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Agrément Certificate
06/4329
Product Sheet 2

RESITRIX ROOF WATERPROOFING SYSTEMS

RESITRIX SK W WATERPROOFING SYSTEM

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Resitrix SK W Waterproofing System, a self-adhesive, TPE/EPDM multi-laminate, root-resistant membrane for use in waterproofing roof garden and green roof applications in flat roofs.

AGRÉMENT CERTIFICATION INCLUDES:

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

KEY FACTORS ASSESSED

Weathertightness — the system will resist the passage of moisture to the interior of the building (see section 5).

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

Resistance to wind uplift — results of tests indicate that the system will enable a roof to be unrestricted under Building Regulations (see section 7).

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

Resistance to root penetration — the system will resist the effects of root penetration from intensive and extensive roof garden systems planted above (see section 9).

Durability — under normal service conditions the system with suitable protection will 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. Any exposed areas will have a service life of at least 30 years (see section 11).

The BBA has awarded this Agrément Certificate to the company named above for the system described herein. The 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 First issue: 8 October 2010

Simon Wroe
Head of Approvals — Materials

Greg Cooper
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, Resitrix SK W Waterproofing System, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:

The Building Regulations 2010 (England and Wales)

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, may be deemed to be of designation AA. See sections 6.1 to 6.3 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		Tests for water resistance on the system, including joints, indicate that the system meets this Requirement. See section 5.1 of this Certificate.
Requirement:	Regulation 7	Materials and Workmanship
Comment:		The membrane is acceptable. See sections 11.1 and 11.2 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The membrane can contribute to a construction meeting this Standard. See sections 10.1, 10.2, 11.1, 11.2 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — 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 aggregate, is considered of designation AA and satisfy the requirements of this Standard, with reference to clause 2.8.1[1][2]. See sections 6.1 to 6.3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Data for water resistance on the system, indicates that the use of this 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 5.1 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for this system under Regulation 9, 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) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The system is acceptable. See sections 11.1 and 11.2 and the *Installation* part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The system is acceptable. See sections 10.1 and 10.2 of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		Data for water resistance on the membrane, including joints, indicate that the use of the membrane can enable a roof to satisfy the requirements of this Regulation. See section 5.1 of this Certificate.
Regulation:	E5(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 aggregate, is considered of designation AA. See sections 6.1 to 6.3 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: 1 *Description* (1.2) and 2 *Delivery and site handling* (2.3) of this Certificate.

Non-regulatory Information

NHBC Standards 2010

NHBC accepts the use of Resitrix SK W Waterproofing System, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.1, *Flat roofs and balconies*.

General

The membrane is manufactured in Germany by Phoenix Dichtungstechnik GmbH and marketed in the UK by a subsidiary company, PDT Sealing Systems Ltd, 11 Arches House, Leicester Road, Rugby, Warwickshire CV21 1FD, Tel: 01788 551294.

Technical Specification

1 Description

1.1 Resitrix SK W is a multi-laminate membrane consisting of; a top layer of thermoplastic elastomer (TPE), a second layer of EPDM with glass reinforcement, a third layer of TPE and a fourth layer of self-adhesive, polymer-modified bitumen with a release film incorporating a 60 mm selvedge with a thermofusible polyethylene film for heat welding of the joint. The membrane also contains a root inhibitor.

1.2 The membrane is manufactured to the nominal characteristics of:

Thickness (mm)	2.5
Length (m)	10
Width (m)	1
Weight per unit	2.75
Roll weight (kg)	27.5

1.3 Ancillary items for use with the membrane:

- FG 35 Surface Primer — a synthetic rubber and resin, low viscosity, solvent-based primer, for use in priming all surfaces prior to application of Resitrix SK W
- Resitrix patches — for use in producing corner details.

1.4 Quality control tests are carried out during production and on the final product. Checks on the final product include:

- thickness
- weight per unit area
- tensile properties
- dimensional stability
- foldability at low temperature
- joint strength
- watertightness
- heat ageing.

