HAPAS

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HAPAS Certificate
21/H310
Product Sheet 1

GCP APPLIED TECHNOLOGIES HIGH-FRICTION SURFACING SYSTEM

SAFETRACK HFS

This HAPAS Certificate Product Sheet(1) is issued by the British Board of Agrément (BBA), supported by National Highways (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 SAFETRACK HFS, a high-friction surfacing system for use on 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
- formal three-yearly review.

KEY FACTORS ASSESSED

Performance — the system complies with the requirements for a Type 1 system in accordance with the *BBA HAPAS Guidelines Document for the Assessment and Certification of High-Friction Surfacing for Highways* (see Table 1).

Durability — when used in an appropriate location as defined in the *BBA HAPAS Guidelines Document for the Assessment and Certification of High-Friction Surfacing for Highways*, the system should have a service life of between 5 and 10 years (see section 7).

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 Third issue: 16 September 2022

Originally certificated on 8 July 2021.

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 are advised to check the validity and latest issue number of this HAPAS 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.

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Requirements

In the opinion of the BBA, SAFETRACK HFS, when assessed in accordance with the BBA HAPAS *Guidelines Document for the Assessment and Certification of High-Friction Surfacing for Highways* (hereinafter referred to as 'Guidelines Document') and used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the following requirements of the *Manual of Contract Documents for Highways Works* (MCHW)(1), Volume 1 *Specification for Highways Works* (SHW), Series 900, Clause 924.

(1) The MCHW is operated by the Overseeing Organisations: National Highways, 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 sections: 3 *Delivery and site handling* and 9 *Precautions during Installation* of this Certificate.

Technical Specification

1 Description

1.1 SAFETRACK HFS is a high-friction surfacing system, comprising a MMA based ESSELAC resin binder and a BPO powder catalyst, broadcast with a graded (1 to 3 mm) Chinese, Guyanan or Indian calcined bauxite aggregate.

1.2 The system is available as both hand- and machine-applied grades.

1.3 The hand-applied grade consists of a liquid resin component and BPO powder catalyst. The machine-applied grade consists of two liquid resin components, Parts A and B, and BPO powder catalyst. The catalyst is added to the resin Part B, which is pigmented grey.

1.4 For new, porous or open-textured bituminous substrates, Metaset Scratchcoat may be used as a pre-treatment to reduce the system binder consumption.

2 Manufacture

2.1 SAFETRACK HFS and Metaset Scratchcoat are manufactured by batch-blending processes.

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 being operated by the manufacturer are being maintained.

2.3 The management system of GCP Applied Technologies (UK) Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by Alcumus ISOQAR (Certificate 15174 QMS-002).

3 Delivery and site handling

3.1 SAFETRACK HFS hand-applied grade is supplied in pre-weighed packages of 25 kg, or in 200 kg drums which can be pre-charged into lorry mounted tanks. The machine-applied grade is supplied in pre-weighed packages of 25 kg (Part A)

and 24.5 kg (Part B), or 200 kg (Part A) and 196 kg (Part B). The BPO powder catalyst is supplied in pre-weighed 250 g bags.

3.2 The Metaset Scratchcoat kit comprises the resin, filler and BPO components, supplied in pre-weighed packages of 4.18 kg (resin) and 20 kg (A1 filler). The BPO powder catalyst is supplied in pre-weighed bags of 70 or 120 g.

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, 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 Safetrack HFS.

Design Considerations

4 Use

4.1 SAFETRACK HFS is satisfactory for use as a high-friction surfacing system on bituminous and concrete highways (without the use of a primer) with surface texture depth ≥0.5 mm, measured using the patch test as defined in BS 598-105 : 2000 or BS EN 13036-1 : 2010.

4.2 On bituminious highways with surface texture depths exceeding 2.0 mm, Metaset Scratchcoat can be used to pre-treat the surface (see section 11.1).

4.3 The system is classified as Type 1, in accordance with the requirements defined in the Guidelines Document, Table 1, and detailed in section 7 of this Certificate.

4.4 The in-service colour retention of the system has not been assessed and is outside the scope of this Certificate.

5 Practicability of installation

The system must be installed by a BBA Approved Installer(1). Operatives must be trained and approved by the Certificate holder.

(1) See also the BBA *Assessment and Surveillance Scheme for Installers of High-Friction Surfacing for Highways*.

6 Maintenance

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

7 Durability

7.1 The results of the performance tests and the performance of the system in use indicate that SAFETRACK HFS, when used in an appropriate location as defined in the Guidelines Document, should have a service life of between 5 and 10 years (see Table 1 of this Certificate).

