HAPAS

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HAPAS Certificate
07/H127
Product Sheet 1 Issue 5

TCB ANTI-CORROSION PROTECTIVE COATING

GREENKOTE

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 Greenkote(1), an anti-corrosion protective coating, factory-applied to steel fixings to be used on steel highways structures which are painted after installation with one of three specified National Highways paint systems(2), in accordance with the *Manual of Contract Documents for Highway Works* (MCHW), Volumes 1 and 2.

(1) Greenkote is a registered trademark.

(2) These systems are outside the scope of this Certificate.

The BBA has awarded this Certificate to the company named above for the product described herein. This product 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 Fifth issue: 4 July 2024

Originally certified on 21 June 2007

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 product under assessment, Greenkote, as a factory-applied, zinc/aluminium, anti-corrosive protective coating for use on steel fixings(1) (including nuts, washers and tension control bolts) intended for use on steel highways structures where galvanizing would normally be used in accordance with the MCHW, Volumes 1 and 2.

(1) The mechanical performance of the fixings is outside the scope of this Certificate.

1.2 The product is available to a single formulation and a minimum local coating thickness of 25 µm.

1.3 The product is factory-applied to the fixings in a thermo-chemical-surface modification (TCSM) process after cleaning and abrasive shot blasting of the steel substrate.

† 1.4 The Certificate holder recommends the following ancillary items, as defined in the *Design Manual for Roads and Bridges* (DMRB), CG 303, for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- Item No. 110, Item No. 123 and Item No. 168
- Item No. 111, Item No. 112 and Item No. 168
- Item No. 115, Item No. 116 and Item No. 168.

2 Requirements

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

- the MCHW(1), Volume 1 (Paints) , Series 1900 and 5000
- the MCHW, Volume 2, Series NG 1900 and NG 5000
- DMRB(2)
  - CG 303 *Quality assurance scheme for paints and similar protective coatings*
  - CM 431, formerly BD 87/05, *Maintenance painting of steelwork.*

(1) 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).
(2) The DMRB is operated by the Overseeing Organisations: National Highways (NH), Transport Scotland, the Welsh Government and the Department for Infrastructure (Northern Ireland).

3 Summary of Product Assessment

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

3.1 Applied coating

Table 1 Applied coating

Product assessed	Assessment method	Requirement	Outcome
System Item No. 115, 116 and 168 Greenkote Bolt	Film Thickness to BS EN ISO 2808 : 2001 and BS 3900-C5 : 1997	Using methods 6 to 8, within declared range or with 20% of declared single value	Pass
System Item No. 111, 112 and 168 Greenkote Bolt	Film Thickness to BS EN ISO 2808 : 2001 and BS 3900-C5 : 1997	Using methods 6 to 8, within declared range or with 20% of declared single value	Pass
System Item No. 110, 123 and 168 Greenkote Bolt	Film Thickness to BS EN ISO 2808 : 2001 and BS 3900-C5 : 1997	Using methods 6 to 8, within declared range or with 20% of declared single value	Pass

3.2 Performance characteristics

Table 2 Complete system

Product assessed	Assessment method	Requirement	Outcome
System Item No. 115, 116 and 168 Greenkote Bolt	Artificial weathering to BS EN ISO 11507 : 2001 and BS 3900-F16 : 1997, followed by:	After total exposure of 1000 hours using Method A type 3 UVA 351 lamps- no appreciable embrittlement, cracking, crazing or loss of adhesion.	Pass
	- pull off adhesion test to ASTM D4541-02, type III	No detachment or failure below 5 MPa	Pass
	Salt spray to BS EN 9227 : 2006	No coating defects, general corrosion or creep at cut apparent after 1000 hours exposure	Pass
	Resistance to sulfur dioxide to BS EN ISO 3231 : 1998 and BS 3900-F8 : 1993	No blistering or loss of adhesion after 25 and 50 cycles (0.2l SO_2 in water)	Pass
	Resistance to humidity to BS 3900-F2 : 1973	No blistering, swelling, softening or loss of adhesion after 1000 and 2000 hrs	Pass
System Item No. 111, 112 and 168 Greenkote Bolt	Artificial weathering to BS EN ISO 11507 : 2001 and BS 3900-F16 : 1997, followed by:	After total exposure of 1000 hours using Method A type 3 UVA 351 lamps- no appreciable embrittlement, cracking, crazing or loss of adhesion.	Pass
	- pull of adhesion test to ASTM D4541-02, type III	No detachment or failure below 5 MPa	Pass
	Salt spray to BS EN 9227 : 2006	No coating defects, general corrosion or creep at cut apparent after 1000 hours exposure	Pass
	Resistance to sulfur dioxide to BS EN ISO 3231 : 1998 and BS 3900-F8 : 1993	No blistering or loss of adhesion after 25 and 50 cycles (0.2l SO_2 in water)	Pass
	Resistance to humidity to BS 3900-F2 : 1973	No blistering, swelling, softening or loss of adhesion after 1000 and 2000 hours	Pass
System Item No. 110, 123 and 168 Greenkote Bolt	Artificial weathering of topcoat only to BS EN ISO 11507 : 2001 and BS 3900-F16 : 1997, followed by:	After total exposure of 1000 hours using Method A type 3 UVA 351 lamps- no appreciable embrittlement, cracking, crazing or loss of adhesion.	Pass
	- pull of adhesion test to ASTM D4541-02, type III	No detachment or failure below 5 MPa	Pass
	Salt spray to BS EN 9227 : 2006	No coating defects, general corrosion or creep at cut apparent after 1000 hours exposure	Pass
	Resistance to sulfur dioxide to BS EN ISO 3231 : 1998 and BS 3900-F8 : 1993	No blistering or loss of adhesion after 25 and 50 cycles (0.2l SO_2 in water)	Pass
	Resistance to humidity to BS 3900-F2 : 1973	No blistering, swelling, softening or loss of adhesion after 1000 and 2000 hrs	Pass

3.3 The assessment showed that the product complies with HAPAS requirements for these characteristics.

3.3.1 The product is compatible with the materials with which it is likely to be in contact in steel highways structures.

