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Agrément Certificate  
**09/H149**  
Product Sheet 1

## CRACK REPAIR SYSTEM FOR HIGHWAYS

### JOINTMASTER IMP (GRADE H) INLAID CRACK REPAIR SYSTEM FOR HIGHWAYS

This Certificate is issued under the Highway Authorities' Product Approval Scheme (HAPAS) by the British Board of Agrément (BBA) in conjunction with the Highways Agency (HA) (acting on behalf of the overseeing organisations of the Department for Transport; the Scottish Executive; the Welsh Assembly Government; the Department for Regional Development, Northern Ireland), the County Surveyors' Society, the Local Government Technical Advisers' Group, and industry bodies. HAPAS Agrément Certificates are normally each subject to a review every five years.

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Jointmaster IMP (Grade H) Inlaid Crack Repair System for Highways, used to seal and repair static cracks in non-porous bituminous and concrete highways.

#### AGRÉMENT 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 five-yearly review.



#### KEY FACTORS ASSESSED

**Performance** — the system meets the requirements for Grade H (high modulus) inlaid crack-sealing systems of the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways* (see section 5).

**Durability** — the results of tests and an assessment of the system's performance in use indicate that it can be used to repair cracks in both longitudinal and transverse directions of the carriageway with a minimum expected life of five years (see section 7).

The BBA has awarded this Agrément Certificate to the company named above for the system described herein. The 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

A handwritten signature in black ink, appearing to read 'Simon Wroe'.

Date of First issue: 26 October 2009

Simon Wroe  
Head of Approvals — Materials

A handwritten signature in black ink, appearing to read 'Greg Cooper'.

Greg Cooper  
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](http://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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# HAPAS Requirements

## Requirements

The Highways Technical Advisory Committee (HiTAC) and HAPAS Specialist Group 2 (Crack Sealing Systems) have agreed with the BBA the aspects of performance to be used by them in assessing the compliance of crack-sealing systems for highways with the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways*. In the opinion of the BBA, the Jointmaster IMP (Grade H) Inlaid Crack Repair System for Highways, when applied to a suitable non-porous bituminous or concrete highway in accordance with the provisions of this Certificate, will meet the relevant performance requirements.

## 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 section: 2 Delivery and site handling (2.1 to 2.3 and 2.5).

## Technical Specification

### 1 Description

1.1 The Jointmaster IMP (Grade H) Inlaid Crack Repair System for Highways comprises graded aggregates coated with a polymer-modified bituminous compound, broadcast with a 2 mm to 3 mm high PSV (60+) aggregate to meet skid resistance requirements. Approved aggregates include granite, basalt and calcined bauxite.

1.2 The system should be used in conjunction with Jointmaster primer when applied to very porous or dusty concrete surfaces.

1.3 The production process is controlled in accordance with a Quality Plan agreed by the BBA. Quality control checks are carried out on the incoming materials, during production and on the finished product.

### 2 Delivery and site handling

2.1 Jointmaster IMP compound is supplied in nominal 25 kg silicone-coated paper bags, stamped with the name of the product and batch number.

2.2 The aggregates are delivered to site in 25 kg bags.

2.3 Jointmaster primer is supplied in 5 litre cans.

2.4 The products should be stored in cool dry conditions and protected from contamination.

2.5 The products are classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP3)* and bear the appropriate hazard warning label. The flashpoints and classification of components are given in Table 1.

Table 1 Flashpoint and hazard classification of components

Product	Flashpoint (°C)	Classification
Jointmaster IMP compound	>200	N/A
Jointmaster primer	0	Highly flammable <sup>(1)</sup> , harmful by inhalation irritating to eyes

(1) This component should be stored in accordance with the *Highly Flammable Liquids and Liquefied Petroleum Gases Regulations (1972)*.

2.6 Health and Safety Data Sheets and COSHH risk assessments for the works should be deposited with the purchaser and be maintained on site.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Jointmaster IMP (Grade H) Inlaid Crack Repair System for Highways.

### 3 Use

3.1 The Jointmaster IMP (Grade H) Inlaid Crack Repair System for Highways is satisfactory for use as an inlaid crack-sealing system for repairing static cracks, typically in excess of 20 mm wide or multiple adjacent cracks, in non-porous bituminous<sup>(1)</sup>, highway surfaces with texture depths not exceeding 2 mm, or concrete highway surfaces.

(1) For the purposes of this Certificate, non-porous bituminous highway surfaces are impermeable and include hot-rolled asphalt, mastic asphalt and thin surfacing systems.

