



## Triton Chemical Manufacturing Co Ltd

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**Agrément  
Certificate  
No 95/3210**  
Second issue\*

Designated by Government  
to issue  
European Technical  
Approvals

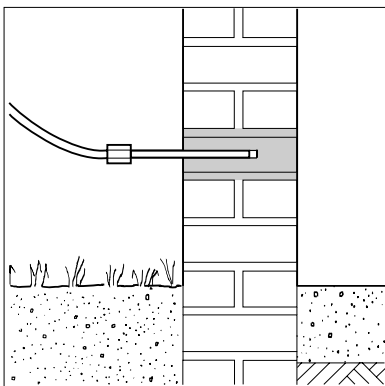
### Product

• THIS CERTIFICATE RELATES TO THE TRIJECT CHEMICAL DAMP-PROOFING SYSTEM, A RANGE OF PRODUCTS FOR FORMING A DAMP-PROOF COURSE IN EXISTING WALLS, AND THE ASSOCIATED REPLASTERING.

• Installation of the damp-proofing system is carried out by Triton Chemical Manufacturing Co Ltd's approved contractors in accordance with BS 6576 : 1985 and the British Wood Preserving and Damp-proofing Association (BWPDPA) Code of Practice : 1997.

• Replastering is necessary to prevent damage to subsequent redecoration. To avoid split responsibility, this should be conducted by the installer or his approved agent.

These Front Sheets must be read in conjunction with the accompanying Detail Sheets, which provide information specific to the damp-proofing materials and the replastering specification.



## TRIJECT CHEMICAL DAMP-PROOFING SYSTEM

Couche d'étanchéité pour murs par injection chimique  
Feuchtigkeitssperre im Wandbereich

### Regulations

#### 1 The Building Regulations 1991 (as amended) (England and Wales)



The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of remedial damp-proofing (walls) with the Building Regulations. In the opinion of the BBA, the use of the Triject Chemical Damp-proofing System in an existing building is not subject to these Regulations, but action to satisfy Requirement C4 and Regulation 7 may be necessary for a 'Material change of use' as defined in Regulation 5(a).

Requirement: C4

Resistance to weather and ground moisture

Comment:

The damp-proofing products satisfy the BBA rising damp test and adequately resist the passage of moisture.

Requirement: Regulation 7

Materials and workmanship

Comment:

The products are acceptable. See marked section of the relevant Detail Sheet.

#### 2 The Building Standards (Scotland) Regulations 1990 (as amended)



In the opinion of the BBA, the Triject Chemical Damp-proofing System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and Technical Standards listed below.

Regulation: 10

Fitness of materials

Standard: B2.1

Selection and use of materials and components

Comment:

The products are acceptable. See marked section of the relevant Detail Sheet.

Regulation: 17

Preparation of sites and resistance to moisture

Standard: G2.6

Resistance to moisture from the ground

Comment:

The damp-proofing products satisfy the BBA rising damp test and adequately resist the passage of moisture.

#### 3 The Building Regulations (Northern Ireland) 1994 (as amended)



In the opinion of the BBA, the use of the Triject Chemical Damp-proofing System in an existing building is not controlled by these Regulations, but action to satisfy Regulations B2 and C5 may be necessary for a 'Material change of use' under Regulation A9.

Regulation: B2

Fitness of materials and workmanship

Comment:

The products are acceptable. The products are either water- or solvent-based, and do not release solvent for an unreasonable period. See marked sections of the relevant Detail Sheet.

Regulation: C5

Resistance to ground moisture and weather

Comment:

The damp-proofing products satisfy the BBA rising damp test and adequately resist the passage of moisture.

#### 4 Construction (Design and Management) Regulations 1994

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

See sections:

2 *Delivery and site handling* of the accompanying Detail Sheets, and 4 *Odour* and 6 *Precautions* of Detail Sheets 2 and 3 only.

## Technical Specification

### 5 Description

5.1 The Triject damp-proofing process consists of solutions or materials which are injected or inserted into existing walls to form a damp-proof course; replastering is subsequently conducted.

5.2 The products are described in the accompanying Detail Sheets.

## Design Data

### 6 General

6.1 The Triject Chemical Damp-proofing System is used in existing:

- (1) solid walls of brickwork, blockwork or natural stone (including flint), up to 600 mm thick
- (2) conventional cavity walls, or
- (3) walls of rubble-filled construction of any thickness to provide a barrier against rising damp where there is no damp-proof course or where the existing damp-proof course has failed.

6.2 Replastering is necessary to retain salts in the body of the wall to prevent damage to subsequent redecoration. This should be carried out according to the Trimix replastering specification (see Detail Sheet 5).

### 7 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.

## Installation

### 8 General

Installation of the Triject Chemical Damp-proofing System is carried out in accordance with BS 6576 : 1985 and the BWPDA Code of Practice : 1997 by a Triton Chemical Manufacturing Co Ltd approved contractor.

### 9 Action with respect to flooring timbers

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

9.2 Where a suspended timber floor is supported on joists and/or a wallplate 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).

9.3 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).

9.4 If the timbers are sound, the existing floor may be retained provided the injected damp-proof course is formed below the timber joists and/or wallplate (see Figure 4).

### 10 Preparation

10.1 The course to be injected is chosen so that the position of the horizontal damp-proof course complies, as far as is practicable, with the recommendations of BS 6576 : 1985, clauses 4.3 and 4.4 and the BWPDA Code of Practice : 1997, clause 8.2.3 (see section 9.4 of these Front Sheets).

