers or other suitable protection)⁽¹⁾⁽²⁾
- green (extensive) flat, zero fall and pitched roofs⁽¹⁾⁽²⁾
- inverted flat and zero fall roofs⁽¹⁾⁽²⁾.
- blue roofs⁽¹⁾⁽²⁾.
- terraces with anti-slip layer⁽²⁾
- walkways across roof areas with anti-slip layer⁽²⁾
- balconies⁽²⁾.

(1) Grades approved by the Certificate holder.

(2) The advice of the Certificate holder should be sought on compatibility with the system. 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
- pedestrian access roof — a roof that is not subjected to vehicular traffic
- 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
- blue roof — a flat roof designed to allow controlled attenuation of rain fall during storm events as part of a SUDS good practice policy⁽²⁾.

(1) *NHBC Standards* 2023 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 product 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 to DD CEN/TS 1187 : 2012, Test 4, the flat roof systems shown in Table 1 of this Certificate achieved a classification under BS EN 13501-5 : 2016 of B_{ROOF}(t4) for roof pitches between 0 and 10°.

Table 1 Tested systems

System (testing orientation)	Substrate	Primer/Air and Vapour Control Layer (AVCL)	Insulation Layer(s)	Primer + Carrier Membrane	Additional layer	Basecoats, Reinforcement and Topcoat
System 1	Calcium silicate board, 9 m thick	Uni-Primer DP applied at $0.22 \text{ kg}\cdot\text{m}^{-2}$	—	—	—	A layer of Protec FW-25 at $1.22 \text{ kg}\cdot\text{m}^{-2}$) with PolyMat 225 reinforcement and then a layer of Protec FW-25 at $0.71 \text{ kg}\cdot\text{m}^{-2}$)
System 2	An 18 mm thick orientated strand board (OSB3) substrate	Polymeric adhesive primer applied at $0.15 \text{ l}\cdot\text{m}^{-2}$ and then 0.6 mm self-adhesive AVCL	150 mm tissue faced PIR (adhesively fixed)	polymeric adhesive primer applied at $0.15 \text{ l}\cdot\text{m}^{-2}$ and then 2 mm self-adhesive carrier layer	—	A layer of Protec FW-25 at $1 \text{ l}\cdot\text{m}^{-2}$ with PolyMat 225 reinforcement and then a layer of Protec FW-25 at $0.5 \text{ l}\cdot\text{m}^{-2}$)
System 3		300 μm polyethylene AVCL (no primer)	150 mm aluminium foil faced PIR (mechanically fixed)	—	An 18 mm thick orientated strand board (OSB3)	
System 4		Polymeric adhesive primer applied at $0.15 \text{ l}\cdot\text{m}^{-2}$ and then 0.6 mm self-adhesive AVCL	120 mm glass tissue-faced PIR and then 53 mm, bitumen-faced, PIR (both bonded with polyurethane adhesive)	—	—	A layer of Protec FW-25 at $1 \text{ l}\cdot\text{m}^{-2}$ with PolyMat 225 reinforcement and a layer of Protec FW-25 at $0.50 \text{ kg}\cdot\text{m}^{-2}$) Then a layer of Protec FW-25 at $0.50 \text{ l}\cdot\text{m}^{-2}$ with 0.7 – 1.2 mm quartz sand broadcast at $2.5 \text{ kg}\cdot\text{m}^{-2}$ and finally a layer of PolyFinish at $0.60 \text{ l}\cdot\text{m}^{-2}$

2.1.2 On the basis of data assessed, the systems listed in Table 1 are 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 green roof.

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 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 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, must 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 must also be included in calculations of unprotected area.

2.2.4 In Wales, the system, when used in pitches greater than 70°, excluding upstands, must 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 must 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 must seek guidance on the proposed use of the system from the relevant Building Control Body.

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 2.

Table 2 Weathertightness results

Product assessed	Assessment method	Requirement	Result (Mean)
Protec FW-25	Permeability to water vapour to BS 3177 : 1995	Value achieved	0.72 g·m ⁻²
	Delamination to EOTA TR 004 : 2004 (substrate)	≥50kPa	
	Steel		Pass
	Day Joint		Pass

3.1.2 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.

3.1.3 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.

