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Agrément Certificate
16/5376
Product Sheet 1

TARMAC TRADING GROUTED MACADAMS

ULTICRETE HEAVY DUTY SURFACING

This Agrément Certificate Product Sheet(1) relates to Ulticrete Heavy Duty Surfacing, for use as a heavy-duty industrial surfacing in locations such as warehouses, cargo handling areas, bus depots and airport hard standings and maintenance areas.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information 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

Flexibility — the system can accommodate minor movement of a base in a flexible construction (see section 6).

Chemical resistance — the chemical resistance of the system will be similar to that of concrete (see section 7).

Mechanical resistance — the system has a rut rate and rut depth that is classified as No.2 in accordance with PD 6691 : 2015 and is suitable for very heavily stressed sites requiring very high rut resistance (see section 8).

Durability — when used in heavy-duty applications, the system will have a service life in excess of traditional asphalt surfacing (see section 11).

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 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

Date of First issue: 6 December 2016

Simon Wroe
Head of Approvals — Engineering

Claire Curtis-Thomas
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

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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Regulations

In the opinion of the BBA, Ulticrete Heavy Duty Surfacing, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	B5(2)	Access and facilities for the fire service
Requirement:	H6(2)	Solid waste storage
Requirement:	M1	Access and use
Requirement:	M2	Access to extensions to buildings other than dwellings
Comment:		Use of the system will contribute towards compliance with these Requirements. See section 8.1 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The system is acceptable. See section 11 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		Use of the system satisfies the requirements of this Regulation. See sections 10 and 11 and the *Installation* part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.12	Fire and rescue service access
Comment:		Use of the system will contribute towards compliance with this Standard, with reference to clauses 2.12.0[(1)(2)], 2.12.2[(1)(2)] and 2.12.3[(1)(2)]. See section 8.1 of this Certificate.
Standard:	3.25	Solid waste storage
Comment:		Use of the system will contribute towards compliance with this Standard, with reference to clauses 3.25.1[(1)] and 3.25.3[(1)]. See section 8.1 of this Certificate.
Standard:	4.1	Access to buildings
Comment:		Use of the system will contribute towards compliance with this Standard, with reference to clause 4.1.4[(1)(2)]. See section 8.1 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		Comments made in relation to the system under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1[(1)(2)] and Schedule 6[(1)(2)].

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23(a)(b)(i)	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	37	Facilities and access for the Fire and Rescue Service
Regulation:	62	Solid waste storage
Regulation:	91	Access and use
Regulation:	92	Access to extensions
Comment:		Use of the system will contribute towards compliance with these Regulations. See section 8.1 of this Certificate.

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* (3.2 and 3.3) of this Certificate.

Technical Specification

1 Description

1.1 Ulticrete Heavy Duty Surfacing comprises an open-textured, asphalt support layer with a controlled proportion of voids, and filled with a proprietary cementitious grout.

1.2 The system provides a jointless, flexible surfacing for heavy-duty pavements which is resistant to the fluids present in vehicle and aircraft maintenance areas and can accommodate limited movement of the underlying substrate.

1.3 The asphalt support layer comprises a 0/10 mm open-graded surface course comprising a penetration-grade bitumen to BS EN 12591 : 2009 and coarse and fine aggregates to BS EN 13043 : 2002. The aggregate is graded to give a controlled proportion of air voids to accommodate the proprietary cementitious grout.

1.4 The grout comprises a proprietary grout powder consisting of Portland cement, plasticisers and fine mineral aggregate mixed with potable water.

1.5 The system is used in conjunction with a machine applied polymer modified bond coat conforming to BS EN 13808 : 2013 to reduce water ingress and enhance adhesion to the substrate. Tack coat C40B4 to BS EN 13808 : 2013 can be hand applied by lance where machine spraying is not possible.

2 Manufacture

2.1 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 as part of a surveillance process to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.2 The management system of Tarmac Trading Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM 503516).

3 Delivery and site handling

3.1 The asphalt support layer is delivered to site in bulk for immediate use and laid in accordance with BS 594987 : 2015 and the Tarmac Trading Ltd *Installation Guide for Ulticrete*.