3.2 In dynamic cracks, the IMP compound may be used as an infill material to support the application of Jointmaster JMB Flexible Inlaid Crack Repair System, subject of Certificate 07/H126.

3.3 The system can be laid at nominal depths between 20 mm and 100 mm in lifts between 20 mm and 40 mm.

### 4 Practicability of installation

The system must only be installed by the Certificate holder.

### 5 Performance

The results of laboratory performance tests carried out on the binder and on the system complied with the requirements of the Guidelines Document for a Grade H inlaid system (see section 12, Table for *Laboratory performance tests on the binder* and Table for *Laboratory performance tests on the system*). This includes the minimum initial and investigatory skid resistance values of 60 and 50 respectively.

### 6 Maintenance

Installations should be periodically inspected as part of a planned maintenance programme and, if necessary, repaired as described in section 11.

### 7 Durability

7.1 The results of tests and an assessment of the product's use in service indicate that the system can be used to seal and repair static cracks in both longitudinal and transverse directions of the carriageway, with a minimum expected life of five years.

7.2 Where cracks have penetrated substantially through the pavement depth due 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, not subject to further movement and remain bonded to the road-base, the five-year minimum life should be achieved.

7.3 The most severe wear from trafficking (primarily by heavy goods vehicles) occurs within the wheel track zones, approximately between 0.5 m and 1.1 m, and between 2.55 m and 3.15 m from the centre of the nearside lane markings for each traffic lane. 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 may be exceeded.

7.4 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, where surface temperatures can approach or even exceed 50°C. Should surface temperatures exceed this figure for periods in an exceptional summer, then the expected minimum life of the product in the wheel track zone may not be attained.

## Installation

### 8 General

8.1 Installation of the Jointmaster IMP (Grade H) Inlaid Crack Repair System for Highways must be conducted in accordance with the Certificate holder's method statement and this Certificate.

8.2 Traffic management should 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.

8.3 The ambient and road surface temperatures are 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 above 0°C. The system must not be used during periods of continuous or heavy rain.

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

### 9 Preparation of the road surface

9.1 The existing surface is mechanically planed-out centrally over the length of the cracks to the required depth (between 20 mm and 100 mm). The width of the recess must be formed to extend at least 25 mm into the sound surface.

9.2 The excavated areas are mechanically swept or for small areas hand swept to remove all spoil from the site.

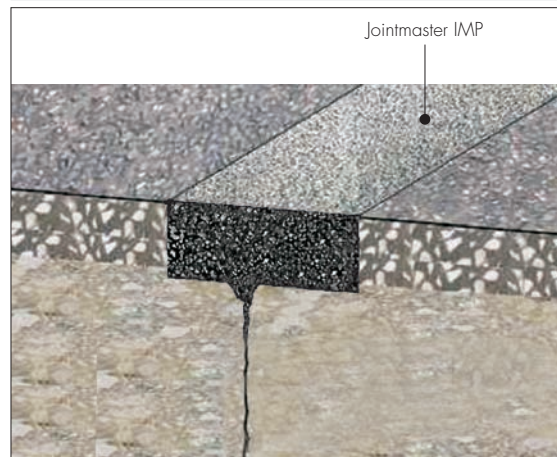
9.3 The recess is cleaned and dried using hot compressed air.

9.4 Porous and/or dusty concrete surfaces should be primed with Jointmaster primer to enhance adhesion. The primer must be applied and allowed to dry in accordance with the Certificate holder's recommendations.

## 10 Application

10.1 The Jointmaster IMP compound is melted down in heated boilers that are agitated by a rotating shaft with paddles at a rate of greater than 6 rpm to a laying temperature of between 180°C and 210°C.

Figure 1 Static crack application

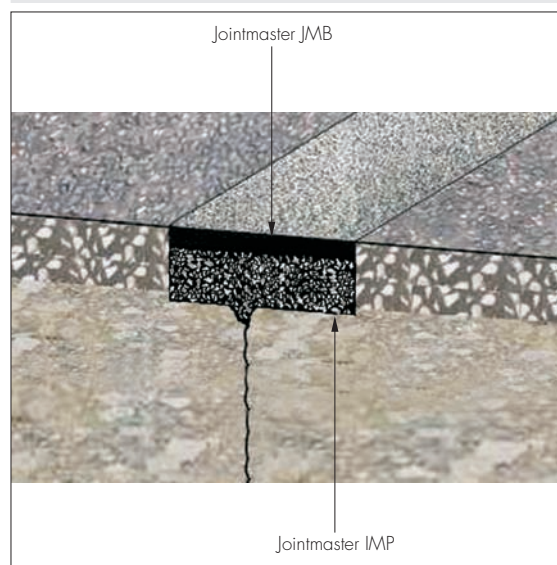


10.2 The molten compound is transferred into the prepared recess, by screed box, to finish flush with the adjacent surface in lifts between 20 mm and 40 mm.

