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Agrément Certificate

13/5005

Product Sheet 2

SILCOR LIQUID-APPLIED ROOF WATERPROOFING SYSTEMS

SILCOR 900HA ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Silcor 900HA Roof Waterproofing System, a two-component, liquid-applied polyurea membrane and a range of primers for use in protected roof specifications on flat, including those with zero fall, and pitched roofs.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

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



KEY FACTORS ASSESSED

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

Properties in relation to fire — when used in a suitably protected specification, the system can enable a roof to be unrestricted under the national 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 mechanical damage — the system will accept, without damage, the foot traffic and loads associated with installation and maintenance (see section 9).

Durability — under normal service conditions, the system will provide a durable roof waterproofing with a service life in excess of 25 years (see section 11).



The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Third issue: 25 July 2019

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

Originally certificated on 6 June 2013

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.*

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

British Board of Agrément

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Regulations

In the opinion of the BBA, the Silcor 900HA Roof 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:		The system, when used with suitable surface protection, will enable a roof to be unrestricted under this Requirement. See section 7 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.
Requirement:	7	Materials and workmanship (applicable to Wales only)
Requirement:	7(1)	Materials and workmanship (applicable to England only)
Comment:		The system is acceptable. See section 11 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 is acceptable and satisfies the requirements of this Regulation. See sections 10.1 and 11 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 used with suitable surface protection, can be regarded as having a low vulnerability and can enable a roof to be unrestricted under this Standard, with reference to clause 2.8.1 ⁽¹⁾⁽²⁾ . See section 7 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:		All comments given for 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)(b)(i)	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 11 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 satisfy the requirements of this Regulation. See section 6.1 of this Certificate.

Regulation:	36(b)	External fire spread
Comment:	The system, when used with suitable surface protection, will enable a roof to be unrestricted under the requirements of this Regulation. On sloping roofs, boundary restrictions will apply. See section 7 of this Certificate.	

Construction (Design and Management) Regulations 2015 Construction (Design and Management) Regulations (Northern Ireland) 2016

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

See section: *3 Delivery and site handling* (3.1 and 3.3) of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, the Silcoe 900HA Roof Waterproofing System, if installed, used and maintained in accordance with this Certificate, will satisfy or contribute to satisfying the relevant requirements 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 ETA 13/0522 and ETAG 005 : 2004, Parts 1 and 6. 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 Silcor 900HA Roof Waterproofing System comprises Silcor 900HA, a two-component, liquid-applied polyurea membrane, and a range of primers.

1.2 The membrane is applied by hand in one coat to provide a waterproofing membrane with a minimum dry film thickness of 2 mm.

1.3 The system is the subject of ETA 13/0522, issued by the BBA in accordance with ETAG 005 : 2004. The level of Use Categories* are:

- working life W2 (10 years)
- climatic zones S (severe)
- imposed loads P3 (TH3) and P4 (TH4) (steel/concrete)
- roof slope S1 (<5%)
- lowest surface temperature in use TL3 (-20°C)
- highest surface temperature in use TH3 (80°C) and TH4 (90°C)
- reaction to fire (Class E).

1.4 Ancillary items which may be necessary for installation of the system and which are within the scope of this Certificate are:

- Primer EPF — a two-component epoxy primer for use on porous substrates prior to the application of Silcor 900HA membrane at temperatures between 5 and 25°C. The primer is broadcast with a minimum of 1 kg·m⁻² dried quartz sand (0.4 – 0.8 mm) whilst wet
- Primer EP LT — a three-component epoxy primer for use on porous substrates prior to the application of Silcor 900HA membrane at temperatures between 0 and 20°C. The primer is broadcast with a minimum of 1 kg·m⁻² dried quartz sand (0.4 – 0.8 mm)

- Primer MT — a two-component zinc phosphate/epoxy primer for use on steel substrates prior to the application of Silcor 900HA membrane
- dried quartz sand — a graded quartz sand (0.4 – 0.8 mm) for broadcasting into Primer EPF.