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

10.3 Complementary vertical damp-proof courses are positioned, where necessary, to isolate treated walls from the effects of rising damp in adjoining walls or to maintain continuity between horizontal damp-proof courses at different levels.

10.4 Internal plastering affected by hygroscopic salts is removed from the area to be treated to a height of 460 mm above the maximum level of the rising damp. Internal skirting, flooring, etc is also removed, as necessary, to expose the area for treatment. Externally, the proposed damp-proof course line is exposed, where necessary, by removing any facing material.

### 11 Procedure

The installation of the various damp-proofing fluids is summarised in the accompanying Detail Sheets.

### 12 General

#### Untreated walls

12.1 Untreated walls are isolated by the injection of a vertical dpc throughout the thickness of the wall.

#### Treated walls

12.2 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 Detail Sheet 5 of this Certificate.

#### Bridging the damp-proof course

12.3 Particular care is taken to avoid bridging the damp-proof course, either internally or externally. Where external rendering has been removed, it is restored, ending in a bell casting above the injected damp-proof course.

#### External wall finish

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

#### Other sources of dampness

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

Figure 1 Suspended timber floor on sleeper wall

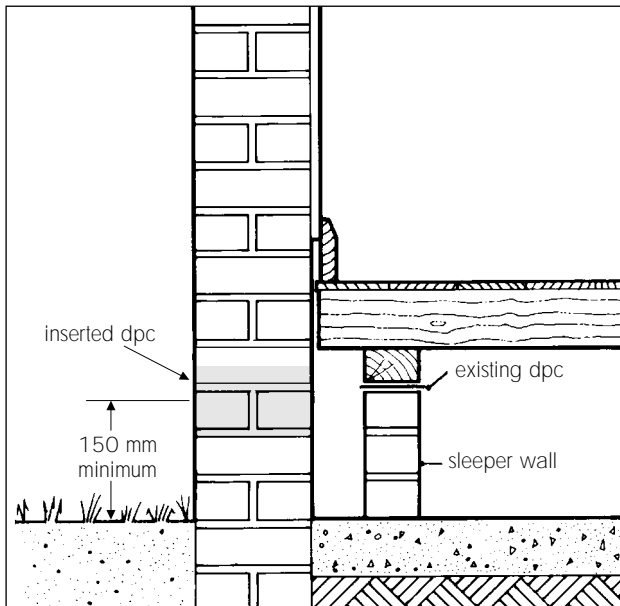


Figure 2 Check embedded timber for decay

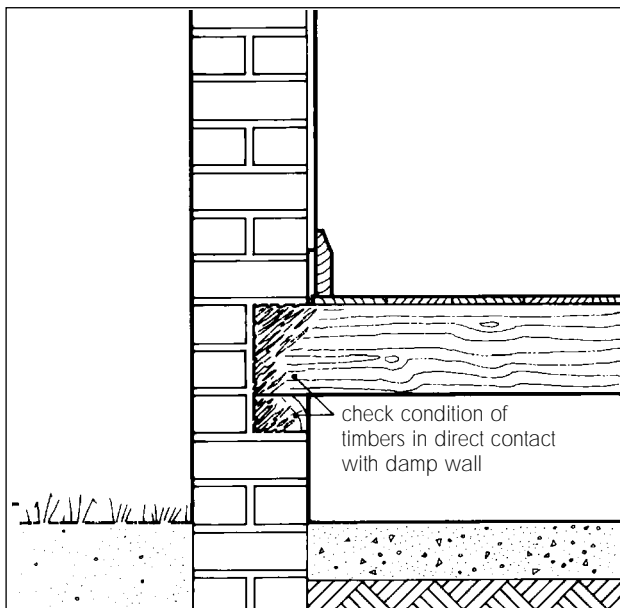


Figure 3 Isolation of timber joists from damp wall

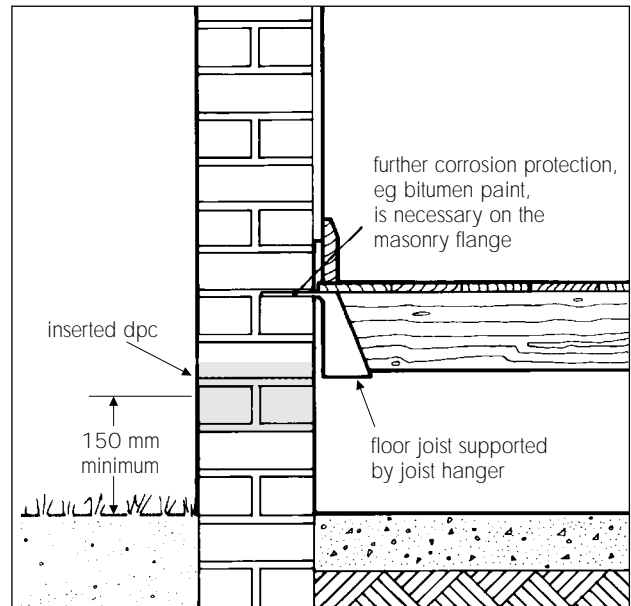
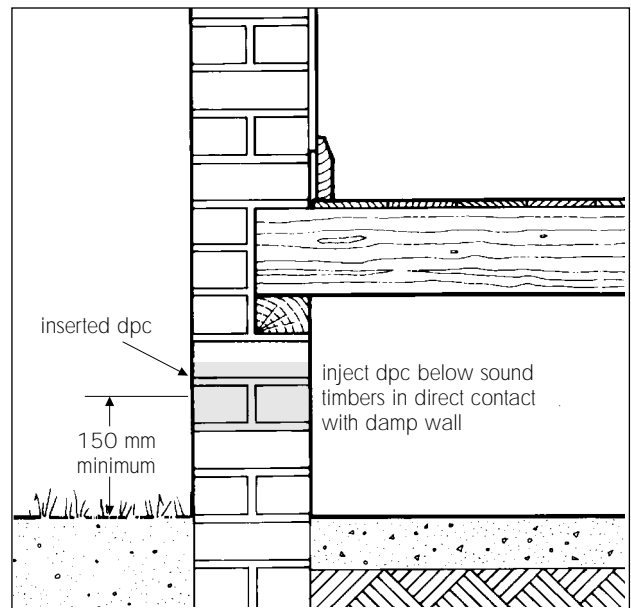


