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Agrément Certificate  
**10/4729**  
Product Sheet 1

### POLYGLASS ROOF WATERPROOFING MEMBRANES

### POLYSHIELD ROOF WATERPROOFING MEMBRANES

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Polyshield Roof Waterproofing Membranes, for use in fully or partially bonded waterproofing systems on flat or pitched roofs with limited access and as a single-layer waterproofing in loose-laid and ballasted systems 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 membranes resist the passage of moisture to the interior of the building (see section 5).

**Properties in relation to fire** — in the opinion of the BBA, the systems, when used in a suitable specification, will enable a roof to be unrestricted under Building Regulations (see section 6).

**Resistance to wind up lift** — when correctly specified, the systems resist the effect of any wind suction likely to occur in practice (see section 7).

**Resistance to foot traffic** — the systems will accept the limited foot traffic and loads associated with the installation and maintenance of the systems without damage (see section 8).

**Durability** — under normal service conditions the systems will provide a durable waterproof covering with a service life in excess of 20 years (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the products described herein. These products 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

Date of First issue: 18 February 2010

*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, Polyshield Roof Waterproofing Membranes, 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 : 1958 indicates that on suitable substructures the use of the membranes will be unrestricted under this Requirement. See sections 6.1 to 6.4 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		Tests for water resistance on the membranes, including joints, indicate that the membranes meet this Requirement. See section 5.1 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The membranes are acceptable. See section 10.1 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 membranes can contribute to a construction meeting this Regulation. See sections 9, 10.1 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 : 1958 indicate that on suitable substructures the use of the membranes will be unrestricted by the requirements, under clause 2.8.1 <sup>(1)(2)</sup> of this Standard. See sections 6.1, 6.2 and 6.4 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Tests for water resistance on the membranes, indicate that the membranes can 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.
Regulation:	12	Building standards – conversions
Comment:		All comments given for the membranes under Regulation 9 also apply to this Regulation, with reference to clause 0.12 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (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 membranes are acceptable. See section 10.1 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The membranes are acceptable. See section 9 of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		Tests for water resistance on the membranes, including joints indicate that the membranes meet this requirement. See section 5.1 of this Certificate.
Regulation:	E5(b)	External fire spread
Comment:		Test data to BS 476-3 : 1958 indicates that on suitable substructures the use of the membranes will be unrestricted under the requirements of this Regulation. See sections 6.1 to 6.4 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: 1 *Description* (1.2) and 2 *Delivery and site handling* (2.3).

# Non-regulatory Information

## NHBC Standards 2008

NHBC accepts the use of Polyshield Roof Waterproofing Membranes, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs and balconies*.

## General

The products are marketed in the United Kingdom by Polyglass Great Britain Ltd, Unit 1, Electrium Point, Ashmore Lake Way, Willenhall, West Midlands WV12 4HD. Tel: 01902 637422, Fax: 01902 637459, e-mail: info@polyglass-gb.com, website: www.polyglass.com.

## Technical Specification

### 1 Description

1.1 Polyshield Roof Waterproofing Membranes are torch-applied, polyester-reinforced, atactic polypropylene, modified-bitumen roof waterproofing membranes, with a powdered talc or mineral finished upper face and a thermofusible thermoplastic film on the lower surface.

1.2 The talc or mineral finished membranes are manufactured to the nominal characteristics given in Table 1. The mineral finish colours are; slate grey, white, green, red and other colours on request.

Table 1 Nominal characteristics

Characteristics (units)	Talc	Mineral
Thickness (mm)	4.0	5.0
Width (m)	1.0	1.0
Length (m)	8.0	8.0
Mass per unit area (kg·m <sup>-2</sup> )	4.2	5.2
Maximum tensile strength (N per 50 mm)	900 <sup>(1)</sup> , 750 <sup>(2)</sup>	900 <sup>(1)</sup> , 750 <sup>(2)</sup>
Elongation at break (%)	45 <sup>(1)</sup> , 50 <sup>(2)</sup>	45 <sup>(1)</sup> , 50 <sup>(2)</sup>
Nail tear	200 <sup>(1)</sup> , 200 <sup>(2)</sup>	200 <sup>(1)</sup> , 200 <sup>(2)</sup>
Water vapour resistance factor (μ)	20000	20000

(1) Longitudinal direction.

(2) Transverse direction.

