



## Polyroof Products Ltd

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**Agrément  
Certificate  
No 91/2604**  
Fourth issue\*

Designated by Government  
to issue  
European Technical  
Approvals

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

Système d'étanchéité pour toitures  
Dachabdichtungen

### Product



Typical applications



• THIS CERTIFICATE REPLACES AND EXTENDS CERTIFICATE No 88/2029 AND RELATES TO POLYROOF 185 AND POLYROOF 185 NON-SLIP ROOF WATERPROOFING SYSTEMS, CONSISTING OF A GLASS-FIBRE REINFORCED POLYESTER RESIN, COLD APPLIED ON SITE BY THE HAND LAY-UP PROCESS.

• The systems are for use as a waterproofing system on flat 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.

• The systems must be installed by contractors appointed and trained by Polyroof Products Ltd.

## Regulations

### 1 The Building Regulations 2000 (England and Wales)



The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of roof waterproofing with the Building 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.

Requirement: **B4(2)**

Comment:

External fire spread

Data obtained from tests to BS 476-3 : 1958 indicate that on suitable substrates the use of the systems will enable the roof to be unrestricted under this Requirement. See sections 11.1 and 11.2 of this Certificate.

Requirement: **C4**

Comment:

Resistance to weather and ground moisture

Tests for water resistance indicate that the systems meet this Requirement. See section 8.1 of this Certificate.

Requirement: **Regulation 7**

Comment:

Materials and workmanship.

The systems comprise acceptable materials. See section 14.

## 2 The Building Standards (Scotland) Regulations 1990 (as amended)



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 satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

<p><b>Regulation:</b> 10  <b>Standard:</b> B2.1  <b>Comment:</b></p>	<p>Fitness of materials                  Selection and use of materials and components                  The systems comply with this Standard. See section 14 of this Certificate.</p>
<p><b>Regulation:</b> 12  <b>Standard:</b> D6.7  <b>Comment:</b></p>	<p>Structural fire precautions                  Distance of sides of buildings from boundaries — Roofs and rooflights                  Test data to BS 476-3 : 1958 indicate that on suitable substructures the use of the systems will be unrestricted by the requirements of this Standard. See sections 11.1 and 11.2 of this Certificate.</p>
<p><b>Regulation:</b> 17  <b>Standard:</b> G3.1  <b>Comment:</b></p>	<p>Resistance to moisture                  Resistance to precipitation                  Test data examined for water resistance indicate that use of the systems can enable a roof to satisfy the requirements of this Standard. See section 8.1 of this Certificate.</p>

## 3 The Building Regulations (Northern Ireland) 2000



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 satisfy or contribute to satisfying the various Building Regulations as listed below.

<p><b>Regulation:</b> B2  <b>Comment:</b></p>	<p>Fitness of materials and workmanship                  The systems comprise acceptable materials. See section 14 of this Certificate.</p>
<p><b>Regulation:</b> C4  <b>Comment:</b></p>	<p>Resistance to ground moisture and weather                  Tests for water resistance indicate that the use of the systems can enable a roof to satisfy the requirements of this Regulation. See section 8.1 of this Certificate.</p>
<p><b>Regulation:</b> E5  <b>Comment:</b></p>	<p>External fire spread                  Data obtained from tests to BS 476-3 : 1958 indicate that on suitable substructures the use of the systems will enable a roof to be unrestricted under the requirements of these Regulations. See sections 11.1 and 11.2 of this Certificate.</p>

## 4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See sections: *6 Delivery and site handling (6.1 and 6.3), 12 Maintenance (12.2) and 13 Precautions.*

## Technical Specification

### 5 Description

5.1 Polyroof 185 and Polyroof 185 Non-slip Roof Waterproofing Systems consist of a glass-fibre 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 top coat to provide the non-slip surface.

5.2 The system comprises:

Polyroof 185B — an unsaturated polyester resin for use as Polyroof base coat.

Polyroof 185C — an unsaturated polyester resin for use as Polyroof top coat.

Polymat — a glass-fibre 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.

5.3 Ancillary materials used with the system include:

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

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

<p>hardness (Barcol)</p>	<p>15 to 20                  after                  48 hours</p>
<p>minimum tensile strength (MPa)</p>	<p>50</p>

5.5 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 square metres) for subsequent testing.

## 6 Delivery and site handling

6.1 Polyroof 185B and Polyroof 185C are supplied in 20 litre steel drums, the catalyst in 2.5 litre plastic containers, the pigment in 1.5 and 2.5 litre plastic containers and the gritting agent in sealed plastic containers showing weight and product kit size. Each container bears the manufacturer's name and the BBA identification mark incorporating the number of this Certificate.

