

Polyroof Products Limited

Furness House
Castle Park Industrial Estate
Flint
Flintshire CH6 5XA

Tel: 01352 735135 Fax: 01352 735182

e-mail: technical@polyroof.co.uk

website: www.polyroof.co.uk



Agrément Certificate

09/4676

Product Sheet 1

POLYROOF ROOF WATERPROOFING SYSTEMS

PROTEC

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

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

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

KEY FACTORS ASSESSED

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

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

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

Resistance to mechanical damage — the system will accept, without damage, the limited foot traffic and loads associated with installation, maintenance, pedestrian traffic (anti-slip specification) and minor structural movements occurring in service (see section 9).

Resistance to root penetration — the system will resist penetration by plant roots (see section 10).

Slip resistance — the anti-slip specification of the system, when wet or dry, has a satisfactory co-efficient of friction to enable its use in pedestrian areas (see section 11).

Durability — under normal service conditions, the system will provide a durable waterproof covering with a service life of at least 25 years (see section 13).



The BBA has awarded this Certificate to the company named above for the system described herein. This system have 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 Sixth issue: 9 March 2022

Originally certificated on 11 August 2009

Hardy Giesler
Chief Executive Officer

The BBA is a UKAS accredited certification body – Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk
Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

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

British Board of Agrément

Bucknalls Lane
Watford
Herts WD25 9BA

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

©2022

Regulations

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



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

Requirement:	B4(1)	External fire spread
Comment:	The system is restricted by this Requirement in some circumstances. See section 7.5 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 sections 7.1 to 7.4 of this Certificate.	
Requirement:	C2(b)	Resistance to moisture
Comment:	The system will enable a roof to satisfy this Requirement. See section 6 of this Certificate.	
Regulation:	7(1)	Materials and workmanship
Comment:	The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.	



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:	The system can satisfy the requirements of this Regulation. See sections 12.1 and 13.1 and the <i>Installation</i> part of this Certificate.	
Regulation:	9	Building standards applicable to construction
Standard:	2.6	Spread to neighbouring buildings
Comment:	The system is restricted under clause 2.6.4 ⁽¹⁾⁽²⁾ of this Standard in some circumstances. See section 7.6 of this Certificate.	
Standard:	2.8	Spread from neighbouring buildings
Comment:	When applied to a suitable substructure the system may enable a roof to be unrestricted under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 7.1 to 7.4 of this Certificate.	
Standard:	3.10	Precipitation
Comment:	The use of the system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 6 of this Certificate.	
Standard:	7.1(a)	Statement of sustainability
Comment:	The system can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.	
Regulation:	12	Building standards applicable to conversions
Comment:	Comments in relation to the system under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .	

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



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

Regulation:	23(a)(i)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The system will enable a roof to satisfy the requirements of this Regulation. See section 6 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 sections 7.1 to 7.4 of this Certificate.

Construction (Design and Management) Regulations 2015

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

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

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

Additional Information

NHBC Standards 2022

In the opinion of the BBA, Protec, 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*.

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

CE marking

The Certificate holder has taken the responsibility of CE marking the system, in accordance with European Technical Assessment 20/0914, issued under EAD 030350-00-0402 issued by ETA-Danmark A/S.

Technical Specification

1 Description

1.1 Protec is a liquid-applied, glass-reinforced, flexible modified polyester system, available in unpigmented or pre-pigmented versions.

1.2 Protec consists of:

- Protec resin — a flexible, modified polyester resin
- Polyroof Pigment — a pigment dispersed in polyester resin, available in three standard colours, chromite grey, quartz grey and light grey; other non-standard colours are available on request
- Polyroof Powder Catalyst — 50% dibenzoyl peroxide powder
- Polymat — a 450 g·m⁻² glassfibre mat for reinforcing the system
- PolyFinish — sealer coat for pedestrian access specification, available in clear, pigmented and unpigmented
- PolyFinish pigment — for use with PolyFinish unpigmented.
- quartz sand (0.7 to 1.2 mm) — an alternative grit for walkways and balconies
- Polygrit — an optional surface finish to provide an anti-slip surface if required.

1.3 Protec resin has the nominal characteristics of:

Specific gravity	1.33
Gel time at 25°C	21 minutes
Viscosity	400 – 600 mPa·s ⁻¹
Thixotropy index	4000 – 7000 ΔA

1.4 The levels of Use Categories in accordance with EAD 030350-00-0402 from ETA 20/0914 are:

External fire performance	B _{ROOF} (t4)
Categorisation by working life	W3
Categorisation by climatic zones	M
Categorisation by imposed loads	P4
Categorisation by roof slope	S1 to S4
Categorisation by surface temperature	
lowest	TL3
highest	TH4
Resistance to wind loads	>50 kPa.

