

FM CONWAY PATCH REPAIR PRODUCTS FOR HIGHWAYS

GREENPATCH 6 MM AND 10 MM

This HAPAS Certificate Product Sheet⁽¹⁾ 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 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 Greenpatch 6 mm and 10 mm, bitumen-based, cold-applied patch repair products for potholes and other similar defects occurring in bituminous surfaces on non-trafficked and trafficked 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

Surface characteristics — the products have satisfactory surface texture and skid resistance (see section 6).

Mechanical resistance and bond strength — the products have a satisfactory resistance to trafficking and loading (see section 7).

Durability — the products are suitable to ensure a safe level repair of a bituminous surface as part of routine (planned) and reactive (unplanned) maintenance works (see section 9).



The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 11 June 2020



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 MUST check the validity and latest issue number of this Agrément 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.

Requirements

In the opinion of the BBA, Greenpatch 6 mm and 10 mm, when manufactured and installed in accordance with the provisions of this Certificate, will provide a satisfactory repair to a road surface.

Additional requirements of the overseeing organisations can be found in the:

- *Potholes and Repair Techniques for Local Highways*, ADEPT, May 2010
- *Manual of Contract Documents for Highway Works* (MCHW)⁽¹⁾, Volume 1 *Specification for Highway Works* (SHW), Series 900, Clause 946
- *Design Manual for Roads and Bridges* (DMRB), Volume 7.

(1) The MCHW is operated by the Overseeing Organisations: Highways England (HE), 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 section: 3 *Delivery and site handling* (3.1 and 3.4) of this Certificate.

Technical Specification

1 Description

1.1 Greenpatch 6 mm and 10 mm are bitumen-based, cold-applied, hand-applied patch repair products comprising:

- 0/6 or 0/10 mm open-graded gritstone aggregate to BS EN 13043 : 2002
- RA 0/4, RA 4/8 and RA 0/14 recycled asphalt to BS EN 13108-8 : 2016 and tested to BS EN 13043 : 2002
- a paving grade bitumen to BS EN 12591 : 2009 and a proprietary additive.

1.2 Ancillary items outside the scope of the Certificate, such as tack coats, bond coats or primers, may be used with the products if required.

2 Manufacture

2.1 The products are manufactured using semi-continuous asphalt plant.

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 the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate FM 33025).

3 Delivery and site handling

3.1 The products are supplied in pre-packed 25 kg plastic containers or bags. The packaging is stamped with the product name, coding traceable to the date of production, health and safety information and installation instructions. The product may also be supplied in 1 tonne bulk bags and bulk open loads.

3.2 The products must be stored under cover in cool, well-ventilated, dry conditions protected from freezing and high temperatures.

3.3 When stored correctly in pre-packed sealed containers the products will have a storage life of at least six months⁽¹⁾. For information on bulk supply storage the advice of the Certificate holder must be sought.

(1) Information provided by the client.

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).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Greenpatch 6 mm and 10 mm.

Design Considerations

4 Use

4.1 Greenpatch 6 mm and 10 mm are satisfactory for use in minor routine or reactive repairs of potholes and other similar defects found in bituminous surfaces. Potholes are defined for the purpose of this Certificate as irregular-shaped defects with a total area less than 1 m² and a depth greater than 15 mm. They are not continuous or whole width defects.

4.2 The products must only be installed where the adjacent surface has surface properties which are considered at least equivalent to those of Greenpatch (see section 6).

4.3 The products will satisfactorily fill a pothole or similar defect. They will not delay or stop the deterioration of the adjacent surface.

5 Practicability of installation

The products must only be installed by operatives who have completed training provided by the Certificate holder.

6 Surface characteristics

6.1 An assessment of the surface characteristics on existing installations, and laboratory testing of raw materials, indicate that the products have the following surface properties:

- an initial texture depth of >1.2 mm
- an initial skid resistance value (SRV) of >70
- a polished stone value (PSV) of aggregate (including RA) >60
- an aggregate abrasion value (AAV) of aggregate of <16 for RA and <10 for primary aggregate.

6.2 The properties listed in section 6.1 should be compared to those of the existing adjacent surface to ensure the product is compatible as detailed in section 4.2. Aggregate selection may depend on site specific requirements for PSV and AAV and should be identified to ensure the correct aggregate is used.

6.3 If the properties of the existing adjacent surface are unknown, Section S2 of the *New Roads and Street Works Act 1991 : Specification for the Reinstatement of Openings in Highways* (SROH) provides additional guidance on categorising Local Authority sites and selection of appropriate aggregates. For the motorway and trunk road network, additional guidance can be found within the relevant parts of the MCHW, Volume 1, and the DMRB, Volume 7.

7 Mechanical resistance and bond strength

7.1 Results of visual inspections on new and existing sites and information received from users of the products confirm that they have satisfactory resistance to trafficking and satisfactory bond characteristics on sites classified as Type 3 and 4 as defined in the SROH.

7.2 In common with deferred set asphalts, the products may be susceptible to minor deformation, scuffing, marking, and de-bonding if used when a combination of the following apply:

- in areas of excessive turning, braking or static loads (eg within the wheel track)
- when air and road temperatures are high (typically greater than 20°C) immediately following installation
- when the complete depth of the repair is greater than 40 mm
- on sites classified higher than type 3 and 4 as defined in SROH
- where installation methods are other than best practice (see section 10).