Figure 4 Inject dpc below wallplate



## Technical Investigations

The following is a summary of the technical investigations carried out on the Triject Chemical Damp-proofing System.

### 13 Investigations

13.1 The manufacturing processes were examined, and the raw material specifications, formulations and quality control procedures were established.

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

13.3 Visits were made to sites to assess the practicability of installation.

13.4 Assessments were made of the presence of odour and the materials available for replastering.

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

13.6 User surveys of treated properties were conducted.

13.7 An examination was made of Triton Chemical Manufacturing Co Ltd's approval procedures for contractors.

13.8 Other specific tests and investigations on the products are detailed in sections 8 and 9 of the appropriate Detail Sheets.

## Additional Information

The management systems of Triton Chemical Manufacturing Co Ltd have been assessed and registered as meeting the requirements of BS EN ISO 9002 : 1994 by the British Standards Institution Quality Assurance (Certificate No FM25396).

## Bibliography

BS 5492 : 1990 *Code of practice for internal plastering*

BS 6576 : 1985 *Code of practice for installation of chemical damp-proof courses*

BS EN ISO 9002 : 1994 *Quality systems — Model for quality assurance in production, installation and servicing*

British Wood Preserving and Damp-proofing Association Code of Practice *The Installation of Remedial Damp-proof Courses in Masonry Walls* : January 1997

## Conditions of Certification

### 14 Conditions

14.1 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.

14.2 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.

14.3 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; and
- (c) are reviewed by the BBA as and when it considers appropriate.

14.4 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.

14.5 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 Triton Chemical Damp-proofing System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 95/3210 is accordingly awarded to Triton Chemical Manufacturing Co Ltd.

On behalf of the British Board of Agrément

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

Date of Second issue: 8th October 1999

Chief Executive

*\*Original Certificate issued on 22nd November 1995. This amended version includes references to updated national Building Regulations, addition of CDM Regulations, updated Conditions of Certification and change of Certificate holder's name, telephone and facsimile numbers.*



Triton Chemical Manufacturing Co Ltd

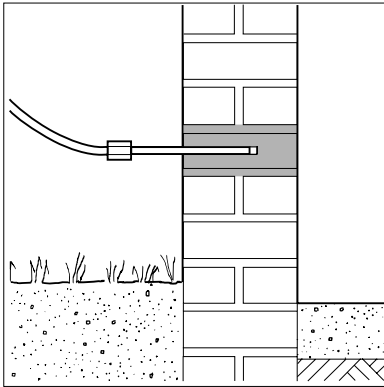
Certificate No 95/3210

**TRIJECT 1 PRESSURE INJECTION  
DPC SYSTEM**

**DETAIL SHEET 2**  
Second issue\*



## Product



• THIS DETAIL SHEET RELATES TO TRIJECT 1 PRESSURE INJECTION DPC SYSTEM, A POLYOXO-ALUMINIUM STEARATE SOLUTION FOR FORMING A DAMP-PROOF COURSE IN EXISTING WALLS.

• Installation is by pressure injection in accordance with BS 6576 : 1985 and the BWPDA Code of Practice : 1997.

*This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification, respectively.*

## Technical Specification

### 1 Description

1.1 Triject 1 is a solution of a polyoxo-aluminium stearate water repellent in white spirit. The solution is manufactured by a controlled batch blending process. Regular quality control checks are conducted on the final product.

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

### 2 Delivery and site handling

2.1 The product is supplied in 25 litre and 200 litre metal containers, bearing the manufacturer's markings.

2.2 The product is flammable with a flashpoint of 40°C and must be stored in a cool place away from naked flames.

## Design Data

### 3 General

Triject 1 fluid can dissolve expanded polystyrene, and injection into a cavity wall with this insulant should not be attempted. However, expanded polystyrene may be installed in a treated cavity wall, after the solvent has evaporated.

### 4 Odour



Under normal circumstances a building with a 230 mm thick solid wall or a conventional cavity wall should be free from solvent odour two to four weeks after the application. If the building has thicker walls, if fireplace areas have been treated, if the property has both solid and suspended timber floors (which restrict ventilation) or if the

property is cold or unventilated, solvent odour may persist for a longer period.

### 5 Durability



Polyoxo aluminium stearate surface water repellents for masonry are known to be effective for 10 years. These products are applied to the surface of a wall, but a dpc application saturates the wall in depth. Excluding use in new repair work (where highly alkaline mortars are present), the process is expected to remain effective for at least 20 years.

