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Agrément Certificate  
**91/2604**  
Product Sheet 1

### POLYROOF GRP ROOFING

### POLYROOF 185 AND POLYROOF 185 NON-SLIP ROOF WATERPROOFING SYSTEMS

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Polyroof 185 and Polyroof 185 Non-slip Roof Waterproofing systems, for use as waterproofing systems on flat, zero fall or pitched roofs with limited access and internal gutters. Polyroof 185 Non-slip is for use on verandas and terraces, or on walkways on flat roofs.

#### AGRÉMENT 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 systems will resist the passage of moisture into the building (see section 5).

**Properties in relation to fire** — tests indicate that the systems will enable a roof to be unrestricted under Building Regulations (see section 8).

**Resistance to wind uplift** — the adhesion of the systems 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 6).

**Resistance to foot traffic** — the systems will accept the limited foot traffic and loads associated with installation, maintenance of the system and pedestrian traffic on defined walkways, verandas and terraces without damage (see section 7).

**Durability** — under normal service conditions the systems will provide a durable waterproof covering with a service life of at least 25 years (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the systems described herein. These systems have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Simon Wroe  
Head of Approvals — Materials

Greg Cooper  
Chief Executive

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Originally certificated on 19 March 1991

*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](http://www.bbacerts.co.uk)*

*Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.*

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# Regulations

In the opinion of the BBA, Polyroof 185 and Polyroof 185 Non-Slip Roof Waterproofing Systems, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



## The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	B4(2)	External fire spread
Comment:		Test data to BS 476-3 : 2004 indicate that on suitable non-combustible substructures the systems will enable a roof to be unrestricted under this Requirement. See sections 8.1 and 8.2 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		Data for water resistance on the systems, including joints, indicate that the systems meet this Requirement. See section 5.1 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The systems are acceptable. See section 10 and the <i>Installation</i> part of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The systems satisfy the requirement of this Regulation. See sections 9, 10 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	2.8	Spread from neighbouring buildings
Comment:		Test data to BS 476-3 : 2004 indicate that on suitable non-combustible substructures the use of the systems will be regarded as having low vulnerability under clause 2.8.1 <sup>(1)(2)</sup> of this Standard. See sections 8.1 and 8.2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Data for water resistance on the systems, indicate that the use of the systems will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.7 <sup>(1)(2)</sup> . See section 5.1 of this Certificate. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The systems are acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The systems are acceptable. See section 9 of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		Data for water resistance on the systems indicate that the use of the systems will enable a roof to satisfy the requirements of this Regulation. See section 5.1 of this Certificate.
Regulation:	E5(b)	External fire spread
Comment:		Test data to BS 476-3 : 2004 indicate that on suitable non-combustible substructures the use of the systems will be unrestricted by the requirements of this Regulation. See sections 8.1 and 8.2 of this Certificate.

## Construction (Design and Management) Regulations 2007

## Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 2 *Delivery and site handling* (2.3) and 12 *Precautions* (12.1 and 12.2).

# Non-regulatory Information

## NHBC Standards 2008

NHBC accepts the use of Polyroof 185 and Polyroof 185 Non-Slip Roof Waterproofing Systems, when installed and used in accordance with this Certificate, as meeting Technical Requirement R3 in relation to *NHBC Standards*, Chapter 7.1 *Flat Roofs and balconies*.

## Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Polyroof 185 and Polyroof 185 Non-Slip Roof Waterproofing Systems, when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *Flat roofs* (pages 268 to 270).

# Technical Specification

## 1 Description

1.1 Polyroof 185 and Polyroof 185 Non-slip Roof Waterproofing Systems consist of a glassfibre reinforced polyester resin, cold applied on site by the hand lay-up process to a minimum thickness of 1.5 mm. The non-slip grade incorporates a gritting agent in the topcoat to provide the non-slip surface.

1.2 The systems comprise:

- Polyroof 185B — an unsaturated polyester resin for use as Polyroof basecoat
- Polyroof 185C — an unsaturated polyester resin for use as Polyroof topcoat
- Polymat — a glassfibre chopped strand mat reinforcement
- Catalyst — a peroxide supplied in powder form
- Pigment — a thixotropic paste available in a number of colours
- Polygrit — a gritting agent to provide a non-slip surface on trafficked areas.

1.3 Ancillary materials used with the system include:

- calibrated mixing containers
- measuring scoops for catalyst
- preformed glassfibre reinforced trims.