Table 1 Area[1] of application by type classification

Site category[2]	Site definition	Maximum traffic levels — Type 1[3]
Q	Approaches to and across major junctions and approaches to roundabouts	3500
G1	Gradient from 5% to 10%, longer than 50 m	3500
S1	Bend radius <500 m – dual carriageway	3500
R	Roundabout	3500
G2	Gradient >10%, longer than 50 m	2500
S2	Bend radius <500 m – single carriageway	2500
K	Approaches to pedestrian crossing and other high-risk situations	2500

(1) Suitable areas for use of systems classified in accordance with the Guidelines Document, Table 1, to give an expected service life of 5 to 10 years.
(2) Site category as defined in CS 228.
(3) Commercial vehicles per lane per day.

7.2 If the system is used in other locations or at different traffic levels then the expected life will be increased or decreased in relation to the severity of the site.

Installation

8 General

8.1 The ambient and road surface temperatures should be recorded. Installation should not be carried out if the road surface temperature is outside the range of -5 to 50°C.

8.2 The Certificate holder is responsible for training and monitoring the BBA Approved Installers to ensure that the system is installed in accordance with the BBA agreed Method Statement and this Certificate.

9 Precautions during Installation

Health and Safety Data Sheets and the *Control of Substances Hazardous to Health Regulations 2002* (COSHH) risk assessments for the works must be deposited with the purchaser and be maintained on site by the approved installer.

10 Preparation

10.1 All imperfections in the road surface not acceptable to the installer should be reinstated with a material approved by the purchaser in consultation with the installer.

10.2 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.

10.3 Surface contamination may be removed using any suitable method agreed between the installer and purchaser including grit blasting, high-pressure water jetting, scabbling and hot compressed air. Oil contamination is removed by washing with a suitable detergent followed by flushing with clean water and drying.

10.4 Existing road markings, iron works and studs must be masked.

11 Pre-treatment

11.1 If the texture depth of the road is greater than 2.0 mm, Metaset Scratchcoat can be applied to adjust the texture depth to between 0.5 and 2.0 mm. Metaset Scratchcoat must be fully cured before application of SAFETRACK HFS.

11.2 The Metaset Scratchcoat resin component is shaken thoroughly and poured into a suitably sized container. The pre-weighed BPO powder catalyst is added to the resin and mixed until evenly dispersed. The pre-weighed filler is added and mixed until evenly dispersed and free from lumps.

11.3 The mixed material is spread onto the prepared surface with a flat bladed squeegee or similar tool, providing a coverage of approximately 2 $kg \cdot m^{-2}$ per mm texture.

12 Application

Hand-applied grade

12.1 When supplied in pre-weighed packages of 25 kg, the SAFETRACK HFS base component is mixed thoroughly. Whilst still mixing, the required amount of BPO powder catalyst is added and mixed until fully dispersed.

12.2 When supplied in 200 kg drums, the material is mixed thoroughly before charging into lorry mounted tanks (which can be pre-charged with SAFETRACK HFS prior to reaching the site). The resin is then decanted into a calibrated hopper to achieve 25 kg, then dropped into a suitable pail and mixed thoroughly. Whilst still mixing, the required amount of BPO powder catalyst is added and mixed until fully dispersed.

12.3 The mixed binder is spread in rows onto the prepared surface and spread with a serrated squeegee at a minimum coverage rate of 2.35 kg·m^2 for an unfilled asphalt substrate with a texture depth of 0.5 mm. The coverage rate will vary according to the texture depth and porosity of the surface.

12.4 Immediately after the binder is applied, calcined bauxite aggregate should be broadcast ensuring that the binder is fully covered. Typical coverage rate is 6 – 8 kg·m^2.

12.5 All masking is removed, and the system is allowed to set. During the setting period, no disturbance or trafficking the system is allowed.

12.6 Rolling of the aggregate is not permitted.

12.7 After the binder is sufficiently cured, the excess aggregate is removed by vacuum sweeper or other suitable means.

Machine-applied grade

12.8 Both Parts A and Part B are mixed thoroughly. Separate mixing paddles must be used for Parts A and Part B to avoid cross-contamination.

12.9 The required amount of BPO powder catalyst is added to Part B and mixed until fully dispersed. The BPO powder catalyst must not be added to Part A, as it will initiate an immediate reaction causing the resin to gel.

12.10 Parts A and Part B are placed using suitable plural component airless pump equipment, as required by the Certificate holder. Parts A and B must not be mixed together before putting through the pump.