## Installation

### 6 Precautions

Triject 1 fluid gives off a flammable vapour and it is essential that no open fires are lit or other sources of ignition are present during and for two days after injection. Full ventilation must be provided during this time to prevent the accumulation of pockets of flammable vapour.

### 7 Procedure

#### Brickwork -high pressure

7.1 Two 10 mm or 13 mm holes are drilled in each stretcher and one in each header, to an average spacing of approximately 120 mm (maximum spacing of 150 mm). If the brickwork is too dense to allow adequate penetration of the fluid, drilling may be carried out in the adjacent mortar course.

Percussion drills are not normally used on half-brick walls but may be used when the walls are in good condition. Procedures for different types of wall are:

(1) Walls 115 mm thick — injected from one side only.

(2) Solid walls 230 mm thick — normally injected from both sides. If access is restricted they may be drilled progressively (using a sequence of drilling,

injecting, redrilling to deepen the hole by 100 mm to 120 mm and reinjecting).

(3) Solid walls of greater thickness — treated from one or both sides. In each case the progressive injection technique is used.

(4) 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.

7.2 The stearate solution is normally injected at a pressure of 700 kPa. Nozzles fitted with pressure-tight seals are inserted into the drilled holes and injection is continued until complete saturation is achieved and the fluid begins to exude from the substrate. The application rate in typical 225 mm thick solid brickwork is approximately 3.5 litres per metre of wall. The nozzles are removed and subsequent holes are similarly injected.

### Mortar low pressure

7.3 Holes are drilled at 150 mm to 170 mm spacings into the mortar, and the fluid is injected at 150 kPa to 350 kPa.

### Stone walls

7.4 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, but in each case the procedure chosen ensures a continuous unbroken treatment along the length of the wall.

### Rubble-filled stone walls

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

(1) 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. Alternatively, a timed injection method may be employed.

(2) Thicker walls — drilled and injected in the same way from both sides, for example 600 mm walls are drilled to a depth of 200 mm and each hole is injected singly until fluid exudes from the mortar joints below the injection level.

## Technical Investigations

The following is a summary of the technical investigations carried out on the Triject 1 Pressure Injection DPC System.

### 8 Tests

Tests were carried out by the BBA to determine:

effectiveness against rising damp to MOAT No 39 :

1988, Method 4.3.1.3

substantivity of injection treatment to BBA test specification aluminium and active solids contents to BWPDA,

DP4, Method 1.1<sup>(1)</sup>

specific gravity to BS 3900 : Part A12 : 1975(1991)

flashpoint to BS 3900 : Part A9 : 1986(1991).

(1) Method of analysis for damp-course fluids.

### 9 Investigations

An assessment was made of Triton Chemical Manufacturing Co Ltd's safety assessment on the product under Regulation 12 of the Control of Substances Hazardous to Health Regulations 1988.

## Bibliography

BS 3900 *Methods of test for paints*

Part A9 : 1986(1991) *Determination of flashpoint (closed cup equilibrium method)*

Part A12 : 1975(1991) *Determination of density*

BS 6576 : 1985 *Code of practice for installation of chemical damp-proof courses*

MOAT No 39 : 1988 *The assessment of damp-proof course systems for existing buildings*

British Wood Preserving and Damp-proofing Association Code of Practice *The Installation of Remedial Damp-proof Courses in Masonry Walls* : January 1997



On behalf of the British Board of Agrément

Date of Second issue: 11th October 1999

Chief Executive

*\*Original Certificate issued on 22nd November 1995. This amended version includes reference to change of Certificate holder's name.*



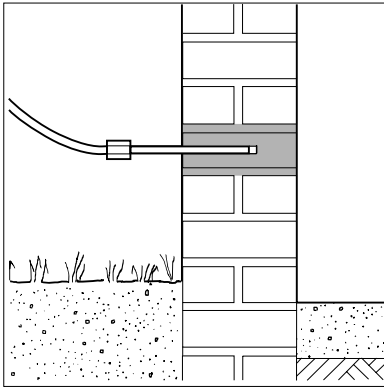
Triton Chemical Manufacturing Co Ltd

Certificate No 95/3210

**TRIJECT 2 PRESSURE INJECTION  
DPC SYSTEM**
**DETAIL SHEET 3**

Second issue\*

## Product



• THIS DETAIL SHEET REPLACES CERTIFICATE No 86/1586, AND RELATES TO TRIJECT 2 PRESSURE INJECTION DPC SYSTEM, A SILICONE SOLUTION FOR FORMING A DAMP-PROOF COURSE IN EXISTING WALLS.

• Installation is by pressure injection in accordance with BS 6576 : 1985 and the BWPDA Code of Practice : 1997.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification, respectively.

## Technical Specification

### 1 Description

1.1 Triject 2 is a solution of a silicone water repellent in white spirit. The solution is manufactured by a controlled batch blending process. Regular quality control checks are conducted on the final product.

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

### 2 Delivery and site handling

2.1 The product is supplied in 25 litre and 200 litre metal containers bearing the manufacturer's markings.

2.2 The product is flammable, with a flashpoint of 38°C, and must be stored in a cool place away from naked flames.

## Design Data

### 3 General

Triject 2 fluid can dissolve expanded polystyrene, and injection into a cavity wall with this insulant should not be attempted. However, expanded polystyrene may be installed in a treated cavity wall, after the solvent has evaporated.

