

HAPAS

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HAPAS Certificate

20/H298

Product Sheet 2 Issue 1

CRACK SEALING SYSTEMS FOR HIGHWAYS

MAXI-CRETE F20 AND F40 (FLEXIBLE) INLAID CRACK REPAIR SYSTEM

This Product Sheet⁽¹⁾ is issued by the British Board of Agrément (BBA). The Highways Authorities Product Approval Scheme (HAPAS) is supported by National Highways (NH) (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.

(1) Hereinafter referred to as 'Certificate'.

This Certificate relates to the Maxi-Crete F20 and F40 (Flexible) Inlaid Crack Repair System, a polymer-modified thermoplastic Grade F system, used to seal and repair cracks, fretted joints, reinstatement joints and slots in excess of 5 mm wide, or multiple adjacent cracks, in non-porous bituminous and concrete highway surfaces with texture depths not exceeding 2 mm, in accordance with the BBA HAPAS Guideline Document for the Assessment and Certification of Crack Sealing Systems for Highways and the Manual of Contract Documents for Highway Works (MCHW), Volume 1, Series 700, Clause 711.



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 complying with the requirements of the BBA HAPAS Certification Scheme according to the assessments set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 8 November 2024
Originally certificated on 15 February 2010

A handwritten signature in black ink, appearing to read 'Hardy Giesler'.

Hardy Giesler
Chief Executive Officer

This BBA HAPAS Certificate is issued under the BBA's accreditation to ISO/IEC 17065 (UKAS accredited Certification Body Number 0113).

Clauses marked † are additional information outside the scope of accreditation.

Readers MUST check the validity and latest issue number of this BBA HAPAS Certificate by referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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1 Product Description

1.1 The Certificate holder specifies the system under assessment, the Maxi-Crete F20 and F40 (Flexible) Inlaid Crack Repair System, a polymer-modified thermoplastic Grade F system, used to seal and repair cracks, fretted joints, reinstatement joints and slots in excess of 5 mm wide, or multiple adjacent cracks, in non-porous bituminous⁽¹⁾ and concrete highway surfaces with texture depths not exceeding 2 mm, in accordance with the BBA HAPAS *Guideline Document for the Assessment and Certification of Crack Sealing Systems for Highways* and the MCHW⁽²⁾, Volume 1, Series 700, Clause 711.

- (1) For the purpose of this Certificate, non-porous bituminous highway surfaces include hot-rolled asphalt, asphalt concrete, mastic asphalt and thin surfacing systems.
- (2) The MCHW is operated by National Highways (NH) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Government and the Department for Infrastructure, Northern Ireland).

1.2 The system comprises a hot-applied, polymer-modified thermoplastic binder, incorporating graded aggregates and other additives. The system is broadcast with a nominal 3 mm graded skid-resistant aggregate.

1.3 Aggregates approved for use in the system include granite, basalt, and calcined bauxite.

1.4 Creteprime CP Primer is essential to use with the system on concrete surfaces and has been assessed with the system.

2 Requirements

Requirements for the system are outlined in the BBA HAPAS Certification Scheme and Technical Specifications Documents, and have been established from the following specification documents:

- the MCHW, Volume 1, Series 700, Clause 711
- the MCHW, Volume 2, Series NG 700, Clause NG 711

3 Summary of Product Assessment

The system was assessed on the basis of the following characteristics in accordance with HAPAS requirements.

3.1 Binder characteristics

Table 1 Laboratory performance tests on the binder⁽¹⁾

Product assessed	Assessment method	Requirement ⁽²⁾	Outcome
Maxi-Crete F20 and F40 (Flexible) Inlaid Crack Repair System ⁽¹⁾	Cone penetration (dmm) to BS EN 13880-2 : 2003		
	Control	> 25	Pass
	Heat aged ⁽³⁾	≥ 60 % of control value	Pass
	Resilience (%) to BS EN 13880-3 : 2003		
	Control	Value achieved	64.0
	Heat aged ⁽³⁾	≥ 60 % of control value	Pass
	Flow resistance at 60 °C (mm) to BS EN 13880-5 : 2004	≤ 2	Pass

(1) Binder without aggregates.

(2) Requirements for Grade F inlaid crack sealing systems as defined in the BBA HAPAS Guidelines Document.

