HAPAS

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HAPAS Certificate
20/H304
Product Sheet 1

RHINO ASPHALT SOLUTIONS SURFACE TREATMENTS FOR HIGHWAYS

RHINO MASTERSCREED

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 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 Rhino Masterscreed, a hot hand-applied, single-layer surface treatment (nominal 7 mm depth), for the repair of areas of defective asphalt surfacing including full road widths limited to a maximum of 15 linear metres in length.

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

Surface characteristics — the system's initial and retained texture depth and skid resistance have been measured and are considered satisfactory (see section 6).

Mechanical resistance and bond to substrate — the system's resistance to abrasion and bond strength has been measured and is considered satisfactory (see section 7).

Durability — under normal service conditions and where the substrates are sound, the system will provide a satisfactory surface treatment which will extend the life of the existing surface (see section 9).

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: 2 October 2020

Hardy Giesler
Chief Executive Officer

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 MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.
Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

Requirements

In the opinion of the BBA, Rhino Masterscreed, when used in accordance with the provisions of this Certificate, will provide a satisfactory repair to delay the deterioration of a defective bituminous surface course.

Additional requirements of the Overseeing Organisations can be found in the:

- *Manual of Contract Documents for Highway Works* (MCHW)(1), Volume 1 *Specification for Highways Works* (SHW), Series 900, Clause 946 (July 2019)
- *Design Manual for Roads and Bridges* (DMRB), CD 227 *Design for pavement maintenance (Revision 0 : March 2020)*
- DMRB, CD 236 *Surface course materials for construction (Revision 4 : March 2020).*

(1) The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh 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 section: 3 *Delivery and site handling* of this Certificate.

Technical Specification

1 Description

Rhino Masterscreed is a hand-applied synthetic polymer modified compound incorporating fillers and granite aggregates to BS EN 13043 : 2002.

2 Manufacture

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 25 kg meltable polythene bags and should be stored under cover in the original packaging in a cool, well ventilated area and protected from direct sunlight.

3.2 The Certificate holder has taken the responsibility of classifying and labelling the system 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 Rhino Masterscreed.

Design Considerations

4 Use

4.1 Rhino Masterscreed is suitable for maintenance of bituminous surfaces courses, where the adjacent properties are considered at least equivalent to those of Rhino Masterscreed (see section 6), and where limited surface regulation is required.

4.2 The system will contribute to providing a uniform overall (continuous and full width) appearance on existing bituminous surface courses that have been subjected to a high number of reinstatements and patching, and/or are showing signs of early deterioration such as fretting or minor ravelling.

5 Practicability of installation

The system must only be installed by installers who have been trained and approved by the Certificate holder.

6 Surface characteristics

6.1 An assessment of the surface characteristics based on laboratory testing indicate that the system can achieve the following properties:

Table 1 Properties

	Skid resistance value (SRV)	Texture depth (mm)
Initial	88	2.4
After wheel tracking(1) at 50°	66	
After scuffing without prior conditioning(2)	64	1.5
After heat aging for 112 days at 70 ±3°C and scuffing(2)	66	1.9
After freeze/thaw and scuffing(2)	67	1.5

(1) In accordance to the BBA/HAPAS *Guidelines document for the Assessment and Certification of Crack Sealing Systems for Highways,* Method 2 — *Retention of skid resistance.*

(2) In accordance to the BBA/ HAPAS *Guidelines Document for the Assessment and Certification of High Friction Surfacing for Highways*, Appendix G:

- a polished stone value (PSV) of aggregate 65
- an aggregate abrasion value (AAV) of aggregate of 10.

6.2 Retained measurements on site will be affected by traffic and site stress levels, therefore the laboratory measurements may not be achieved in all cases.

6.3 The properties listed in section 6.1 should be compared to those of the existing adjacent surface to ensure the system is compatible. If the properties of the existing adjacent surface are unknown, the *Specification for the Reinstatement of Openings in Highways* (SROH), Section S2, provides additional guidance on categorising Local Authority sites. For the motorway and trunk road network, additional guidance can be found within the relevant parts of the MCHW, Volume 1 SHW, and the DMRB, CD 236 *Surface course materials for construction* (March 2020).

7 Mechanical resistance and bond to substrate

7.1 The system has a satisfactory resistance to trafficking, wear and bond characteristics (see section 6).

7.2 Results of laboratory tests for wear and stability indicate that the system has a satisfactory resistance to wear and will remain stable enough to withstand the traffic levels as identified in sections 4 and 6.

7.3 The tensile bond strength on dry bituminous substrates is considered satisfactory when installed in accordance with this Certificate. See Table 2 of this certificate.

Table 2 Tensile bond strength(1)

Temperature (°C)	Tensile adhesion N·mm^2
-10	1.32
20	1.71

(1) TRL Report 176, Appendix J.

8 Maintenance

The product is not subject to any routine maintenance requirements, but any damaged areas must be removed and replaced (see sections 11 and 12).

9 Durability

9.1 Provided that the substrate is structurally sound and that installation is carried out in accordance with the provisions of this Certificate, the product will contribute to extending the life of the existing surface.

9.2 Where there is evidence that the substrate is unstable or cracks have penetrated substantially through the underlying pavement, the expected durability will be reduced.