2 Delivery and site handling

2.1 The membrane is delivered to site in individually wrapped rolls on a pallet, 20 rolls per pallet. The wrapper bears the product name, dimensions, weight, production code and the BBA identification mark incorporating the number of this Certificate.

2.2 Rolls should be stored vertically on a clean, dry, level surface and kept under cover.

2.3 Ancillary items classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009* (CHIP4) are given in Table 1 along with flashpoints. These products bear the appropriate hazard warning.

Table 1 Flashpoint and hazard classification

Materials	Flashpoint (°C)	Classification
FG 35 Surface primer[1][2]	–20	highly flammable

(1) These components should be stored in accordance with the *Highly Flammable Liquids and Petroleum Gases Regulations 1997*.

(2) These components are harmful to aquatic organisms.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Resitrix SK W Waterproofing System.

Design Considerations

3 Use

3.1 Resitrix SK W Waterproofing System is satisfactory for use as a roof waterproofing and root-resistant membrane in roof garden and green roof applications in flat roofs.

3.2 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80. For design purposes, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including for example, overall and local deflection and direction of falls. Pitched roofs are defined for the purpose of this Certificate as those having a fall in excess of 1:6.

3.3 For the purposes of this Certificate, the finished falls of the roof bearing the drainage layer should be between 1:80 and 1:20. The falls are provided by the substrate.

3.4 Decks to which the membrane are to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and *NHBC Standards* 2010, Chapter 7.1.

3.5 Structural decks to which the membrane is to be applied must be suitable to transmit the dead and imposed loads experienced in service.

3.6 Dead loads, wind loading and imposed loads 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.

3.7 Dead loads on garden roofs can dramatically increase if the drains become partially or completely clogged causing waterlogging of the drainage soil layers. Gravel guards should be used on rainwater outlets which should be inspected annually.

3.8 Insulation must have adequate compression strength to withstand the dead load imposed by a green roof. Glass fibre and mineral wool are not to be used with this system.

3.9 Insulation systems or materials used in conjunction with the membrane must be approved by the Certificate holder and either:

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

3.10 Contact with low-grade bitumen, coal tar and oil-based products should be avoided. If contact with such products is likely, a separating layer should be interposed before installing the waterproofing membrane. If the compatibility with other products is in doubt, the advice of the Certificate holder should be sought.

4 Practicability of installation

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

5 Weathertightness

5.1 Results of test data confirm that the membrane, and joints in the membrane, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of the building and so meet the requirements of the national Building Regulations:

England and Wales — Approved Document C, Requirement C2(b), Section 6

Scotland — Mandatory Standard 3.10, clauses 3.10.1 and 3.10.7

Northern Ireland — Regulation C4(b).

5.2 The system is impervious to water and, when used in one of the systems described in this Certificate, will give a weathertight roof capable of accepting minor structural movement without damage.

6 Properties in relation to fire

6.1 In the opinion of the BBA a roof garden covered with a drainage layer of gravel 100 mm thick and a soil layer of 300 mm thick will be designated AA.

6.2 In the opinion of the BBA, when used in irrigated roof gardens or green roof, the use of the system will be unrestricted under the national Building Regulations.

6.3 The designation of other specifications should be confirmed by:

England and Wales — Test or assessment in accordance with Approved Document B, Appendix A, clause A1

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.

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

7 Resistance to wind uplift

7.1 The membrane, when used with a suitable roof garden or green roof specification, will adequately resist the effects of wind uplift likely to occur in practice.

7.2 The soil used in intensive planting should not be of a type that will be removed, or become localised due to wind scour experienced on site.

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

8 Resistance to foot traffic

8.1 Results of test data indicate that the system can accept, without damage, the limited foot traffic and light concentrated loads associated with the installation and maintenance operations. However, reasonable care must be taken to avoid sharp objects or concentrated loads. Anywhere regular traffic is envisaged, ie maintenance of lift equipment, a walkway should be provided using concrete slabs supported on bearing pads.

