

Premcrete

26 Whitehall Road
Leeds
West Yorkshire LS12 1BE
Tel: 0800 619 1619
e-mail: sales@premcrete.com
website: www.premcrete.com



Agrément Certificate
13/5008
Product Sheet 1

PREMCRETE CONCRETE PRODUCTS

PREMCRETE CONCRETE REPAIR AND PROTECTION SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Premcrete Concrete Repair and Protection System, for use in repairing untrafficked concrete damaged by reinforcement corrosion, impact or abrasion.

(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

Protection — the system provides concrete with increased resistance to the penetration of water, chloride ions, carbon dioxide and oxygen, thereby protecting reinforcing steel against corrosion (see sections 6 to 11).

Freeze/thaw resistance — the system provides concrete with adequate resistance to freeze/thaw damage (see section 12).

Strength and stability — the system has satisfactory compressive and flexural strengths and forms a good bond to concrete (see section 13).

Durability — the system is durable and will extend the life of a repaired concrete structure (see section 18).

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

A handwritten signature in black ink, appearing to read 'Simon Wroe'.

Date of Second issue: 23 April 2014

Originally certificated on 23 July 2013

Simon Wroe
Head of Approvals — Materials

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

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tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

Regulations

In the opinion of the BBA, the Premcrete Concrete Repair and Protection System, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting 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:	A1	Loading
Requirement:	A2	Ground movement
Requirement:	A3	Disproportionate collapse
Comment:		Application of the system will not adversely affect an existing building in relation to compliance with these Requirements. See section 13 of this Certificate.
Requirement:	B2(1)	Internal fire spread (lining)
Requirement:	B3(1)(2)	Internal fire spread (structure)
Requirement:	B4(1)	External fire spread
Comment:		Application of the system will not adversely affect an existing building in relation to compliance with the fire spread component of these Requirements. See section 14 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The system components are acceptable. See sections 18.1 to 18.3 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The system components can contribute to a construction satisfying this Regulation. See sections 17 and 18.1 to 18.3 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(a)(b)	Structure
Standard:	2.1	Disproportionate collapse
Comment:		Application of the system will not adversely affect an existing building in relation to compliance with these Standards, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ , 1.1.2 ⁽¹⁾⁽²⁾ , 1.1.3 ⁽¹⁾⁽²⁾ , 1.2.1 ⁽¹⁾⁽²⁾ , 1.2.2 ⁽¹⁾⁽²⁾ , 1.2.3 ⁽¹⁾⁽²⁾ and 1.2.4 ⁽¹⁾⁽²⁾ . See section 13 of this Certificate.
Standard:	2.5	Internal linings
Standard:	2.6	Spread to neighbouring buildings
Standard:	2.7	Spread on external walls
Comment:		The system components are not classified as 'non-combustible' and are therefore restricted under these Standards, with reference to clauses 2.5.1 ⁽¹⁾⁽²⁾ , 2.6.4 ⁽¹⁾⁽²⁾ , 2.6.6 ⁽¹⁾⁽²⁾ and 2.7.1 ⁽¹⁾⁽²⁾ . See section 14 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The system can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for 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

Regulation:	23(a)(b)(i)	Fitness of materials and workmanship
Comment:		The system components are acceptable materials. See sections 18.1 to 18.3 and the <i>Installation</i> part of this Certificate.
Regulation:	30	Stability
Regulation:	31	Disproportionate collapse
Comment:		Application of the system will not adversely affect the existing building in relation to compliance with these Regulations. See section 13 of this Certificate.
Regulation:	34	Internal fire spread – Linings
Regulation:	35	Internal fire spread – Structure
Regulation:	36	External fire spread
Comment:		The system is unrestricted under these Regulations. See section 14 of this Certificate.

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 section: 3 *Delivery and site handling* (3.1, 3.3 and 3.4) of this Certificate.

Additional Information

NHBC Standards 2014

In the opinion of the BBA, the use of the Premcrete Concrete Repair and Protection System, in relation to this Certificate, is not subject to the requirements of these Standards.