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

- specialist primers
- UV resistant top coat
- concrete repair products
- proprietary joint systems
- drainage membranes
- surface protection.

Details of suitable products/specifications may be obtained from the Certificate holder.

2 Manufacture

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

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

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

3 Delivery and site handling

3.1 The system components are delivered to site in drums and/or packs bearing a label that includes the component's name, health and safety information and batch number. The pack sizes are detailed in Table 1.

Table 1 Pack Sizes

Component	Pack sizes (kg)
Silcor 900HA Resin (Part A)	0.96
Silcor 900HA Iso (Part B)	9.04
Primer EPF (Part A)	3.2
Primer EPF (Part B)	1.8
Primer EP LT (Part A)	3.16
Primer EP LT (Part B)	0.72
Primer EP LT (Part C)	1.12
Primer MT (Part A)	6.2
Primer MT (Part B)	0.9
dried quartz sand (0.4 – 0.8 mm)	25

3.2 The system components must be stored in a cool, dry location and protected from freezing temperatures, all sources of moisture, direct sunlight and at a temperature of between 5 and 25°C. When stored in accordance with the Certificate holder's instructions they will have a shelf-life of at least 12 months.

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

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Silcor 900HA Roof Waterproofing System.

Design Considerations

4 Use

4.1 The Silcor 900HA Roof Waterproofing System is satisfactory for use as a fully adhered waterproofing layer on the following new and existing flat, including those with zero fall, and sloping protected roof specifications including:

- inverted roofs below extruded polystyrene (XPS) insulation boards
- ballasted
- podium decks and covered walkways for pedestrian access
- terraces.

4.2 The system has been assessed for use on the following substrates:

- concrete and plywood primed with Primer EPF
- concrete and plywood with Primer EP LT
- steel primed with Primer MT.

4.3 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, additional protection to the membrane must be provided as specified by the Certificate holder.

4.4 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 overall and local deflection, direction of falls, etc.

4.5 Pitched roofs are defined for the purpose of this Certificate as those having a fall greater than 1:6.

4.6 Zero fall roofs are defined for the purpose of this Certificate as those having a finished fall which can vary between 0 and 1:80.

4.7 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018 and, where appropriate, *NHBC Standards 2019*, Chapter 7.1.

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

4.9 Imposed loads, dead loading and wind load specifications are calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003 and BS EN 1991-1-4 : 2005, and their UK National Annexes.

4.10 The drainage systems for inverted roofs and zero fall roofs must be correctly designed, and the following points should be addressed:

- provision made for access for maintenance purposes
- for zero fall roofs, it is particularly important to identify the correct drainage points, to ensure that drainage is sufficient and effective
- additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs — Drainage and U value corrections*.

4.11 Insulation materials used in conjunction with the system must be in accordance with the manufacturer's instructions and be either:

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

5 Practicability of installation

The system must only be installed by installers who have been trained by the Certificate holder.

6 Weathertightness



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

6.2 The system is impervious to water and will achieve a weathertight roof capable of accepting minor structural movement.

7 Properties in relation to fire



7.1 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 enable a roof to be unrestricted under the national Building Regulations.

7.2 The designation of other specifications 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.

8 Resistance to wind uplift

8.1 The adhesion of the system to the substrates given in section 4.3 is sufficient to resist the effects of wind suction, thermal cycling or other minor structural movements likely to occur in service. Acceptable adhesion to other substrates must be confirmed by test.

8.2 The ballast requirements for the insulation in inverted roof specifications components should be calculated by a suitably experienced and competent individual in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. The insulation should always be ballasted with a minimum depth of 50 mm of aggregate or paving. In areas of high-wind exposure, the Certificate holder's advice must be sought.

9 Resistance to mechanical damage

The system can accept the foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads.

