

## SIKALASTIC 841 ST BRIDGE DECK WATERPROOFING SYSTEM

This HAPAS Certificate Product Sheet<sup>(1)</sup> is issued by the British Board of Agrément (BBA), supported by the Highways Agency (HA) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers' Group and industry bodies. HAPAS Certificate Product Sheets are normally each subject to a review every three years.  
(1) Hereinafter referred to as 'Certificate'.

This Certificate relates to the Sikalastic<sup>(2)</sup> 841 ST Bridge Deck Waterproofing System, for use on concrete decks of highway bridges.

(2) Sikalastic is a registered trade mark.

### CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations 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

**Performance** — the system meets the requirements of the *Guidelines Document for the Assessment and Certification of Waterproofing Systems for Use on Concrete Decks of Highway Bridges* (see section 5).

**Durability** — the system will provide an effective waterproof layer to the concrete bridge deck, provided it is not damaged during subsequent resurfacing (see section 8).

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 First issue: 19 September 2013

Simon Wroe  
Head of Approvals — Materials

Claire Curtis-Thomas  
Chief Executive

*The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](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.*

# Requirements

In the opinion of the BBA, the Sikalastic 841 ST Bridge Deck Waterproofing System, when assessed in accordance with the BBA HAPAS *Guidelines Document for the Assessment and Certification of Waterproofing Systems for Use on Concrete Decks of Highway Bridges* and used in accordance with the provisions of this Certificate, will meet or contribute to meeting the requirements of the Manual of Contract Documents for Highways Works (MCHW)<sup>(1)</sup>, Specification for Highways Works (SHW), Volume 1, Series 2000.

(1) The MCHW is operated by the Overseeing Organisations: the Highways Agency (HA), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

# Regulations

## Construction (Design and Management) Regulations 2007

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

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

See sections: 3 *Delivery and site handling* and 10 *Precautions* of this Certificate.

# Additional Information

## CE marking

The Certificate holder has taken the responsibility of CE marking the system in accordance with ETA 13/0653 and ETAG 033. An asterisk (\*) appearing in this Certificate indicates that data shown is given in the Manufacturer's Declaration of Performance.

# Technical Specification

## 1 Description

1.1 The Sikalastic 841 ST Bridge Deck Waterproofing System comprises:

- Sika Concrete Primer – a two-part, solvent-based, polyurea/polyurethane hybrid resin, comprising Part A and Part B, applied in two coats, with quartz sand (particle size 0.3 mm – 0.8 mm) broadcast in the first wet applied coat
- Sika Scratch Coat System – a two-component, scratch coat system comprising Sika Concrete Primer filled with natural quartz sand (particle size 0.3 mm – 0.8 mm), for optional use only on very rough concrete bridge decks
- Sikalastic 841 ST – a two-part, polyurea resin waterproofing membrane, comprising Part A and Part B (pigmented grey)
- Sika Tack Coat System – a two-component tack coat system, for use with hot-rolled asphalt (HRA) surfacing, comprising:
  - Sika Concrete Primer – a two-part, solvent-based, polyurea/polyurethane hybrid resin, comprising Part A and Part B
  - Sikalastic 827 LT – modified ethyl-vinyl-acetate/polypropylene copolymer, white/yellowish pellets, particle size approximately 2 mm, broadcast into the wet applied Sika Concrete Primer
- Natural Quartz (0.3 mm to 0.8 mm) – fire-dried natural quartz sand, for broadcast into the wet applied Sika Concrete Primer and for use with Sika Scratch Coat System
- Sika Extender T – PE fibre-based extender to increase the viscosity of Sika Concrete Primer, to prevent run-down
- Sika Thinner C – a mixture of xylene, ethyl benzene and pentanon, for use as a cleaner for dirty or contaminated existing waterproofing membrane.

1.2 The system is the subject of ETA 13/0653, issued by Deutsches Institut für Bautechnik (DIBt) in accordance with ETAG 033.

## 2 Manufacture

2.1 The components of the system are manufactured by a batch-blending process.

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 the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 SQS (Certificate 31982).