1.4 The standard Polyroof 185 Waterproofing System when fully cured has characteristics of:

Hardness after 48 hours (Barcol) 15 to 20

Minimum tensile strength (MPa) 50

1.5 Quality control checks are carried out on raw materials and on flat sheets made up as the finished product. During site application site records are maintained and quality control samples are prepared (approximately every 2000 m<sup>2</sup>) for subsequent testing.

## 2 Delivery and site handling

2.1 Polyroof 185B and Polyroof 185C are supplied in 10 litre steel drums. The catalyst is supplied in 2.5 litre plastic containers, the pigment in 0.5 litre plastic containers and the gritting agent in 1 litre plastic containers indicating weight and product kit size. Each container bears the manufacturer's name and the BBA identification mark incorporating the number of this Certificate.

2.2 Glassfibre reinforcement is supplied in rolls wrapped in heavy duty polyethylene.

2.3 Materials for the systems should be stored in sealed containers in dry conditions, at a temperature between 5°C and 25°C until ready for application. The topcoat and basecoat have a flashpoint of 31°C and are classified as 'flammable' under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP3)*. The topcoat, basecoat and catalyst are classified 'harmful' and 'irritant', the catalyst is also an 'organic peroxide', under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP3)* and carries the appropriate hazard warnings.

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Polyroof 185 and Polyroof 185 Non-Slip Roof Waterproofing Systems.

## Design Considerations

### 3 General

3.1 Polyroof 185 Roof Waterproofing System is satisfactory for use as a waterproofing system on flat, zero fall or pitched roofs with limited access and internal gutters. Polyroof 185 Non-slip is for use on verandas, terraces or walkways on flat roofs.

3.2 Installation must be carried out only by specialist roofing contractors trained and approved by the Certificate holder.

3.3 Limited access roofs are defined for the purpose of this Certificate as those roofs that are subjected only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc. Where traffic in excess of this is envisaged, either Polyroof 185 Non-slip must be used or special precautions such as additional protection to Polyroof 185 must be taken.

3.4 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80. Zero fall roofs are defined for the purpose of this Certificate as those roofs having a finished fall of less than 1:80. Pitched roofs are defined as those having falls in excess of 1:6. When designing flat roofs, 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.

3.5 Polyroof 185 and Polyroof 185 Non-slip should only be applied to plywood substrates that are approved by the Certificate holder and which have a minimum thickness of 18 mm (unsupported) or 12 mm (fully supported). Where written approval is given by the manufacturer other substrates may be permitted, where appropriate, provided they comply with *NHBC Standards*, Chapter 7.

## 4 Practicability of installation

The systems should only be installed by contractors who have been trained and approved by the Certificate holder.

## 5 Weathertightness



5.1 Test data confirm that the systems will adequately resist the passage of moisture to the inside of the building and so meet the requirements of the national Building Regulations:

*England and Wales* — Approved Document C, Requirement C2(b), Section 6

*Scotland* — Mandatory Standard 3.10, clauses 3.10.1 and 3.10.7

*Northern Ireland* — Regulation C4(b).

5.2 The systems are impervious to water when used as described, and will give a weathertight roofing capable of accepting minor structural movements without damage.

## 6 Resistance to wind uplift

The systems, applied in accordance with the manufacturer's literature, have adequate resistance to the effects of wind suction likely to occur in practice providing the plywood substrate is adequately fixed.

## 7 Resistance to foot traffic

7.1 The standard system can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance operations. Reasonable care is required, however, to avoid puncture by sharp objects or concentrated loads.

7.2 The Non-slip system is suitable for use on verandas, terraces or walkways on flat roofs.

## 8 Properties in relation to fire



8.1 A system comprising Polyroof 185 applied to a 19 mm thick chipboard substrate, when tested to BS 476-3 : 1958, was designated EXT.F.AA.

8.2 The designation of other specifications (eg on combustible substrates) should be confirmed by:

*England and Wales* — test or assessment in accordance with Approved Document B, Appendix A, Clause A1

*Scotland* — test to conform with Technical Standard 2.8, clause 2.8.1

*Northern Ireland* — test or assessment by a UKAS accredited laboratory or an independent consultant with appropriate experience.

## 9 Maintenance



The systems should be subjected to regular annual inspections and roof drains kept clear as is good practice with all membrane and liquid-applied roofing systems. In the case of inverted roofs, any vegetation must be removed and displaced gravel redistributed.

