

Construction Products Solutions International Ltd Presentation

2014

Presenter:
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Presentation Contents

- History, Production & Products
- Technical Information
- Applications & Installation
- Practical Examples & Projects
- New Build Applications & Installation
- Additional Products & Point of Sale

History, Production & Products

- 1995 New Manufacturing facility in Hungary designed and upgraded by the original helical designers and patent owners.
- 1998 Structural Beam Tests, Bath University
- 2001 Test Programme at the IGBT test centre in Leipzig Germany
- 2005 Development of the new build BigTwist Flat roof fixing range. Tested at the Imperial College London.

History, Production & Products

- 2008 Test Programme at the Polish Research Institute LOK-1118/A/08 CE Certificate for use in Timber and Masonry
- 2009 New wall tie machinery doubling the manufacturing capacity
- 2010 German Approval for Grout Ties

Production

SureTwist Helical production features.

Stainless Steel Rod



Drawn Rod



SureTwist Helical Bar



Production

SureTwist Helical Production Process

- 304 grade austenitic stainless steel
(316 Available upon Request)
- Engineered to form a profiled section having pronounced workhardened cutting fins that wind around & along a central core
- Available in 3mm, 4.5mm, 6mm, TC7mm, 8mm, TC8mm, TC9mm and 10mm sections, which are balanced in stiffness, length & pitch to optimise driving ease and provide enhanced bending resistance



Production

SureTwist Helical Production Process

- Consistent tensile & compressive characteristics
- The PZ steel TC8mm, (BigTwist) is manufactured from 8.8 high tensile steel, zinc plated

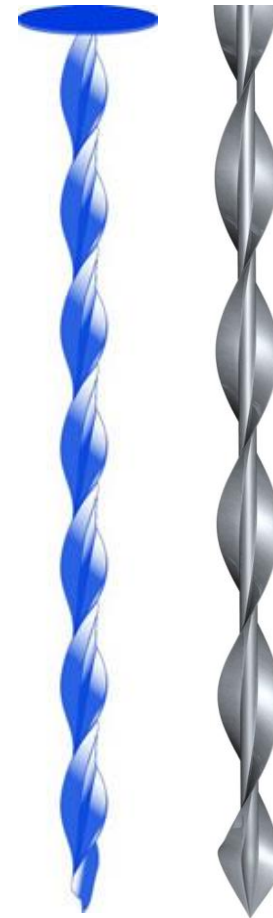
SureTwist Bar (No Points)

- 3mm Stainless Steel
- 4.5mm Stainless Steel
- 6mm Stainless Steel
- 8mm Stainless Steel
- TC8mm Stainless Steel
- 10mm Stainless Steel



SureTwist Plus (One Point)

- 4.5mm Stainless Steel
- 6.0mm Stainless Steel
- TC7mm Stainless Steel
- 8mm Stainless Steel
- TC8mm Stainless Steel
- PZ Steel TC8 8.8 High Tensile Steel
- TC9mm Stainless Steel
- 10mm Stainless Steel



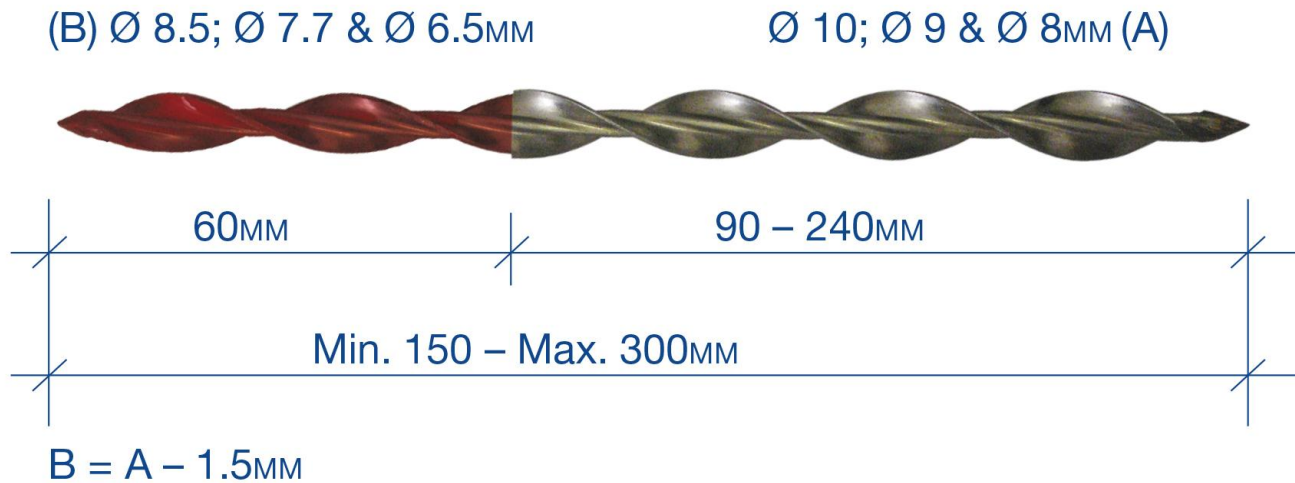
SureTwist Extra (Two Points)

- 4.5mm Stainless Steel
- 6.0mm Stainless Steel
- TC7mm Stainless Steel
- 8mm Stainless Steel
- TC8mm Stainless Steel
- TC9mm Stainless Steel
- 10mm Stainless Steel



SureTwist AS Dual Diameter (Two Points)

- 8mm Stainless Steel
- TC9mm Stainless Steel
- 10mm Stainless Steel



SureTwist Thick Core Sections

Production & Main Benefits

- TC7mm Stainless Steel
- TC8mm Stainless Steel
- TC9mm Stainless Steel

304 Cu grade austenitic stainless steel. (316 L available upon Request)

Engineered to form a profiled section having pronounced workhardened cutting fins that wind around & along a central core, which is balanced in stiffness, length & pitch to optimise driving ease and provide enhanced bending resistance

SureTwist Thick Core Sections

Main Benefits

- Improved performance in shear loads
- Improved compression loads (Wind suction loads in Large cavities)
- Larger cross sectional area, means an improved tensile steel strength

SureTwist Thick Core Sections

Main Benefits

- Prevents deflection, bending and wandering of wall ties over a longer fixing distance
- Wall ties can be used with a SDS drill
- Ease of installation, specifically into harder substrates

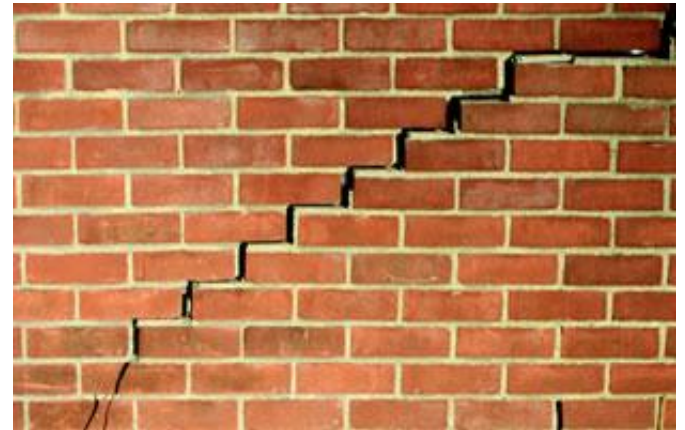


Technical Information

SureTwist Helical Technology

Causes – Crack origin:

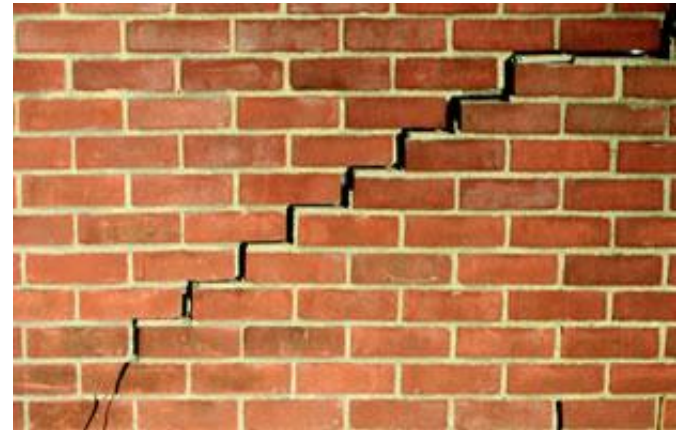
- Temperature influence
- Damage due to damp
- Wind loads
- Fractured masonry
- Lack of foundation
- Cracks due to freeze/thaw activity



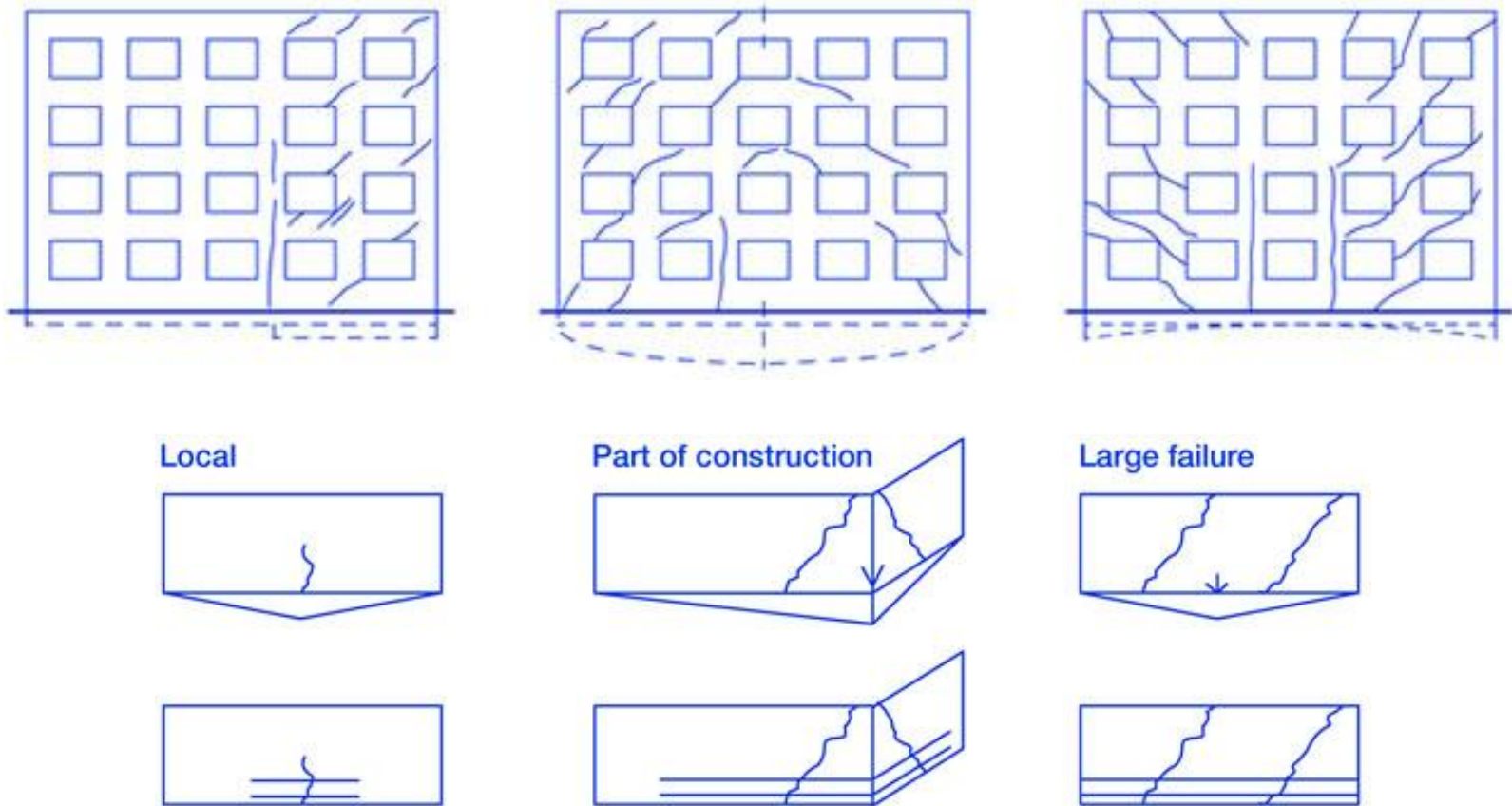
SureTwist Helical Technology

Causes – Crack origin:

- Lowering of ground water
- Imbalanced building grounds
- Road traffic vibration
- Air traffic
- Damaged drains
- Proximity of trees to the building



Suretwest Helical System – Crack/Cause

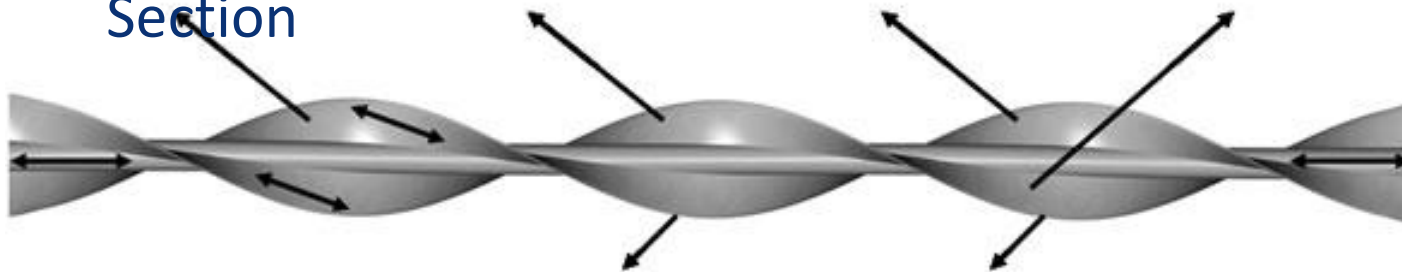


Helical Technology – Comparison Benefits

Common Rod



**Helical
Section**



SureTwist Helical Technology

Advantages

- Elasticity / Flexible System
- Stainless Steel Helical-Design gives greater effectiveness, used with SureGrout.
- Load distributed over the complete length of the SureTwist bar
- No load and tension concentration
- Ideal Diameter and Solidness

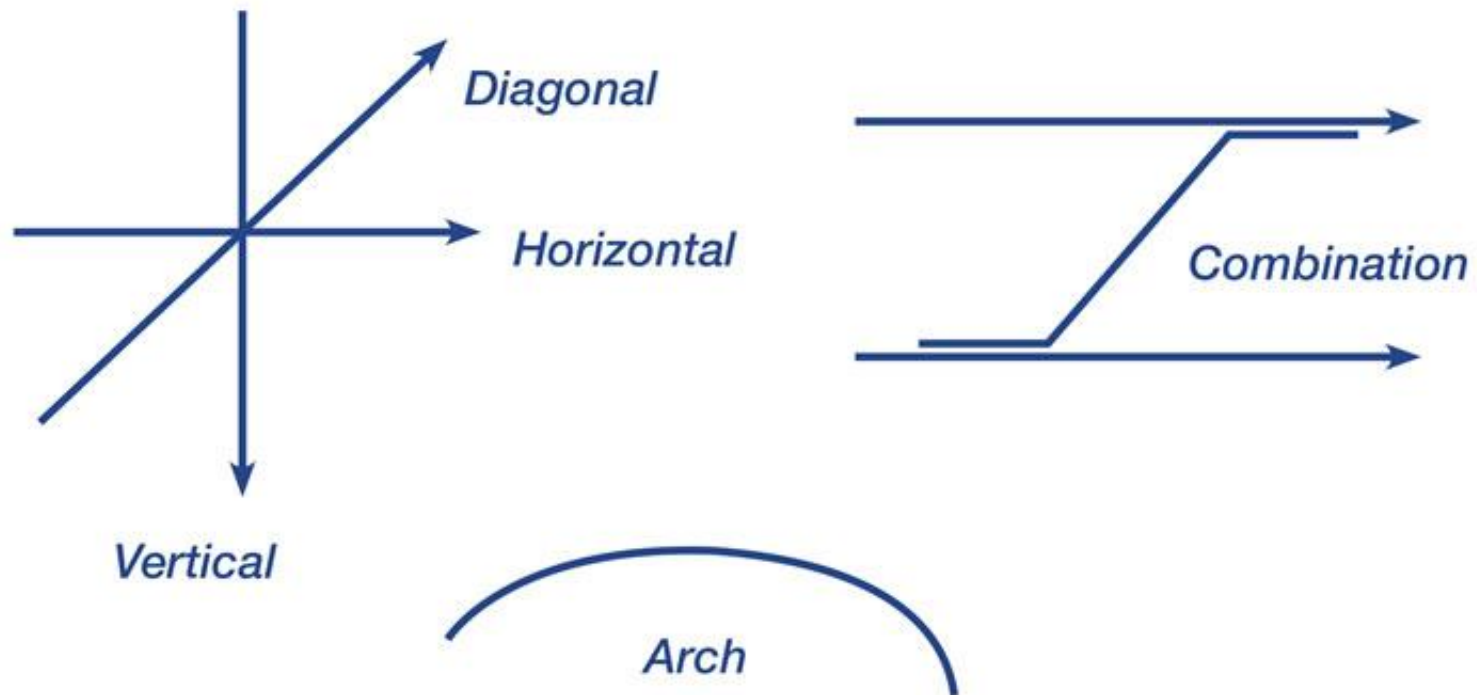
SureTwist Helical Technology

Advantages

- Long life – Stainless Steel
- Ideal for aggressive environments
- No additional plates or screws
- No additional fixings
- Ideal interaction with the masonry

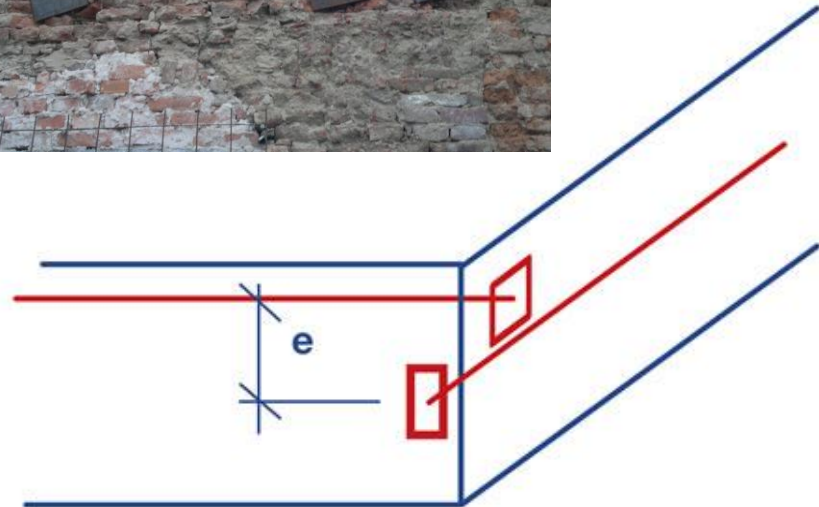
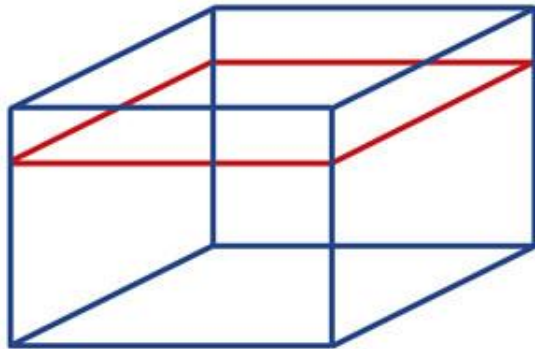
Helical Technology - Overall Effectiveness

Usage of the material (Reinforcement)



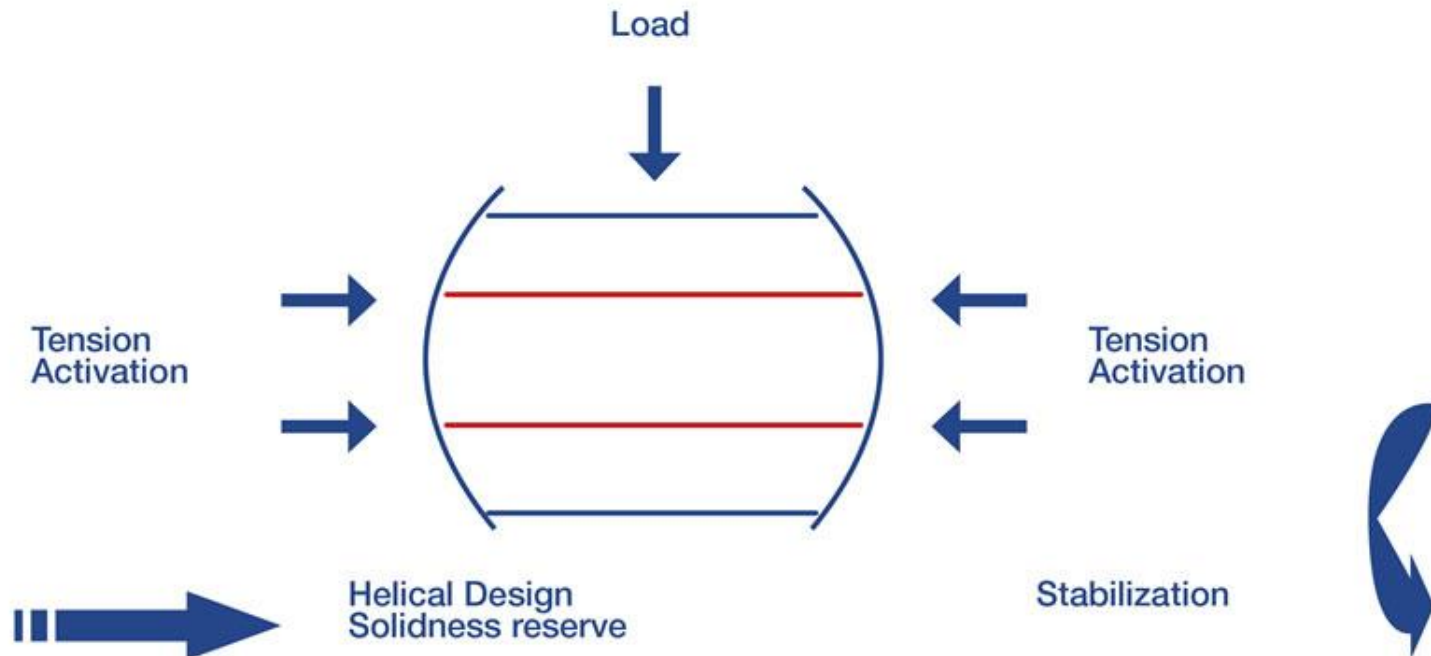
Helical Technology - Overall Effectiveness

