



Triton Systems

Structural Repair Data Pack



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STRUCTURAL REPAIR

Mortars / Grouts / Adhesives

- Trimol 15
- Trimol 23
- TrigROUT Extra
- Trifix Adhesive

Ties / Restraints

- AA10 Double Adhesive Tie
- RR10
- ER10 Expanding Resin Tie
- RS10 Resin / Mechanical Tie
- EE10 Single Fix
- PB10 Expanding Torque Nut Tie
- Lateral Restraint



Triton TRIMOL 15 LIGHTWEIGHT MORTAR

Description

Triton TRIMOL 15 is a three component system comprising of a low viscosity epoxy resin, an almost colourless low viscosity hardener and a khaki – grey low density filler, which provides a cold or warm setting, lightweight, low slump filler for use in non-structural applications.

Characteristics

The mixture will remain in place on vertical and inverted surfaces and although it will form a strong bond to structural materials it is best employed in conjunction with Triton TRIMOL 23, a Thixotropic adhesive, used as a primer.

Uses

Triton TRIMOL 15 is particularly suited to the fast, effective repair of concrete in vertical and overhead work and will rapidly attain mechanical strength sufficient to exceed that of good quality concrete.

Trimol System

Product	Appearance	Density at 25°C
TRIMOL 15 RESIN	Pale golden liquid	1.14
TRIMOL 15 HARDENER	Almost colourless liquid	1.02
TRIMOL 15 FILLER	Khaki – grey powder	0.35

Instructions for use

PRETREATMENT OF SURFACES

All surfaces must be free of contamination by dust, grease laitance and corrosion products. Concrete and mortars should be shot –blasted or mechanically abraded or scabbled but need not necessarily be completely dry as both primer and lightweight mortar will bond to damp – but not wet substances.

Priming

It is strongly recommended that surfaces be primed with Triton TRIMOL 23 prior to application of lightweight mortar due to the 'dryness' of the product. Triton TRIMOL 23 should be well brushed or knifed into the prepared areas and Triton TRIMOL 23 applied whilst the primer is still wet.

Mixing

Mix all resin and hardener thoroughly followed by addition of the filler, blending should continue until a homogenous mixture is achieved.

Usable life

- 45 Mins at 20°C
- 1½ hours at 10°C
- 3 hours at 5°C

Application

- This may be by wooden or steel float or by gloved hand.
- Work or push the material into the primed surface and compact well, smooth off with a clean steel trowel or float.

Curing

Triton TRIMOL 15 will set within 6 hours at 20°C and will have achieved 90% of its ultimate mechanical and chemical resistant qualities by 36 hours at 20°C.

Storage

The separate components stored unopened at 5°C - 25°C in dry conditions have a shelf life of 2 years.

Cleansing Equipment

Clean before the mixture has hardened with Triton RESIN CLEANER

Cured Trimol 15

Property	Unit	Value
Specific Gravity	MPa	0.70
Flexural Strength	MPa	18
Compressive Strength	MPa	35
Linear shrinkage during cure at 20°C for 7 days	%	0.03-0.05

Caution

Triton TRIMOL 15 Resin and hardener are generally harmless providing that the normal common-sense precautions taken when handling chemicals are observed. For instance neither the separate components nor the uncured mixture should be allowed to come in contact with foodstuffs or utensils. Measures should also be taken to prevent contact with the skin: wearing rubber or plastic gloves will normally suffice along with eye protection. Thoroughly cleanse the skin at the end of each working period by washing with soap and warm water. Disposable paper towels are recommended to dry the skin. Precautions are fully discussed in the Triton TRIMOL Handling Precautions sheet and also Triton TRIMOL Product Safety Information for Triton TRIMOL 15 Resin and Hardener which are available upon request.

Health & Safety

- For full information consult the relevant Material Safety Data Sheet.

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Triton TRIMOL 23

THIXOTROPIC EPOXY ADHESIVE

Description

Triton TRIMOL 23 is two component solvent-free system, both components are Thixotropic. The resin component is black and the hardener component is white thus a dark uniform grey is produced upon thorough mixing. Triton TRIMOL 23 is formulated to provide an adhesive, which may be applied in cold, damp or dry conditions.

