

# PRODUCT GUIDE



STRUCTURAL REFURBISHMENT AND RESTORATION



For more than twenty years Clan have provided their clients with a complete service in the field of structural engineering and remedial works to both the public and private sectors. Contracts undertaken have been diverse, from tower blocks and listed buildings to water treatment works and local authority housing estates.

# SUCCESS BUILT ON INNOVATION

Since the early 1980's, Clan have been at the forefront of remedial cavity wall tie technology designing new remedial wall ties, the Kontrakt tie, lateral restraint systems, the Clanbolt, and the unique isolation process for treatment of corroding wall ties, the Clansleeve.

Over the years as we have been confronted with new problems within the refurbishment industry, we have introduced innovative solutions designed in conjunction with our structural engineers, with not just the specifier in mind, but also the contractor. A good product not only overcomes the structural problems but is simple to fix reducing operator error. All of our products are designed in accordance with the basic principles that Clan adhere to; a quick, simple and virtually unobtrusive repair.

In addition to our own range of structural fixings, Clan have brokered relationships with many European companies, exchanging ideas enabling us to introduce new methods of repair, such as Xypex crystalline waterproofing, high strength concrete repair materials and the latest carbon fibre technology for repairing structures.

Our range of services is continuing to grow with our sister company, Thin Joint Technology, which supplies tools, fixings and mortars for construction using thin jointed aerated blockwork. TJT also supply coloured render systems, external wall insulation systems and decorative plasters.

Traditionally horizontal cracking of every 5 mortar joints was a good indication of wall tie failure. The cracking is caused by “fishtail” wall ties corroding, expanding in size and lifting panels of brickwork. A building which has wall ties in this advanced state of corrosion has already been affected structurally and rebuilding of the outer leaf may be the best course of action.

Installation of wall ties into a structure should be used as a preventative measure before distortion of the brickwork has occurred.

Unfortunately it is virtually impossible to pinpoint the precise moment a building will begin to move. Movement would usually be due to a force being applied to the wall and the wall ties, whether due to corrosion, omission, poor design, bad workmanship or failure, all causing bulging of the wall, or in more extreme cases, collapse.

Identification of cracking caused by corroding wall ties can be seen as regular cracking of joints containing wall ties, usually every fifth course with occasional stepped cracking.

Generally vertical cracking is caused by moisture expansion, drying shrinkage or foundation movement.

Portland cement can suffer from sulphate attack causing cracking of every mortar joint, sulphate attack cannot affect black ash or lime mortars.

Location of the wall tie with a wall tie locator and the subsequent inspection with an endoscope will give an idea to the degree of corrosion but more importantly will give an experienced surveyor an idea of the particular crack patterns and movement that are generally associated with each type of tie.

It is important to understand that the wall tie will corrode in the outer leaf, where moisture and air are present, and more often than not, the middle section of the tie is still in good condition within the cavity.

**A) Spacing of wall ties**

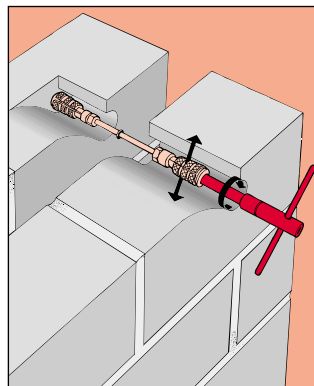
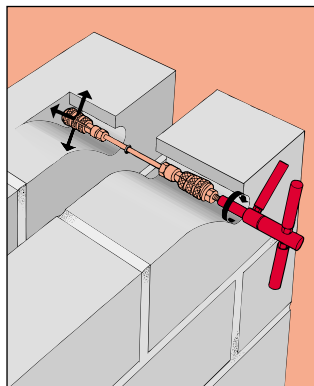
Least leaf thickness (one or both) mm	Type of tie	Cavity width mm	Equivalent number of ties /M <sup>2</sup>	Spacing of ties	
				Horizontal mm	Vertical mm
65 to 90	All	50-75	4.9	450	450
90 or more	See B below	50-300	2.5	900	450

**B) Selection of wall ties: Types and lengths**

Least leaf thickness (one or both) mm	Cavity width mm	Tie length mm	Permissible type of tie <sup>1</sup>
90	15-30	195	Kontrakt tie or Griptie
90	30-65	195	Kontrakt tie or Griptie
90	50-90	220	Kontrakt tie or Griptie
90	80-140	250	Griptie <sup>2</sup>
90	130-180	300	Griptie <sup>2</sup>

NOTE 1  
The list of ties is restricted to mechanical-mechanical ties as this should be the first choice for any remedial contract. However, some types of construction, such as lightweight block, hollow brick etc, will necessitate the use of resins and sieves.

