HAPAS
Roads and Bridges

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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
10/H161
Product Sheet 1

MATACRYL (ONE COAT) BRIDGEDECK WATERPROOFING SYSTEM

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 Matacryl (One Coat) Bridgedeck Waterproofing System for use as a bridgedeck waterproofing system for concrete decks of highway bridges.

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 of the *Guidelines Document for the Assessment and Certification of Waterproofing Systems for Use on Concrete Decks of Highway Bridges* (see section 5).

Durability — The system will provide an effective waterproof layer to the concrete bridge deck, provided it is not damaged during subsequent resurfacing (see section 8).

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

Date of First issue: 9 July 2010

Simon Wroe
Head of Approvals — Materials

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

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.

HAPAS Requirements

Requirements

The Highways Technical Advisory Committee (HiTAC) and HAPAS Specialist Group 7 (Bridgedeck Waterproofing) have agreed with the BBA the aspects of performance to be used by them in assessing the compliance of bridgedeck waterproofing systems with the Guidelines Document. In the opinion of the BBA, the Matacryl (One Coat) Bridgedeck Waterproofing System when applied to concrete decks of highway bridges, in accordance with the provisions of this Certificate, will meet the relevant requirements.

Additional requirements of the overseeing organisations are given in the Manual of Contract Documents for Highway Works (MCHW)[1], Volumes 1 and 2, Series 900.

(1) The MCHW is operated by the Overseeing Organisations: The Highways Agency (HA), Transport Scotland, The Welsh Assembly Government and The Department for Regional Development (Northern Ireland).

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 sections: 3 *Delivery and site handling*, and 10 *Precautions*.

Technical Specification

1 Description

1.1 The Matacryl (One Coat) Bridgedeck Waterproofing System comprises:

- Matacryl Primer CM — a single-component, reactive resin, based on methyl methacrylate
- Matacryl Waterproofing — a two-part urethane modified resin, based on methyl methacrylate, comprising Part A and Part B pigmented grey
- Matacryl STC Tack Coat — a single-component, reactive resin pigmented light ivory, based on methyl methacrylate, for use with hot-rolled asphalt (HRA) surfacing
- Matacryl Catalyst — a 50% dibenzoyl peroxide with a solid plasticiser, for use in Matacryl Primer CM, Matacryl Waterproofing and Matacryl STC Tack Coat
- Natural Quartz (0.3 mm to 0.7 mm) — fire-dried, natural quartz sand, for broadcast into the still wet applied Matacryl Primer CM
- Natural Quartz (2.0 mm to 3.5 mm) — fire-dried, natural quartz sand, for broadcast into the still wet applied Matacryl STC Tack Coat
- Matacryl Accelerator — a single component, yellow-coloured resin solution, for use in Matacryl Primer CM, Matacryl Waterproofing to accelerate curing at temperatures below 0°C
- Matacryl Adcol Thinner — a single-component, colourless liquid, based on methyl methacrylate, for use in Matacryl Waterproofing to improve workability and flow. Also used as a cleaner before overlapping with the system.

2 Manufacture and quality control

The components of the system are manufactured by a batch-blending process. Quality control checks are carried out on the incoming materials, during production and on the finished components.

3 Delivery and site handling

3.1 The components of the system are delivered as detailed in Table 1.

Table 1 Weights and packaging

Component	Weight (kg)	Container	Shelf-life (months)
Matacryl Primer CM	20, 180	Metal containers	9
Matacryl Waterproofing Part A	25, 125	Metal containers	9
Matacryl Waterproofing Part B	25, 125	Metal containers	9
Matacryl STC Tack Coat	20, 180	Metal containers	9
Matacryl Catalyst	25	Cardboard containers	9
Natural Quartz	25	Paper sacks	N/A
Matacryl Accelerator	5	Metal containers	9
Matacryl Adcol Thinner	20, 180	Metal containers	9

3.2 The components are classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009* (CHIP4) and all containers bear the appropriate hazard warning labels. Flashpoints and hazard classification are given in Table 2.

