

## STIRLING LLOYD CRACK SEALING SYSTEMS FOR HIGHWAYS

### SAFETRACK (FLEXIBLE) INLAID ROAD REPAIR SYSTEM

This HAPAS Certificate Product Sheet<sup>(1)</sup> 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 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 Certificates are normally each subject to a review every three years.  
(1) Hereinafter referred to as 'Certificate'.

This Certificate relates to the Safetrack (Flexible) Inlaid Road Repair System, a bitumen-free, cold liquid-applied, fast-curing, thermosetting resin system, used to seal and repair cracks, fretted joints, reinstatement joints and slots typically in excess of 5 mm wide or multiple adjacent cracks, in non-porous bituminous and concrete highway surfaces.

#### 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 relevant requirements for Grade F (Flexible) inlaid crack-sealing systems of the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways* (see section 6).

**Durability** — the system can be used to repair cracks, fretted joints, reinstatement joints and slots typically in excess of 5 mm wide or multiple adjacent cracks, in both longitudinal and transverse directions of the carriageway with a minimum life expectancy of five years (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: 16 March 2017

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*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 Safetrack (Flexible) Inlaid Road Repair System, when assessed in accordance with the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways*, 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 Highway Works (MCHW)*<sup>(1)</sup>, *Specification for Highway Works, Volume 1, Series 700*, clause 711 and *Notes for Guidance on the Specification for Highway Works, Volume 2, Series NG700*, clause NG711.

(1) The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (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 section: 3 *Delivery and site handling* (3.1, 3.3, 3.4, and 3.6) of this Certificate.

## Technical Specification

### 1 Description

1.1 The Safetrack (Flexible) Inlaid Road Repair System comprises a bitumen-free, cold liquid-applied, fast-curing thermosetting resin, formulated with fillers and other additives. When applied to the road surface, the resin component is broadcasted with a nominal 3 mm graded skid resistant aggregate in addition to the aggregate throughout the product, to ensure that skid resistance is retained throughout its life. The binder is thermosetting and has greater resistance to softening and spreading compared to thermoplastic materials.

1.2 Approved aggregates include granite, basalt and calcined bauxite.

### 2 Manufacture

2.1 The resin component of the system is manufactured by a typical 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 Certificate holder has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BVQI (Certificate 20778).

### 3 Delivery and site handling

3.1 The Safetrack (Flexible) Inlaid resin component can be supplied as a ready-mixed slurry with filler incorporated or as separate resin and filler components. The components are available in 8 kg packs, 25 kg metal containers and 200 litre metal drums. Additional pack sizes are available upon request.

3.2 Each container is marked with the Certificate holder's name, product name, product code, batch number and date of manufacture.

3.3 The broadcast aggregate is delivered to site in 25 kg bags or bulk bags of 1 tonne.

3.4 The components must be stored in tightly-sealed containers under cool and dry conditions protected from sources of ignition. Packs must be protected from direct sunlight and storage temperature must not exceed 25°C.

3.5 If stored correctly in unopened containers in accordance with the Certificate holder's instructions, the components will have a storage life of at least 12 months from the date of manufacture.

3.6 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 Safetrack (Flexible) Inlaid Road Repair System.

## Design Considerations

### 4 Use

4.1 The Safetrack (Flexible) Inlaid Road Repair System is satisfactory for use as a Grade F inlaid crack sealing system for the repair of cracks, fretted joints, reinstatement joints or slots<sup>(1)</sup> typically in excess of 5 mm wide or multiple adjacent cracks, in non-porous bituminous<sup>(2)</sup> highway surfaces with texture depths not exceeding 2 mm or on concrete highway surfaces.

- (1) For the purposes of this Certificate, a 'slot' is defined as a prepared routed section in the highway to take cables etc. Where the system is likely to come into contact with cables, the compatibility must be confirmed with the Certificate holder.
- (2) For the purposes of this Certificate, non-porous bituminous highway surfaces are impermeable and include hot-rolled asphalt, asphalt concrete, mastic asphalt and thin surfacing systems.

4.2 The system can be laid between 5 and 300 mm in depth. The width of the recess must be formed to extend into sound existing surface.

### 5 Practicability of installation

The system must be installed by a competent highways contractor experienced with this type of system.