Characteristics

The mixed adhesive remains in place on vertical or inverted surfaces and, when cured, forms strong bonds to most structural materials, e.g., wood, metals, glass, reinforced plastics and laminates. Triton TRIMOL 23 is resistant to most common chemicals – in case of doubt a telephone call to our Technical Department will result in an opinion regarding life expectancy.

Uses

Triton TRIMOL 23 is well suited to applications in the building and civil engineering industries where a Thixotropic (negligible slump) adhesive or primer is required. Its ability to cure in damp, cold conditions is further enhanced as the adhesive will cure under water after placing.

Trimol System

Product	Appearance	Density at 25°C
TRIMOL 23 RESIN	Black, Thixotropic paste	1.6
TRIMOL 23 HARDENER	White, Thixotropic paste	1.4

Instructions for use

SURFACE PRETREATMENT

Contaminated surfaces can inhibit adhesion. Remove any surface deposits e.g., grease, dust or corrosion products. For optimum bond strength cementitious materials should be abraded by sand-blasting, needle-gunning, wire brushing, etc. any laitance on concrete should be 28 days old before using Triton TRIMOL 23. Metals should ideally be cleaned by sand or grit blasting. Thermoset plastics should be abraded and solvent washed.

Mixing

The entire contents of the hardener container should be mixed with the entire contents of the resin container and mixing with a spatula should be continued until an even grey colour is achieved.

Usable life

The mixture has a usable life (pot-life) of:

- 40 mins at 20° C
- 90 mins at 10°C
- 180 mins at 5°C

Application

Triton TRIMOL 23 may be applied by trowel, very stiff brush, serrated spreader or spatula and worked in well.

- Recommended glue-line thickness: 1-30mm
- Joints must be closed whilst the adhesive is still tacky.

Curing

Ultimate bond strengths are achieved after 4-5 days at 20°C, however, the material will have gelled within 16-18 hours at 20°C.

Cleaning

All tools and surfaces should be cleaned with **Triton RESIN CLEANER** before the mixture has hardened.

Storage

The separate components stored in dry conditions at 5°C - 25°C have a shelf life of 18 months.

Mechanical Properties

Thixotropic Adhesive Mechanical Properties after curing 21 days at 20°C Test temperature 20°C		
Tensile strength ISO/R527	MPa	14.8
Tensile modulus (E) ISO/R527	GPa	7.3
Elongation break ISO 178	%	1
Flexural strength* ISO 178	Mpa	37
Compressive strength* ISO 604	Mpa	8033

Caution

Triton TRIMOL 23 Resin and hardener are generally harmless providing that the normal common-sense precautions taken when handling chemicals are observed. For instance neither the separate components nor the uncured mixture should be allowed to come in contact with foodstuffs or utensils. Measures should also be taken to prevent contact with the skin: wearing rubber or plastic gloves will normally suffice along with eye protection. Thoroughly cleanse the skin at the end of each working period by washing with soap and warm water. Disposable paper towels are recommended to dry the skin. Precautions are fully discussed in product safety information for **Triton TRIMOL 23** resin and hardener, which is available on request.

Removed

It is advised that cementitious finishes should be 28 days old.

Health & Safety

- For full information consult the relevant Material Safety Data Sheet.

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Triton TRIGROUT EXTRA

HIGH PERFORMANCE CEMENT BASED STRUCTURAL GROUT

Triton TRIGROUT EXTRA has been designed as a structural grout for the bedding and bonding of stainless steel reinforcement bar and wall ties. Triton TRIGROUT EXTRA is shrinkage compensated, non-gassing and thixotropic; it is suitable for application with hand or powered applicators.

Key Benefit

- Pre-Packed Powder and Liquid
- Simple Mixing
- Long Pot-Life
- Excellent Application Properties

Description and Use

Triton TRIGROUT EXTRA is composed of Portland cement, quartz aggregates and water retention additives and is mixed with a pre-prepared SBR latex liquid before use. The thixotropic grout produced is placed in slots or holes in masonry walls to bond spiral or helical stainless steel reinforcement bar or wall ties when carrying out crack stitching or masonry reinforcement repairs.