1.5 Ancillary items for use with the system are:

- Uni-Primer S — a standard primer for preparing bituminous, wood, concrete, and other substrates, as approved by the Certificate holder
- Uni-Primer DP — an alternative primer for preparing bituminous, wood, concrete, and other substrates, as approved by the Certificate holder
- Twin Pack Epoxy Metal Primer — a two-part primer for preparing metal substrates
- Mordant T-Wash — a pre-treatment for new galvanized steel or zinc substrates
- proprietary anti-fungicidal solution — a fungicide for the removal of algae and moss prior to application
- Taping Mat — a reinforcing tape for use at points of weakness such as detailing, protrusions and over cracks
- Protec MMA resin — a liquid-applied methyl methacrylate resin that may be used over excessive movement joints and other special case applications
- Protec Accelerator — an additive to allow application at lower temperatures
- Uni-Primer DP Accelerator — an additive to allow application at lower temperatures
- Protec Inhibitor — an additive to allow application in elevated temperatures
- preformed 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.

1.6 Ancillary items that can be used in conjunction with the system, but which are outside the scope of this Certificate, are:

- mineral slate — an alternative grit for walkways and balconies
- SP Primer 202 — a primer for preparing selected single-ply substrates
- Metal Detailing Primer — a single pack primer for minor detail work
- Polyroof Quick Dry Epoxy Primer — a primer for metals and other substrates approved by the certificate holder.

2 Manufacture

2.1 Protec resin, Uni-Primer DP, inhibitors and accelerators are manufactured via a batch-blending process using conventional methods.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated

- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by the British Board of Agrément (Certificate 18/Q060).

3 Delivery and site handling

3.1 Protec resin is delivered to site in 10-litre 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.

3.2 The system components and ancillary items packaging type and size are given in Table 1.

Table 1 Packaging

Component/item	Package type	Size
Protec resin	Tins	10 litre
Polyroof Pigment ⁽¹⁾	Packs	0.6 and 0.9 kg
Polymat	Rolls	17, 30 and 100 m ²
Polyroof Powder Catalyst	Packs	0.5 or 1 kg
PolyFinish		
Clear	Tins	10 kg (10.3 litre)
Pigmented	Tins	10 kg (9.6 litre)
Unpigmented	Tins	8.5 kg (8.7 litre)
PolyFinish Pigment	Tins	1.5 kg (0.9 litre)
Polygrip	Packs	2.25 or 25 kg
Uni-Primer S	Containers	5 litre
Uni-Primer DP	Tins	5 litre
Twin Pack Epoxy Metal Primer	Tins	4 litre
Protec MMA resin	Tins	10 litre
Mordant T-Wash	Tins	5 litre
Protec Accelerator	Tins	1 litre
Protec Inhibitor	Tins	125 millilitre (105 g)
Uni-Primer DP Accelerator	Tins	0.5 litre

(1) Extra pigment is sometimes used to improve opacity of the top coat.

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

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Protec.

Design Considerations

4 General

4.1 Protec is satisfactory for use 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⁾
- terraces with anti-slip layer⁽²⁾
- walkways across roof areas with anti-slip layer⁽²⁾

4.2 The system is suitable for use on the following substrates:

- concrete
- asphalt
- plywood⁽¹⁾
- OSB 3⁽²⁾
- reinforced bitumen membranes (including sanded and mineral surfaced felts)
- insulation⁽¹⁾
- 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 sought on compatibility with the system.

4.3 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018 and, where appropriate, *NHBC Standards* 2021, Chapter 7.1.

4.4 For the purpose of this Certificate, green roofs (extensive) are defined as those with a shallow layer of growing medium planted with low-maintenance plants such as mosses, sedums, grasses and some wildflower species.

4.5 For the purpose of this Certificate, limited access is defined as roofs subject only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc. Where traffic in excess of this is envisaged, special precautions such as additional protection to the membrane must be taken; for example, quartz sand (0.7 – 1.2 mm), Polygrip or similar incorporated into the final coat.

4.6 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80⁽¹⁾.

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

4.7 Pitched roofs are defined for the purpose of this Certificate as those having falls in excess of 1:6.

4.8 Zero fall roofs are those having a finished fall of between 0 to 1:80⁽¹⁾. Reference should also be made to the appropriate clauses in *Liquid Roofing and Waterproofing Association (LRWA) Note 7 — Specifier Guidance for Flat Roof Falls*.