### 4 Odour



Under normal circumstances a building with a 230 mm thick solid wall or a conventional cavity wall should be free from solvent odour two to four weeks after the application. If the building has thicker walls, if fireplace areas have been treated, if the property has both solid and suspended timber floors (which restrict ventilation) or if the

property is cold or unventilated, solvent odour may persist for a longer period.

### 5 Durability



Silicone surface water repellents for masonry are known to be effective for 12 years. These products are applied to the surface of a wall, but a dpc application saturates the wall in depth. Excluding use in new repair work (where highly alkaline mortars are present), the process is expected to remain effective for at least 20 years.

## Installation

### 6 Precautions

Triject 2 fluid gives off a flammable vapour and it is essential that no open fires are lit or other sources of ignition are present during, and for two days after, injection. Full ventilation must be provided during this time to prevent the accumulation of pockets of flammable vapour.

### 7 Procedure

#### Brickwork high pressure

7.1 Two 10 mm or 13 mm holes are drilled in each stretcher and one in each header, to an average spacing of approximately 120 mm (maximum spacing of 150 mm). If the brickwork is too dense to allow adequate penetration of the fluid, drilling may be carried out in the adjacent mortar course.

Percussion drills are not normally used on half-brick walls but may be used when the walls are in good condition. Procedures for different types of wall are:

(1) Walls 115 mm thick — injected from one side only.

(2) Solid walls 230 mm thick — normally injected from both sides. If access is restricted they may be drilled progressively (using a sequence of drilling,

injecting, redrilling to deepen the hole by 100 mm to 120 mm and reinjecting).

(3) Solid walls of greater thickness — treated from one or both sides. In each case the progressive injection technique is used.

(4) 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.

7.2 The silicone solution is normally injected at a pressure of 700 kPa. Nozzles fitted with pressure-tight seals are inserted into the drilled holes and injection is continued until complete saturation is achieved and the fluid begins to exude from the substrate. The application rate in typical 225 mm thick solid brickwork is approximately 3.0 litres per metre of wall. The nozzles are removed and subsequent holes are similarly injected.

#### Mortar low pressure

7.3 Holes are drilled at 150 mm to 170 mm spacings into the mortar, and the fluid is injected at 150 kPa to 350 kPa.

#### Stone walls

7.4 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, but in each case the procedure chosen ensures a continuous unbroken treatment along the length of the wall.

#### Rubble-filled stone walls

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

(1) 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. Alternatively, a timed injection method may be employed.

(2) Thicker walls — drilled and injected in the same way from both sides, for example 600 mm walls are drilled to a depth of 200 mm and each hole is injected singly until fluid exudes from the mortar joints below the injection level.

## Technical Investigations

The following is a summary of the technical investigations carried out on the Triject 2 Pressure Injection DPC System.

### 8 Tests

Tests were carried out by the BBA to determine: effectiveness against rising damp to MOAT No 39 : 1988, Method 4.3.1.3  
substantivity of injection treatment to BBA test specification total and active solids contents to BWPDA, DP4, Method 1.1<sup>(1)</sup>  
specific gravity to BS 3900 : Part A12 : 1975(1991)  
flashpoint to BS 3900 : Part A9 : 1986(1991).  
(1) Method of analysis of damp-course fluids.

### 9 Investigations

9.1 A re-examination was made of the data and investigations on which previous Certificate No 86/1586 was based. The conclusions drawn from the original data remain valid.

9.2 An assessment was made of Triton Chemical Manufacturing Co Ltd's safety assessment on the product under Regulation 12 of the Control of Substances Hazardous to Health Regulations 1988.

## Bibliography

BS 3900 *Methods of test for paints*  
Part A9 : 1986(1991) *Determination of flashpoint (closed cup equilibrium method)*  
Part A12 : 1975(1991) *Determination of density*  
BS 6576 : 1985 *Code of practice for installation of chemical damp-proof courses*  
MOAT No 39 : 1988 *The assessment of damp-proof course systems for existing buildings*  
British Wood Preserving and Damp-proofing Association Code of Practice *The Installation of Remedial Damp-proof Courses in Masonry Walls* : January 1997



On behalf of the British Board of Agrément

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

Date of Second issue: 11th October 1999

Chief Executive

\*Original Certificate issued on 22nd November 1995. This amended version includes reference to change of Certificate holder's name.



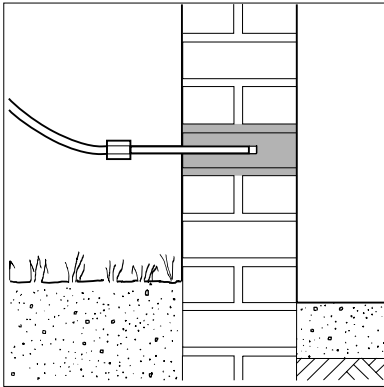


Triton Chemical Manufacturing Co Ltd

Certificate No 95/3210

**TRIJECT 3 PRESSURE INJECTION  
DPC SYSTEM**
**DETAIL SHEET 4**  
*Second issue\**

## Product



• THIS DETAIL SHEET RELATES TO TRIJECT 3 PRESSURE INJECTION DPC SYSTEM, AN AQUEOUS SILICONATE SOLUTION IN CONCENTRATED FORM.

