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HAPAS Certificate
03/H085
Product Sheet 2

NORTHSTONE THIN SURFACING SYSTEMS FOR HIGHWAYS

MAXPHALTE 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 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 MAXPHALTE 10 mm Thin Surfacing System, a polymer-modified asphalt concrete for use as a 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

Resistance to permanent deformation — the system complies with the requirements of PD 6691 : 2015, Appendix D, Table D.2, for a Class 2 site (see section 6).

Surface macrotexture — the system satisfies the required initial and retained macrotexture depths for an installed 10 mm upper aggregate size thin surface course system for high speed roads as defined in the *Manual of Contract for Highways Works* (MCHW), Volume 1, Series 900, Clauses 942.19 Table 9/12 and 942.20 Table 9/14 (see section 7).

Water Sensitivity — the system can achieve category ITSRmin70 and so complies with the requirements of the MCHW, Volume 1, Series 900, Clause 942.9 (see section 8).

Bond to substrate — the installed system can achieve a torque bond strength greater than 400 kPa as required by the MCHW, Volume 1, Series 900, Clause 942, Table 9/15 (see section 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, Volume 1 SHW, Series 900, Clauses 942.19 and 942.20, and Table 9/12, for high speed roads (see section 11).

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

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Originally certified on 19 December 2014

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Requirements

In the opinion of the BBA, the MAXPHALTE 10 mm Thin Surfacing System, when assessed in accordance with the MCHW, Volume 1 *Specifications for Highway Works* (SHW), Series 900, Clause 942 (05/18), and used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the requirements of the specified document for a thin surface course system.

(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.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking the asphalt concrete in accordance with harmonised European standard BS EN 13108-1 :2006.

Technical Specification

1 Description

1.1 The MAXPHALTE 10 mm Thin Surfacing System is an asphalt concrete surface course, consisting of a polymer-modified bitumen to BS EN 14023 : 2010, 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 coat conforming to BS EN 13808 : 2013, or a proprietary polymer-modified bitumen emulsion bond coat.

1.3 Ancillary items used with the system include:

- joint preparation — hot applied 40/60 penetration bitumen to BS EN 12591 : 2009
- tack coat — C40 B 4 (K1-40) 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 Northstone (NI) Ltd has been assessed and registered as satisfying the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate FM 36203).

3 Delivery and site handling

3.1 The system components are delivered 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.

3.3 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 and 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 MAXPHALTE 10 mm Thin Surfacing System.

Design Considerations

4 Use

4.1 The MAXPHALTE 10 mm Thin Surfacing System can be designed to satisfy or contribute to satisfying the relevant installation requirements of the MCHW, Volume 1 SHW, Series 900, Clause 942.

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 service.

4.3 Guidance on evaluating the condition of an existing surface is provided in the *Design Manual for Roads and Bridges* (DMRB)(1), CD 227 *Design for Pavement Maintenance, Revision 0 (03/20)*.

4.4 Guidance on appropriate surfacing selection is provided in the DMRB(1), CD 236 *Surface course materials for construction*, *Revision 4 (03/20).* Local Authorities may have different criteria, which should be taken into consideration.

(1) The Design Manual for Roads and Bridges is operated by the Overseeing Organisations: The Highways England (HE), Transport Scotland, the Welsh Government and the Department for Infrastructure (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 Resistance to permanent deformation

The resistance to permanent deformation of the system complies with the requirements of PD 6691 : 2015, Appendix D, Table D.2, for Class 2 sites.

7 Surface macrotexture depth

7.1 The initial surface macrotexture depth of the system was recorded as between 1.1 and 1.6 mm. This complies with the initial macrotexture depth requirements for an installed 10 mm upper (*D)* aggregate size thin surface course system as defined in the MCHW, Volume 1, Series 900, Clause 942, Table 9/12.

7.2 The retained surface macrotexture depth of the system has been recorded as greater than 0.8 mm and so satisfies the requirements for an installed 10 mm upper (*D)* aggregate size thin surface course system as defined in the MCHW, Volume 1, Series 900, Clause 942, Table 9/14.

8 Water sensitivity

The water sensitivity for the system satisfies the requirements of the MCHW, Volume 1, Series 900, Clause 942.9. The system complies with category ITSRmin70.

