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Agrément Certificate
95/3210
Product Sheet 3

TRITON CHEMICAL DAMP-PROOFING SYSTEMS

TRIJECT 3 PRESSURE INJECTION DPC

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Triject 3 Pressure Injection DPC, an aqueous silicate solution in concentrated form, for forming a damp-proof course (dpc) in existing walls by pressure injection.

(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

Effectiveness against rising damp — when injected into suitable substrates in accordance with BS 6576 : 2005, the system forms an effective barrier against rising damp in existing walls (see section 6).

Odour — the system is odourless and does not give off harmful vapours (see section 7).

Drying time — after treatment, a 230 mm solid brick wall previously affected by rising damp should normally dry out in 6 to 12 months (see section 8).

Durability — the system will remain effective against rising damp for at least 20 years (see section 10).

The BBA has awarded this Certificate to the company named above for the product described herein. This product 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 First issue: 28 March 2014

Simon Wroe
Head of Approvals — Materials

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

Claire Curtis-Thomas
Chief Executive

Originally certificated on 22 November 1995

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations



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

In the opinion of the BBA, the use of the Triject 3 Pressure Injection DPC System in an existing building is not subject to these Regulations, but action to satisfy Requirement C2(a) and Regulation 7 may be necessary for a 'Material change of use' as defined in Regulation 5(a) (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):

Requirement:	C2(a)	Resistance to moisture
Comment:		The system satisfies the BBA rising damp test and adequately resists the passage of moisture. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The system is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

In the opinion of the BBA, the use of the Triject 3 Pressure Injection DPC System in an existing building is not subject to these Regulations, but action to satisfy the Regulations and related Mandatory Standards below may be necessary for a 'Conversion' as defined in Regulation 4 (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):

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The system can contribute to a construction satisfying this Regulation. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.3	Flooding and ground water
Standard:	3.4	Moisture from the ground
Comment:		The system satisfies the BBA rising damp test and adequately resists the passage of moisture and can contribute to satisfying these Standards, with reference to clauses 3.3.1 ⁽¹⁾⁽²⁾ , 3.4.1 ⁽¹⁾⁽²⁾ and 3.4.5 ⁽¹⁾⁽²⁾ . See section 6 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 this 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

In the opinion of the BBA, the use of the Triject 3 Pressure Injection DPC System in an existing building is not controlled by these Regulations, but action to satisfy Regulations 23(a)(i)(ii)(iii)(iv) and 28(a) may be necessary for a 'Material change of use' under Regulation 8 (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):

Regulation:	23(a)(i)(ii)(iii)(iv)	Fitness of materials and workmanship
Comment:		The system is acceptable. See sections 7 and 10 and the <i>Installation</i> part of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The system satisfies the BBA rising damp test and adequately resists the passage of moisture. See section 6 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* of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of the Triject 3 Pressure Injection DPC System, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 5.1 *Substructure and ground floors*.

Technical Specification

1 Description

1.1 The Triject 3 Pressure Injection DPC System is an aqueous concentrate of potassium methyl silicate, used to form a barrier against rising damp in a wall where there is no dpc, or where the existing dpc has failed.

1.2 The concentrate is diluted with tap water (1 : 6 by volume) at the installer's premises to give the injection fluid.

1.3 The accuracy of dilution can be checked by tests to The Property Care Association *Code of Practice for the Installation of Remedial Damp-proof Courses in Masonry Walls*. The minimum values (percentage by weight) that should be achieved are:

solids content	6.00
silicate content	3.50
silicon content	1.46.

2 Manufacture

2.1 The product is manufactured in a controlled batch blending process.

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 Triton Chemical Manufacturing Co Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2000 by BSI (Certificate FM25396).

3 Delivery and site handling

3.1 The product is supplied in 3.6 litre and 25 litre containers⁽¹⁾ which bear the BBA logo and the number of this Certificate.

(1) Also available in 200 litre and 1000 litre containers on special request.

