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### Agrément Certificate

22/6057

Product Sheet 1 Issue 2

## TREMCO CPG UK LIQUID-APPLIED ROOF WATERPROOFING SYSTEM

### ALPHAGUARD PUMA LIQUID-APPLIED ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the AlphaGuard PUMA Liquid-Applied Roof Waterproofing System, for use as an elastomeric roof waterproofing membrane on new and existing flat roofs with limited access, including those with protected zero falls, and pitched roofs including green roof and roof garden specifications.

(1) Hereinafter referred to as 'Certificate'.

#### The assessment includes

##### Product factors:

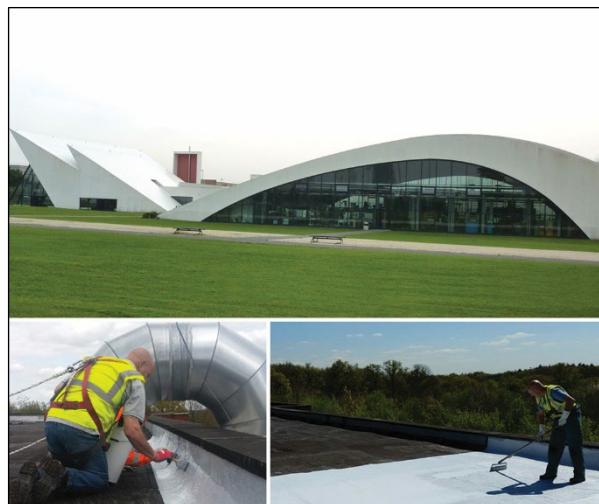
- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

##### Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

##### Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



#### KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 3 October 2024

Originally certified on 5 May 2022

Hardy Giesler  
Chief Executive Officer

*This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.*

*The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).*

*Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*

*The Certificate should be read in full as it may be misleading to read clauses in isolation.*

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

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## SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

### Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that the AlphaGuard PUMA Liquid-Applied Roof Waterproofing System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations:



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

<b>Requirement:</b>	<b>B4(1)</b>	<b>External fire spread</b>
<b>Comment:</b>		The system is restricted by this Requirement in some circumstances. See section 2 of this Certificate.
<b>Requirement:</b>	<b>B4(2)</b>	<b>External fire spread</b>
<b>Comment:</b>		On a suitable substructure, the system may contribute to satisfying this Requirement. See section 2 of this Certificate.
<b>Requirement:</b>	<b>C2(b)</b>	<b>Resistance to moisture</b>
<b>Comment:</b>		The system will enable a roof to satisfy this Requirement. See section 3 of this Certificate.
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship</b>
<b>Comment:</b>		The system is acceptable. See sections 8 and 9 of this Certificate.



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

<b>Regulation:</b>	<b>8(1)(2)</b>	<b>Fitness and durability of materials and workmanship</b>
<b>Comment:</b>		The system is acceptable. See sections 8 and 9 of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards – construction</b>
<b>Standard:</b>	<b>2.8</b>	<b>Spread from neighbouring buildings</b>
<b>Comment:</b>		When applied to a suitable substructure, the system contributes to satisfying this Standard, with reference to clause 2.8.1 <sup>(1)(2)</sup> . See section 2 of this Certificate.
<b>Standard:</b>	<b>3.10</b>	<b>Precipitation</b>
<b>Comment:</b>		The system will enable a roof to satisfy this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.7 <sup>(1)(2)</sup> . See section 3 of this Certificate.
<b>Standard:</b>	<b>7.1(a)</b>	<b>Statement of sustainability</b>
<b>Comment:</b>		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting at least a bronze level of sustainability as defined in this Standard.
<b>Regulation:</b>	<b>12</b>	<b>Building standards – conversion</b>
<b>Comment:</b>		All comments given for the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <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) 2012 (as amended)

<b>Regulation:</b>	<b>23(1)(a)(i)(ii)</b>	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>	<b>(iii)(iv)b(i)</b>	The system is acceptable. See sections 8 and 9 of this Certificate.
<b>Regulation:</b>	<b>28(b)</b>	<b>Resistance to moisture and weather</b>
<b>Comment:</b>		The system will enable a roof to satisfy this Regulation. See section 3 of this Certificate.
<b>Regulation:</b>	<b>36(b)</b>	<b>External fire spread</b>
<b>Comment:</b>		On a suitable substructure, the system may enable a roof to satisfy this Regulation. See section 2 of this Certificate.

