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Agrément Certificate  
**10/H166**  
Product Sheet 1

## BRITDEX MDP (TWO COAT) BRIDGEDECK WATERPROOFING SYSTEM

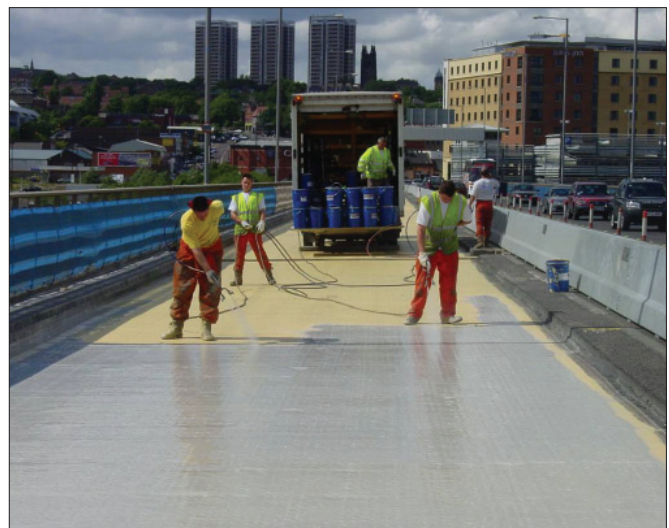
This Certificate is issued under the Highway Authorities' Product Approval Scheme (HAPAS) by the British Board of Agrément (BBA) in conjunction with the Highways Agency (HA) (acting on behalf of the overseeing organisations of the Department for Transport; the Scottish Executive; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), 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 the Britdex MDP (Two 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 bridgedeck, 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: 20 October 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](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.*

# 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 Britdex MDP (Two 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)<sup>(1)</sup>, 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 (3.1, 3.2) and 10 Precautions.

## Technical Specification

### 1 Description

The Britdex MDP (Two Coat) Bridgedeck Waterproofing System comprises:

- Britdex DSP Primer — a two-part, solvent-free, epoxy resin, comprising Base and Hardener
- Britdex MDP Primer — a two-part, solvent-free, highly-reactive methacrylate resin, comprising Part A and Part B
- Britdex MDP Waterproofing — a two-part, solvent-free, methacrylate resin, comprising Part A and Part B pigmented yellow or grey
- Britdex MDP Tack Coat — a single-component, solvent-based, acrylic resin solution, orange pigmented tack coat, for use with additional protective layer (APL) of sand asphalt
- Britdex MDP/Britdex F.E. Tack Coat System — for use with hot-rolled asphalt (HRA) surfacing. A two-component tack coat system comprising:
  - Britdex MDP Tack Coat — a single component, solvent-based, acrylic resin solution, orange pigmented tack coat
  - Britdex F.E. Tack Coat — a polymer-modified, bituminous-based hot-melt adhesive
- Hardener Powder — 50% benzoyl peroxide with a solid plasticiser, for use in Britdex MDP Primer Part B and Britdex MDP Waterproofing Part B.

### 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 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)
Britdex DSP Primer (Base)	3.127, 15.635	Metal containers	6
Britdex DSP Primer (Hardener)	1.88, 9.4	Metal containers	6
Britdex MDP Primer Part A	25	Metal containers	6
Britdex MDP Primer Part B	25	Metal containers	6
Britdex MDP Waterproofing Part A	25, 200	Metal containers	6
Britdex MDP Waterproofing Part B	23.75, 190	Metal containers	6
Hardener Powder	25	Cardboard containers	6
Britdex MDP Tack Coat	25	Metal containers	6
Britdex F.E. Tack Coat	18	Paper sacks	N/A

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 label(s). Flashpoints and hazard classification are given in Table 2.

*Table 2 Flashpoint and hazard classification*

Component	Flashpoint (°C)	Classification
Britdex DSP Primer (Base)	130	Irritant/Dangerous for the environment
Britdex DSP Primer (Hardener)	76	Harmful
Britdex MDP Primer Part A	10	Highly flammable <sup>(1)</sup> /Irritant
Britdex MDP Primer Part B	10	Highly flammable <sup>(1)</sup> /Irritant
Britdex MDP Waterproofing Part A	10	Highly flammable <sup>(1)</sup> /Irritant
Britdex MDP Waterproofing Part B	10	Highly flammable <sup>(1)</sup> /Irritant
Hardener Powder	>55	Oxidising/Irritant
Britdex MDP Tack coat	1	Highly flammable <sup>(1)</sup> /Irritant
Britdex F.E. Tack Coat	>200	Not classified as hazardous

(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 Britdex MDP (Two Coat) Bridgedeck Waterproofing System.

