



## Stirling Lloyd Polychem Ltd

Union Bank  
King Street  
Knutsford  
Cheshire WA16 6EF  
Tel: 01565 633111 Fax: 01565 633555

**Roads and Bridges  
Agrément Certificate  
No 99/R112**  
Second issue\*

Designated by Government  
to issue  
European Technical  
Approvals

## ELIMINATOR (TWO COAT) BRIDGEDECK WATERPROOFING SYSTEM

Système d'étanchéité pour tablier de pont  
Wasserdichtungsmittel für Brückentafel

## Product



Spray application of first coat



Spray application of second contrasting coat

- THIS CERTIFICATE RELATES TO THE ELIMINATOR (TWO COAT) BRIDGEDECK WATERPROOFING SYSTEM, INCORPORATING A TWO-PART METHYL METHACRYLATE RESIN, SPRAY-APPLIED IN TWO COLOUR CODED COATS.

- The system is for use as a bridgedeck waterproofing system for concrete decks of highway bridges in accordance with the requirements of the Highways Agency; acting on behalf of the Department for Transport, the Scottish Executive Development Department; the National Assembly of Wales and the Department for Regional Development and the conditions set out in this Certificate.

- The system is manufactured and marketed by Stirling Lloyd Polychem Ltd and is applied by Stirling Lloyd Polychem Ltd's authorised contractors.

## Highways Agency Requirements

### 1 Requirements

The requirements for Bridgedeck Waterproofing are given in the following documents:

- (a) Manual of Contract Documents for Highway Works, Volume 1 (MCHW1) Specification for Highways Works, and
- (b) BD 47 Waterproofing and Surfacing of Concrete Bridge Decks.

## Regulations

### 2 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See sections:

3 Description, 4 Delivery and site handling, and 6 Precautions during installation.

## Technical Specification

### 3 Description

3.1 The Eliminator (Two Coat) Bridgedeck Waterproofing System comprises:

PA1 Primer — a single-component, solvent-based methyl methacrylate resin solution, for use at temperatures above 5°C.

PAR1 Primer — a single-component, solvent-free, highly reactive methyl methacrylate resin, for use at temperatures up to 30°C.

Eliminator (Spray Grade) Waterproofing — a two-part, solvent-free, methyl methacrylate resin, comprising Part A and Part B.

Eliminator Patch Repair (HG) Waterproofing — a single-component, solvent-free, methyl methacrylate resin, for repair work and use in inaccessible areas.

Tack Coat No 2 — a single-component, solvent-based, methyl methacrylate resin solution, orange pigmented, for use with additional protective layer (APL) of sand asphalt.

Tack Coat SA1030 — a polymer-modified, bituminous-based hot melt adhesive, for use with hot-rolled asphalt (HRA) surfacing.

Hardener Powder — 50% benzoyl peroxide with a solid plasticiser, for use in PAR1 Primer, Eliminator (Spray Grade) Waterproofing Part B and Eliminator Patch Repair (HG) Waterproofing.

3.2 The components of the system are manufactured by a batch-blending process. A series of quality control checks is conducted on each batch and on the combined components.

### 4 Delivery and site handling

4.1 The components are delivered as detailed in Table 1. When correctly stored, in unopened containers, these products have a shelf-life of at least six months.

Table 1 Weights and packaging

Component	Weight and packaging
PA1 Primer	5 kg, 20 kg and 190 kg supplied in metal containers
PAR1 Primer	5 kg kit 4.85 kg Primer supplied in metal containers 150 g Hardener Powder supplied in plastic bags
	20 kg kit 19.4 kg Primer supplied in metal containers 600 g Hardener Powder supplied in plastic bags
Eliminator (Spray Grade) Waterproofing	48 kg kit 24 kg Part A supplied in metal containers 23.04 kg Part B supplied in metal containers 960 g Hardener Powder supplied in plastic bags
	400 kg kit 200 kg Part A supplied in metal containers 192 kg Part B supplied in metal containers 8 kg Hardener Powder supplied in plastic bags
Eliminator Patch Repair (HG) Waterproofing	5 kg kit 4.85 kg supplied in metal containers 150 g Hardener Powder supplied in plastic bags
Tack Coat No 2	5 kg and 20 kg supplied in metal containers
Tack Coat SA1030	45.5 kg supplied in cardboard tubs

4.2 The components are classified under the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP3) and all containers bear the appropriate hazard warning label(s). Flashpoints and hazard classifications are given in Table 2.