(3) Heat aged for 28 days at 70 (±2) °C.

3.1.1 The assessment showed that the system complies with HAPAS requirements for this characteristic.

3.2 Performance characteristics

Table 2 Laboratory performance tests on the system⁽¹⁾

Product assessed	Assessment method	Requirement ⁽¹⁾	Outcome
Maxi-Crete F20 and F40 (Flexible) Inlaid Crack Repair System	Skid Resistance Value (SRV) to Appendix A, Method 1 ⁽²⁾		
	Initial	≥ 60	Pass
	After rut resistance test to Appendix A, Method 3 ⁽²⁾	≥ 50	Pass
	Rut resistance rate (mm·h ⁻¹) at 50 °C to Appendix A, Method 4 ⁽²⁾	≤ 5	Pass
	Rut depth (mm) to Appendix A, Method 4 ⁽²⁾	≤ 10	Pass
	Tensile bond (N·mm ⁻²) ⁽³⁾ to TRL Report 176 : 1997, Appendix J ⁽²⁾		
	Control	≥ 0.5	Pass
	Heat aged ⁽⁴⁾	≥ 60 % of control value	Pass
	Texture depth (mm) to Appendix A, Method 5 ⁽²⁾		
	Initial	≥ 1.5	Pass
	After rut resistance test	≥ 0.75	Pass
	Elongation to Appendix A, Method 7 ⁽²⁾ , extension (%) at 1000 N load (N)	≥ 30	Pass

(1) Requirements for Grade F inlaid crack sealing systems as defined in the BBA HAPAS Guideline Document.

(2) Test methods are defined in Appendix A of the Guidelines Document.

(3) Tested on asphalt substrates.

(4) Heat aged for 28 days at 70 (±2) °C.

3.2.1 The assessment showed that the system complies with the HAPAS requirements for this characteristic.

3.3 Durability

3.3.1 The system can be used to seal and repair cracks in both longitudinal and transverse directions of the carriageway. Under normal service conditions it will have a minimum expected life of five years.

3.3.2 Where cracks have penetrated substantially through the pavement depth owing to structural failure, resulting in significant movement under traffic, an expectation of life cannot be predicted. Where pavements are structurally sound and cracking is confined to the surfacing layer or layers, and these remain bonded to the road-base, the five-year minimum life should be achieved.

3.3.3 The most severe wear from trafficking (primarily by heavy goods vehicles) occurs within the wheel track zones, approximately between 0.5 and 1.1 m and between 2.55 and 3.15 m from the centre of the nearside lane markings for each traffic lane of 3.65 m. In the wheel-track zones, the expected minimum life is unlikely to be exceeded. Conversely, for cracks outside the wheel-track zones, provided the pavement surface is otherwise sound the expected minimum life in terms of skid and deformation resistance is likely to be exceeded.

3.3.4 The most onerous conditions occur typically during the summer months on heavily trafficked, exposed carriageways with significant gradients in cuttings, and on the surface of pavements carried by elevated structures. In these situations, surface temperatures can approach or even exceed 50 °C. Should surface temperatures exceed this figure for periods (such as in an exceptionally hot summer), the expected minimum life of the system in the wheel-track zone may not be attained.

4 Summary of Process Assessment

Manufacturing process and quality control	Complies with HAPAS requirements
Delivery and site handling	Complies with HAPAS requirements
Installation	Complies with HAPAS requirements

4.1 Manufacture

4.1.1 The BBA has undertaken the following tasks for the assessment of product manufacture and has established that the manufacture complies with BBA HAPAS Certification Scheme requirements:

- the BBA has recorded and evaluated the manufacturer's documentation of the methods adopted for quality control procedures and product testing against HAPAS requirements
- the BBA has assessed the quality control operated over batches of incoming materials and formulations against HAPAS Requirements
- the BBA has evaluated the process for management of non-conforming work
- the BBA has audited the production process and verified that it is in accordance with the documented process
- the BBA has checked that equipment has been properly tested and calibrated.

4.1.2 The BBA has undertaken to review 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.

4.2 Delivery and site handling

† 4.2.1 The Certificate holder states that the system is delivered to site in 20 kg bags or 8 kg blocks labelled with the Certificate holder's name, product code, batch number and date of manufacture.