## 10 Durability



A GRP laminate constructed in accordance with the installation guide and formed in satisfactory weather conditions can be expected to maintain its integrity and show no measurable loss of physical properties for a period of 30 years. However, the system will have a minimum life expectancy of at least 25 years provided there is no abnormal movement of the roof structure and the roof is subject to the normal regular inspections and maintenance.

# Installation

## 11 General

11.1 Application of Polyroof 185 and Polyroof 185 Non-slip Roof Waterproofing Systems must be carried out only by applicators trained and approved by the Certificate holder, following the installation instructions of the Certificate holder.

11.2 The plywood to which the product is to be applied must be properly prepared in accordance with the Certificate holder's instructions. Adhesion to the substrate will depend on its condition and cleanliness. The substrate should be dry, sound, and free from loose material or contamination (eg moss, algae).

11.3 All points of potential weakness, such as cracks, joints and other defects in the plywood, should be reinforced using an additional 100 mm wide strip of 450 gm<sup>-2</sup> glassfibre reinforcement incorporated into the basecoat whilst wet.

11.4 A non-slip finish for use on verandas and terraces, or walkways on flat roofs, is achieved by the addition of Polygrit to the topcoat.

11.5 Polyroof's preformed glassfibre reinforced trims should be used when roofing details are required, eg upstands.

## 12 Precautions

12.1 Vapours from the individual components of the systems, some of which contain styrene monomer, may cause sensitization and irritation to the respiratory system, eyes and skin. The systems should be used only in areas with sufficient ventilation to prevent the build-up of vapour. Contact with the skin, eyes and clothes must be avoided. The Certificate holder's instructions and the relevant safety regulations for working procedures must be adhered to at all times.

12.2 Individual components must not be allowed to enter the drainage system.

## 13 Procedure

13.1 The systems should not be applied if the air or substrate temperature is outside the range of 5°C to 30°C; in damp or cold conditions which could cause surface condensation; during frost or if there is a risk of rain. The curing time of the resin is dependent upon temperature, but may be modified by adjusting the catalyst content (see Table 1). The amount of catalyst used in the systems must not be less than 2% nor exceed 4%.

Temperature (°C)	Catalyst addition (%)
5-10	4
10-15	3
15-20	2.5-3
20-25	2-2.5
30	2

13.2 The basecoat is prepared on site by mixing Polyroof 185B with the catalyst in the correct proportions immediately prior to application (see Table 1). The thoroughly mixed base coat is applied to the prepared plywood, at a coverage rate of 1.2 litres per m<sup>2</sup> using a synthetic lambswool roller to ensure a uniform coating is obtained, sufficient to fully bond the glass-fibre reinforcement to the substrate.

13.3 The glassfibre reinforcement is embedded into the freshly applied basecoat by rolling until the reinforcement is thoroughly soaked. Further rolling is carried out using a metal paddle roller to consolidate and roll out air bubbles. The reinforcement should have a side overlap of at least 50 mm and a 50 mm overlap onto the preformed trims.

13.4 The topcoat is applied, as soon as it is possible to walk on the basecoat without disturbing the glass strands.

13.5 The topcoat is prepared on site by mixing Polyroof 185C with the catalyst and a colour pigmented paste in the correct proportions immediately prior to application (see Table 1). When thoroughly mixed, the topcoat should be applied at a coverage rate of 0.6 litres per m<sup>2</sup> using a fresh synthetic lambswool roller.

13.6 When the non-slip finish is required, grit is added to the topcoat after the pigment 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.

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

## 14 Repair

14.1 In the event of damage, repair should be carried out in accordance with the Certificate holder's instructions. Repairs are made by cutting out the damaged section and grinding or sanding the surrounding area to a smooth surface extending 100 mm in each direction from the damaged area. The area to be covered should be thoroughly cleaned before application of the system. Application should be restricted to the repair area, with care taken not to overcoat existing areas.

14.2 The non-slip grade, where subject to heavy foot traffic, may lose some of the surface grit. This can be repaired by preparing the damaged area as described in section 14.1. The area to be covered should be thoroughly cleaned before the application of a base resin. The topcoat, including grit, is then applied.

## Technical Investigations

## 15 Tests

Samples of Polyroof 185 and Polyroof 185 Non-slip Roof Waterproofing Systems were prepared by the manufacturer. The results of the BBA's tests, are summarised in Tables 2 and 3.

