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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

HAPAS Certificate
00/H042
Product Sheet 1

TARMAC THIN SURFACING SYSTEMS FOR HIGHWAYS

ULTIFLEX 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 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 ULTIFLEX 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

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 surfacing system in accordance with the MCHW, Volume 1, SHW, Clause 942, incorporating Interim Advice Note 154/12, Clause 921, Tables 9/3SR and 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).

Noise — the measured road surface influence indicates that the system will generate less road traffic noise than a hot-rolled asphalt with a 2 mm surface macrotexture and meets the requirements of Level 3 in accordance with Table NG 9/30 of Interim Advice Note 154/12 (see section 8).

Durability — the system can be designed to provide a durable surface course that will meet the MCHW, Volume 1, SHW, Clause 942 requirements for texture depth and bond strength (see section 10).

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 Fourth issue: 6 March 2018

Originally certificated on 3 February 2012

Paul Valentine
Technical Excellence Director

Claire Curtis-Thomas
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 ULTIFLEX 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], Volume 1 *Specification for Highways Works* (SHW), 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 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 : 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 ULTIFLEX 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 or a cold-applied, thixotropic bitumen emulsion, for use on all cut joints
- 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 Tarmac Trading Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM 503516).

3 Delivery and site handling

3.1 The system components are 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.

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 ULTIFLEX 10 mm Thin Surfacing System.

Design Considerations

4 Use

4.1 The ULTIFLEX 10 mm Thin Surfacing System can be designed to meet or contribute to meeting the relevant installed requirements of the MCHW, Volume 1, SHW, 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 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 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 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 surfacing system in accordance with the MCHW, Volume 1, SHW, Clause 942, incorporating Interim Advice Note 154/12, Clause 921, Tables 9/3SR and NG 9/32, and is satisfactory for use on roads with this requirement.

7 Bond to substrate

The torque bond strength for the system measured greater than 400 kPa and meets the minimum requirement of Table B.5 of the Guideline Document.

8 Noise

8.1 The road surface influence (RSI_H) was recorded as -5.5 [dB (A)]. The system meets the requirements of Level 3 in accordance with Table NG 9/30 of Interim Advice Note 154/12.

8.2 Road traffic noise levels will be affected by several factors, including location, traffic type and the condition of the road, and therefore the RSI_H value may not be reproduced on other installations.

9 Maintenance

The system is not subject to any routine maintenance requirements. However, any damage must be repaired (see section 15).

10 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, Clause 942, incorporating Interim Advice Note 154/12.

Installation

11 General

11.1 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 which:

- employs 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.

11.2 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.

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

11.4 The system can be applied to bituminous or concrete substrates at a nominal layer thickness of between 20 and 50 mm in depth on roads installed in accordance with the MCHW, Volume 1, SHW, Series 900, Clause 942. The minimum thickness at any point must not fall below 15 mm.

11.5 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 –1°C measured on a rising thermometer. For lifts of less than 25 mm nominal thickness, laying must cease if the air temperature falls below 5°C.

12 Substrate preparation

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

12.2 Bitumen emulsion bond coat or tack coat is spray-applied to achieve a minimum 0.3 $kg \cdot m^{-2}$ residual bitumen on concrete and 0.15 to 0.35 $kg \cdot m^{-2}$ on bitumen substrates. Bitumen emulsion tack coat can only be applied when the installed depth is to be greater than 30 mm on bituminous substrates.

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

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

13 Laying and compaction procedures

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

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

13.3 Rolling and compaction must commence as soon as possible above the minimum rolling temperature. The temperature is binder specific and will be between 110 and 135°C. This must be identified by the Certificate holder prior to the commencement of installation.

14 Joints

14.1 All joints must be prepared in accordance with BS 594987 : 2015, Sections 6.8.1 and 6.8.2. Any cut joints 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.

14.2 Cold longitudinal joints must be either:

- cut to a full-depth vertical face and painted prior to matching, or
- formed into a chamfer during the laying process and subsequently painted prior to matching. Chamfers must be at an angle of 70 to 80° rather than a vertical right angle.

14.3 Hot longitudinal joints may be hot matched, provided that the temperature of the earlier laid mat is at least 120°C.

15 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

16 Tests

An assessment was made of data supplied as part of installation trials and of test data to BS EN 13108-1 : 2016, and in accordance with the *Guideline Document for the Assessment and Certification of Thin Surfacing Systems* for Highways in relation to:

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

17 Investigations

17.1 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 confirmed that it complied with the contractual requirements.

17.2 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.

17.3 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.

17.4 Data gathered from a monitored installation trial showed that when laid at a nominal thickness of 25 mm on a road of Stress Level 1(1) and estimated Traffic Level(2) of 3300 cv/l/d the system will meet clause 942, Interim Advice Note 154/12, clause 921, Tables 9/3SR and NG 9/32 requirements for initial and retained surface macrotexture. The initial texture measured was 1.6 mm and the retained texture was >1.0 mm.

(1) Site Stress Levels are defined in the Guideline Document, Appendix C.

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

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 : 2016 *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 : 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*

18 Conditions

18.1 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.

18.2 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.

18.3 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.

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

18.5 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.

18.6 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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