### 6 Performance

The results of laboratory performance tests carried out on the system complied with the requirements of the Guidelines Document for a Grade F inlaid system (see section 13, Table 1). This includes the minimum initial and investigatory skid resistance values of 60 and 50 respectively.

### 7 Maintenance

Installations must be periodically inspected as part of a planned maintenance programme and, if necessary, repaired as described in section 12.

### 8 Durability

8.1 The system can be used to seal and repair cracks, fretted joints, reinstatement joints and slots in both longitudinal and transverse directions of the carriageway, with a minimum expected life of five years.

8.2 Where cracks have penetrated substantially through the pavement depth owing to structural failure, resulting in significant movement under traffic, an expectation of life cannot be predicted. Where pavements are structurally sound with cracking confined to the surfacing layer or layers, and these remain bonded to the road-base, the five-year minimum life should be achieved.

8.3 The most severe wear from trafficking (primarily by heavy goods vehicles) occurs within the wheel track zones, approximately between 0.5 and 1.1 m and between 2.55 and 3.15 m from the centre of the nearside lane markings for each traffic lane. In the wheel track zones, the expected minimum life is unlikely to be exceeded. Conversely, for cracks outside the wheel track zones, provided the pavement surface is otherwise sound the expected minimum life in terms of skid and deformation resistance is likely to be exceeded.

8.4 The most onerous conditions occur typically during the summer months on heavily-trafficked, exposed carriageways with significant gradients in cuttings and on the surface of the pavements carried by elevated structures. In these situations, surface temperatures can approach or even exceed 50°C. Should surface temperatures exceed this figure for prolonged periods (such as in an exceptionally hot summer), the expected minimum life of the system in the wheel track zone may not be attained.

## Installation

### 9 General

9.1 Installation of the Safetrack (Flexible) Inlaid Road Repair System must be conducted in accordance with the Certificate holder's Installation Method Statement and this Certificate.

9.2 Traffic Management should be in accordance with the latest issue of the Department for Transport *Traffic Signs Manual*, Chapter 8, or as agreed between the purchaser and installer.

9.3 The ambient and road surface temperatures are recorded at the start and, if the weather is variable, during the installation process. Installation must only be carried out if the road surface temperature is above 0°C. The system must not be used during periods of continuous or heavy rain (see section 10.3).

9.4 The areas to which the system is to be applied must be clearly defined by the client prior to commencement of work on site.

9.5 In all cases, the installer must conduct a visual check on the installation for uneven surface texture and any other discernable faults, and carry out any remedial work as necessary.

## 10 Preparation of the road surface

10.1 The existing surface is mechanically planed out centrally over the length of the cracks to the required depth. The width of the recess must be formed to extend into sound existing surfacing.

10.2 The excavated areas are mechanically swept to remove all spoil, or arisings removed with dry blown air or vacuum extraction. Small areas may be hand swept.

10.3 The area must be dry before application which can be achieved with suitable drying equipment, with low heat but high air flow being preferred.

## 11 Application

### Slurry and resin filler versions

11.1 A draw box or similar is required to apply the product. Application is carried out to suit the width of the excavated recess.

11.2 For the slurry version, the material must be thoroughly stirred prior to use or splitting. The catalyst is then added and mixed thoroughly until homogeneous.

11.3 For the resin and filler version, the catalyst is first added into the resin prior to mixing in the fillers.

11.4 The mixed material is immediately poured into the draw box and pulled over the surface to fill the prepared recess.

11.5 The material must be finished with dry aggregate (typically 2 kg·m<sup>2</sup>) which must be broadcast within the time specified in the technical data sheet of the product.

11.6 Once the material is cured<sup>(1)</sup>, the area is swept clean of any loose aggregate before the site is re-opened to traffic.

(1) According to the technical specification of the product.

### Material for machine application

11.7 The product can be formulated to be applied by machine, using appropriate proportioning and mixing devices, to give continuous delivery to a draw box fitted to a vehicle to suit the width of the prepared recess.

11.8 Mixing equipment must be approved by the Certificate holder and subject to a defined calibration schedule to ensure that the components are mixed in the correct proportions defined by the Certificate holder.