Table 2 Flashpoint and hazard classification

Component	Flashpoint (°C)	Classification
Matacryl Primer CM	12	Highly flammable[1]/Irritant
Matacryl Waterproofing Part A	12	Highly flammable[1]/Irritant
Matacryl Waterproofing Part B	12	Highly flammable[1]/Irritant
Matacryl STC Tack coat	12	Highly flammable[1]/Irritant
Matacryl Catalyst	>55	Oxidising/Irritant
Matacryl Accelerator	12	Highly flammable[1]/Harmful
Matacryl Adcol Thinner	12	Highly flammable[1]/Irritant

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

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Matacryl (One Coat) Bridgedeck Waterproofing System.

Design Considerations

4 Use

The Matacryl (One Coat) Bridgedeck Waterproofing System is suitable for use on highway concrete bridge decks as part of new and maintenance applications with HRA surfacing. The deck surface should have a Class U4 (in accordance with Specification for Highway Works, Volume 1 Clause 1708.4), formed or tamped surface finish and be at least 28 days old (or minimum 7 days where agreed in consultation with the purchaser) with a maximum surface moisture content of 6%.

5 Performance

The system meets the requirements of the *Guidelines Document for the Assessment and Certification of Waterproofing Systems for Use on Concrete Decks of Highway Bridges* (see section 15).

6 Practicability of installation

The system should only be installed by installers who have been trained and approved by the Certificate holder (see section 9.2).

7 Maintenance

The system is not subject to any routine maintenance requirements but any damage must be repaired before being overlaid. (see section 13).

8 Durability

8.1 The system will provide an effective waterproof layer to the concrete bridge deck, provided that care is taken to ensure that the system is not damaged during subsequent resurfacing work.

8.2 The durability of the system is dependant on the surfacing and this will vary on a number of factors; including traffic load, location and environmental conditions.

Installation

9 General

9.1 Installation of the Matacryl (One Coat) Bridgedeck Waterproofing System must only be carried out by contractors authorised and trained by the Certificate holder.

9.2 The Certificate holder is responsible for training and monitoring its authorised contractors to ensure that the system is installed in accordance with the BBA Agreed Method Statement and this Certificate.

10 Precautions

Health and Safety Data Sheets and the *Control of Substances Hazardous to Health Regulations 2002* (COSHH) risk assessments for the works should be deposited with the purchaser and maintained on site.

11 Preparation

11.1 Imperfections in the concrete deck should be reinstated by the purchaser with a material agreed in consultation with the authorised contractor.

11.2 The concrete deck must be clean, dry, and free from ice, frost, laitance, loose aggregate, oil, grease, moss, algae growth, dust and other debris, and where the adhesion to the concrete would be impaired, free from curing liquids, compounds and membranes.

11.3 The air and substrate temperature together with relative humidity should be recorded and the installation of the waterproofing system only carried out on concrete bridge decks when either:

- the minimum air and substrate temperature is at -5°C and rising with the bridge deck temperature above the dew-point for decks which are a minimum of 28 days old, or
- the minimum air and substrate temperature is at 4°C and rising with the bridge deck temperature above the dew-point for decks which are a minimum of 7 days old.

12 Application

Primer

12.1 Matacryl Primer CM can be applied by roller or brush, at a coverage rate of 0.3 kg·m^{-2} to 0.5 kg·m^{-2} dependent on the porosity of the concrete deck.

12.2 Immediately before use the Matacryl Catalyst is added to the Matacryl Primer CM and mixed thoroughly. The quantity of Matacryl Catalyst can be varied according to the substrate temperature (see Table 3). At –5°C first 0.8% Matacryl Accelerator (by weight of the primer) is mixed before adding the Matacryl Catalyst.

Table 3 Dosage of Matacryl Catalyst — primer

By weight of primer (%)	Temperature (°C)
1	30
2	20
4	10
6	0
6	–5

12.3 Fire-dried natural quartz sand (particle size 0.3 mm to 0.7 mm) is then broadcast into the still wet primer at a coverage rate of 0.3 kg·m^{-2} to 0.4 kg·m^{-2}.

12.4 The primer can be over-sprayed with Matacryl Waterproofing membrane provided the primed surface is fully cured and the surface is clean and dry.

Waterproofing membrane

12.5 The Matacryl Waterproofing membrane can be applied by spray, trowel, roller or brush at a coverage rate of 2.8 kg·m^{-2} on a U4 surface. The coverage rate will increase with surface irregularity.