Helical bars - Reinforcement on one level



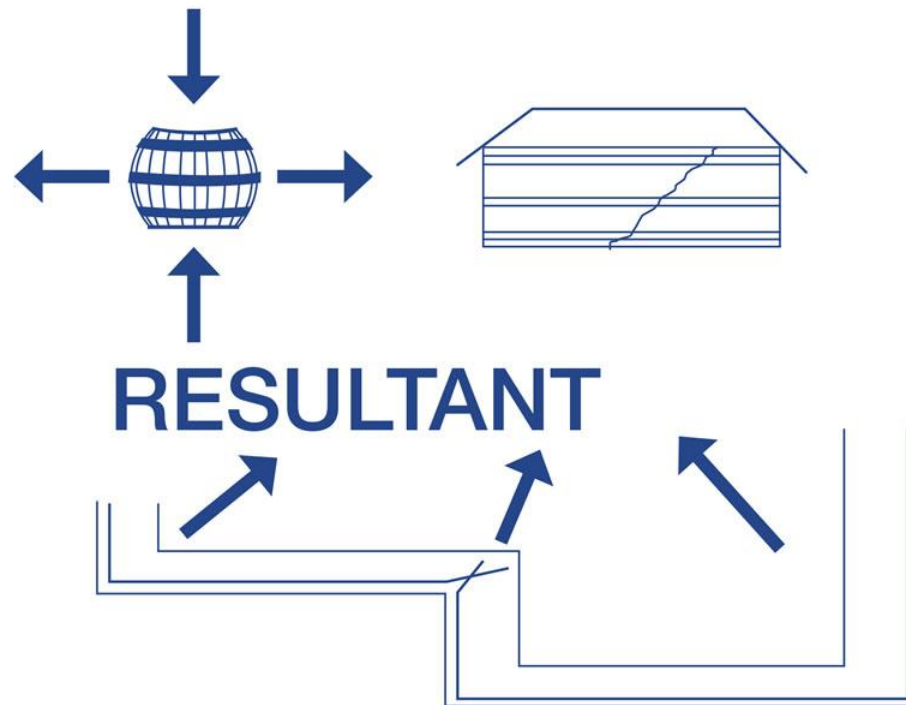
Helical Technology - Overall Effectiveness

Other Advantages > Barrel-Effect



Helical Technology - Overall Effectiveness

Other Advantages > Barrel-Effect



Helical Technology - Site Examination

Static Model



Load model (remaining and accidental loads)

Force Model (external and internal forces)

Static Formula



Model Selection, personal examination

(Simple Beam, Console, Joint Beam, Arch, Plate)



Calculation – Boundary Forces und Boundary Tension
Comparison

Helical Technology - Documents

Building – Existing Situation, Tech. Description, Personal Examination

Control of the Construction Situation:

- Age, Construction Type of the Building
- Used Materials, Constructions
- Material Type (Brick, Stone, Concrete, Wood, etc.)
- Construction Type (Wall, Ceiling, Arch, Plate, Pillar, etc.)
- Construction Connections
- Control of the Materials
- Control of the Movements
- Registration of the Crack Type

Helical Technology - Documents

Building Object – Existing Situation, Tech. Description, Personal Examination

Environmental Controls:

- Dynamic Effects
- Metrological Situation
- Floor Situation
- Single Constructions, Neighbor Buildings
- Ground

SureTwist Helical System - Tests



SureTwist Helical System - Tests



SureTwist Helical System - Tests

Beam test

Brick Beam-span 1,8m

- Simply supported
- Self weight 0,16 kN / m

The four course deep brick beam, reinforced in the bottom bed joint And the top bed joint with two pieces of 6mm BruttBar, achieved a maximum point loading of **21.21kN**.



At a deflection of 20mm the above Brick beam Achieved a loading of **15.76 kN**.

SureTwist Helical Profile – Technical Data



Profile	Area mm ²	Tensile KN/Mpa	Yield Point Mpa	Elongation %	E Module Gpa
Profile Ø6	8	7,2 / 900	745	5,1	156,269
Profile Ø8	10	8,8 / 880	745	4,7	148,813
Profile Ø10	13	10,7 / 823	640	4,2	146,114






Profile	1	2	3	4	5
Profile Ø6	8	16	24	32	40
Profile Ø8	10	20	30	40	50
Profile Ø10	13	26	39	52	65

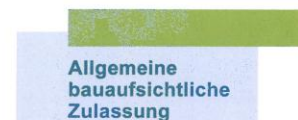
SureTwist CE Approval

CE	Declaration of Performance	No.: 1120
1. Product Type: Unique identification code of the Product Type:	SURETWIST	
2. Type Batch or serial Number or any other element allowing identification of the construction product as required under Article 11(4):	SURETWIST 6mm 1120-01 / length 1000-10000mm / SURETWIST 8mm 1120-02 / length 1000-10000mm / SURETWIST 10mm 1120-03 / length 1000-10000mm /	
3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:	The product SURETWIST Bar is a symmetrical construction product, in accordance helical stainless reinforcing wire for structural application used for bed joint reinforcement, connections of construction units and used for connection between external and internal part of cavity wall.	
4. Name, company, registered trade name or contact address of the manufacturer as required under Article 11(5):	SURETWIST ® Brutt Saver Hungary Kft. Pipis Hegy, 3200 Gyongyos Hungary	
5. Contact Address Where applicable, name and contact address of the authorized representative whose mandate covers the tasks specified in Article 12(2):	Not relevant (see 4)	
6. AVCP: System or systems of assessment and verification of constancy of performance (AVCP) of the construction product as set out in CPR Annex V:	4 ISO 9001:2008 No.:BE-03 1997 c	
7. Notified body (Harmonised EN): In case of the declaration of performance (DoP) concerning a construction product covered by a harmonised standard:	Building research institut ITB Katowice ID 1448 Issued Approval number - LOK-1118-A-08 regarding a statement on the structural products properties subject to the standard EN 10002-1:2001,845-1:2003 EN 846-5:2000,846-7:2000	
8. Notified body (ETA) In case of the declaration of performance concerning a construction product for which a European Technical Assessment (ETA) has been issued:	Not relevant (see 7)	

9. Declaration of performance			
Product dimensions			
Dimension mm		Types	
Length		1000 mm to 10000 mm	
Diameter		6mm, 8mm , 10mm	
Pitch		25±1 mm, 30±1 mm, 50±1 mm,	
Durability			
Type		Coating	
SURETWIST		Austenitic Stainless Steel	
Information and regulated characteristics: When the mentioned products are used in accordance with the instructions on the product installation leaflet the product gives the characteristics as mentioned in the table below.			
SURETWIST / Characteristics			
Intended use		Structural Application	
Material		Austenitic Stainless Steel - Designation 1.4567 Reference R3	
Tensile strength		Diameter 6 mm – 7200 N, Diameter 8 mm – 8800 N, Diameter 10 mm – 10700 N	
Profile Size mm		Area mm²	Yield Point N/mm²
6		8	745
8		10	745
10		13	640
Lap Length		500 mm	
Test Results (Tensile Loads)		Described in Report LOK-1118-A-08	
Compressive Load		Calculated according to EN 1996	
Bond strength		Described in Report LOK-1118-A-08	
Water penetration resistance		Resistant	
Dangerous substances		No	
10. Declaration: The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance (DoP) is issued under the sole responsibility of the manufacturer identified in point4.			
Date of Issue: 1.7.2013	Page 2 of 2	Approved by:  General manager Brutt Saver	

SureTwist Testing Approvals

		BUILDING RESEARCH INSTITUTE European Notified Body No. 1488	
 		GROUP OF TESTING LABORATORIES accredited by the Polish Center of Accreditation Accreditation Certificate no. AB 023	
LOK	TEST REPORT NO. LOK-1118/A/08	Page 1/12	
LABORATORY: LABORATORIUM ŁĄCZNIKÓW I WYROBÓW BUDOWLANYCH LOK 40-153 Katowice al. Korfanteo 191			
WORK/PRODUCT: Brutt Saver Product (Saver, Saver Plus and Saver Extra - diameter 6, 8 and 10 mm) for the reinforcement, protection and repair of masonry structures			
CUSTOMER: BRUTT SAVER Hungary Kft, Pipis Hegy, 3200 Gyongyos, Hungary			
ACCEPTED FOR TESTING: accepted from Customer according to the report no. LOK-1118/A/08 of 17.09.2008 pursuant to the Quality Assurance Procedure no. 18			
TEST PERIOD: 17.09.2008-13.02.2009			
TEST METHOD: EN 10002-1:2001 (IDT PN-EN 10002-1:2004) EN 845-1:2003+A1:2008 (IDT PN-EN 845-1:2004+A1:2008) EN 846-5:2000 (IDT PN-EN 846-5:2002) EN 846-7:2000 (IDT PN-EN 846-7:2002)			



Zulassungsstelle für Bauprodukte und Bauarten
 Bautechnisches Prüfamt
 Eine vom Bund und den Ländern
 gemeinsam getragene Anstalt des öffentlichen Rechts
 Mitglied der EOTA, der UEAtc und der WFTAO

Datum: 16.03.2012
 Geschäftszeichen: 122-1.21.3-74/07

Zulassungsnummer:
 Z-21.3-1942

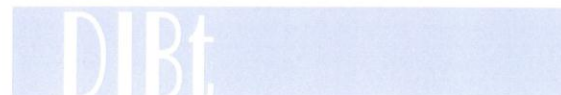
Antragsteller:
 Brutt Saver Hungary Kft
 Pipis hegy
 3200 GYÖNGYÖS
 UNGARN

Geltungsdauer
 vom: 16. März 2012
 bis: 16. März 2017

Zulassungsgegenstand:
 Brutt Saver Luftschichtanker zur nachträglichen Verankerung von Vormauerschalen



Der oben genannte Zulassungsgegenstand wird hiermit allgemein bauaufsichtlich zugelassen.
 Diese allgemeine bauaufsichtliche Zulassung umfasst sieben Seiten und vier Anlagen.



DIBt | Kolonnenstraße 30 B | D-10829 Berlin | Tel.: +49 30 78730-0 | Fax: +49 30 78730 320 | E-Mail: dibt@dibt.de | www.dibt.de

SureGrout – Technical Data



Density of grout 1. Day (kg/m ³)	1800 +/- 5%
Density of grout 28. Days (kg/m ³)	1610 +/- 5%
Workability	max. 40 Minutes
Adhesion:	
Concrete	min. 0,8 MPa
Brick	min. 0,5 MPa
Water absorption	max. 5%
Frost resistance	min. 25 Cycle
Press strength 28 Days	
Grout S 27	27 MPa
Grout HS 38	38 MPa
Grout SR Sulfatresistent	30 MPa

SureGrout – CE Certificate



Saver Powder S (SureGrout S)

Composition:
 - Quartz sand 0 / 0.8 mm
 - Binder according to DIN EN 197
 - Mortar admixture

Colour:
 Grey

Supply forms:
 Buckets each with two separate packages Saver Powder S dry components and two separate packages Saver Powder S liquid components

Yield:
 One package Saver Powder S dry component and one package of the liquid component together produce approx. 3 litres (or 6 kg) of fresh mortar.

Application:
 Saver Powder S is to be used in accordance with the application instructions for the Brutt Saver spiral anchor system.

Properties:
 - Ready-mix mortar MG III to DIN EN 998-2 and DIN V 18580
 - Frost and weather-resistant
 - Compressive strength 27 N/mm² (28 days)
 - Suitable for pumping

Processing:
 Mix the Saver Powder S dry and liquid components in the above-mentioned ratio using a stirrer-beater. Shake the liquid component well before mixing!
 Only prepare as much mortar as will be used within one hour.
 Fill the joint, bore hole or cavity using a mortar gun.
 Observe the minimum masonry and processing temperature + 5°C!

Storage:
 Store in a dry and frost-free place!
 Storage life 6 months.



CE	
0908	
Rubensteinmark GmbH Mühlener Straße 7 - 9 D-09350 Lichtenstein	
2008	
0908-BPR-04/072.01-M-11	
DIN EN 998-2:2004	
Normal masonry mortar in a recipe suitable for use for indoor and outdoor building elements relevant for structural stability.	
Reaction to fire	A1
Compressive strength	27 N/mm ²
Adhesive shear strength	0.8 N/mm ² (reference stone)
Water absorption	≤ 0.05 kg/(m ² ·min ^{1/2})
Chloride content	≤ 0.07% Cl
Water vapour transmission μ	≤ 25 (table value according to DIN EN 1745)
Thermal conductivity λ _{10,25}	≤ 0.83 W/(m·K) for IF = 52%, ≤ 0.93 W/(m·K) for IF = 90%, (table values according to DIN EN 1745)
Durability (frost resistance): On the basis of experience to date, suitable for strongly aggressive environments to DIN EN 998-2 Annex B, subject to proper application.	

Safety notes:
 Detailed information is provided in the material safety data sheet, which can be requested from our offices at any time.

X ₁	Saver Powder S	Contains: PC dinker
 Irritating	Risk notes • H360DF May cause sensitisation by skin contact	
	Safety advice • S2 Keep out of reach of children • S36 Avoid contact with skin • S37 In case of contact with eyes, rinse with plenty of water and seek medical advice • S53 Wear suitable gloves	
Rubensteinmark GmbH Mühlener Str. 7-9 09350 Lichtenstein		

Note

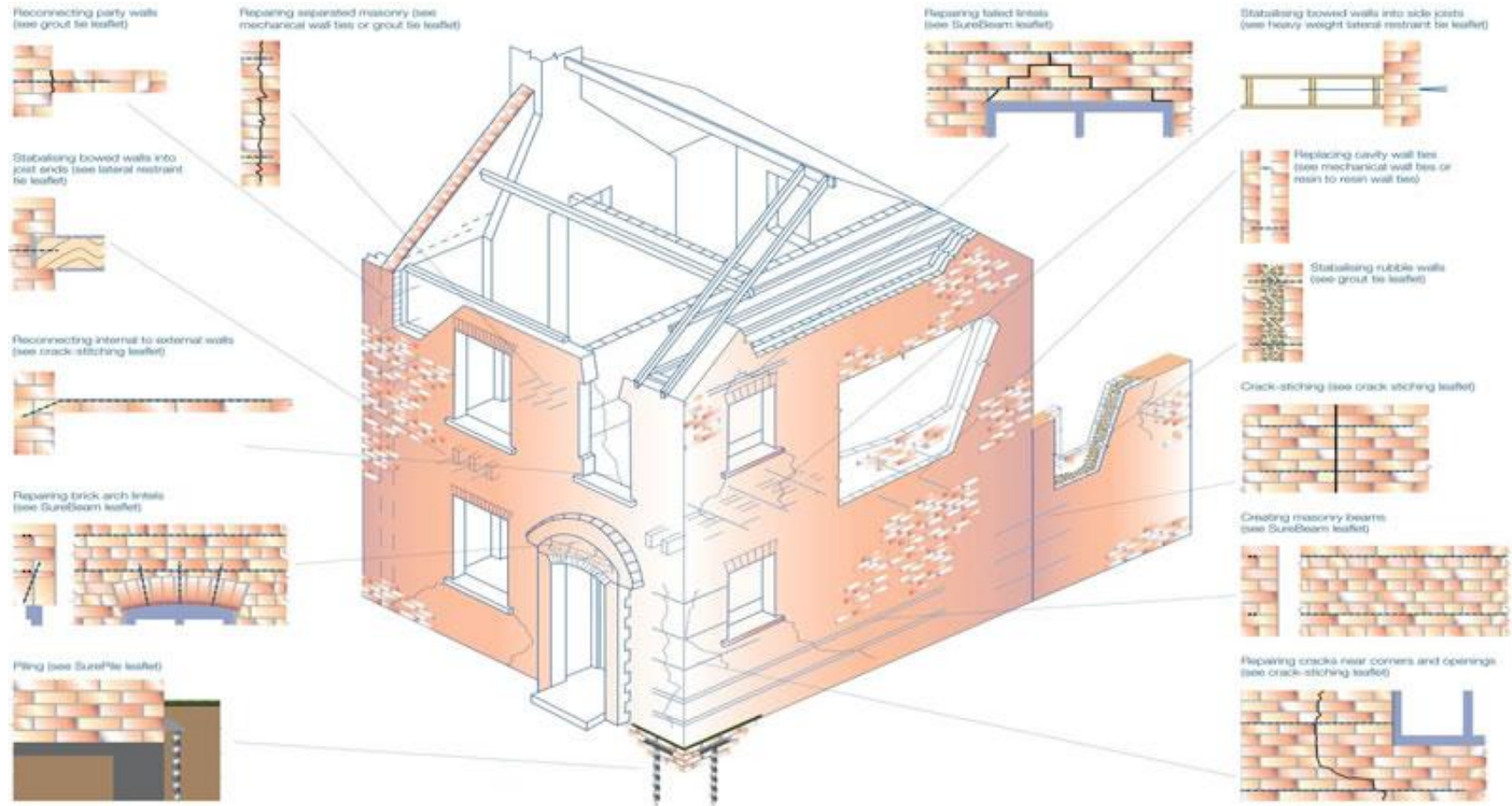
These contents of this Technical Information represent our current knowledge and experience to date. Given the multitude of factors which may influence processing and application of our products, the information provided here does not release the user from his obligation to perform tests and trials of his own. Observe the generally relevant and recognised rules for construction work. No legally binding warranty of particular properties or the suitability for a specific purpose may be derived from this Technical Information. It is the sole responsibility of the recipient of our products to observe any protected rights as well as all existing legislation and regulations.
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Status: October 2008



Applications & Installation

Applications & Installation



Applications & Installation

Crack-Stitching





Applications & Installation Animation



Applications & Installation

Advantages of Crack-Stitching

- Ease of installation
- A concealed, non-disruptive repair method
- Eliminates the need to rebuild
- Cost effective
- Free from further stress
- Permanent repair
- Still allows for the natural movement of the structure

Disadvantages of Crack-Stitching

- *“Crack Stitching cannot cure the causes of the crack”*
- “Crack Stitching can only stabilise the symptoms of the cause”

Applications & Installation

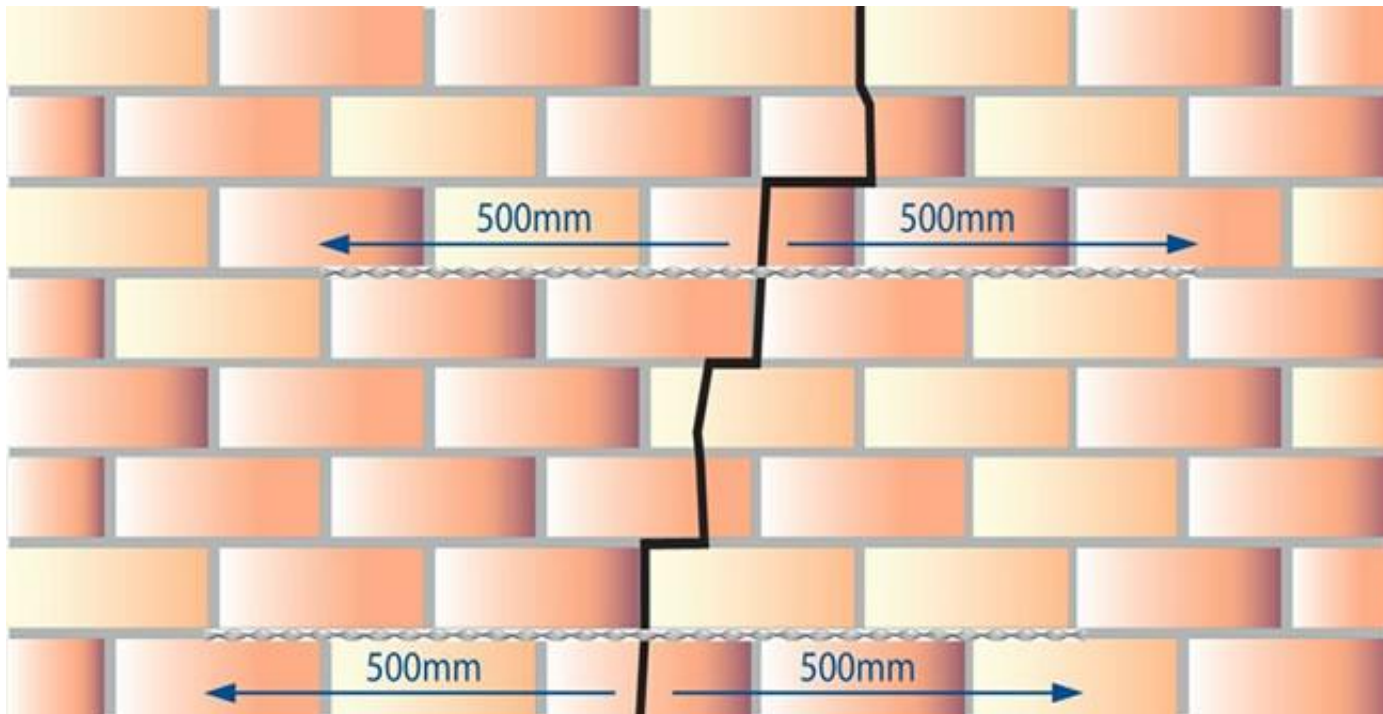
Traditional Methods of Repair

- Rebuilding
- Underpinning
- Over pinning (Beaming)
- Filling the crack with traditional mortars
- Filling and Repairing the crack with Epoxy Crack Injection Systems

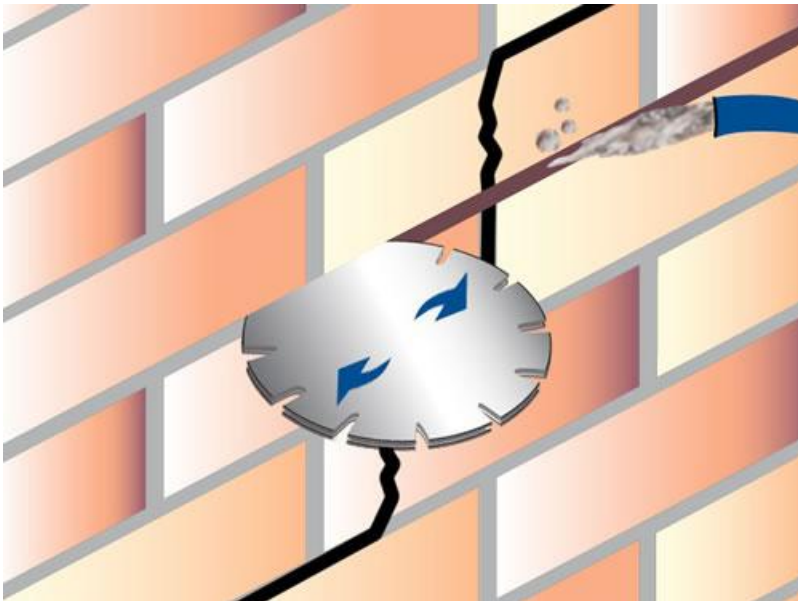
Epoxy Resin Solutions

- | | |
|--------------|------------------|
| • 2K | TE Injection |
| • Fosroc | Nitoki LV & TH |
| • Parex | Epoxy Inj System |
| • Sika | Sikadur 31 & 45 |
| • Webber | Epik |
| • Tam Resins | TamRez 210 |
| • Remmers | Inj Resin EP |