### Design Considerations

#### 4 Use

4.1 The Britdex MDP (Two Coat) Bridgedeck Waterproofing System is suitable for use on highway concrete bridge decks as part of new and maintenance applications with APL or 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 the purchaser) with a maximum surface moisture content of 6%.

4.2 The Britdex DSP Primer is suitable for use with Britdex MDP Waterproofing on concrete bridge decks which are a minimum of 7 days (where agreed in consultation the purchaser) with a maximum surface moisture content of 6%, and a deck surface finish of class U4 finish.

#### 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 bridgedeck, 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 dependent 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 Britdex MDP (Two 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 bridgedecks when either:

- the minimum air and substrate temperature is at 0°C and rising with the bridgedeck temperature above the dew-point for decks which are a minimum of 28 days old when using Britdex MDP Primer, or
- the minimum air and substrate temperature is at 4°C and rising with the bridgedeck temperature above the dew-point for decks which are a minimum of 7 days old when using Britdex DSP Primer.

## 12 Application

### Primer

12.1 Britdex MDP Primer or Britdex DSP Primer should be applied by spray, roller or brush, at a coverage rate of 0.2 kg·m<sup>-2</sup> to 0.4 kg·m<sup>-2</sup> for MDP Primer and 0.3 kg·m<sup>-2</sup> to 0.5 kg·m<sup>-2</sup> for DSP Primer dependent on the porosity of the concrete deck.

12.2 The primer used will depend upon site conditions and the application must be carried out in accordance with the BBA Agreed Method Statement.

12.3 The Britdex MDP Primer can be over-sprayed with Britdex MDP Waterproofing membrane provided the primed surface is fully cured and the surface is clean and dry. The DSP Primer should be over-sprayed while it is still tacky.

### Waterproofing membrane

12.4 The Britdex MDP Waterproofing membrane can be applied by spray, roller or brush at a coverage rate of 1.3 kg·m<sup>-2</sup> per coat on a U4 surface. The coverage rate will increase with surface irregularity.

12.5 The Britdex MDP Waterproofing is supplied as Part A and Part B. Immediately before use, the hardener powder (percentage by weight calculated on the total Part A and Part B components) is stirred into Part B and mixed thoroughly. Part B is either pigmented yellow or grey.

12.6 For spray application, the quantity of hardener powder in Part B can be varied according to the ambient temperature (see Table 3). The two components Part A and Part B of the Britdex MDP Waterproofing are metered and mixed in an airless spray unit at a ratio of 1:1 by volume during application.

12.7 For roller or brush application, the quantity of hardener powder in Part B can be varied according to the ambient temperature (see Table 3). The Part B component is stirred into Part A of the Britdex MDP Waterproofing at a ratio of 1:1 by volume or weight and mixed thoroughly, prior to application.

Table 3 Dosage of hardener powder — waterproofing

Application		Temperature (°C)
Spray by weight of Parts A and B (%)	Brush/roller by weight of mixed resin (%)	
2	1.5	30
2.5	2	20
3	3	10
4	4	5
4	4	0

12.8 The Britdex MDP Waterproofing membrane is applied in two coats, first coat pigmented yellow and second coat pigmented grey. Each coat is applied to give a minimum wet film thickness of 1.1 mm to ensure a minimum dry film thickness of 1.0 mm overall, and a total minimum dry film thickness of 2.0 mm overall, including peaks, arrises and irregularities in the concrete deck.

12.9 The second coat is applied directly onto the first once it has cured. The curing period will vary with temperature but is typically 20 minutes at 20°C.

### Lapping

12.10 Where a new waterproofing membrane is to be joined to an existing Britdex MDP Waterproofing membrane and at day joints, the new application must be lapped onto the existing joint 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 clean but over 24 hours old, Britdex MDP Primer must be applied to give a minimum margin of 20 mm greater than the lap and allowed to dry.

12.13 Where the existing membrane is dirty or contaminated, the surface must be cleaned using a suitable solvent, eg acetone.