6.2 The glass-fibre reinforcement is supplied in rolls wrapped in heavy duty polyethylene.

6.3 Materials for the systems should be stored in sealed containers in dry conditions, in temperatures between 5°C and 25°C until ready for application. The top coat and base coat have a flashpoint of 31°C and are classified 'Flammable' under the Chemicals (Hazard Information and Packaging for Supply) Regulations (CHIP2) 1994. The top coat, base coat and catalyst are classified 'Harmful' and 'Irritant', the catalyst is also an 'Organic Peroxide', under the Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 and carries the appropriate hazard warnings.

## Design Data

### 7 General

7.1 Polyroof 185 Roof Waterproofing System is satisfactory for use on flat or pitched roofs with limited access and internal gutters. Polyroof 185 Non-slip is for use on verandas, terraces or walkways on flat roofs.


7.2 Installation must be carried out only by specialist roofing contractors trained and approved by Polyroof Products Ltd.

7.3 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.

7.4 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 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.

7.5 Polyroof 185 and Polyroof 185 Non-slip should only be applied to plywood substrates of a minimum thickness of 18 mm (unsupported) or 12 mm (fully supported). The bond class should be a minimum of exterior WBP, with the upper laminate of a solid sanded surface with splits not exceeding a width of 0.75 mm. Where written approval is given by the manufacturer other substrates may be permitted, where appropriate, provided they comply with NHBC Standards, Chapter 7.

## 8 Weathertightness

 8.1 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 C4, Section 5.1

### Scotland

Regulation 17, Standard G3.1

### Northern Ireland

Regulation C4.

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

## 9 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.

## 10 Resistance to foot traffic

10.1 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.

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

## 11 Properties in relation to fire

 11.1 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.

11.2 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 Standard D6.7

## Northern Ireland

test or assessment by a UKAS accredited laboratory or an independent consultant with appropriate experience.

## 12 Maintenance

12.1 In the event of damage, repair should be carried out in accordance with the manufacturer's instructions. Repairs should be 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 and care must be taken not to coat existing areas

12.2 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 in the manner described in section 12.1. The area to be covered should be thoroughly cleaned before the application of a base resin. The top coat, including grit, is then applied.

## 13 Precautions

13.1 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 manufacturer's instructions and the relevant safety regulations for working procedures must be adhered to at all times.

13.2 The individual components must not be allowed to enter the drainage system.

## 14 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

## 15 General

15.1 Application of Polyroof 185 and Polyroof 185 Non-slip Roof Waterproofing Systems must be carried out only by applicators trained and approved by Polyroof Products Ltd, following the installation instructions of the marketing company.

15.2 The approved substrate to which the product is to be applied must be properly prepared in accordance with the manufacturer'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, etc).

15.3 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> glass-fibre reinforcement incorporated into the base coat whilst wet.

15.4 A non-slip finish for use on verandas and terraces, or walkways on flat roofs, can be achieved by the addition of Polygrit to the top coat.

15.5 Polyroof's preformed glass-fibre reinforced trims should be used when roofing details are required, eg upstands.

## 16 Procedure

16.1 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%.

Table 1 Catalyst addition

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

16.2 The base coat should be 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 should be applied to the prepared plywood, at a coverage rate of 1.2 litres per m<sup>2</sup> using a synthetic lambswool roller so that a uniform coating is obtained, sufficient to fully bond the glass-fibre reinforcement to the substrate.

16.3 The glass-fibre reinforcement should be embedded into the freshly applied base coat by rolling until the reinforcement is thoroughly soaked. Further rolling should be 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.

16.4 The top coat should be applied as soon as it is possible to walk on the base coat without disturbing the glass strands.

16.5 The top coat should be 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 top coat should be applied at a coverage rate of 0.6 litres per m<sup>2</sup> using a fresh synthetic lambswool roller.

16.6 When the non-slip finish is required, it is added to the top coat after the pigment paste has been mixed in thoroughly. The grit should be added at a rate of 120 g per litre of top coat (a weight ratio of 1:10) and stirred in well before the catalyst is added. The top coat including grit should be constantly mixed during application to ensure that the grit is evenly dispersed throughout.

16.7 The top coat should be 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 top coat before the top layer of resin is cured.

## Technical Investigations

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

### 17 Tests

Samples of the systems were prepared by the manufacturer. The results for the tests, which show typical results for the materials, are summarised in Tables 2 to 4.

Table 2 Physical properties

Test (units)	Method <sup>(1)</sup>	Mean result
Thickness (mm)	Dial gauge	2.15
Apparent density (kgm <sup>-3</sup> )	ISO 1183	1360
Glass/resin ratio	BS 2782-10 : 1002	1:4
Barcol hardness	BS 2782-10 : 1001	9–18
Cross-breaking strength (Nmm <sup>-2</sup> )	BS 2782-10 : 1005	
unaged	(test speed 1 mm min <sup>-1</sup> )	108
UV aged <sup>(2)</sup>		107
Tensile strength (Nmm <sup>-2</sup> )	BS 2782-10 : 1003	
unaged	(test speed 2 mm min <sup>-1</sup> )	72.8
heat aged <sup>(3)</sup>		53.5
UV aged <sup>(4)</sup>		53.0
water soak <sup>(5)</sup>		59.5
Water vapour permeability (gm <sup>-1</sup> day <sup>-1</sup> )	BS 3177	0.83
Water vapour resistance (MNs <sup>g</sup> <sup>-1</sup> )	BS 3177	247
Dimensional stability (%)	MOAT 27 : 5.1.6	
longitudinal direction		-0.08
transverse direction		-0.88

(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.