3.2 The cementitious grout powder is delivered premixed in 25 kg sacks. The packs must be stored in a dry location at temperatures below 25°C. The cementitious grout powder can also be supplied in bulk in IBCs and decanted on-site.

3.3 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 Ulticrete Heavy Duty Surfacing.

Design Considerations

4 Use

4.1 Ulticrete Heavy Duty Surfacing is satisfactory for use as a heavy-duty industrial surfacing in new or maintenance pavement construction, and is satisfactory for use in locations such as warehouses, cargo handling areas, bus depots and airport hard standings and maintenance areas.

4.2 The system can be applied to a bituminous or concrete substrate provided the underlying layers of the pavement are stable and have sufficient load-spreading capabilities to support the imposed loading of the surface course during the installation and expected service life.

4.3 Construction joints are not required for the system. However, where it is laid over an existing concrete surface, any existing joints should be retained in the new surface to reduce the likelihood of reflective cracking.

4.4 The choice of aggregate type will depend on site-specific details, including location and contractual requirements for polished stone value (PSV), texture depth and other properties.

5 Practicability of installation

The asphalt support layer and cementitious grout are to be installed only by the Certificate holder.

6 Flexibility

The system does not require expansion joints and can accommodate the limited movement to be expected in a flexible pavement construction.

7 Chemical resistance

7.1 The system's chemical resistance is similar to concrete.

7.2 The system is particularly suitable for vehicle (including aircraft) maintenance areas, where there is the possibility of spillage of fuel, oil and hydraulic fluids.

7.3 Where abnormal chemical spillage is expected, the advice of the Certificate holder must be sought.

8 Mechanical resistance

8.1 The system is able to sustain the abrasion and loading caused by industrial traffic, heavy commercial vehicles, public service vehicles or aircraft in such locations as warehouses, cargo handling areas, bus depots and airfields (hard standings and maintenance areas).

Resistance to permanent deformation

8.2 The system has a Class 2 resistance to rut rate and rut depth in accordance with PD 6691 : 2015, Appendix D, Table D2, and is suitable for heavily stressed sites requiring very high rut resistance.

Torque bond strength

8.3 The system, when installed in accordance with the provisions of this Certificate, has a torque bond strength of >400 kPa when measured in accordance with Appendix A.3 of the BBA HAPAS *Guideline Document for the Assessment and Certification of Thin Surfacing Systems for Highways*.

9 Surface characteristics

Slip/skid resistance

9.1 The mean initial slip/skid resistance, measured in accordance with BS EN 13036-4 : 2011, indicates that the surface slip/skid resistance is satisfactory when used as described in this Certificate.

Erosion index

9.2 The system can maintain an erosion index of 0 when measured before and after surface immersion in diesel and freeze thaw conditioning and is satisfactory when used as described in this Certificate.

10 Maintenance

Where conditions are very severe, (eg areas where steel-wheeled or tracked vehicles regularly turn or reverse) localised damage may take place. This must be repaired promptly by patching, under the guidance of the Certificate holder.

11 Durability

The system will have a service life in excess of conventional asphalt surfacing in areas where greater resistance to permanent deformation, mechanical damage, and exposure to fuel and oils is required.

Installation

12 Procedure

Asphalt support layer

12.1 The Ulticrete 0/10 mm asphalt support layer is installed in accordance with the Certificate holder's Installation Guide, incorporating requirements for the transport, laying and compaction of asphalt mixtures as described in BS 594987 : 2015, sections:

- *5 Preparatory works at the laying site*
  - polymer modified bond coat will be applied at a minimum target rate of spread for bond coats of not less than 0.2 kg·m^{-2} of residual binder on newly laid asphalt and 0.35 kg·m^{-2} on planed, milled and existing asphalt and concrete substrates
- *6 Laying*
  - the asphalt support layer can be applied at a nominal target layer thickness of 40 mm. The minimum compacted thickness at any point is 30 mm and the maximum is 50 mm
  - the asphalt support layer must not be laid in ambient temperatures below 5°C on a falling thermometer, or if standing water, ice or snow is present
  - construction joints are not required for the system. However, where it is laid over an existing concrete surface, any existing joints should be retained in the new surface to reduce the possibility of reflective cracking
  - cut joints must not be painted
- *9 Compaction*
  - the rolling temperature should be between 135 and 160°C
- *10 Opening to traffic*
  - the asphalt support layer should not be opened to traffic prior to the application of the grout. If this is unavoidable then the Certificate holder must be informed.