### Additional Information

#### NHBC Standards 2024

In the opinion of the BBA, the AlphaGuard PUMA Liquid-Applied Roof Waterproofing System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs, terraces and balconies*.

In addition, in the opinion of the BBA, the system, when installed and used in accordance with this Certificate can satisfy or contribute to satisfying the relevant requirements in relation to NHBC Standard for *Conversions and Renovations*, taking account of other relevant guidance within the chapter and the suitability of the substrate to receive the system.

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

### Fulfilment of Requirements

The BBA has judged the AlphaGuard PUMA Liquid-Applied Roof Waterproofing System to be satisfactory for use as described in this Certificate. The system has been assessed for use on new and existing flat roofs with limited access, including those with protected zero falls, and pitched roofs including green roof and roof garden specifications.

### ASSESSMENT

#### Product description and intended use

The Certificate holder provided the following description for the system under assessment. The AlphaGuard PUMA Liquid-Applied Roof Waterproofing System consists of:

- AlphaGuard PUMA (WP) — a two-component, flexible polyurethane modified methacrylate resin-based roof waterproofing membrane
- AlphaGuard PUMA (TC) — a two-component, flexible, UV resistant methyl methacrylate resin-based coloured topcoat for use over AlphaGuard PUMA (WP)
- AlphaGuard PUMA Concrete Primer — a two-component, low viscosity methyl methacrylate-based primer for use on concrete substrates
- AlphaGuard PUMA Thix — a two-component, high-viscosity flexible polyurethane modified methacrylate resin-based roof waterproofing membrane, for detailing applications
- AlphaGuard PUMA Catalyst — a 50% dibenzoyl peroxide catalyst powder for use with AlphaGuard PUMA (WP), AlphaGuard PUMA (TC), AlphaGuard PUMA Concrete Primer and AlphaGuard PUMA Thix.

## Ancillary Items

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

- AlphaGuard PUMA Reinforcement Fabric — a non-woven polyester fabric with a nominal weight per unit area of 165 g·m<sup>-2</sup> for use as an embedded reinforcement in AlphaGuard PUMA (WP)
- 0.3 – 0.8 mm diameter quartz sand.

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

- specialist primers
- AlphaGuard PUMA Accelerator — for use at temperatures below 0°C
- AlphaGuard PUMA Cleaner — for cleaning tools
- concrete repair products
- low modulus silicone for use with the above termination detail
- PU adhesive
- GRP trims
- GRP termination bars
- refurbishment outlets and overflows
- PIR and mineral wool insulation
- rooflights
- outlet leaf guards
- secondary cover flashing.

## Applications

The system is intended for use on new and existing roofs with limited access in:

- inverted roof specifications in flat, zero fall and pitched roof specifications
- protected roofs in flat, zero fall and pitched specifications, ie covered by paving or other suitable protection
- green roofs and roof gardens in flat, zero fall and pitched roof specifications
- exposed roof in flat and pitched roof specifications.

The system is suitable for use on the following substrates:

- concrete
- reinforced bituminous membranes
- steel.

## Definitions for products and applications inspected

The following terms are defined for the purpose of this Certificate as:

- limited access roof — a roof subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc
- zero fall roof — a roof having a finished fall which can vary between 0 and 1:80<sup>(1)</sup>
- flat roof — a roof having a minimum finished fall of 1:80<sup>(1)</sup>
- pitched roof — a roof having a fall in excess of 1:6
- roof garden (intensive) — a roof with a substantial layer of growing medium with planting that can include shrubs and trees generally accessible to pedestrians
- green roof (extensive) — a roof with a shallow layer of growing medium planted with low-maintenance plants such as mosses, sedums, grasses and some wild flower species
- invasive plant species — vegetation species having vigorous and/or invasive root systems likely to cause damage to components of the inverted roof insulation system and roof waterproofing.