Table 3 Service performance

Test (units)	Method <sup>(1)</sup>	Mean result
Resistance to water pressure (6 metre head)	MOAT 27 : 5.1.4	pass
Static indent control	EOTA TR 007	L <sub>4</sub>
water exposure <sup>(2)</sup>		L <sub>4</sub>
Dynamic indentation control	EOTA TR 006	
22°C		L <sub>2</sub>
-10°C		L <sub>2</sub>
UV aged <sup>(3)</sup>		
22°C		L <sub>2</sub>
-10°C		L <sub>2</sub>
Fatigue cycling unaged	MOAT 27 : 5.1.8	pass
heat aged <sup>(4)</sup>		pass
Tensile bond strength (MPa) plywood substrate	BS 5241	
unaged		0.254 <sup>(5)</sup>
heat aged <sup>(6)</sup>		0.202

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the documents.

(2) One surface exposed to water at 60°C for 60 days.

(3) UV aged in accordance with EOTA TR 010 using moderate climate conditions and five years equivalence of energy.

(4) Heat aged 28 days in an oven at 80± 2°C.

(5) All failures within the plywood.

(6) Heat aged 56 days in an oven at 80± 2°C.

Table 4 Tests on Polyroof 185 Non-slip

Test (units)	Method <sup>(1)</sup>	Mean result
Apparent density (kgm <sup>-3</sup> )	ISO 1183	1541
Barcol hardness	BS 2782-10 : 1001	25–35
Tensile strength (Nmm <sup>-2</sup> )	BS 2782-3 : 320E	
unaged		66.3
UV aged <sup>(2)</sup>		71.1

(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.

### 18 Other investigations

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

18.2 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.

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

18.4 User surveys have been carried out to determine the systems' performance in use.

## Bibliography

BS 476 *Fire tests on building materials and structures*  
BS 476-3 : 1958 *External fire exposure roof test*  
BS 1088 and 4079 : 1966(1988) *Specifications for plywood for marine craft*  
BS 2782 *Methods of testing plastics*  
BS 2782-3 *Mechanical properties*  
BS 2782-3 : Methods 320A to 320F : 1976(1996) *Tensile strength, elongation and elastic modulus*  
BS 2782-10 *Glass reinforced plastics*  
BS 2782-10 : Method 1001 : 1977(1989) *Measurement of hardness by means of a Barcol impressor*  
BS 2782-10 : Method 1002 : 1977(1989) *Determination of loss on ignition*  
BS 2782-10 : Method 1003 : 1977(1996) *Determination of tensile properties*  
BS 2782-10 : Method 1005 : 1977(1996) *Determination of flexural properties. Three point method*  
BS 3177 : 1959(1995) *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

BS 5241 : 1975 *Rigid polyurethane (PUR) and polyisocyanurate (PIR) foam when dispensed or sprayed on a construction*

ISO 1183 : 1970 *Method 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 (LARWK) — Determination of the resistance to dynamic indentation*

EOTA Technical Report TR 007 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARWK) — Determination of the resistance to static indentation*

EOTA Technical Report TR 010 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARWK) — Exposure procedure for artificial weathering*

## Conditions of Certification

### 19 Conditions

19.1 This Certificate:

- (a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;
- (b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;
- (c) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (d) is copyright of the BBA.

19.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

19.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) thereof:

- (a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked by the BBA or its agents; and

(c) are reviewed by the BBA as and when it considers appropriate.

19.4 In granting this Certificate, the BBA makes no representation as to:

- (a) the presence or absence of any patent or similar rights subsisting in the product or any other product;
- (b) the right of the Certificate holder to market, supply, install or maintain the product; and
- (c) the nature of individual installations of the product, including methods and workmanship.

19.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do 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 or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future 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 installation and use of this product.



In the opinion of the British Board of Agrément, Polyroof 185 and Polyroof 185 Non-slip Roof Waterproofing Systems are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 91/2604 is accordingly awarded to Polyroof Products Ltd.

On behalf of the British Board of Agrément

Date of Fourth issue: 24th October 2001

A handwritten signature in black ink, appearing to read 'P. C. Hewitt', is written over a light grey background.

Chief Executive

*\*Original Certificate issued 19th March 1991. This revised version includes increased durability statement, revised Building Regulations and additional test results.*