**Table 2 Physical properties**

Test (units)	Mean result	Method <sup>(1)</sup>
Thickness (mm)	2.15	Dial gauge
Apparent density (kgm <sup>-3</sup> )	1360	ISO 1183
Glass/resin ratio	1:4	BS 2782-10.1002
Barcol hardness	9–18	BS 2782-10.1001
Cross-breaking strength (N mm <sup>-2</sup> ) unaged (test speed 1 mm min <sup>-1</sup> ) UV aged <sup>(2)</sup>	108 107	BS 2782-10.1005
Tensile strength (N mm <sup>-2</sup> ) unaged (test speed 2 mm min <sup>-1</sup> ) heat aged <sup>(3)</sup> UV aged <sup>(4)</sup> water soak <sup>(5)</sup>	72.8 53.5 53.0 59.5	BS 2782-10.1003
Water vapour permeability (gm <sup>-1</sup> day <sup>-1</sup> )	0.83	BS 3177
Water vapour resistance (MNsg <sup>-1</sup> )	247	BS 3177
Dimensional stability (%) longitudinal direction transverse direction	-0.08 -0.88	MOAT 27 : 5.1.6
Resistance to water pressure (6 metre head)	pass	MOAT 27 : 5.1.4
Static indent control water exposure <sup>(5)</sup>	L <sub>4</sub> L <sub>4</sub>	EOTA TR 007
Dynamic indentation control 22°C -10°C UV aged <sup>(2)</sup> 22°C -10°C	I <sub>2</sub> I <sub>2</sub> I <sub>2</sub> I <sub>2</sub>	EOTA TR 006
Fatigue cycling unaged heat aged <sup>(6)</sup>	pass pass	MOAT 27 : 5.1.8
Tensile bond strength (MPa) plywood substrate unaged heat aged <sup>(8)</sup>	0.254 <sup>(7)</sup> 0.202	BS 5241

- (1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the documents.  
(2) UV aged in accordance with EOTA TR010 using moderate climate conditions and five years equivalence of energy.  
(3) Heat aged 100 days at 80°C.  
(4) UV aged 1500 light hours using QUV 313 lamps and a cycle of 4 hours light at 50°C and 4 hours condensation at 50°C.  
(5) Water soak 60 days at 60°C.  
(6) Heat aged 28 days in an oven at 80± 2°C.  
(7) All failures within the plywood.  
(8) Heat aged 56 days in an oven at 80± 2°C.

**Table 3 Tests on Polyroof 185 Non-slip**

Test (units)	Mean result	Method <sup>(1)</sup>
Apparent density (kgm <sup>-3</sup> )	1541	ISO 1183
Barcol hardness	25–35	BS 2782-10.1001
Tensile strength (Nmm <sup>-2</sup> ) unaged UV aged <sup>(2)</sup>	66.3 71.1	BS 2782-3.320E

- (1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the documents.  
(2) UV aged 1000 light hours using QUV 313 lamps and a cycle of 4 hours light at 45°C and 4 hours condensation at 40°C.

## 16 Investigations

16.1 Existing data on the fire performance of the product were examined.

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

16.3 Visits were made to sites to examine the practicability of installation and performance in use.

16.4 User surveys have been carried out to determine the product's performance in use.

## Bibliography

- BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*
- BS 476-3 : 2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*
- BS 2782-3.320A to 320F : 1976 *Methods of testing plastics — Mechanical properties — Tensile strength, elongation and elastic modulus*
- BS 2782-10.1001 : 1977 *Methods of testing plastics — Glass reinforced plastics — Measurement of hardness by means of a Barcol impressor*
- BS 2782-10.1002 : 1977 *Methods of testing plastics — Glass reinforced plastics — Determination of loss on ignition*
- BS 2782-10.1003 : 1977 *Methods of testing plastics — Glass reinforced plastics — Determination of tensile properties*
- BS 2782-10.1005 : 1977 *Methods of testing plastics — Glass reinforced plastics — Determination of flexural properties — Three point method*
- BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*
- BS 5241 : 1975 *Specification for rigid urethane foam when dispensed or sprayed on a construction site*
- ISO 1183 : 1970 *Methods for determining the density and relative density (specific gravity) of plastics excluding cellular plastics*
- MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*
- EOTA Technical Report TR 006 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARVK) — Determination of the resistance to dynamic indentation*
- EOTA Technical Report TR 007 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARVK) — Determination of the resistance to static indentation*
- EOTA Technical Report TR 010 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARVK) — Exposure procedure for artificial weathering*

## 17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

17.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

17.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

17.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.