1.3 Polyprimer is a primer for use with Polyshield consisting of a solution of bitumen in a mixture of aliphatic and chlorinated hydrocarbons.

1.4 Other ancillary items for use with the membranes include the following materials:

- Polyver ALU — a solar protective paint manufactured from aluminium metallic pigment, oxidised bitumen and solvents
- Polyver ACRIL — a water-based acrylic emulsion solar protective paint.

1.5 Quality control checks are carried out on raw materials, coating mass and final product. Checks on the final product include:

- tensile properties
- heat resistance
- nail tear
- low temperature flexibility
- dimensional stability
- adhesion of granules.

### 2 Delivery and site handling

2.1 The membranes are delivered to site in rolls sealed with tape on pallets and shrink-wrapped in polyethylene. The tape bears product name, manufacturer's name, size and batch number with appropriate CE Marking.

2.2 Rolls must be stored upright and positioned in a clean and dry level area.

2.3 Polyprimer is classified under *The Chemicals (Hazard Information and Packaging Supply) Regulations 2009* (CHIP4), has a flashpoint of <21°C and is classified as 'highly flammable'. The product bears the appropriate hazard warnings.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Polyshield Roof Waterproofing Membranes.

## Design Considerations

### 3 General

3.1 Polyshield Roof Waterproofing Membranes are satisfactory for use as partially or fully bonded waterproofing on flat and pitched roofs with limited access, as part of a built-up specification and where necessary in conjunction with appropriate felts to BS 8747 : 2007.

3.2 The talc finished membrane is also suitable for use as a loose-laid single waterproof covering, ballasted with aggregate on flat roofs with limited access or under heavy protection, such as concrete slabs, on flat roofs with regular pedestrian traffic.

3.3 The mineral finished membrane is suitable for use where appropriate as an exposed cap sheet or in detail work.

3.4 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 for the purpose of this Certificate as those having a fall in excess of 1:6.

3.5 Limited access roofs are defined for the purpose of this Certificate as those roofs subjected only to pedestrian traffic for maintenance of the roof waterproofing and cleaning of gutters, etc. Where traffic in excess of this is envisaged, special precautions such as additional protection to the membrane must be taken.

3.6 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.

3.7 Decks to which the products are to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and, where appropriate *NHBC Standards 2008*, Chapter 7.1.

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

- as described in the relevant Clauses of BS 8217 : 2005, or
- the subject of a current BBA Certificate and be used in accordance with, and with the limitations of that Certificate.

## 4 Practicability of installation

The products are designed to be installed by a competent roofing contractor, experienced with this type of product.

## 5 Weathertightness



5.1 Results of test data confirm that the membranes, including joints, when completely sealed and consolidated 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 membranes are impervious to water and when used as described will give a weathertight roof waterproofing capable of accepting minor structural movement without damage (see section 14 Table for *Physical properties* — general).

## 6 Properties in relation to fire



6.1 When tested in accordance with BS 476-3 : 1958, a product comprising 19 mm thick plywood deck, one layer BS 747 : 1977 type 3B felt, 50 mm of glass tissue-backed polyurethane insulation board, one layer of 3 mm thick Polybond polyester-reinforced bitumen membrane, fully bonded and one layer of torch-applied Polyshield mineral finished cap sheet achieved an EXT.F.AA rating.

6.2 The Polyshield talc finished membrane, when used in a loose-laid application ballasted by a minimum surface finish of 50 mm aggregate shall be deemed to satisfy BS 476-3 : 1958 designation EXT.F.AA.



6.3 When used on flat roofs with the surface finishes (listed below) defined in part iii of Table 5 of Appendix A of Approved Document B of the Building Regulations, England and Wales, or Technical Booklet E, Table 4.6 of Part IV of the Building Regulations, Northern Ireland the roof is deemed to be of designation AA.

### Surface finishes

- bitumen-bedded stone chipping covering the whole surface to a depth of not less than 12.5 mm
- bitumen-bedded tiles of a non-combustible material
- sand cement screed, or
- macadam.



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

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

**Scotland** — tests conform to Mandatory Standard 2.8, clause 2.8.1

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

## 7 Resistance to wind uplift

7.1 Results of test data confirm that the adhesion of the bonded systems to decking, or bituminous felt, is sufficient to resist the effects of wind suction, elevated temperature and thermal shock conditions likely to occur in practice.

