



SPIRA-LOK[®]

THE ORIGINAL HELICAL WALL TIE SYSTEM



REPAIR.

RESTORE.

REVITALIZE.



ABOUT

The **Spira-Lok®** Stainless Steel Wall Tie System is an easy to use, cost effective method of re-connecting existing veneers to their structural back-up by means of a corrosion resistant tie assembly. The process eliminates the need to tear down an existing veneer. **Spira-Lok®** is the least invasive way of retrofitting wall ties into an existing structure and is particularly well suited to historical restoration. The combination of material and tie geometry provides for long-term durability and structural stability for the design life of the structure.

Spira-Lok® is installed into a pre-drilled pilot hole, and cuts its own thread in both the veneer and substrate to form a flexible threaded connection between the two components of the wall being rehabilitated. No pre-load or toxic chemicals are introduced into the structure, and the helical form of the tie acts as a "spring" to absorb differential movement without inducing cracking. Once installed, the anchors resist veneer loading in both compression and tension. The design of the system provides two threaded connections that do not create tension between wythes. This presents a sound solution for façade stabilization to prevent collateral damage caused during a seismic event. Basically, the **Spira-Lok®** system replicates the original wall tie's design performance. That is, live loads on the veneer are transferred to the backup thereby stiffening the veneer and minimizing crack potential. All **Spira-Lok®** ties are installed in the bed joints, concealed with a mortar patch or sealant, and have no exposed hardware. Since the entry point is small, the installation is virtually undetectable upon completion.

The **Spira-Lok®** ties are manufactured from AISI Type 300 series austenitic stainless steel. They are available in a variety of lengths, and can be made to special lengths upon request. Variants include Patch-Lok™ to mechanically key patching compounds in concrete and other materials, and Spira-Bar® for laying horizontally in the mortar joints to stitch cracks or form load-bearing beams in masonry.

BASIC APPLICATIONS

Use where facades have missing or corroded wall ties or anchors. Can be applied at peripheral areas that are bulging or areas that are to be removed. Use as a mechanical key for patching. In bar form, can be installed horizontally into mortar joints for crack control and forming beams in masonry.