Preparation

Cut the slot or hole to the required size; in general there should be a minimum clearance of 2mm all round the component being installed, e.g., for a 6mm bar or tie, a 10mm slot or hole should be cut. Very absorbent substrates may require a larger clearance to be made. The depth cut for a slot will vary with the type of wall, for single skin or cavity construction a depth of 25-35mm is required, for solid walls a depth of 35-45mm should be cut. After slot cutting or drilling, the hole should be flushed clean with water to allow for maximum bond strength to be obtained. Highly absorbent materials may need to be primed to reduce suction.

Mixing

Triton TRIGROUT EXTRA is supplied in plastic buckets containing all the powder and liquid needed to make up the product. No extra water is needed or added. Add the powder to the liquid in the supplied bucket. Mix thoroughly using a powered paddle for at least 2 minutes until a creamy lump free consistency is obtained. MIX ONLY WHOLE PACKS. Transfer the mixture into the grout injection gun and inject into the slot or hole in one, smooth, continuous operation, immediately apply the reinforcement bar or tie and apply further grout over the top as necessary. Aim to use up each cartridge load within 5 minutes. The pot life of the mix is typically 45 minutes with re-stirring before loading the injection gun.

Curing

Exposed areas of grout should be protected from the wind and sun to maintain damp conditions for at least 3 days to maximise strength development and shrinkage compensation. A primer may be needed on highly absorbent surfaces. DO NOT USE at ambient temperatures above 25°C or at 5°C or below (or if danger of frost).

Clean Up

Clean out injection guns and tools with clean water immediately after use before the grout sets.

Health and Safety

Triton **TRIGROUT EXTRA** contains Portland cement, which becomes alkaline when wet. Avoid contact with grout powder and the mixed product.

Refer to the product label and the Safety Data Sheet for more detailed information.

Packaging

- Two pack sizes are available, producing 3 litres and 6 litres
- 3 litres: 1 x 5kg **Triton TRIGROUT EXTRA** powder, 1 x 1tr Polymer gauging liquid
- 6 litres: 2 x 5kg **Triton TRIGROUT EXTRA** powder, 1 x 1ltr Polymer gauging liquid

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Ref: Triton TrigROUT Extra 07/11



Triton TRIFIX ADHESIVE

Description

Triton TRIFIX is a two component epoxy resin system formulated for use with twin component side by side cartridges using either hand operated or, more normally, air operated guns, using "at the nozzle" static spiral mixer or pot mix for larger applications.

Characteristics

Triton TRIFIX is colour coded for visual assurance that the two components are fully mixed. The product is solvent free, thixotropic i.e., will not readily slump, and cures in cold, damp conditions.

Uses

Triton TRIFIX is formulated as an adhesive for bonding and anchoring most building materials e.g. brick, stone, steel, mortar and timber. Once cured Triton TRIFIX creates a strong stress free joint regardless of the surrounding environment.

*The colour, but no other ingredient, may be changed at the manufacturers discretion. The change will not affect the cured product in any way.

Trimol System

Product	Appearance	Density at 25°C
TRIFIX RESIN	*Orange	1.7
TRIFIX HARDENER	*Red	1.2

Instructions for use

PRETREATMENT

Prior to the application of Triton TRIFIX all surfaces must be free from dust, oil, rust and grease. Any loose materials must be removed back to a sound surface.

MIXING

When supplied in cartridge form the mixing takes place in a static spiral mixer, which delivers the mixed product to the required surface. When supplied in pots, all of the resin must be mixed with all of the hardener. Under no circumstances should part mixes be used. Mix the two components thoroughly until a consistent, no streaky colour is achieved. When using cartridges, extrude Triton TRIFIX onto a surface until a consistent non-streaky colour is achieved.

Usable life

In cartridges Triton TRIFIX has no waste apart from the mixed product in the nozzle, which will stay workable for a minimum of 15 mins. In pot form the mixed product will remain workable for approximately 15 mins. This time can vary depending upon the working temperature.

Curing

Complete Cure: 7 days

Testing

Not less than 24 hours after application, the temperature to be 12°C or above.

Working temperature

The material is formulated for use at 5°C to 25°C; it is seasonably adjusted during manufacture to ensure the flow characteristics of the mixed product are constant.

Trifix Adhesive

Mechanical properties after curing 21 days at 20°C.

Test temperature: 20°C.