CE marking

The Certificate holder has taken the responsibility of CE marking the Teknoprime 841 component of the system in accordance with harmonised European Standard BS EN 1504-7 : 2006, the Hydroseal FX component of the system in accordance with harmonised European Standard BS EN 1504-2 : 2004 and the Teknocem HB50 and Teknocem Rapid components in accordance with harmonised European Standard BS EN 1504-3 : 2005. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Premcrete Concrete Repair and Protection System is a pre-batched, multi-component system based on polymer, microsilica and fibre-modified Portland cement mortars and organic coatings.

1.2 The Premcrete Concrete Protection System consists of:

- Teknoprime 841 — a two-component, polymer-modified, cementitious coating for the protection of steel reinforcement, applied prior to the application of the appropriate repair mortar
- Teknoprime 842 — a two-component, polymer-modified, cementitious bonding aid for sealing the surface of porous concrete substrates
- Teknocem M50 — a two-component, high-build, polymer-modified, cementitious mortar for vertical and horizontal concrete repairs up to 50 mm depth in marine and tidal areas
- Teknocem M80 — a three-component, thixotropic, high-build, polymer-modified, cementitious mortar for vertical and horizontal concrete repairs up to 100 mm depth in marine and tidal areas
- Hydroseal FX — a two-component, thixotropic, polymer-modified, cementitious coating, available in grey or white, for waterproofing concrete substrates and providing a protective barrier to reinforcement
- Teknocem HB 50 — a single-component, low-density, high-build, polymer-modified, cementitious mortar for vertical and horizontal repair of concrete
- Teknocem Rapid — a single-component, rapid-hardening and rapid-setting, polymer-modified, Portland cement mortar for vertical and horizontal repair of concrete
- Cureaid AC — a single-component, non-degrading, water-based overcoatable curing compound, for use in confined areas.

2 Manufacture

2.1 The system components are manufactured by batch blending processes.

2.2 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 through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by the British Standards Institute Quality Assurance Services (Certificate FM41091).

3 Delivery and site handling

3.1 The system components are delivered to site as shown in Table 1.

Table 1 Packaging and weights

Component	Package type	Weight	Shelf-life (years)
Teknoprime 841	composite packs	5 kg	1
Teknoprime 842	composite packs	4 kg	1
Teknocem M50	composite packs	30 kg	1
Teknocem M80	composite packs	30 kg	1
Hydroseal FX	composite packs	30 kg	1
Teknocem HB 50	packs	25 kg	1
Teknocem Rapid	packs	25 kg	1
Cureaid AC	containers	5 litre	1

3.2 All components must be stored in a clean, dry area and protected from frost.

3.3 The classifications of the system components under *The Chemicals (Hazards and Packaging for Supply) Regulations 2009 (CHIP 4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009* are given in Table 2.

Table 2 Hazard classifications

Component	Classification
Teknoprime 841	Irritant
Teknoprime 842	Irritant
Teknocem M50	Irritant
Teknocem M80	Irritant
Hydroseal FX	Irritant
Teknocem HB 50	Irritant
Teknocem Rapid	Irritant
Cureaid AC	Not classified

3.4 When handling the components normal health and safety procedures associated with cementitious materials must be observed.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Premcrete Concrete Repair and Protection System.

Design Considerations

4 Use

4.1 The Premcrete Concrete Repair and Protection System is satisfactory for use in repairing untrafficked concrete damaged by reinforcement corrosion, impact or abrasion.

4.2 The desired extended life of the building must be taken into account when preparing the repair specification. The overall repair situation must always be subject to appraisal by a suitably qualified engineer (see section 19).

4.3 It is essential that diagnosis, preparation and repair are carried out in accordance with the stipulations of the *Design Considerations* and *Installation* parts of this Certificate.

5 Practicability of installation

The system must only be installed by installers who have been trained and approved by the Certificate holder.

6 Protection of reinforcing steel against corrosion

Teknoprime 841 will provide a protective environment for reinforcing steel. The repair mortars and protective coatings resist carbon dioxide penetration and also reduce the presence of water in both the repair and parent concrete, so restricting the ingress of sulfate and chloride ions.

7 Chloride ion diffusivity

The repair mortars provide significant resistance to the transmission of chloride ions. Additional protection can be provided by the application of one of the coating protection systems.