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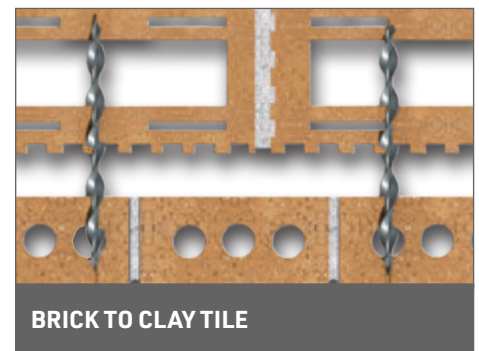
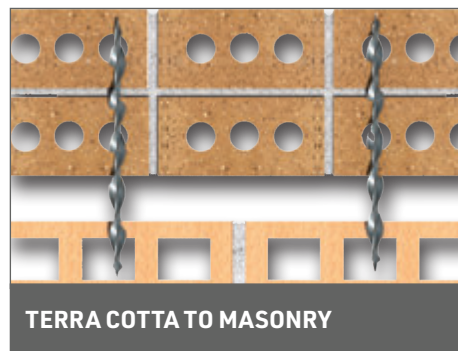
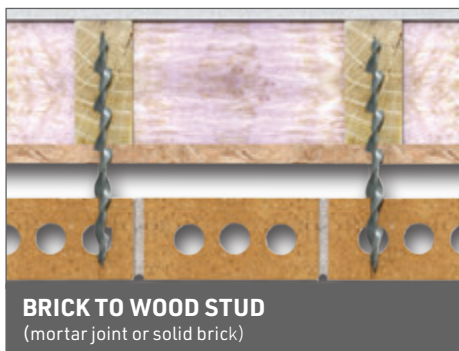
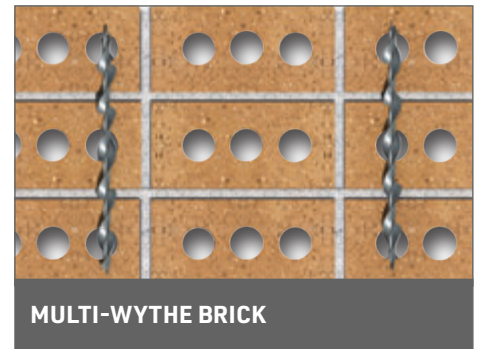
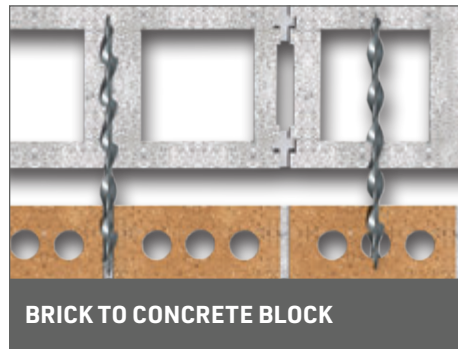
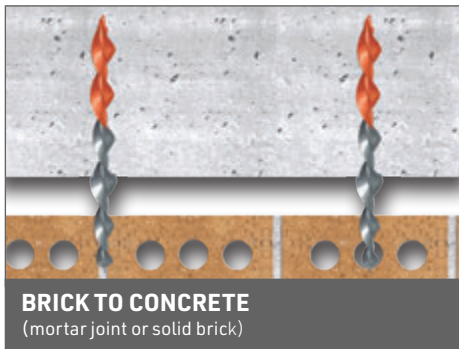
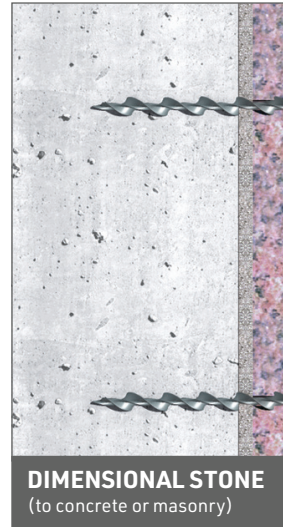
A one-piece, flexible stainless steel wall tie for pinning masonry to new or existing walls. Also suitable for temporary support for lintel and shelf angle replacement. The dry-set technique may involve various tie diameters, drill bits and installation tools.

AVAILABLE: 8 mm or 10 mm diameter x 6-1/8" (155 mm) up to 24" (600 mm) long in Stainless Steel Type 304. (316 available by special order).

SPECIAL FEATURES:

- » Only a small diameter pilot hole required
- » No toxic adhesives or expansion devices
- » Functional in a wide variety of building materials
- » Able to withstand cyclic loading
- » Accommodates differential movement between materials
- » Does not stress or fracture fragile substrates

NOTE: An on-site survey should be carried out prior to project tendering to determine material strength, tie diameter & length, pilot hole size and appropriate drilling technique



SPIRA-LOK® INSTALLATION

Installation techniques have evolved to optimize the performance of the **Spira-Lok® Wall Tie System**. Installation procedures are available along with product specifications for typical masonry stabilization. Rotary percussion drilling usually achieves the best results.

TOOLS AND ACCESSORIES

All installation components required, whether it be new construction, refacing, or a dry set pinning application are available from Blok-Lok. Blok-Lok drill bits and setting tools are required for proper **Spira-Lok®** anchor installations.

TYPICAL SPIRA-LOK® MASONRY BIT SIZE (MM)

Facade Material	Spira-Lok	BACK-UP MATERIAL					
		Mortar Joint	Brick	CMU	Concrete	Wood Stud	Metal Stud
Mortar Joint	8mm	5.0	AS	5.0	AS	5.0	5.0
	10mm	6.5	AS	6.5	AS	6.5	6.5
Brick	8mm	6.5/5.0	6.5	6.5/5.0	6.5	6.5/5.0	6.5/5.0
	10mm	8.0/6.5	8.0	8.0/6.5	8.0	8.0/6.5	8.0/6.5
CMU	8mm	5.0	AS	5.0	AS	5.0	5.0
	10mm	6.5	AS	6.5	AS	6.5	6.5
Precast Concrete	8mm	6.5/5.0	6.5	6.5/5.0	6.5	6.5/5.0	6.5/5.0
	10mm	8.0/6.5	8.0	8.0/6.5	8.0	8.0/6.5	8.0/6.5
Stone	8mm	6.5/5.0	6.5	6.5/5.0	6.5	6.5/5.0	6.5
	10mm	8.0/6.5	8.0	8.0/6.5	8.0	8.0/6.5	8.0
Facade Hole / Back-up Hole		AS = Asymmetric Anchor Required					