Cementitious grout

12.2 The grout is applied by the Certificate holder in accordance with their Installation Guide, which includes recommendations for:

- spread rates of the grout

- limiting weather conditions
- compaction
- support coat requirements.

12.3 The grout can be mixed on-site using a combined mixer/pump unit, or off-site supplied in bulk and discharged through a tanker.

12.4 The grout should not be applied in ambient temperatures below 5°C on a falling thermometer, or less than 3°C on a rising thermometer. If the ambient temperature is forecast to rise above 25°C or the asphalt support layer temperature is greater than 27°C, on-site technical support is required to control flow and viscosity.

12.5 The grout can only be applied when the asphalt support layer has been compacted and has cooled to a temperature of 30°C.

12.6 The grout is applied to the asphalt support layer and spread with brooms and squeegees. Grout movement through the receiving course is aided by pooling the grout on the surface and allowing a head of pressure forcing the material into the receiving course.

12.7 Penetration of the grout is achieved by adding grout until surface voids are no longer visible and air bubbles have stopped rising to the surface. The receiving course is deemed to be fully penetrated when no further grout can be forced into the voids and surplus grout remains on the surface.

12.8 The grout spread rate is calculated by measuring the square metre coverage versus the tonnage of grout.

Opening to traffic

12.9 The opening to traffic time varies with ambient conditions, but the following minimum periods before use by different types of traffic must be observed:

- pedestrians — 7 hours
- cars and light traffic — 24 hours
- lorries, standing loads, possibility of oil spillage — 48 hours.

12.10 Where exceptional loads (eg point loading from trailer jockey wheels or stands) or chemical spillage are expected, longer curing periods may be necessary. The Certificate holder's advice should be sought in these situations.

13 Repair

Major repairs

13.1 The damaged area is removed by planing to the full depth of the affected layer. The planed area is reinstated using material to the same specification, unless otherwise agreed with the purchaser, using the procedures identified in section 12.

Minor repairs

13.2 Minor repairs can be carried out by cutting out the damaged section and replacing it with a material of suitable specification agreed between the Certificate holder and the purchaser.

Technical Investigations

14 Tests

Tests were conducted on samples of Ulticrete Heavy Duty Surfacing and the results assessed to determine:

- erosion index at 45°C after scuffing
  - — control
  - — after diesel immersion
  - — after freeze/thaw
- sensitivity to water
- resistance to fuel
- torque bond strength at 20°C (kPa)
- wheel tracking at 60°C
  - — rate ($mm \cdot h^{-1}$)
  - — rut depth (mm)
- compressive and flexural strength
  - — control
  - — after freeze/thaw
- texture depth
- skid resistance.

15 Investigations

15.1 A trial was carried out to assess the practicability of the installation and on-site quality control procedures for the asphalt support layer and the cementitious grout. A visual inspection of the site concluded that it was free from significant abnormalities.

15.2 A user/specifier survey relating to the performance in use was carried out and confirmed the system's performance and durability in applications typical of those quoted in this Certificate.

15.3 The manufacturing process for the cementitious powder was evaluated by inspection of the factory and the methods adopted for quality control, and the quality and composition of the materials used. The inspection confirmed that the plant operated in accordance with requirements of the Quality Plan and Quality System agreed with the BBA.

15.4 The BBA carried out additional visual inspections at existing sites to confirm the performance of the system.

Bibliography

BS 594987 : 2015 *Asphalt for roads and other paved areas — Specification for transport, laying and compaction and product-type testing protocols*

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

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 13036-4 : 2011 *Road and airfield surface characteristics — Test methods — Method for measurement of slip/skid resistance of a surface — The pendulum test*

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

BS EN 13808 : 2013 *Bitumen and bituminous binders — Framework for specifying cationic bituminous emulsions*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

Guideline Document for the Assessment and Certification of Thin Surfacing Systems for Highways, July 2004

PD 6691 : 2015 *Guidance on the use of BS EN 13108, Bituminous mixtures — Material specifications*

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.

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