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Agrément Certificate

97/3336

Product Sheet 1

PERMAQUIK 6100 MONOLITHIC HOT-MELT MEMBRANE

PERMAQUIK 6100 MONOLITHIC HOT-MELT ROOFING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the PermaQuik 6100 Monolithic Hot-Melt Roofing System, a waterproofing system for use in flat roof specifications, in either an inverted roof, green roof, blue roof or protected roof, such as covered by pavers or other suitable protection.

(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 membrane will resist the passage of moisture into the building (see section 6).

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

Adhesion — the system will resist the effects of any likely wind suction acting on the roof (see section 8).

Resistance to foot traffic — the system will accept the limited foot traffic and loads associated with installation and maintenance of the system without damage and the effects of thermal or other minor movement likely to occur in practice (see section 9).

Resistance to root penetration — the system is resistant to plant root penetration (see section 10).

Durability — under normal service conditions, and when fully protected, the system will provide a durable waterproofing for the design life of the roof in which it is incorporated (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

A handwritten signature in black ink, appearing to read 'John Albon'.

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

Date of Third issue: 8 January 2018

John Albon – Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

Originally certificated on 4 March 1997

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
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, the PermQuik 6100 Monolithic Hot-Melt Roofing 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 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)

Requirement:	B4(2)	External fire spread
Comment:		On suitable substructures, the use of the system can enable a roof to be unrestricted under this Requirement. See sections 7.1 to 7.3 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The system will enable a roof to satisfy this Requirement. See section 6.1 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The system is acceptable. See sections 12.1 and 12.2 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The use of the system satisfies the requirements of this Regulation. See sections 11.1, 12.1 and 12.2 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.8	Spread from neighbouring buildings
Comment:		The system, when applied to a non-combustible substrate, can be regarded as having low vulnerability under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 7.1 to 7.3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Use of the system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 6.1 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to meeting 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.
Regulation:	12	Building standards applicable to conversions
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 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23(a)(i)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The system is acceptable. See sections 12.1 and 12.2 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The use of the system will enable a roof to satisfy the requirements of this Regulation. See section 6.1 of this Certificate.

Regulation: 36(b)

Comment:

External fire spread

On suitable substructures, the use of the system can 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 sections: 3 *Delivery and site handling* (3.1) and 14 *Procedure* (14.2) of this Certificate.

Additional Information

NHBC Standards 2018

In the opinion of the BBA, the PermQuik 6100 Monolithic Hot-Melt Roofing 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 and balconies*.

Technical Specification

1 Description

1.1 The PermaQuik 6100 Monolithic Hot-Melt Roofing System is a one-part, hot-applied seamless membrane made from bitumen, natural rubbers and a blend of polymers reinforced with polyester.

1.2 Ancillary products used with the system include:

- PQ 2017 — a 50 g·m⁻² spunbonded polyester scrim for use as a reinforcement to the membrane
- PQ 2060 and PQ 2061 — elastomeric membranes (neoprene compound) for use as a reinforcement to the membrane in localised areas where limited movement occurs
- polythene sheet — 0.01 mm thick for use as a separating layer (only as part of an insulated roof assembly, and subject to light foot traffic only)
- PQ 2250 — a bitumen protection board
- PQ 2450 — a polypropylene protection board
- Esha Primer — for surface conditioning of concrete and brickwork
- Radmat Red Primer — a rapid drying primer made with SBS resins and non-flammable solvent
- ProTherm Quantum XENERGY SL-EP — subject of BBA Certificate 17/5397
- ProTherm Quantum Hybrid — subject of BBA Certificate 16/5347, Product Sheet 2
- ProTherm Quantum Pure — subject of BBA Certificate 16/5347, Product Sheet 1.

1.3 Ancillary items used with the system, but outside the scope of this Certificate, include:

- PQ 1800 Access Sheet — a bituminised polyester mat to be used as a secondary access layer
- Radmat Standard Access Sheet — a reinforced SBS modified bitumen compound for use as a secondary access layer
- Radmat Root Protection Membrane — an FLL approved protection layer for use in green roof applications
- D10 — a 10 mm drainage and reservoir board
- D25 — a 25 mm drainage and reservoir board
- D40 — a 40 mm drainage and reservoir board
- D80 — a 80 mm drainage and reservoir board
- DM12 — a drainage and reservoir board
- DM25 — a reservoir and drainage board
- DM10HD — a high-density drainage element
- G11 — a geotextile filter sheet
- G12 — a geotextile filter sheet

- GM10 — a green roof growing media
- GM20 — a green roof growing media
- GM30 — a green roof growing media
- GM40 — a green roof growing media
- GM50 — a green roof growing media
- GS12 — a two height gravel stop
- GS13 — a curved gravel stop
- GS14 — an 80 mm gravel stop
- IC100 — an aluminium inspection chamber
- Pipe Pocket
- PQ-T1520 Double Sided Sealing Tape
- SWG Blue Roof Geocells
- SWB Blue Roof Geocells.