10 Maintenance



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

10.2 Any damage should be repaired in accordance with section 14 and the Certificate holder's instruction.

11 Durability



Under normal conditions, the system will function effectively as a roof waterproofing for a period in excess of 25 years. In a fully protected specification and when subject to normal service conditions, the system 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

Installation

12 General

12.1 Installation of the Silcor 900HA Roof Waterproofing System must be in accordance with the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, BS 6229 : 2003, the Certificate holder's instructions and this Certificate.

12.2 Installation must not be carried out during inclement weather, eg rain, fog or snow.

12.3 Substrates to which the system is to be applied must be sound, clean, frost free, dry and free from sharp projections such as nail heads and concrete nibs. The Certificate holder's advice must be sought for the suitability of the substrate to receive the system and for suitable cleaning procedures, including the use of a proprietary surface cleaner/HSE approved fungicidal wash where required.

12.4 Previously coated areas must be checked for integrity and adequate adhesion to the substrate. Defects such as cracks and blisters must be repaired prior to application of the system in accordance with the Certificate holder's instructions.

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

12.6 Primer EPF and Primer MT must be applied to the prepared substrate at a temperature between 5 and 25°C and Primer EP LT between 0 and 20°C by brush or roller at a typical coverage rate of 350 g·m⁻². Concrete surfaces must have a moisture content of <5%.

12.7 The Silcor 900HA components must be applied to the primed substrate at an ambient temperature between 5 and 30°C and the substrate must be at least 3°C above the dew point.

12.8 Detailing, such as at upstands, penetrations and joints, must be carried out in accordance with the Certificate holder's instructions.

12.9 Equipment should be cleaned with a suitable solvent such as acetone or methyl-ethyl ketone (MEK).

13 Procedure

13.1 The Silcor 900HA Resin component is poured into the Silcor 900HA Iso component and mixed using a slow speed drill fitted with a suitable paddle for at least 3 minutes or until homogenous.

13.2 The mixed material is applied by trowel or squeegee in one coat to achieve a minimum membrane thickness of 2 mm. This equates to a coverage rate of at least 2.4 kg·m⁻².

13.3 If work is interrupted for periods in excess of 24 hours, the cured membrane must be wiped with MEK or acetone prior to applying subsequent coats. The minimum lap width is 100 mm.

13.4 The cured system must be overlaid with suitable finishes. The Certificate holder must be consulted for details of suitable specifications.

14 Repair

14.1 Damaged membrane must be cut back to sound, well-adhered material, abraded with coarse abrasive paper and cleaned with MEK or acetone.

14.2 After the cleaner has evaporated, the system is applied as described in sections 12.12 to 12.15, ensuring that there is at least a 100 mm overlap over the existing sound material.

14.3 A check for adequate adhesion must be carried out once the system has cured, taking care not to damage the repair.

Technical Investigations

15 Tests

Tests were conducted on the Silcor 900HA Roof Waterproofing System and the results assessed to determine:

- water vapour permeability/water vapour diffusion resistance coefficient (μ)
- tensile strength and elongation
- watertightness
- tensile bond strength
- resistance to fatigue
- crack bridging capability
- resistance to dynamic indentation
- resistance to static indentation
- resistance to low temperatures
- resistance to high temperatures
- effect of heat ageing
- effect of exposure to surface water at 60°C
- effect of short term exposure to UV-A radiation.

16 Investigations

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

16.2 Independent test reports relating to reaction to fire and classification in accordance with EN 13501-1 : 2007 were reviewed.

Bibliography

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

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

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 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 + A2 : 18 to BS EN 1991-1-3 : 2002 + 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 : 2002 *UK National Annex to Eurocode 1 — Actions on structures — General actions — Wind actions*

EN 13501-1 : 2007 + A1 : 2009 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

ETAG 005 : 2004 *Liquid Applied Roof Waterproofing Kits, Part 1 General*

ETAG 005 : 2004 *Liquid Applied Roof Waterproofing Kits, Part 6 Specific stipulations for kits based on polyethurane*

17 Conditions

17.1 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.