Tensile strength 35 MPa

ISO/R 527

Flexural strength 30 MPa

ISO 178

Compressive strength 60 MPa

Storage

The separate components, stored at 5°C to 20°C in dry conditions, have a shelf life of at least 9 months.

Packaging

400ml side-by-side cartridge

Cleaning

The method of application cuts cleaning to a minimum but should it be necessary to clean then **Triton RESIN CLEANER** should be employed: cured **Triton TRIFIX ADHESIVE** will require removal by chipping or other mechanical means.

Caution

Triton TRIFIX ADHESIVE is generally harmless providing that the normal common-sense precautions are taken when handling chemicals are observed. For instance neither the separate components nor the uncured mixture should be allowed to come into contact with foodstuffs or utensils. Measures should also be taken to prevent contact with the skin: wearing rubber or plastic gloves will normally suffice along with eye protection. Thoroughly cleanse the skin at the end of each working period by washing with soap and water. Disposable paper towels are recommended to dry the skin. Precautions are fully discussed in Product Safety Information sheet for **Triton TRIFIX ADHESIVE**, which is available on request.

Health & Safety

- For full information consult the relevant Material Safety Data Sheet.

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Triton DOUBLE ADHESIVE TIE – AA10

Description and Use

The Triton AA10 is a 10mm diameter stainless steel replacement wall tie, which can be used in situations that require both the inner and outer wall to be anchored with resin. It has the added advantage of being virtually self-centering. The "Triton AA10" tie has "waisted" ends which give the tie both a mechanical and an adhesive fixing, once the resin is applied.

Triton AA10 tie can be used in most building materials i.e. brick, lightweight block, timber and mortar.

Triton AA10 tie is manufactured from austenitic stainless steel, of which grade 316 is used.

Triton AA10 ties are available in various lengths to deal with varying cavity widths and construction types.

Application

An 11mm diameter hole is drilled through the outer wall and into the inner wall at a slightly inclined angle (as recommended in BRE Digest 329) to a minimum depth of 56mm. The hole must then be blown out to remove dust etc., prior to the installation of the resin.

The resin is then applied to the inner wall, ensuring the hole is filled. The correct length tie should then be inserted and pushed manually to the back of the hole. Resin is then applied to the outer hole encasing the tie end. The hole should then be capped off with mortar or mastic.

Load Testing

The Triton AA10 tie has an inbuilt feature that enables load tests to be carried out on site on the inner leaf if necessary. Two projections are formed extending inwardly into the bore of the tubular body on the outer end of the tie.

A load test adaptor is supplied which has a 6mm thread on the outer end for connecting to the load test equipment and two slots for passing over the projections in the wall tie at the opposite end. With the two flats on the major diameter of the adaptor in the vertical position, fit the slotted end into the bore of the wall tie. Turn adaptor through 90 degrees and in this position the head is engaged behind the projections and the load can be applied.

Typical loads achieved are in excess of 2.5 kn.

Packaging

Triton AA10 ties are packed in boxes of 100

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Triton DOUBLE ADHESIVE TIE RR10

Description and Use

The Triton RR10 is a 5mm diameter stainless steel replacement wall tie which can be used in situations that require both the inner and outer wall to be anchored with resin.

The RR10

- Consists of a 5mm stainless steel bar with two 10mm nuts on each end of the tie with a centre drip.
- The Triton RR10 tie is manufactured from 304 grade austenitic stainless steel.

Application

A 10mm diameter hole is drilled through the outer leaf brick and into the inner leaf to a minimum depth of 55mm. The hole should be drilled at a slightly inclined angle to avoid ingress of dampness (as recommended in Bre Digest 329) and blown out to remove any loose dust and drillings. Care must be taken in selecting the correct length wall tie for the appropriate cavity width. Triton TRIFIX RESIN must then be injected into the inner leaf hole and the Triton RR10 pushed across the cavity and firmly into the resin filled hole. Resin is then applied to the outer hole encasing the tie end. The hole should then be capped off with mortar or mastic.

Load Testings

Once the resin has cured a pull test on the inner leaf can be performed using the appropriate adaptor and testing machine.

Typical loads achieved are in excess of 2.5kn.