9 Bond to substrate

The torque bond strength for the system measured according to MCHW, Volume 1, Series 900, Clause 951 (05/18) is greater than 400 kPa and so satisfies the minimum requirements of the MCHW, Volume 1, Series 900, Clause 942.21, Table 9/15.

10 Maintenance

The system is not subject to any routine maintenance requirements. However, any damage must be repaired (see section 16).

11 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, Volume 1 SHW, Series 900, Clauses 942.19 and 942.20, and Table 9/12, for high speed roads.

Installation

12 General

12.1 Application of the system, within the context of this Certificate, is carried out by installers approved by the Certificate holder. 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.

12.2 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.

12.3 The system must be installed in accordance with the Certificate holder's installation method statement, incorporating guidance provided in BS 594987 : 2015 and this Certificate.

12.4 The system can be applied to bituminous or concrete substrates at a nominal layer thickness of between 25 and 40 mm in depth on roads installed in accordance with the MCHW, Volume 1 SHW, Series 900, Clause 942.

12.5 Provided the substrate is free from standing water or ice and that the minimum rolling temperature can be achieved, the system can be installed at a minimum ambient temperature of 5°C (taking into account wind chill) and a surface temperature greater than 0°C.

13 Substrate preparation

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

13.2 Bitumen emulsion bond coat or tack coat is spray applied to achieve a minimum 0.35 $kg \cdot m^{-2}$ residual bitumen.

13.3 For small areas and detailing, bitumen emulsion tack coat can be applied leaving a uniform coating, using appropriate hand-held equipment.

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

14 Laying and compaction procedures

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

14.2 Compaction must follow the requirements of BS 594987 : 2015, Sections 9.2 and 9.3 and the Certificate holder's installation method statement.

14.3 The minimum rolling temperature shall not fall below 110 °C.This must be identified by the Certificate holder prior to the commencement of installation.

15 Joints

All joints must be prepared in accordance with the requirements of the MCHW Volume 1 SHW, Series 900, Clauses 903.21 to 903.25, the BS 594987 : 2015, Sections 6.8.1 and 6.8.2, and the certificate holder's installation method statement.

16 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 re-instatement. Materials must be selected in agreement with the Certificate holder and the purchaser.

Technical Investigations

17 Product characteristics

Data supplied as part of the Assessment and test data from the System Installation Performance Trial (SIPT) have been evaluated against the requirements and in accordance with the MCHW, Volume 1 SHW, Series 900, Clause 942 (05/18). See Table 1 of this Certificate.

Table 1 Installed performance characteristics

Property	Parameter	Requirements met
Durability	Initial Surface macrotexture depth	1.1 – 1.6mm at opening to traffic
	Surface macrotexture depth(trafficked)	> 0.8mm 2 years after opening to traffic
Bond to substrate	Torque bond	≥ 400 kPa
Resistance to permanent deformation	WTS_{AIR}	Class 2, PD6691 : 2015
	PRD_{AIR}	Table D.2
Sensitivity to water	$ITSR_{MIN}$	≥ 70
Visual Inspection	Visual Condition at opening to traffic	Good or Excellent
	Visual Condition 12 months after opening to traffic	Good or Excellent
	Visual Condition 24 months after opening to traffic	Good or Excellent

18 Investigations

18.1 A SIPT 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 faults. Results from the installation confirmed that it complied with the MCHW, Volume 1, Series 900, Clause 942, Table 9/15.

18.2 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.

18.3 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 and Quality System agreed with the BBA.

Bibliography

BS 594987 : 2015 + A1 : 2017 *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 13108-1 : 2006 *Bituminous mixtures — Material specifications — Asphalt Concrete*

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 : 2015 *Quality management systems — Requirements*

CD 227 - Design Manual for Roads and Bridges : *Design for Pavement Maintenance, Revision 0, (03/20)*
CD 236 - Design Manual for Roads and Bridges : *Surface course materials for construction, Revision 4, (03/20*)

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works*, Series 900 *Road pavements — bituminous bound materials*

PD 6691 : 2015 + A1 : 2016 *Guidance on the use of BS EN 13108, Bituminous mixtures — Material specifications*

19 Conditions

19.1 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.

19.2 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.

19.3 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.

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

19.5 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.

19.6 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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