(1) *NHBC Standards 2024* require a minimum fall of 1:60 for green roofs and roof gardens.

## Product assessment – key factors

The system was assessed for the following key factors, and the outcome of the assessment is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

### 1 Mechanical resistance and stability

Not applicable.

### 2 Safety in case of fire

Data were assessed for the following characteristics.

#### 2.1 External fire spread

2.1.1 When tested to CEN/TS 1187 : 2012 Test 4 and classified to BS EN 13501-5 : 2016, the construction given in Table 1 of this Certificate achieved B<sub>ROOF</sub>(t4) for slopes below 10°.

*Table 1 External fire spread*

System tested	System <sup>(1)</sup>
Substrate	12 mm 1800 kg·m <sup>-3</sup> fibre cement board <sup>(2)</sup>
Primer	AlphaGuard PUMA Concrete Primer
Quartz sand	0.3 – 0.8 mm diameter quartz sand broadcasted at 300 g·m <sup>-2</sup>
Layer 1	AlphaGuard PUMA (WP) <sup>(3)</sup>
Reinforcement	AlphaGuard PUMA Reinforcement Fabric <sup>(3)</sup>
Layer 2	AlphaGuard PUMA (WP) <sup>(3)</sup>
Topcoat	0.3 mm AlphaGuard PUMA (TC)

(1) Fire Test Report 18859D and Fire Classification Report 18859F, conducted by Warringtontonfiregent, available from the Certificate holder on request.

(2) These items are outside the scope of this Certificate.

(3) A total 2 mm thickness for layers 1 and 2 combined with the reinforcement.

2.1.2 On the basis of data assessed, the construction listed in Table 1 will be unrestricted by the documents supporting the national Building Regulations with respect to proximity to a relevant boundary.

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

- when protected by an inorganic covering (eg gravel or paving slabs) listed in the Annex of Commission Decision 2000/553/EC
- a roof garden covered with a drainage layer of gravel 100 mm thick and a soil layer 300 mm thick
- irrigated roof gardens and green roofs.

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

2.1.5 If allowed to dry, plants used in a roof garden may allow flame spread across the roof. This must be taken into consideration when selecting suitable plants for the roof. Appropriate planting irrigation and/or protection must be applied to ensure the overall fire-rating of the roof is not compromised. Further guidance is available in the Department for Communities and Local Government publication *Fire Performance of Green Roof and Walls*.

#### 2.2 Reaction to fire

2.2.1 The Certificate holder has not declared a reaction to fire classification to EN 13501-1 : 2018 for the system.

2.2.2 The system will be restricted in use under the documents supporting the national Building Regulations in some cases.

2.2.3 In England, the system, when used in pitches greater than 70°, excluding upstands, must not be used less than 1 m from a relevant boundary, or on residential buildings more than 11 m in height or on other buildings more than 18 m in height. Restrictions apply on assembly and recreation buildings. These constructions must also be included in calculations of unprotected area.

2.2.4 In Wales, the system, when used in pitches greater than 70°, excluding upstands, must not be used less than 1 m from a relevant boundary, or on other buildings more than 18 m in height. Restrictions apply on assembly and recreation buildings. These constructions must also be included in calculations of unprotected area.

2.2.5 In Northern Ireland, the system, when used in pitches greater than 70°, excluding upstands, does not achieve the minimum Class E reaction to fire classification to BS EN 13501-1 : 2018, and designers must seek guidance on the proposed use of the system from the relevant Building Control Body.

2.2.6 In Scotland, the system may be used without restriction in terms of height and proximity to a relevant boundary. However, restrictions on the overall construction may apply, depending on the reaction to fire classification achieved by the complete system, which must be established on a case-by-case basis.

### 3 Hygiene, health and the environment

Data were assessed for the following characteristics.