8 Carbon dioxide resistance

The repair mortars provide significant resistance to the transmission of carbon dioxide. Additional protection can be added by the application of one of the coating protection systems.

9 Oxygen resistance

The repair mortars provide good resistance to the transmission of oxygen. The oxygen diffusion coefficients for layer thickness are detailed in Table 3.

Table 3 Oxygen diffusion coefficients

Component	Oxygen diffusion coefficient ⁽¹⁾ (cm ² ·s ⁻¹)
Teknoprime 841 ⁽²⁾	52.4 × 10 ⁻⁶
Hydroseal FX ⁽³⁾⁽⁴⁾	58.34 × 10 ⁻⁶
Teknocem HB50	272 × 10 ⁻⁶

(1) Typical oxygen diffusion coefficient values through average permeability concrete at 28 days, conditioned at 55% relative humidity, are 500 × 10⁻⁶ cm²·s⁻¹ to 5000 × 10⁻⁶ cm²·s⁻¹ (ref: Concrete Society Technical Report No 31 *Permeability*).

(2) Owing to the nature of this material, the layer thickness was for a composite of coated stainless steel wire mesh.

(3) Owing to the nature of the material, the layer was applied in two coats to porous plates.

(4) Based on the grey product; the white product will be similar.

10 Water vapour resistance

The protective coatings will allow satisfactory transmission of water vapour from the concrete.

11 Resistance to liquid water

Water will not readily pass through the protective coatings under the conditions likely to be met in service. The coatings will tend to shed water and so considerably reduce the amount of water that would otherwise be absorbed by the substrate.

12 Freeze/thaw resistance

12.1 As the surface coating reduces the presence of water, the system will have improved resistance to frost attack compared with that of the parent concrete.

12.2 The mortar components of the system have improved resistance to frost attack compared with that of a control concrete.

13 Strength and stability



13.1 When tested in accordance with BS EN 12190 : 1999 and BS 4551 : 1980, the repair mortars achieved satisfactory 28-day compressive and flexural strengths. Results are given in Table 4.

Table 4 28-day compressive and flexural strengths

Component	Compressive strength (N·mm ⁻²)	Flexural strength (N·mm ⁻²) ⁽¹⁾
Teknocem M50	N/A	17
Teknocem M80	N/A	15
Hydroseal FX ⁽²⁾	Class I ≥ 35 N·mm ⁻² *	22
Teknocem HB50	Class R3 ≥ 25 N·mm ⁻² *	10
Teknocem Rapid	Class R4 ≥ 45 N·mm ⁻² *	13

(1) The repair mortars were cured for 7 days under polythene followed by 21 days at 23°C and 50% RH.

(2) Based on the grey product; results for the white product will be similar.

13.2 When tested in accordance with BS EN 13412 : 2006, the repair mortars achieved satisfactory static moduli of elasticity. Results are given in Table 5.

Table 5 Static moduli of elasticity

Component	Static modulus of elasticity (GN·m ⁻²)
Teknocem M50	N/A
Teknocem M80	N/A
Hydroseal FX	N/A
Teknocem HB50	Class R3 ≥ 15 GN·m ⁻² *
Teknocem Rapid	Class R4 ≥ 20 GN·m ⁻² *

13.3 The repair mortars have thermal movement and wetting and drying characteristics similar to those of concrete.

13.4 The bond strength of the repair mortars to prepared concrete is similar to that of the cohesive strengths of the mortar and of concrete. An analysis of test results indicated no significant loss of bond strength following heat ageing, thermal shock or freeze/thaw cycling.

14 Behaviour in relation to fire



14.1 When tested in accordance with BS EN 13501-1 : 2007, the grey Hydroseal FX achieved a reaction to fire classification of A2-S1, d0 *. Designations of other colours and/or material combinations should be confirmed by:

England and Wales — test or assessment in accordance with Approved Document B, Appendix A, clause 1

Scotland — test to conform to the Table to Annex 2B⁽¹⁾ or 2E⁽²⁾ of Regulation 9

(1) Technical Handbook (Domestic)

(2) Technical Handbook (Non-Domestic)

Northern Ireland — test or assessment in accordance with Technical Booklet E, clauses 3.4, 3.7, 4.3 and 4.4, and Table 5.1.