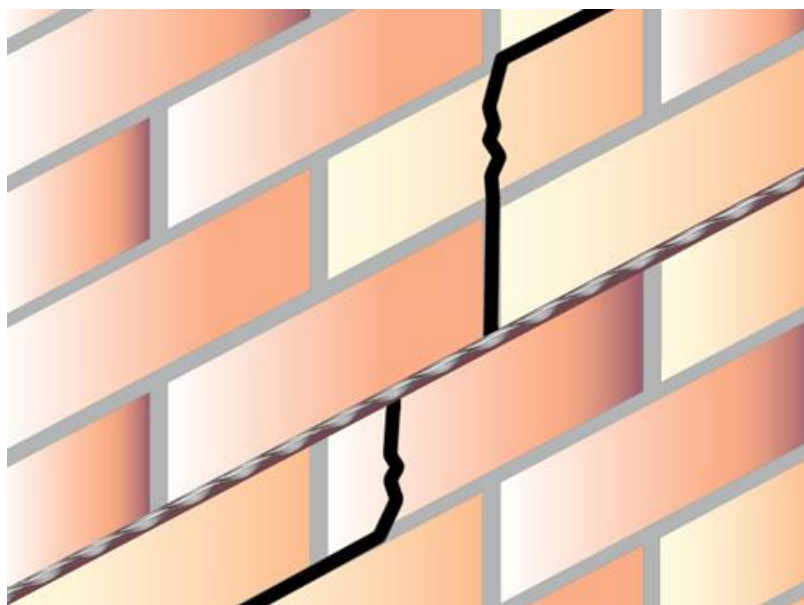
Applications & Installation

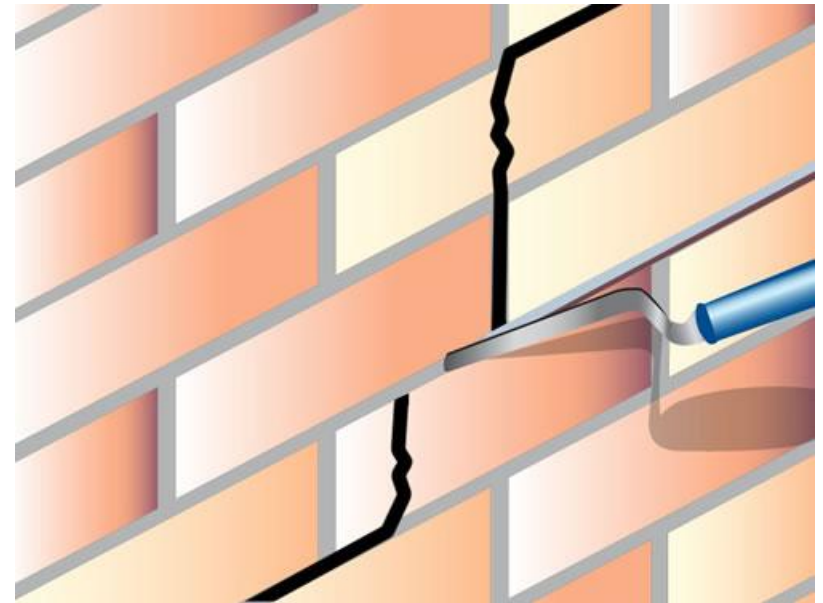
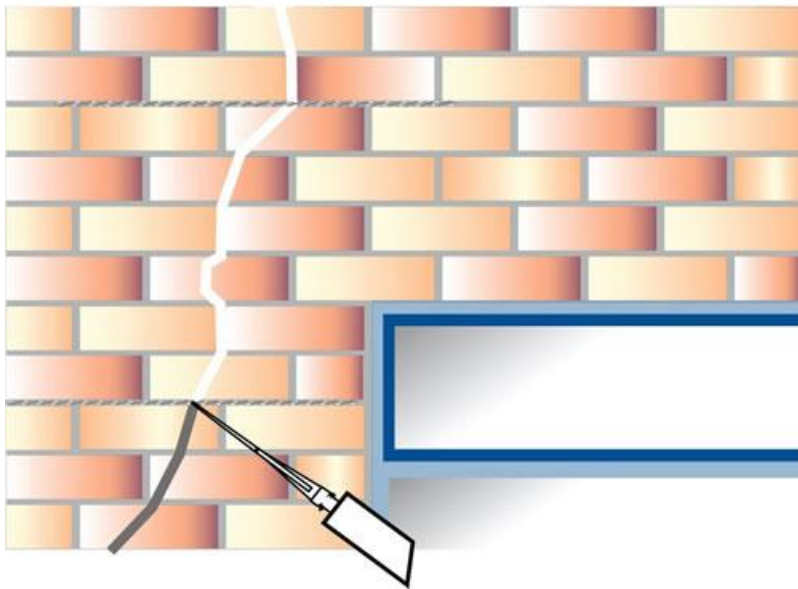


Applications & Installation

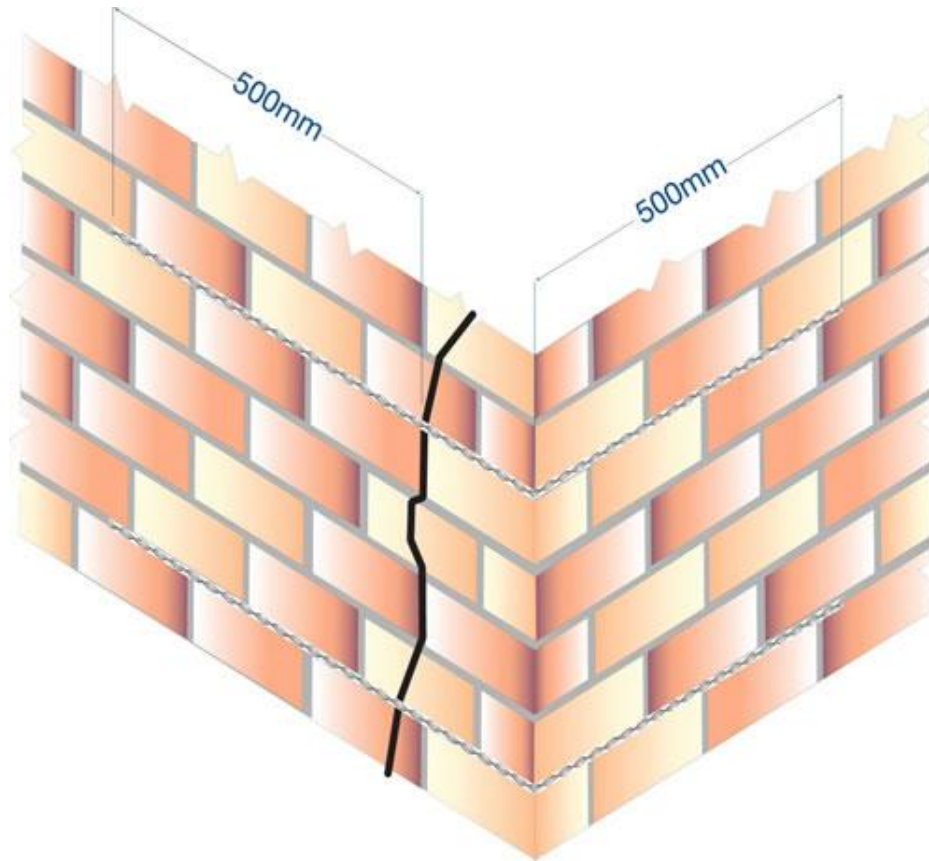


Applications & Installation





Applications & Installation



Applications & Installation

Installation Characteristics

Wall Thickness and Application		Slot depth	Depth of bar
102mm wall	Crack Stitch	30 – 35mm	20mm
215 mm wall	Crack Stitch	40 – 45mm	30mm

Vertical spacing every 4 to 6 brick courses (300 – 450mm).

Please contact the CPSI technical department for advice.



Grout Ties

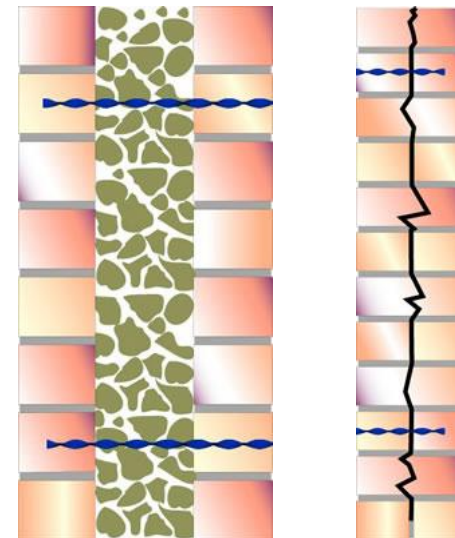
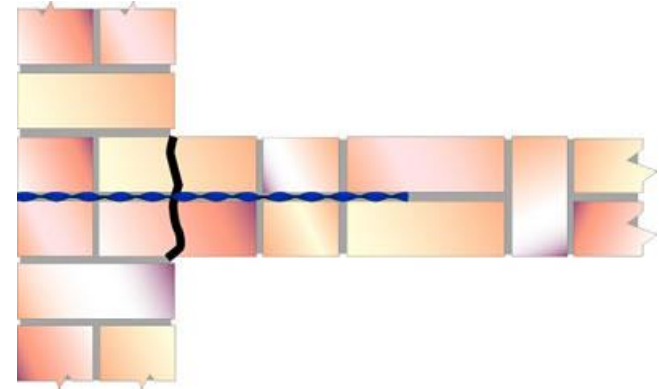


Grout Tie Installation Animation

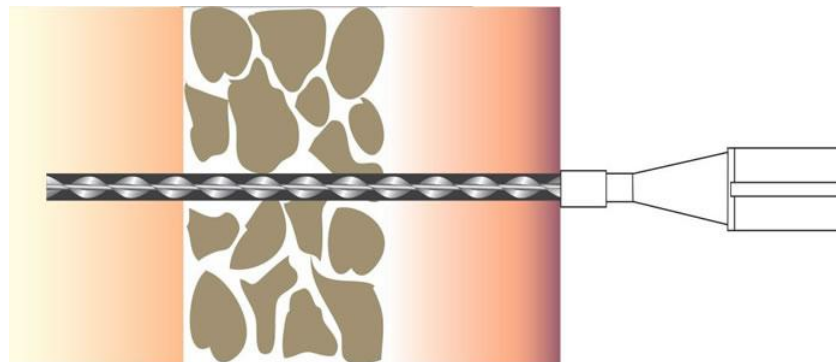
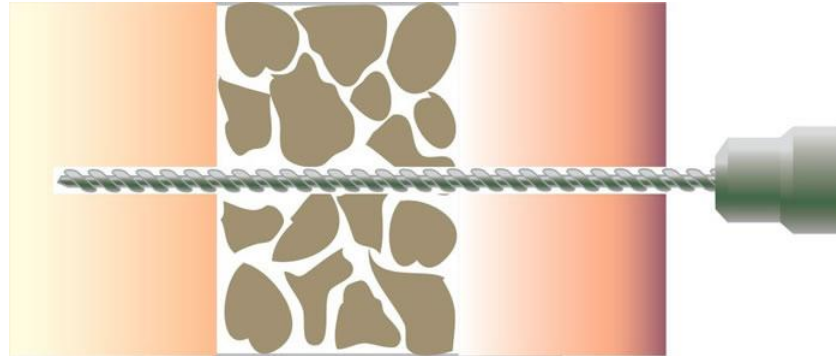


Grout Ties

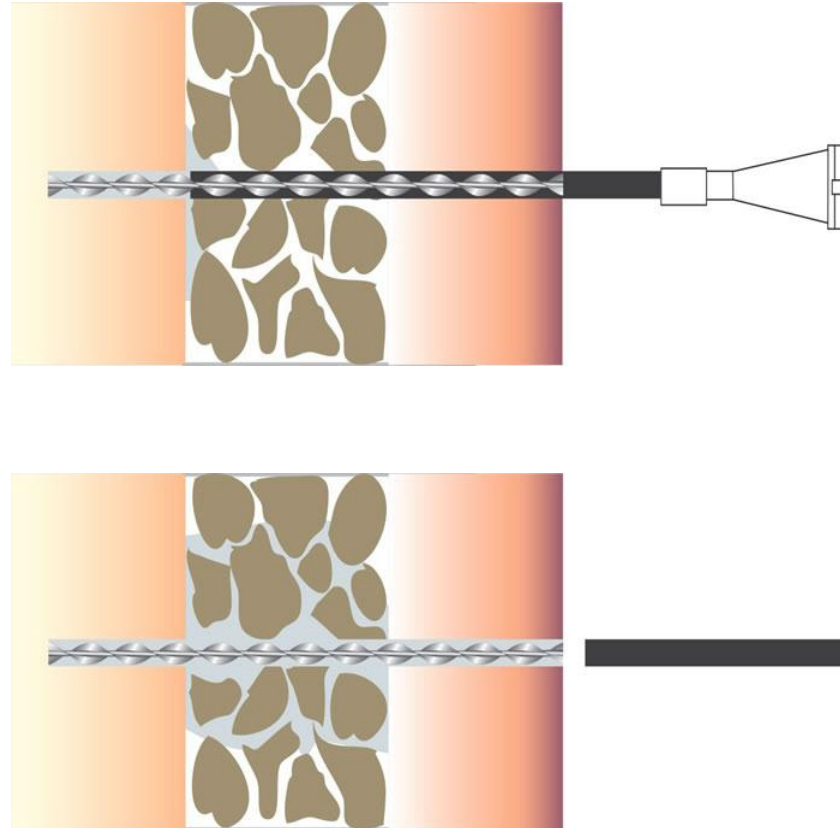
- SureTwist 8mm Stainless Steel
- SureTwist TC8mm Stainless Steel
- A grouted remedial tie system consisting of stainless steel SureTwist bar and SureGrout. For stabilising solid, rubble filled and cavity walls. Repairing delaminated bricks and reconnecting internal party walls to external leafs.



Grout Tie Installation



Grout Ties Installation

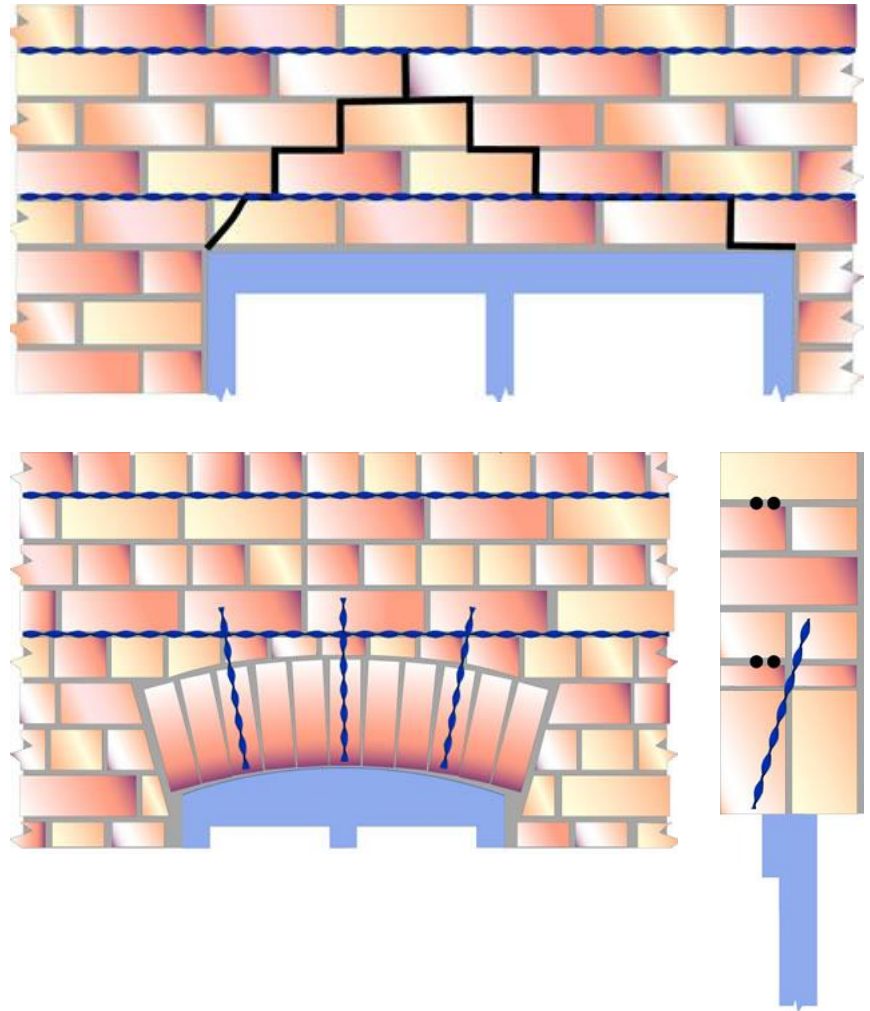


SureBeam



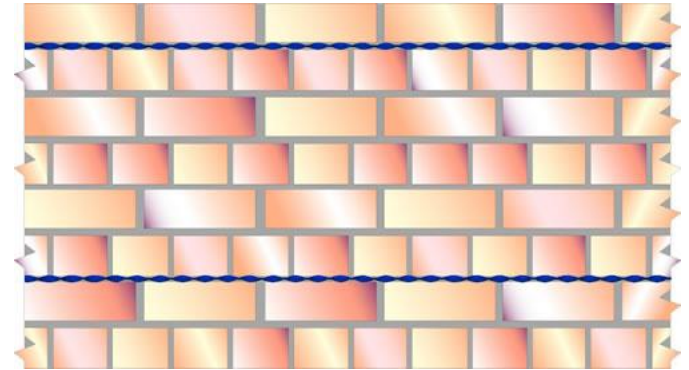
SureBeam

- Re-introduce a structure's integral and load bearing Capabilities.
- A method of reconnecting cracked masonry

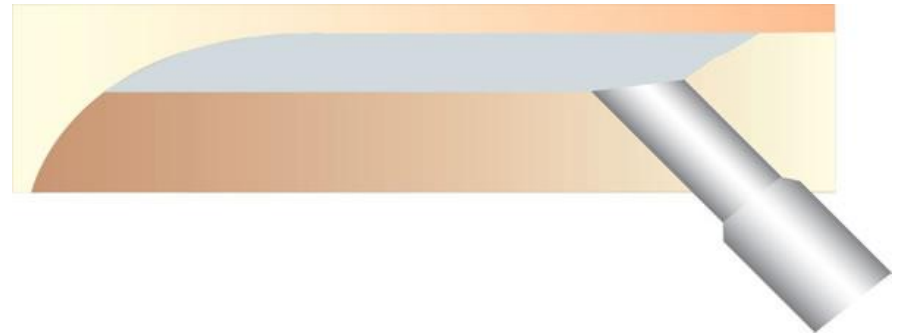
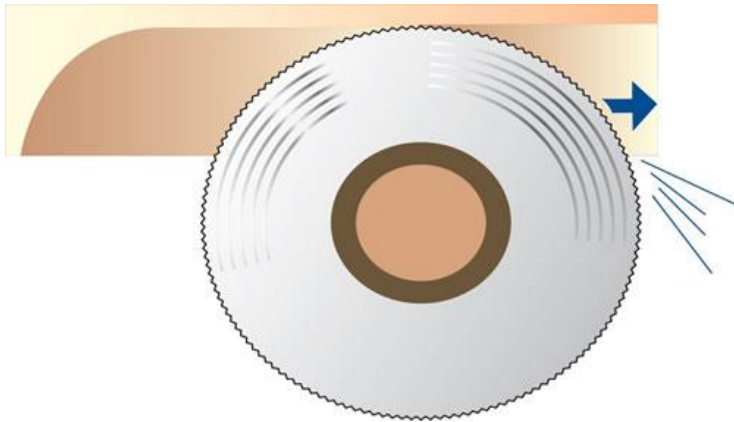


SureBeam

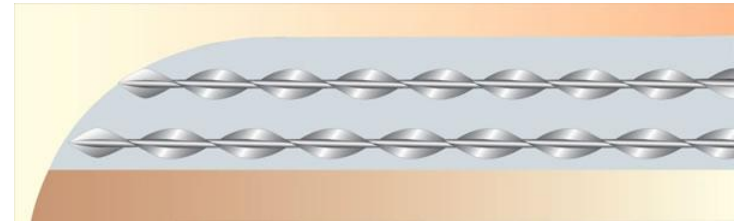
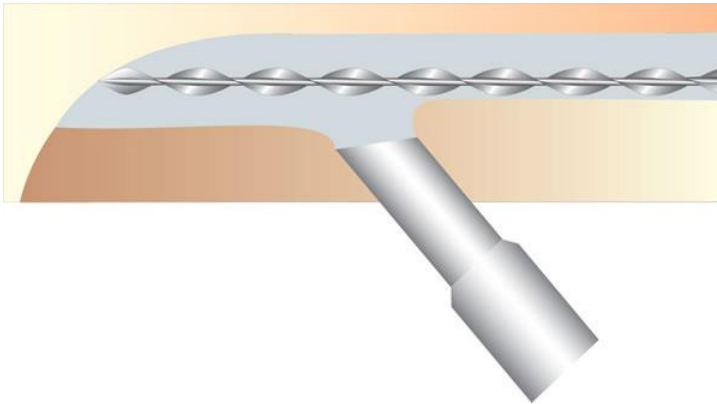
- The SureBeam system can be used in situations where masonry has lost its structural integrity and load bearing capabilities. Reinforcing the horizontal mortar joints, which connects the masonry together forming masonry beams, that distributes most of the building loads.