#### 3.1 Weathertightness

3.1.1 Results of weathertightness tests are given in Table 2.

<i>Table 2 Weathertightness</i>			
System assessed	Assessment method	Requirement	Result
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric	Watertightness to EOTA TR-003 : 2004	No leakage	Pass
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric	Resistance to delamination to EOTA TR-004 : 2004	≥ 50 kPa	
- on steel			Pass
- on bitumen			Pass
- on unprimed concrete			Pass
- on concrete primed with AlphaGuard PUMA Concrete Primer			Pass
- on steel at 40°C			Pass
- on bitumen at 40°C			Pass
- on unprimed concrete at 40°C			Pass
- on concrete primed with AlphaGuard PUMA Concrete Primer at 40°C			Pass
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric	Water vapour diffusion equivalent air layer thickness ( $s_d$ ) to DIN ISO 12572 : 2001 (23°C / 85% RH)	Value achieved	11.6 m

3.1.2 On the basis of data assessed, the system will adequately resist the passage of moisture to the interior of a building and so satisfy the requirements of the national Building Regulations.

3.1.3 The adhesion of the system is sufficient to resist the effects of wind suction, elevated temperature and thermal shock conditions likely to occur in practice and remain weathertight.

3.1.4 The resistance to wind uplift for warm roofs will be dependent on the cohesive strength of the insulation and the method by which it is secured to the roof deck. This must be taken into account when selecting a suitable insulation material.

#### 3.2 Resistance to mechanical damage

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

**Table 3 Resistance to mechanical damage**

System assessed	Assessment method	Requirement	Result
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric	Static indentation to EOTA TR-007 : 2004	Value achieved	
- on insulation	Tested at 23°C		L <sub>4</sub>
- on steel	Tested at 23°C		L <sub>4</sub>
- on steel at 40°C	Tested at 90°C		L <sub>4</sub>
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric	Dynamic indentation to EOTA TR-006 : 2004	Value achieved	
- on insulation	Tested at 23°C		I <sub>4</sub>
- on steel	Tested at 23°C		I <sub>4</sub>
- on concrete	Tested at -30°C		I <sub>4</sub>
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric	Tensile strength to DIN ISO 527-1 : 1996	Value achieved	10.72 MPa
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric	Elongation at break to DIN ISO 527-1 : 1996	Value achieved	83%
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric	Resistance to fatigue movement to EOTA TR-008 : 2004	Watertight and less than 75 mm delamination from the substrate	Pass
- on concrete without primer	1000 cycles and tested at -10°C		Pass
- on concrete with AlphaGuard PUMA Concrete Primer			

3.2.2 On the basis of data assessed, the system can accept, without damage, the limited foot traffic and light concentrated loads associated with installation, maintenance and pedestrian traffic on defined walkways and the effects of minor structural movement while remaining weathertight.

3.2.3 Where traffic in excess of the examples given in section 3.2.2 is envisaged, such as for maintenance of lift equipment, a walkway must be provided (for example, using concrete slabs supported on bearing pads). Reasonable care must be taken to avoid puncture of the membranes by sharp objects or concentrated loads.

### 3.3 Resistance to root penetration

3.3.1 The result of a resistance to root penetration test is given in Table 4.

**Table 4 Resistance to root penetration**

System assessed	Assessment method	Requirement	Result
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric	Resistance to root penetration to EN 13948 : 2007	No root penetration	Pass

3.3.2 On the basis of data assessed, the system, when used in green roof and roof garden applications, will resist penetration by plant roots and remain weathertight.

## 4 Safety and accessibility in use

Not applicable.

## 5 Protection against noise

Not applicable.

## 6 Energy economy and heat retention

Not applicable.

## 7 Sustainable use of natural resources

Not applicable.