3.2 Both the concentrate and diluted fluid are alkaline and classified as 'corrosive' under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009* and carry the appropriate health warning. Precautions are necessary during handling, dilution and injection to avoid contact from spillage or leakage. The normal precautions (use of goggles or visor, gloves and protective clothing, and the prompt removal of contaminated clothing) should be rigidly adhered to during the handling of the concentrate. Should the fluid come into contact with the skin it must be washed off promptly. If it comes into contact with the eyes they should be flushed with cold water for 10 minutes, and medical attention sought.

3.3 To protect third parties from contact with the alkaline fluid, the working area is coned off from the public highway during treatment (for example, when terraced houses abutting the pavement are treated).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Triject 3 Pressure Injection DPC System.

Design Considerations

4 Use

4.1 The Triject 3 Pressure Injection DPC System is satisfactory for use to form a damp-proof course in accordance with BS 6576 : 2005 in existing:

- solid walls of brickwork, blockwork or natural stone (including flint), up to 600 mm thick
- conventional cavity walls
- walls of rubble-filled construction of any thickness.

4.2 The installation process involves the saturation of a selected course of brickwork, or an equivalent area of blockwork, stone or the mortar bed, with this fluid by pressure injection, and the subsequent replastering.

4.3 Replastering is necessary to retain salts in the body of the wall to prevent damage to subsequent redecoration. This must be carried out in accordance with the Trimix Replastering Specification (see Product Sheet 4 of this Certificate).

4.4 The system does not affect expanded polystyrene or bitumen.

5 Practicability of installation

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

6 Effectiveness against rising damp



When installed in the substrates defined in section 4.1, in accordance with BS 6576 : 2005, the system forms an effective barrier against rising damp.

7 Odour



The diluted fluid is odourless and does not emit harmful vapours.

8 Drying time

After treatment, a 230 mm thick solid brick wall previously affected by rising damp should normally dry in 6 to 12 months provided normal heating is used during the winter months. A thicker wall may take longer. Where hygroscopic salts are present, the wall may not dry completely but the replastering system will prevent damage to internal decorations.

9 Maintenance

The system does not require maintenance.

10 Durability



Excluding use in new repair work (where highly-alkaline mortars are present), the process is expected to remain effective against rising damp for at least 20 years.

Installation

11 General

11.1 Installation of the Triject 3 Pressure Injection DPC System is carried out by the Certificate holder's approved contractors in accordance with BS 6576 : 2005 and The Property Care Association *Code of Practice for the Installation of Remedial Damp-proof Courses in Masonry Walls*.

11.2 Replastering is necessary to prevent damage to subsequent redecoration. To avoid split responsibility, this should be conducted by the approved contractor or its approved agent.

11.3 The original survey may have identified other possible causes of dampness, and measures to rectify these must be taken as necessary.

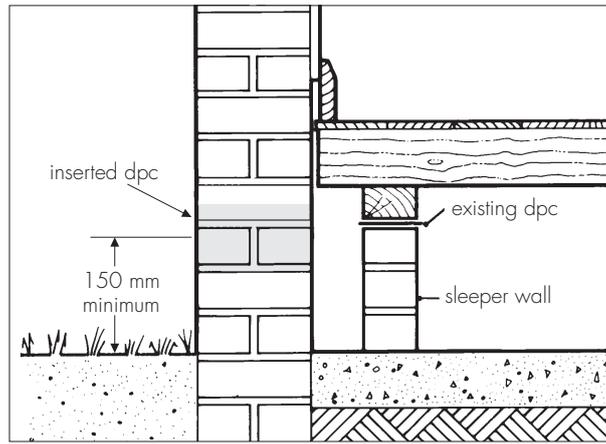
12 Precautions

The system concentrate and diluted fluid are water-based and do not present a flammability hazard.