### 3 Delivery and site handling

3.1 The components of the system are delivered to site as detailed in Table 1.

Component	Weight	Container	Shelf-life (months)
Sika Concrete Primer Part A	3.5, 9.0 litres	Metal containers	6
Sika Concrete Primer Part B	1.0, 2.5 litres	Metal containers	6
Sikalastic 841 ST Part A	212 kg	Metal containers	18
Sikalastic 841 ST Part B	191 kg	Metal containers	18
Sikalastic 827 LT	25, 750 kg	Plastic container	9
Natural Quartz	25 kg	Paper sacks	N/A
Sika Extender T	1.0 kg	Plastic containers	N/A
Sika Thinner C	5, 25 litres	Metal containers	N/A

3.2 The system components are classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009* and classifications are given in Table 2. These components bear the appropriate hazard warning.

Component	Flashpoint (°C)	Classification
Sika Concrete Primer Part A	40	Flammable/Harmful/Irritant
Sika Concrete Primer Part B	73	Corrosive/Harmful/Irritant
Sikalastic 841 ST Part A	>123	Harmful/Irritant
Sikalastic 841 ST Part B	>101	Toxic/Corrosive/Harmful
Sikalastic 827 LT	>200	Harmful/Irritant
Sika Thinner C	24	Flammable/Harmful/Irritant

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Sikalastic 841 ST Bridge Deck Waterproofing System.

### Design Considerations

#### 4 Use

The Sikalastic 841 ST Bridge Deck Waterproofing System is suitable for use on concrete highway bridge decks as part of new and maintenance applications with HRA surfacing. The deck must be shot blasted and must be at least 28 days old (or a minimum of 7 days where agreed in consultation with the purchaser) with a maximum surface moisture content of 4%.

#### 5 Performance

The system meets the requirements of the *Guidelines Document for the Assessment and Certification of Waterproofing Systems for Use on Concrete Decks of Highway Bridges* (see section 1.5).

#### 6 Practicability of installation

The system must only be applied by installers who have been trained and approved by the Certificate holder (see section 9.2).

#### 7 Maintenance

The system is not subject to any routine maintenance requirements, but any damage must be repaired before being overlaid (see section 1.3).

#### 8 Durability

8.1 The system will provide an effective waterproof layer to the concrete bridge deck, provided that care is taken to ensure that the system is not damaged during subsequent resurfacing work.

8.2 The durability of the system is dependent on the surfacing and will vary according to a number of factors, including traffic load, location and environmental conditions.

## 9 General

9.1 Installation of the Sikalastic 841 ST Bridge Deck Waterproofing System must only be carried out by contractors authorised and trained by the Certificate holder.

9.2 The Certificate holder is responsible for training and monitoring its authorised contractors to ensure that the system is installed in accordance with the BBA Agreed Method Statement and this Certificate.

## 10 Precautions

Health and Safety Data Sheets and the *Control of Substances Hazardous to Health Regulations 2002 (COSHH)* risk assessments for the works must be deposited with the purchaser and maintained on site.

## 11 Preparation

11.1 Imperfections in the concrete deck must be reinstated by the purchaser with a material agreed with the authorised contractor.

11.2 The concrete deck must be clean, dry, and free from ice, frost, laitance, loose aggregate, oil, grease, moss, algal growth, dust and other debris and, where the adhesion to the concrete would be impaired, free from curing liquids, compounds and membranes.

11.3 The air temperature, substrate temperature and relative humidity must be recorded, and the installation of the system only carried out on concrete bridge decks when the minimum air and substrate temperature is at 5°C and rising, with the air temperature at least 3°C above the dew-point.

## 12 Application

### Primer (two coat)

12.1 The first coat of Sika Concrete Primer can be applied by roller or brush, at a coverage rate of 0.35 kg·m<sup>-2</sup> to 0.55 kg·m<sup>-2</sup> dependent on the porosity of the concrete deck.