## 8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the system were assessed.

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

Table 5 Durability			
System assessed	Assessment method	Requirement	Result
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric AlphaGuard PUMA (TC) - on steel	Delamination to EAD 030350-00-402 A4.1 : 2018 after water exposure for 216 days at 60°C	≥ 50 kPa	Pass
- on bitumen			Pass
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric AlphaGuard PUMA (TC)	Tensile strength to BS EN ISO 527-4 : 1997 after heat ageing at 70°C for 240 days Longitudinal direction Transverse direction	Value achieved	8.52 MPa 8.23 MPa
	after UV ageing 1200 MJ·m <sup>-2</sup> at 50°C Longitudinal direction Transverse direction		8.46 MPa 8.31 MPa
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric AlphaGuard PUMA (TC)	Elongation to BS EN ISO 527-4 : 1997 after heat ageing at 70°C for 240 days Longitudinal direction Transverse direction	Value achieved	34.2% 32.7%
	after UV ageing 1200 MJ·m <sup>-2</sup> at 50°C Longitudinal direction Transverse direction		29.8% 31.3%
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric AlphaGuard PUMA (TC) - on steel	Dynamic indentation to EAD 030350-00-402 A4.3 : 2018 after heat ageing at 70°C for 240 days tested at 90°C	Value achieved	I <sub>4</sub>
- on steel	after UV ageing 1200 MJ·m <sup>-2</sup> at 50°C Tested at -10°C		I <sub>4</sub>
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric AlphaGuard PUMA (TC) - on steel	Static indentation to EAD 030350-00-402 A4.3 : 2018 after water exposure at 70°C for 216 days, tested at 90°C	Value achieved	L <sub>4</sub>
AlphaGuard PUMA (WP) reinforced with AlphaGuard PUMA Reinforcement Fabric AlphaGuard PUMA (TC) - on concrete primed with AlphaGuard concrete primer	Resistance to fatigue movement to EAD 030350-00-402 A4.3 : 2018 after heat ageing at 70°C for 240 days tested at -10°C for 50 cycles	Watertight and less than 75 mm delamination from the substrate	Pass

### 8.3 Service life

8.3.1 Under normal service conditions, the system will have a life in excess of 30 years provided it is designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.



8.3.2 When fully protected and subjected to normal service conditions in an inverted roof specification with an open covering (eg aggregate pavers), the system will provide an effective barrier to the transmission of liquid water and water vapour for the life of the roof in which it is incorporated.

8.3.3 The colour fastness of the system including AlphaGuard PUMA (TC) has not been assessed and repeated application may be required to maintain the required colour at shorter intervals.

## PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

### 9 Design, installation, workmanship and maintenance

#### 9.1 Design

9.1.1 The design process was assessed by the BBA and the following requirements apply in order to meet the performance assessed in this Certificate:

9.1.2 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018 and, where appropriate, *NHBC Standards 2024*, Chapter 7.1.

9.1.3 For design purposes of flat roofs, twice the minimum finished fall must be assumed, unless a detailed structural analysis of the roof is available, including overall and local deflection, and direction of falls.

9.1.4 Structural decks to which the system is to be applied must be suitable to transmit the dead and imposed loads experienced in service. Allowance must be made for loading deflections to ensure that the free drainage of water is maintained.

9.1.5 Imposed loads, dead loading and wind loads must be calculated by a suitably experienced and competent individual in accordance with the principles of BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003 and BS EN 1991-1-4 : 2005, and their UK National Annexes.

9.1.6 In inverted roof specifications, the ballast requirements must be calculated by a suitably experienced and competent individual in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex.

9.1.7 The ballast on protected roofs or growing medium used in green roofs and roof gardens must not be of a type that will be removed or become delocalised owing to wind scour experienced on the roof.

9.1.8 It must be recognised that the type of plants used in roof gardens could significantly affect the expected wind loads experienced in service. Appropriate mitigation measures must be taken; the advice of the Certificate holder and/or the Green Roof Organisation (GRO) may be sought, but such advice is outside the scope of this Certificate.

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

9.1.10 For green roofs and roof garden finishes, to protect the roof waterproofing and any system components above the waterproofing, such as insulation or water flow reducing layer, invasive plant species must not be used. In particular, the following species must be excluded:

- invasive weeds including buddleia
- plants and grasses with aggressive rhizomes such as bamboo
- self-setting woody weeds such as sycamore and ash seedlings must be removed at early germination stage
- other woody plants which spread aggressively including rhododendron.