13 Timber floor — inspection, preparation and repair

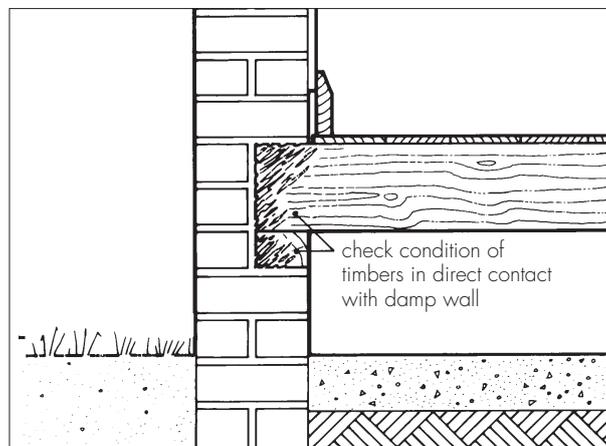
13.1 Where a suspended timber floor is independently supported on sleeper walls, with an effective dpc and showing no signs of dampness, these need not be treated (see Figure 1).

Figure 1 Suspended timber floor on sleeper wall



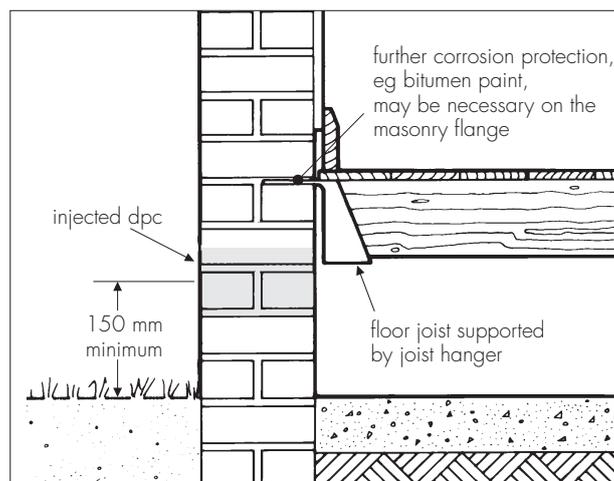
13.2 Where a suspended timber floor is supported on joists and/or a wall plate bearing on or embedded in the wall, there is a possibility of decay, particularly where concealed timbers are in contact with the damp wall. The condition of these timbers should be ascertained and remedial action taken if necessary (see Figure 2).

Figure 2 Check embedded timber for decay



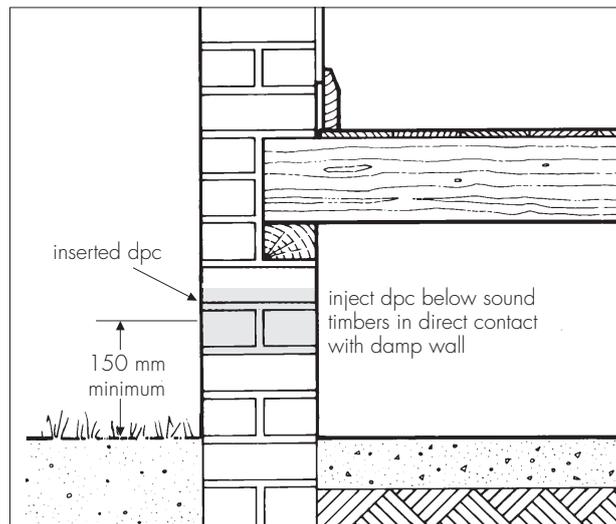
13.3 If damage is limited to the joist ends, the floors may be re-formed, using sleeper walls or joist-hangers, to isolate the timbers from the damp wall (see Figure 3).

Figure 3 Isolation of timber joists from damp wall



13.4 If the timbers are sound, the existing floor may be retained provided the injected dpc is formed below the timber joists and/or wall plate (see Figure 4).

Figure 4 Inject dpc below wall plate



14 Preparation

14.1 The course to be injected is chosen so that the position of the horizontal dpc complies, as far as is practicable, with the recommendations of BS 6576 : 2005, clause 8.3 (see section 11.1 of this Certificate).

14.2 Internal walls on solid floors are treated as close to the floor as possible.

14.3 Complementary vertical dpc's are positioned, where necessary, to isolate treated walls from the effects of rising damp in adjoining walls or to maintain continuity between horizontal dpc's at different levels.

14.4 Internal plastering which may be affected by hygroscopic salts is removed from the area to be treated to a height of 450 mm above the maximum level of the rising damp. Internal skirtings and flooring are also removed, as necessary, to expose the area for treatment. Externally, the proposed dpc line is exposed, where necessary, by removing any facing material.