TIE SELECTION

- » Available in 8.0 mm and 10.0 mm diameters.
- » Tie length to suit wall conditions having a nominal facade width of 4 inches.
- » Ties are produced from austenitic stainless steel Type 304. Type 316 Stainless is also available for more severe corrosive environments.

SPIRA-LOK® LENGTH SELECTION

Catalog #	Nominal Length	Minimum Drilled Hole Depth	Cavity Range	
			CMU	Concrete
HWT-155	6-1/8"	6-5/8"	1-1/8" - 0	1-1/2" - 0
HWT-170	6-5/8"	7-1/8"	1-5/8" - 0	2-1/2" - 1-1/2"
HWT-195	7-5/8"	8-1/8"	2-5/8" - 0	3-1/2" - 2-1/2"
HWT-220	8-5/8"	9-1/8"	3-5/8" - 0	4-1/2" - 3-1/2"
HWT-245	9-7/8"	10-1/8"	4-7/8" - 0	5-5/8" - 4-5/8"
HWT-270	10-7/8"	11-3/8"	5-7/8" - 0	6-5/8" - 5-5/8"
HWT-295	11-7/8"	12-3/8"	6-7/8" - 0	7-5/8" - 6-5/8"
HWT-330	13-1/4"	14"	8-1/4" - 0	8-3/4" - 7-3/4"

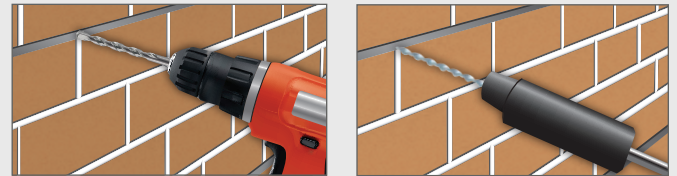
NOTE: The SDS rotary hammer is ALWAYS used with the dry set insertion tool to install the **Spira-Lok® Wall Tie**.

INSTALLATION MECHANISM



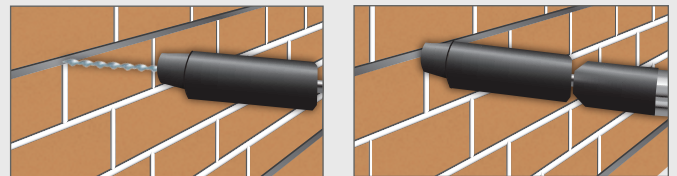
1. Drill a pilot hole through the veneer and into the substrate.
2. Tie cuts a helical channel through both wythes of the wall.
3. Helical channel with "slots" offers resistance to compressive and tensile loads.

SPIRA-LOK® INSTALLATION



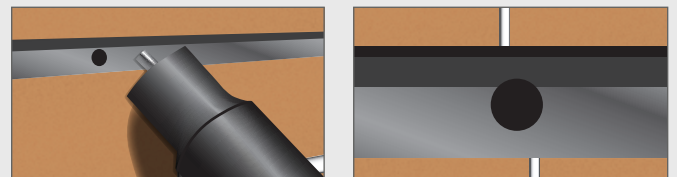
STEP 1: Drill a pilot hole using percussion hammer drill (3-jaw chuck type) through the mortar joint and into the block back-up.

STEP 2: Insert the Spira-Lok Wall Tie into the dry set installation tool mounted on the rotary hammer S.D.S. drill.



STEP 3.1: Drive the Spira-Lok Wall Tie through the mortar joint and into the back-up.

STEP 3.2: Drive the Tie until the nose of the dry set installation tool is hard against the veneer.