14.2 In situations where the reinstatement of fire protection is of prime importance, further testing or assessment will be necessary.

15 Resistance to thermal shock

The system can resist the effects of thermal shock likely to be met in service.

16 Movement and cracking

16.1 The protective coatings will retain adequate flexibility under normal weathering conditions and will resist movement of the substrate resulting from anticipated temperature and moisture variations. However, they are unlikely to restrict the development of existing visible cracks in the substrate, and those occurring during its service life.

16.2 Advice should be sought from the Certificate holder with regard to the use of additional reinforcement as part of the repair, where necessary. Reference should also be made to the recommendations under section 17.1.

17 Maintenance



17.1 Since the protective function of the system is dependent on its integrity, provision should be made for periodic examination for local damage or defects. Early rectification of such flaws must be carried out using relevant materials and techniques indicated in this Certificate.

17.2 Maintenance waterproofing and finishing (see section 22.9) should be carried out to maintain protection and appearance when required, using the relevant materials and techniques indicated in this Certificate.

18 Durability



18.1 The cementitious components will extend the life of the repaired elements.

18.2 The lifetime of the repaired elements and parent concrete will be further extended by the use of the protective coatings.

18.3 Under normal conditions, Hydroseal FX will perform as a protective surface coating for a period of at least 10 years.

18.4 If during the diagnosis (see section 19.3) levels of chloride are detected which, under the scheme given in Table 4 of BRE Digest 444 Part 2, *Corrosion of steel in concrete — investigation and assessment*, would give more than a low risk of reinforcement corrosion, further maintenance or repair may subsequently be required.

Installation

19 Diagnosis and specification

19.1 Any diagnostic survey must be carried out by suitably experienced and qualified personnel in accordance with the recommendations of the Certificate holder and current professional practice. Attention is also drawn to the advice on diagnosis contained in BS EN 1504-10 : 2003, BS EN 1504-9 : 2008 and BRE Digest 444.

19.2 An initial survey of the whole of the damaged structure is carried out, with reference to the original plans if available, to establish suitable methods of testing for structural damage, fire damage and chemical analysis and test locations. Any relevant factors such as the direction of the prevailing wind and the proximity of industrial plants are noted.

19.3 A full diagnostic survey is made using appropriate techniques to establish the cause or causes of the damage and contamination. This may include chemical testing and petrographic examination of core samples.

19.4 The results of these tests must be interpreted by a suitably experienced and qualified engineer, who must determine the extent of the damage and structural implications and ensure that areas of latent damage are identified. In particular, when repairing loadbearing elements, the engineer must identify those situations where the load must be

supported before removing concrete. In addition, the engineer should include the extent to which the repair mortar will carry structural loads in specific situations. Where necessary, the Certificate holder must be consulted.

19.5 A full repair specification is prepared using suitably qualified and experienced personnel on the basis of the survey and diagnosis. For advice on the preparation of a specification and the associated Bills of Quantities, the Certificate holder must be consulted. Advice is also given in Concrete Society Technical Report No. 38 *Patch repair of reinforced concrete subject to reinforcement corrosion – Model specification and method of measurement*.

20 Preparation

20.1 The concrete surface is cleaned in accordance with the instructions of the Certificate holder, and loadbearing supports installed where required (see section 19.4).

20.2 All damaged concrete identified during the survey is removed back to sound concrete. Areas to be repaired are cut back at the edges to avoid feather-edging of the repairs.

20.3 Steel reinforcement is exposed beyond its corroding length. Concrete is removed from around the corroding reinforcement only with the approval of the engineer responsible.

20.4 Where cover to the steel reinforcement is low or absent, the recommendations of the engineer must be obtained with regard to the establishment of requisite reinforcement cover necessary to maintain the structural and protective characteristics.

20.5 Exposed steel reinforcement is thoroughly cleaned by abrasive blasting or, on certain thin sections, by the use of appropriate abrasive tools.

20.6 Preparation carried out as described in sections 20.1 to 20.5 is ratified by the engineer responsible before repairs are conducted. Reference must be made to the relevant information contained in BS EN 1504-10 : 2003, BS EN 1504-9 : 2008 and BRE Digest 444.