15 Procedure

Mortar — low pressure

15.1 Holes 10 mm or 13 mm in diameter are drilled horizontally to predetermined depths along the selected mortar course at spacings of 150 mm to 170 mm, avoiding the perpend (percussion drills are not used on half-brick walls). Procedures for different types of wall are:

- walls 115 mm thick — injected from one side only
- solid walls 230 mm thick — normally injected from both sides. If access is restricted they may be drilled progressively (using a sequence of drilling, injection, re-drilling to deepen the hole by 100 mm to 120 mm and re-injecting)
- solid walls of greater thickness — treated from one or both sides. In each case the progressive injection technique is used
- cavity walls — normally treated from both sides, but if the thickness of the individual leaves permits, the progressive injection technique is used from one side.

15.2 The silicate solution is injected at pressures of between 150 kPa and 350 kPa. Nozzles fitted with pressure-tight seals are inserted into the drilled holes and injection is continued until the fluid is seen to reach the wall surface. Normally the treatment of brickwork 230 mm thick will require 3 litres of fluid per metre run. The nozzles are removed and subsequent holes are similarly injected.

Stone walls

15.3 In solid or cavity walls of conventional construction in blockwork or stone, the drilling and injection procedure is adjusted to accommodate variations in the density, porosity and structure. In each case the procedure chosen must ensure a continuous unbroken treatment along the length of the wall.

Rubble-filled stone walls

15.4 In stone walls with a rubble-filled cavity, the two leaves are first injected using the techniques appropriate to the substrate, then:

- in walls 450 mm thick — holes in one leaf are re-drilled to the centre of the wall (into the rubble infill) and injected singly until fluid exudes from mortar joints below the injection level
- in walls of between 450 mm and 900 mm thick — holes in both walls are re-drilled to the centre of the wall and injected singly until fluid exudes from the mortar joints below the injection level.

15.5 Normally, the treatment of the rubble core of a 450 mm thick wall will require 4 to 5 litres of fluid per metre run (increased pro rata for thicker walls).

Finishing

15.6 The treated walls are left for a period of at least 14 days to allow initial drying out. Internal plastering is applied in accordance with the details given in Product Sheet 4 of this Certificate.

15.7 Particular care must be taken to avoid bridging the dpc either internally or externally. Where external rendering has been removed, it must be restored, ending in a bellcasting above the injected dpc.

15.8 Holes in the external wall surfaces are plugged with sand/cement mortar or preformed plastic plugs coloured to match the existing wall surface.

Technical Investigations

16 Tests

Tests were carried out and the results assessed to determine:

- effectiveness against rising damp
- substantivity of injection method
- total and active solids contents
- specific gravity.

17 Investigations

17.1 The manufacturing process was evaluated, and the raw material specifications, formulations and quality control procedures were established.

17.2 A reassessment was made of existing data on the system's effectiveness against rising damp.

17.3 Details were obtained of the criteria used by the Certificate holder in appointing approved contractors.

17.4 User surveys of treated properties were conducted.

17.5 The methods of application and durability of the products were assessed.

17.6 Assessments were made of the treatment of existing walls of rubble-filled and flint construction.

17.7 Assessments were made of the presence of odour.

Bibliography

BS 6576 : 2005 *Code of practice for diagnosis of rising damp in walls of buildings and installation of chemical damp-proof courses*

BS 8481 : 2006 *Design, preparation and application of internal gypsum, cement, cement and lime plastering systems — Specification*

BS EN 197-1 : 2011 *Cement — Composition, specifications and conformity criteria for common cements*

BS EN 13139 : 2002 *Aggregates for mortar*

BS EN 13914-2 : 2005 *Design, preparation and application of external rendering and internal plastering — Design considerations and essential principles for internal plastering*

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

Property Care Association *Code of Practice for the Installation of Remedial Damp-proof Courses in Masonry Walls*

18 Conditions

18.1 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.

18.2 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.

18.3 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.

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

18.5 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.

18.6 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.