

## IKO PLC CRACK SEALING SYSTEMS FOR HIGHWAYS

### PERMATRACK

This HAPAS Certificate Product Sheet<sup>(1)</sup> 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 Permatrack, a polymer-modified asphalt crack sealing system for use in sealing and repairing cracks in non-porous bituminous and concrete highway surfaces.

#### 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 meets the requirements for Hard (Grade H) inlaid crack-sealing systems of the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways* (see section 7).

**Durability** — the system can be used to repair static cracks in both longitudinal and transverse directions of the carriageway with a minimum expected life of 5 years (see section 9).



The BBA has awarded this 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



Paul Valentine  
Technical Excellence Director



Claire Curtis-Thomas  
Chief Executive

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Originally certificated on 23 October 2002

*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.*

*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, Permatrack, when assessed in accordance with the *Guidelines Document for the Assessment and Certification of Crack Sealing 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)*<sup>(1)</sup>, Volume 1 *Specification for Highways Works (SHW)*, Series 700, clause 711 for Inlaid Crack Sealing Systems.

(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 sections: 3 *Delivery and site handling* and 10 *General* (10.4) of this Certificate.

## Technical Specification

### Description

1.1 Permatrack is a polymer-modified asphalt crack sealing system, comprising a flexible waterproof layer (Permatrack PSB) and a high-modulus surface course (Permatrack H).

1.2 The system is used in conjunction with:

- 14 or 20 mm graded pre-coated chippings or 2 or 3 mm calcined bauxite aggregate, either of which is applied to Permatrack H to match the adjacent highway surface and meet skid resistance requirements
- IKO Quick Dry Bitumen Primer, for use on concrete surfaces prior to the application of Permatrack PSB.

### 2 Manufacture

2.1 Permatrack H and Permatrack PSB are manufactured by mixing their respective bitumens, fillers, aggregates, rubber and synthetic polymers using conventional techniques.

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 IKO plc has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 (Certificate Q05233).

### 3 Delivery and site handling

3.1 Permatrack H and Permatrack PSB are supplied in block form (similar to traditional asphalt) with nominal weights of 20 and 12 kg respectively, on pallets. IKO Quick Dry Bitumen Primer is supplied in 25 litre drums. Each bears a label detailing the product type, name and batch number.

3.2 Alternatively, Permatrack H may be supplied in hot-charge (molten) form, delivered to site in purpose-built transporters which are heated and thermostatically controlled and continually agitate the product. The product information is supplied on the relevant delivery notes with each consignment.

3.3 Permatrack blocks must be stored away from contaminants such as oil-based substances and acid solutions. Double stacking of pallets is not recommended.

3.4 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)

3.5 The Certificate holder's material safety data sheets must be observed for the safe handling of all system components.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Permatrack.

### Design Considerations

## 4 Environmental information

4.1 Permatrack PSB has a recycled content of 28% by mass of the total product.

4.2 The recycled materials are described as limestone filler and ground rubber crumb, the latter manufactured from post-consumer vehicular tyres. Post-consumer material is defined in BS EN ISO 14021 : 2001 and the Waste & Resources Action Programme (WRAP) '*Rules of Thumb*' *Guide to Recycled Content in Construction Products*.

4.3 The recycled content has been calculated in accordance with BS EN ISO 14021 : 2001 by expressing the input mass of recycled material as a percentage of the total input mass for the product.

4.4 The source and quantity of recycled material added to the product is verified by the BBA as part of post-certification auditing.

## 5 Use

5.1 Permatrack is satisfactory for use as a Grade H inlaid crack-sealing system for repairing static cracks with widths typically in excess of 20 mm, or multiple adjacent cracks in non-porous bituminous or concrete highway surfaces<sup>(1)</sup> with texture depths not exceeding 2 mm.

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

5.2 Installation of the system must be carried out only when the road surface is dry and the temperature is above  $-5^{\circ}\text{C}$ .

## 6 Practicability of installation

Installation of the system must be carried out by the Certificate holder's approved installers in accordance with the Certificate holder's instructions and the agreed BBA Method Statement.

## 7 Performance

The results of laboratory performance tests carried out on the binder and on the system components fulfilled the requirements of the *Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways* for a Grade H inlaid system. This includes the minimum initial and investigatory skid resistance values of 60 and 50 respectively.

## 8 Maintenance

Installations should be inspected periodically for damage, loss of texture and skid resistance as part of a planned maintenance programme and, if necessary, repaired as described in section 13.

## 9 Durability

9.1 The system can be used to seal and repair static cracks typically in excess of 20 mm or multiple adjacent cracks in both longitudinal and transverse directions of the carriageway. Under normal conditions it will have a minimum expected life of five years.

9.2 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 with cracking 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.