7.2 The precise ballast requirement should be calculated in accordance with the relevant parts of BS 6399-2 : 1997, but should not be below a minimum thickness of 50 mm. The use of concrete slabs on suitable protective supports should be considered in areas of high design wind loads.

## 8 Resistance to foot traffic

The membranes can accept, without damage the limited foot traffic and light concentrated loads associated with installation and maintenance operations. Where traffic in excess of this is envisaged, additional protection to the membrane in accordance with the Certificate holder's instructions must be provided. Reasonable care is required, however, to avoid puncture by sharp objects or concentrated loads.

## 9 Maintenance



The installed membranes should be subjected to regular annual inspections and roof drains kept clear as is good practice with all roofing membranes.

## 10 Durability



10.1 Accelerated weathering tests confirm that satisfactory retention of physical properties is achieved. All available evidence indicates that the membranes should have a service life in excess of 20 years.

10.2 With the mineral finished membrane, it is possible that some localised loss of mineral surfacing may occur after some years in areas where complex detailing of the roof design is incorporated.

# Installation

## 11 General

11.1 Installation of Polyshield Roof Waterproofing membranes must be in accordance with the Certificate holder's instructions, the relevant Clauses of BS 8000-4 : 1989 and BS 8217 : 2005.

11.2 Substrates to which the roof waterproofing membranes are applied must be firm, dry and clean, and free from sharp projections such as nail heads, concrete nibs.

11.3 The membranes should not be laid in rain, snow or heavy fog, nor if the temperature falls below 5°C, unless precautions against condensation can be taken.

11.4 If the roof is likely to be subject to uncontrolled pedestrian access, the substructure must meet the requirements of BS 8217 : 2005, and to prevent damage to the roof covering one of the appropriate surface finishes referred to in Clauses 8.19 and 9.2 of the Code must be used.

11.5 At falls in excess of 1:11, the nominal provision for mechanical fixings as required by BS 8217 : 2005 should be observed.

11.6 On completion of the roof, the talc finished membrane, when used as a top layer, may have a surface finish applied in accordance with BS 8217 : 2005, Clauses 8.19 and 9.2. Surface finishes in the Code of Practice include:

- stone aggregate in dressing compound
- precast concrete paving slabs
- proprietary tiles on bonding compound.

11.7 When using the mineral surface finished membrane, further surface protection is not required when it is used on roofs with limited access.

11.8 When used for remedial work, existing waterproofing layers must be made sound and existing surface finishes (eg surface dressing) must be removed and then primed.

11.9 Concrete substrates where partial or full applications are to be made should be primed with Polyprimer at an application rate between 150 g·m<sup>-2</sup> and 400 g·m<sup>-2</sup> depending upon the porosity of the concrete.

11.10 Where additional protection against wind uplift is not required, the surface of the membranes can be finished with a solar protective coating. Such paints should be the subject of regular inspection to ensure their effectiveness.

## 12 Procedure

### Fully bonded applications

12.1 Bonding is achieved by melting the lower surface by torching and pressing the membrane down. Care must be taken not to overheat the coating.

12.2 Side laps should be a minimum of 100 mm and end laps should be a minimum of 150 mm. Where used partially bonded, the membrane must be fully bonded to the substrate at least one metre immediately before and after the end lap. A bead of molten material must extrude from all laps to indicate a satisfactory seal and which should be levelled out using a heated, rounded tip trowel.

### Partially bonded applications

12.3 A layer of type 3G felt to BS 8747 : 2007 should be loose-laid edge to edge over the substrate.

12.4 The membrane is then fully torch welded onto the perforated layer ensuring that the bitumen seeps regularly into the perforations.

## Loose-laid applications

12.5 Side laps should be a minimum of 100 mm and end laps should be a minimum of 150 mm. The laps should be welded by torching the lower surface and pressing the membrane down.

12.6 With loose-laid systems the membranes should be ballasted to combat the effects of wind uplift. This can be achieved by:

- 0.2 mm thick polythene protective sheet by at least 50 mm of well-rounded gravel (gravel size 15/30 mm)
- 0.2 mm thick polyethylene or a non-woven (polyester) sheet (minimum mass 300 g·m<sup>-2</sup>) covered by a 20 mm thick layer of sand, overlaid with a layer of concrete paving slabs<sup>(1)</sup>.

(1) If paving on plastic pads the sand is not required.