### Sealing into parapet chase

12.14 The Britdex MDP Waterproofing membrane should be terminated into a primed chase when provided.

### Tack coat

12.15 The appropriate tack coat should be applied to the fully cured waterproofing membrane only in areas due to receive the APL or HRA surfacing.

12.16 When APL surfacing is to be applied directly onto the system, the Britdex MDP Tack Coat is applied by spray, roller or brush at a coverage rate of 0.3 kg·m<sup>-2</sup> to 0.4 kg·m<sup>-2</sup>.

12.17 When HRA surfacing is to be applied directly onto the system, the Britdex MDP Tack Coat must first be applied as described in section 12.16. Then the Britdex F.E. Tack Coat is preheated to between 160°C and 190°C, and applied by squeegee at a coverage rate of 1.25 kg·m<sup>-2</sup> to 2.5 kg·m<sup>-2</sup>.

12.18 In both cases, the applied tack coat must be dry prior to the application of the APL or HRA surfacing. Drying time of the tack coat will depend upon site conditions. Typical drying time for the Britdex MDP Tack Coat is 30 minutes at 20°C. The Britdex F.E. Tack Coat must be allowed to cool for a minimum of 30 minutes.

12.19 The APL or HRA surfacing should be applied without undue delay and preferably no more than seven 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 each coat, any identified pin/blow holes must be over-coated with Britdex MDP Waterproofing membrane at an additional minimum wet film thickness of 1.1 mm per coat.

### Blisters and damage

13.2 Any blisters or damage must be made good by cutting back to sound material, the periphery prepared if necessary as for lapping and a repair coat of Britdex MDP Waterproofing membrane applied as described in sections 12.8 and 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 surfacing must not fall below the minimum reactivation temperature of 80°C required for the Britdex MDP Tack Coat and 120°C required for Britdex MDP/Britdex F.E. Tack Coat System.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Britdex (Two Coat) MDP 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 (which were also part of an assessment resulting in the previous Certificate O2/R128) carried out on the system achieved the Guidelines Document requirements as detailed in Tables 4 and 5.

Table 4 Tests on waterproofing membrane

Test	Requirement	Method <sup>(1)</sup>
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 5 Tests on waterproofing membrane/system bonded to concrete*

Test (units)	Requirement	Method <sup>(1)</sup>
Tensile adhesion (N·mm <sup>-2</sup> )		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·mm <sup>-2</sup> )	0.3 min	
chloride ion penetration (%)	0.04 max	
Resistance to heat ageing		Section 3.3.2.4
tensile adhesion (N·mm <sup>-2</sup> )	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	
Sand asphalt surfacing to waterproofing system interface shear adhesion (N·mm <sup>-2</sup> )		Section 3.3.2.9
Britdex MDP Tack Coat		
at -10°C	0.2 min	
at 23°C	0.2 min	
at 40°C	0.1 min	
Sand asphalt surfacing to waterproofing system interface tensile bond (N·mm <sup>-2</sup> )		Section 3.3.2.10
Britdex MDP Tack Coat	0.1 min	
Surface finish of concrete substrate		Section 3.3.2.11
tensile adhesion (N·mm <sup>-2</sup> )		
tamped	0.3 min	
timber formed	0.3 min	
Age of concrete substrate (7 days)		Section 3.3.2.12
tensile adhesion (N·mm <sup>-2</sup> )	0.3 min	
Overlapping time (6 months)		Section 3.3.2.13
tensile adhesion (N·mm <sup>-2</sup> )		
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·mm <sup>-2</sup> )		
Britdex MDP/Britdex F.E. Tack Coat System		
at -10°C	0.2 min	
at 23°C	0.2 min	
at 40°C	0.1 min	
HRA surfacing to waterproofing system		Section 3.3.3.3
interface tensile bond (N·mm <sup>-2</sup> )		
Britdex MDP/Britdex F.E. Tack Coat System	0.1 min	
Installation temperature test (0°C)		Section 3.3.3.4
tensile adhesion (N·mm <sup>-2</sup> )	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

An evaluation of existing data from the previous Certificate 02/R128 was taken and includes:

- an assessment of the practicability of the installation and quality control/assurance procedures at an installation site trial
- examination of the manufacturing process, including the methods adopted for quality control, and details 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)*

## 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.