



**THORHELICAL<sup>®</sup> AUSTRALIA**

**THE CONCISE GUIDE TO MASONRY REPAIRS**

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## **The Helical Originators Range – Continuous Development and Improvement since 1978**

This comprehensive second generation range of Thor Helical Remedial Wall Ties, Crack Stitching components and Reinforcement Wires have been designed to enhance the performance and installation procedures of an accepted variety of construction and repair applications proven over a quarter of a century of usage.

*European Patent No. EP1307303*

[www.thorhelical.com.au](http://www.thorhelical.com.au)

**THORHELICAL<sup>®</sup>**  
**REMEDIAL SOLUTIONS**

Phone: 02 8788 8000

Fax: 02 9725 1622

Email: [sales@wds.com.au](mailto:sales@wds.com.au)



### Thor Helical History

The innovation of hammer driven helical fixings originated from a GKN/Timber Research and Development Association (TRADA) programme undertaken in the 1970s, headed by their Chief Architect John Ollis. Together with his son Henry, they researched, tested, developed and patented a wide range of fixing and reinforcement technologies using extrusions, drawn tubes and wire sections.

As the originators and pioneers of the helical fixing concept, John and Henry Ollis founded Helifix Ltd in 1984, to exploit their early-patented technologies under license. **Helifix** was licensed to manufacture under the Ollis' two patents, EP0150906B1 and EP0171250B1 in 1986, and subsequently Target Fixings Ltd., (UK), and Brutt Helical Kft were also licensed. Many helical stainless steel ties and reinforcement wires bear the Ollis' Pat. No. 171250. This is a European Patent No. E00171250B1, which had a priority date of 31/07/1984 which expired in July 2005.

In the late 1990s the Ollis' formed the Thor Helical Product Development team to progress and nurture new concepts, with highly consistent characteristics, using precision engineering to tolerance levels that had not previously been achievable. This comprehensive second generation range of Thor Helical fixings, wall ties, reinforcement wires and anchors have been designed to suit a variety of construction and repair applications. New patents have been filed on many products, manufacturing methods and building applications, as one innovation has followed another, e.g. "Precision Pitch Twisting Technology" (**European Patent EP1307303**).

### Thor Helical Materials

#### **Thor Helical 6mm Grade 316 Austenitic Stainless Steel Helical Wire**

Description –

***Thor Helical 9.00mm nominal O.D., 316 grade austenitic stainless steel, helically roll – formed wire having a characteristic cross-sectional area of 14.88mm<sup>2</sup> and a pitch accuracy variation of no more than 0.5% from any given probate pitch along the axis.***

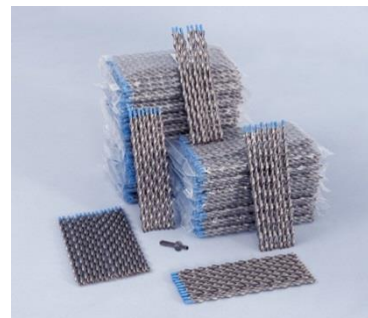
Characteristics -

**Nominal O.D. 9mm C.S.A. 14.88mm<sup>2</sup>, Mass 0.122kg/metre**

**Tensile Strength = 1040.35MPa, 2% Proof Stress = 756.04MPa**

**Availability in a variety of standard tie lengths and in custom lengths by the metre, up to 6000mm.**

**Applications – New or Remedial Wall Ties, Masonry Bed-Joint Reinforcement, (new or remedial), and Concealed Lintels.**



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### **Thor Helical Materials**

A shrink compensated, two-part, thixotropic cementitious grout, suitable for injection with a hand applicator, for use with Thor Remedial Reinforcement and Thor Remedial Wall Ties. Supplied in a sealed tamperproof mixing bucket, the components are mixed on-site with a drill powered mixing paddle, to a smooth creamy consistency. Manufactured in Australia for Australian conditions, (under arrangement), the high strength bonding agent is an integral proprietary component in the Thor Remedial Masonry Reinforcement System.

**Applications – crack stitching, remedial masonry reinforcement and specific remedial wall tie specifications.**

### **Thor Helical Materials**

Thor Helical 9mm Remedial Wall Ties are available in a variety of standard lengths and in custom lengths to order. They may also be used in new construction. Used to secure many types of masonry to varying substrates, the Thor 9mm Helical remedial wall ties may be used as an impact driven self-threading screw fixing, or with our proprietary Thor Helical WHO60 Cementitious Grout where deep masonry embedment is required and where masonry quality is inconsistent.

Longer custom-cut length may also be used as remedial wall ties to secure bowed masonry walls to either a pair of parallel floor/ceiling joists or into the floor/ceiling joists end grain.

Thor Helical 9mm remedial wall ties are often installed in conjunction with crack stitching or remedial expansion joint installations.