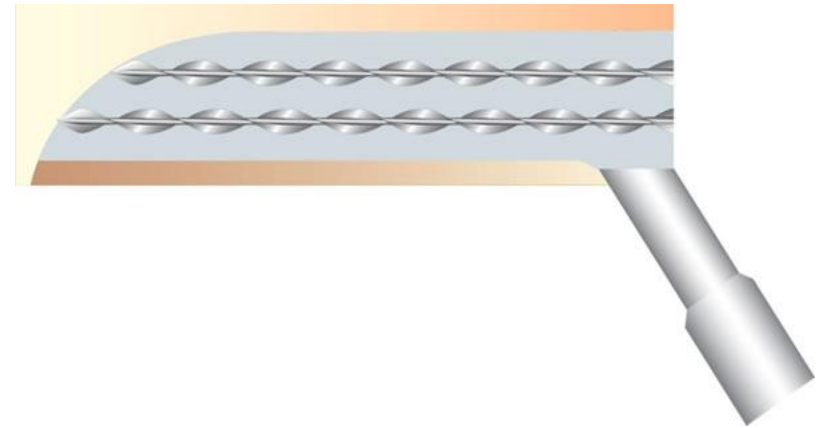
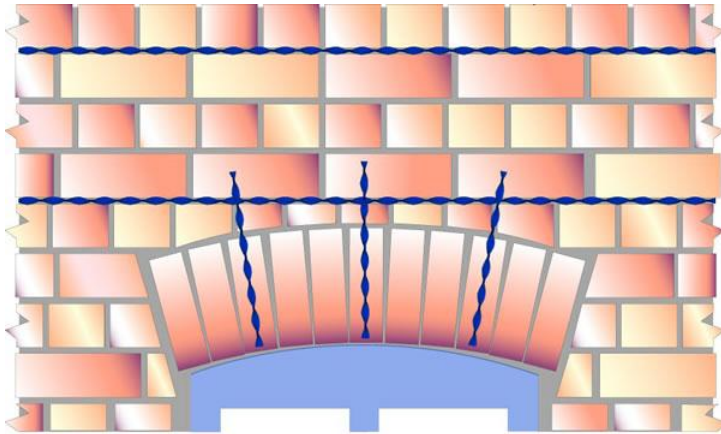
SureBeam Installation



SureBeam Installation



SureBeam Installation



SureBeam

Installation Characteristics

Wall Thickness and Application		Slot depth mm		Depth of bar mm
102mm wall	SureBeam	40 – 45mm	30 - 40mm	20 - 30mm
215 mm wall	SureBeam	50 – 55mm	45 – 50mm	30 - 40mm

Vertical spacing every 1 brick course to 12 brick courses.

Please ask the CPSI technical department for advice.



Remedial Wall Ties & Tooling



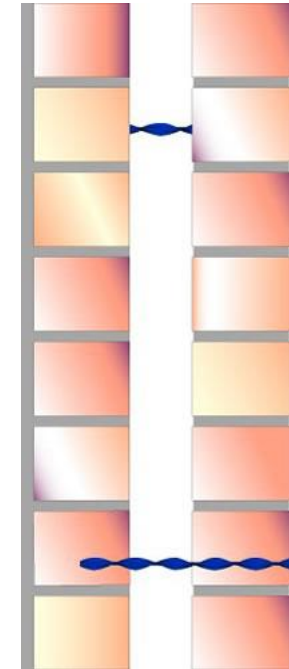
Mechanical Remedial Wall Tie Animation



Mechanical Remedial Wall

- SureTwist Extra 8mm Stainless Steel
- SureTwist Extra TC8mm Stainless Steel
- SureTwist Extra TC9mm Stainless Steel
- SureTwist Extra 10mm Stainless Steel
- Plus Power Support Tool and SDS Drill

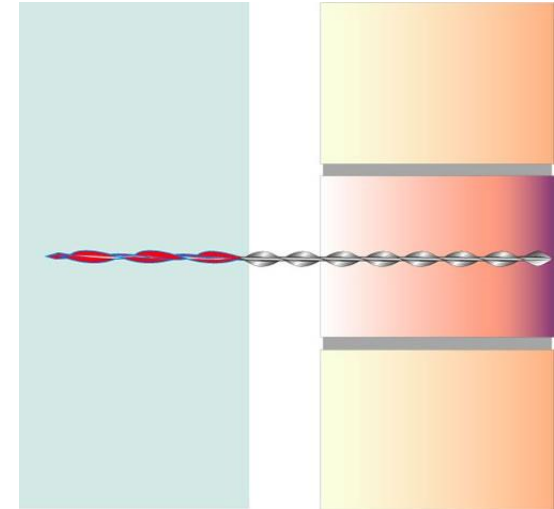
For Re-tying external masonry to the internal Structural brick, block, concrete or timber.
Pinning together delaminated masonry.



AS Mechanical Remedial Wall Tie

- SureTwist AS 8mm Stainless Steel
- SureTwist AS TC9mm Stainless Steel
- SureTwist AS 10mm Stainless Steel
- Plus Power Support Tool and SDS Drill

The Asymmetric tie is a dual diameter stainless steel tie, designed to be used When connecting soft external substrate to harder internal walls.



AS Mechanical Remedial Wall Tie

Cavity & Tie sizes

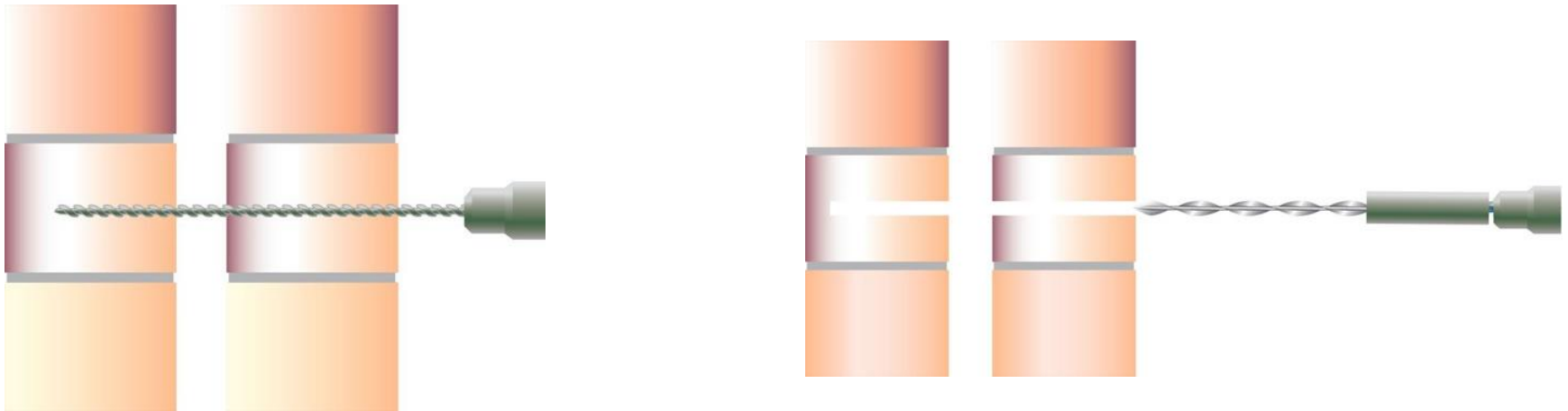
Typical tensile failure in accordance with BSI DD 140 Part 1

		Base Material	Compressive strength Nm	Tensile Proof Load Nm	Min. Embedment
• 50mm	220mm				
• 75mm	245mm				
• 100mm	270mm	Common facing brick	20 – 20.75	3.16	70mm
• 125mm	300mm	Deep frogged brick	20 – 20.50	2.98	70mm
		Dense concrete block	7 - 10	3.38	70mm
		Lightweight block	2.8 – 3.5	1.76	70mm
		Mortar bed joints	1.16	2.66	70mm

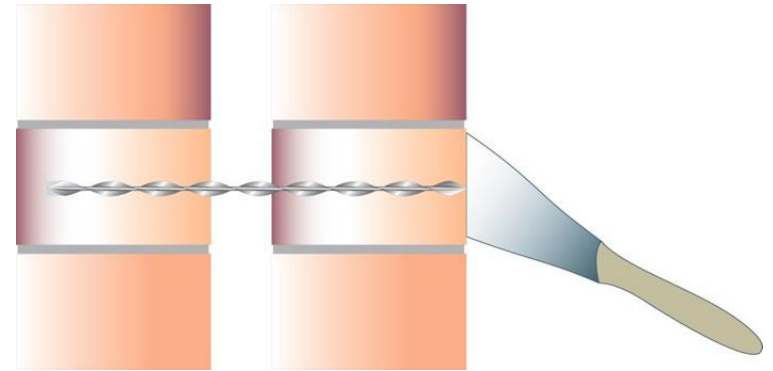
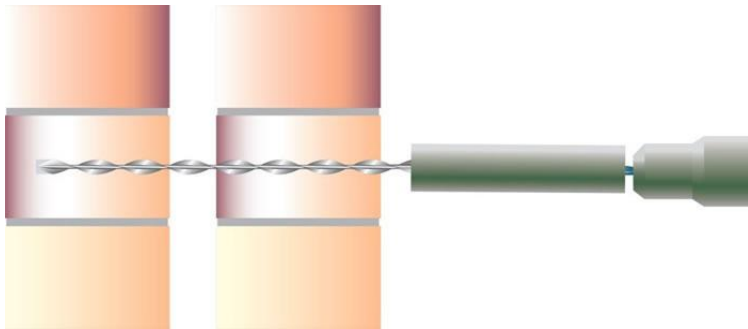
Indicative values of the tie performance

The couplet test produces results of a conservative nature.

Remedial Wall Ties Installation

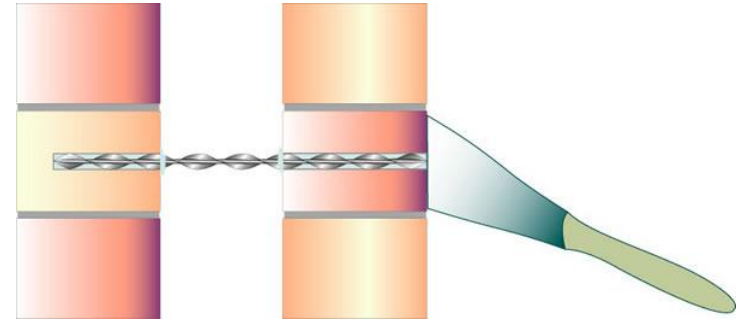


Remedial Wall Ties Installation



Resin to Resin Remedial Wall Tie

- SureTwist Extra 4.5mm Stainless Steel
- SureTwist Extra 6mm Stainless Steel
- For tying and pinning masonry
- Plus Power Support Tool and SDS Drill



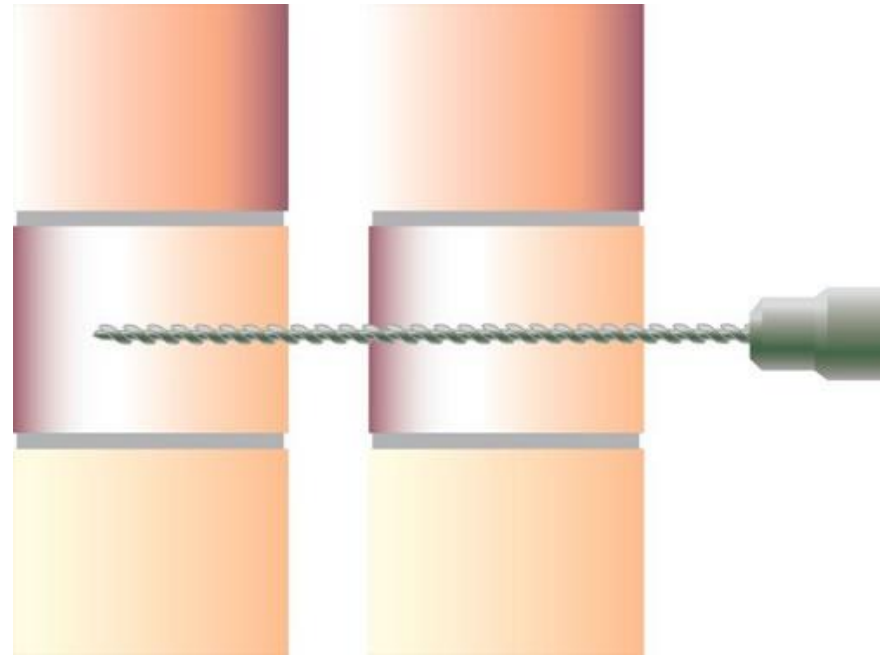
For Re-Tying the external masonry to the Internal Structural wall.



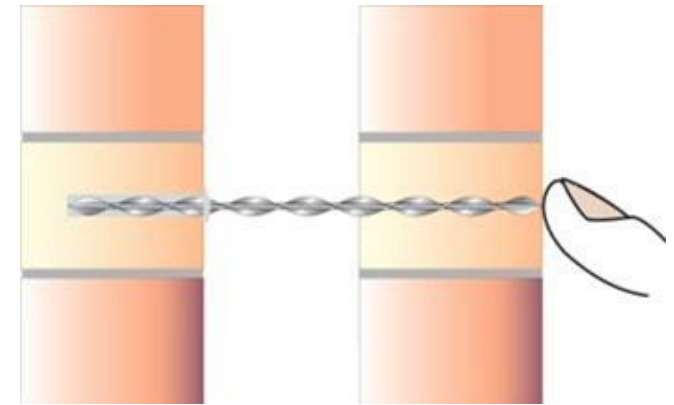
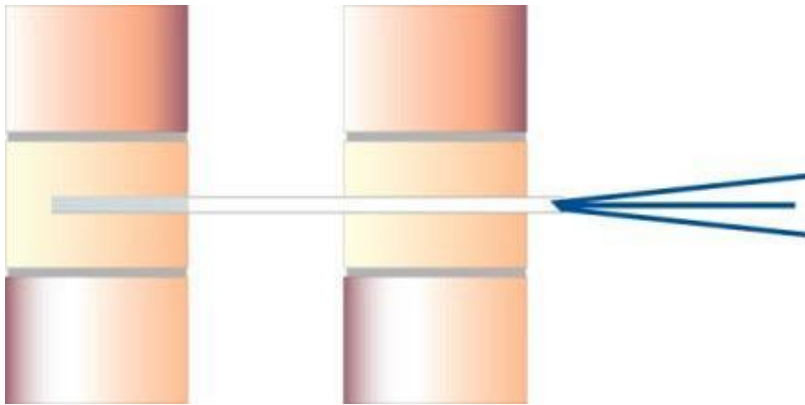
Resin to Resin Remedial Wall Tie Installation

Cavity & Tie sizes

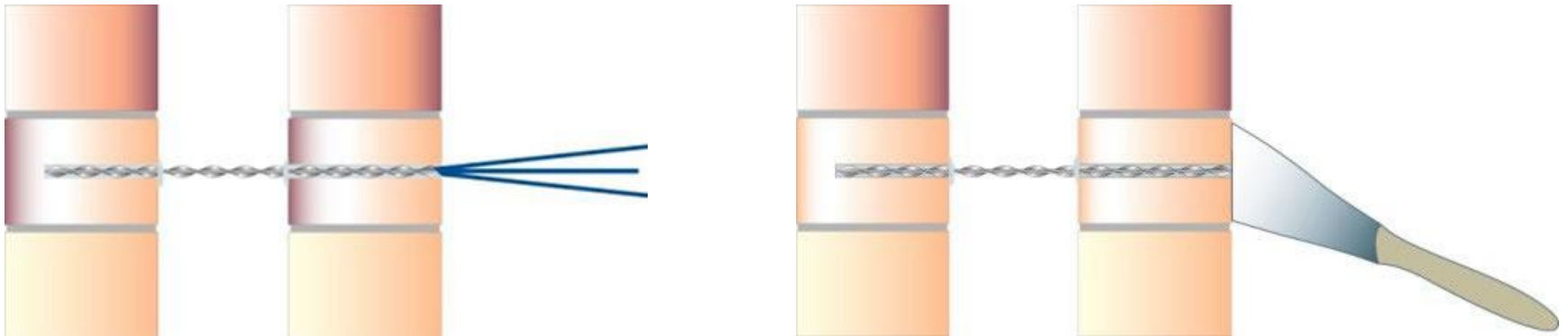
- 50mm 195mm
- 75mm 220mm
- 100mm 245mm



Resin to Resin Remedial Wall Tie Installation



Resin to Resin Remedial Wall Tie Installation



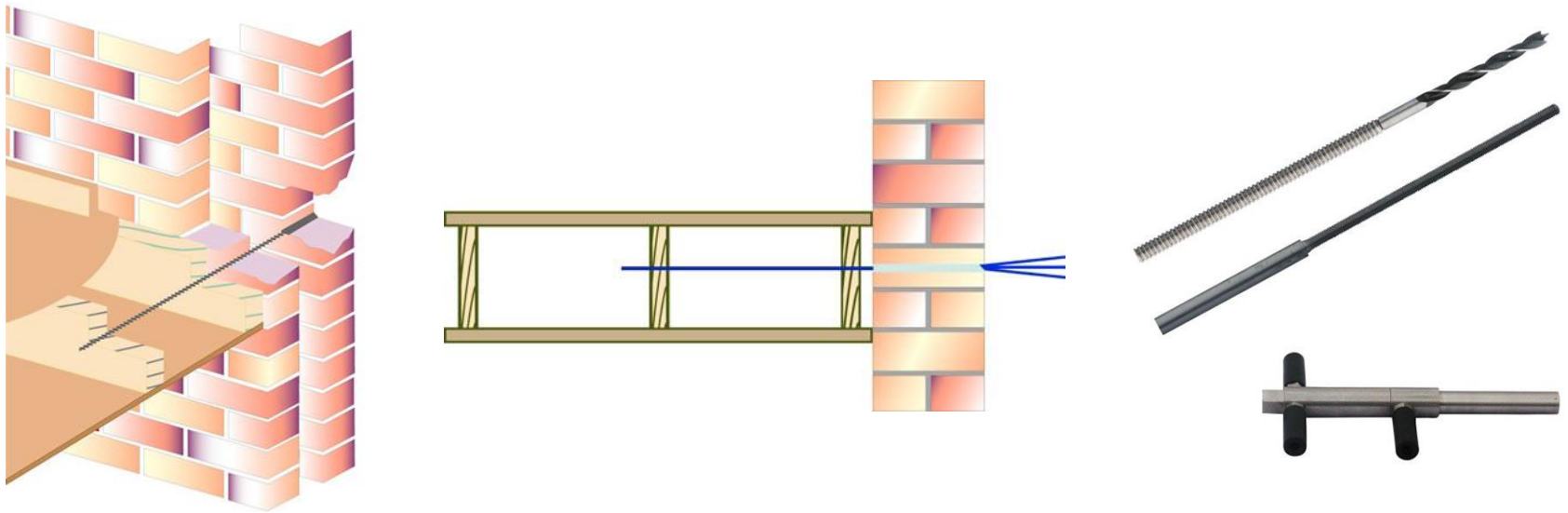
Performance Data

INDICATIVE CHARACTERISTIC PERFORMANCE

APPLICATION	SCREW CONNECTION (S)						GROUT CONNECTION (G)	
MATERIAL STRENGTH	AAC 2.8N/ mm ²	3.5N/ mm ²	Brick >10N/ mm ²	Concrete >30N/ mm ²	Timber - SC3 Side End		Brick >10N/ mm ²	Concrete >30N/ mm ²
PENETRATION DEPTH	85mm	85mm	75mm	50mm	50mm	75mm	75mm	75mm
SureTwist 4.5mm					0.9kN			
SureTwist TC5mm					1.7kN		1.8kN	1.5kN
SureTwist 6mm					1.2kN			
SureTwist TC7mm	1.2kN	1.6kN	2.2kN	1.8kN	1.7kN	1.7kN	2.2kN	1.8kN
SureTwist 8mm	1.2kN	1.6kN	2.2kN	1.8kN	1.75kN	1.5kN	2.3kN	1.9kN
SureTwist TC8mm							2.4kN	2.1kN
SureTwist TC9mm	1.4kN	1.9kN	2.6kN	2.3kN	2.3kN	2.1kN	2.6kN	2.2kN
SureTwist 10mm			2.4kN				3.2kN	1.9kN

Heavy Weight Lateral Restraint Tie

10mm Heavy Weight Lateral Restraint Tie Stainless Steel



For restraining bulged walls. Secured into the side of joists (minimum two joists from the wall). The Heavy Weight section increases the tensile strength of the section not allowing the tie to stretch.

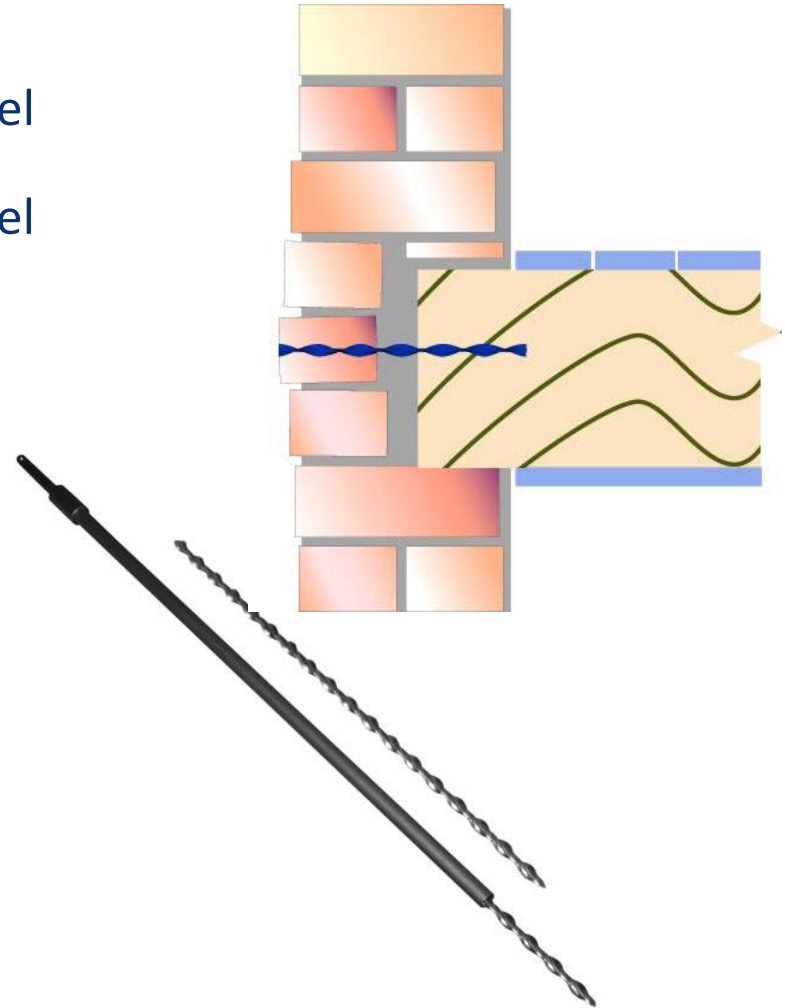
Lateral Restraint Tie

- SureTwist Extra TC8mm Stainless Steel
- SureTwist Extra TC9mm Stainless Steel

For restraining bulged walls.