3.2 Resistance to mechanical damage

3.2.1 Results of resistance to mechanical damage tests are given in Table 3.

Table 3 Results of mechanical damage results

Product assessed	Assessment method	Requirement	Results	
Protec FW-25	Dynamic indentation to EOTA TR 006 : 2004 (on steel) Control tested at -20°C	Value achieved	I ₄	
	Dynamic indentation to EOTA TR 006 : 2004 (on PIR insulation) Control tested at - 20°C	Value achieved	I ₂	
	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 PIR insulation) Control tested at 23°C	Value achieved	L ₄	
	Tensile strength to BS EN ISO 527-4 : 1996 Control cured 28 Days at 23°C Cured for 28 days at 40°C Cured for 28 days at 3°C	Value achieved	2600 N per 50 mm 2600 N per 50 mm 2400 N per 50 mm	
	Elongation to BS EN ISO 527-4 : 1996 Control cured 28 Days at 23°C Cured for 28 days at 40°C Cured for 28 days at 3°C	Value achieved	3.3 % 3.4 % 3.4 %	
	Fatigue to EOTA TR 008 : 2004 Control (1000 cycles)	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	
	Polyroof Quick Dry 2-Pack Epoxy Primer and as topcoat a relative product of Polyroof FW- 25	Delamination to EAD 030350-00-0402 : August 2018 (on steel) control	50 kPa	Pass
	Metal Detailing Primer and as topcoat a relative product of Polyroof FW- 25	Delamination to EAD 030350-00-0402 : August 2018 (on steel) control	50 kPa	Pass

3.2.2 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.

3.2.3 Where traffic in excess of the examples given in section 3.2.1 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.

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

3.3 Resistance to root penetration

The system will resist penetration by plants that do not have invasive root systems, such as mosses, sedums and some wild flower species and can be used as a waterproofing system in green roof specifications (see section 9.4).

3.4 Slip resistance

3.4.1 Results of slip resistance tests are given in Table 4.

<i>Table 4 Slip resistance</i>			
Product assessed	Assessment method	Requirement	Results
Protec FW-25 Anti-slip system	Slip resistance to BS 7976-2 : 2002	Pendulum Test Value \geq 36	
	Wet		69
	Dry		80

3.4.2 Protec FW-25 with anti-slip layer has a low slip potential in both dry and wet conditions and so may be used in areas of pedestrian access.

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 the system were assessed.

8.2 Specific test data were assessed as given in Table 5.

Table 5 Results of resistance to mechanical damage results

Product assessed	Assessment method	Requirement	Tensile Strength Result (Mean)
Protec FW-25	EOTA TR 004 : 2004 (on steel) Hot water soaked at 60°C for 180 days. Heat aged at 70°C for 200 days	≥ 50kPa	Pass Pass
	Dynamic indentation to EOTA TR 006 : 2004 UV aged for 1000 MJm ⁻² at 60°C (on steel) Tested at -10°C	Declared value	I ₄
	Static indentation to EOTA TR 007 : 2004 (on steel) Hot water soaked at 60°C for 180 days	Declared value	L ₄
	Ultimate tensile strength to BS EN ISO 527-3 : 2018 UV aged for 800 MJ·m ⁻² (50°C) Heat aged for 200 days at 70°C	Value achieved	50 MPa 53 MPa
	Elongation to BS EN ISO 527-3 : 2018 UV aged for 800 MJ·m ⁻² (50°C)	Value achieved	2.97 %
	Fatigue to EOTA TR 008 : 2004 (on concrete) Heat aged for 200 days at 70°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
	Delamination to EOTA TR 004 : 2004 (on concrete) Hot water soaked, at 60°C for 180 days Heart aged for 200 days at 70°C to EOTA TR 011 : 2004	≥50kPa	Pass Pass

8.3 Service life

8.3.1 The system will achieve an initial life expectancy of at least 25 years. When fully protected, and subjected to normal service conditions in an inverted roof specification with an open covering (eg aggregate pavers), the system can 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.

8.3.2 An estimation cannot be given for the life of green roof specifications owing to the nature of use; however, under normal circumstances, it should be significantly greater than for exposed waterproof coverings.

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 Sections 5.1.2 and 6.7 and, where appropriate, *NHBC Standards* 2023, Chapter 7.1.

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

9.1.5 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.

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

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

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

9.1.9 For green, blue roofs and inverted roofs, structural decks to which the system is to be applied must be capable of transmitting the dead and imposed loads experienced in service.

9.1.10 The drainage systems for zero fall roofs, green roofs, blue 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, blue roofs imposed and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer
- additional guidance for inverted roof specifications is given in *BBA Information Bulletin No 4 Inverted roofs – Drainage and U value corrections*.

9.1.11 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.

9.2 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 carried out in accordance with the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, and the Certificate holder's instructions and this Certificate. Additional instructions and guidance are provided in Annex A of this Certificate.

9.2.3 Application of the system must be carried out at a minimum substrate temperature and air temperature of 5°C stable (1°C with the use of Protec FW-25 Accelerator), rising to a maximum air temperature of 30°C and a substrate temperature of 40°C. The system must not be installed in rain, snow, fog or misty conditions, or when the relative humidity is above 95%.