12.2 The Sika Concrete Primer is supplied as Part A and Part B. Immediately before use, Part A is stirred thoroughly for at least one minute, then Part B is added and thoroughly mixed for a further one minute until a homogeneous mix is achieved.

12.3 Fire-dried natural quartz sand (particle size 0.3 mm to 0.8 mm) is then broadcast into the still wet primer at a coverage rate of 0.9 kg·m<sup>-2</sup> to 1.1 kg·m<sup>-2</sup>.

12.4 The second coat of the primer can be applied provided the primed surface is fully cured and the surface is clean and dry.

12.5 The second coat of Sika Concrete Primer can be applied by roller or brush, at a coverage rate of 0.35 kg·m<sup>-2</sup>.

12.6 The primer can be over-sprayed with Sikalastic 841 ST waterproofing membrane provided the primed surface is fully cured and the surface is clean and dry.

### Scratch coat (optional use only for very rough concrete bridge decks)

12.7 The Sika Concrete Primer filled with fire-dried natural quartz sand can be applied by trowel, at a coverage rate of 0.45 kg·m<sup>-2</sup> to 0.65 kg·m<sup>-2</sup>, dependent on the roughness of the concrete deck.

12.8 The Sika Concrete Primer is supplied as Part A and Part B. Immediately before use, Part A is stirred thoroughly for at least one minute, then Part B is added and thoroughly mixed for a further one minute. During mixing, 12.5 kg or 32.5 kg (depending on the Sika Concrete Primer pack size) of natural quartz sand (particle size 0.3 mm to 0.8 mm) is added and mixed until a homogeneous mix is achieved.

12.9 Fire-dried natural quartz sand (particle size 0.3 mm to 0.8 mm) is then broadcast into the still wet scratch coat at a coverage rate of 0.9 kg·m<sup>-2</sup> to 1.1 kg·m<sup>-2</sup>.

12.10 The scratch coat can be over-sprayed with Sikalastic 841 ST waterproofing membrane, provided the primed surface is fully cured and the surface is clean and dry.

### Waterproofing membrane (one coat)

12.11 The Sikalastic 841 ST waterproofing membrane is applied by spray to a shot-blasted and primed surface at a minimum coverage rate of 2.2 kg·m<sup>-2</sup>. The coverage rate will increase with surface irregularities.

12.12 The Sikalastic 841 ST is supplied as Part A and Part B, which are stored at a minimum temperature of 20°C, and maintained at 60°C to 70°C within the spray equipment plant during application.

12.13 The spray equipment is computer controlled and maintains a Part A : Part B mix ratio of 1:1 ±2% by volume.

12.14 The Sikalastic 841 ST waterproofing membrane (pigmented grey) is applied in one coat, at a minimum film thickness of 2.0 mm overall, including peaks, arrises and irregularities in the concrete deck.

## Lapping

12.15 Where a new waterproofing membrane is to be joined to an existing Sikalastic 841 ST waterproofing membrane, and at day joints, the new application must be lapped onto the existing by a minimum of 50 mm.

12.16 Where the existing waterproofing membrane is clean and less than four hours old, additional preparation is not necessary.

12.17 Where the existing waterproofing membrane is clean but over four hours old, Sika Concrete Primer must be applied at a coverage rate of  $0.15 \text{ kg}\cdot\text{m}^{-2}$  to  $0.25 \text{ kg}\cdot\text{m}^{-2}$  to give a minimum margin of 20 mm greater than the lap, and allowed to dry.

12.18 Where the existing cured waterproofing membrane is dirty or contaminated, the surface must first be cleaned using Sika Thinner C, then Sika Concrete Primer is applied at a coverage rate of  $0.15 \text{ kg}\cdot\text{m}^{-2}$  to  $0.25 \text{ kg}\cdot\text{m}^{-2}$  to give a minimum margin of 20 mm greater than the lap, and allowed to dry.

## Sealing into parapet chase

12.19 The Sikalastic 841 ST waterproofing membrane must be terminated into a primed chase when provided.

## Tack coat

12.20 Sika Tack Coat System must only be applied to the fully cured waterproofing membrane in areas intended to receive the HRA surfacing.