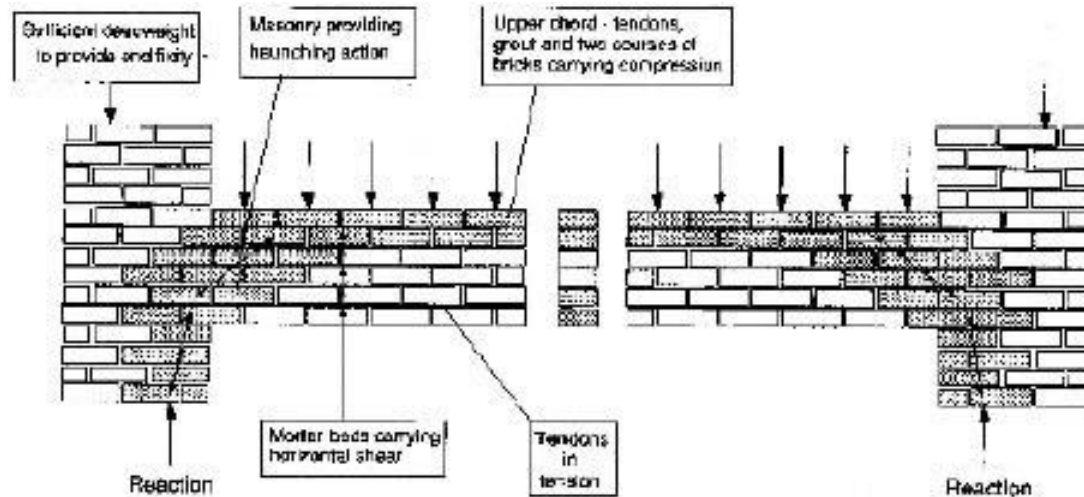
Secured into the End Grain of the joist.

Thick core increases the tensile strength of the section not allowing the tie to stretch.

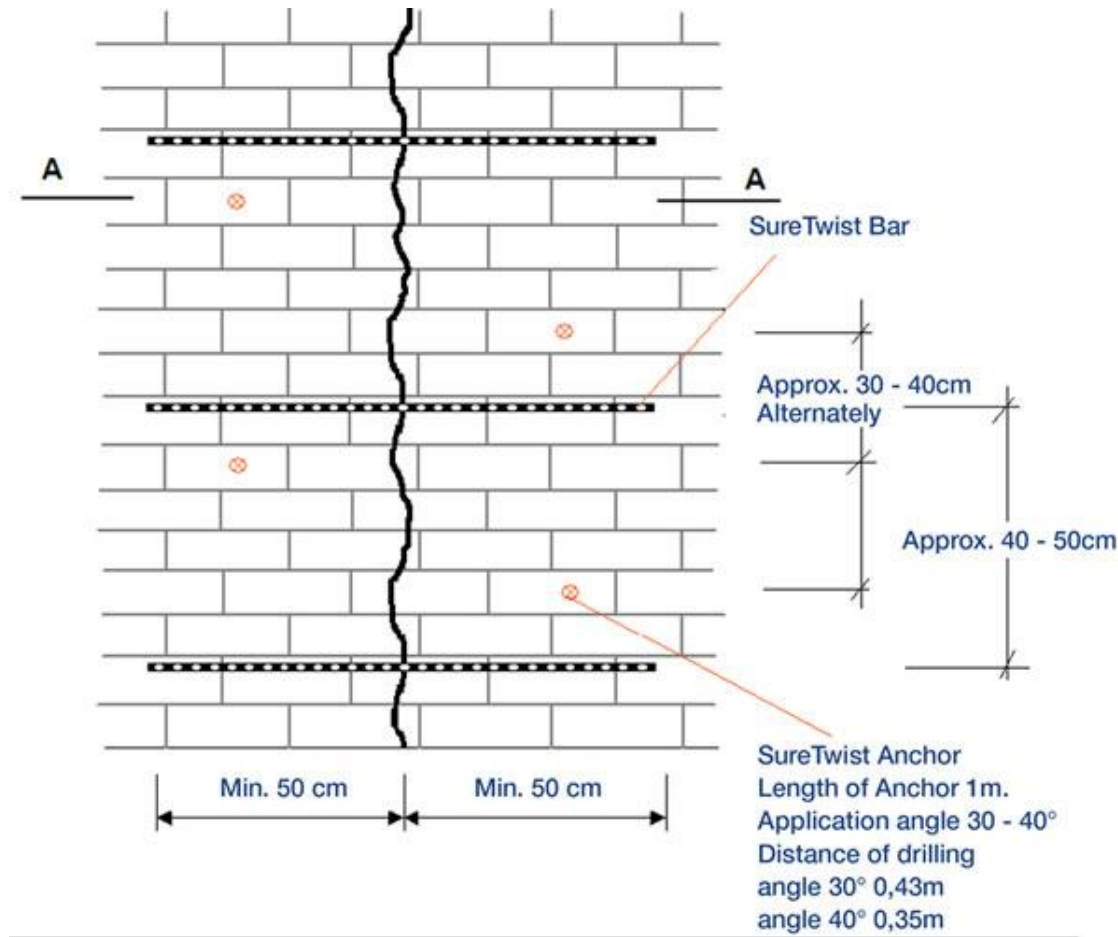


Practical Examples & Projects

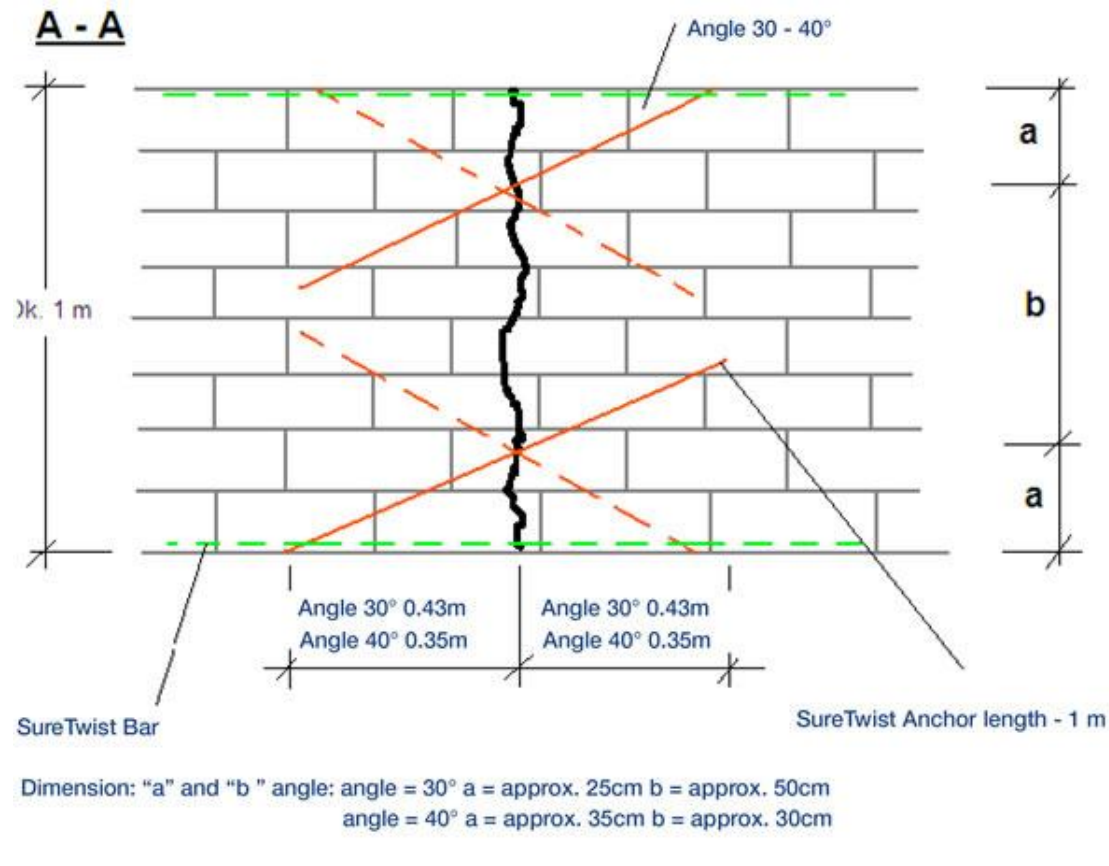
SureTwist Helical System - SureBeam



SureTwist Helical System - SureBeam



SureTwist Helical System - SureBeam



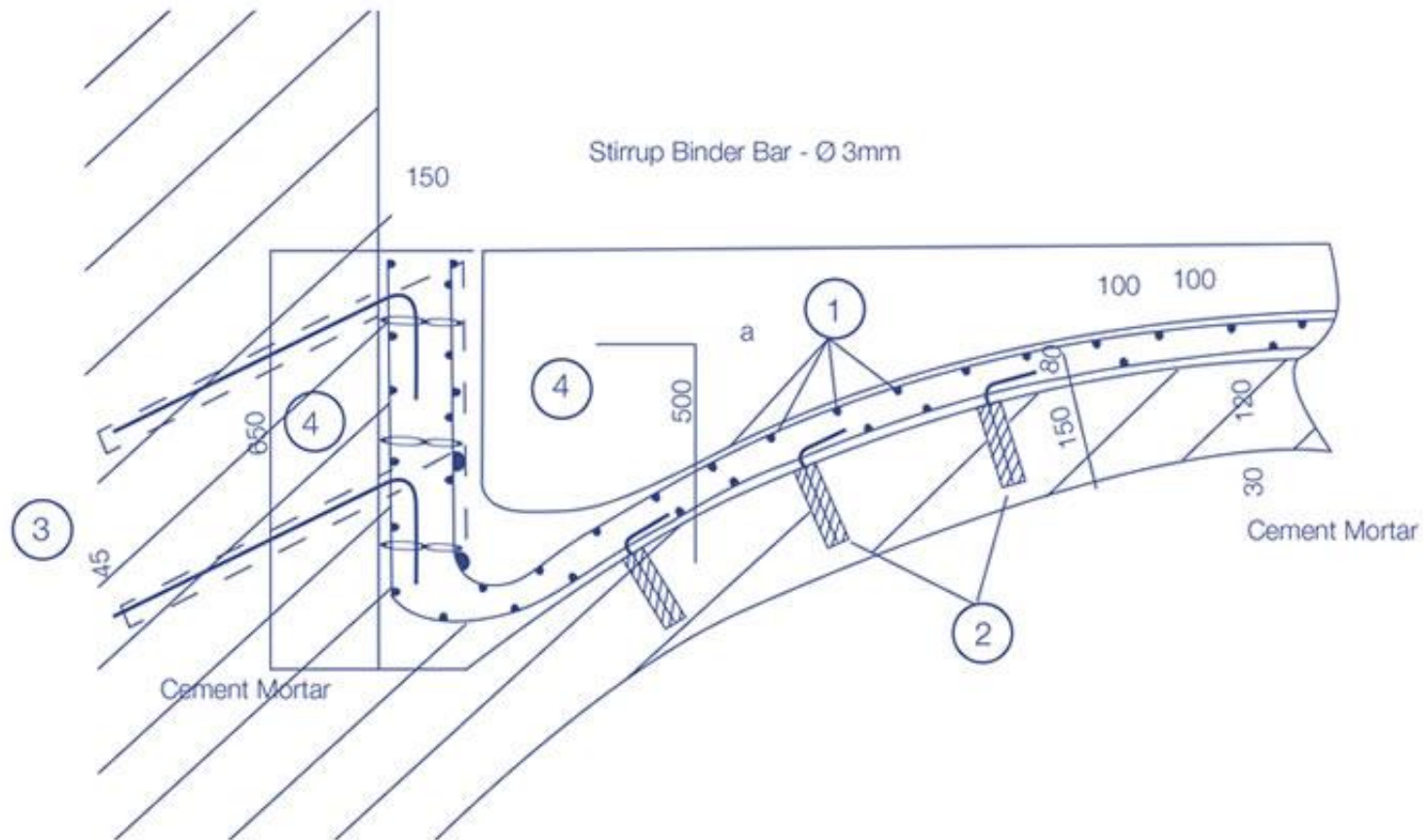
[illegible]

Example of Helical System Bill of Quantities

1 x SureTwist 6 8 10

	No.	SLOT	FIRST END			SLOT + HOLE	WIRE		GROUT - COMSUMPTION		
ENTRY	of		FIRST END	SECOND END	SUM	SUM	OVERLAP	SUM	SLOT	HOLE	SUM
	ENTRY	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(unit - packing 6 litre)		
1	1	10	0	0	0	10	0	10	0.63	0.00	0.63
2	2	10	0	0	0	10	0	20	0.63	0.00	1.25
3	1	15	0	0	0	15	0.5	15.5	0.94	0.00	0.94
4	1	9	0.5	1.5	1	10	0	10	0.56	0.05	0.61
5	1	14	0.5	1.5	1	15	0.5	15.5	0.88	0.05	0.93
6	2	100	0	0	0	100	4.5	209	6.65	0.00	12.50
Sum	No.	158			2.0			280.0			16.9

Arch Constructions Standard method



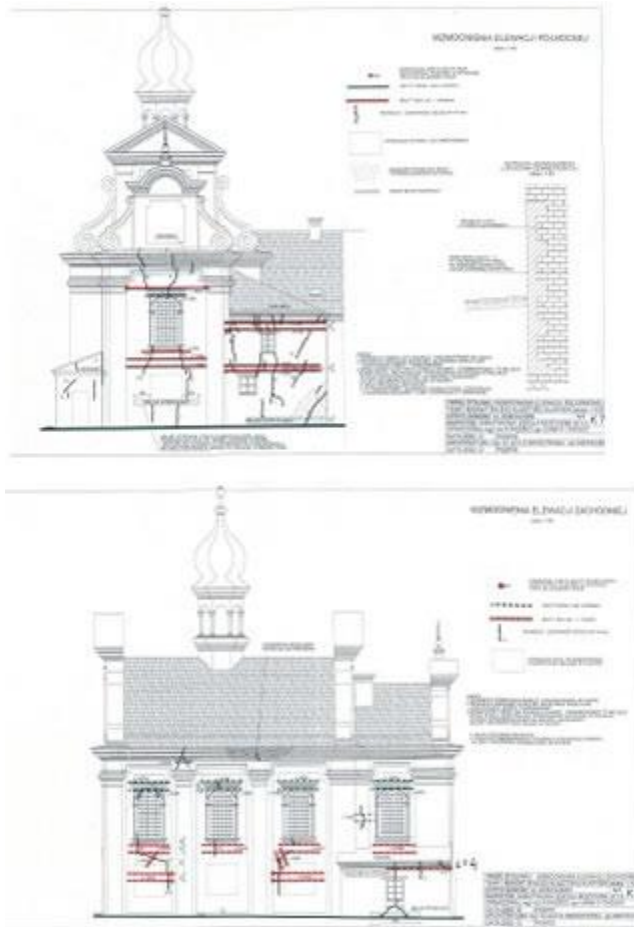
Arch Constructions – helical Solution



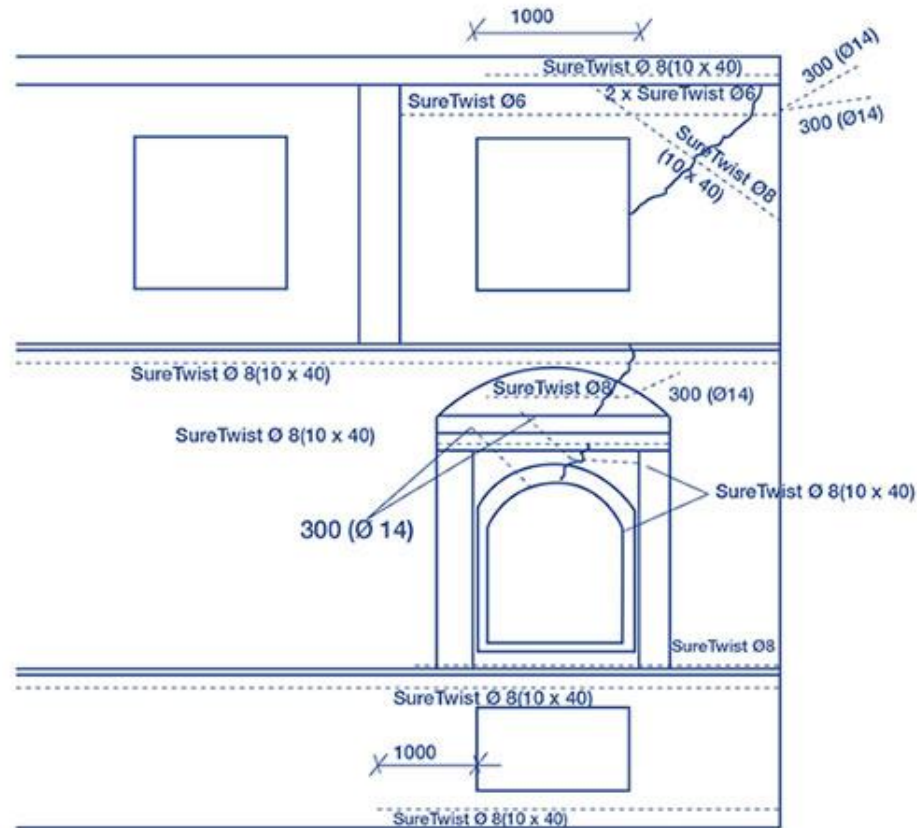
Arch Constructions – helical Solution



Arch Constructions – Helical Solution

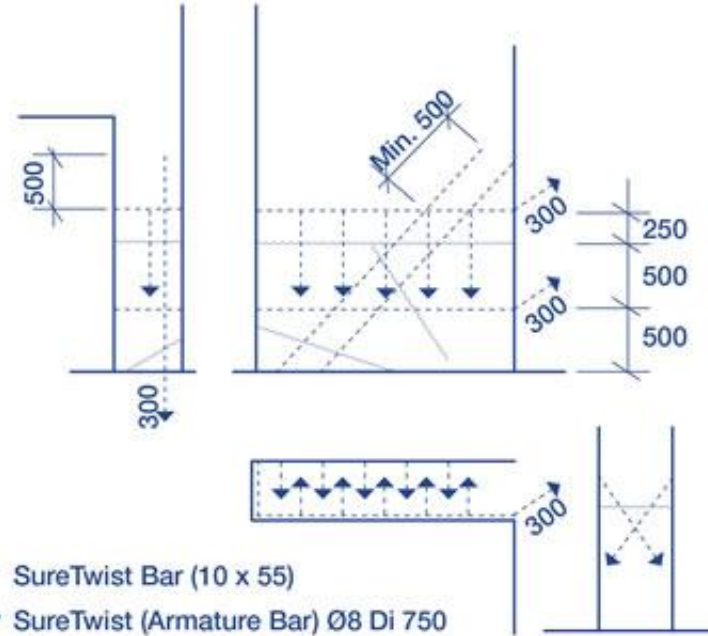


SureTwist Helical Solution Proposal



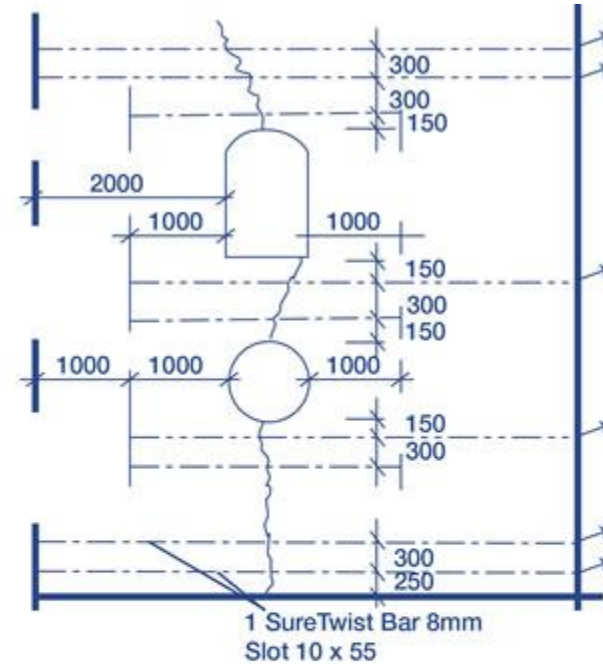
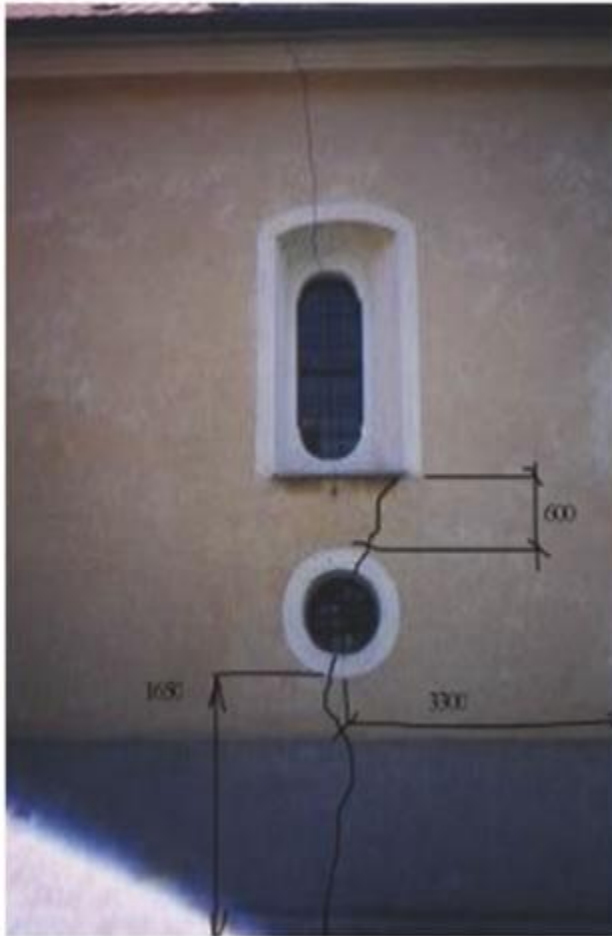
SureTwist Ø6mm... 6,0m
 SureTwist Ø8mm... 33,0m
 Grout 27 mpa... 2.5 liter

Practical Example 1



- SureTwist Bar (10 x 55)
- > SureTwist (Armature Bar) Ø8 Di 750
- Drill Hole Ø 14mm
- SureGrout