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

9 Resistance to root penetration

9.1 Results of tests on Resitrix SK W membrane to the German FLL Standard, in accordance with EN 13948 : 2007, indicate that it is suitable for use as a root- resistant membrane.

9.2 Resitrix SK W when incorporated in an inverted roof and using the standard protection sheet will resist the effects of root penetration from intensive and extensive roof garden systems planted. Advice on suitable plant specifications can be sought from the Certificate holder.

9.3 Where there is a run-off from a large sill or gully onto the roof surface, the build-up of silt may allow the germination of seeds, therefore this type of detail should be avoided. However, any growth occurring will be restricted and will not normally affect the performance of the roof and will be no worse than that occurring on normal flat roofs.

10 Maintenance

10.1 Roofs should be inspected annually in autumn after leaf fall and in the spring to ensure vegetation and other debris are cleared from the roof and drainage outlets cleared. Guidance is available within the latest edition of *Guidelines to Green Roofing* The Green Roof Organisation (GRO).

10.2 It is imperative that the drainage system of the green roof or roof garden is designed correctly, and provision is made for access for maintenance purposes. Inspection of the drains should be carried out regularly to avoid waterlogging of the garden and the subsequent increase in dead weight load.

11 Durability

11.1 Resitrix membranes have been used in Europe since 1981, and evidence from tests confirm that the exposed waterproofing membrane will have a life of least 30 years. When fully protected and subject to normal service conditions in roof garden and green roof specifications, 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.

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

Installation

12 General

12.1 Installation of Resitrix SK W Roof Waterproofing System must be carried out by trained and approved installers working in accordance with the relevant Clauses of the Certificate holder's instructions and BS 8000-4 : 2001.

12.2 Conditions on site should be those for normal roof waterproofing work. Deck surfaces must be dry, clean and free from sharp projections such as nail heads, concrete nibs. When used over a rough substrate, a suitable protection layer should be placed over the substrate.

12.3 Installation must not be carried out during wet weather (eg rain, fog, snow) nor when the temperature is below 5°C unless suitable precautions against surface condensation are taken.

12.4 All flashings are to be formed in accordance with the Certificate holder's instructions.

12.5 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.

13 Procedure

13.1 The substrate is primed using FG 35 Surface Primer at a rate of 100% coverage.

13.2 When the primer is dry (minimum of 60 minutes curing time), the membrane is laid out flat onto the substrate without folds or ripples, with 50 mm overlaps.

13.3 The membrane is either rolled or folded back to the centre of the membrane and the release film is carefully scored with a knife along the centre line and removed.

13.4 The membrane is applied to the substrate, pressed down ensuring a good bond between membrane and substrate. The operation is repeated for the other half of the sheet.

Joints

13.5 The joints are formed by heat welding in accordance with the Certificate holder's installation instructions.

Detailing

13.6 Details are formed in accordance with the Certificate holder's installation instructions. Corner details should be reinforced using Resitrix patches.

13.7 The subsequent layers, such as separation layers, drainage layers, growing medium, are installed in accordance with the Certificate holder's installation instructions.

14 Repair

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

Technical Investigations

15 Investigations

15.1 Test result data on a material of similar formulation to Resitrix SK W (covered by Product Sheet 1 of this Certificate) were examined on:

- tensile strength and elongation
- resistance to water pressure
- resistance to nail tear
- resistance to folding at low temperature
- resistance to leakage at joints
- tensile strength of joints
- peel strength of joints
- static indentation
- dynamic indentation.

15.2 Existing data for Resitrix SK W were examined regarding resistance to root penetration.

15.3 The manufacturing processes were examined, including methods of quality control. Details were also obtained of the quality and composition of the materials used.

Bibliography

BS 476-3 : 2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*

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

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 *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*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

16.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

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

16.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

16.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

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