2 Manufacture

2.1 The membrane is manufactured by heating and blending together polymer-modified bitumen, processing oils, fillers and other additives.

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 being operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 PermaQuik is delivered to site in 16 kg kegs each wrapped in polythene film bearing the product's name, the manufacturer's name and the BBA logo incorporating the number of this Certificate.

3.2 Reinforcing materials and protection layers must be stored under cover and kept dry.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the PermaQuik 6100 Monolithic Hot-Melt Roofing System.

Design Considerations

4 Use

4.1 The PermaQuik 6100 Monolithic Hot-Melt Roofing System is satisfactory for use on flat, limited or pedestrian access roofs as a waterproofing layer in:

- inverted roof specifications using aggregate ballast on flat roofs, including zero fall roofs with limited access
- protected inverted roof specifications using pavers or other suitable protection on flat roofs, including zero fall roofs with limited or pedestrian access
- green roof (extensive) specifications on flat roofs, including zero fall roofs with limited or pedestrian access, or pitched roofs with limited access
- roof garden (intensive) specifications on flat roofs, including zero fall roofs with limited or pedestrian access
- blue roof specifications.

4.2 Limited access roofs are defined for the purposes of this Certificate as those subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters etc. Where traffic in excess of this is envisaged, special precautions, such as additional protection to the membrane, must be taken (See section 9).

4.3 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80. Pitched roofs are defined as those having falls in excess of 1:6.

4.4 Zero fall roofs are defined for the purpose of this Certificate as those having a finished fall which can vary between 0° and 0.7°. Reference should also be made to the appropriate clauses in Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*.

4.5 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 wild flower species
- Biodiverse living roof — a roof with a growing medium selected to allow indigenous plant species to inhabit the roof over time
- blue roof — a flat roof designed to allow controlled attenuation of rain fall during storm events as part of a sustainable drainage system (SUDS) good practice policy.

4.6 When designing flat roofs, twice the minimum finished fall should be assumed unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc.

4.7 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and, where appropriate, *NHBC Standards* 2018, Chapter 7.1.

4.8 Insulation systems or materials used in conjunction with the system must be suitable for the specification and either be:

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

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

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

4.11 Guidance for the design and construction of blue roofs is available in the *NFRC Technical Guidance Note for the construction and design of Blue Roofs*.

4.12 Structural decks for green roofs, brown roofs, roof gardens and blue roofs to which the system is to be applied must be suitable to transmit the dead and imposed loads experienced in service.

4.13 The drainage system for completely flat green roofs, brown roofs or roof gardens must be correctly designed, and provision made for access for maintenance purposes. Dead loads for green roofs and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.

4.14 In inverted roof specifications the ballast requirements should be calculated in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. Additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs — Drainage and U value corrections*.

5 Practicability of installation

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

6 Weathertightness



6.1 The membrane will adequately resist the passage of moisture into the building and enable a roof to comply with the requirements of the national Building Regulations.

6.2 The membrane is impervious to water and, when used as described in this Certificate, will give a weathertight roofing capable of accepting minor movement without damage.

7 Properties in relation to fire



7.1 The membrane, when used in an inverted roof specification including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC, can be considered to be unrestricted under the national Requirements.

7.2 In the opinion of the BBA, when used in irrigated roof gardens, brown roofs or green roofs, the use of the membrane can be unrestricted under the national Building Regulations.

7.3 The membrane must always be used under a protective surface finish. The fire rating of the roof is dependent on the finish and the insulation used, the designation of which should be confirmed by:

England and Wales — test or assessment in accordance with Approved Document B, Appendix A, Clause 1

Scotland — test to 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.

7.4 If allowed to dry, the plants used may allow flame spread across the roof. This should be taken into consideration when selecting suitable plants for the roof. Appropriate planting irrigation and/or protection should be applied to ensure the overall fire-rating of the roof is not compromised.

8 Adhesion

8.1 The membrane will adequately resist the effects of wind suction likely to occur in practice.

8.2 The soil used in roof gardens must not be of a type that will be removed or become delocalised due to wind scour.

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

9 Resistance to foot traffic

9.1 The system can accept the limited foot traffic and light concentrated loads associated with the installation and maintenance operations. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads. Where traffic in excess of this is envisaged, such as for maintenance of lift equipment, a walkway must be provided.

9.2 When used over construction or bridging joints, the membrane can accommodate the minor structural movement likely to occur under normal service conditions.

10 Resistance to penetration of roots

10.1 The Radmat Root Protection Membrane has been tested in accordance to the FLL Standard and EN 13948 : 2007, and is suitable for use as a root-resistant membrane.