• After dilution with water it is installed by pressure injection in accordance with BS 6576 : 1985 and the BWPDA Code of Practice : 1997.

*This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification, respectively.*

## Technical Specification

### 1 Description

1.1 Triject 3 is an aqueous concentrate of potassium methyl siliconate, manufactured by a controlled batch blending process. Regular quality control checks are conducted on the final product.

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

### 2 Delivery and site handling

2.1 Triject 3 Pressure Injection DPC System concentrate is supplied in 4 litre, 25 litre and 200 litre plastic containers, bearing the manufacturer's markings.

2.2 The concentrate and diluted fluid are alkaline and are classified as 'Corrosive' and 'Irritant', respectively, under the Chemicals (Hazard Information and Packaging for Supply) Regulations 1994. Precautions are necessary during handling, dilution and injection, to avoid contact from spilling or leakage. The normal precautions (use of goggles or visor, gloves, protective clothing and the prompt removal of contaminated clothing) should be observed with particular rigour 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.

2.3 To protect third parties from contact with the alkaline fluid, the working area is tightly screened off from the public highway during treatment (for example, when treating terraced houses abutting the pavement).

## Design Data

### 3 General

Triject 3 fluid has no effect on expanded polystyrene or bitumen.

### 4 Odour



The product is odourless and gives off no harmful vapours.

### 5 Durability



Silicone surface water repellents for masonry are known to be effective for 12 years. These products are applied to the surface of a wall, but a dpc application saturates the wall in depth. Excluding use in new repair work (where highly alkaline mortars are present), the process is expected to remain effective for at least 20 years.

## Installation

### 6 Precautions

Triject 3 Pressure Injection DPC System concentrate and fluid are water-based and present no flammability hazards.

### 7 Procedure

#### Brickwork -high pressure

7.1 Two 10 mm or 13 mm holes are drilled in each stretcher and one in each header, to an average spacing of approximately 120 mm (maximum spacing of 150 mm). If the brickwork is too dense to allow adequate penetration of the fluid, drilling may be carried out in the adjacent mortar course. Percussion drills are not normally used on half-brick walls but may be used when the walls are in good condition. Procedures for different types of wall are:

- (1) Walls 115 mm thick — injected from one side only.
- (2) Solid walls 230 mm thick — normally injected from both sides. If access is restricted they may be drilled progressively (using a sequence of drilling, injecting, redrilling to deepen the hole by 100 mm to 120 mm and reinjecting).
- (3) Solid walls of greater thickness — treated from one or both sides. In each case the progressive injection technique is used.
- (4) 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.

## Mortar low pressure

7.2 Holes 10 mm or 13 mm in diameter are drilled at 150 mm to 170 mm spacings into the mortar, and the fluid is injected at 150 kPa to 350 kPa.

7.3 The silicate solution is normally 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 complete saturation is achieved and the fluid begins to exude from the substrate. The application rate in typical 225 mm thick solid brickwork is approximately 3.5 litres per metre of wall. The nozzles are removed and subsequent holes are similarly injected.

## Stone walls

7.4 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, but in each case the procedure chosen ensures a continuous unbroken treatment along the length of the wall.

## Rubble-filled stone walls

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

- (1) In walls 450 mm thick — holes in one leaf are redrilled to the centre of the wall (into the rubble infill) and injected singly until fluid exudes from mortar joints below the injection level. Alternatively, a timed injection method may be employed.

- (2) Thicker walls — drilled and injected in the same way from both sides, for example 600 mm walls are drilled to a depth of 200 mm and each hole is injected singly until fluid exudes from the mortar joints below the injection level.

## Technical Investigations

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

## 8 Tests

Tests were carried out by the BBA to determine: effectiveness against rising damp to MOAT No 39 : 1988, Method 4.3.1.3  
substantivity of injection treatment to BBA test specification total and active solids contents to BWPDA, DP4, Method 1.1<sup>(1)</sup>  
specific gravity to BS 3900 : Part A12 : 1975(1991).  
(1) Method of analysis of damp-course fluids.

## 9 Investigations

An assessment was made of Triton Chemical Manufacturing Co Ltd's safety assessment on the product under Regulation 12 of the Control of Substances Hazardous to Health Regulations 1988.

## Bibliography

BS 3900 *Methods of test for paints*  
Part A12 : 1975(1991) *Determination of density*  
BS 6576 : 1985 *Code of practice for installation of chemical damp-proof courses*  
MOAT No 39 : 1988 *The assessment of damp-proof course systems for existing buildings*  
British Wood Preserving and Damp-proofing Association Code of Practice *The Installation of Remedial Damp-proof Courses in Masonry Walls* : January 1997



On behalf of the British Board of Agrément

Date of Second issue: 11th October 1999

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

Chief Executive

*\*Original Certificate issued on 22nd November 1995. This amended version includes reference to change of Certificate holder's name.*



Triton Chemical Manufacturing Co Ltd

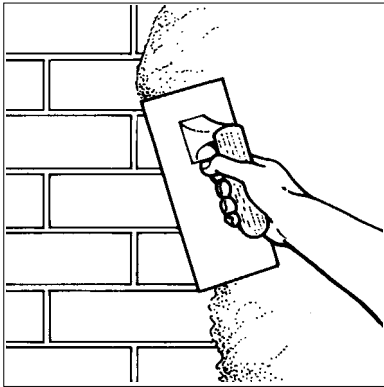
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**DETAIL SHEET 5**

Second issue\*

**TRIMIX 1 REPLASTERING ADDITIVE**

## Product



• THIS DETAIL SHEET RELATES TO TRIMIX 1 REPLASTERING ADDITIVE FOR USE WITH CEMENT MORTARS TO PROVIDE WATER REPELLENCY AND SALT RESISTANCE FOR INTERNAL REPLASTERING ON EXISTING INTERNAL WALLS AFFECTED BY RISING DAMP.

