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HAPAS Certificate
05/H112
Product Sheet 4

BREEDON THIN SURFACING SYSTEMS FOR HIGHWAYS

BREEDON POLYMER 10 mm THIN SURFACING 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 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 Breedon Polymer 10 mm Thin Surfacing System, a stone mastic asphalt for use as a thin surface course on new and maintenance road construction.

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 macrotexture — the system is designed to comply with the initial and retained texture depth requirements for an installed 10 mm upper aggregate size thin surface course in accordance with the MCHW, SHW, Volume 1, Clause 942, incorporating Interim Advice Note 154/12, Clause 921, Table 9/3SR and Table NG 9/32, and is satisfactory for use on roads with this requirement (see section 6).

Bond to substrate — the installed system can achieve a torque bond strength greater than 400 kPa and is satisfactory for use on roads with this requirement (see section 7).

Durability — the system can be designed to provide a durable surface course that will meet the MCHW, SHW, Volume 1, Clause 942, requirements for texture depth and bond strength (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 Second issue: 1 March 2017

Simon Wroe

Claire Curtis-Thomas

Originally certificated on 14 March 2016

Head of Approvals — Engineering

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 Breedon Polymer 10 mm Thin Surfacing System, when assessed in accordance with the BBA HAPAS *Guideline Document for the Assessment and Certification of Thin Surfacing 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 Highways Works (MCHW)*⁽¹⁾, *Specification for Highways Works (SHW)*, Volume 1, Series 900, Clause 942, incorporating Interim Advice Note 154/12.

(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* of this Certificate.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking the stone mastic asphalt in accordance with harmonised European Standard BS EN 13108-5 : 2016. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 The Breedon Polymer 10 mm Thin Surfacing System is a stone mastic asphalt thin surface course, consisting of a polymer-modified bitumen to BS EN 14023 : 2010 and limestone filler and fine and coarse aggregates to BS EN 13043 : 2002.

1.2 The system is used in conjunction with a spray-applied, bitumen emulsion tack or bond coat conforming to BS EN 13808 : 2013.

1.3 Ancillary items used with the system but outside the scope of this Certificate include:

- joint preparation — hot-applied 40/60 penetration bitumen to BS EN 12591 : 2009, hot elastomeric polymer modified bitumen (with a penetration not less than 40 in accordance with BS EN 14023 : 2010) and/or cold-applied thixotropic bituminous compound
- tack coat — C40 B 4 (K1-40) or C60 B 4 (K1-60) bitumen emulsion tack coat conforming to BS EN 13808 : 2013, for use on small areas not accessible by machine application.

2 Manufacture

2.1 The system is manufactured using conventional asphalt production methods.

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 Breedon Southern Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM 33936).

3 Delivery and site handling

3.1 The product is delivered to site in bulk in insulated vehicles.

3.2 Bond and tack coats may be delivered to site either in bulk by tanker or in 205 litre drums.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Breedon Polymer 10 mm Thin Surfacing System.

Design Considerations

4 General

4.1 The Breedon Polymer 10 mm Thin Surfacing System can be designed to meet or contribute to meeting the relevant installed requirements of the MCHW, SHW, Volume 1, Series 900, Clause 942, incorporating Interim Advice Note 154/12.

4.2 The system is satisfactory for use on bituminous or concrete substrates, provided they are stable and have sufficient loadbearing strength to support the loads imposed during installation and in service.

4.3 Guidance on evaluating the condition of an existing surface is provided in the *Design Manual for Roads and Bridges* (DMRB)⁽¹⁾, HD 30/08, 7.3.3.

4.4 Guidance on appropriate surfacing selection is provided in the DMRB⁽¹⁾, HD 36/06, 7.5.1. Local Authorities may have different criteria, which should be taken into consideration.

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

5 Practicability of installation

The system is installed only by contractors approved by the Certificate holder using conventional paving equipment (see the *Installation* part of this Certificate).

6 Surface macrotexture

The system can be designed to comply with the initial and retained texture depth requirements for an installed 10 mm upper aggregate size thin surfacing system in accordance with the MCHW, SHW, Volume 1, Clause 942, incorporating Interim Advice Note 154/12, Clause 921, Table 9/3SR and Table NG 9/32, and is satisfactory for use on roads with this requirement.

7 Bond to substrate

The torque bond strength of the system measured greater than 400 kPa and meets the minimum requirement of the BBA HAPAS *Guideline Document for the Assessment and Certification of Thin Surfacing Systems for Highways*, Table B.5.

8 Maintenance

The system is not subject to any routine maintenance requirements. However, any damage must be repaired (see section 14).

9 Durability

When installed in accordance with this Certificate, the system will provide a durable surface course for new and maintenance road construction in accordance with the MCHW, SHW, Volume 1, Series 900, Clause 942, incorporating Interim Advice Note 154/12.

Installation

10 General

10.1 Application of the system, within the context of this Certificate, is carried out by installers recommended or recognised by the Certificate holder. Such an installer is a company:

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

10.2 As part of the assessment and ongoing surveillance of the quality of installation of the system, the BBA has:

- agreed the quality control procedures and testing to be undertaken
- monitored the process and verified that it is in accordance with the documented procedures
- 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 quality control operated is being maintained.

