**GCP Applied Technologies (UK) Limited**
487/488 Ipswich Road
Slough
Berkshire SL1 4EP

Tel: 01753 490000 Fax: 01753 490001
e-mail: info.gb@gcpat.com
website: www.gcpat.com

**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 roofs, including those with zero fall, inverted roofs, podium decks and terraces.

(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 the interior of a building (see section 6).

**Properties in relation to fire** — the system, when used in a suitable protected specification, may enable a roof to be unrestricted under the national Building Regulations (see section 7).

**Adhesion** — the adhesion of the system is sufficient to resist the effects of any likely wind suction and the effects of thermal or other minor movement likely to occur in practice (see section 8).

**Resistance to mechanical damage** — the system will accept, without damage, the foot traffic and loads associated with installation and maintenance, and minor structural movements occurring in service (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 Fourth issue: 30 November 2022

Originally certificated on 6 June 2013

Hardy Giesler
Chief Executive Officer

## 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, may 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 of this Certificate. |
| **Regulation:** | **7(1)** | **Materials and workmanship** |
| Comment: | | The system is acceptable. See section 11 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 system comprises acceptable materials and satisfies the requirements of this Regulation. See sections 10.1 and 11 and the *Installation* 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, may 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 of this Certificate. |
| Standard: | 7.1(a) | Statement of sustainability |
| Comment: | | The system can contribute to satisfying 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, 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(1)(a)(i) (iii)(b)(i)** | **Fitness of materials and workmanship** |
| Comment: | | The system comprises acceptable materials and satisfies the requirements of this Regulation. See section 11 and the *Installation* 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 of this Certificate. |

| | | |
|---|---|---|
| **Regulation:** | **36(b)** | **External fire spread** |
| Comment: | | The system, when used with suitable surface protection, may enable a roof to be unrestricted under the requirements of this Regulation. 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* of this Certificate.

# Additional Information

## NHBC Standards 2022

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 in relation to *NHBC Standards*, Part 7 *Roofs*, Chapter 7.1 *Flat roofs, terraces and balconies*.

In addition, in the opinion of the BBA, the system when installed and used in accordance with this Certificate can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards for Conversions and Renovations*, taking account of other relevant guidance within the chapter and the suitability of the substrate to receive the system.

The NHBC Standards do not cover the use of the system in the refurbishment of existing roofs.

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

- Primer EPF — a two-component epoxy primer for use on porous substrates prior to the application of Silcor 900HA membrane. The primer is broadcast with a minimum of 1 $kg \cdot m^{-2}$ 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. The primer is broadcast with a minimum of 1 $kg \cdot m^{-2}$ dried quartz sand (0.4 – 0.8 mm) whilst wet
- 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 Primers EPF and EP LT.

1.4 The Certificate holder recommends the following ancillary items for use with the system, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- 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 the product's name, safety data, batch number and the BBA logo. The pack sizes are detailed in Table 1.

Table 1 Pack Sizes

| Component | Pack sizes (kg) |
|---|---|
| Silcor 900HA Resin (Part A) | 1.01 |
| Silcor 900HA Iso (Part B) | 8.99 |
| 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 dry location, protected from freezing temperatures and all sources of moisture, away from heat and out of direct sunlight, 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 General

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 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 primed with Primer EP LT
- steel primed with Primer MT.

4.3 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018 and, where appropriate, *NHBC Standards* 2022, Chapter 7.1.

4.4 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.

4.5 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.

4.6 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. Reference should also be made to appropriate clauses in Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*.

4.7 Pitched roofs are defined for the purpose of this Certificate as those having falls in excess of 1:6.

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. Imposed loads, dead loading and wind loads 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.

4.9 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*.

4.10 Insulation materials to be used in conjunction with the membranes must be in accordance with the manufacturer's instructions and be either:

- as described in the relevant clauses of BS 6229 : 2018, or
- the subject of a current BBA Certificate and used in accordance with, and within the limitations of, that Certificate.

4.11 The Certificate holder must be consulted for advice on suitable protection, depending on the use of the roof.

4.12 Detailing requirements, eg at service penetrations, movement joints, must be evaluated on a case-by-case basis. The Certificate holder has standard details or can advise of suitable details for a particular application.

4.13 The NHBC requires that the roof membranes, once installed, be inspected in accordance with *NHBC Standards* 2022, Chapter 7.1, Clause 7.1.11, including the use of an appropriate integrity test, where required. Any damage to the membrane must be repaired in accordance with section 14 of this Certificate and reinspected.

## 5 Practicability of installation

The system is installed by installers approved by the Certificate holder.

## 6 Weathertightness

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

## 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, will enable a roof to be unrestricted, with respect to the proximity of relevant boundaries, under the national Building Regulations.

7.2 The designation and permissible areas of use of other specifications will be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

## 8 Adhesion

8.1 The adhesion of the system to the substrates given in section 4.2 is sufficient to resist the effects of wind suction, thermal cycling or other minor structural movements likely to occur in practice. 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

9.1 The system can accept, without damage, the foot traffic and light concentrated loads associated with installation and maintenance. Care should be taken to avoid puncture by sharp objects or concentrated loads.

9.2 The system is capable of accepting minor structural movement while remaining weathertight.

## 10 Maintenance

10.1 The roof system must be the subject of six-monthly inspections and maintenance in accordance with the recommendations in BS 6229 : 2018, Chapter 7 and the manufacturer's own maintenance requirements, where relevant, to ensure continued satisfactory performance.

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

## 11 Durability

Under normal service conditions, the system will function effectively as a roof waterproofing for a period in excess of 25 years. When fully protected and subject to normal service conditions, the system can provide an effective barrier to the transmission of liquid water and water vapour for the life of the roof in which it is incorporated.

# Installation

## 12 General

12.1 Installation of the system must be carried out in accordance with the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, BS 6229 : 2018, Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*, the Certificate holder's instructions and this Certificate.

12.2 Concrete structures should be designed and built in accordance with BS EN 1992-1-1 : 2004 and its UK National Annex.

12.3 Substrates to which the system is to be applied must be sound, clean, free from laitance and corrosion, dry and free from ice and frost.

12.4 Concrete surfaces must be 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/fungicidal wash, where required.

12.5 Defects such as large cracks must be repaired prior to application of the system in accordance with the Certificate holder's instructions.

12.6 Installation should not be carried out during inclement weather, eg rain, fog or snow.

12.7 The system 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 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.

12.9 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.

12.10 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 $g \cdot m^{-2}$. Concrete surfaces must have a moisture content of < 5%.

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

12.12 All equipment should be cleaned after use with a suitable solvent (acetone, etc).

## 13 Procedure

13.1 The Silcor 900HA Iso component (Part B) is mixed for 2 minutes until a homogeneous, lump free mix and a uniform colour is obtained.

13.2 The Silcor 900HA Resin component (Part A) is poured into the Silcor 900HA Iso component (Part B) and mixed using a slow speed drill fitted with a suitable paddle for at least 1 minute or until homogenous.

13.3 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 $kg \cdot m^{-2}$.

13.4 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.

13.5 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 a suitable solvent (acetone, etc).

14.2 After the cleaner has evaporated, the system is applied as described in section 13, 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

The following tests were conducted:

- 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 Data on fire performance in accordance with BS EN 13501-1 : 2018 were assessed.

## 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 : 2003 + A1 : 2015 *UK National Annex to Eurocode 1 — Actions on structures — General actions — Snow loads*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 *UK National Annex to Eurocode 1 — Actions on structures — General actions — Wind actions*

BS EN 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

## 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.