

## Carlisle Construction Materials GmbH

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Agrément Certificate  
**06/4329**  
Product Sheet 2

### RESITRIX ROOF WATERPROOFING SYSTEMS

#### RESITRIX SK W FULL BOND WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the Resitrix SK W Full Bond Waterproofing System, a self-adhesive, glass-reinforced thermoplastic elastomer/EPDM multi-laminate, root-resistant fully-adhered membrane for waterproofing flat, zero fall and pitched roofs with limited access and flat roofs in roof garden and green roof applications.

(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

**Weather-tightness** — the system and its joints, when completely sealed and consolidated, will resist the passage of moisture to the interior of the building (see section 6).

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

**Resistance to wind uplift** — when correctly specified, the system will resist the effects of any wind suction likely to occur in practice (see section 8).

**Resistance to foot traffic** — the system will accept, without damage, the limited foot traffic and loads associated with installation and maintenance (see section 9).

**Resistance to root penetration** — the system will resist the effects of root penetration from intensive and extensive roof garden installations (see section 10).

**Durability** — under normal service conditions, the system will provide a durable waterproof covering with a service life of at least 30 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

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

John Albon — Head of Approvals  
Construction Products

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

Claire Curtis-Thomas  
Chief Executive

Date of Third issue: 5 December 2014

Originally certificated on 8 October 2010

*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](http://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 Resitrix SK W Full Bond Waterproofing System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the 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 7.4 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		Tests for water resistance on the system, including joints, indicate that it will meet this Requirement. See section 6.1 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The system is acceptable. See section 12 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 system can contribute to a construction meeting this Regulation. See sections 11 and 12 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 <sup>(1)(2)</sup> of this Standard. See sections 7.1 to 7.4 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Tests for water resistance of the system indicate that it 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 6.1 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:		All comments given for this 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

Regulation:	23(a)(i)(iii)(b)(i)	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		Tests for water resistance of the system, including joints, indicate that it will enable a roof to satisfy the requirements of this Regulation. See section 6.1 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		On suitable substructures, the use of the system will enable a roof to be unrestricted under the requirements of this Regulation. See sections 7.1 to 7.4 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 3 *Delivery and site handling* (3.3) of this Certificate.

# Additional Information

## NHBC Standards 2014

NHBC accepts the use of the Resitrix SK W Full Bond Waterproofing 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*.

## CE marking

The Certificate holder has taken the responsibility of CE marking the system in accordance with Common Understanding of Assessment Procedure (CUAP) 06.05/22 *Composite waterproofing kit of rubber for roofs and construction works*. An asterisk (\*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

# Technical Specification

## 1 Description

1.1 The Resitrix SK W Full Bond Waterproofing System is a multi-laminate membrane consisting of a top layer of thermoplastic elastomer, a second layer of EPDM with glass reinforcement, a third layer of thermoplastic elastomer 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 nominal characteristics of the membrane are given in Table 1.

Characteristic (unit)	Resitrix SK W Full Bond
Thickness* (mm)	2.5
Length* (m)	10
Width* (m)	1
Mass per unit area* (kg·m <sup>-2</sup> )	2.75
Roll weight (kg)	27.5
Flexibility at low temperature* (°C)	-30
Dimensional stability* (%)	≤ 0.5
Resistance to static loading (kg)	
most compressible substrate	10
least compressible substrate	20

1.3 Ancillary items necessary for installation of the system products and included in this assessment are:

- 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 Full Bond
- Resitrix patches — a range of Resitrix membrane patches with a heat-activated adhesive on the lower face, for use in producing corner details.

## 2 Manufacture

2.1 The polymer components are compounded, blended, calendered and laminated with the reinforcement. The semi-finished membrane is coated on the underside with the modified bitumen coating mass and a surface finish applied.

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.

2.3 The management system of Carlisle Construction Materials GmbH has been assessed and registered as meeting the requirements of EN ISO 9001 : 2008 and EN ISO 14001 : 2004 by DQS GmbH (Certificate 502001QM08UM).

2.4 The membranes are manufactured in Germany by Carlisle Construction Materials GmbH and marketed in the UK by Carlisle Construction Materials Ltd, Eleven Arches House, Leicester Road, Rugby, Warwickshire CV21 1FD, tel: 01788 551294.

## 3 Delivery and site handling

3.1 The membranes are 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 logo incorporating the number of this Certificate.

3.2 Rolls must be stored vertically on a clean, dry, level surface and under cover.

3.3 FG 35 Surface Primer is classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009* as 'highly flammable' (flashpoint -20°C<sup>(1)</sup>) and bears the appropriate hazard warning. The primer is also harmful to aquatic organisms.

(1) This component should be stored in accordance with the *Dangerous Substances and Explosive Atmospheres Regulations 2002*.

# Assessment and Technical Investigations

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

## Design Considerations

### 4 General

4.1 The Resitrix SK W Full Bond Waterproofing System is satisfactory for use as a fully-adhered waterproofing on flat, zero fall and pitched roofs with limited access, and in roof garden and green roof applications in flat roofs.

