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HAPAS Certificate
15/H237
Product Sheet 1

SIKA BRIDGE DECK WATERPROOFING SYSTEM

SIKALASTIC -851 BRIDGE DECK WATERPROOFING SYSTEM

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

This Certificate relates to the Sikalastic⁽¹⁾-851 Bridge Deck Waterproofing System for use on concrete decks of highway bridges.

(1) 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 — provided the installed system is not damaged during subsequent resurfacing, it will provide an effective waterproof layer to the concrete bridge deck (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

Claire Curtis-Thomas

Date of Second issue: 30 November 2017

John Albon — Head of Approvals

Claire Curtis-Thomas

Originally certificated on 11 September 2015

Construction Products

Chief Executive

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

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Requirements

In the opinion of the BBA, the Sikalastic -851 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 satisfy or contribute to satisfying the following requirements of the *Manual of Contract Documents for Highways Works (MCHW)*⁽¹⁾, Volume 1 *Specification for Highways Works (SHW)*, Series 2000.

(1) The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Infrastructure (Northern Ireland).

Regulations

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 sections:

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

Technical Specification

1 Description

The Sikalastic -851 Bridge Deck Waterproofing System comprises:

- SikaDur -188 Normal/Rapid Primer — a two-part, low viscous, transparent epoxy resin, comprising Part A (Normal/Rapid) and Part B (Normal or Rapid), applied in one or two coats, with fire-dried natural quartz sand (particle size 0.3 – 0.8 mm) broadcast over the first wet applied coat. Normal version primer is slow curing and is used at temperatures >10°C. Rapid version primer is fast curing and is used at temperatures <10°C
- SikaDur -188 Normal/Rapid Scratch Coat System — a two-component scratch coat system comprising SikaDur -188 Normal/Rapid Primer and fire-dried natural quartz sand (particle size 0.3 – 0.8 mm), for optional use on very rough concrete
- Sikalastic -851 waterproofing membrane — a two-part polyurethane resin, 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:
 - Sikalastic -8902 Tack Coat — a two-part solvent free, self-levelling, polyurethane resin, comprising Part A and Part B
 - Sikalastic 827 LT/HT — modified ethyl-vinyl-acetate/polypropylene copolymer, white/yellowish pellets, particle size approximately 2 mm, broadcast into the wet applied Sikalastic -8902 Tack Coat
- Sika Concrete Primer — a two-part, solvent-based, polyurea/polyurethane hybrid resin, comprising Part A and Part B
- Sika Thinner C — a mixture of xylene, ethyl benzene and pentanon, for use as a cleaner for dirty or contaminated existing waterproofing membrane.

2 Manufacture

2.1 The system components 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 Sika Germany GmbH has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by SQS (Certificate 31982).

3 Delivery and site handling

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

Table 1 Weights/volumes and packaging

Component	Weight/volume	Packaging	Shelf-life (months)
SikaDur -188 Primer Part A (Normal/Rapid)	24 kg	Metal container	6
SikaDur -188 Primer Part B (Normal)	6 kg	Metal container	6
SikaDur -188 Primer Part B (Rapid)	6 kg	Metal container	6
Sikalastic -851 Part A	211 kg	Metal container	18
Sikalastic -851 Part B	202 kg	Metal container	18
Sikalastic -8902 Part A	20.25 kg	Metal container	12 ⁽¹⁾
Sikalastic -8902 Part B	4.75 kg	Metal container	12 ⁽¹⁾
Sikalastic -827 LT/HT	25, 750 kg	Plastic container	9
Natural quartz	25 kg	Paper sack	N/A
Sika Concrete Primer Part A	3.5, 9.0 litres	Metal container	6
Sika Concrete Primer Part B	1.0, 2.5 litres	Metal container	6
Sika Thinner C	5, 25 litres	Metal container	N/A

(1) From production date.

3.2 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 Sikalastic -851 Bridge Deck Waterproofing System.

Design Considerations

4 Use

The Sikalastic -851 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 minimum 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 14).

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 13).

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.

Installation

9 General

9.1 Installation of the Sikalastic -851 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 made good by the purchaser with a material agreed in consultation 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 (one coat)

12.1 The SikaDur -188 Normal/Rapid Primer can be applied by roller or brush at a coverage rate of 0.35 to 0.45 kg·m⁻², dependent on the porosity of the concrete deck.

12.2 The SikaDur -188 Normal/Rapid Primer is supplied as Part A (Normal/Rapid) and Part B (Normal or Rapid). Immediately before use, Part A is stirred thoroughly for at least one minute. Part B is then added and mixed thoroughly for a further three minutes until homogeneous.

12.3 Fire-dried natural quartz sand (particle size 0.3 to 0.8 mm) is then broadcast into the still wet primer at a coverage rate of 0.8 to 1.0 kg·m⁻².

12.4 At substrate and ambient temperatures <10°C, SikaDur -188 Rapid Primer must be used.

12.5 The primer can be over-sprayed with Sikalastic -851 waterproofing membrane provided the primed surface is clean and dry.

Primer (two coat) (for use on very porous concrete bridge decks)

12.6 The first coat of SikaDur -188 Normal/Rapid Primer can be applied by roller or brush, at a coverage rate of 0.35 to 0.45 kg·m⁻², dependent on the porosity of the concrete deck.

12.7 The SikaDur Normal/Rapid Primer is supplied as Part A (Normal/Rapid) and Part B (Normal or Rapid). Immediately before use, Part A is stirred thoroughly for at least one minute. Part B is then added and mixed thoroughly for a further three minutes until homogeneous.