Table 2 Flashpoint and hazard classification

Component	Flashpoint (°C)	Classification
PA1	11	Highly flammable and irritant
PAR1	12	Highly flammable and irritant
Spray Grade Part A	16	Highly flammable and irritant
Spray Grade Part B	16	Highly flammable and irritant
Patch Repair (HG)	16	Highly flammable and irritant
Tack Coat No 2	1	Highly flammable and irritant

## Design Data

### 5 General

5.1 The Eliminator (Two Coat) Bridgedeck Waterproofing System is suitable for use on concrete bridge decks of at least 28 days old with a Class U4 surface finish.

5.2 Installation of the system should only be carried out at a minimum air temperature of 4°C and rising.

### 6 Precautions during installation

Health and Safety Data Sheets and a COSHH risk assessment for the works should be deposited with the Highway Authority and be maintained on site.

### 7 Durability

Results of tests indicate that the Eliminator (Two Coat) Bridgedeck Waterproofing System will provide an effective waterproof layer to the concrete bridge deck, provided it is not damaged during subsequent resurfacing.

## Installation

### 8 General

8.1 Installation of the Eliminator (Two Coat) Bridgedeck Waterproofing System should be carried out only by contractors authorised and trained by the Certificate holder.

8.2 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.

### 9 Preparation

9.1 Imperfections in the concrete deck should be reinstated by the Highway Authority with a material agreed in consultation with the authorised contractor.

9.2 The concrete deck should 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.

9.3 The air temperature and relative humidity should be recorded and the installation should only proceed if air temperature is a minimum of 4°C and rising, and the bridge deck temperature is above the dew-point.

### 10 Application

#### Primer

10.1 PA1 Primer or PAR1 Primer can be applied by spray, roller or brush, at a coverage rate of 0.15 kgm<sup>-2</sup> to 0.25 kgm<sup>-2</sup> for PA1 and 0.20 kgm<sup>-2</sup> to 0.30 kgm<sup>-2</sup> for PAR1 dependent on the porosity of the concrete deck.

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

10.3 The primer can be oversprayed with Eliminator waterproofing membrane provided the primer is fully cured and the surface is clean and dry.

#### Waterproofing membrane

10.4 Eliminator (Spray Grade) Waterproofing is supplied as Part A and Part B. Immediately before use the pre-weighed hardener powder is stirred into Part B and mixed thoroughly. Part A and Part B are metered and mixed in an airless spray unit at a ratio of 1:1. Part B is either pigmented yellow, white or grey.

10.5 Eliminator (Spray Grade) Waterproofing is spray applied in two coats, first coat pigmented yellow and second coat pigmented white or grey.

10.6 Each coat must be applied to give a minimum wet film thickness of 1.2 mm to ensure a minimum dry film thickness of 1.0 mm and a total minimum dry film thickness of 2.0 mm overall, including peaks, arrises and irregularities in the concrete deck. This can be achieved by a coverage rate of 1.6 kgm<sup>-2</sup> per coat on a U4 surface. The coverage rate will vary with surface irregularity.

10.7 The second coat can be applied directly onto the first coat once it has cured. This will vary with temperature but is typically one hour at 23°C.

### Lapping

10.8 Where the waterproofing membrane is to be joined to an existing Eliminator (Spray Grade) Waterproofing membrane and at day joints, the new application should be lapped onto the existing by a minimum of 50 mm.

10.9 Where the existing membrane is clean, additional preparation is not necessary.

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

### Sealing into parapet chase

10.11 Eliminator (Spray Grade) Waterproofing membrane should be terminated into a primed chase when provided.

### Tack coat

10.12 The appropriate tack coat should be applied to the cured waterproofing membrane only in areas due to receive the additional protective layer (APL) of sand asphalt or hot-rolled asphalt (HRA).

10.13 When APL is to be applied directly onto the system, Tack Coat No 2 should be applied either by spray, roller or brush at a coverage rate of 0.1 kgm<sup>-2</sup> to 0.3 kgm<sup>-2</sup>.

10.14 When HRA is to be applied directly onto the system, Tack Coat SA 1030 should be pre-heated to between 175°C and 200°C and applied by squeegee at a coverage rate of 1.25 kgm<sup>-2</sup> to 1.75 kgm<sup>-2</sup>.

10.15 The tack coat should be dry before the application of the APL or HRA. Drying time of the tack coat will depend upon site conditions. Typical drying time for Tack Coat No 2 is one hour at 23°C. Tack Coat SA1030 must be allowed to cool for a minimum of 30 minutes.

10.16 The APL or HRA should be applied without undue delay after the tack coat application.

## 11 Repair of defects

### Pin/blow holes

11.1 After application of each coat, any identified pin/blow holes should be overcoated with Eliminator (Spray Grade) or Patch Repair (HG) Waterproofing membrane with an additional minimum wet film thickness of 1.2 mm per coat.