21 Mixing

21.1 All the component products which make up the system are mixed in accordance with the Certificate holder's instructions, and as described in sections 21.2 to 21.8.

Teknoprime 841

21.2 Component A is placed into a suitable system mixing container and the corresponding quantity of Component B added (mixing ratio Component B:Component A is 3:1 by volume or 4:1 by weight). Mixing is carried out for two to three minutes, either by hand for small amounts or by using a low-speed, hand-held electric drill fitted with a helical paddle for larger amounts. Care must be taken to avoid aeration and the mix should be smooth and have a brushable, barely-dripping consistency.

Teknoprime 842

21.3 Component A is shaken before half is added to a suitable container. Component B is added slowly, while mixing with a low-speed, hand-held electric drill fitted with a helical paddle. When homogeneous, the remainder of Component A is added and mixing continued for two to three minutes to produce a smooth, thin-slurry consistency. Smaller amounts may be prepared by using the measuring kit provided and mixing by hand.

Teknocem M50

21.4 Mixing takes place in a forced action pan mixer or in a clean drum using a low-speed, hand-held electric drill, fitted with a helical paddle (a normal concrete mixer is not suitable). Component A must be shaken before pouring approximately half into the mixing vessel, then Component B is added and mixing continued. Care must be taken to avoid aeration. Mixing normally takes between two and three minutes, depending on the type of mixer.

Teknocem M80

21.5 Mixing is as detailed in section 21.4. However, in this case, both Components B and C are added slowly to Component A.

Hydroseal FX (white or grey)

21.6 The modules must be mechanically mixed using a low speed, hand-held electric drill fitted with a helical paddle specially designed to entrap as little air as possible. The bottle marked Part A must be shaken before pouring into a suitable container, then the pack marked Part B is slowly added while mixing until homogeneous. The mixing must be continued for a minimum of five minutes. Only full modules of Part A and B should be mixed.

Teknocem HB50 and Teknocem Rapid

21.7 The products are mechanically mixed in a forced action pan mixer or in a clean drum, using a low-speed, hand-held electric drill fitted with a helical paddle. For normal applications, a 25 kg bag is added slowly to 3.5 litres of clean water and mixed until a uniform desired consistency is reached (normally in two minutes) with care being taken to avoid aeration.

Cureaid AC

21.8 The product is supplied ready for use.

22 Application

General

22.1 Application must not take place in temperatures of 5°C or below and the coating protection system must not be applied in wet weather. Freshly coated work must be protected from rain.

22.2 The protective performance depends on achieving full integrity of the components. Care must be taken to achieve even and uniform coatings free from defects. At each stage of a repair, curing must be carried out correctly to prevent the occurrence of associated problems (such as plastic shrinkage cracking).

Priming

22.3 Teknoprime 841 is applied by brush as soon as possible (and in any event within a maximum of 24 hours) to the cleaned reinforcing bars, to a thickness of approximately 1 mm. To ensure total protection, a second coat approximately 1 mm thick is applied before the first coat is fully set, typically within 30 to 90 minutes depending on temperature.

22.4 The surrounding concrete substrate must be free from all unsound material such as dust, oil, grease, corrosion by-products, organic growth and surface laitance. The prepared substrate is thoroughly soaked with clean water until uniformly saturated (but free of standing water), preferably 24 hours prior to application of the Teknoprime 842.

22.5 Teknoprime 842 is brushed onto and worked into the damp surface to be repaired. The bonding bridge must be protected from strong sunlight or drying winds. If the bonding bridge is allowed to dry, it must be mechanically removed before a reapplication is carried out.

Repair

22.6 The repair mortars Teknocem M50, Teknocem M80, Teknocem HB50 and Teknocem Rapid must be applied while the primer is still wet or tacky, and compacted by trowel or gloved hand to remove any trapped air. Care must be taken to ensure full compaction around steel reinforcement. The mortars are finished by striking off with a straight edge and closing with a steel float. For Teknocem Rapid, advice should be sought from the Certificate holder on the repair of pockets greater than 100 mm deep.