7.3 An evaluation of the rate of cure of the products indicates that they are susceptible to scuffing and marking as identified in 7.2 but that this will reduce following installation. The rate of cure is dependent on the volume of traffic and ambient conditions.

8 Maintenance

The products are not subject to any routine maintenance requirements, but any damaged areas must be removed and replaced (see section 12).

9 Durability

9.1 For planned routine maintenance work where best practice installation is followed (see section 10) and where the substrate and adjacent material are generally sound, the products will provide an effective repair for at least 12 months.

9.2 For reactive (immediate/emergency/unplanned) repairs with minimum preparation and installation (see section 10) the expected durability will be reduced.

9.3 If a routine or reactive repair is located as identified in section 7.2 the expected durability will be reduced.

Installation

10 General

10.1 To ensure that optimum performance and durability is achieved, installation of the products must follow best practice. For the purpose of this Certificate this is considered to be in accordance with either BS 434-2 : 2006, Clause 13.2, or the DMRB, Part 7.4.1. If best practice is not followed, for example reactive repairs, then the method of installation must be agreed with the Overseeing Organisation.

10.2 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 overseeing organisation and the installer.

10.3 The products can be installed, compacted and trafficked immediately when air and road temperatures are between 0 and 35°C and due consideration of the position of the repair in the road is taken as identified in section 7. If the product is installed at temperatures below 0°C compactability will be reduced and this should be taken into account when considering installation.

11 Preparation of the road surface

11.1 The area to be repaired must be marked out and the edges saw cut back to sound material. The prepared area should ideally be regular in shape. For high-speed roads, BS 434-2 : 2006 recommends a diamond shape.

11.2 All surfaces must be swept clean and free from ice, loose material, oil, grease, standing water or other contaminants that may affect the bond to the existing surface.

12 Application

12.1 The products must be applied in uniform lifts of between 15 mm (for 6 mm Greenpatch) and 25 mm (for 10 mm Greenpatch) up to a maximum 50 mm, allowing approximately 10–15 mm surcharge per lift to allow for compaction.

12.2 The products must be fully compacted and finished level with the adjoining surface using suitable equipment. Compaction must cease before migration of binder to the surface or crushing of aggregates is observed.

12.3 On completion the installer visually inspects the finished surface for uniformity and any discernible faults, and takes remedial action if necessary.

Technical Investigations

13 Investigations

13.1 Test data were assessed to determine:

- vacuum repeat load axial to BS DD 226 : 1996 (50 kPa confining pressure), test temperature 45°C
- air voids to BS EN 12697-8 : 2003, Procedure B
- initial and retained texture depth to BS EN 13036-1 : 2010
- initial and retained skid resistance by pendulum to TRL Report 176, Appendix E
- PSV and AAV of aggregates to BS EN 1097-8 : 2009
- aggregate and bitumen affinity to BS EN 12697-11 : 2005, Part B *Static Method*
- compactability based on relative height and density measurements at –10°C and +20°C in accordance with BS EN 12697-10 : 2001.

13.2 An installation trial was carried out to assess the practicability of installation in accordance with the Certificate holder's instructions and best practice methods identified in section 10. The results of the trial concluded that the products can be satisfactorily installed and compacted.

13.3 A performance in use survey, site trials and visual inspections were carried out to assess the products' performance in service. The responses and results from the inspections confirmed that the expectation of users was being achieved, and that satisfactory performance on sites, representative of those identified in sections 6, 7 and 9, were met.

13.4 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 434-2 : 2006 *Bitumen road emulsions — Code of practice for the use of cationic bitumen emulsions on roads and other paved areas*

BS DD 226 : 1996 *Method for determining resistance to permanent deformation of bituminous mixtures subject to unconfined dynamic loading*

BS EN 1097-8 : 2009 *Tests for mechanical and physical properties of aggregates — Determination of the polished stone value*

BS EN 12591 : 2009 *Bitumen and bituminous binders — Specifications for paving grade bitumens*

BS EN 12697-8 : 2003 *Bituminous mixtures — Test methods for hot mix asphalt — Determination of void characteristics of bituminous specimens*

BS EN 12697-10 : 2017 *Bituminous mixtures — Test methods for hot mix asphalt — Compactibility*

BS EN 12697-11 : 2012 *Bituminous mixtures — Test methods for hot mix asphalt — Determination of the affinity between aggregate and bitumen*

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 13043 : 2002 *Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas*

BS EN 13108-8 : 2016 *Bituminous mixtures — Material specifications — Reclaimed asphalt*

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

Design Manual for Roads and Bridges Volume 7, Pavement Design and Maintenance: Section 4, Pavement Maintenance Methods Part 1, Maintenance of Bituminous Roads

New Roads and Street Works Act 1991 : Specification for the Reinstatement of Openings in Highways : Code of Practice, Third Edition (England), April 2010

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

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 900 Road pavements – bituminous bound materials

14 Conditions

14.1 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.

14.2 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.

14.3 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.

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

14.5 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.

14.6 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.