### Blisters and damage

11.2 Any blisters or damage should be made good by cutting back to sound material, the periphery prepared if necessary as for lapping and a repair coat of Eliminator (Spray Grade) or Patch Repair (HG) Waterproofing membrane applied as in sections 10.6 and 10.7, ensuring a minimum peripheral lap of 50 mm around the repair.

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

## 12 Surfacing

The rolling temperature of the surfacing must not fall below the minimum reactivation temperature of 85°C required for Tack Coat No 2, and 90°C for Tack Coat SA 1030.

The following is a summary of the technical investigations carried out on the Eliminator (Two Coat) Bridgedeck Waterproofing System.

## 13 Tests

Laboratory performance tests were carried out on the system which achieved the BD 47 requirements as detailed in Tables 3 and 4.

Table 3 Tests on waterproofing membrane

Test	Method <sup>(1)</sup>	BD 47 requirements
Resistance to water penetration membrane joint	BD 47 B4.1(d)	satisfactory satisfactory

(1) Test documents are detailed in the *Bibliography*. Numbers/letters in the tables refer to the sections/parts of the document.

Table 4 Tests on waterproofing membrane/system bonded to concrete

Test (units)	Method <sup>(1)</sup>	BD 47 requirements
Tensile adhesion (Nmm <sup>-2</sup> ) at -10°C at 23°C at 40°C	BD 47 B4.2(d)	0.3 min 0.3 min 0.2 min
Resistance to chloride ion penetration (%)	BD 47 B4.2(e)	0.04 max
Resistance to freeze/thaw tensile adhesion (Nmm <sup>-2</sup> ) chloride ion penetration (%)	BD 47 B4.2(f)	satisfactory 0.3 min 0.04 max
Resistance to heat ageing tensile adhesion (Nmm <sup>-2</sup> ) chloride ion penetration (%)	BD 47 B4.2(g)	satisfactory 0.3 min 0.04 max
Resistance to chisel impact — chloride ion penetration (%) at -10°C at 23°C at 40°C	BD 47 B4.2(h)	satisfactory 0.04 max 0.04 max 0.04 max
Resistance to aggregate indentation — chloride ion at 40°C at 80°C at 125°C	BD 47 B4.2(i)	satisfactory 0.04 max 0.04 max 0.04 max
Thermal shock, heat ageing and crack cycling — chloride ion penetration (%) at -10°C at 23°C at 40°C	BD 47 B4.2(j)	satisfactory 0.04 max 0.04 max 0.04 max
Surfacing to waterproofing system interface shear adhesion (Nmm <sup>-2</sup> ) Sand asphalt at -10°C at 23°C at 40°C Hot-rolled asphalt at -10°C at 23°C at 40°C	BD 47 B4.2(k)	satisfactory 0.2 min 0.2 min 0.1 min 0.2 min 0.2 min 0.1 min
Surfacing to waterproofing system interface tensile bond (Nmm <sup>-2</sup> ) sand asphalt hot-rolled asphalt	BD 47 B4.2(l)	satisfactory 0.1 min 0.1 min

(1) Test documents are detailed in the *Bibliography*. Numbers/letters in the tables refer to the sections/parts of the document.

## 14 Other investigations

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

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

## Bibliography

BD 47 *Waterproofing and Surfacing of Concrete Bridge Decks, Appendix B Certification Test Requirements for Waterproofing Systems on Concrete Bridge Decks*

Manual of Contract Documents for Highway Works, Volume 1, (MCHW1) *Specification for Highway Works* : May 2001

## Conditions of Certification

### 15 Conditions

15.1 This Certificate:

- (a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;
- (b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;
- (c) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (d) is copyright of the BBA.

15.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

15.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) thereof:

- (a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;
- (b) continue to be checked by the BBA or its agents;
- (c) are reviewed by the BBA as and when it considers appropriate; and
- (d) remain in accordance with the requirements of the Highways Agency.

15.4 In granting this Certificate, the BBA makes no representation as to:

- (a) the presence or absence of any patent or similar rights subsisting in the product or any other product;
- (b) the right of the Certificate holder to market, supply, install or maintain the product; and
- (c) the nature of individual installations of the product, including methods and workmanship.

15.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do 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 or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future 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 installation and use of this product.



In the opinion of the British Board of Agrément, the Eliminator (Two Coat) Bridgedeck Waterproofing System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 99/R112 is accordingly awarded to Stirling Lloyd Polychem Ltd.

On behalf of the British Board of Agrément

Date of Second issue: 16th August 2002

A handwritten signature in black ink, appearing to read 'P. C. Newson'.

Chief Executive

*\*Original Certificate issued 17th May 1999. This revised version includes references to additional primer, updated CDM Regulations and other minor amendments.*