

HITEX HIGH-FRICTION SURFACING SYSTEM

HITEX TYPE 1 THERMOPLASTIC

This HAPAS Certificate Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA), supported by the Highways Agency (HA) (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 Certificates are normally each subject to a review every three years.
(1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Hitex Type 1 Thermoplastic, a high-friction surfacing system for use on bituminous 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 *Guidelines Document for the Assessment and Certification of High-Friction Surfacing for Highways* (see Table 2).

Durability — the system, when used in an appropriate location as defined in the *Guidelines Document for the Assessment and Certification of High-Friction Surfacing for Highways*, 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



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Originally certificated on 26 February 2004

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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.

Requirements

In the opinion of the BBA, Hitex Type 1 Thermoplastic, when assessed in accordance with BBA HAPAS *Guidelines Document for the Assessment and Certification of High-Friction Surfacing 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 924.

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

Regulations

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1 and 3.2) and 9 *Precautions during installation* of this Certificate.

Technical Specification

1 Description

Hitex Type 1 Thermoplastic comprises a thermoplastic rosin ester binder incorporating graded calcined bauxite aggregates.

2 Manufacture

2.1 The material is manufactured by a batch-blending process. A series of quality control checks is conducted on each batch. The packaged material is identified by unique batch numbers which are recorded on a Certificate of Conformity prior to delivery on site.

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 Hitex has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate KM 93503).

3 Delivery and site handling

3.1 The material is delivered to site in granular form in 25 kg polythene bags. Each bag may also include a pre-weighed amount of pigment, if a coloured system is required.

3.2 The material has been classified as 'harmful by inhalation' under the European Regulation (EC) No 1272/2008 — *Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation)*, and the packaging bears the appropriate hazard warning label. Suitable personal protective clothing (eg gloves and eye protection) must be worn to prevent skin contact with hot material.

3.3 When stored in accordance with the Certificate holder's instructions the unopened material has a shelf-life of at least 12 months.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Hitex Type 1 Thermoplastic.

Design Considerations

4 General

4.1 Hitex Type 1 Thermoplastic is satisfactory for use as a high-friction surfacing system on highways with surface texture depths of between 0.5 mm and 2.0 mm, measured using the sand patch test as defined in BS 598-105 : 2000.

4.2 The system is classified as Type 1, in accordance with the requirements defined in Table 1 of the *Guidelines Document for the Assessment and Certification of High-Friction Surfacing for Highways* and detailed in section 7 of this Certificate.

4.3 The system is suitable for use on bituminous surfaces.

4.4 The suitability of the system for use on highways with concrete surfaces and the in-service colour retention of the system have not been assessed and are 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 *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 13).

7 Durability

7.1 The results of the performance tests and the performance of the system in use indicate that Hitex Type 1 Thermoplastic, when used in an appropriate location as defined in the *Guidelines Document for the Assessment and Certification of High-Friction Surfacing for Highways*, should have a service life of between 5 and 10 years (see Table 2).

Table 2 Area⁽¹⁾ of application by type classification

Site category (as defined in HD 28/04)	Site definition	Maximum traffic levels ⁽²⁾
		Type 1
Q	Approaches to and across major junctions and approaches to roundabouts	3500
G1	Gradient from 5% to 10%, longer than 50 m Bend radius <500 m – dual carriageway Roundabout	2500
S1		
R		
G2	Gradient >10%, longer than 50 m	2500
S2	Bend radius <500 m – single carriageway	
K	Approach to pedestrian crossing and other high-risk situations	2500

(1) Suitable areas for use of systems classified in accordance with Table 1 of the *Guidelines Document* to give an expected service life of 5 to 10 years.

(2) Commercial vehicles per lane per day.

7.2 If the system is used in other locations or at different traffic levels, 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 0°C to 35°C.

8.2 Installation of Hitex Type 1 Thermoplastic is only carried out by BBA Approved Installers⁽¹⁾ with trained operatives under competent supervision.

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

8.3 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 should 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, ironworks and studs must be masked.

10.5 The material is melted and mixed in a suitable boiler, fitted with a vertically- or horizontally-mounted agitator. The required amount of the material is loaded into the boiler and the temperature of the material raised to the application temperature range of between 180°C and 200°C, and mixed until fully homogeneous. The temperature of the mixed material is checked using a long-handled, digital temperature probe accurate to $\pm 2^\circ\text{C}$.

10.6 The molten material can be maintained at the maximum application temperature of 200°C for up to four hours with constant agitation, without serious degradation or discoloration.

10.7 The maximum safe heating temperature is 230°C and the material should not be heated above this as it will lead to degradation of the binder.

11 Application

11.1 The mixed material is discharged from the boiler into buckets and transferred to the screed box.

11.2 The material is applied to the prepared surface using a screed box with a suitably-designed trailing edge to give an applied finish of between 3 mm and 5 mm by combing transversely across the road surface. The aggregate should be evenly distributed to provide a well-textured finish, free from lumps and similar surface blemishes.

11.3 On a surface with an average texture depth of 1.5 mm the coverage rate should be between 11 kg·m⁻² and 12.5 kg·m⁻² (80–90 m² per tonne). This coverage rate may need to be increased on a more highly-textured surface.

12 After-care

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

13 Repair

Should the system be damaged or become debonded from the substrate it may be repaired by cutting out any loose material, cleaning the prepared area using hot compressed air or a propane torch, masking the perimeter and reinstating to the original specification. The repair should overlap the existing sound material as required, by a minimum of 25 mm.

Technical Investigations

14 Tests

Tests were conducted on Hitex Type 1 Thermoplastic and the results assessed to determine:

- scuffing
- texture depth
- erosion index
- effect of heat ageing
- wear
- skid resistance value
- tensile adhesion
- resistance to freeze/thaw
- resistance to diesel
- thermal movement.

15 Investigations

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

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

15.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of 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 ISO 9001 : 2008 *Quality management systems — Requirements*

Guidelines Document for the Assessment and Certification of High-Friction Surfacing for Highways

Conditions of Certification

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.