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

4.9 For design purposes, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc.

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

4.11 For green 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.

4.12 Dead loads, wind loading and imposed 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.

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

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

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

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

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

5 Practicability of installation

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

6 Weathertightness



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

7 Properties in relation to fire



7.1 When tested to DD CEN/TS 1187 : 2012, Test 4, the following flat roof systems achieved a classification under BS EN 13501-5 : 2016 of B_{ROOF}(t4) for roof pitches between 0° and 10° and so are unrestricted with respect to proximity from a boundary by the documents supporting the national Building Regulations:

- a primed 18 mm orientated strand board, a 0.6 mm thick self-adhesive vapour control layer, a 120 mm thick, foil-faced polyisocyanurate insulation board bonded with a polyurethane adhesive, one coat of Protec resin at $1.25 \text{ l}\cdot\text{m}^{-2}$, a layer of Polymat reinforcement and one coat of Protec resin at $0.50 \text{ l}\cdot\text{m}^{-2}$ ⁽¹⁾
- an 18 mm thick oriented strand board, 0.6 mm thick self-adhesive vapour control layer, 210 mm thick rockwool insulation board, one coat of Polyroof Uni-Primer DP at $0.25 \text{ l}\cdot\text{m}^{-2}$, one coat of Protec resin at $1.5 \text{ l}\cdot\text{m}^{-2}$, a layer of Polymat glass reinforcement and one coat of Protec resin at $0.5 \text{ l}\cdot\text{m}^{-2}$ ⁽²⁾
- a primed 18 mm orientated strand board, a self-adhesive vapour control layer, a 150 mm thick tissue-faced polyisocyanurate insulation board bonded with a polyurethane adhesive, a 2.0 mm thick self-adhesive carrier membrane, one coat of Protec resin at $1.5 \text{ l}\cdot\text{m}^{-2}$, a layer of Polymat reinforcement and one coat of Protec resin at $0.5 \text{ l}\cdot\text{m}^{-2}$ ⁽³⁾
- a primed 18 mm orientated strand board, a 0.6 mm thick self-adhesive vapour control layer, a 123 mm thick, polyisocyanurate insulation board, including a 3 mm bituminous facing board, bonded with a polyurethane adhesive, one coat of Uni-Primer DP at $0.25 \text{ l}\cdot\text{m}^{-2}$, one coat of Protec resin at $1.5 \text{ l}\cdot\text{m}^{-2}$, a layer of Polymat reinforcement, one coat of Protec resin at $0.50 \text{ l}\cdot\text{m}^{-2}$, one coat of Protec resin 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 one layer of light grey PolyFinish at $0.60 \text{ l}\cdot\text{m}^{-2}$ ⁽⁴⁾.

(1) Fire test and classification reports, references P110210-1001 and P110210-1002 respectively, conducted by BRE Global, Report available from the Certificate holder.

(2) Fire test and classification reports, references Q101049-1000 and Q101049-1001 respectively, conducted by BRE Global, Report available from the Certificate holder.

(3) Fire test and classification reports, references Q100928-1005 and Q100928-1006 respectively, conducted by BRE Global, Report available from the Certificate holder.

(4) Fire test and classification reports, references Q101049-1002 and Q101049-1003 respectively, conducted by BRE Global, Report available from the Certificate holder.

7.2 When tested to BS 476-3 : 2004 at 0° pitch, a roof system comprising a 6 mm calcium silicate board, one coat of Polyroof Uni-Primer at $0.25 \text{ l}\cdot\text{m}^{-2}$, one coat of Protec resin at $1.25 \text{ l}\cdot\text{m}^{-2}$, a layer of Polymat reinforcement and one coat of Protec resin at $0.50 \text{ l}\cdot\text{m}^{-2}$ ⁽¹⁾ achieved an EXT.F AB rating and is also unrestricted with respect to proximity from a boundary by the documents supporting the national Building Regulations.

(1) Fire test report, reference 312872, conducted by Exova Warringtonfire, Report available from the Certificate holder.

7.3 A roof incorporating the system will also be unrestricted with respect to proximity from a boundary under the national Building Regulations in the following circumstances:

- when used in protected or inverted roof specifications including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC,
- irrigated green roofs.

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



7.5 In England and Wales, the system, when used in pitches of greater than 70°, excluding upstands, should not be used on 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 or dormitories in boarding schools.