## 13 Repair

In the event of damage, the membranes can be effectively repaired after cleaning, with the membranes torch welded to the damaged area.

# Technical Investigations

## 14 Tests

14.1 Technical data from tests carried out by ITC leading to the issue of Italian Agrément Certificate 552/00 were evaluated in the context of UK roofing practice and building regulations. The results are summarised in Tables 2 to 4.

*Table 2 Physical properties of the coating mass*

Tests (units)	Mean results	Methods <sup>(1)</sup>
Softening point (ring and ball) (°C)	152.5	MOAT 30 : 6G
Cold temperature flexibility (°C)		MOAT 30 : 6D
unaged	-30	
heat aged 180 days at 70°C	-5	
Fines content (%)	12.6	MOAT 30 : 6F
Penetration (dmm)		DIN : 52010
at 25°C	34	
at 60°C	125	

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

*Table 3 Physical properties — directional*

Tests (units)	Mean results		Methods <sup>(1)</sup>
	Longitudinal	Transverse	
Tensile strength (N per 50 mm)			MOAT 30 : 6C
talc	777	638	
mineral	746	627	
Elongation at break (%)			MOAT 30 : 6C
talc	43	48	
mineral	40	43	
Tear strength (N)			MOAT 27 : 5.4.1
talc	204	237	
mineral	225	294	
Dimensional stability (%)			UNI 8202-17
talc	-0.08	-0.05	
mineral	-0.15	-0.09	

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

Table 4 Physical properties — general

Tests (units)	Mean results	Methods <sup>(1)</sup>
6 m head of water	pass	MOAT 27 : 5.1.4
Low temperature flexibility (°C)		MOAT 30 : 6D
control	-25	
heat aged 180 days at 70°C	-5	
water soak for 7 days at 23°C	-15	
Heat resistance (°C)		MOAT 30 : 6E
control	150	
heat aged 180 days at 70°C	120	
Static indentation	L <sub>4</sub>	MOAT 27 : 5.1.9
concrete	L <sub>3</sub>	
EPS		
Dynamic indentation		UNI 8202-12a
perlite	PD <sub>4</sub>	
EPS	PD <sub>4</sub>	
Unrolling at low temperature	pass	MOAT 27 : 5.4.3
Loss of mineral surface (%)	14.8	MOAT 30 : 6
Air leakage at joints		MOAT 27 : 5.2.1
control	pass	
heat aged 28 days at 80°C	pass	
water soak 7 days at 23°	pass	

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

14.2 Other tests carried out by ITC are as follows:

- thickness
- width
- mass per unit area
- mass per unit area of reinforcement
- tensile strength and elongation of reinforcement
- peel from substrate
- joint tensile strength — control, heat aged and water soak
- joint peel strength — control, heat aged and water soak
- low temperature flexibility after 2000 hours UV ageing (Xenotest).

14.3 Test data to MOAT 27 : 1983 from previous ITC Agrément Certificates for the membranes were used for the following properties:

- slip resistance
- fatigue cycling
- resistance to wind uplift
- thermal shock.

## 15 Investigations

15.1 Data from the original Certificate (93/2874) were re-examined as part of the assessment for this Certificate.

15.2 A factory visit was carried out to examine the manufacturing practice and quality control procedures employed in the manufacture of the membranes.

15.3 An examination was made of reports of fire tests carried out to BS 476-3 : 1958.

15.4 An examination of data from the Initial Type Testing for CE Marking to EN 13707 : 2004 was made.

## Bibliography

BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*

BS 747 : 1977 *Specification for roofing felts*

BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

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 8747 : 2007 *Reinforced bitumen membranes (RBMs) for roofing — Guide to selection and specification*

DIN 52010 : 1983 *Testing of bitumen — Determination of needle penetration*

EN 13707 : 2004 *Flexible sheets for waterproofing — Reinforced bitumen sheets for roof waterproofing — Definitions and characteristics*

MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*

MOAT No 30 : 1984 *Special Directives for the Assessment of Reinforced Waterproof Coatings in Atactic Polypropylene (APP) Polymer Bitumen*

UNI 8202-12a : 1988 *Building work. Waterproof sheets. Determination of dynamic punching resistance*

UNI 8202-17 : 1988 *Building work. Waterproof sheets. Determination of dimension stability to heat*

## 16 Conditions

16.1 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.

16.2 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.

16.3 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.

16.4 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.

16.5 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.