*This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification, respectively.*

## Technical Specification

### 1 Description

1.1 Trimix 1 Replastering Additive, a water and salt resistant additive for cement-based renders, is an alkali metal salt of an aliphatic fatty acid dissolved in water. The concentrate is mildly alkaline.

1.2 The product is diluted for use with 1 litre of the concentrate made up with water to a total of 25 litres of solution.

### 2 Delivery and site handling

2.1 The concentrate is supplied in 1 litre, 5 litre and 25 litre containers. The product should be stored in a cool, dry area and protected from frost.

2.2 The product is classified as 'Irritant' under the Chemicals (Hazard Information and Packaging for Supply) Regulations 1994.

2.3 Each container bears the manufacturer's markings, dilution, and the BBA identification mark incorporating the number of this Certificate.

## Design Data


### 3 General

3.1 Trimix 1 Replastering Additive is satisfactory for use in application to walls of all types of masonry where there has been rising damp and a remedial dpc treatment has been conducted.

3.2 The product should be used with Portland cement to BS 12 : 1996, or sulphate-resisting cement to BS 4027 : 1996. Replastering mortars should be mixed using sharp washed natural sand to BS 1199 : 1976 or BS 882 : 1992.

3.3 Renovating plaster should be applied using the normal procedures in BS 5492 : 1990 at a thickness of 10 mm and finished using 2 mm of a porous finishing plaster.

### 4 Durability

 The addition of the product to the cementitious replastering mortar mixture will not affect the durability of the equivalent traditional mortar to BS 5492 : 1990.

## Installation

### 5 General

5.1 A remedial chemical damp-proofing treatment (see the appropriate Detail Sheet) is conducted in accordance with BS 6576 : 1985 and the BWPDA Code of Practice : 1997.

5.2 The standard of installation should comply with BS 8000 : Part 10 : 1995.

5.3 Replastering should not normally be conducted for at least 14 days after the remedial dpc installation.

5.4 If the background is impermeable and offers little suction (ie where rising damp has occurred in the mortar joints) the joints are raked out to provide a mechanical key and a cement slurry is applied to the surface and the wall is replastered immediately.

### 6 Preparation

6.1 All plaster is removed to a height of 450 mm above the highest level of dampness or salt. A moisture meter should be used to detect the affected areas.

6.2 Existing skirtings, architraves and any other surface timbers are removed.

# Electronic Copy

6.3 Brickwork is stripped bare and mortar joints raked out to provide a key.

6.4 Timber fixing grounds and any built-in timbers are removed. Plastics fixings should be used where possible and new timber fixings pretreated.

6.5 Having ensured a good key for replastering, the surface is dubbed out where necessary, using 1:3 cement/sharp sand mix.

## 7 Replastering

7.1 The quantities, given by volume, in sections 7.2 to 7.6 should be measured in a gauging box.

### First coat

7.2 The first coat is mixed using 1 part Portland cement to BS 12 : 1996, class 42.5, to 3 parts washed sharp sand to BS 882 : 1992, type M, or to BS 1199 : 1976, Table 1.

7.3 This mix is gauged with a 1:24 solution of the product and clean, potable water. It is important that the minimum amount of water is used compatible with workability.

7.4 This first coat is applied at a minimum thickness of 10 mm.

### Second coat

7.5 The second coat is mixed using 1 part Portland cement to 4 parts washed sharp sand (materials as defined in section 7.2).

7.6 The gauging water should not contain any of the product; the minimum amount of water should be used to produce a compatible mix for workability. If necessary, a workability aid may be used.

7.7 The second coat is applied at a minimum thickness of 10 mm after the first coat has set but before it has fully cured. If the first coat is allowed to cure and dry, the surface will become water repellent and will not bond to the second coat.

### Finishing coat

7.8 The plaster undercoat is allowed to cure and either a board finish or similar proprietary finishing plaster is applied.

## Bibliography

BS 12 : 1996 *Specification for Portland cement*

BS 882 : 1992 *Specification for aggregates from natural sources for concrete*

BS 1199 : 1976(1996) *Specifications for building sands from natural sources*

BS 4027 : 1991 *Specification for sulfate-resisting Portland cement*

BS 5492 : 1990 *Code of practice for internal plastering*

BS 6576 : 1985 *Code of practice for installation of chemical damp-proof courses*

BS 8000 *Workmanship on building sites*  
Part 10 : 1995 *Code of practice for plastering and rendering*

British Wood Preserving and Damp-proofing Association Code of Practice *The Installation of Remedial Damp-proof Courses in Masonry Walls* : January 1997



On behalf of the British Board of Agrément

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

Date of Second issue: 11th October 1999

Chief Executive

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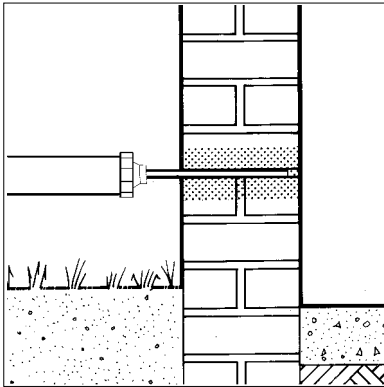


For technical or additional information, contact the Certificate holder (see front page).  
For information about the Agrément Certificate, including validity and scope, tel: Hotline 01923 665400, or check the BBA website.