Practical Example 2



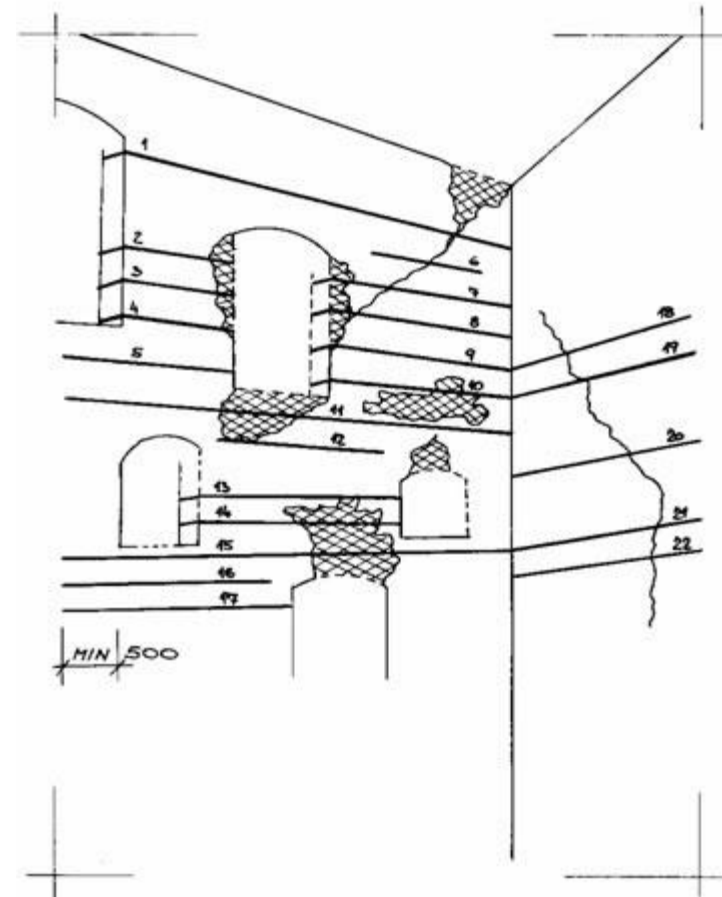
----- 1 SureTwist Bar 6mm - Slot 10 x 55

----- 2 SureTwist Bar 6mm - Slot 10 x 55

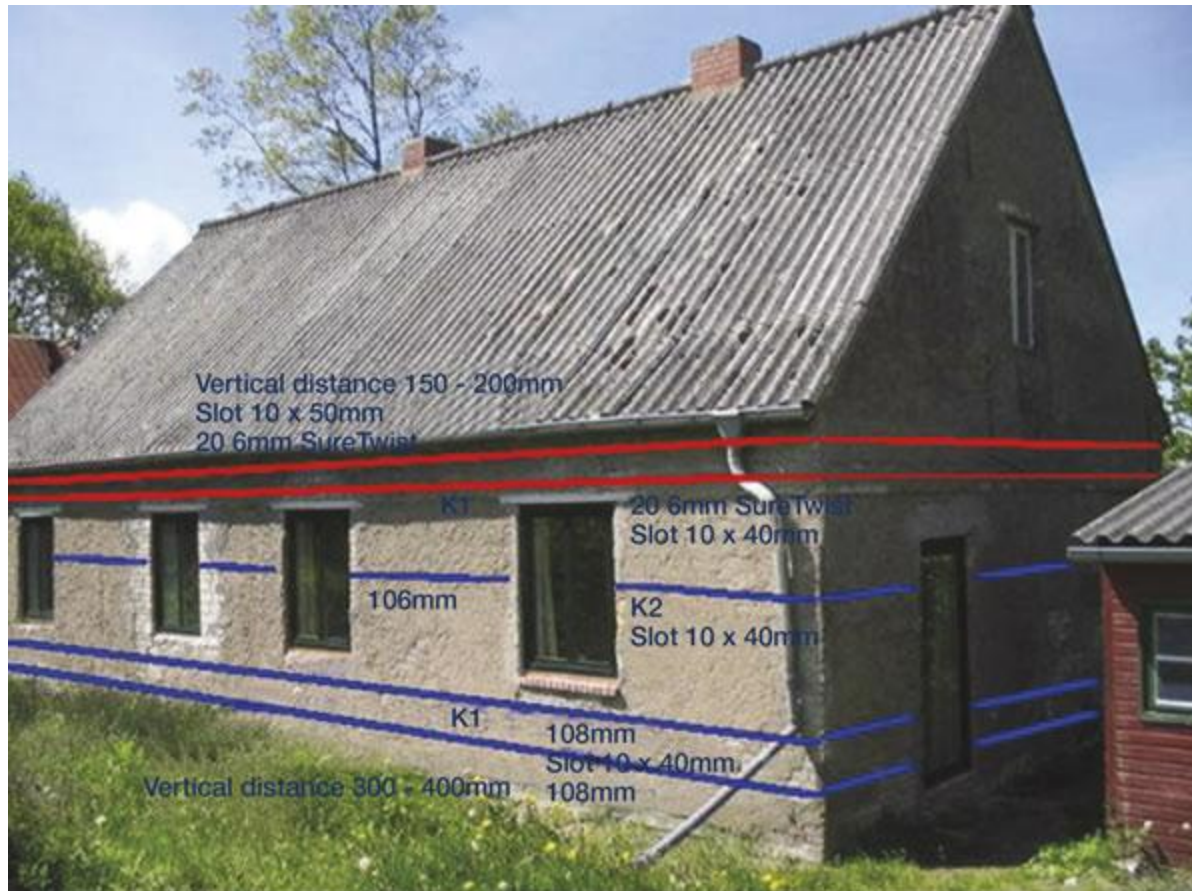
SureGrout

Note: Anchor in the slot round the corner min. 500mm
Also second side - in the slot round the corner 1000mm

Practical Example 3

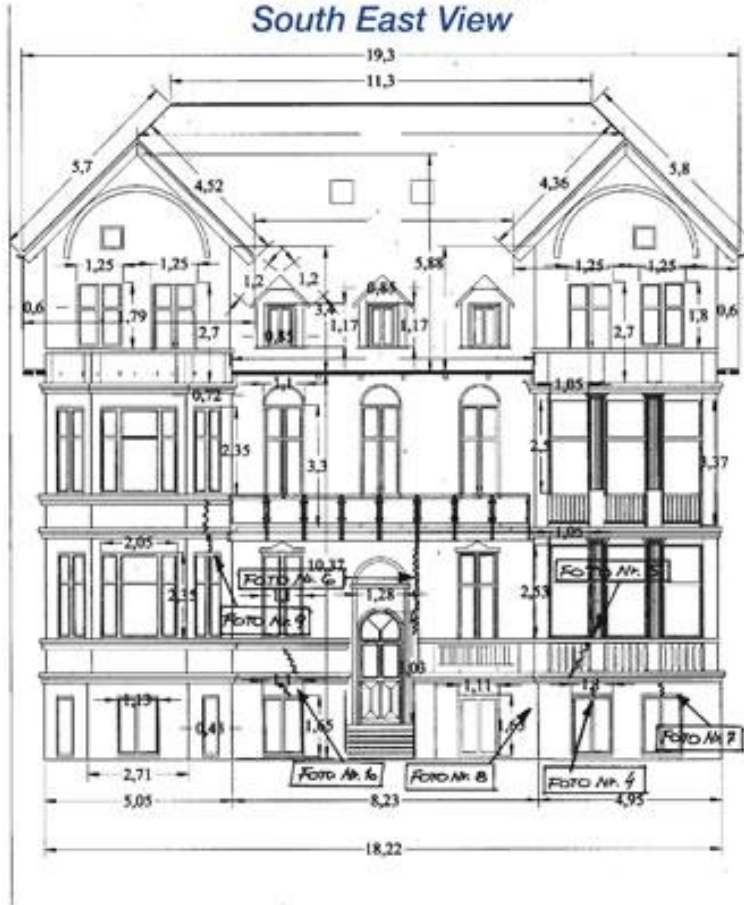


Practical Example 4

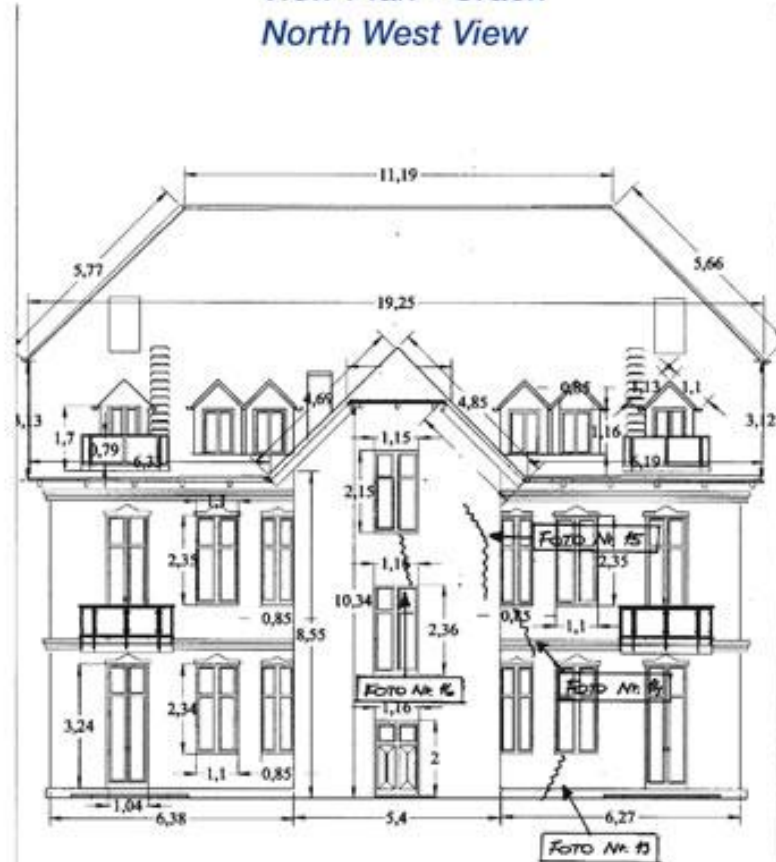


Helical Technology Design

View Plan - Crack
South East View



View Plan - Crack
North West View



Helical Technology Design



9/3/2015

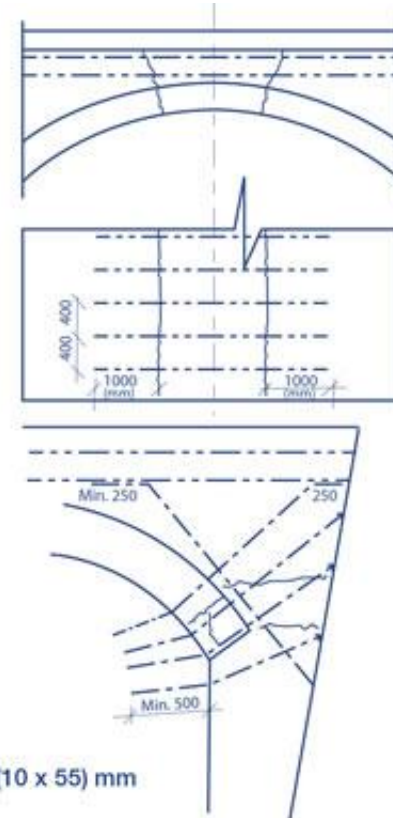
Construction Products Solutions International Ltd.



Practical Example



2 x Sure Twist Bar Ø6 Slot (10 x 55) mm
SureGrout

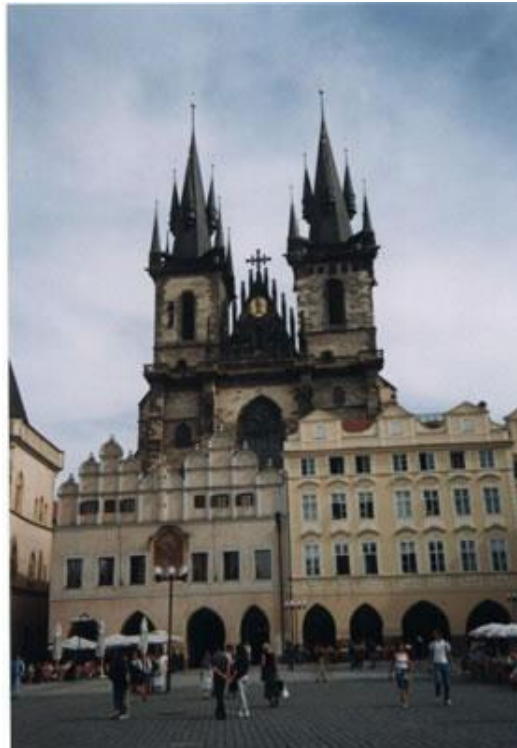


----- 1 x Sure Twist Bar Ø8 Slot (10 x 55) mm
SureGrout
-----> Drill Hole Ø 14mm
dl min. 300mm

References - Bridges



References - Historic Buildings



References - Historic Buildings



References - Historic Buildings



References - Arch Constructions



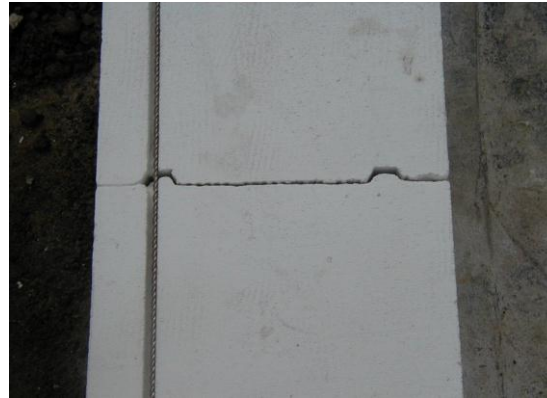
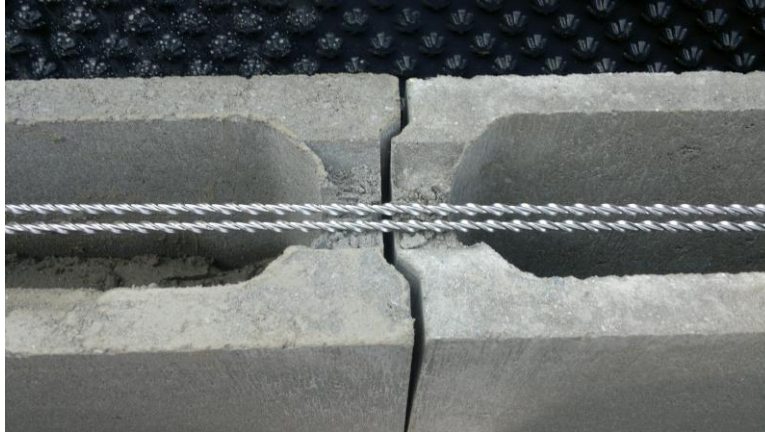
References – Concrete Modular Panels



References – Concrete Modular Panels



References – Newbuild



References – Other Examples

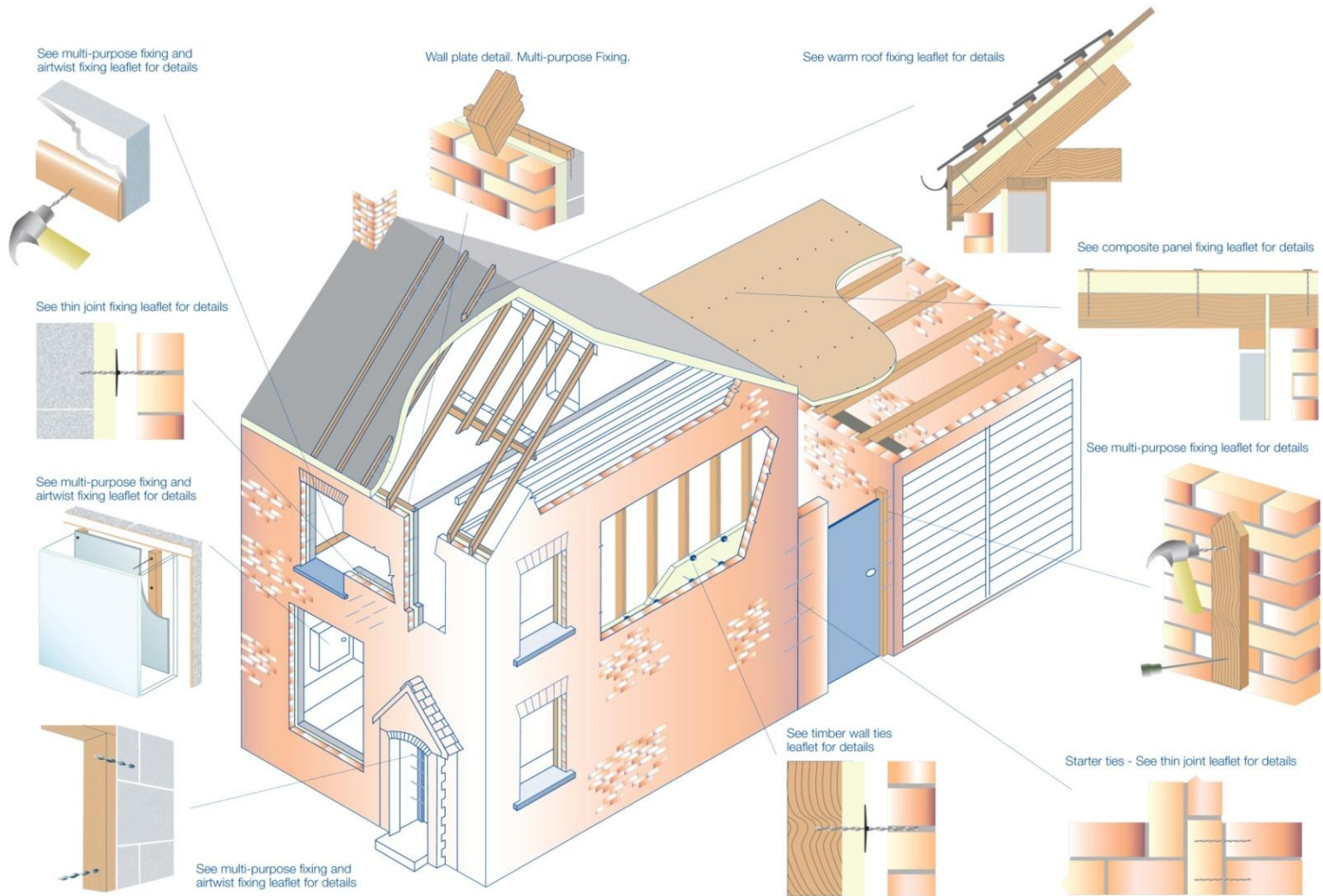


References – Other Examples





New Build Applications and Installations



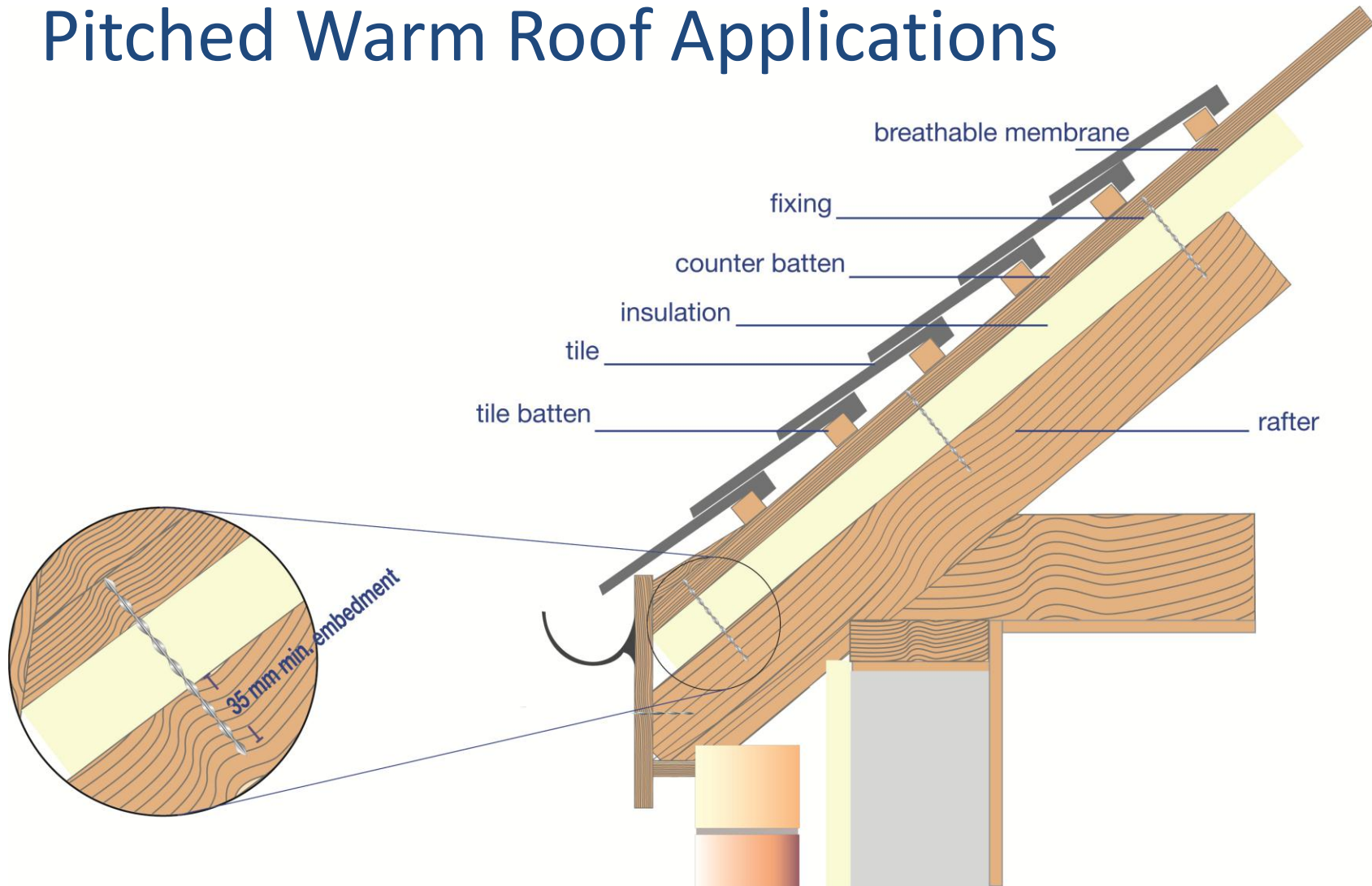
Why Use A SureTwist Helical Fixing ?

- One piece, stress free stainless steel fixing.
- Installed as easily as a nail, grips better than a screw.
- Hammered or power driven with no pre-drilling.
- Self tapping action avoids batten bouncing and splitting of timbers.
- Does not compress insulation or impair its thermal performance.
- Headless flush fixing for minimal cold bridging and heat transfer.