4.2 Limited access roofs are defined for the purpose 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.

4.3 Flat roofs are defined for the purpose of this Certificate as those 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 (see also 4.9). Zero fall roofs are defined for the purpose of this Certificate as those having a finished fall of less than 1:80. Pitched roofs are defined for the purpose of this Certificate as those having a fall in excess of 1:6.

4.4 Decks to which the membrane is to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and, where appropriate, *NHBC Standards 2014*, Chapter 7.1.

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

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

- 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.

#### Exposed roofs

4.7 If rigid glassfibre or mineral wool roof insulation products are used they must be overlaid with 13 mm thick fibreboard unless otherwise authorised by the Certificate holder.

#### Roof gardens and green roofs

4.8 Insulation used in roof garden and green roof applications must have adequate compression strength to withstand the dead load imposed by the system. Glass-fibre and mineral wool are not to be used in roof garden and green roof applications.

4.9 Finished falls of the roof bearing the drainage layer should be between 1:80 and 1:20. The falls are provided by the substrate.

4.10 Structural decks to which the membrane is 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 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.

4.12 Dead loads on roof gardens 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.

### 5 Practicability of installation

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

### 6 Weathertightness



6.1 The membranes and joints between them, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of the building and so meet the relevant requirements of the national Building Regulations.

6.2 The system is impervious to water and, when used in accordance with this Certificate, will give a weathertight roof capable of accepting minor structural movement without damage.

## 7 Properties in relation to fire



7.1 When classified to BS EN 13501-5 : 2005, a system comprising an 18 mm thick primed marine plywood substrate, a self-adhesive bitumen/aluminium vapour control layer, an 80 mm thick mechanically-fastened primed polyisocyanurate insulation board, and a layer of Resitrix SK<sup>(1)</sup> fully bonded is designated as B<sub>ROOF</sub>(t4).

(1) Resitrix SK is to the same specification as Resitrix SK W Full Bond but does not incorporate an anti-root additive.

7.2 The system, when used in protected or inverted roof specifications including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC, can be considered to be unrestricted under the national Requirements.

7.3 In the opinion of the BBA, a roof garden incorporating the system covered with a 100 mm thick drainage layer of gravel and a soil layer of minimum 300 mm thick will be unrestricted.

7.4 The designation of other specifications (eg on combustible substrates) should be confirmed by:

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

**Scotland** — test to conform with 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.

7.5 If allowed to dry, plants used may allow flame spread across a roof. This should be taken into consideration when selecting plants for a 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 adhesion of the fully-adhered system to the substrate will be limited by the cohesive strength of the substrate. Tests indicate that on substrates of high cohesive strength the adhesion of the system is sufficient to resist the effects of wind suction, thermal cycling or minor structural movements occurring in practice.

8.2 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.

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

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

## 9 Resistance to foot traffic

9.1 Results of test data indicate that the system can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care should be taken, however, to avoid sharp objects or concentrated loads. Wherever regular traffic is envisaged, eg for maintenance of lift equipment, a walkway should be provided using concrete slabs supported on bearing pads.

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

## 10 Resistance to root penetration

10.1 Results of tests on Resitrix SK W Full Bond membrane in accordance with EN 13948 : 2007 indicate that it is suitable for use as a root-resistant membrane.

10.2 Resitrix SK W Full Bond, 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.

10.3 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, and 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.

## 11 Maintenance



11.1 Roofs covered with the system should be the subject of annual inspections, as is good practice with single-layer waterproofing systems, to ensure continued security and performance.

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

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

## 12 Durability



The system has been used in Europe since 1981 and has performed satisfactorily. Accelerated weathering tests and evidence from long-term existing sites confirm that satisfactory retention of physical properties is achieved. Available evidence indicates that the system will have a life in excess of 30 years.

## Installation

### 13 General

13.1 Installation of the Resitrix SK W Full Bond 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 : 1989.

13.2 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 and concrete nibs. When used over a rough substrate, a suitable protection layer should be laid first.

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

13.4 All flashings must be formed in accordance with the Certificate holder's instructions.

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

### 14 Procedure

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

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

14.3 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.

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

#### Joints

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

#### Detailing

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

14.7 Subsequent layers, such as separation layers, drainage layers and the growing medium, are installed in accordance with the Certificate holder's installation instructions.

### 15 Repair

In the event of damage, repairs must be carried out by cleaning the area around the damage and applying a patch as described in the Certificate holder's instructions.

## Technical Investigations

### 16 Tests

16.1 Tests were carried out on a material of similar formulation to Resitrix SK W Full Bond and the results assessed to determine:

- 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.

16.2 Existing data for Resitrix SK W Full Bond were evaluated regarding resistance to root penetration.



## 17 Investigations

17.1 Existing data on fire performance were evaluated.

17.2 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.

## Bibliography

- 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 National Annex to *Eurocode 1 — Actions on structures — General actions — Wind actions*
- BS EN 13501-5 : 2005 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roofs tests*
- EN 13948 : 2007 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to root penetration*
- EN ISO 9001 : 2008 *Quality management systems — Requirements*
- BS EN ISO 14001 : 2004 *Environmental Management systems — Requirements with guidance for use*

## 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
- 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.