Installation

10 General

10.1 Installation of Rhino Masterscreed is conducted by installers who have been trained and approved by the Certificate holder, in accordance with the Certificate holder's instructions and the agreed BBA Installation Method Statement. Such an installer is a company which:

- employs operatives who have been trained and approved by the Certificate holder to install the system
- has undertaken to comply with the Certificate holder's application procedure
- is subject to supervision by the Certificate holder, including site inspections.

10.2 Traffic management should be in accordance with the *Department for Transport Traffic Signs Manual (2009)*, Chapter 8, or as agreed between the purchaser and installer.

10.3 The ambient and road surface temperatures are recorded at the start and, if the weather is variable, during the installation process. Installation should only be carried out when the surface is dry and road temperature is between 10 to 35°C. Where road surface temperature is below 10°C, the surface can be warmed by hot compressed air. The system must not be installed during periods of continuous or heavy rain.

10.4 The system is applied in one layer to a nominal depth of 7 mm.

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

11 Preparation of the road surface

11.1 The area to be treated must be marked out and any defects in the road surface greater than 7 mm must be reinstated with a material approved by the purchaser in consultation with the Certificate holder.

11.2 The road surface must be clean, dry, and free from ice, frost, loose aggregate, oil, grease, road salt and other loose matter likely to impair adhesion of the system to the road surfacing. Surface contamination must be removed by lancing with hot compressed air.

11.3 Existing road markings, ironwork, road edges of area to be treated and road studs may be masked. If this cannot be carried out, any spillages must be removed during the installation using specially designed scrapers.

12 Application procedure

12.1 The system is supplied in meltable polyethylene bags, the temperature of the product is raised to between 180 and 210°C and mixed until fully homogeneous.

12.2 The maximum safe heating temperature of Rhino Masterscreed is 230°C. Material should not be heated above this temperature as prolonged overheating could lead to degradation of the binder component, which will adversely affect system performance.

12.3 The hot mixed material is applied with a screed onto the prepared substrate. The Masterscreed compound is poured into a screed box with a suitably designed trailing edge to give an applied finish thickness of nominal 7 mm. Screeding of the material must be carried out across the prepared road surface depending on a constant rate and thickness to give an even texture, ensuring the box is topped up and joints remain level, neat and tidy. The application should be carried out transversely or longitudinally when more suitable, depending on the orientation of the prepared road surface

12.4 The finished surface will be regular in shape and screed finished to overlap the adjacent sound material.

12.5 A visual inspection must be carried out by the installer to check for any discernible faults. These should be repaired before the site is open to traffic, or as agreed with the purchaser.

12.6 Before opening to traffic the system must be allowed to set. During the setting period, no disturbance or trafficking the system is allowed.

13 Aftercare

The installer conducts a visual check for uniform surface texture, blemishes and any other discernible faults, and carries out any remedial works as necessary.

Technical Investigations

14 System Characteristics

Test data were assessed relating to:

- texture depth and SRV Control(1)
- texture depth and SRV after Scuffing at 35°C(1)
- texture depth and SRV after 112 days at (70 ±3)°C heat aging(1)
- texture depth and SRV after freeze/thaw(1)
- retained SRV, spread and thickness after wheel tracking at 50°C(2)
- PSV and AAV of aggregates to BS EN 1097-8 : 2009
- tensile bond to dry asphalt substrate to TRL Report 176, Appendix J at 20 and -10°C.

(1) In accordance with the BBA/HAPAS *Guidelines document for the assessment and certification of High Friction Surfacing for highways*, Appendix G.
(2) In accordance with the *BBA/HAPAS Guidelines document for the Assessment and Certification of Crack Sealing Systems for highways*, Method 2 — *Retention of Skid resistance.*

15 Investigations

15.1 A system installation performance trial on a worn HRA motorway site was carried out to assess the practicability of the installation. A visual inspection of the site concluded that it was free from significant faults. The initial SRV (inside the wheel track) was measured 86 and the texture depth higher than 3 mm. The site was revisited after 12 months and the retained SRV was measured at 79 and the texture depth higher than 1.8 mm. Results from the installation confirmed that that the system can be satisfactorily installed.

15.2 A user/specifier survey relating to existing sites that were at least two years old was carried out to confirm the system's performance in use. The responses confirmed that the expectation of users and satisfactory performance were being achieved.

15.3 A visual inspection carried out by the BBA of existing sites that were at least two years old, marked all sites as moderate to excellent condition with no significant defects

15.4 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 1097-8 : 2009 *Tests for mechanical and physical properties of aggregates — Determination of the polished stone value*

BS EN 13043 : 2002 *Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas*

Design Manual for Roads and Bridges, CD 227 *Design for pavement maintenance (Revision 0: March 2020)*
Design Manual for Roads and Bridges, CD 236 *Surface course materials for construction (Revision 4: March 2020)*

Guidelines document for the Assessment and Certification of Crack Sealing Systems for highways (October 2010)
Guidelines document for the assessment and certification of High Friction Surfacing for highways (March 2015)

Department for Transport Traffic Signs Manual (2009)

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works, Series 900 (July 2019)*

TRL Report 176 *Specification for the Reinstatement of Openings in Highways, (SROH), 4th Edition (February 2019)*

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.

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