

## COLSTRIPS CRACK SEALING SYSTEMS FOR HIGHWAYS

### COLSTRIPS ANTI-SKID OVERBANDING 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 Colstrips Anti-Skid Overbanding System, for use in sealing and repairing static cracks, reinstatement joints and fretted joints up to 5 mm wide and 20 mm deep in non-porous bituminous and concrete highways.

#### 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.



#### KEY FACTORS ASSESSED

**Performance** — the system meets the relevant requirements for overband 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 in both longitudinal and transverse directions of the carriageway and has a minimum life expectancy of three 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



*Claire Curtis-Thomas*

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Originally certificated on 30 October 2012

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.

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## Requirements

In the opinion of the BBA, the Colstrips Anti-Skid Overbanding 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 sections: 3 *Delivery and site handling* (3.2 and 3.5) of this Certificate.

## Technical Specification

### 1 Description

1.1 The Colstrips Anti-Skid Overbanding System is a torch-applied, black, anti-skid crack repair system supplied as a preformed layer in strips, nominally 3 mm thick, 35 mm wide and 1 metre in length.

1.2 The Colstrips Anti-Skid Overbanding System must be used with a primer on concrete surfaces and old- or polished-asphalt.

### 2 Manufacture

2.1 The system is an extruded thermoplastic binder comprising filler and pigment, dressed with factory-applied anti-skid glass aggregates on the upper surface.

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 is supplied in cardboard boxes, flat-packed in strips. Each box is marked with the Certificate holder's name and item description.

3.2 The system should be kept in its original packaging until ready for use, and protected against sunlight and moisture. It must be kept dry during storage, in transit and in use, and stored flat in temperatures above 2°C but not exceeding 32°C. Packages should not be stacked more than 25 units high.

3.3 Extra care must be taken when handling the system in temperatures below 10°C as it will be less flexible. Cutting the system will be easier if it can be maintained at temperatures in excess of this.

3.4 When stored correctly in unopened boxes in accordance with the Certificate holder's instructions, the system will have a shelf-life in excess of 12 months.

3.5 The system is not classified under the *CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures*. Suitable non-synthetic protective clothing should be worn during installation.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Colstrips Anti-Skid Overbanding System.

## Design Considerations

### 4 Use

4.1 The Colstrips Anti-Skid Overbanding System is satisfactory for use as an overbanding and sealing system for the repair of static cracks, reinstatement joints and fretted joints up to 5 mm wide and 20mm deep in non-porous bituminous<sup>(1)</sup> and concrete highway surfaces with texture depths not exceeding 2 mm.

(1) 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 use of a primer/sealer is necessary on non-bituminous surfaces (eg concrete) and old and/or polished asphalt.

4.3 Surfaces on which the system is to be installed must be horizontal or with very little slope.

### 5 Practicability of installation

The system is designed to 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 an overbanding system (see Table 1). This includes the minimum initial and investigatory skid resistance values of 60 and 50 respectively.

### 7 Maintenance

The system 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 has a minimum expected service life of three years and can be used to seal and repair cracks in both longitudinal and transverse directions of the carriageway.

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 and cracking is confined to the surfacing layer or layers, and these remain bonded to the road base, the three-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 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 typically occur during the summer months on heavily-trafficked, exposed carriageways and on the surface of 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 Colstrips Anti-Skid Overbanding System must be carried out in accordance with the Certificate holder's installation instructions and this Certificate.

9.2 Traffic management must 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 system must not be installed during periods of continuous or heavy rain.

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

### 10 Preparation of the road surface

10.1 All traces of sand, dirt, chemicals and oily substances are removed from the area of application using a stiff brush or high-pressure water jet, or by grinding.

10.2 The area to be treated, including down into the cracks, is dried thoroughly using a gas burner before installation commences.

### 11 Application

11.1 On non-bituminous surfaces, a primer/sealer is applied to the entire surface of the repair and allowed to dry until it is no longer sticky. The more porous the surface, the more primer will be required. The primer/sealer must be allowed to dry naturally, ie without assistance.

11.2 The system is laid onto the road surface with the 'beaded' topcoat facing upwards. Individual strips must be positioned correctly over the centre of the crack. At lower temperatures, a knife should be used to score the material, which is then carefully broken along the score. In warmer weather, it may be cut with scissors.

11.3 The system is heated using a powerful gas burner (minimum pressure 3 bar). The flame is moved slowly but steadily over the system above the surface so that heat is evenly applied. This is continued until all the material is liquid (approximately 200°C).

11.4 Sufficient heat has been applied when:

- the entire surface of the material is liquid and has started to bubble (as if boiling)
- the edges of the material have sealed against the road surface
- individual pieces or joins have fused together into one.

11.5 Insufficient heat application will result in inadequate bonding and failure. If the system is overheated, superficial scorching can occur and will appear as brown blotching. However, this will disappear once the repair is exposed to traffic and weather.

11.6 The system will cool down and harden within 5 to 10 minutes of the removal of the heat source, depending on the prevailing air temperature. If necessary, cooling down time can be accelerated by spraying the repair with cold water.

11.7 Once it has cooled sufficiently, the installation should be checked by attempting to lift parts of the system from the surface using a knife or chisel. This should be done both at the edges and by making 'V-shaped' cuts in the system. If the system can be lifted without evidence of asphalt on the underside (or, on non-bituminous surfaces, without evidence of surface parts on the underside of the system, or of the system still sticking to the road surface) insufficient

heat has been applied. In these instances, heat should be reapplied until adequate bonding has occurred. This should be done immediately, as any delay in completing the seal could result in moisture becoming trapped beneath it, rendering subsequent attempts to reseal it unsuccessful.

11.8 Road markings on cement/concrete surfaces may create adhesion difficulties even when using a recommended primer/sealer. The drying time of the cement/concrete and the transpiring of salts, alkalis and other additives or coloured pigments is difficult to evaluate and never consistent. Total elimination of chemical reactions is an extended process which can take weeks or even months after laying of the concrete.

## 12 Repair

Damage to the system can be repaired by removing the defective area and re-application in accordance with the Certificate holder’s instructions and the procedures described in section 11.

## Technical Investigations

### 13 Tests

13.1 A series of tests, the results of which were found to be satisfactory, were carried out on the bitumen binder used for the system and the results assessed to determine:

- cone penetration (initial and after heat ageing)
- resilience (initial and after heat ageing)
- flow resistance.

13.2 Laboratory performance tests were carried out on the Colstrips Anti-Skid Overbanding System in accordance with the requirements of the Guidelines Document, and the results were found to be satisfactory. The tests and requirements are given in Table 1.

13.3 Tests, including infra-red analysis, ash content, softening point, flow, resistance and tensile strength were carried out to characterise the bitumen binder used for the system.

*Table 1 Laboratory performance tests on the system*

Test	Requirement <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 3
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	
Wheel tracking at 50°C		
spread after wheeltracking (mm)	Record value	Appendix A, Method 2
deformation after wheel tracking (mm)	Record value	

(1) Requirements as defined in the Guidelines Document.

(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 for 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 Installation Method Statement. An assessment of the results of the SRV 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 in service.

14.3 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 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 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
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- 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.