9.1.11 The Green Roof Organisation (GRO) can provide guidance on species not included in section 9.1.10 but such advice is outside the scope of this Certificate.

9.1.12 The drainage systems for inverted roofs, zero fall roofs, green roofs or roof gardens must be correctly designed, and the following points must 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 in accordance with the relevant clauses of BS 6229 : 2018
- dead loads for green roofs and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.

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

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

## 9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate and visits were carried out to sites in progress to assess the practicability of installation.

9.2.2 Installation of the system must be carried out in accordance with the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, the installation instructions of the Certificate holder and this Certificate.

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

9.2.4 The area to be waterproofed must be dry and free from dirt, grease, oil and other contaminants that could impair the adhesion of the system. Steel surfaces must be free from rust.

9.2.5 The substrate must be free from sharp projections such as nail heads and concrete nibs.

9.2.6 On concrete surfaces, residual humidity must be  $\leq 4\%$  prior to the application of AlphaGuard PUMA (WP) or AlphaGuard Concrete Primer. Laitance and other loose material must be thoroughly removed by suitable mechanical means, eg shot blasting.

9.2.7 Damaged areas of the substrate (eg blistered bitumen or roofing membranes) must be removed, replaced or repaired. Damaged concrete surfaces must be repaired using a suitable repair product compatible with the system. The Certificate holder can advise on suitable materials for this purpose, but such advice and products are outside the scope of this Certificate.

9.2.8 Detailing, eg upstands and penetrations, must be carried out in accordance with the Certificate holder's instructions.

9.2.9 Tools must be cleaned with a suitable cleaning solvent before the system cures.

9.2.10 Installation must not be carried out during inclement weather (eg rain, fog or snow) or when the substrate, air or material temperature is outside of the range specified by the Certificate holder.

9.2.11 When required, concrete surfaces must be primed with AlphaGuard PUMA Concrete Primer.

9.2.12 AlphaGuard PUMA Concrete Primer must be thoroughly stirred prior to addition of the catalyst to ensure uniform distribution of the paraffin contained in the product.

9.2.13 The required quantity of AlphaGuard PUMA Catalyst must be added and thoroughly mixed using a slow speed drill fitted with a suitable mixing blade. The amount of catalyst powder required is dependent on the ambient temperature, as detailed in Table 6.

**Table 6 AlphaGuard PUMA Concrete Primer – PUMA catalyst addition by temperature**

Ambient temperature (°C)	Catalyst addition (% by weight of primer)
30	1
20	2
10	4
0	6

9.2.14 After the catalyst has been stirred in, the primer must be poured onto the substrate in stripes and evenly spread over the substrate using a short pile roller or squeegee to achieve a coverage rate of between 300 and 500 g·m<sup>-2</sup> until saturation occurs resulting in a continuous film of primer. On very porous surfaces, a second coat of primer may be required.

9.2.15 When a continuous primer film is achieved, fire-dried graded quartz sand (0.3 to 0.8 mm) is broadcast into the wet primer at a rate of 300 to 500 g·m<sup>-2</sup>.

9.2.16 AlphaGuard PUMA (WP) must be thoroughly stirred prior to addition of the catalyst.

9.2.17 The required quantity of AlphaGuard PUMA Catalyst must then be added and thoroughly mixed using a slow speed drill fitted with a suitable mixing blade. The amount of catalyst powder required is dependent on the ambient temperature as detailed in Table 7.

**Table 7 AlphaGuard PUMA (WP), AlphaGuard PUMA Thix and AlphaGuard PUMA (TC) catalyst addition by temperature**

Ambient temperature (°C)	Catalyst addition (g)			
	AlphaGuard PUMA (WP)		AlphaGuard PUMA Thix	AlphaGuard PUMA (TC)
	13.25 kg Pail	25 kg Pail	25 kg Pail	10 litres
30	85	170	250	80
20	170	340	350	100
10	350	700	600	200
0	520	1000	1000	300

9.2.18 After the catalyst has been stirred in, the mixed AlphaGuard PUMA (WP) must be poured onto the substrate and evenly spread using a short pile roller or squeegee to achieve a coverage rate of at least 1.2 kg·m<sup>-2</sup>.

