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**Agrément Certificate**  
**16/5322**  
Product Sheet 1 Issue 3

## AXTER COLD LIQUID WATERPROOFING AND SURFACING SYSTEMS

### STARCOAT PMMA ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Starcoat PMMA, a polymethyl methacrylate liquid-applied roof waterproofing system for use on exposed flat and pitched roofs with limited access, green and biodiverse roofs on flat, zero fall and pitched roofs, and roof garden specifications on flat and zero fall roofs.

(1) Hereinafter referred to as 'Certificate'.

#### CERTIFICATION INCLUDES:

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

#### KEY FACTORS ASSESSED

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

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

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

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

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

**Durability** — under normal service conditions, the system will provide a durable roof waterproofing with a service life of at least 25 years (see section 12).

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 Third issue: 28 September 2021



Hardy Giesler  
Chief Executive Officer

Originally certificated on 6 June 2016

Certificate amended on 26 January 2023 to change Certificate holder's address.

*The BBA is a UKAS accredited Inspection Body (No.4345).*

*This certificate has been amended on 26 January 2023 as part of a transition of The BBA Agrément Certificate scheme delivered under the BBA's ISO/IEC 17020 accreditation. Sections marked with the symbol † are not issued under accreditation.*

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

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

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## Regulations

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



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

<b>Requirement:</b>	<b>B4(1)</b>	<b>External fire spread</b>
Comment:		The system is restricted by this Requirement in some circumstances. See section 7.4 of this Certificate.
<b>Requirement:</b>	<b>B4(2)</b>	<b>External fire spread</b>
Comment:		On suitable substructures, the system may enable a roof to be unrestricted under this Requirement. See sections 7.1 to 7.3 of this Certificate.
<b>Requirement:</b>	<b>C2(b)</b>	<b>Resistance to moisture</b>
Comment:		The system will enable a roof to satisfy this Requirement. See section 6 of this Certificate.
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship</b>
Comment:		The system is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.



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

<b>Regulation:</b>	<b>8(1)(2)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:		The system satisfies the requirements of this Regulation. See sections 11.1, 11.2 and 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	2.6	Spread to neighbouring buildings
Comment:		The system is restricted under clause 2.6.4 <sup>(1)(2)</sup> of this Standard in some circumstances. See section 7.5 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		The system, when applied to a suitable substructure, may enable a roof to be unrestricted under clause 2.8.1 <sup>(1)(2)</sup> of this Standard. See sections 7.1 to 7.3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.7 <sup>(1)(2)</sup> . See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
Comment:		Comments in relation to the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <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(a)(i)(iii)</b>	<b>Fitness of materials and workmanship</b>
Comment:	<b>(b)(i)(ii)(iv)</b>	The system is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>28(b)</b>	<b>Resistance to moisture and weather</b>
Comment:		The system will enable a roof to satisfy the requirements of this Regulation. See section 6 of this Certificate.
<b>Regulation:</b>	<b>36b</b>	<b>External fire spread</b>
Comment:		On suitable substructures, the system may enable a roof to be unrestricted under the requirements of this Regulation. See sections 7.1 to 7.3 of this Certificate.

## Construction (Design and Management) Regulations 2015

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

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

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

## Additional Information

### NHBC Standards 2021

In the opinion of the BBA, Starcoat PMMA, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards, Part 7 Roofs, Chapter 7.1 Flat roofs, terraces and balconies*.

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

## Technical Specification

### 1 Description

1.1 The Axtar Starcoat PMMA Roof Waterproofing and Surfacing System is a two-component, cold liquid-applied polymethyl methacrylate reinforced system comprised of the following components:

- Starcoat PMMA — a polymethyl methacrylate waterproofing resin available in Traffic Grey (RAL 7043). Other RAL colours are available on request
- Starcoat PMMA Thix — a thixotropic version of the standard resin. For use in detailing at upstands, corners, connections and other details, available in Traffic grey (RAL 7043). Other RAL colours are available on request
- Starcoat PMMA TT — a low-temperature installation version of the standard resin, with a modified cure system, to allow application between  $-15^{\circ}\text{C}$  and  $+25$ . Available in Traffic Grey (RAL 7043). Other RAL colours are available on request.
- Starcoat PMMA catalyst — a polymethyl methacrylate catalyst, used with all three resin versions as a two-component system
- Starcoat PMMA fleece — a  $110\text{ g}\cdot\text{m}^{-2}$  polyester fleece for use as a reinforcement
- Starcoat PMMA A (Asphalt) Primer — pigmented or non-pigmented primer based on a two-component fast-reactive polymethyl methacrylate resin, for the preparation of asphaltic and bituminous substrates
- Starcoat PMMA P (Porous) Primer — pigmented or non-pigmented primer based on a two-component fast-reactive and fast-curing polymethyl methacrylate resin, for the preparation of absorbent substrates such as concrete, screeds and timber.