12.6 The Matacryl Waterproofing is supplied as Part A and Part B. Immediately before use, for spray application the Matacryl Catalyst (percentage by weight calculated on total Part A and Part B components) is stirred into Part B and mixed thoroughly. Part B is pigmented grey.

12.7 For spray application the quantity of Matacryl Catalyst in Part B can be varied according to the ambient temperature (see Table 4). At –5°C first 1.6% Matacryl Accelerator (by weight of Part A) is mixed into Part A. Then 5% Matacryl Adcol Thinner is added to each of Part A and B respectively, before adding the Matacryl Catalyst to Part B. The two components Part A and Part B of the Matacryl Waterproofing are metered and mixed in an airless spray unit at a ratio of 1:1 by volume during application.

12.8 For trowel, roller or brush application Parts A and B of the Matacryl Waterproofing are mixed together at a ratio of 1:1 by volume or weight. The quantity of Matacryl Catalyst can be varied according to the ambient temperature by weight of the mixed resin (see Table 4). At –5°C first 0.8% Matacryl Accelerator (by weight of the mixed resin) is mixed before adding the Matacryl Catalyst. To improve workability of the mixed resin, 5% Matacryl Adcol Thinner should be added.

Table 4 Dosage of Matacryl Catalyst – waterproofing

Application		Temperature (°C)
Spray by weight of Parts A and B (%)	Trowel/brush/roller by weight of mixed resin (%)	
1	1	30
1.5	1.5	20
2	2	10
3	3	0
4	3	–5

12.9 The Matacryl Waterproofing membrane pigmented light grey is applied in one coat, at a minimum wet film thickness of 2.2 mm to ensure a minimum dry film thickness of 2.0 mm overall, including peaks, arrises and irregularities in the concrete deck

Lapping

12.10 Where new waterproofing membrane is to be joined to an existing Matacryl Waterproofing membrane and at day joints, the new application should be lapped onto the existing by a minimum of 50 mm.

12.11 Where the existing membrane is clean and less than 24 hours old, no additional preparation is necessary.

12.12 Where the existing membrane is contaminated or over 24 hours old, Matacryl Adcol Thinner should be applied to give a minimum margin of 20 mm greater than the lap and allowed to dry.

Sealing into parapet chase

12.13 The Matacryl Waterproofing membrane should be terminated into a primed chase when provided.

Tack coat

12.14 Matacryl STC Tack Coat for use with HRA surfacing should be applied to the fully cured waterproofing membrane in all areas by roller or brush at a coverage rate of 0.5 $kg \cdot m^{-2}$ to 0.6 $kg \cdot m^{-2}$.

12.15 Immediately before use the Matacryl Catalyst is added to the Matacryl STC Tack Coat and mixed thoroughly. The quantity of Matacryl Catalyst can be varied according to the ambient temperature (see Table 5).

Table 5 Dosage of Matacryl Catalyst — Tack Coat

By weight of tack coat (%)	Temperature (°C)
1	30
2	20
3	10
4	0
5	–5

12.16 Fire-dried natural quartz sand (particle size 2.0 mm to 3.5 mm) is then broadcast into the still wet tack coat at a coverage rate of 1.0 $kg \cdot m^{-2}$ to 1.1 $kg \cdot m^{-2}$ only on the areas to receive the HRA surfacing.

12.17 Matacryl STC Tack Coat should be fully cured prior to the application of the HRA surfacing. Curing time of the tack coat will depend upon site conditions, but is typically 60 minutes at 20°C.

12.18 The HRA surfacing should be applied without undue delay and preferably no more than 7 days after the tack coat application. Should this period be exceeded or the tack coated areas become contaminated or damaged, the Certificate holder should be contacted for advice.

13 Repair of defects

Pin/blow holes

13.1 After application of the waterproofing membrane, any identified pin/blow holes must be over-coated with Matacryl Waterproofing membrane at an additional minimum wet film thickness of 2.2 mm.

Blisters and damage

13.2 Any blisters or damage must be made good by cutting back to sound material. The periphery is then prepared as for lapping and a repair coat of Matacryl Waterproofing membrane applied as in section 12.9, ensuring a minimum peripheral lap of 50 mm around the repair.