12.8 Fire-dried natural quartz sand (particle size 0.3 to 0.8 mm) is then broadcast into the still wet primer at a coverage rate of 0.8 to 1.0 kg·m⁻².

12.9 Once the primed surface is clean and dry, the second coat of SikaDur -188 Normal/Rapid Primer can be applied by roller or brush, at a coverage rate of 0.35 kg·m⁻².

12.10 At substrate and ambient temperatures <10°C, SikaDur -188 Rapid Primer must be used.

12.11 The primer can be over-sprayed with Sikalastic -851 waterproofing membrane provided the primed surface is clean and dry.

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

12.12 The SikaDur -188 Normal/Rapid Primer filled with fire-dried natural quartz sand can be applied by trowel at a coverage rate of 1.55 to 1.75 kg·m⁻², depending on the roughness of the concrete deck.

12.13 The SikaDur Normal/Rapid Primer is supplied as Part A (Normal/Rapid) and Part B (Normal or Rapid). Immediately before use, Part A is stirred thoroughly for at least one minute. Part B is then added and thoroughly mixed for a further three minutes. During mixing, 60 kg of natural quartz sand (particle size 0.3 to 0.8 mm) is added and mixed until homogeneous.

12.14 Fire-dried natural quartz sand (particle size 0.3 to 0.8 mm) is then broadcast into the still wet scratch coat at a coverage rate of 0.8 to 1.0 kg·m⁻².

12.15 At substrate and ambient temperatures <10°C, SikaDur -188 Rapid Primer must be used.

12.16 The scratch coat can be over-sprayed with Sikalastic -851 waterproofing membrane, provided the primed surface is clean and dry.

Waterproofing membrane (one coat)

12.17 The Sikalastic -851 waterproofing membrane is applied by spray to a shot blasted and primed surface at a minimum coverage rate of 2.2 kg·m⁻². The coverage rate will be affected by surface irregularities.

12.18 The Sikalastic -851 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.

12.19 The spray equipment is plural component, computer controlled and maintains a Part A : Part B mix ratio of 1:1 $\pm 2\%$ by volume.

12.20 The Sikalastic -851 waterproofing membrane (pigmented grey) is applied in one coat, at a minimum film thickness of 2.0 mm overall. This thickness must be maintained over peaks, arrises and irregularities in the concrete deck.

Lapping

12.21 Where a new waterproofing membrane is to be joined to an existing Sikalastic -851 waterproofing membrane, and at day joints, the new application must be lapped onto the existing by a minimum of 50 mm.

12.22 Where the existing waterproofing membrane is clean and less than four hours old, no additional preparation is necessary.

12.23 Where the existing waterproofing membrane is clean but over four hours old, Sika Concrete Primer or SikaDur -188 Normal/Rapid Primer must be applied at a coverage rate of 0.15 to 0.25 kg·m⁻² to give a minimum margin of 20 mm greater than the lap, and allowed to dry.

12.24 Where the existing cured waterproofing membrane is dirty or contaminated, the surface must first be cleaned using Sika Thinner C. Sika Concrete Primer or SikaDur -188 Normal/Rapid Primer is then applied at a coverage rate of 0.15 to 0.25 kg·m⁻² to give a minimum margin of 20 mm greater than the lap, and allowed to dry.

Sealing into parapet chases

12.25 The membrane must be terminated into a primed chase when provided.

Tack coat

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

12.27 The Sikalastic -8902 Tack Coat is supplied as Part A and Part B. Immediately before use, Part A is stirred thoroughly for at least one minute. Part B is then added and mixed thoroughly for a further three minutes until homogeneous. The coating can be applied by roller or brush, at a coverage rate of 0.6 to 0.8 kg·m⁻².

12.28 Sikalastic 827 LT/HT pellets are applied by hand or by mechanical means onto the still wet tack coat, at a coverage rate of 0.6 to 0.8 kg·m⁻².

12.29 The system must be fully cured prior to the application of the HRA surfacing. Curing time will depend on site conditions, but is typically 24 hours at 20°C.

12.30 The system must be covered using suitable protection if HRA surfacing cannot be applied within 48 hours.

12.31 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.

12.32 The rolling temperature of the HRA surfacing must not fall below the minimum activation temperature of 140°C required for the Sika Tack Coat System.

13 Repair

13.1 Within three hours of membrane application, identified pin/blow holes are over-sprayed with Sikalastic -851 waterproofing membrane to a minimum thickness of 2.0 mm.

13.2 After three 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 and Sika Concrete Primer/ quartz sand applied.

13.3 A minimum of one hour must be allowed for the primer to dry, after which the Sikalastic -851 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 the Sika Tack Coat System.

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

Technical Investigations

14 Tests

14.1 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.

14.2 Resistance to water penetration tests were carried out on the waterproofing membrane.

14.3 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
- resistance to thermal shock, heat ageing and crack cycling
- tensile adhesion to 7 day old concrete substrate
- tensile adhesion of overlaps after 6 months
- shear adhesion of HRA surfacing to waterproofing system interface
- tensile bond strength of HRA surfacing to waterproofing surfacing system interface.

15 Investigations

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

15.2 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

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), Volume 1 *Specification for Highways Works* (SHW), Series 2000

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

16 Conditions

16.1 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.

16.2 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.

16.3 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.

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

16.5 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.

16.6 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.