9.3 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. 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.

9.4 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 prolonged periods (such as in an exceptional summer), then the expected minimum life of the system in the wheel track zone may not be attained.

## Installation

## 10 General

10.1 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.

10.2 The ambient and road surface temperatures are recorded at the start and, if the weather is variable, during the installation process. Installation must not be carried out if the road surface temperature is below -5°C.

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

10.4 Health and Safety Data Sheets and COSHH risk assessments for the works must be deposited with the purchaser and be maintained on-site.

## 11 Preparation of the road surface

11.1 The existing surface is mechanically planed out centrally over the length of the cracks to a width of at least 100 mm and a depth of 20 mm. The width of the recess formed should extend at least 25 mm into a sound surface (see Figure 1).

*Figure 1 Mechanical planning out of cracks*



11.2 The recessed area and local road surface are swept, spoil is removed, and the recess is dried and cleaned using hot compressed air (see Figure 2).

*Figure 2 Mechanical planning out of cracks*



11.3 On porous substrates, eg concrete, IKO Quick Dry Primer must be applied by brush or spray and allowed to dry, typically for one hour in favourable conditions.

## **12 Application**

12.1 The recess must be clean and dry, and free from ice, frost, loose aggregate, oil, grease, road salt and other loose material.

12.2 Permatrack PSB is melted in a mechanically agitated cauldron (or similar) to a laying temperature of between 150 and 190°C. The temperature must not exceed 200°C at any stage.

12.3 Permatrack PSB is applied to the prepared base and sides of the recess with a squeegee or trowel to a minimum thickness of 5 mm and allowed to cool. All surfaces must be covered and all cracks and joints filled level (see Figure 3).

Figure 3 Application of Permatrack PSB to recess



12.4 Permatrack H blocks do not contain the required amount of coarse aggregate which is added during the re-melt process. The blocks are broken into suitably sized pieces and melted in a mechanically agitated mixer. The coarse aggregate is supplied in pre-weighed 25 kg bags and the required amount is added to the mixer. The two components are thoroughly mixed together until homogeneous. The ratio of Permatrack H block to coarse aggregate is 65 : 35 by weight.

12.5 Permatrack H is drawn from the mixer at a temperature of between 150 and 210°C. The temperature must not exceed 250°C at any stage.

12.6 Permatrack H is poured into the recess to form a flush finish with the surrounding road surfacing. Allowance must be made for the surface finish of calcined bauxite or pre-coated chippings as appropriate. Where the recess depth exceeds 60 mm, Permatrack H is installed in two layers ensuring that the thickness of the final layer is between 20 and 60 mm. Levelling of Permatrack H is achieved with suitable tools such as shovels, trowels, floats and scraper boxes (see Figure 4).

Figure 4 Application of Permatrack H



12.7 Chinese or Guyanan calcined bauxite aggregate graded 2 or 3 mm, or 14 or 20 mm pre-coated chippings, are rolled into the Permatrack H surface while it is still warm. Where necessary, the products are warmed to remove any moisture. The bauxite is broadcasted over the repair ensuring that all areas are covered. Precoated chippings are spread at a rate of between 7.5 and 10 kg·m<sup>-2</sup> for the 14 mm chippings, and between 10 and 14 kg·m<sup>-2</sup> for the 20 mm chippings (see Figure 5).

Figure 5 Rolling in pre-coated chippings



12.8 Before opening to traffic the installer must conduct a visual check for uneven surface texture and any other discernible faults, and carry out remedial work if necessary.

### 13 Repair

In the event of damage occurring during installation or during service, the system is repaired by planing out to firmly adhered material or the existing road surface. The recess is squared off, cleaned and primed, if necessary, and the system reinstated as described in section 12.

## Technical Investigations

### 14 Tests

Performance tests were carried out on Permatrack, in accordance with the Guidelines Document, to establish:

- skid resistance value, initial and retained after wheel tracking at 50°C
- texture depth, initial and retained after wheel tracking at 50°C
- rut resistance after wheel tracking at 50°C
- tensile bond on asphalt and concrete substrate, initially and after heat ageing for 28 days at  $70 \pm 2^\circ\text{C}$
- yield strain
- binder tests including cone penetration, resilience and flow resistance.

### 15 Investigations

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

15.2 Skid resistance and texture depth on the trial site were taken initially and after a period of nine months, to assess the system's retention of surface properties.

15.3 A user/specifier survey relating to existing sites dating from 1998 was carried out to assess the system's performance and durability.

15.4 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 EN ISO 9001 : 2015 *Quality management systems — Requirements*

BS EN ISO 14021 : 2001 *Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling)*

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

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works*, Series 700, Clause 711 for inlaid Crack Sealing Systems

### 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.