13.3 Where the damage is through to the concrete deck, the exposed concrete must first be cleaned and then re-primed.

14 Surfacing

The rolling temperature of the HRA surfacing must not fall below the minimum temperature of 100°C required for the Matacryl STC Tack Coat.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Matacryl (One Coat) Bridgedeck Waterproofing System.

15 Tests

Laboratory performance tests were carried out on the system by the BBA in accordance the requirements of the *Guidelines Document for the Assessment and Certification of Waterproofing Systems for Use on Concrete Decks of Highway Bridges*, the results were satisfactory. The tests carried out on the system achieved the Guidelines Document requirements as detailed in Tables 6 and 7.

Table 6 Tests on waterproofing membrane

Test	Requirement	Method[1]
Resistance to water penetration membrane	satisfactory	Section 3.2.2.10

(1) *Guidelines Document for the Assessment and Certification of Waterproofing Systems for use on Concrete Decks of Highway Bridges* March 2005

Table 7 Tests on waterproofing membrane/system bonded to concrete

Test (units)	Requirement	Method[1]
Tensile adhesion ($N \cdot mm^{-2}$)		Section 3.3.2.1
at −10°C	0.3 min	
at 23°C	0.3 min	
at 40°C	0.2 min	
Resistance to chloride ion penetration (%)	0.04 max	Section 3.3.2.2
Resistance to freeze/thaw		Section 3.3.2.3
tensile adhesion ($N \cdot mm^{-2}$)	0.3 min	
chloride ion penetration (%)	0.04 max	
Resistance to heat ageing		Section 3.3.2.4
tensile adhesion ($N \cdot mm^{-2}$)	0.3 min	
chloride ion penetration (%)	0.04 max	
Resistance to chisel impact		Section 3.3.2.5
at −10°C		
chloride ion penetration (%)	0.04 max	
at 23°C		
chloride ion penetration (%)	0.04 max	
at 40°C		
chloride ion penetration (%)	0.04 max	
Resistance to aggregate indentation	satisfactory	Section 3.3.2.6
at 40°C		
chloride ion penetration (%)	0.04 max	
Resistance to aggregate indentation	satisfactory	Section 3.3.2.7
at 80°C		
chloride ion penetration (%)	0.04 max	
Thermal shock, heat ageing and crack cycling	satisfactory	Section 3.3.2.8
at −10°C		
chloride ion penetration (%)	0.04 max	
at 23°C		
chloride ion penetration (%)	0.04 max	
at 40°C		
chloride ion penetration (%)	0.04 max	
Surface finish of concrete substrate		Section 3.3.2.11
tensile adhesion ($N \cdot mm^{-2}$)		
tamped	0.3 min	
timber formed	0.3 min	
Age of concrete substrate (7 days)		Section 3.3.2.12
tensile adhesion ($N \cdot mm^{-2}$)	0.3 min	
Overlapping time (6 months)		Section 3.3.2.13
tensile adhesion ($N \cdot mm^{-2}$)		
covered	0.3 min	
uncovered	0.3 min	
Resistance to aggregate indentation		Section 3.3.3.1
at 125°C		
chloride ion penetration (%)	0.04 max	
HRA surfacing to waterproofing system		Section 3.3.3.2
interface shear adhesion ($N \cdot mm^{-2}$)		
at −10°C	0.2 min	
at 23°C	0.2 min	
at 40°C	0.1min	
HRA surfacing to waterproofing system		Section 3.3.3.3
interface tensile bond ($N \cdot mm^{-2}$)	0.1 min	
Installation temperature test (0°C)		Section 3.3.3.4
tensile adhesion ($N \cdot mm^{-2}$)	0.3 min	

(1) *Guidelines Document for the Assessment and Certification of Waterproofing Systems for use on Concrete Decks of Highway Bridges* March 2005.

16 Investigations

16.1 An installation site trial was carried out to assess the practicability of the installation and quality control/assurance procedures.

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

Bibliography

Guidelines Document for the Assessment and Certification of Waterproofing Systems for use on Concrete Decks of Highway Bridges March 2005

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works, August 1998 (as amended)*

Manual of Contract Documents for Highway Works, Volume 2 *Notes for Guidance on the Specification for Highway Works,* August 1998 (as amended)

Conditions of Certification

17 Conditions

17.1 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.

17.2 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.

17.3 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 Highway Authorities' Product Approval Scheme.

17.4 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.

17.5 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.

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