† 4.2.2 The Certificate holder states that Creteprime CP Primer is supplied in 5 litre cans.

4.2.3 To achieve the performance described in this Certificate, delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

4.2.3.1 The system components must be stored in cool, dry conditions and protected from inclement weather.

4.3 Design

4.3.1 The Maxi-Crete F20 and F40 (Flexible) Inlaid Crack Repair System is satisfactory for use as a flexible (Grade F) inlaid crack sealing system for repairing cracks, typically in excess of 20 mm wide, or multiple adjacent cracks, in non-porous bituminous and concrete highway surfaces with texture depths not exceeding 2 mm.

4.3.2 Maxi-Crete F20 (Flexible) is used when the system is laid at a nominal depth of 20 mm and in lifts thereof until flush with the adjacent surfacing (See section 4.4).

4.3.3 Should the depth of repair exceed 40 mm, Maxi-Crete F40 (Flexible) is incorporated as a suitable infill material in combination with Maxi-Crete F20 (Flexible).

4.4 Installation

4.4.1 The Certificate holder's instructions for installation of the system were confirmed as meeting the BBA HAPAS Certification Scheme requirements.

4.4.2 To achieve the performance described in this Certificate, the system must be installed by operatives familiar with this type of system in accordance with the Certificate holder's Installation Method Statement and this Certificate.

4.4.3 Traffic management must be in accordance with the latest issue of the Department for Transport Traffic Signs Manual, Chapter 8, or as agreed between the purchaser and installer.

4.4.4 The ambient and road surface temperatures must be recorded at the start, and if the weather is variable, during the installation process. Installation must only be carried out if the road surface temperature is ≥ 0 °C. The system must not be installed during periods of prolonged or heavy rain.

4.4.5 The areas to which the system is to be applied must be clearly defined by the purchaser prior to commencement of work on-site.

† 4.4.6 The Certificate holder's instructions advise the following:

4.4.7 The existing surface is mechanically planed out centrally over the length of the cracks up to a maximum depth of 100 mm. The width of the recess should be formed to extend at least 25 mm into the sound surface.

4.4.8 The excavated areas and adjacent road surfaces are mechanically swept, or, for smaller areas hand swept to remove all spoil from the site.

4.4.9 The recess is cleaned and dried using hot compressed air.

4.4.10 The system can be used in two different circumstances. When repairs are being undertaken in surfaces where no, or minor movement is anticipated, only Maxi-Crete F20 (Flexible) is utilised. Where areas of reflective cracking are evident and further movement is expected, the system should incorporate Maxi-Crete F40 (Flexible) as a base course and Maxi-Crete F20 (Flexible) as a surface course.

Installation procedure for reflective cracking repair [System 1, Maxi-Crete F20 and F40 (Flexible) Inlaid Crack Repair System]

4.4.11 The recess must be clean and dry, and free from all loose aggregate, moribund sealants, road salt and any other loose material. Cleaning with hot compressed air is essential.

4.4.12 Maxi-Crete F40 (flexible) compound is melted down in dedicated heated boilers that are agitated by a rotating shaft with paddles at a rate of ≥ 10 rpm to a laying temperature of between 180 and 210 °C and must be kept at this temperature for a period of 40 minutes before using.

4.4.13 Maxi-Crete F40 (Flexible) is poured into the prepared recess and levelled using a hot tool to finish within approximately 20 mm of the adjacent surface.

4.4.14 If the depth of the recess is greater than 40 mm the material should be applied in layers, not exceeding 40 mm and not less than 20 mm.

4.4.15 Maxi-Crete F20 (Flexible) is melted down in dedicated heated boilers that are agitated at a rate of ≥ 10 rpm to a laying temperature of between 180 and 210 °C.

4.4.16 Maxi-Crete F20 (Flexible) is then applied to the prepared recess (approximately 20 mm deep), by screed box, to finish flush and to overlap by approximately 10 mm to the adjacent surface.

4.4.17 The application of Maxi-Crete F20 (Flexible) material must be applied to Maxi-Crete F40 (Flexible) base material before its temperature falls below 25 °C. Should the temperature fall below 25 °C, the recess and Maxi-Crete F40 (Flexible) surface must be carefully re-heated using hot compressed air.