7.6 In Scotland, the system, when used in pitches greater than 70°, excluding upstands, should not be used on domestic buildings that have a storey more than 11 m above ground level.

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

8 Adhesion

The adhesion of the system to the substrates and finishes listed in clause 4.2 is sufficient to resist the effects of any wind suction, elevated temperatures, thermal shock or minor movement likely to occur in practice.

9 Resistance to mechanical damage

9.1 The system can accept, without damage, the limited foot traffic and light concentrated loads associated with installation, maintenance and pedestrian traffic on defined walkways. However, care must be taken to avoid puncture by sharp objects or concentrated loads.

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

10 Resistance to root penetration

The system will resist penetration by plant roots and can be used as a waterproofing layer in green roof specifications.

11 Slip resistance

The system, when installed with the anti-slip layer, has a satisfactory slip resistance in dry and wet conditions to allow it to be used in areas of pedestrian access.

12 Maintenance



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

12.2 Green roofs must be the subject of regular inspections, particularly in autumn after leaf fall and in spring, to ensure that unwanted vegetation and other debris are cleared from the roof and drainage outlets (see section 4.13). Guidance is available within the latest edition of *The GRO Green Roof Code — Green Roof Code of Best Practice for the UK*.

12.3 Any damage should be repaired in accordance with section 17 of this Certificate and the Certificate holder's instructions.

13 Durability



13.1 The system will achieve an initial life expectancy, for an exposed roof, of at least 25 years. When fully protected and subjected to normal service conditions in an inverted roof specification with a suitable covering, for example aggregate or 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.

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

13.3 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.

Installation

14 General

14.1 Installation of Protec must be carried out in accordance with the relevant clauses of Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*, the Certificate holder's instructions and this Certificate only by specialist roofing contractors trained and approved by the Certificate holder in accordance with their Installation Manual.

14.2 Application of the system is carried out at a minimum substrate temperature and air temperature of 3°C stable (1°C with the use of accelerators), rising to a maximum air temperature of 30°C and 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%.

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

14.4 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.

15 Site and surface preparation

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

15.2 Adhesion to substrates depends on the condition and cleanliness of the substrate. Substrates must be visibly dry, sound and free from loose materials or contamination (eg moss or algae). In cases of doubt the advice of the Certificate holder's Technical Department should be sought.

15.3 Any areas of fungal growth or moss must be treated with an approved, proprietary anti-fungal solution to ensure that all spores are destroyed.

15.4 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.

15.5 Damaged areas of the substrate, for example, blistered reinforced bitumen membranes, must be removed, replaced or repaired.

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

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

15.8 New galvanized steel and zinc substrates are treated with Mordant T-Wash at a coverage rate of 15 m² per litre. The wash is allowed to react and the surface conversion is indicated by a black deposit. The surface residue is washed off with water and dried prior to the application of the primer.

15.9 Metal substrates are primed using Twin Pack Epoxy Metal Primer at a coverage rate of 5 to 10 m²·ℓ⁻¹, rough or porous surfaces will significantly reduce coverage rate. The primer should be left to dry for a minimum of 2 hours and ideally between 8 and 24 hours to maximize adhesion. The maximum overcoating period is 14 days; after this period, it may be necessary to rub down and/or re-prime the surface.

15.10 Other substrates are primed, using catalysed Polyroof Uni-Primer DP at a coverage rate of 4 to 6 m²·ℓ⁻¹. Porous surfaces should be visually checked to ensure an adequate seal and any suspect areas re-primed as necessary. The primer is allowed to dry for at least one hour before overcoating. 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 prior to the installation of the waterproofing. The catalyst proportion for Uni-Primer S and Uni-Primer DP are given in Table 2 in respect of the surface/air temperature.

Table 2 Catalyst proportion for Uni-Primer S and Uni-Primer DP

Temperature (°C)	Catalyst addition (%)	
	S	DP
3 – 10	4 – 6	3 – 4
10 – 20	3 – 4	2 – 3
20 – 35	2	2

16 Application

16.1 The system is mixed on site by adding the pigment (if required) and then the catalyst to the resin in the correct proportions. The catalyst is added in the proportions given in Table 3, depending on the surface/air temperature, and stirred in accordance with the mixing instructions.

Table 3 Catalyst proportion for Protec

Temperature (°C)	Catalyst addition (%)
3 – 10	4
10 – 15	3
15 – 20	2 – 3
20 – 30	2

16.2 One coat of Protec is applied to all upstands, detailing, protrusions, cracks, joints, and stepped joints with adjoining dissimilar substrates, and reinforced with Taping Mat or pre-cut strips of Polymat prior to the application of the main waterproofing. Protec is allowed to dry before overcoating with the main waterproofing.

