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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 on flat roofs in either an inverted roof specification, a green roof, or a protected roof specification (eg 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 water to the inside of the building (see section 6).

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

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

Resistance to penetration of roots — the system will resist the penetration of roots (see section 10).

Durability — under normal service conditions and when fully protected, the system will provide a durable roof 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

Date of Second issue: 24 July 2013

Originally certificated on 4 March 1997

Simon Wroe
Head of Approvals — Materials

Claire Curtis-Thomas
Chief Executive

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 PermaQuik 6100 Monolithic Hot Melt Roofing System, if installed, used and maintained in accordance with the provisions of this Certificate, will meet or contribute to meeting 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 flat roofs the membrane, when used in an inverted roof system specification including a minimum surface finish of 50 mm of aggregate, will 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 meet 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)	Fitness and durability of materials and workmanship
Comment:	The use of the system satisfies the requirements of this Regulation. See sections 11, 12.1, 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:	On flat roofs, the membrane, when used in an inverted roof system specification including a minimum surface protection of 50 mm of aggregate, is regarded as having low vulnerability under clauses 2.8.1 ⁽¹⁾⁽²⁾ 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 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 6.1 of this Certificate.
Standard: 7.1(a)	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 made 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

Regulation: 23(a)(i)(iii)b(i)	Fitness of materials and workmanship
Comment:	The system is acceptable. See sections 12.1, 12.2 and the <i>Installation</i> part of this Certificate.
Regulation: 28(b)	Resistance to moisture and weather
Comment:	The system will enable a roof to meet the requirements of this Regulation. See section 6.1 of this Certificate.
Regulation: 36(b)	External fire spread
Comment:	On flat roofs, the membrane, when used in an inverted roof system specification including a minimum surface protection of 50 mm of aggregate, will be unrestricted under the requirements of this Regulation. See sections 7.1 to 7.3 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1) and 14 *Procedure* (14.2) of this Certificate.

Additional Information

NHBC Standards 2013

NHBC accepts the use of the PermaQuik 6100 Monolithic Hot Melt Roofing System, provided it is installed, used and maintained in accordance with this Certificate, 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 consists of 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 fabric for use as 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 as part of an insulated roof assembly which is subject to light foot traffic only
- PQ 2250 — a bitumen protection board
- PQ 2450 — polypropylene protection board
- Esha Primer — for surface conditioning of concrete and brickwork
- 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 — an 80 mm drainage and reservoir board
- 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.

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 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 name, the manufacturer's name and the BBA identification mark 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.

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 an inverted roof specification
- a waterproofing layer protected by pavers or other suitable protection
- a waterproofing layer on a roof with a zero fall slope
- a waterproofing layer in an intensive roof garden, extensive green roof or a biodiverse specification.

4.2 Limited access roofs are defined for the purposes of this Certificate as those roofs 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).

4.3 Pitched roofs are defined for the purpose of this Certificate as those having a fall greater than 1:6. Flat roofs are defined for the purpose of this Certificate as those having a finished fall of 1:80. For design purposes, twice the minimum fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls etc. Completely flat roofs (zero fall slope) are defined for the purpose of this Certificate as those having a finished fall of less than 1:80.

4.4 Structural 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 2013*, Chapter 7.1 *Flat roofs and balconies*.

4.5 Imposed loads, dead loads and wind loading are calculated in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003, BS EN 1991-1-4 : 2005 and their respective UK National Annexes.

4.6 The drainage system must be correctly designed and provision made for access for maintenance purposes. Dead loads can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.


4.7 Insulation materials used in conjunction with the system must be:

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

5 Practicability of installation

Installation of the system must only be carried out by specialist trained contractors approved by the Certificate holder.

6 Weathertightness

 6.1 Results of test data confirm that when completely sealed and consolidated, the membrane will adequately resist the passage of moisture to the inside of a building and so meet or satisfy the relevant requirements of the national Building Regulations:


England and Wales — Approved Document C, Requirement C2(b), Section 5.1

Scotland — Regulation 9, Standard 3.10, clauses 3.10.1 and 3.10.7

Northern Ireland — Regulation 36(b).

6.2 The membrane is impervious to water and when used in the system described will give a waterproofing layer capable of accepting minor structural movements 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 or green roofs the use of the system will be unrestricted under the national Requirements.

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

8 Resistance to wind uplift

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

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 installation and maintenance. Where traffic in excess of this is envisaged, such as maintenance of lift equipment, a walkway must be provided. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads.

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 with the German FLL Standard EN 13948 : 2007 and is suitable for use as a root-resistant membrane.

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

11 Maintenance



11.1 Maintenance should include checks and operations to ensure the following where applicable:

- adequate ballast is in place and evenly distributed over the membrane
- protection layers are in good condition.

11.2 Green roofs must be the subject of regular inspections, particularly in autumn after leaf fall and in spring to ensure that vegetation and other debris are cleared from the roof and drainage outlets cleared. Guidance is available within *The GRO Green Roof Code — Green Roof Code of Best Practice for the UK 2011*.

11.3 It is imperative that the drainage system of the green roof is designed correctly, and provision made for access for maintenance purposes. Inspection of the drains should be carried out regularly to avoid waterlogging of the garden (see section 4.6).

12 Durability



12.1 The system has been in use in the UK since 1978 and evidence from tests indicates that the waterproofing membrane will have a life of at least 25 years. In the opinion of the BBA, when fully protected and subject to normal service conditions, the system will provide an effective barrier to the transmission of moisture for the design life of the roof in which it is incorporated.

12.2 In situations where maintenance or repair of any of the components in the roof structure is necessary (eg protection layer, insulation, or deck), the durability of the membrane may be reduced. In these circumstances the Certificate holder should be consulted.

12.3 An estimate cannot be given for the life of green roof and roof garden specifications due 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, 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 must be carried out. If bonding problems occur, advice must be obtained from the Certificate holder.

13.3 Prior to the application of the membrane, 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 Esha Primer or other Certificate holder-approved bitumen primer (at a coverage rate between 7 m²·l⁻¹ 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 must be covered with an access or protection layer as soon as possible after installation, in accordance with the manufacturer's instructions.

14 Procedure

14.1 Cakes of membrane are heated in a manufacturer-approved internally stirred double jacketed (insulated) 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, rubberbladed squeegees or by brush on small areas.

14.4 When used over construction joints, the membrane must be reinforced with a strip of PQ 2017 polyester fabric bedded into it. When used over bridging joints, the membrane must be reinforced with PQ 2060/2061 neoprene.

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 coat 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 access or 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 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 2016 and reinforcing scrim 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
- tensile bond strength.

17 Investigations

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

17.2 Existing data on root penetration were evaluated.

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

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 *Eurocode 1 : Actions on structures — General actions — Snow loads*

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

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

NA to BS EN 1991-1-4 : 2005 *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 to root penetration*

Conditions of Certification

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 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.

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
- individual 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.