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Ref: Triton RR10 07/11



Triton EXPANDING RESIN TIE – ER10

Description and Use

The Triton ER10 is a 10mm diameter replacement cavity wall tie, that combines 304 grade austenitic stainless steel and Neoprene.

The Triton ER10 is most suited to situations where the outer leaf is of a solid construction and the inner leaf is of a weaker material (blockwork) as one end of the tie is resin bonded into the structure, and the other end is expanded to form a fix.

Application

A 11mm diameter hole is drilled through the outer leaf brick and into the inner leaf to a minimum depth of 55mm. The hole should be drilled at a slightly inclined angle to avoid ingress of dampness, (as recommended in BRE Digest 329) and blown out to remove any loose dust and drillings. Care must be taken in selecting the correct length wall tie for the appropriate cavity width. Suitable resin must then be injected into the inner leaf hole and then the ER10 pushed across the cavity and firmly into the resin filled hole. The resin must then be given appropriate time to cure. (See manufacturers instruction). Once the resin has cured a pull test on the inner leaf can be performed if required, using the appropriate adaptor and testing machine.

The outer leaf is loaded by fitting the fixing tool on to the inner nut and turning clockwise until hand tight. If testing is required on the completed installation it is performed as described previously.

Typical loads achieved are in excess of 2.5kn.

If further information or a site demonstration is required contact our technical department.

Packaging

The Triton ER10 is packed in boxes of 200.

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Triton RESIN / MECHANICAL TIE RS10

Description and Use

These ties are used in situations where the inner leaf construction is of low compressive strength i.e., normally below 7n/mm^2 .

The inner "wavy tail" end has been in use for over 20 years and is acknowledged as being the best possible resin anchor design.

Triton RS10

The Triton stainless steel expander is designed to provide a wide range of fixings into soft and hard materials alike without undue relaxation or creep under continuous tensile and compressive loading or cyclical vibration by using strip of a precise thickness, high localized compressive point loads that are normally associated with conventional expanders are reduced; thereby reducing the possibility of cracking the masonry.

Installation Procedure

1. Drill a 23mm diameter hole through the masonry to a depth of 55mm in the inner leaf. Remove all dust and debris from the hole.
2. Inject a quantity of **Triton TRIFIX RESIN** into the inner leaf hole, via a resin extension tube. Insert the wavy end of the remedial tie into the resin and push firmly home.
3. When the resin has set, undertake a pull test, if required.
4. Tighten the outer expander to the specified torque setting.
5. make good the hole with matching mortar.

The metallic components of these ties are manufactured from 304 grade austenitic stainless steel.

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Triton EE10 SINGLE FIX WALL TIE

Description and Use

The stainless steel double expansion remedial wall ties are manufactured from Neoprene and Austenetic 304 Grade Stainless Steel. The tie has been designed with neoprene expanders being more sympathetic to the material we are fixing to. It uses a newly designed torque nut to set both the inner and outer expanders independently. The inner fix is affected by a ribbed neoprene, which gives the best possible grip on the inner leaf. This design is an improvement over other ties where the expanders have to be continually taken out, pre-expanded and re-inserted to effect a fix.

Application

An 11mm diameter hole is drilled through the outer leaf brick and into the inner leaf brick to a minimum, depth of 55mm. The hole should be drilled at a slightly inclined angle to avoid ingress of dampness (as recommended in BRE Digest 329) and if necessary, blow out to remove any loose dust and drillings. Care must be taken in selecting the correct length wall tie for the appropriate cavity width.

The Triton EE10 is then inserted into the hole and located into the hole in the inner leaf. The Triton EE10 should be left approximately 10mm inside the face of the outer brickwork. Once in place the setting tool, held in a suitable cordless drill, should be applied to the torque nut to expand the inner body. At a pre-set strength the torque nut will then run down the thread. If a pull test is required for the inner leaf only, it should now be carried out using the appropriate adapter and testing machine.

The outer leaf is loaded by continuing to set the nut with the drill and tool. If testing is required on the completed installation it is performed as described previously.

Typical loads achieved are in excess of 2.3kn.

Below are listed typical tensile failure loads under testing in accordance with BSI DD140 Part 1 and provide indicative values of the tie performance in various base materials. The couplet test produces results of a conservative nature compared to actual wall tests.

