

DryFix • ResiTie • RetroTie

Remedial stainless steel wall tie systems

Helifix wall ties are made from stainless steel helical bar and are suitable for use as remedial wall ties in cavity, veneer and solid multi-leaf construction.

Description

Helifix remedial wall ties are identified by a Hi-Fin helical, one-piece design with “Helifix” printed at regular intervals along their length. Helifix remedial wall ties are manufactured as standard from Grade 316 austenitic stainless steel, with a nominal tensile strength of 1100MPa and 0.2% proof stress of 860MPa, and typically have a nominal diameter of 8mm and nominal cross sectional area of 10.0mm². Ties are available in different lengths and diameters. Helifix remedial wall ties are named according to intended use and method of installation as follows: DryFix ties provide a dry mechanical fix at both ends of the tie; ResiTies provide a resin-based fix at both ends; RetroTies provide a dry/resin combination fix. Helifix ties are manufactured in the UK to ISO 9001:2008 quality assured standards and are available in New Zealand direct from Helifix, a division of Ancon Building Products.

Use

Helifix remedial wall ties are intended for use as replacement or supplementary wall ties in cavity, veneer and solid multi-leaf (or multi-wythe) construction. Recommended installation procedures and a variety of indicative remedial situations are presented in repair details ANZ-RT01 to ANZ-RT09. Installation details are provided with every pack of ties and are available from Helifix. Recommendations for responsible and safe use are given in the Helifix Remedial Wall and Pinning Tie Safe Installation Guide, available from Helifix.

Characteristic Performance Data

1. Characteristic material properties, Helifix 8mm, Grade 316 stainless steel wall ties

Grade of Stainless Steel	Weight (g/m)	Pitch (mm)	Cross Sectional Area (mm ²)	Ultimate Tensile Strength (MPa)	UTS (kN)	0.2% Proof Stress (MPa)	Shear Strength (MPa)
ASTM 316	80	39	10.0	1100	11.4	860	700

2. AS/NZS2699.1 Type B Tie Classification (Remedial Category)

Specimen Detail (using Helifix 8mm, Grade 316 stainless steel wall ties)	Test Type (Veneer connection/ structural member connection)	Cavity Width ^A (mm)	Axial Stiffness (kN/mm)	Axial Strength (kN)	Residual Strength (kN)	Type B Classification
(i)	Type B Remedial – DryFix (Drive-in connection to brick / Drive-in connection to brick)	75	0.610	1.902	2.321	Earthquake Heavy Duty ^B (EH), for cavity of 75mm
(ii)	Type B Remedial – RetroTie (Resin connection in mortar joint / drive-in connection to Timber)	75	0.859	1.317	1.353	Earthquake Medium Duty (EH), for cavity of 75mm
(i)	Type B Remedial – ResiTie (Resin connection in brick / Resin-based DryLink side-fix connection to steel member)	75	0.758	0.813	1.026	Earthquake Medium Duty (EH), for cavity of 75mm

Reference Tests

1. MIS Testing, Eden House: Consett, UK. Project reference CON55231.
2. Newcastle Innovation, The University of Newcastle: Newcastle, NSW Australia. Project reference numbers: A/520 and A/559 Helifix wall tie testing, dated February / March 2011 and February / March 2012 respectively. Tests conducted to AS/NZS 2699.1:2000, Appendix A (Method for determining the stiffness and strength of type B veneer ties). Masonry materials supplied by Austral Bricks. Product information available from Austral Bricks (Product Code and Name: 8240-1, Dry Press Common). Product information for Helifix EpoxyPlus TE2 pure epoxy resin and Helifix DryLink used in test specimens (ii) and (iii) published separately and available from Helifix. Results subject to the following:
 - A) Specimens were prepared with a 75mm cavity to match the maximum allowable to NZS4210 and in keeping with a conservative testing regime. Specimen designs were chosen to demonstrate the performance of each remedial tie system and sample different fixing types, including: drive-in tie to masonry; drive-in tie connection to timber; resin-based tie bonding into brick, mortar and DryLink connectors.
 - B) AS/NZS 2699.1:2000, Appendix A refers to the stiffness and strength of 'veneer ties': "a wall tie designed to connect an outer masonry skin to an inner wall of timber, metal or other relevant material" (AS/NZS 2699.1:2000, p.6). Hence, it is to be noted that the published standardised classification is not strictly applicable to the brick-brick design tested in specimen (i), which the standard defines as a 'cavity tie': "a wall tie designed to connect two leaves of masonry that are separated by a clear cavity of any width" (ibid). The methodology outlined in AS/NZS 2699.1:2000, Appendix A was used in this instance to provide an indication of seismic performance when installed with a dry masonry connection at both ends of the tie and performed in the absence of any other standard intended to provide seismic rating for a remedial cavity wall tie. Remedial tying of a cavity wall to reach even a proportion of the New Zealand new build standard may require the strengthening or bracing of the load-bearing (typically internal) masonry leaf.



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HELIFIX
SUSTAINABLE STRUCTURAL SOLUTIONS

Use Subject to

1. Load Requirements

Loads published above derive from laboratory testing and are to be used as guide values only. Base materials and cavity widths can vary widely and on-site assessment and testing may be required to verify pull-out load capacities and base material conditions. It is recommended that the design actions for the elements to be connected by the installation of remedial wall ties be based on the provisions in NZS1170.5:2004.

NOTE: Wall ties are load sharing devices and specifications demanding high point loads are to be avoided. New Zealand Society for Earthquake Engineering (NZSEE) guidelines note that replacement or supplementary ties should have a tensile capacity in excess of the lateral loads developed for the area tributary to the tie. Reference: NZSEE, Assessment and Improvement of the Structural Performance of Buildings in Earthquakes, dated June 2006.

2. Spacing Requirements

Wall ties should be spaced in accordance with building code requirements to suit site conditions and location. New build requirements for the use of Type B ties are given in NZS4210:2001 and NZS4230:2004.

3. General Requirements

Installation shall be in accordance with the manufacturer's technical literature packed with product and available from Helifix.

Limited Warranty

Helifix remedial and new build wall ties are supported by a 25 year limited product warranty. Helifix ties are warranted not to malfunction due to manufacturing defects, corrosion or for adequacy of design when used and installed in accordance with the manufacturer's instructions, subject to the design limits listed above. Helifix ties are designed to perform in accordance with the requirements for wall ties in accordance with New Zealand Standard NZS4210:2001, *Masonry Construction: Materials and Workmanship*, and AS/NZS 2699.1:2000, *Built-in components for masonry construction – Wall ties*. All warranty obligations of Helifix shall be at the Company's sole discretion and shall be limited to the replacement of any defective items. In no event will Helifix be responsible for incidental, consequential, or special loss or damage, however caused.

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