1.2 Other items or components which may be used with the system, but which are outside the scope of this Certificate, are:

- Starcoat PMMA M (Metal) Primer — one-component, solvent-free, acrylate-based primer for metal substrates, available in grey
- Starcoat PMMA R (Refurb) Primer — a combination primer for interface details and upstands with changing substrate materials
- Starcoat PMMA W (Wet) Primer — a primer for mineral substrates
- Starcoat PMMA FPO/TPO Primer — a one-component primer used as a bonding agent between FPO and TPO
- Starcoat PMMA Spray (A+B) Primer — a PMMA-based waterproofing resin for waterproofing main areas, developed specifically for spray application
- Starcoat PMMA Self-Levelling Mortar — for use in levelling rough substrates of less than 10 mm depth, levelling of gradients, and as additional protection in trafficked areas such as roof terraces, communal walkways and balconies
- Starcoat PMMA Mortar — for use in levelling rough substrates of greater than 10 mm depth and levelling of gradients
- Starcoat PMMA Vapour Release Mesh — a prefabricated, compression-resistant mesh for use on cementitious substrates.
- Starcoat PMMA Filler — for use in filling small cracks and joints in the substrate
- Starcoat PMMA Reinforced Filler — a fibre-filled waterproofing product for sealing minor penetrations, eg screws
- Starcoat PMMA De-Bonding Tape — for use in providing a bond breaker at expansion/construction joints
- Starcoat PMMA Decorative Chips — an acrylate-based topping available in black, grey and white, for use on a surface sealant coat as decorative medium
- Starcoat PMMA Roller-Applied Surfacing — for use as a wearing layer for Starcoat PMMA systems
- Starcoat PMMA Vehicular Coat — a surface finish based on polymethyl methacrylate, available in Stone Grey (RAL 7030), Pebble Grey (RAL 7032) and Traffic Grey (RAL 7043)
- Starcoat PMMA Coloured Sealer — a pigmented surface sealant, based on polymethyl methacrylate, available in Stone Grey (RAL 7030), Pebble Grey (RAL 7032) Traffic Grey (RAL 7043) and Beige (RAL 1001). Other RAL colours are available on request
- Starcoat PMMA Clear Sealer — a colourless, clear sealer for surfaces with topping
- Starcoat PMMA Cleaner — for use in cleaning the substrate prior to the installation of the system.

## 2 Manufacture

2.1 The liquid components of the system are manufactured by batch-blending processes.

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

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

## 3 Delivery and site handling

3.1 The components of the system are delivered to site in packs consisting of liquid resin and powder catalyst components. The packs bear a label that include the components name, health and safety information and batch number. The components are available in the pack sizes specified in Table 1

**Table 1 – Packaging of the system components**

Component	Packaging type	Packaging size
Starcoat PMMA	Tub + catalyst bag	10 and 25 kg
Starcoat PMMA Thix	Tub + catalyst bag	10 and 25 kg
Starcoat PMMA TT	Tub + catalyst bag	10 and 25 kg
Starcoat PMMA Fleece	Roll	50 m x 1.05 m, 50 m x 0.7 m 50 m x 0.52 m, 50 m x 0.35 m 50 m x 0.26 m, 50 m x 0.20 m 50 m x 0.15 m, 50 m x 0.10 m
Starcoat PMMA A primer	Tub	5 and 10 kg
Starcoat PMMA P primer	Tub	5 and 10 kg

3.2 Resins must be stored in a ventilated, dry location, away from heat and oxidising agents and out of direct sunlight, and at a temperature between 0 and 25°C. The resins will have a shelf-life of greater than six months if stored correctly and unopened, in accordance with the Certificate holder’s instructions.

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

## Assessment and Technical Investigations

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

### Design Considerations

#### 4 General

4.1 Starcoat PMMA is satisfactory for use as a waterproofing system on flat and pitched roofs with limited access, on substrates of:

- concrete
- bituminous
- timber
- metal
- plastic.

4.2 The system is also satisfactory for use in green roof applications on flat, zero fall and pitched roofs, and roof gardens on flat and zero fall roofs. The adhesion to, and compatibility with, other substrates must be confirmed by test (see also section 13.5).

4.3 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018, BS 8217 : 2005 and, where appropriate, *NHBC Standards 2021*, Chapter 7.1.

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

- 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 wildflower species
- Biodiverse roof — a roof designed to create a desired habitat that will attract a particular flora and fauna (this includes the historical definition of a brown roof).

4.5 Limited access roofs are defined for the purpose of this Certificate as those subjected only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc. Where traffic in excess of this is envisaged, additional protection to the membrane must be provided (see section 9).

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

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

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

4.8 Zero fall roofs are defined for the purpose of this Certificate as those having a finished fall which can vary between 0 and 1:80<sup>(1)</sup>. Reference should also be made to appropriate clauses in Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*.