4.4.18 Whilst the compound is still in a molten state at ≥ 75 °C, a covering of 1.5 – 5 mm aggregate pre-heated to ≥ 100 °C is applied to the surface.

4.4.19 Once the repair has cooled (30 to 120 minutes) the work area is mechanically swept to remove any excess aggregate.

4.4.20 When repairs are being undertaken in surfaces where only minor movement is expected, the method given in sections 4.4.21 to 4.4.26 can be applied.

Installation procedure for other repairs [System 2, Maxi-Crete F20 (Flexible) Inlaid Crack Sealing System]

4.4.21 The recess must be clean and dry and free from all loose aggregate, moribund sealants, road salt and any other loose material. Cleaning with hot compressed air is essential.

4.4.22 Maxi-Crete F20 (Flexible) is melted down in dedicated heated boilers that are agitated at a rate of ≥ 10 rpm to a laying temperature of between 180 and 210 °C.

4.4.23 Maxi-Crete F20 (Flexible) is then applied to the prepared recess and levelled using a smoothing iron or screed box to finish flush to the adjacent surface and to overlap by approximately 10 mm. It must not be applied in layers exceeding 20 mm.

4.4.24 Whilst the compound is still in a molten state at $\geq 75\text{ }^{\circ}\text{C}$, a covering of 1.5 – 5 mm aggregate pre-heated to $\geq 100\text{ }^{\circ}\text{C}$ is applied to the surface.

4.4.25 Once the repair has cooled (30 to 120 minutes) the work area is mechanically swept to remove any excess aggregate.

4.4.26 After application of the system the installer should conduct a visual check for uniform surface texture and any other discernible faults and carry out any remedial work as necessary prior to opening the site to traffic.

4.5 Maintenance

4.5.1 To achieve the performance described in this Certificate, installations must be periodically inspected for damage, loss of texture and skid resistance as part of a planned maintenance programme and, if necessary, repaired as described in section 4.5.2.

4.5.2 Damage to the system must be repaired by mechanically planing out the defective section(s) and reapplying the system to the original specification in accordance with section 4.4 of this Certificate and the Certificate holder's application procedures.

5 Fulfilment of Requirements

5.1 The conclusion of this BBA assessment is that the Maxi-Crete F20 and F40 (Flexible) Inlaid Crack Repair System, when used in accordance with the provisions of this Certificate, complies with the BBA HAPAS Certification Scheme requirements.

5.2 In order for the system to continue to meet scheme requirements, it must be installed, used and maintained as per the Certificate holder's instructions and as detailed in the Certificate.

6 Validity of Certificate

Continuing validity of this Certificate is dependent on the following factors:

- continuing compliance with product or process requirements, as described in the HAPAS Scheme document, and the specification documents referred to therein
- ongoing BBA surveillance of factory production control, to verify that the specifications and quality control being operated by the manufacturer are being maintained
- formal triennial Review of the Certificate, and Reissue for required technical or non-technical updates
- compliance with ongoing Certificate obligations by the Certificate holder and manufacturer(s).

†7 Additional 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.

CLP Regulation

The Certificate holder has taken the responsibility of classifying and labelling the system components under the *GB CLP Regulations* and the *CLP Regulation (EC) No 1272/2008 – Classification and Labelling and Packaging of Substances and Mixtures*. Users must refer to the relevant Safety Data Sheet(s).

8 Bibliography

BBA HAPAS *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways*

BS EN 13880-2 : 2003 *Hot applied joint sealants — Test method for the determination of cone penetration at 25°C*

BS EN 13880-3 : 2003 *Hot applied joint sealants — Test method for the determination of penetration and recovery (resilience)*

BS EN 13880-5 : 2004 *Hot applied joint sealants — Test method for the determination of flow resistance*

Manual of Contract Documents for Highway Works, Volume 1, Specification for Highway Works, Series 700, Clause 711 (02/16)

Manual of Contract Documents for Highway Works, Volume 2 Notes for Guidance on the Specification for Highway Works, Series NG700, Clause NG711 (02/16)

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

9 Conditions of Certification

9.1 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.

9.2 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.

9.3 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.

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

9.5 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 UKCA marking and CE marking.

9.6 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.