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

9.2.5 Adhesion to substrates depends on the condition and cleanliness of the substrate. Substrates must be visibly dry and when measured have a maximum moisture content of 20% wood moisture equivalent (WME), be sound and free from loose materials or contamination (eg moss or algae). In cases of doubt the advice of the Certificate holder's Technical Department should be sought.

9.2.6 Any areas of fungal growth or moss must be treated with a Health and Safety Executive approved proprietary anti-fungal solution to ensure that all spores are destroyed, but the performance of such products is outside of the scope of this Certificate.

9.2.7 High-pressure sand-blasting or water-jetting may be used to remove loose or flaking materials and residues following treatment with the anti-fungal wash, but the substrate must be visibly dry before application of the system.

9.2.8 Damaged areas of the substrate (eg broken fibre-cement sheets or blistered reinforced bituminous membranes) must be removed, replaced or repaired.

9.2.9 Deck surfaces must be free from sharp projections, such as protruding fixing bolts or concrete nibs.

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

9.2.11 The Polyroof Powder Catalyst proportion for Uni-Primer DP is given in Table 6 in respect of the surface/air temperature.

Table 6 Polyroof Powder Catalyst for Uni-Primer DP

Temperature (°C)	Catalyst addition (level scoops per litre of primer) ⁽¹⁾
5–10	4
11–17	3
18–30	2

(1) Scoop provided with the catalyst.

9.2.12 The system is mixed on site by adding the catalyst, and accelerator if required, to the resin in the correct proportions. The catalyst is added in the proportions given in Table 7, depending on the surface/air temperature, and stirred in accordance with the mixing instructions.

Table 7 Catalyst addition

Air temperature range	1 to 4°C	5 to 10°C	11 to 17°C	18 to 30°C
Protec FW-25 Accelerator	must be used		not required	
Resin volume in litres	Number of catalyst level scoops ⁽¹⁾			
1	4	4	3	2
2	8	8	6	4
3	12	12	9	6
4	16	16	12	8
5	20	20	15	10
6	24	24	18	12
7	28	28	21	14

(1) Scoop provided with the catalyst.

9.2.13 Polyroof Pre-formed GRP Trims prefabricated details are installed where required in accordance with the Certificate holder's instructions.

9.2.14 Small areas of new galvanized steel and zinc substrates must be treated with a mordant solution at the recommended coverage rate. The wash is allowed to react, the surface conversion is indicated by a black deposit. The surface residue must be washed off with water and dried prior to the application of the primer.

9.2.15 Metal substrates must be primed using Twin Pack Metal Epoxy Primer at a coverage rate of 5 m² per litre; rough or porous surfaces will significantly reduce the coverage rate. The primer should be left to dry for a minimum of 8 hours to maximize adhesion. The maximum overcoating period is 28 days; after this period, it will be necessary to rub down and/or re-prime the surface.

9.2.16 Other substrates may be primed, using Uni-Primer DP at a coverage rate of 4 to 6 m² per litre, depending on surface roughness, in dry conditions between 5°C (1°C when accelerator used) and 30°C ambient air temperature. Porous surfaces must be visually checked to ensure an adequate seal and any suspect areas re-primed as necessary.

9.2.17 The primer must be allowed to dry for at least one hour before overcoating.

9.2.18 If the primed surface is left for longer than seven days before application of the system, it is necessary to solvent wipe the surface with acetone and may require re-priming prior to the installation of the waterproofing. Advice on the necessity of re-priming should be sought from the Certificate holder, but such advice is outside of the scope of this Certificate.

9.2.19 The application is normally in two coats. Depending on the substrate, the first coat of resin is applied at the rates given in Table 8 and chopped strand glass fibre mat rolled out and laid with 50 mm side and end laps and ensuring the mat is correctly oriented so the cut edge is overlapped by the feathered edge of the next strip of reinforcement. Extra resin is immediately applied to achieve a closed, pinhole-free surface.

Table 8 First coat coverage rate⁽¹⁾

Substrate	Coverage rate (l·m ⁻²)
Concrete screed	1.0
OSB 3 TG4	0.85
Asphalt	
– smooth	0.85
– medium	1.0
– rough	1.4
Sanded felt	0.85
Mineral felt	1.15
Single ply	0.85
GRP	0.85

(1) The rates given in this Table are minimum values and it is the contractor's responsibility to ascertain the rate used on the specific site.

9.2.20 The second coat of resin is applied as soon as it is practical to do so at a coverage rate of 0.5 l·m⁻².

9.2.21 Where required, an anti-slip finish is achieved by broadcasting Anti-slip Additive onto a further coat of Protec FW-25 resin applied, in accordance with the Certificate holder's instructions, at a coverage rate of 0.5 l·m⁻². Alternatively, quartz sand or mineral slate can be used instead of Anti-slip Additive.