10.2 The PermaQuik 6100 Monolithic Hot-Melt Roofing System will resist the effects of root penetration from intensive or extensive roof garden systems when incorporated in an inverted roof specification using the Standard sheet. Advice on suitable plant specifications can be sought from the Certificate holder.

11 Maintenance



11.1 Maintenance must include checks and operations, where applicable, to ensure that:

- adequate ballast is in place and is evenly distributed over the membrane
- protection layers are in good condition
- exposed membrane is free from the build-up of silt and other debris, and unwanted vegetation is cleared.

11.2 Green roofs, brown 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). Guidance is available within the latest edition of *The GRO Green Roof Code, Green Roof Code of Best Practice for the UK*.

11.3 Where damage has occurred it should be repaired in accordance with section 15 and the Certificate holder's instructions.

12 Durability



12.1 The system will achieve an initial life expectancy of at least 25 years.

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

12.3 However, in situations where maintenance or repair of any of the components in the roof structure are necessary (eg protection layer, insulation), the durability of the membrane may be reduced.

12.4 An estimation cannot be given for the life of green roof, brown roof, blue roof or roof garden specifications owing to the nature of use. However, under normal circumstances, it should be significantly greater than for open coverings.

Installation

13 General

13.1 The Permaquik 6100 Monolithic Hot-Melt Roofing System must be installed in accordance with the relevant clauses of the Certificate holder's instructions, and this Certificate, on a dry and frost-free substrate. After rain or snow, at least one full day of good drying conditions must be allowed before installation can recommence. Once applied, the membrane is not affected by rain, snow or frost.

13.2 To assess the suitability of a substrate to receive the membrane, initial tests, ie adhesion test, must be carried out. If bonding problems occur, advice must be sought from the Certificate holder.

13.3 Prior to the application of the membrane to the substrate, defects such as cracks, irregularities, and areas of potential weakness should be made good, and the substrate cleaned. Any gaps, irregularities and areas of potential weakness may be filled with latex modified repair mortar. Where faults are not critical, additional membrane may be used to fill in.

13.4 The substrate should be conditioned with Radmat Red Primer at a coverage rate between 7 and 11.5 m²·l⁻¹ and allowed to dry before application of the membrane.

13.5 The membrane will adhere to concrete, brickwork, blockwork, metal, plywood and timber details. Metal should be free from oil, rust, paint or other coatings liable to affect the bond.

13.6 The membrane should be covered with a protective layer as soon as possible after installation, in accordance with the Certificate holder's instructions.

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

14 Procedure

14.1 Cakes of membrane are heated in an insulated and stirred heater fitted with thermometers to measure the melt and oil temperatures.

14.2 The nominal temperature range for the molten membrane is 190°C to 205°C. The temperature of the melt must not exceed 215°C.

14.3 The melt is discharged from the heater into a suitable container and applied to the roof using long-handled, rubber-bladed squeegees, or by brush on small areas.

14.4 The membrane, when used over construction joints, must be reinforced with PQ 2017 polyester scrim bedded into it. When used over bridging joints, the membrane must be reinforced with PQ 2060 or PQ 2061.

14.5 The first coat of membrane must have a minimum thickness of 3 mm.

14.6 The PQ 2017 polyester reinforcement layer is embedded by lightly brushing it into the first layer of the membrane whilst it is still warm and tacky. The reinforcement overlaps should be at least 75 mm.

14.7 The second layer of membrane, applied over the top of the reinforcement, must have a minimum thickness of 3 mm.

14.8 The membrane must be protected immediately with the specified protection layer, in accordance with the Certificate holder's instructions, prior to applying ballast, paving slabs or green roof finish.

15 Repair

Damage to the membrane can be adequately repaired by patching in accordance with the Certificate holder's instructions.

Technical Investigations

16 Tests

Tests were conducted on control and artificially aged samples of the Permaquik 6100 Monolithic Hot-Melt Roofing System, PQ 2017 and reinforcing scrims, and the results assessed to determine:

- thickness
- weight per unit area
- tensile strength and elongation
- fines content
- oil loss
- density
- moisture absorption
- ring and ball softening point
- resistance to imposed loads
- low temperature flexibility
- water vapour permeability
- water vapour resistance
- resistance to cracking
- resistance to static indentation
- resistance to dynamic indentation
- resistance to water pressure
- water tightness at six metre head
- water exposure (180 days at 60°C)

- tensile bond strength.

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 Visits were made to sites in progress to evaluate the practicability of installation.

17.3 Existing data on root penetration were evaluated.

Bibliography

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

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 + A1 : 15 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*

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

18 Conditions

18.1 This Certificate:

- relates only to the product/system 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 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.

18.2 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.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system 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.

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

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

18.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal 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, 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.