Why Use A SureTwist Helical Fixing ?

- Excellent holding power in both tension and compression
- Withstands heavy sliding and wind loads.
- High performance – fewer fixings required.
- Recommended by all leading insulation manufacturers.
- In-house design service – Full technical data available.
- Tested & fully endorsed by many leading national testing authorities.

Pitched Warm Roof Applications



SureTwist Warm Roof Fixings



- 304 grade austenitic stainless steel. (316 available upon request).
- Engineered to form a profiled section having pronounced work-hardened cutting fins that wind around & along a central core.
- Available in 6mm and TC7mm and TC8mm sections, which are balanced in stiffness, length & pitch to optimise driving ease and provide enhanced bending resistance.
- Consistent tensile & compressive characteristics

Advantages Of A Warm Roof

- Creates a continuous thermal envelope without cold bridges, improving the thermal efficiency of the property.
- Roof timbers are kept warm and dry.
- Protects against damp and corrosion.
- Roof tile ventilation is no longer required.
- Produces warm usable space.
- Capable of achieving Part L of building regulations.

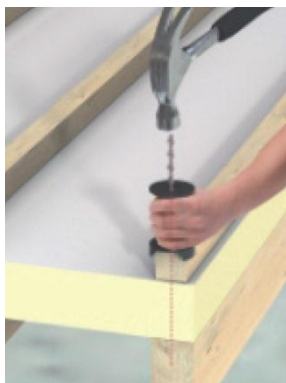
SureTwist Warm Roof Fixing Tooling



Installation tools



SureTwist Warm Roof Fixing Tools



Alignment Square

- Steady & precise insertion accuracy eliminates the technical & practical deficiencies associated in driving a helical fixing.



Support Tools

- Must have a means of alignment when being used to insert fixings through insulation board that are thicker than 60mm to help prevent wayward driving.

How To Calculate A SureTwist Warm Roof Fixing

Length.

- Counter batten thickness? (minimum 25mm) 2003 British standard 38mm
- Insulation thickness?
- Additional materials? (e.g. plywood or plasterboard)
- 35mm minimum rafter penetration.

How To Calculate A SureTwist Warm Roof Fixing

Axial Spacing and Quantity Required.

- Rafter centres? (counter batten centre)
- Roof Pitch?
- Weight of the tile / slate to be used?
- Wind exposure. Where is the site?
- What is the area of the roof?
- $\text{Fixings per M}^2 \times \text{Total Roof Area} = \text{Qty Req}$

Guide to Calculating the length and Quantity of fixings

Technical specifications

CALCULATING CORRECT LENGTH OF 6mm FIXING

BATTEN/ COUNTERBATTEN THICKNESS	+ INSULATION THICKNESS	+ THICKNESS OF ANY ADDITIONAL MATERIAL - (PLYWOOD, DAMP-PROOFING)	+ 35mm EMBEDMENT IN RAFTER	= LENGTH OF FIXING REQUIRED
e.g. 37mm	+ 40mm	+ 12mm	+ 35mm	= 124mm Use 125mm

THE DENSITY AND SPACING OF SURETWIST WARM ROOF FIXINGS

INSULATION THICKNESS	FIXINGS PER M2	400mm	RAFTER SPACING 450mm	600mm
0 - 40mm	4.6	525	475	350
41 - 60mm	7	350	300	225

CALCULATING THE QUANTITY OF FIXINGS

Batten fixings per m² x Total roof area m² = Quantity required

Insulation is getting thicker to conform to Part L of building regulations helping to reduce carbon emissions. SureTwist now has a 7mm ϕ fixing to improve the efficiency of fixing insulation over 50mm thick.

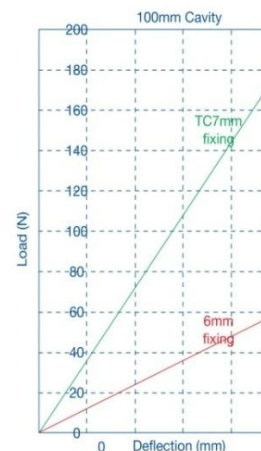
Note:

The table above has been designed to suit the majority of applications. It is suitable for projects matching all of the following criteria:

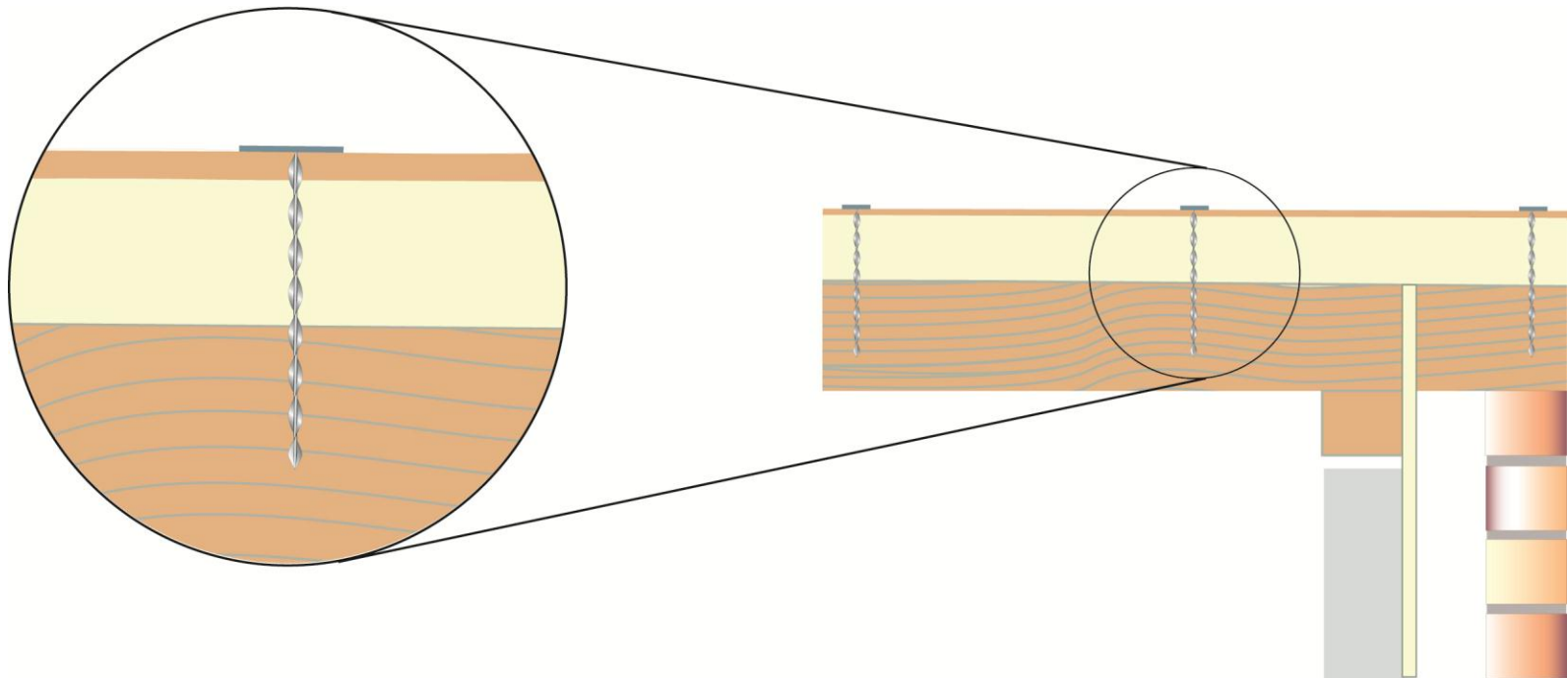
- Buildings up to 15 metres in height
- Roof coverings up to 60kg/m²
- Minimum counter-batten thickness of 37mm
- Slope of ground within 1km up to 1:12.5
- Locations in wind zones up to 52m/s.

Testing

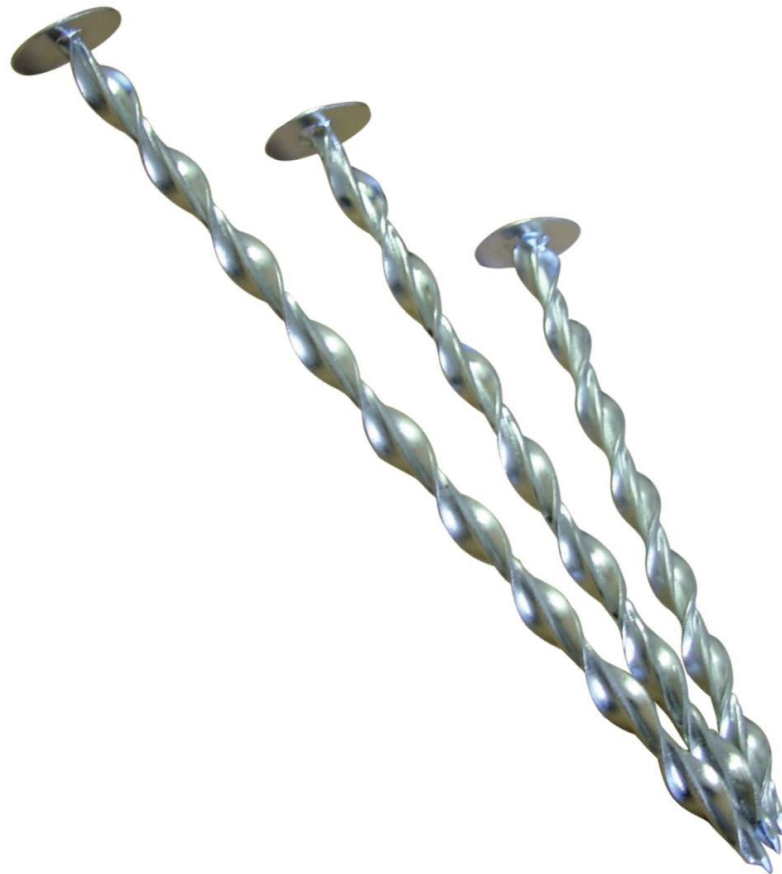
Independent laboratory tests have been carried out on the SureTwist, counter batten and rafter arrangement with gaps of up to 150mm being set between timbers to replicate a wide variety of site conditions. The Building Research Establishment has applied a design method, which includes factors of safety taken from the National Annexes of Eurocodes 0 and 5, to establish 'BRE verified' load density tables that are specific to the SureTwist second generation Thor Helical product.



Flat Warm Roof Applications



SureTwist, BigTwist Flat Roof Fixing



The BigTwist Materials Characteristics

- 8mm nominal diameter.
- 8.8 high tensile steel – zinc plated.
- Cross sectional area – 13.1 mm².
- Cold rolled from wire with a raised fin special profile around a thick central core, to help prevent bending.
- 20mm flat head.
- Fully tested at the imperial college London and recommended by all insulation manufacturers.

BigTwist Benefits

- Hammer driven for easy and fast instalment. No drilling required.
- Minimal compression of insulation.
- Reduces cold bridging.
- Excellent holding power.
- Larger helical section to prevent bending.
- Easy fixing selection.
- Economical and easily obtainable from nearly all Builders Merchants.

BigTwist Test Results

Summary of test results of the BigTwist Composite Panel Fixing

8mm fixings installed into 4" x 2" Softwood Timber battens.

Tension is then applied until a deflection of 1mm has occurred.

8mm	Embedment	Failure	Deflection
8mm	25mm	600N	1mm
8mm	25mm	550N	1mm
8mm	25mm	570N	1mm
8mm	25mm	600N	1mm
8mm	25mm	525N	1mm
8mm	25mm	800N	1mm
8mm	25mm	750N	1mm
8mm	25mm	700N	1mm
8mm	30mm	520N	1mm
8mm	30mm	750N	1mm
8mm	30mm	650N	1mm
8mm	30mm	700N	1mm
8mm	35mm	980N	1mm
8mm	35mm	1300N	1mm
8mm	35mm	960N	1mm
8mm	35mm	1380N	1mm
8mm	35mm	1120N	1mm
8mm	35mm	960N	1mm
8mm	35mm	1260N	1mm
8mm	35mm	890N	1mm
8mm	35mm	965N	1mm
8mm	50mm	1300N	1mm
8mm	50mm	1500N	1mm
8mm	50mm	1400N	1mm
8mm	50mm	1300N	1mm
8mm	50mm	1700N	1mm
8mm	50mm	1400N	1mm
8mm	50mm	1300N	1mm
8mm	50mm	1350N	1mm

Embedment. Mean Average

25mm	636.88 N
30mm	655.00 N
35mm	1090.56 N
50mm	1406.25 N

All measurements were recorder using software built into the Inston data acquisition system

The Tests above were carried out by:

Dr Sunday Popo-Ola and Mr Les Clark, of the Imperial College Consultants Ltd.

Quantity of fixings per M² / Sizes Available

TEST RESULTS	Max. LOAD	Min. LOAD	MEAN LOAD
35mm Embedment	1380 N	890 N	1090 N
50mm Embedment	1700 N	1300 N	1406 N

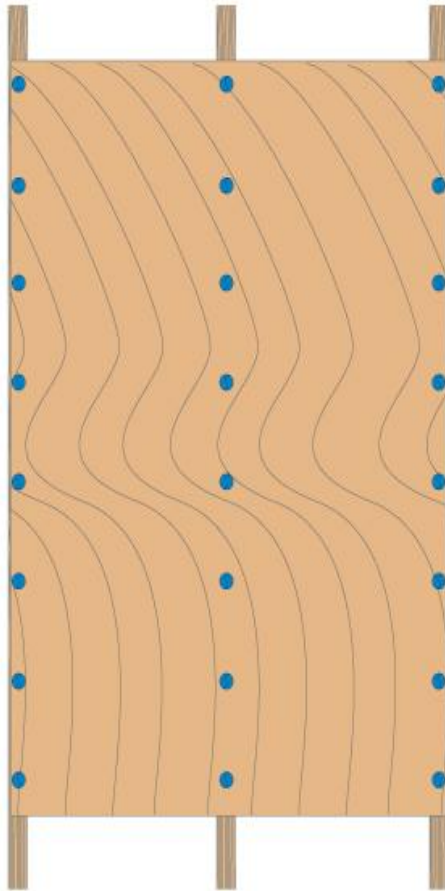
SPACINGS AND QUANTITIES		
	RAFTER CENTRES	
	400mm	600mm
90mm Insulation	8.6 per m ²	8.6 per m ²
80mm Insulation	8.6 per m ²	8.6 per m ²
70mm Insulation	8.6 per m ²	8.6 per m ²
Axial spacing	400mm	300mm

Range: SureTwist PZ Steel TC8mm

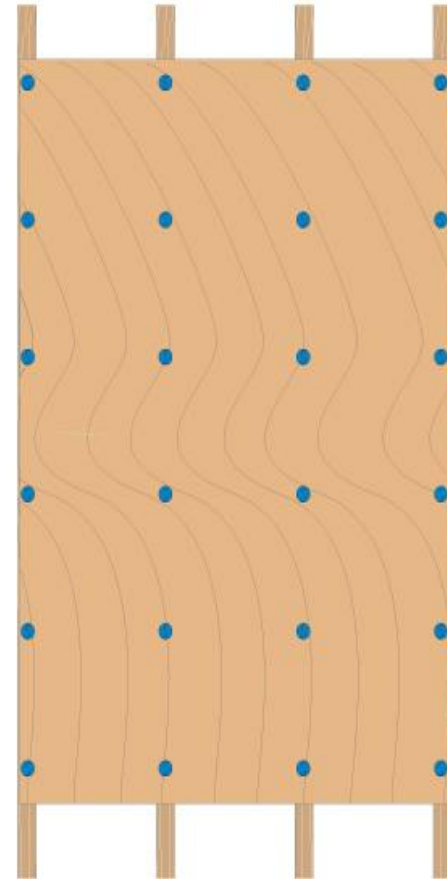
TC8 x 90mm suitable for up to 55mm panels
 TC8 x 135mm suitable for 70mm–96mm panels
 TC8 x 165mm suitable for 96mm–126mm panels
 TC8 x 195mm suitable for 126mm–156mm panels
 TC8 x 220mm suitable for 156mm–185mm panels

Tested at the Imperial college London

BigTwist Fixing Layout

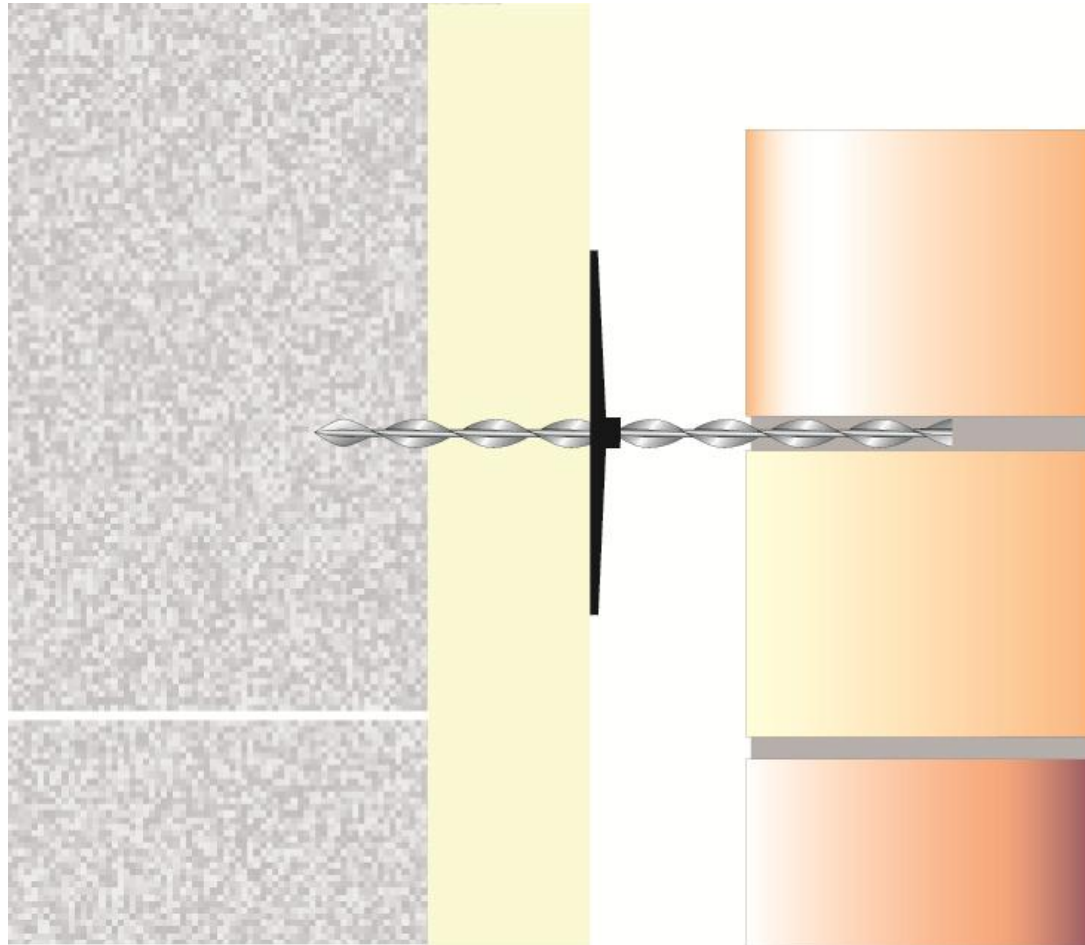


600mm rafter centre



400mm rafter centre

Thin Joint Application



The SureTwist Thin Joint Wall Tie

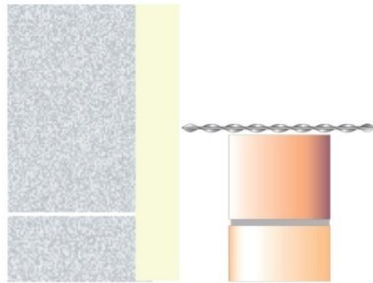


- 304 grade austenitic stainless steel. (316 Available upon Request)
- Engineered to form a profiled section having pronounced work-hardened cutting fins that wind around & along a central core.
- Available in TC7mm and 8mm sections, which are balanced in stiffness, length & pitch to optimise driving ease and provide enhanced bending resistance.
- Consistent tensile & compressive characteristics.

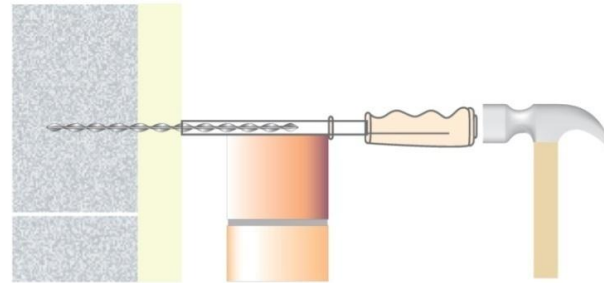
Insulation Support



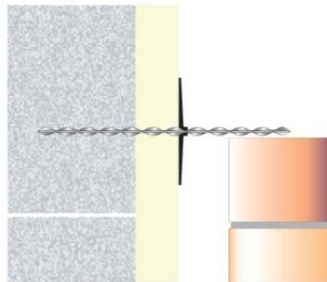
Installation of the SureTwist Thin Joint Wall Tie



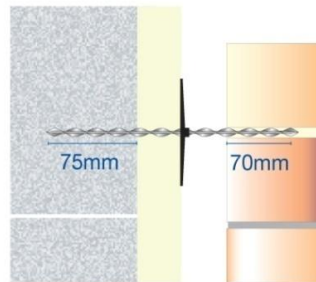
1. Position the tie against the inner leaf so that the outer end will be located in the bed joint of the external leaf.