9.2.19 AlphaGuard PUMA Reinforcement Fabric with a nominal weight per unit area of 165 g·m<sup>-2</sup> is then bedded into the wet AlphaGuard PUMA (WP) and a second layer of AlphaGuard PUMA (WP) must be applied wet on wet over the fabric at a minimum application rate of 1.6 kg·m<sup>-2</sup>, to achieve an overall minimum application rate of AlphaGuard PUMA (WP) of 2.8 kg·m<sup>-2</sup> and a minimum dry film thickness of 2.3 mm.

9.2.20 When AlphaGuard PUMA (WP) is fully cured, AlphaGuard PUMA (TC) can, if required, be applied.

9.2.21 The topcoat must be thoroughly stirred prior to addition of the catalyst.

9.2.22 Due to a short pot life, only small quantities of AlphaGuard PUMA (TC) must be mixed at any time. The required quantity of AlphaGuard PUMA Catalyst must be added and thoroughly mixed using a slow speed drill fitted with a suitable mixing blade. The amount of catalyst powder required is dependent on the ambient temperature as detailed in Table 7.

9.2.23 Once mixed, the product must be immediately poured onto the cured AlphaGuard PUMA (WP) and spread with a paint roller to achieve a minimum coverage of 300 g·m<sup>-2</sup>.

9.2.24 The NHBC requires that the system, once installed, is inspected in accordance with *NHBC Standards 2024*, Chapter 7.1, Clause 7.1.11, and undergoes an appropriate integrity test, where required. Any damage to the system assessed in this Certificate must be repaired in accordance with section 9.4 of this Certificate and reinspected, in order to maintain system performance.

### 9.3 Workmanship

Practicability of installation was assessed by the BBA, on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the system must be carried out by contractors who have been trained and approved by the Certificate holder.

### 9.4 Maintenance and repair

9.4.1 Ongoing satisfactory performance of the system in use requires that it is suitably maintained. The guidance provided by the Certificate holder was assessed by the BBA and found to be appropriate and adequate.

9.4.2 The following requirements apply in order to satisfy the performance assessed in this Certificate:

9.4.2.1 The system must be the subject of six-monthly inspections and maintenance in accordance with the recommendations in BS 6229 : 2018, Chapter 7, and the manufacturer's own maintenance requirements. For green roof, roof garden and drainage systems, these six-monthly inspections must be carried out by a suitably experienced and competent individual (with horticultural knowledge) to ensure continued satisfactory performance. This must include an examination of the overall condition of the roof, ensure that drain outlets and gutters are kept clear and unblocked and, for green roofs and roof gardens, the removal of any self-propagated plants and invasive plant species found, see section 9.1.10.

9.4.2.2 Green roofs and roof gardens must be the subject of regular inspections, particularly in autumn after leaf fall and in spring, to ensure unwanted vegetation and other debris is cleared from the roof and drainage outlets. Guidance is available within the latest edition of the *Green Roof Organisation (GRO) Code of Best Practice*.

9.4.2.3 For green roofs, to protect the waterproofing and any system components above the waterproofing, such as insulation or water flow reducing layer, invasive plant species (see sections 9.1.10 and 9.1.11) must be eliminated through maintenance.

9.4.2.4 The control and removal of invasive plant species is carried out by hand. Where this is not possible, any chemicals used must be checked for compatibility with the roof waterproofing layer and any system components above the waterproofing, such as insulation or water flow reducing layer. The Certificate holder can advise on the suitability of a particular system, but such advice and materials are outside the scope of this Certificate. Note, if using chemicals on a green roof or roof garden, rainwater outlets may need to be disconnected from the main drainage system to prevent contamination of the local water system and/or harm to flora and fauna.