11.9 The application instructions given in sections 11.5 and 11.6 must then be followed.

### Material for depths up to 300 mm

11.10 A draw box or similar is required to apply the product. Application is carried out to suit the width of the excavated area. The material can either be poured directly from the pail (hand application) or extruded (machine application).

11.11 The slurry material must be mixed thoroughly prior to use, the catalyst added, and applied immediately (hand application). Machine application must follow the method of application approved by the Certificate holder.

11.12 Depending on the total depth it may be practical to apply the material up in layers and allow it to cure, this ensures the ducting remains in-situ prior to full reinstatement. An initial layer over the ducting of 50 mm is recommended, with subsequent layers of 50 to 100 mm.

11.13 If no coloured indicator layer is used then the final layer should finish flush with the adjacent surface and blinded aggregate. If a coloured indicator layer is used this should be applied to within 10 mm of the road surface and allowed to cure. A final layer to match the adjacent substrate is then applied and it must be finished with dry aggregate (typically 2 kg·m<sup>2</sup>) which must be broadcasted within the time specified in the technical data sheet of the product.

## 12 Repair

12.1 Should the system become worn over time, the surface can be reinstated by re-application of new material over the existing. Removal of the existing system is not required if it remains well adhered to the substrate as the material will bond to itself after any period of time so can be over-coated (see sections 11.4 to 11.6 of this Certificate).

12.2 The existing material and adjacent road surface must be clean, dry and free from any contamination that may affect the adhesion of the fresh material. If uncertain, bond tests must be carried out to ensure that adequate adhesion can be achieved.

12.3 Contaminated or debonded from the substrate material needs removing or cleaning prior to application of fresh material. Debonded material must be cut back to sound material and the fresh material butted up to and lapped onto the adjacent material.

12.4 The finished repair must be checked to ensure that it does not stand too proud of the adjacent road surface.

## 13 Tests

13.1 Laboratory performance tests were carried out on the Safetrack (Flexible) Inlaid Road Repair System in accordance with the requirements of the Guidelines Document, the results of which were satisfactory.

13.2 Characterisation tests were carried out, including infra-red analysis and tensile strength/elongation of the binder component.

13.3 The tests and requirements are given in Table 1.

*Table 1 Laboratory performance tests on the system*

Test	Requirement for Grade F <sup>(1)</sup>	Method <sup>(2)</sup>
Skid resistance value (SRV)		
initial	≥60	Appendix A, Method 1
retention <sup>(3)</sup>	≥50	Appendix A, Method 1
Rut resistance		
rate (mm·h <sup>-1</sup> )	≥5	Appendix A, Method 4
depth (mm)	≥7	Appendix A, Method 4
Tensile bond (N·mm <sup>-2</sup> ) <sup>(4)</sup>		
control	≥0.5	TRL Report 176, Appendix J
heat aged <sup>(5)</sup>	≥60% of control value	TRL Report 176, Appendix J
Elongation(%)	≥30	Appendix A, Method 7
Texture depth (mm)		
initial	≥1.5	Appendix A, Method 5
retention <sup>(3)</sup>	≥0.75	Appendix A, Method 5

(1) Requirements as defined in the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways*.

(2) Test methods are defined in Appendix A of the Guidelines Document.

(3) Conducted after the wheel tracking at 50°C.

(4) Conducted on both asphalt and concrete substrates.

(5) Heat aged 28 days at 70 ±2°C.

## 14 Investigations

14.1 An installation trial was carried out to assess the practicability of the installation in accordance with the Certificate holder's procedures. An assessment of the results of SRV and texture depth tests carried out on the installation was satisfactory.

14.2 A user/specifier survey and visits to existing sites were carried out to assess the system's performance and durability.

14.3 The intercoat adhesion between new and aged systems was assessed for the purpose of repairs and found to be acceptable.

14.4 The installation of machine mixed and applied material was assessed and found to be suitable.

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

## Bibliography

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

*Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways*, October 2010

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works*, Series 700, clause 711 Overbanding and Inlaid Crack Sealing Systems, February 2016

Manual of Contract Documents for Highway Works, Volume 2 *Notes for Guidance on the Specification for Highway Works*, Series NG700, clause NG711 Overbanding and Inlaid Crack Sealing Systems, February 2016

TRL Report 176 : 1997 *Laboratory tests on high-friction surfaces for highways*

## 15 Conditions

15.1 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.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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.