2. Hammer the tie through the insulation, and into the blockwork to the correct embedment depth.



3. Install a Suretwist Insulation Retaining Clip to restrain the insulation.



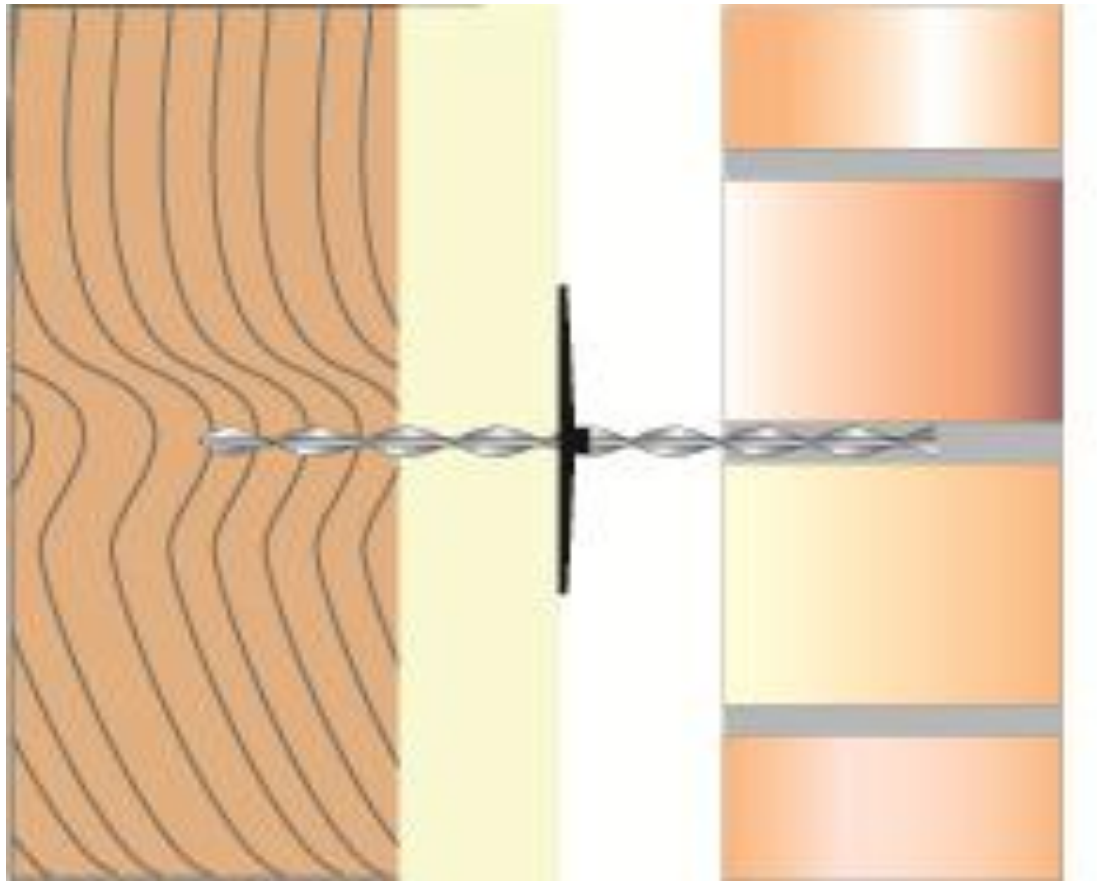
4. Build into the bed joint of the outer leaf ensuring the tie is surrounded by mortar.

Block strength / Length of Tie Required

AIRCRETE BLOCK STRENGTH N/mm ²	SURETWIST TO DD140
2.8	Type 4
3.5 - 4.0	Type 3
7.0 - 10.5	Type 2

LENGTH (mm)	CAVITY (mm)
195	50
220	75
245	100
270	125
300	155

Timber Frame Applications



The SureTwist Timber Frame Wall Tie

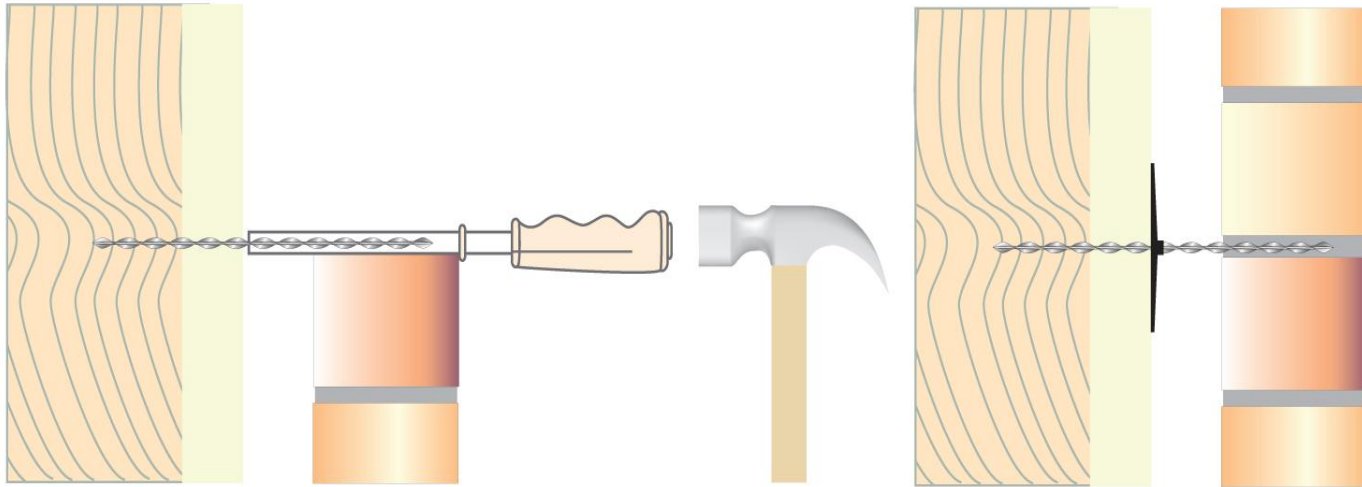


- 304 grade austenitic stainless steel. (316 Available upon Request)
- Engineered to form a profiled section having pronounced work-hardened cutting fins that wind around & along a central core.
- Available in 4.5mm sections, which are balanced in stiffness, length & pitch to optimise driving ease and provide enhanced bending resistance.
- Consistent tensile & compressive characteristics.

Insulation Support



Installation of the SureTwist Timber Frame Wall Tie



1. Position the tie into the hand held fixing tool as shown above. Drive directly into timber stud through insulation.

2. Place insulation support over tie, and embed the outer end into the outer leaf mortar.

Quantity of SureTwist Timber Ties / Size Required

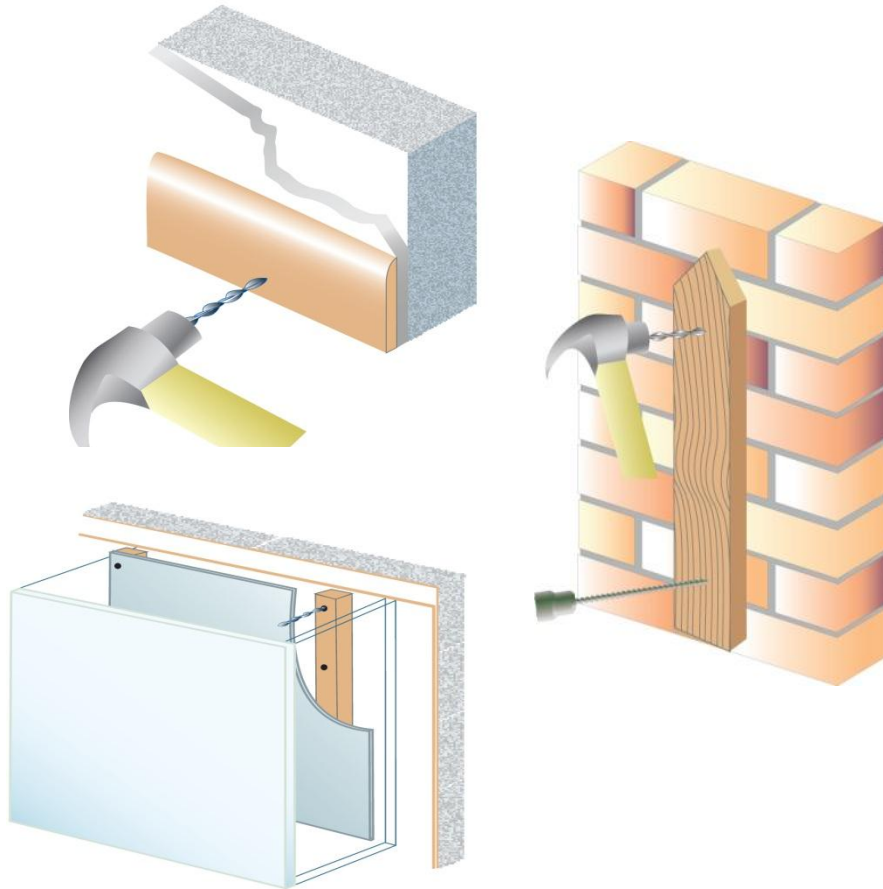
SURETWIST QUANTITIES/m²

AREA OF BRICKWORK TO BE TIED	NUMBER OF TIES TO BE USED	PACK QTY.
100m ²	500	100
200m ²	900	100
300m ²	1400	100
400m ²	1800	100

SURETWIST TIE SELECTION CHART

CAVITY - mm	DD140: Pt2: 1987 TYPE 6
50	195
75	220
100	245
125	270
150	295

SureTwist Multi-Purpose Fixings



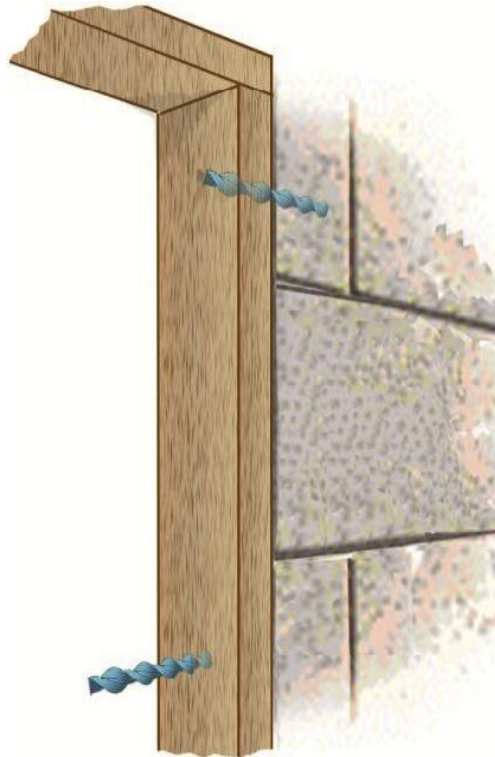
- **Applications.**
- Skirting, Dado and Picture rails.
- Door and Window frames.
- Vertical Tile Battens.
- Battens to Support Kitchen Cupboards.
- Battens to Support Plasterboard.
- Carbon Steel should only be used for internal applications

SureTwist Multi-Purpose Fixings



- 8.8 grade Carbon Steel and 304 grade austenitic stainless steel. (316 Available upon Request)
- Engineered to form a profiled section having pronounced work-hardened cutting fins that wind around & along a central core.
- Available in PZ Steel, 6mm, TC7mm and TC8mm sections, which are balanced in stiffness, length & pitch to optimise driving ease and provide enhanced bending resistance.
- Consistent tensile & compressive characteristics.

SureTwist AirTwist Batten Fixing



SureTwist AirTwist Technical Data

- 8.8 High Tensile Steel, Zinc Plated.
- For fixing timber to all substrates

- **Tensile Load**

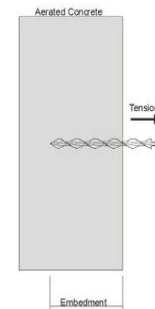


AirTwist by Thor Helical

Tension Test (pull-out) in 2.8N/mm Aircrete

70mm embedment in aircrete

Tie No.	Load(N) at Deflection		
	0.5mm	1.0mm	3.0mm
1	520.00	730.00	1470.00
2	510.00	860.00	1420.00
3	400.00	620.00	1270.00
4	520.00	830.00	1340.00
5	460.00	820.00	1450.00
6	410.00	630.00	1250.00
7	510.00	760.00	1320.00
8	480.00	770.00	1340.00
9	460.00	790.00	1400.00
10	500.00	830.00	1480.00
SD	43.98	82.76	81.95
Mean	477.00	764.00	1374.00
CV	449.74	712.71	1323.21
min	400.00	620.00	1250.00



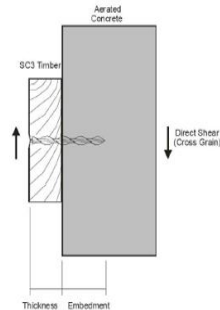
SureTwist AirTwist Technical Data

• Shear Load

AirTwist by Thor Helical
28mm timber thickness
72mm embedment in aircrete

Tie No.	Load(N) at Deflection		
	0.5mm	1.0mm	3.0mm
1	190.00	420.00	790.00
2	200.00	300.00	610.00
3	130.00	340.00	750.00
4	200.00	400.00	820.00
5	200.00	300.00	760.00
6	185.00	410.00	760.00
7	160.00	290.00	590.00
8	140.00	330.00	770.00
9	200.00	390.00	810.00
10	190.00	440.00	780.00
SD	26.50	56.13	79.19
Mean	179.50	362.00	744.00

CV 163.07 327.21 694.92
min 130.00 290.00 590.00

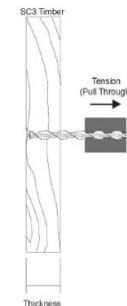


• Pull Through Load

AirTwist by Thor Helical
28mm timber thickness
Tension Test (pull-through) in timber

Tie No.	Load(N) at Deflection		
	0.5mm	1.0mm	3.0mm
1	300.00	620.00	900.00
2	520.00	930.00	1260.00
3	490.00	700.00	1140.00
4	390.00	530.00	880.00
5	580.00	790.00	1110.00
6	420.00	520.00	950.00
7	360.00	690.00	1040.00
8	430.00	720.00	1220.00
9	320.00	520.00	840.00
10	460.00	640.00	1160.00
SD	88.58	130.66	149.96
Mean	427.00	666.00	1050.00

CV 372.10 685.02 957.05
min 300.00 520.00 840.00





Additional Products & Point of Sale

SureClip



SureBond Resin Systems

SureBond Thixotropic Epoxy Resin

- SureBond 2.5 Litre TE Injection Resin
Supplied with 7 No 400ml mastic cartridges
- SureBond Application Gun
- For sealing or repairing cracks after crack Stitching and Beaming has been carried out.



SureBond Resin Systems

SureBond Polyester Resin

- SureBond 380 / 400ml Polyester Resin
- SureBond 400ml Resin Applicator Gun
- For use in SureTwist resin to resin and SureKontrakt RM applications. and general fixings.



SureBond SureFill Mortar

SureFill Joint & Crack Filler Mortar

- 1.5 Kg Tube
- Fills cracks between .5mm to 25mm
- For Interior & Exterior Use
- Non Hazard Classification
- Use the Crack-Stitching or Grout tie gun to install



SureBond SureStain Coloured Stains

SureStain Colour Pointing Mortar

- 8 x 5 Litre Tubs. For colour matching existing brickwork
Covering Cracks and drilled holes
- Mix with water



SureBond SureTech Injection Cream

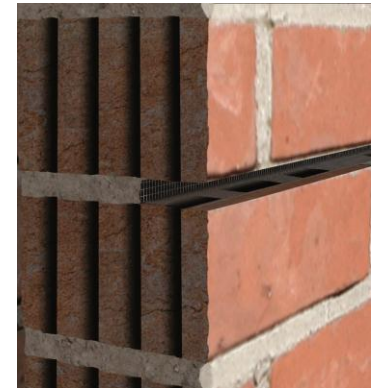
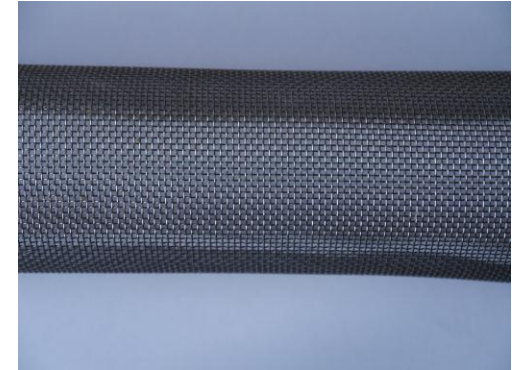
- SureBond 380 - 400ml
SureTech Injection Cream
- SureBond 400ml mastic
Installation Gun
- For the control of rising damp.



Containment Mesh

SureMesh

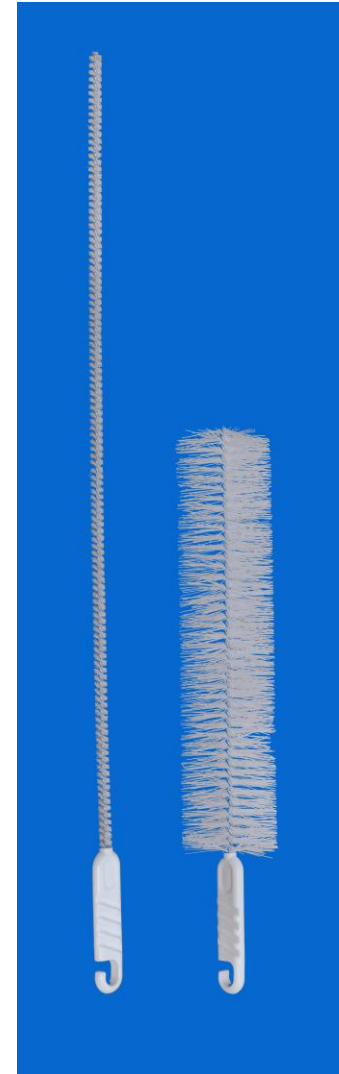
- Use with Crack-Stitching, SureBeam & Grout Tie Systems
- Stainless Steel
- Use in Hollow-Potted Brick, Hollow-Potted Block and Terracotta Bricks
- 9mm x 35mm x 1000mm
- 17.5mm DIA x 1000mm Welded Tube



SureTwist SureBrush

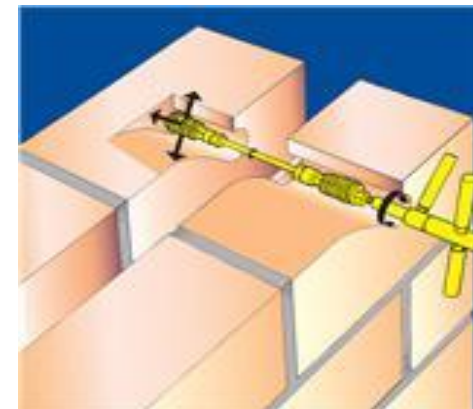
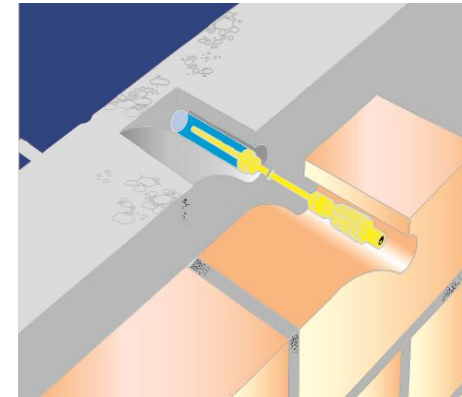
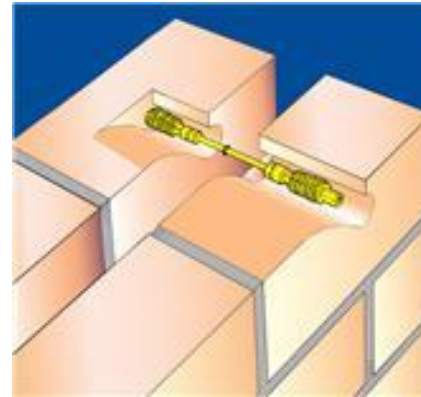
SureBrush

- 9mm x 650mm
Cleaning SureGrout
Nozzle & Brushing Drilled holes
- 68mm x 350mm
Cleaning Crack-Stitching &
Grout Tie Black Tubes



SureTwist SureKontrakt Remedial Wall Ties

- SureKontrakt MM
A Mechanical tie for use in sound masonry and concrete.
- Sizes
5mm x 195mm
5mm x 215mm
5mm x 250mm
5mm x 3000mm
- SureKontrakt RM
A Resin / Mechanical tie for use when the internal wall is weaker.
- Sizes
5mm x 195mm
5mm x 215mm
5mm x 250mm
5mm x 3000mm



Crack-Stitching Box Own Label

REMEDIAL CRACK-STITCHING SYSTEM

BRICK-FIX

REMEDIAL CRACK-STITCHING SYSTEM
A two component system consisting of stainless steel Brickfix Bar and Brickfix Grout

Applications

- ✓ A method of reconnecting cracked masonry

Benefits

- ✓ Brickfix bar manufactured from 304 austenitic stainless steel
- ✓ Brickfix grout is a non-corrosive, non-oxidising, thixotropic cement based grout, which is suitable for injection by hand
- ✓ Brickfix bars and Brickfix grout provide excellent bonding characteristics within the masonry
- ✓ Brickfix Bars have a superb combination of axial strength and flexibility
- ✓ Non-disruptive repair method
- ✓ Cost effective and more stable than other repair systems
- ✓ Absorbs further localised stress
- ✓ Minimises the likelihood of further cracking
- ✓ Eliminates the need to rebuild
- ✓ Permanent repair
- ✓ A fast, cost effective and economical solution
- ✓ No special skills required for installation

Installation Tools & Equipment Required

- ✓ Suitable Chasing tool
- ✓ PPE Clothing and protection
- ✓ After installing the crack-stitches, fill the crack with Brickfix TE Resin and make good with Brickfix Colour-Pointing Mortar

✓ If you require any further assistance, please contact the manufacturer whose details are below.

BRICK-FIX SAFEGUARD EUROPE LTD
REDKILN CLOSE
HITCHAM
WEST SUSSEX
UNITED KINGDOM
RH13 5QL
TEL: +44 1403 210204
FAX: +44 1403 210209
http://www.surecpi.com/brickfix

REMEDIAL CRACK-STITCHING SYSTEM

BRICK-FIX

REMEDIAL CRACK-STITCHING SYSTEM
A two component system consisting of stainless steel Brickfix Bar and Brickfix Grout

Contents

- 10 No 6mm x 1000mm Brickfix Bar
- 1 No 3 Lit Tub of Brickfix Grout
- 1 No Crack-Stitching Gun
- 1 No Stainless Steel Nozzle
- 1 No Mixing Paddle
- 1 No Finger Trowel

✓ If you require any further assistance, please contact the manufacturer whose details are below.

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Installation Details

Installation Characteristics

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REMEDIAL CRACK-STITCHING SYSTEM

BRICK-FIX

REMEDIAL CRACK-STITCHING SYSTEM
A two component system consisting of stainless steel Brickfix Bar and Brickfix Grout

The Brickfix Remedial Crack-Stitching repair system has been successfully used by professional installers for 15 years.

This repair system is suitable for cracked buildings where cracks are now static.

Please remember that crack-stitching will not repair the causes of the cracking, but it will permanently repair the symptoms of the cause of cracking.

General Applications

✓ If you require any further assistance, please contact the manufacturer whose details are below.

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Crack-Stitching Box



Thank you very much
for your attention

Construction Products Solutions International
Ltd Presentation

2014

Presenter:

Jan Fiala