STEP 4: The dry set installation tool automatically recesses the Spira-Lok Wall Tie into the face of the masonry.

STEP 5: Cap the pilot hole with an aesthetically compatible material.

PATCH-LOK

Helical Patch Reinforcement

APPLICATION

Patch-Lok Helical Patch Reinforcement is used for providing a powerful mechanical key between the damaged substrate and the patching compound used to effect a repair. Primarily designed for spalled concrete repairs, **Patch-Lok** can also be used wherever a strong, non-chemical bond between a substrate and patching compound is required.

SPECIAL FEATURES

- » Forms a powerful bond without chemicals
- » Maintains structural stability
- » Minimizes the need to build patch up to required profile
- » Quick and easy to install
- » Drill bit and installation tool required for installation provided

SIZES

Patch-Lok Helical Patch Reinforcement is manufactured from ASTM 304 or 316 austenitic stainless steel and is available in 8.0mm diameters and in lengths of 3" (75mm). Should the patch profile require shorter lengths, **Patch-Lok** can be bent or cut to suit.

INSTALLATION PROCEDURE

- » Clean area to be patched, removing any loose material, and preparing any exposed reinforcing steel.
- » Drill 1/4" (6.5mm) pilot holes to a depth of 1-3/4" (45mm) using an SDS Hammer Drill. **Patch-Lok** reinforcement is to be placed according to the engineer's instruction.
- » Using an SDS Hammer Drill and the **Patch-Lok** Installation Tool provided, insert the Patch-Lok reinforcement into the pilot holes ensuring that they remain below the intended finished profile of the repair. **Patch-Lok** may be bent or cut if it is too long.
- » Apply the patching compound.

LOAD DATA

The "pull-out" load data for **Patch-Lok** is dependent upon the substrate in which it is installed. Load Tests in a variety of different grades of reinforced poured concrete have yielded results having a minimum "pull-out" strength of 350 lbf when **Patch-Lok** pins are installed in accordance with the above procedure. Results may vary for other substrate materials, but Blok-Lok's technical department will be pleased to advise the optimum pilot hole size to use in order to maximize "pull-out" performance. The average Shear Load capacity of **Patch-Lok** is in excess of 2,000 lbf, and the average Tensile Load bearing capacity of the pin itself is in excess of 2,600 lbf.

LINTEL AND SHELF ANGLE REPLACEMENT

Using Spira-Lok® Helical Wall Ties

APPLICATION

Spira-Lok® Stainless Steel Helical Wall Ties can be used for providing temporary support to the masonry wall when removing three or four courses of masonry veneer to enable the replacement of lintels, shelf angles and or flashing. The installation procedure described below is for lintel or shelf angle replacement in walls with brick veneer and block back-up. Cavity width is a limiting factor, please contact Blok-Lok for more information.

SPECIAL FEATURES

- » Maintains structural stability of the wall
- » Alleviates the need to use shoring systems which restrict the work area
- » Quick and easy to install
- » Only minor touch-up required upon completion

SIZES

The length of tie to use is determined by the wall make-up. The ties should, however, be imbedded into the back-up wall to a depth of at least 2".

LOAD DATA

The "pull-out" load data for **Spira-Lok® Stainless Steel Helical Wall Ties** is dependent upon the material into which it is installed, and Blok-Lok's technical department will be pleased to advise the optimum pilot hole size to use in order to maximize "pull-out" performance. The average Shear Load capacity of 8.0 mm Blok-Lok Helical Wall Ties is in excess of 2,000 lbf, and the average Tensile Load bearing capacity of the tie itself is in excess of 2,600 lbf. The bending moment introduced into the wall by removing masonry courses will vary with cavity width and is countered by using multiple rows of ties as shown.