3.4 Durability

The product, when applied and overcoated in accordance with this Certificate, will perform satisfactorily as an anti-corrosive treatment for fixings used in steel highway constructions for a period at least equivalent to that achieved by 85 to 100 µm of galvanizing.

4 Summary of Process Assessment

Manufacturing process and quality control	Complies with HAPAS requirements
Delivery and site handling	Complies with HAPAS requirements
Application / 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.

† 4.1.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of ISO 9001 : 2015 by LRQA (Approval number 0044115).

4.2 Delivery and site handling

† 4.2.1 The Certificate holder stated that coated fixings are delivered to site in either 25 kg polypropylene bags or in steel kegs of up to 80 kg. All packs are marked with a product description, quantity and a lot number.

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

4.2.2.1 Steel kegs must be handled in accordance with the Manual Handling Regulations 1992.

4.2.2.2 Prior to installation, the fixings must be stored under cover and protected from damp ingress or other contamination.

4.3 Installation

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

4.3.2 Greenkote-coated fixings are installed on site following the Certificate holder's instructions and in accordance with conventional good practice, using the correct tools in good condition, including shear wrenches where appropriate.

4.3.3 The possibility of mechanical damage during installation must be minimised by use of the correct tools in good condition.

4.3.4 On completion of the installation, the fixings are painted using one of the systems listed in section 1.4 of this Certificate in accordance with the requirements of the MCHW, Volume 1 (Paints), Series 1900 and 5000, and Volume 2, Series NG 1900 and NG 5000.

4.3.5 The coating systems defined in section 1.4 of this Certificate must be applied strictly in accordance with the Certificate holder's instructions and the relevant BBA/HAPAS Certificate. In particular, care must be taken to ensure that the surfaces are clean and dry prior to application of the paint system.

4.3.6 When used on tension control bolts, particular care is required when painting the unprotected surface created by the designed shearing process on tightening, to ensure that the overall corrosion protection is maintained.

4.3.7 Any scratches on the fixing will be sacrificially protected by the zinc in the coating. However, as with galvanized steel, any damage sustained by the organic coating in service must be repaired as soon as is practicable.

4.3.8 Damage to the coating system is repaired as described in section 4.4. If this is not possible the fixings must be replaced.

4.4 Maintenance

To achieve the performance described in this Certificate, regular planned maintenance may be required and any damage can be repaired in accordance with MCHW, Volume 1 (Paints), Series 5000.

5 Fulfilment of Requirements

5.1 The conclusion of this BBA assessment is that Greenkote, when used in accordance with the provisions of this Certificate, complies with the BBA HAPAS Certification Scheme requirements.

5.2 In order for the product to continue to meet Scheme requirements, it must be installed, used and maintained as per the manufacturer'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
- acceptable results from long-term exposure monitoring
- 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.

† 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 Regulations

The Certificate holder has taken the responsibility for classifying and labelling the product under the *GB CLP Regulation* and the *CLP Regulation (EC) No 1272/2008 - classification, labelling and packaging of substances and mixtures.* Users must refer to the relevant Safety Data Sheet(s).

8 Bibliography

ASTM D4541-02 *Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers*

BS 3900-C5 : 1997 *Paints and varnishes —Determination of film thickness*
BS 3900-F16 : 1997 *Paints and varnishes. Exposure of coatings to artificial weathering. Exposure to fluorescent UV and water*
BS 3900-F8 : 1993 *Methods of test for paints- Determination of resistance to humid atmospheres containing sulfur dioxide.*
BS 3900-F2 : 1973 *Methods of test for paints- Methods of test for paints — Durability tests on paint films — Determination of resistance to humidity (cyclic condensation)*

BS EN 9227 : 2006 *Corrosion tests in artificial atmospheres. Salt spray tests*

ISO 9001 : 2015 *Quality management systems — Requirements*

BS EN ISO 2808 : 2001 *Paints and varnishes —Determination of film thickness*

BS EN ISO 11507 : 2001 *Paints and varnishes. Exposure of coatings to artificial weathering. Exposure to fluorescent UV and water*

BS EN ISO 3231 : 1998 *Paints and varnishes — Determination of resistance to humid atmospheres containing sulfur dioxide*

CG 303 *Design Manual for Roads and Bridges, Highways Structures & Bridges, General Information. Quality assurance scheme for paints and similar protective coatings*

CM 431 *Design Manual for Roads and Bridges, Highways Structures & Bridges, Maintenance & Operation. Maintenance painting of Steelwork*

Manual of Contract Documents for Highway Works*, Volume 1 Specification for Highway Works, Series 1900 Protection of steelwork against corrosion*
Manual of Contract Documents for Highway Works*, Volume 1 Specification for Highway Works, Series 5000 Maintenance painting of steelwork*
Manual of Contract Documents for Highway Works*, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 1900 Protection of steelwork against corrosion*
Manual of Contract Documents for Highway Works*, Volume 2 Notes for Guidance on the Specification for Highway Works, Series 5000 Maintenance painting of steelwork*

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.

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