10.3 Whilst the IMP compound is still in a molten state (typically greater than 75°C), a covering of 3 mm aggregate, pre-heated to greater than 50°C, is broadcast into the surface.

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

Figure 2 Dynamic crack application



10.5 Where further movement of the cracks to be sealed is expected, the molten compound is transferred into the prepared recess by screed box, to finish within 10 mm and 20 mm of the adjacent surface in lifts between 20 mm and 40 mm.

10.6 Jointmaster JMB, a flexible (Grade F) crack sealing system is poured into the recess over Jointmaster IMP using a screed box to finish flush with the adjacent surface, ensuring that the temperature of the Jointmaster IMP compound is above 25°C. If the temperature of the Jointmaster IMP compound falls below 25°C it can be warmed up using a hot-air lance taking care not to overheat the compound.

10.7 Whilst the JMB compound is still in a molten state (typically greater than 75°C), a covering of 3 mm aggregate, pre-heated to greater than 50°C, is broadcast into the surface.

10.8 In all cases, the installer should conduct a visual check for uniform surface texture and any other discernible faults and carry out any remedial work as necessary.

## 11 Repair

Damage to the system can be repaired by mechanically planing out the defective area and re-applying the system to the original specification.

## 12 Tests

12.1 Laboratory performance tests were carried out on the Jointmaster IMP (Grade H) Inlaid Crack Repair System for Highways in accordance with the requirements of the Guidelines document for Grade H inlaid crack sealing systems. The results were satisfactory.

12.2 The tests and requirements are given in Tables 2 and 3.

*Table 2 Laboratory performance tests on the binder*

Test	Requirement <sup>(1)</sup>	Method <sup>(2)</sup>
Cone penetration (dmm)		BS 2000-50
control	>10	
heat aged <sup>(3)</sup>	>60% of control value	
Resilience (%)		BS 2499-3, Method 12
control	Record value	
heat aged <sup>(3)</sup>	≥60% of control value	
Flow resistance (mm)	≤2	BS 2499-3, Method 6

(1) Requirements for Type F, inlaid crack-sealing systems as defined in the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways*.

(2) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the various documents.

(3) Heat aged 28 days at 70°C.

*Table 3 Laboratory performance tests on the system*

Test	Requirement <sup>(1)</sup>	Method <sup>(2)</sup>
Skid Resistance Value (SRV)		
Initial	60	Appendix B, Method 1
after rut resistance test	50	Appendix B, Method 3
Rut resistance		Appendix B, Method 3
rate (mm·h <sup>-1</sup> )	<5	
rut depth	<7	
Tensile bond (N·mm <sup>-2</sup> ) <sup>(3)</sup>		TRL Report 176, Appendix J
control	0.5	
heat aged <sup>(4)</sup>	60% of control value	
Texture depth (mm)		Appendix B, Method 4
initial	1.5	
after rut resistance test	0.75	
Yield	>2.5	Appendix B, Method 7

(1) Requirements for Grade H, inlaid crack-sealing systems as defined in the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways* (Draft 2a C April 2000).

(2) Test methods are defined in the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways*.

(3) Conducted on both asphalt and concrete substrates.

(4) Heat aged 28 days at (70±2)°C.

## 13 Investigations

13.1 An installation trial was carried out to assess the practicability of the installation in accordance with the agreed method statement.

13.2 Existing information and test data on Jointmaster IMP relating to the issue of Certificate 06/H123 was reviewed in the context of this Certificate.

13.3 Existing information and test data on Jointmaster JMB relating to the issue of Certificate 07/H126 was reviewed in the context of this Certificate.

13.4 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of materials used.

## Bibliography

BS 2000-50 : 1993 *Methods of test for petroleum and its products — Determination of cone penetration of lubricating grease*

BS 2499-3 : 1993 *Hot-applied joint sealant systems for concrete pavements— Methods of test*

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

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

## 14 Conditions

14.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

14.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

14.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.
- remain in accordance with the requirements of Highways Authorities' Product Approval Scheme.

14.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

14.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.