10.3 The system must be installed in accordance with the Certificate holder's installation procedures, incorporating the guidance provided in BS 594987 : 2015.

10.4 The system can be applied to bituminous or concrete substrates at a nominal layer thickness of between 25 and 50 mm in depth on roads installed in accordance with the MCHW, SHW, Volume 1, Series 900, Clause 942. The minimum thickness at any point must not fall below 20 mm.

10.5 Provided the substrate is free from standing water or ice and the minimum rolling temperature can be achieved, the system can be installed at a minimum ambient temperature of -1°C measured on a rising thermometer.

11 Substrate preparation

11.1 The substrate must be prepared in accordance with BS 594987 : 2015, Section 5.

11.2 Bitumen emulsion bond coat is spray-applied to achieve a minimum $0.15 \text{ kg}\cdot\text{m}^{-2}$ residual bitumen depending on the porosity and binder content of the receiving layer, at a temperature $\geq 80^{\circ}\text{C}$.

11.3 For small areas and detailing, the bitumen emulsion tack or bond coat must be applied leaving a uniform coating, using appropriate hand-held equipment.

11.4 The emulsion must be allowed to break (change from brown to black) prior to the application of the system.

12 Laying and compaction procedures

12.1 Machine and hand installation must follow the requirements of BS 594987 : 2015, Sections 6.3, 6.4 and 6.7.

12.2 Compaction must follow the requirements of BS 594987 : 2015, Sections 9.2 and 9.3.

12.3 Rolling and compaction must commence as soon as possible above the minimum rolling temperature of 115°C .

13 Joints

All joints must be prepared in accordance with BS 594987 : 2015, Sections 6.8.1 and 6.8.2. They must be saw cut to a full depth vertical face, cleaned, and painted with a thick uniform coating of joint preparation as identified in section 1.3.

14 Repair

Any damaged areas must be cut back to sound material by planing or other suitable means and replaced with a material appropriate to the location, traffic and area of reinstatement. Materials must be selected in agreement with the Certificate holder and the purchaser.

Technical Investigations

15 Tests

An assessment was made of data supplied as part of installation trials and of test data to BS EN 13108-5 : 2016, and in accordance with the *Guideline Document for the Assessment and Certification of Thin Surfacing for Highways* in relation to:

- texture depth
- wheel tracking (resistance to permanent deformation)*
- torque bond
- visual condition of system installation and performance trial (SIPT).

16 Investigations

16.1 An installation trial was carried out to assess the practicability of the installation and on-site quality control procedures. A visual inspection of the site concluded that it was free from significant abnormalities. Results from the installation trial confirmed that it complied with the contractual requirements.

16.2 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.

16.3 The manufacturing process was evaluated by inspection of a typical coating plant, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used. The inspection confirmed that the plant operated in accordance with the requirements of the Quality Plan agreed with the BBA.

16.4 Data gathered from an installation trial show that, when laid at a nominal thickness of 40 mm on a road of Stress Level 1⁽¹⁾ and estimated Traffic Level⁽²⁾ of 410 cv/l/d, the system will meet clause 942, Interim Advice Note 154/12, clause 921, Table 9/3SR and Table NG 9/32 requirements for initial and retained surface macrotexture. The initial texture measured was 1.5 mm and the retained texture was 0.9 mm.

(1) Site Stress Levels are defined in Interim Advice Note 154/12, Clauses NG942SR and NG9/27.

(2) Traffic levels are defined as commercial vehicles/lane/day (cv/l/d).

Bibliography

- BS 594987 : 2015 *Asphalt for roads and other paved areas — Specification for transport, laying, compaction and product-type testing protocols*
- BS EN 12591 : 2009 *Bitumen and bituminous binders — Specifications for paving grade bitumens*
- BS EN 13043 : 2002 *Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas*
- BS EN 13108-5 : 2016 *Bituminous mixtures — Material specifications — Stone mastic asphalt*
- BS EN 13808 : 2013 *Bitumen and bituminous binders — Framework for specifying cationic bituminous emulsions*
- BS EN 14023 : 2010 *Bitumen and bituminous binders — Specification framework for polymer modified bitumens*
- BS EN ISO 9001 : 2008 *Quality management systems — Requirements*
- Guideline Document for the Assessment and Certification of Thin Surfacing Systems for Highways*, January 2000 and May 2008
- HD 30/08 *Design Manual for Roads and Bridges : Volume 7, Pavement Design and Maintenance : Section 3, Pavement Maintenance Assessment : Part 3, Maintenance Assessment Procedure*
- HD 36/06 *Design Manual for Roads and Bridges : Volume 7, Pavement Design and Maintenance : Section 5, Pavement Materials : Part 1, Surfacing Materials for New and Maintenance Construction*
- IAN 154/12 *Revision of SHW Clause 903, Clause 921 and Clause 942*
- Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 900 Road pavements — bituminous bound materials*

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.