9.4.2.5 The chemical fertiliser used on green roofs and roof gardens must be checked for compatibility with the roof waterproofing layer and any system components above the waterproofing, such as insulation or water flow reducing layer. The Certificate holder can advise on the suitability of a particular system, but such advice and materials are outside of the scope of this Certificate.

9.4.2.6 If a leak occurs in the roof waterproof membrane in inverted roof, protected roof, green roof, or roof garden specifications, it must be repaired following removal of the gravel ballast, paving ballast, green roof or roof garden layer, water-flow-reducing layer and the insulation boards. Correct reinstatement of these layers must be carried out with particular care and the advice of the Certificate holder must be sought, but such advice is outside the scope of this Certificate.

9.4.2.7 In the event of the system being contaminated by oil, grease or other chemicals, the advice of the Certificate holder must be sought, but such advice is outside the scope of this Certificate.

9.4.2.8 In the event of damage, repair must be carried out in accordance with the Certificate holder's instructions. Damaged areas of the system must be repaired as soon as practicable to maintain the waterproofing integrity by cutting back the damaged area to sound material and reinstating the system to the original specification as described in section 9.2, ensuring a minimum 100 mm overlap over the cleaned and prepared existing coating. The Certificate holder must be consulted for details, but such advice is outside the scope of this Certificate.

## 10 Manufacture

10.1 The production processes for the system have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

## 11 Delivery and site handling

11.1 The Certificate holder stated that the system components are delivered to site as detailed in Table 8.

*Table 8 Weights and packaging*

Component	Weight (kg)	Packaging type
AlphaGuard PUMA (WP)	13, 25	Metal pails
AlphaGuard PUMA Thix	5, 25	Metal pails
AlphaGuard PUMA (TC)	20	Metal pails
AlphaGuard PUMA Concrete Primer	20	Metal pails
AlphaGuard PUMA Catalyst	25	Cardboard boxes

11.2 AlphaGuard PUMA Reinforcement Fabric is available in rolls 100 x 1 m and 100 x 0.15 m.

11.3 Delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.3.1 The system must be stored away from open flames and other ignition sources and at a temperature between 15 and 20°C

Supporting information in this Annex is relevant to the system but has not formed part of the material assessed for the Certificate.

### Construction (Design and Management) Regulations 2015

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

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

### CLP Regulations

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

### Additional Guidance

A.1 Additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs – Drainage and U value corrections*.

A.2 Recommendations for the design of green roofs and roof garden specifications are available within the latest edition of the *Green Roof Organisation (GRO) Code of Best Practice*.

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

## Bibliography

BS 6229 : 2018 *Flat roofs with continuously supported coverings — Code of practice*

BS 8000-0 : 2014 + A1 2024 *Workmanship on construction sites — Introduction and general principles*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

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 + A2 : 18 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 ISO 527-4 : 1997 *Determination of tensile properties — Test conditions for isotropic and orthotropic fibre reinforced plastic composites*

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

DIN ISO 12572 : 2001 *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties*

DIN ISO 527-1 : 1996 *Plastics — Determination of tensile properties — Part 1 : General Principles*

EN 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*

EN 13501-5 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roofs tests*

EN 13948 : 2007 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to root penetration*

EOTA TR-003 : 2004 *Determination of the watertightness*

EOTA TR-004 : 2004 *Determination of the resistance to delamination*

EOTA TR-006 : 2004 *Determination of the resistance to dynamic indentation*

EOTA TR-007 : 2004 *Determination of the resistance to static indentation*

EOTA TR-008 : 2004 *Determination of the resistance to fatigue movement*

EAD 030350-00-402 : 2018 *European Assessment Document Liquid applied waterproofing kits*

### Conditions

#### 1 This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- 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
- and any matter arising out of or in connection with it or its subject matter (including non-contractual disputes or claims) is governed by and construed in accordance with the law of England and Wales.
- the courts of England and Wales shall have exclusive jurisdiction to settle any matter arising out of or in connection with this Certificate or its subject matter (including non-contractual disputes or claims).

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

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

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

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

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

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

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