12.11 For pumped or extruded application intended to be spread by hand, the system is pumped into rows onto the prepared surface and spread using a serrated squeegee to achieve a wet film thickness of 1.0 mm.

12.12 For sprayed application, spraying must be continuous and applied to achieve a minimum wet film thickness of 1.0 mm.

12.13 Minimum coverage rate for an unfilled asphalt substrate with a texture depth of 0.5 mm is 2.35 kg·m^2.

12.14 Immediately after the binder is applied, calcined bauxite aggregate should be broadcast ensuring that the binder is fully covered, at a typical coverage rate of 6 – 8 kg·m^2.

12.15 All masking is removed, and the system is allowed to set. During the setting period, there must be no disturbance, trafficking or rolling of the system.

12.16 After the binder is sufficiently cured, the excess aggregate is removed by vacuum sweeper or other suitable means.

13 After-care

The installer must conduct a visual check on the installation for uniform surface texture, surface blemishes and any discernible faults. Any remedial work must be conducted as necessary.

14 Repair

Should the system be damaged or become debonded from the substrate, it is repaired by cutting the damaged area back to firmly bonded material, cleaning the prepared area, masking the perimeter and reinstating to the original specification.

Technical Investigations

15 Tests

Laboratory performance tests were carried out on SAFETRACK HFS and the results are summarised in Tables 2 and 3 of this Certificate. The results of the tests comply with the requirements for a Type 1 system.

Table 2 Laboratory performance tests and requirements

Test	Parameter measured	Type 1 Requirements met	Method in TRL Report 176(1)
Scuffing at 45°C			
initial	Texture depth (mm)	≥1.4	Appendix G
after 500 wheel-passes	Texture depth (mm)	≥1.2	Appendix G
	Erosion index	≤3	
After heat ageing for 112 days at 70±3°C and 500 wheel-passes	Texture depth (mm	≥1.2	Appendix G
	Erosion index	≤5	
Wear			
initial	Texture depth (mm)	≥1.4	Appendix H
	SRV	≥65	
after 100 000 wheel-passes	Texture depth (mm	≥1.1	Appendix H
	Erosion index	≤3	
	SRV	≥70	
Tensile adhesion	Stress at –10±2°C (N·mm^{-2})	≥1.0	Appendix J
	Stress at 20±2°C (N·mm^{-2})	≥0.5	Appendix J

(1) Including any agreed amendments detailed in the Guidelines Document, Appendix D.

Table 3 Additional tests

Test	Parameter	Requirements met	Method in TRL Report 176(1)
Resistance to freeze/thaw	Texture depth/Erosion index	≥1.2 mm / ≤5	Appendix L
Resistance to diesel	Texture depth/Erosion index	≥1.2 mm / ≤5	Appendix M
Thermal movement	Thermal expansion coefficient	Record	Appendix N
Installation temperature test at -5°C	Texture depth/Erosion index	Initial ≥1.4,	Appendix P
Installation temperature test at 50°C	Texture depth/Erosion index	retained ≥1.2/≤3Initial ≥1.4, retained	Appendix P Appendix P
Application to negatively textured bituminous surfacing pre-treated with void filler	Texture depth/Erosion index	≥1.2/≤3Initial ≥1.4, retained	
Application to negatively textured bituminous surfacing without pre-treatment	Texture depth/Erosion index	≥1.2/≤3Initial ≥1.4, retained ≥1.2/≤3	

(1) Including any agreed amendments detailed in the Guidelines Document, Appendix D.

16 Investigations

16.1 An installation trial was carried out to assess the practicability of the installation and quality control/assurance procedures.

16.2 A user/specifier survey relating to existing sites, at least two years old, was carried out to assess the system's performance and durability.

16.3 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

BS 598-105 : 2000 *Sampling and examination of bituminous mixtures for roads and other paved areas — Methods of test for the determination of texture depth*

BS EN 13036-1 : 2010 *Road and airfield surface characteristics — Test methods — Measurement of pavement surface macrotexture depth using a volumetric patch technique*

BS EN ISO 9001 : 2015 *Quality Management Systems - Requirements*

BBA HAPAS *Guidelines Document for the Assessment and Certification of High-Friction Surfaces for Highways (2017) CS 228 : Skidding resistance, Revision 2, January 2021*

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works*, Series 900, Clause 924 (05/18)

TRL Report 176 : 1997 *Laboratory tests on high-friction surfaces for highways*

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.

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