Base Material	Compressive Strength (N/mm ²)	Tie Anchorage (Kn)
Common facing brick	19-25.5	7.01
Deep frogged brick	18-25.0	6.52
Dense concrete block	7-19.3	3.12
Lightweight concrete block	2.3-3.2	1.78

NOTE: The above results are mean failure loads and are either the ultimate pull out load or the load at a deformation of 5mm, whichever occurred first.

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Triton PB10 DOUBLE EXPANDING TORQUE NUT WALL TIE

Description and Use

The stainless steel double expansion remedial wall ties are manufactured from Brass and Austenetic 304 Grade Stainless Steel. The tie has been designed with brass expanders being more sympathetic to the material we are fixing to. It uses a newly designed torque nut to set both the inner and outer expanders independently. The inner fix is affected by a crimped nut which gives the best possible grip on the inner leaf and forces a free moving cone into the expander. This design is an improvement over other ties where the expanders have to be continually taken out, pre-expanded and re-inserted to effect a fix.

Application

A 10mm diameter hole is drilled through the outer leaf brick and into the inner leaf brick to a minimum, depth of 55mm. The hole should be drilled at a slightly inclined angle to avoid ingress of dampness (as recommended in BRE Digest 329) and if necessary, blow out to remove any loose dust and drillings. Care must be taken in selecting the correct length wall tie for the appropriate cavity width.

The Triton PB10 is then inserted into the hole and located into the hole in the inner leaf. The Triton PB10 should be left approximately 10mm inside the face of the outer brickwork. Once in place the setting tool, held in a suitable cordless drill, should be applied to the torque nut to expand the inner body. At a pre-set strength the torque nut will then run down the thread. If a pull test is required for the inner leaf only, it should now be carried out using the appropriate adapter and testing machine.

The outer leaf is loaded by continuing to set the nut with the drill and tool. If testing is required on the completed installation it is performed as described previously.

Typical loads achieved are in excess of 2.5kn.

Below are listed typical tensile failure loads under testing in accordance with BSI DD140 Part 1 and provide indicative values of the tie performance in various base materials. The couplet test produces results of a conservative nature compared to actual wall tests.

Base Material	Compressive Strength (N/mm ²)	Tie Anchorage (Kn)
Common facing brick	19-25.5	7.01
Deep frogged brick	18-25.0	6.52
Dense concrete block	7-19.3	3.12
Lightweight concrete block	2.3-3.2	1.78

NOTE: The above results are mean failure loads and are either the ultimate pull out load or the load at a deformation of 5mm, whichever occurred first.

Specification

Certification of conformity. All brass is manufactured from CZ121 1986 and conforms with BS-EN12164/BS2874.

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Triton LATERAL RESTRAINT

Description and Use

Triton LATERAL RESTRAINTS are manufactured from 304 austenitic Stainless Steel rods 8mm in diameter. These are supplied in standard lengths of 1 metre but are available in any length by prior arrangement.

Triton LATERAL RESTRAINTS are designed to restrain the whole of the brick outer structure to the floor joists.

The process would normally be done by using angle straps screwed onto the joists. This has several drawbacks:

- The disturbance caused to the householder is quite considerable.
- The fixing to the joist is only as strong as the shear strength of the screw heads.
- If there is fitted furniture or bathroom suites these have to be removed which would involve using specialist trades such as joiners and plumbers.

The Triton LATERAL RESTRAINTS can be fitted from outside the property with a minimum of disturbance - in most cases just a lifting of the floorboards to determine the position of the joists.

The same restraint is used to suit different situations i.e. joists bearing into the wall and joists parallel to the wall.

Installation Procedure

1. Drill a 14mm hole through both brick outer and inner leaf.
2. Push the long restraint into the pilot hole and attach the restraint fixing tool provided. The restraint is then slowly wound through the joists leaving the outer end recessed approximately 10-15mm. The outer end can then be tested for the strength of fix. Typical test results range from 5kn-10kn. The outer end is then resin bonded into the brickwork and finished off with either mortar or mastic.
3. Tools required to fix Triton LATERAL RESTRAINTS:
 - a. 14 x 460mm drill bit
 - b. 1 Fixing Kit
 - c. 1 Drilling Machine
 - d. 2 Spanners to suit
 - e. Trifix Resin

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