16.3 The application is normally in two coats. Depending on the substrate, the first coat of resin is applied at the rates given in Table 4, and Polymat rolled out and laid with 50 mm side and end laps. Extra resin is immediately applied to achieve a closed, pinhole-free surface.

Table 4 First coat coverage rate⁽¹⁾

Substrate	Coverage rate ($\ell \cdot m^{-2}$)
Smooth concrete	1.25 – 1.50 ⁽²⁾
Plywood	1.25 – 1.50
Asphalt	1.25 – 1.50
Sanded felt	1.25 – 1.50
Mineral felt	1.50 – 2.00 ⁽²⁾
De-chipped felt/asphalt	1.50 – 2.00 ⁽²⁾
Single ply	1.25 – 1.50
GRP	1.25 – 1.50
Metal	1.25 – 1.50
Insulation	1.25 – 1.50

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

(2) When applying to very rough, uneven or heavily mineralised surfaces, the coverage rate may be significantly reduced. This should be taken into account when estimating material usage.

16.4 The second coat of resin can be applied as soon as it is practical to do so. However, the maximum period between coats is seven days, after which it is necessary to clean the surface with acetone allowing a further seven days' application time. The coverage rate for the second coat is $0.5 \ell \cdot m^{-2}$.

16.5 Joints subjected to excessive movement may require the use of Protec MMA resin as an alternative bridging material; the Certificate holder should be consulted for advice.

Anti-slip layer

16.6 An additional third coat of Protec is applied at a coverage rate of 0.5 litres per m^2 to the waterproofing system. Quartz sand (0.7 – 1.2 mm) is broadcast in excess, approximately $4 \text{ kg} \cdot m^{-2}$, into the wet resin. The loose excess quartz sand is removed to leave a coverage of approximately $2.5 \text{ kg} \cdot m^{-2}$.

16.7 The quartz sand is sealed with a coat of PolyFinish at a coverage rate of $0.6 \ell \cdot m^{-2}$. PolyFinish is catalysed with Polyroof Powder Catalyst in accordance with the Certificate holder's instructions.

17 Repair

17.1 Should minor damage occur, it can be rectified by cleaning back to unweathered material, reactivating the surface and applying the Protec system to the damaged area at the total application rate stated in sections 15 and 16.

17.2 The anti-slip layer may require maintenance and repair for either cosmetic or anti-slip performance. In most situations a visual inspection will reveal if the sealer coat has worn away. A further application of the sealer coat, at the coverage rate given in 16.7. Preparation before coating includes a thorough clean and, if any of the original sealer coat remains a solvent wipe. A small quantity of extra quartz sand may be required to be broadcast onto the wet sealer coat and rolled in to maintain anti-slip properties.

17.3 If more severe wear of the anti-slip layer has occurred, with a significant loss of the quartz sand, the full anti-slip layer specification should be applied (see sections 16.6 and 16.7) following appropriate surface preparation in accordance with the Certificate holder's instructions.

Technical Investigations

18 Tests

Tests were conducted on samples of the system and ancillary items, and the results assessed to determine:

- tensile strength and elongation on control, heat aged⁽¹⁾ and UV aged⁽²⁾ samples
- tensile adhesion on control, heat aged⁽¹⁾ and after water exposed⁽³⁾ samples
- resistance to fatigue on control and after heat ageing⁽¹⁾
- resistance to dynamic impact on control, hard and soft substrates and on a hard substrate at -10°C on a control, after heat ageing⁽¹⁾ and UV ageing⁽²⁾

- resistance to static indent on control hard and soft substrates and on a hard substrate at 80°C on a control and after water exposure⁽³⁾.

(1) Heat aged for 200 days at 70°C.

(2) UV aged at 1000 MJ·m⁻² UV-A.

(3) 180 days surface water exposure at 60°C.

19 Investigations

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

19.2 Visits were made to a site in progress to assess the practicability of installation.

19.3 Data on fire performance were evaluated.

19.4 Data on the slip resistance, wet and dry, for the system incorporating the anti-slip specification were evaluated.

Bibliography

BS 476-3 :2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*

BS 6229 : 2018 *Flat roofs with continuously supported flexible waterproof coverings — 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 13501-5 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roof tests*

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

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

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

20 Conditions

20.1 This Certificate:

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

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

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

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

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

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

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

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