22.7 Cureaid AC is spray-applied within 15 minutes of striking the mortar or sooner if conditions of hot sun and drying winds prevail. Care must be taken to ensure complete coverage. If necessary a second coat may be applied in hot, drying conditions. To provide an acceptable finish and enhanced durability to the repaired structure, the additional finishes detailed in sections 22.8 and 22.9 may be applied.

Waterproofing and finish

22.8 Highly-porous substrates can be sealed with Teknoprime 842. Hydroseal FX is preferably sprayed on but may also be applied by brush or trowel, care being taken to ensure that air is not trapped into the surface. To ensure full protection, the first coat should be approximately 1 mm thick, the second coat being applied in the same way when the first coat is stable but not fully cured. This should be after approximately 30 minutes, depending on ambient temperature. Substrates showing evidence of water infiltration must first be sealed in accordance with the Certificate holder's recommendations.

Finishing

22.9 If appearance is critical, advice with regard to finishing, for both decoration or added algal protection, can be obtained from the Certificate holder.

Technical Investigations

23 Tests

23.1 Tests were carried out (see Table 6) on the Premcrete Concrete Repair and Protection System and the results assessed to determine characteristics of components and bond strength to concrete.

Table 6 Tests carried out on system components

Test	System component				
	Teknoprim 841	Hydroseal FX (grey)	Teknoprim 842	Teknocem M50 and Teknocem M80	Teknocem HB50 and Teknocem Rapid
Product characteristics	•				
Adhesion to steel	•				
Adhesion to mortars	•				
Strength characteristics		•		•	•
Resistance to thermal shock		•		•	•
Resistance to heat ageing		•		•	•
Resistance to impact		•		•	•
Initial surface absorption		•		•	•
Bond strength to steel and/or concrete		•		•	•
Adhesion to repair mortars			•		
Freeze/thaw resistance				•	•

23.2 An evaluation was made of test reports, as shown in Table 7.

Table 7 Test reports examined in relation to system components

Test report aspect	System component		
	Hydroseal FX (grey)	Teknocem M50 and Teknocem M80	Teknocem HB50 and Teknocem Rapid
Behaviour in fire	•	•	•
Linear drying shrinkage	•	•	•
Linear coefficient of expansion	•	•	•
Modulus of elasticity		•	•
Resistance to carbon dioxide		•	
Resistance to carbon dioxide diffusion	•		
Resistance to chloride diffusion	•		• ⁽¹⁾
Water permeability	•	•	
Water vapour permeability	•		• ⁽¹⁾
Oxygen diffusion coefficient	•		• ⁽¹⁾
Abrasion resistance	•		
Strength characteristics	•	•	•

(1) Teknocem HB50 only.

24 Investigations

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

24.2 Visits were made to sites in progress to enable examinations to be made at various stages of diagnosis and repair.

24.3 Visits were made to finished sites to enable examination of finished repairs and resistance to algal growth.

24.4 The Certificate holder's instructions concerning diagnosis, specification, preparation, mixing and application were reviewed.

24.5 As part of the assessment for this Certificate a re-evaluation was made of data on which previous Certificates were based. The conclusions drawn from the original data remain valid.

Bibliography

BS 4551 : 1980 *Methods of testing mortars, screeds and plasters*

BS 13412 : 2006 *Products and systems for the protection and repair of concrete structures — Test methods — Determination of modulus of elasticity in compression*

BS EN 1504-3 : 2005 *Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and evaluation of conformity — Structural and non-structural repair*

BS EN 1504-7 : 2006 *Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and evaluation of conformity — Reinforcement corrosion protection*

BS EN 1504-9 : 2008 *Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and evaluation of conformity — General principles for use of products and systems*

BS EN 1504-10 : 2003 *Products and systems for the protection and repair of concrete structures — Definitions — Requirements — Quality control and evaluation of conformity — Site application of products and systems and quality control of the works*

BS EN 12190 : 1999 *Products and systems for the protection and repair of concrete structures — Test methods — Determination of compressive strength of repair mortar*

BS EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

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

Conditions of Certification

25 Conditions

25.1 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.

25.2 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.

25.3 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.

25.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

25.5 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.

25.6 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.