12.21 Sika Concrete Primer can be applied by roller or brush, at a coverage rate of  $0.55 \text{ kg}\cdot\text{m}^{-2}$  to  $0.75 \text{ kg}\cdot\text{m}^{-2}$ . Addition of 1.0% Sika Extender T is mixed into the Sika Concrete Primer when applied on base slopes greater than 1%, to prevent run-down.

12.22 Sikalastic 827 LT pellets are applied by hand or by mechanical means onto the still wet primer, at a coverage rate of  $0.6 \text{ kg}\cdot\text{m}^{-2}$  to  $0.8 \text{ kg}\cdot\text{m}^{-2}$ .

12.23 Sika Tack Coat System must be fully cured prior to the application of the HRA surfacing. Curing time of the tack coat will depend on site conditions, but is typically 60 minutes at 20°C.

12.24 Sika Tack Coat System must be covered using suitable protection if HRA surfacing cannot be applied within 48 hours.

12.25 The HRA surfacing must be applied without undue delay, and preferably no more than seven days after the tack coat application. Should this period be exceeded, or the tack coated areas become contaminated or damaged, the Certificate holder should be contacted for advice.

## 13 Repair of defects

### Pin/blow holes

13.1 Within four hours of membrane application, identified pin/blow holes are over-sprayed with Sikalastic 841 ST waterproofing membrane to a minimum thickness of 2.0 mm.

13.2 After four hours of membrane application, the area over and around any pin/blow holes must be cleaned using a suitable solvent, ensuring a minimum 150 mm lap. The repair area is then abraded, cleaned of dust and Sika Concrete Primer/Quartz Sand applied.

13.3 A minimum of 30 minutes must be allowed for the primer to dry, after which the Sikalastic 841 ST waterproofing membrane is applied to a minimum thickness of 2.0 mm, ensuring a minimum peripheral lap of 100 mm around the repair. The membrane is allowed to cure prior to the application of Sika Tack Coat System.

### Blisters and damage

13.4 These are made good by cutting back to sound material and repairing as described in sections 13.1 to 13.3.

## 14 Surfacing

The rolling temperature of the HRA surfacing must not fall below the minimum activation temperature of 125°C required for the Sika Tack Coat System.

## Technical Investigations

## 15 Tests

15.1 Laboratory performance tests were carried out on the system by the BBA in accordance with the requirements of the *Guidelines Document for the Assessment and Certification of Waterproofing Systems for Use on Concrete Decks of Highway Bridges*, and the results found to be satisfactory.

The tests carried out on the waterproofing membrane included:

- resistance to water penetration.

The tests carried out on the waterproofing membrane/system bonded to concrete included:

- tensile adhesion at -10°C, 23°C and 40°C

- resistance to chloride ion penetration
- resistance to freeze/thaw
- resistance heat ageing
- resistance to chisel impact
- resistance to aggregate indentation at 40°C, 80°C and 125°C
- thermal shock, heat ageing and crack cycling
- age of concrete substrate (7 days)
- overlapping time (6 months)
- HRA surfacing to waterproofing system interface shear adhesion
- HRA surfacing to waterproofing surfacing system interface tensile bond.

15.2 Test data were also examined from an independent laboratory relating to ETA 13/0653 for the system carried out to ETAG 033. The tests carried out included:

- bond strength to support\*
- capacity to bridge cracks\*
- resistance to compaction\*
- resistance to perforation\*
- resistance to shear to support\*
- resistance to shear to overlay\*
- bond strength to overlays\*.

## 16 Investigations

16.1 An installation site trial was carried out to assess the practicability of the installation and quality/assurance procedures.

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

## Bibliography

*Guidelines Document for the Assessment and Certification of Waterproofing Systems for Use on Concrete Decks of Highway Bridges (2012)*

*Manual of Contract Documents for Highways Works (MCHW) Specification for Highways Works (SHW), Volume 1, Series 2000.*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

ETAG 033 *Liquid applied bridge deck waterproofing kits*

## 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.