SPIRA-LOK® FEATURES AND BENEFITS

One Piece Anchor	Simplified handling and increased site productivity.
Austenitic Stainless Steel	Long term durability.
Helical Configuration	Acts as a drip and maximizes cutting edge contact. Provides self-tapping action. Simulates thread conditions without pre-load stress. Accommodates in-plane cyclic loading. Provides flexibility to accommodate differential movement between wythes.
Central Core Cruciform Shape	Optimizes axial strength in tension and compression. Dissipates installation energy and centralizes load transfer.
Pointed End Symmetry	Easy installation.
Only a Small Pilot Hole Required	Minimal visual impact.
No Adhesive Required	Can be used in any climatic condition. Eliminates substrate preparation, enhances in-plane ductility and is less problematic.
Pullout Resistance	Up to TEN (10) times conventional wall tie capacity.
Engineered Design	Can be tested for performance verification on site and will work in various building materials.

SPIRA-LOK® PHYSICAL CHARACTERISTICS (nominal dimensions)

Outside Tie Diameter	8mm	10mm
Pitch Length: in. (mm)	0.84 (21.4)	1.0 (25.4)
Tie Cross-Sectional area: in.2 (mm2)	0.017 (11.6)	0.022 (14.2)
Yield Strength: ksi (MPa)	65.9 (455)	73.8 (509)
Tensile Strength: ksi (MPa)	137.0 (950)	137.0 (950)

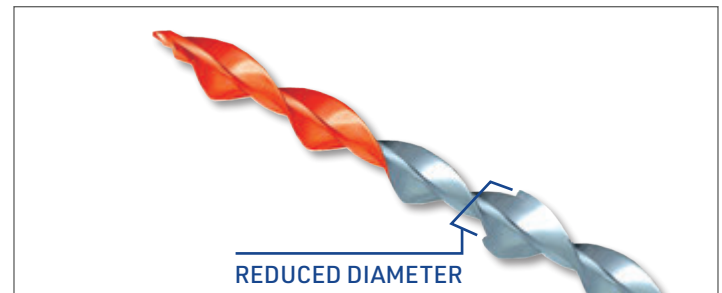
*Material: ASTM A-167 TYPE 304 Stainless Steel)

SPIRA-LOK® PROPERTIES (ultimate buckling strength)

Unsupported Length in. (mm)	Capacity (lb.)	
	8mm	10mm
1 (25)	1638	2335
2 (50)	1290	1613
4 (100)	690	1185
6 (150)	375	614

SPIRA-LOK® PERFORMANCE CHARACTERISTICS

Material	Effective Minimum Embed (inches)	Ultimate Tension/Compression (lbs.)	
		8mm	10mm
Mortar Joint (100 psi)	3-1/4	616	780
Solid Brick (9000 psi)	3-1/4	700	700
Cavity Brick	3-1/4	1280	1390
Normal Weight CMU	1-1/4	801	907
Light Weight CMU	2	550	550
Concrete (3500 psi)	1-1/2	1200	1300
Kiln Dried Wood Stud 2x4 2x6	3	517	N/R
	3	520	N/R
Metal Stud	16 Gauge	310	N/R
Granite	1-1/8	620	650
Travertine	7/8	590	800
Limestone	3	600	620
3/16" Steel	3/16	520	N/R



Spira-Lok® Asymmetrical Ties are dual diameter **Spira-Lok® Stainless Steel Helical Wall Ties** designed for use in connecting soft veneer materials to a hard back-up. Typically a larger installation pilot hole is required in hard substrates, such as concrete or brick, than, for example, in a soft veneer mortar.

Since drilling a larger diameter pilot hole behind a small entry hole in the veneer is not possible, Blok-Lok supplies a dual diameter **Spira-Lok® Asymmetrical Tie** with a smaller diameter on the end being installed in the substrate. This ensures the connection in both the veneer and substrate attain optimum pull-out loading in service.

SPIRA-BAR®

Helical Reinforcement for Masonry Crack Repair

APPLICATION

Used for stitching distressed masonry. **Spira-Bar®** is "grouted" in mortar joints to bridge cracked sections. Restores structural stability with minimal building disfiguration or disturbance to building occupants. **Spira-Bar®** installs easily with no special equipment required.

SPECIAL FEATURES

- » Restores structural stability
- » No special equipment required for installation
- » Quick and easy to install
- » Minimal disturbance to building occupants
- » Minimal disfiguration of the building



LOCKING-CLIP for
Seismic Applications

SIZES

Spira-Bar® is available in 6 mm or 8 mm diameter x 39' long or in a 34.5' (10.5 m) coil. Manufactured in Type 304 Stainless Steel. Type 316 by special order.

