Dri Flex

Target Fixings
Construction Solutions

Remedial Wall Tie

Introduction

During the 1970's, research was conducted into the need for replacement wall ties. The actual durability of the protective zinc or galvanised coatings of the original built-in wall ties was studied, and this now affects the design and use of walls ties for both new build and replacement. The results of the research was found to be quite beyond any previous expectations:

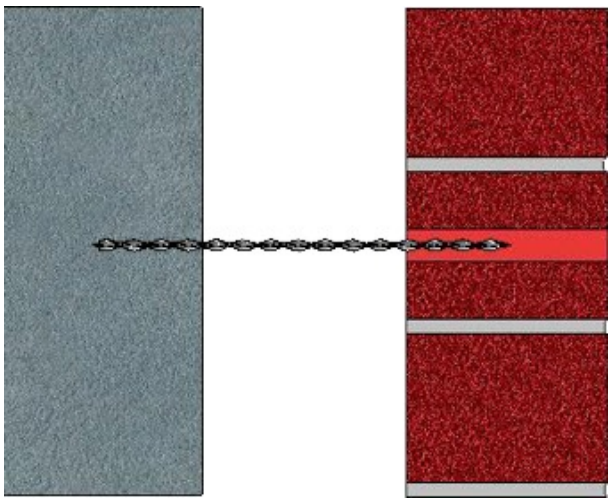
1. Vertical twist ties ("fish tails") were found to have a life expectancy of only 30 years - half of that originally intended.
2. Wire ties ("butterflies") were found to have a service life of only 15 years.
3. Mortar is alkaline which actually protects and enhances the working life of wall ties
4. A reaction between mortar and the air causes a process called carbonation which turns the mortar acidic which then attacks the wall ties.

Early attempts at producing a method for replacing existing wall ties highlighted many of the pitfalls that were to be encountered. The expansion type of tie has been found to induce additional stresses into the masonry - similar to the expansion caused by the existing, rusting walls ties - and were costly to make and fit. The use of heavy section re-bars was soon outlawed because of the need for flexibility to allow the necessary differential horizontal and vertical movement between the two leafs of the wall. Generally, a connection between each leaf using a bar of 8 mm diameter or above was found to act like mini crowbars and would eventually work themselves loose. The introduction of BSI DD140, BRE Digest 329 and the more recent BRE Digest 401 at last gave guidance for manufacturers and specifiers of remedial wall ties.

The System

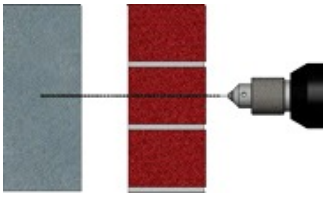
Dri Flex ties were developed as a result of the identified need to drill smaller holes in masonry to control the amount of spalling caused when drilling the near leaf. A large hole drilled through a brick using a SDS-plus hammer drill can result in up to half of it spalling away. This material can cause bridging of the cavity and moisture transfer, and leaves a much reduced fixing thickness for the near leaf Connection. Drilling for the Dri Flex tie requires hole sizes Reduced to between 5 mm and 7 mm, which dramatically reduces the spalling of the brick. Dri Flex offers the advantage of a non-expanding mechanical fixing to both the far and near leaf. Pre-installation testing should be performed to the requirements of local standards and technical help and advice is available. Because the fixing method employed does not induce additional stress into the substrate, Dri Flex can be used in many and varied materials, from poured concrete columns to Aircrete blocks, with satisfactory results. Edge distance spacings, so critical with any expansion-type fixing, are not a requirement with Dri Flex.

The design of Dri Flex remedial tie ensures that any potential for installer error can be minimised. The multiple drip design of each fin allows the Dri Flex to be installed at an angle of up to 25° towards the inner leaf without the possibility of any water transfer across the cavity. It is recommended that each Dri Flex is installed horizontally.



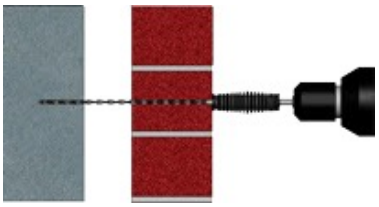
Dri Flex

Installation.

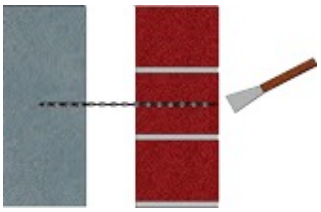


Drill a 5 mm to 7 mm pilot hole through the near leaf and into The far leaf, 15 mm deeper than The length of the Dri Flex tie Being installed, using a rotary Percussion drill. The hole should be 25 mm from the end of any brick and on its horizontal centre line.

Insert the Dri Flex tie into The Power Support Tool, offer the free end of the tie up to the hole in the near leaf and, using a SDS-plus hammer drill, drive the Dri Flex tie into the pilot hole.



Once the Dri Flex tie is installed into the near leaf pilot hole, it will proceed across any cavity and into the far leaf. The Dri Flex Power Support Tool is designed so that the end of the Dri Flex tie is set Below the surface of the near leaf.



The near leaf pilot hole may then Be filled with a mastic material and/or colour matched for an Excellent finish.

The Materials

Dri Flex ties are manufactured from Grade 304 austenitic stainless steel. The 8 mm diameter Dri Flex has a tensile strength in excess of 10 kN. The manufacturing process produces very hard fins that Are able to cut a thread into the hardest concrete, but maintains a very soft and flexible core. Dri Flex ties may also be used where there is a need for a fire resistance in excess of 30 minutes.

Fixing Densities

In general terms the fixing densities for Dri Flex remedial wall ties would be the same as new build - 2.5 per m² or 450 mm vertically and 900 mm horizontally in a domino five pattern. This density would, however, be subject to on site testing to Ensure that the required tensile loadings are being Achieved. It should also be borne in mind that around All openings - doors and windows - ties should be Installed at no more than 300 mm vertical centres and no more than 225 mm from the edge of the opening. BRE Digest 401 gives more information on the proof load test requirements. If the masonry is so weak or friable that the required proof test load for standard density fixings cannot be achieved, it is quite acceptable to increase the density of Dri Flex ties to ensure that the overall loading per m² is achieved. Lowering the installation density below the standard is not recommended.

Testing

Because Dri Flex ties cannot be randomly tested on site, it is necessary to perform comprehensive pre-Installation Tests. There are several different methods of Performing tests, but the most straightforward way is to drill into both leafs as described in the Installation Procedures section above. The near leaf hole may then be Overdrilled to 12 mm. The Dri Flex tie should then be installed into the far leaf and a test performed using the Target Load Test Unit. The fixing capability into the near leaf material may ascertained by drilling into the near leaf as in the Installation Procedures section above and inserting the tie to a maximum depth of 80 mm and then test using a Target Load Test Unit. It is recommended that testing is performed in accordance with the requirements of BRE Digest 401. Only in exceptional circumstances does the proof test load requirement exceed 1 kN.

Special Features

One piece design - no moving parts to lose
Immediate proof testing of connection
Multiple drip points to deter water transfer
Flexible design allows natural building movement
Fixes through insulation material
Minimal disfiguration to buildings
Fixes into all commonly found building materials
Quick and easy installation
Three different diameters for all applications