Triton Chemical Manufacturing Co Ltd

Certificate No 95/3210

**DETAIL SHEET 6****TRI-GEL DPC SYSTEM****Product**

• THIS DETAIL SHEET RELATES TO THE TRI-GEL DPC SYSTEM, AN AQUEOUS SILICONATE GEL FOR INSERTION INTO MORTAR COURSES TO FORM A REMEDIAL DAMP-PROOF COURSE IN EXISTING WALLS.

• Installation of Tri-Gel is carried out in accordance with BS 6576 : 1985 and the British Wood Preserving and Damp-proofing Association (BWPDA) Code of Practice COP3 : 1997.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification, respectively.

**Technical Specification****1 Description**

1.1 The Tri-Gel DPC System is an aqueous gel of potassium methyl siliconate, manufactured by a controlled batch blending process. Quality control is exercised over raw materials, during production and on the final product.

1.2 The installation process involves delivering a set amount of Tri-Gel via the application gun or compression pump into a series of holes drilled into the mortar course and the subsequent replastering.

1.3 Trimix 1 Replastering Additive, (the subject of Detail Sheet 5) is incorporated into a sand/cement mortar and used to plug injection holes.

**2 Delivery and site handling**

2.1 Tri-Gel is supplied in 1 litre cartridges or 5 litre tubs, which should be stored in a cool, dry place and protected from frost.

2.2 The product is alkaline and classified as Corrosive' under the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP3). Precautions are necessary during handling, dilution and injection, to avoid contact from spilling or leakage. The normal precautions (use of goggles or visor, gloves, protective clothing and the prompt removal of contaminated clothing) should be observed with particular rigour during

the handling of the product. Should it 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 at least 15 minutes, and medical attention sought.

2.3 To protect third parties from contact with the product, the working area is tightly screened off from the public highway during treatment (for example, when treating terraced houses abutting the pavement).

**Design Data****3 General**

The product has no effect on expanded polystyrene or bitumen.

**4 Odour**

The product is odourless and does not give off harmful vapours.

**5 Durability**

Silicone surface water repellents for masonry are known to be effective for 12 years.

These products are applied to the surface of a wall, but a dpc application saturates the wall in depth. Excluding use in new repair work (where highly alkaline mortars are present), the process is expected to remain effective for at least 20 years.

## Installation

### 6 Procedure

6.1 Holes 12 mm in diameter are drilled horizontally at the perpend joint, mortar bed junction at 100 mm to 120 mm centres into the selected mortar course.

6.2 Solid walls should be drilled to within 20 mm to 40 mm of the far face of the wall being treated. Treatment can be carried out from one or both sides of the wall as appropriate and convenient.

6.3 Cavity walls will normally be treated from both sides. Advice should be sought from the Certificate holder regarding treatment from one side only.

6.4 When dry substrates are to be treated, the drilled holes should be thoroughly flushed with clean water, and allowed to soak in before applying the Tri-Gel in the normal manner.

6.5 The injection process consists of:

- (1) loading the cartridge with its reusable nozzle into a skeleton gun and placing the nozzle end two-thirds of the way into the injection hole. The trigger is squeezed and the nozzle withdrawn whilst backfilling the hole to within 10 mm to 20 mm of the front face of the wall. The holes are capped with a plug of sand/cement mortar incorporating Trimix 1 Replastering Additive (see Detail Sheet 5) or with dpc wall plugs. Spillages should be washed away with water before they dry.
- (2) the tub of Tri-Gel is thoroughly stirred before the contents are transferred to the compression pump using a large bore funnel, as necessary. The pump is pressurised, the nozzle inserted into the injection hole and the procedure detailed in section 6.5 (1) followed.

6.6 Typical usage rates are detailed in Table 1.

Table 1 Usage rates

Wall thickness	Litres/5 m	Litres/10 m
115 mm (4½)	0.5	1.0
230 mm (9)	1.0	2.0
345 mm (13½)	1.5	3.0
460 mm (18)	2.0	4.0

## Technical Investigations

The following is a summary of the technical investigations carried out on the Tri-Gel DPC System.

### 7 Tests

Tests were carried out by the BBA to determine:

- effectiveness against rising damp, generally to MOAT No 39 : 1988, Method 4.3.1.4
- substantivity of injection treatment to MOAT No 39 : 1988, Method 4.3.2
- total solids contents to BWPDA Damp-proofing 4, Method 2.1
- specific gravity to BS 3900-A19 : 1998.

## Bibliography

BS 3900-A19 : 1998 *Methods of test for paints — Determination of density by the pyknometer method*

BS 6576 : 1985 *Code of practice for installation of chemical damp-proof courses*

MOAT No 39 : 1988 *The assessment of damp-proof course systems for existing buildings*

BWPDA DP4 *Method of analysis for damp-course fluids*

BWPDA Code of Practice COP3 : 1997 *Code of Practice for Installation of Chemical Damp-proof Courses*



On behalf of the British Board of Agrément

Date of issue: 21st March 2005

Chief Executive