9.2.22 All upstands, internal outlets, protrusions, cracks/splits and other points of weakness must be locally reinforced using Protec FW-25 resin reinforced with Taping Mat prior to the application of the main system.

9.2.23 The NHBC requires that the 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, installation of 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 The non-slip grade, where subject to heavy foot traffic, may lose some of the surface grit. This must be repaired by preparing the damaged area as described in section 9.4.2.6. The area to be covered must be thoroughly cleaned before the application of the base system. The topcoat, including grit, is then applied.

9.4.2.3 Green roofs 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 Annex A, sections A.7 and A.8). Guidance is available within the latest edition of *The GRO Green Roof Code of Best Practice*.

9.4.2.4 For green roofs (extensive) finishes, in order to protect the water-flow-reducing-layer (WFRL), inverted roof insulation and the roof waterproofing, invasive plant species must be eliminated through maintenance. In particular, the following species must be removed/excluded:

- 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.

9.4.2.5 The Green Roof Organisation (GRO) can provide guidance on species not included in section 9.4.2.4, but such advice is outside of the scope of this Certificate.

9.4.2.6 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.

9.4.2.7 Should a leak occur in the waterproofing layer in green or inverted roof 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 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 Protec FW-25 resin is delivered to site in tins bearing the Certificate holder's name, logo, product name, batch number, health and safety data and the BBA logo incorporating the number of this Certificate.

11.2 The system components and ancillary items, packaging type and sizes are given in Table 9.

Table 9 Packaging

Component/item	Package type	Weight/quality
Protec FW-25 resin	Tins	15 l
Polyroof Powder Catalyst	Packs	1 kg
PolyMat 225	Rolls	15 to 120 m ²
Uni-Primer DP	Tins	5 l
Twin Pack Metal Epoxy Primer	Packs	4 l
Acetone	Cans	1 and 5 l

Supporting information in this Annex is relevant to the product 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 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

General

A.1 Detailing (eg upstands) is carried out in accordance with the Certificate holder's instructions.

A.2 Where applicable, the Certificate holder must be consulted for advice on suitable protection (eg pavers) depending on the use of the roof, but such advice is outside the scope of this Certificate.

A.3 Installation should also be in accordance with the relevant clauses of Liquid Roofing and Waterproofing Association (LRWA) Note 7 - *Specifier Guidance for Flat Roof Falls*.

A.4 Growing medium or other bulk material must not be stored on one area of the roof prior to installation, to ensure that localised overloading does not occur.

A.5 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*.

Procedure

A.6 When the non-slip finish is required, grit is added to the topcoat after the pigmented paste has been mixed in thoroughly. The grit is added at a rate of 120 g per litre of topcoat (a weight ratio of 1:10) and stirred in well before the catalyst is added. The topcoat including grit should be constantly mixed during application to ensure that the grit is evenly dispersed throughout. Alternatively, the topcoat is applied, and the grit is broadcast onto it whilst it is wet, and then over-rolled to embed the grit.

A.7 The topcoat is checked for uniformity of colour, any signs of pin-holing and uniformity of dispersion of grit for the non-slip finish. Any sub-standard areas should receive a further thin application of topcoat before the top layer of resin is cured.

Green roofs and roof gardens

A.8 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.9 Green roofs should be of a suitable design. In cases of doubt the Certificate holder's advice should be sought, but such advice is outside of the scope of this Certificate.

Bibliography

- BS 3177 : 1995 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*
- BS 6229 : 2018 *Flat roofs with continuously supported flexible waterproof coverings — Code of practice*
- BS 7976-2 : 2002 + A1 : 2013 *Determination of slip resistance of pedestrian surfaces — methods of evaluation*
- 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 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 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*
BS EN 13501-5 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roof tests*
- BS EN ISO 527-3 : 1996 *Determination of tensile properties — Part 3: Test conditions for films and sheets*
BS EN ISO 527-4 : 1996 *Determination of tensile properties — Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites*
- DD CEN/TS 1187 : 2012 *Test methods for external fire exposure to roofs*
- EOTA TR 004 : 2004 *Determination of the resistance to delamination*
EOTA TR 006 : 2004 *Determination of the resistance to dynamic indentation*
EOTA TR 007 : 2003 *Determination of the resistance to static indentation*
EOTA TR 008 : 2004 *Determination of the resistance to fatigue movement*
EOTA TR 011 : 2004 *Exposure procedure for accelerated aging by heat*
- EAD 030350-00-0402 : August 2018 *Liquid applied roof waterproofing kits*

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.