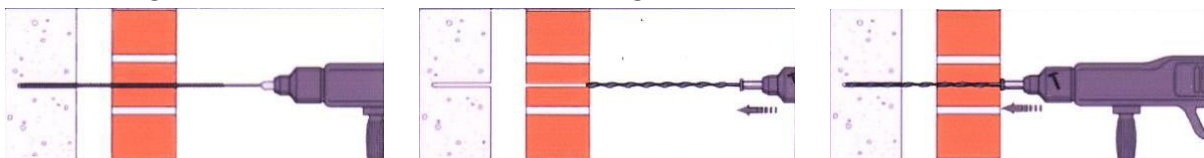
Application Material	Indicative Performance							
	Screw Connection						WHO 60 Grout Connection	
	A.A.C		Brick	Concrete	Timber Grade		Brick	Concrete
Strength	2.8MPa	3.5MPa	>10MPa	>20MPa	Side Grain	End Grain	>10MPa	>20MPa
Penetration Depth	85mm	85mm	60mm	50mm	50mm	75mm	75mm	75mm
THOR 9mm	1.4kN	1.9kN	2.6kN	2.3kN	2.3kNv	2.1kN	2.6kN	2.2kN

### **Thor Helical 9mm (Centre Drive) CD Tie™ Impact Driven Remedial Tie €€**

*(For Consistent Quality Masonry)*

*(Aust. Pat. App. No. 2007264783)*

Thor Helical C.D.™ Wall Ties may be impact driven with a lightweight rotary hammer-drill equipped with a Thor Helical SDS C.D. Setting Tool, through pre-drilled pilot holes to secure brick leave where existing wall ties have failed through corrosion or have been omitted during construction.







**Thor Helical 9mm WHO60 Grout Ties (For Inconsistent Quality Masonry or Deep Embedment)**

Thor Helical Remedial Wall Ties bonded with Thor Helical WHO60 Grout for inconsistent quality masonry, rubble filled or where embedment is required.



**Thor Helical 9mm Diaphragm Ties (Securing Bowed Walls to Timber Sub-Structures)**

Thor Helical 9mm Remedial Wall Ties for securing bowed masonry walls to timber floor and roof framing utilising the frames diaphragmatic properties for load transmission and lateral restraint.



**THOR HELICAL 6MM AND 9MM 316 GRADE STAINLESS STEEL REINFORCEMENT WIRE**

**Masonry Crack-Stitching and Remedial “Beaming”**

Thor Helical 6mm bed joint reinforcement wires are grouted with proprietary Thor WHO60 cementitious grout into slots prepared in existing walls for the purpose of crack repair, increasing flexural strength of masonry to combat the effects of localised ground movement and other forms of distress. The highly deformed helical profile maximises bonding characteristics between the wire and the Thor WHO60 cementitious grout, providing excellent compressive and axial strength along the full length of the bonded composite. Combining these strengths with the torsional yield characteristics of the wire, the composite unit is utilised to accumulate imposed loads and to disperse them along the full length of the reinforced zone to fully reinstate the structural integrity of distressed masonry and provide resilience against further cracking whilst still accommodating natural masonry movement. Both Thor Helical 6mm and 9mm bed joint reinforcement wires may be used remedially to create deep masonry beams.

**Concealed Masonry Lintels**

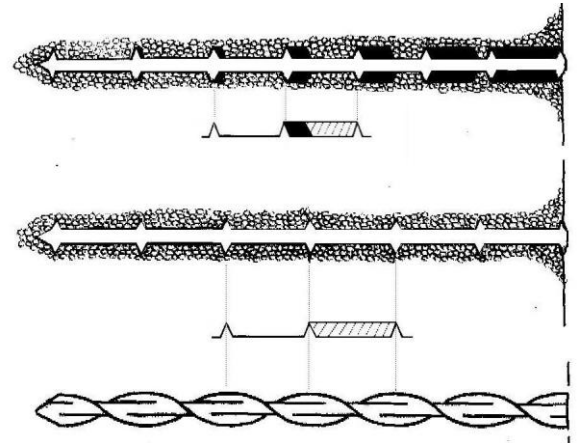
Available in either 6mm or 9mm diameters, available up to 6000mm in length, which may be formed and cut on site as required. Cracking of the masonry at the corners of opening is minimised as active loads are dispersed 500mm into the masonry either side of the opening which is held in tension. 2<sup>nd</sup> Generation manufactured profile enhances the mortar bond and composite strength. The fully concealed system is aesthetically pleasing and would enhance rendered masonry finishes. No mortar joint expansion due to “rust” growth. Thor Helical concealed lintel system providing resilience to accommodate natural masonry movement.



**Thor Helical Precise Pitch**

The Ollis’ earlier patented profiles, (known as **Helifix**, Brutt and Target Fixings U.K.), are still being formed from long lengths of profiled wire, (7-10metres), which are twisted by spinning the wire between two centres such as to provide a defined number of revolutions, (itches), over the length. The resulting length of helical wire has a pitch that is invariably progressively tighter at one end than at its centre.

The upper portion of the adjacent illustration represents an exaggerated behavioural model of an inaccurately twisted helical tie that highlights the deficiencies of pitch variance whereby the angle of the leading end undercut is widened by the trailing threads, to the detriment of the interfacing connection. The lower portion represents the correct interface connection as provided by the “precise pitch” twisting die technology of Thor Helical ties and wires. *(Patent No. EP 1307303B1)*



*Top: Inaccurate Undercut  
Bottom: Precise Pitch Technology*

Features	Benefits
<b>Precise Pitch Technology</b> <i>(EP 1307303B1)</i>	Accurate Helical Interlock Cut
	Easier, Faster Installation
	Accurate Tracking Across Wide Cavities
<b>Balance Robust Profile</b>	Greater Torsional Strength
	Increased Compression Resistance (Reduces Bucking Tendencies)
<b>“End to End” – In-House Production</b>	Consistent Quality and Traceability
<b>2<sup>nd</sup> Generation – Technical Upgrade</b>	Continuous Improvement over 25 years



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