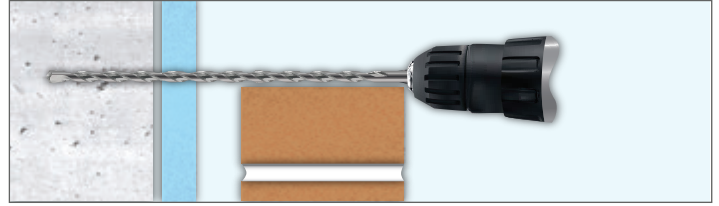


Standard application shown left. Locking-clip for seismic application shown right and at top.

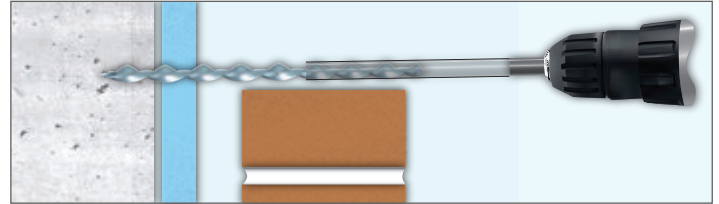
INSTALLATION PROCEDURE

1. Rake out or grind slots into horizontal mortar joints to specified depth at each location and at required vertical spacing. Unless otherwise specified, the ground slot depth should be 1.3/8", and the vertical spacing four brick courses.
2. Blow out slots and thoroughly flush with water.
3. Using a grout gun, insert a bead of cementitious non-shrink grout into the back of the slot.
4. Push the **Spira-Bar®** reinforcement into the wet grout to obtain good coverage (minimum 5/8" cover).
5. Continue filling joint with cementitious non-shrink grout over the exposed **Spira-Bar®** and iron into the slot using a finger trowel.
6. Point up or fill the joint.

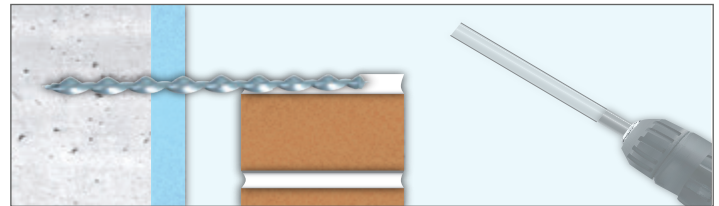
INSTRUCTIONS FOR RE-FACING



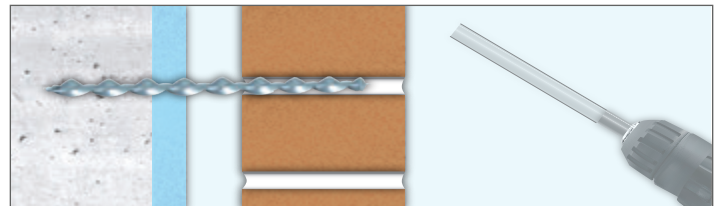
1. A pilot hole is drilled into the back-up to a pre-determined depth.



2. The **Spira-Lok® Tie** is loaded into a Re-facing Tool mounted on an SDS Hammer Drill & driven into position.



3. When the tip of the Re-facing Tool touches the back-up and is withdrawn, the length of exposed **Spira-Lok® Tie** is sufficient to bridge the cavity and provide embedment in the new mortar coursing of the veneer as it is constructed.



4. If required, a longer **Spira-Lok® Tie** may be installed and bent through 90 degrees before being wet set in mortar prior to the next brick course being laid.

SITE TESTING

Wherever possible we strongly urge on-site testing be conducted to verify pull out loads particular to the specific situation. **Spira-Lok® Wall Ties** may be load tested replicating the installation to verify the strength of the connection. The Blok-Lok field test apparatus is custom designed for this purpose. A test key, sized for the appropriate diameter of the helical tie, is quickly installed and a test load applied. The easily read dial indicates the tensile load applied to the tie.



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