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

4.9 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.

4.10 Structural decks to which green roofs and roof garden systems are to be applied, must be suitable to transmit the dead and imposed loads experienced in service.

4.11 Dead loads, wind loading and imposed loads must be calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003 and BS EN 1991-1-4 : 2005, and their UK National Annexes.

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

4.13 The drainage systems for green roofs, biodiverse roofs, roof gardens and zero fall roofs must be correctly designed, and the following points should be addressed:

- provision made for access for maintenance purposes
- for zero fall roofs, it is particularly important to identify the correct drainage points, to ensure that drainage is sufficient and effective
- dead loads for green roof and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.

4.14 Insulation materials to be used in conjunction with the membranes 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 used in accordance with, and within the scope of, that Certificate.

4.15 The NHBC requires that the roof membranes, once installed, are inspected in accordance with *NHBC Standards 2021*, Chapter 7.1, Clause 7.1.12, and undergo an appropriate integrity test, where required. Any damage to the membrane must be repaired in accordance with section 15 of this Certificate and reinspected.

## 5 Practicability of installation

The system is designed to be installed by competent roofing contractors experienced in the installation of cold liquid-applied systems and accredited by the Certificate holder.

## 6 Weathertightness



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

## 7 Properties in relation to fire



7.1 When classified in accordance with BS EN 13501-5 : 2016, the following systems achieved a B<sub>ROOF</sub>(t4) classification and so are unrestricted with respect to proximity to a boundary by the documents supporting the national Building Regulations:

- a 12.5 mm thick cement board substrate, a Starcoat PMMA P Primer coat applied at 0.5 kg·m<sup>-2</sup>, a Starcoat PMMA coat applied at 3 kg·m<sup>-2</sup>, tested flat<sup>(1)</sup>
- a 12.5 mm thick cement board substrate, a 0.6 mm thick carrier membrane (self-adhesive bituminous membrane, foil faced), a 130 mm thick PIR insulation layer (tissue faced), a 0.6 mm thick carrier membrane (self-adhesive bituminous membrane, foil faced), a Starcoat PMMA Primer coat applied at 3 kg·m<sup>-2</sup>, tested flat<sup>(1)</sup>

(1) The test is applicable to systems applied to roofs of pitches between 0 and 10°.

7.2 In the opinion of the BBA, a roof incorporating the system will also be unrestricted under the national Building Regulations in the following circumstances:

- protected or inverted roof specifications, including an inorganic covering 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.

7.3 The designation of other specifications should be confirmed by reference to the requirements of the documents supporting the national Building Regulations.



7.4 The system, when used in pitches of greater than 70°, excluding upstands, should not be used on buildings in England and Wales that have a storey at least 18 m above ground level and which contain one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools.



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

7.6 If allowed to dry, plants used may allow the spread of flame 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.

## 8 Adhesion

8.1 The adhesion of the system to concrete, reinforced bitumen membranes, timber, plastic and metal is sufficient to resist the effects of any wind suction, elevated temperatures, thermal shock or minor movement likely to occur in practice.

8.2 The soil used in intensive plantings on roof gardens should not be of a type that will be removed, or become localised, owing to wind scour experienced on site.

8.3 It should be recognised that the type of plants used in roof gardens could significantly affect the expected wind loads experienced in service.

## 9 Resistance to mechanical damage

9.1 The system will accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance. Where traffic in excess of this is envisaged, such as for maintenance of lift equipment, a walkway must be provided (for example, using concrete slabs supported on bearing pads or the manufacturer's walkway sheets). Reasonable care must be taken to avoid puncture of the membranes by sharp objects or concentrated loads.



9.2 The system can achieve a result of I3 with respect to dynamic indentation and L3 with respect to static indentation when tested in accordance with EOTA TR006 and EOTA TR007, respectively.

9.3 In areas of heavy pedestrian traffic, an additional coat of Starcoat PMMA Self-Levelling Mortar is applied with a finish coat of Starcoat PMMA Coloured Sealer, in accordance with the Certificate holder's instructions.

9.4 Once a green roof or a roof garden is installed, it can be regarded as a suitable protection for the membrane in use.

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

## 10 Resistance to root penetration

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

## 11 Maintenance



11.1 The system should be the subject of six-monthly inspections and maintenance in accordance with BS 6229 : 2018, Chapter 7, to ensure continued satisfactory performance.

11.2 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 are cleared from the roof and drainage outlets (see section 4.12).

11.3 Where damage has occurred it should be repaired, at the earliest opportunity, in accordance with section 15 of this Certificate and the Certificate holder's instructions.

## 12 Durability



Under normal service conditions, the system will achieve a service life of at least 25 years.

## Installation

### 13 General

13.1 Installation of the system must be carried out in accordance with the relevant clauses of BS 8000-0 : 2014 and BS 8000-4 : 1989, Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*, the Certificate holder's instructions and this Certificate.

13.2 Substrates to which the system is to be applied must be sound, dry, clean and free from sharp projections such as nail heads and concrete nibs. Rough substrates must be made good using the appropriate levelling compound in accordance with the Certificate holder's instructions.

13.3 Soil or other bulk material should not be stored on one area of the roof prior to installation, to ensure that localised overloading does not occur.

13.4 Where necessary, substrate priming must be carried out using a sheepskin roller in accordance with the Certificate holder's instructions.

13.5 Adhesion checks may be carried out to ensure that the system is compatible with the existing surfaces. The Certificate holder must be consulted for details of suitable test methods and requirements before use.

13.6 Installation should not be carried out during inclement weather (eg rain, fog or snow). Installation should be carried out only within the ambient, substrate and material temperature ranges specified in Table 2. The substrate temperature must be at least 3°C above the dew point during application and curing.



**Table 2 – Usage temperature ranges**

Product/temperature range (°C)	Air ambient	Substrate	Material
Starcoat PMMA	-5 to +35	+3 to +50	+3 to +30
Starcoat PMMA Thix	-5 to +35	+3 to +50	+3 to +30
Starcoat PMMA TT	-15 to +25	-10 to +30	+3 to +20

13.7 Detailing (eg at upstands) should be carried out in accordance with the Certificate holder’s instructions.

13.8 Expansion or construction joints must be additionally reinforced prior to the application of the main waterproofing layer, in accordance with the Certificate holder’s instructions.

13.9 All equipment should be cleaned after use with Starcoat PMMA Cleaner.

## 14 Application

14.1 Starcoat PMMA catalyst should be mixed with the resin in the weight ratio specified in Table 3.

**Table 3 – Substrate temperature to percentage catalyst**

Resin	Substrate temperature to percentage catalyst				
	-10°C to 2°C	3°C to 14°C	15°C to 34°C	35°C to 39°C	40°C to 50°C
Starcoat PMMA	-	4%	2%	2%	1%
Starcoat PMMA Thix	-	-	-	-	-
Starcoat PMMA TT	6%	4%	2%	-	-

14.2 Once the substrate has been primed and joint treatments have cured, Starcoat PMMA resin is applied at a minimum application rate of 1.5 kg·m<sup>-2</sup>.

14.3 Starcoat PMMA fleece is applied into the wet resin and embedded using sheepskin rollers, ensuring that any trapped air pockets are removed.

14.4 A further layer of Starcoat PMMA resin is applied to the substrate at a minimum application rate of 1 kg·m<sup>-2</sup>, ensuring that the fleece is saturated. Recommended application rates for various situations are:

smooth substrates	2.5 kg·m <sup>-2</sup>
fine-grained substrates	3.0 kg·m <sup>-2</sup>
rough substrates	3.5 kg·m <sup>-2</sup>
below Starcoat PMMA Coloured Sealer/Self-Levelling Mortar	2.5 kg·m <sup>-2</sup> .

14.5 The specification above the waterproofing system should be of suitable design, including a filter layer and drainage where required. In cases of doubt, the Certificate holder’s advice should be sought.

## 15 Repair

Minor damage can be repaired by cleaning back to the unweathered material and recoating the damaged area with the membrane at the appropriate application rate stated in section 14.

## Technical Investigations

## 16 Tests

Tests were conducted on samples of Starcoat PMMA and the results assessed to determine:

- tensile strength and elongation
- water vapour diffusion resistance coefficient (μ)
- watertightness
- tensile bond strength on concrete, steel, bitumen sheet, timber and plastic

- dynamic indentation
- static indentation
- resistance to fatigue cycling
- resistance to low temperatures
- resistance to high temperatures
- heat ageing at 80°C for 200 days
- resistance to UV ageing at 1000 MJ·m<sup>-2</sup>
- resistance to water exposure at 60°C for 60 days
- the effect of application temperatures
- the effect of day joints
- reaction to fire
- water exposure (for 180 days at 60°C).

## 17 Investigations

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

17.2 Data on fire performance were assessed.

17.3 Data on root penetration were assessed.

## Bibliography

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

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

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 EN 1991-1-1 : 2002 *Eurocode 1 — Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*

NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1 — Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*

BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 — Actions on structures — General actions — Snow loads*

NA to BS EN 1991-1-3 : 2003 + A1 : 2015 UK National Annex to *Eurocode 1 — Actions on structures — General actions — Snow loads*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions — Wind actions*

NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 — Actions on structures — General actions — Wind actions*

BS EN 13501-5 : 2016 *Fire classification of construction products and building elements. Classification data from external fire exposure to roof tests.*

### 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
- 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.

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, UKNI or 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.