NOTE 2  
Where cavities increase to over 100 mm then remedial ties should be selected with a 6 mm body such as the Griptie. However, remedial ties with a 5 mm body can be used but the spacings should be increased to 5/M<sup>2</sup> (or 450 mm horizontally by 450 mm vertically)



**KEYS**

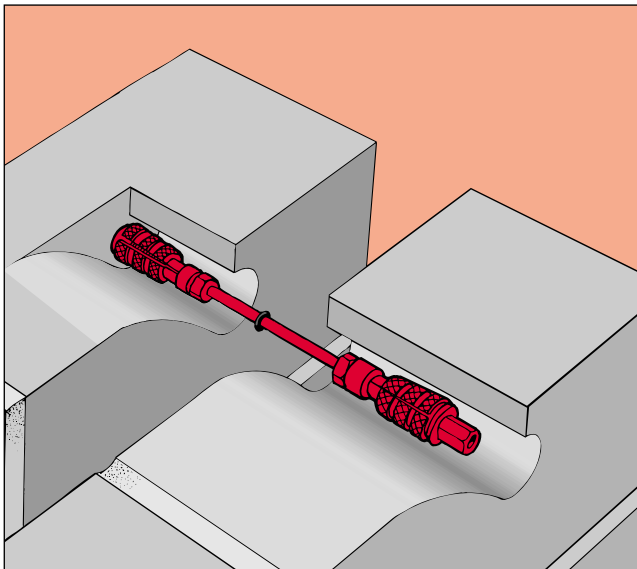
Simple to use keys for use with remedial wall ties and lateral restraints.

Robust stainless steel design available in both 5mm and 6mm.

SEE PAGE 13 FOR INFORMATION ON CLANSLEEVES

Cavity wall tie corrosion is a problem which only became recognised and documented in the mid 1980's. Clan were already a leader in the field of wall tie replacement by 1984 and have since been at the forefront of product development and in producing the first Code of Practice for the installation of replacement wall ties.

Metal wall ties used in cavity wall construction over the past 70 years have been inadequately protected from corrosion and the resultant effects have caused structural defects. These defects, horizontal cracking, bulging of walls or stepped cracking around openings have now been recognised as common occurrences which had hitherto been unexplained.



### **KONTRAKT TIE MM** (Brick to brick)

Grade A2 stainless steel body, 5mm Ø with 10mm copper alloy shells in accordance with BS 1243

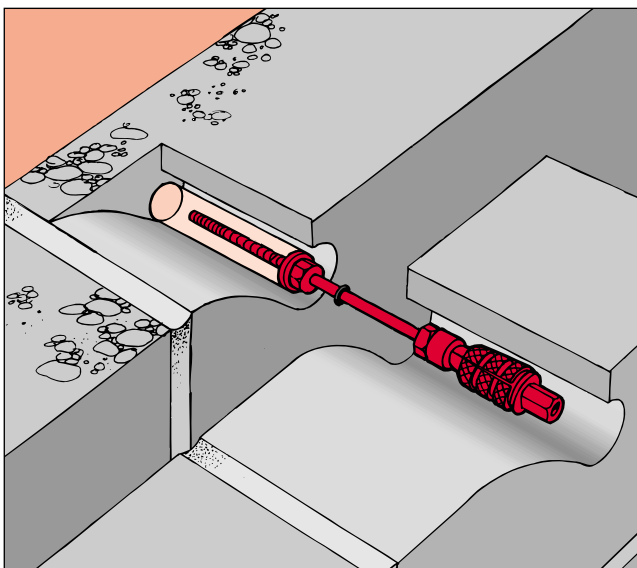
The Kontrakt MM tie is a general purpose fixing for use in brick, concrete and dense blockwork, having malleable expanding elements suitable for all but the most fragile of substrates.

The design of the expansion elements provide a malleable fixing which can be tested independently on the day of installation, or more importantly, in the years to come.

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**DRILL 10.5mm**

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### **KONTRAKT TIE RM** (Brick to block)

Grade A2 stainless steel body, 5mm Ø with 10mm copper alloy shells in accordance with BS 1243 and a unique end profile for enhanced resin bond. Suitable for fixing of fragile inner leaf connections, but allowing testing at a later date. To be used in conjunction with Clan GP3 or Clan SF resin.

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**DRILL 10.5mm**

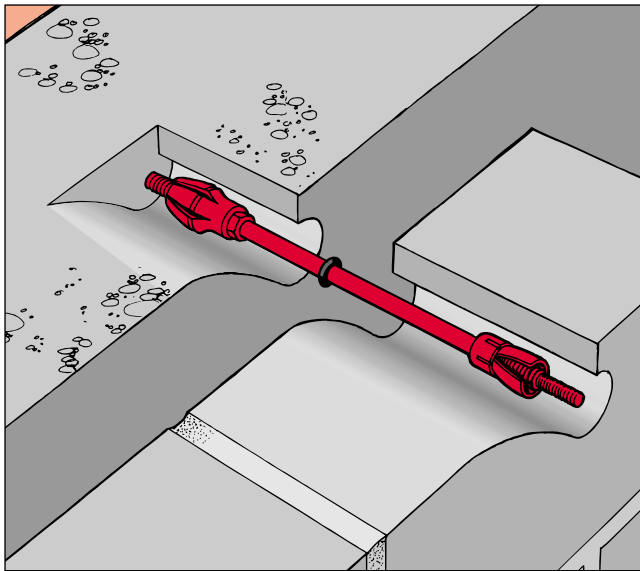
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**FOR SALES AND TECHNICAL ADVICE, PHONE: 0151 422 8000**

To ensure the correct tie is used, a survey of the structure is essential to identify the existing makeup of the wall, i.e. type of inner/outer leaf cavity width etc. Include testing to check for correct tie type.

Before specifying the density and spacing, wall ties should conform to BS 5628 Pt 3 1982. Testing throughout the contract is essential to ensure the quality of workmanship and to ensure any changes encountered in the fabric of the buildings are noted, so that the correct remedial action can be taken.

Testing loads should be applied to the remote leaf only, with at least 5% of ties tested.



### **GRIPTIE** (Brick to concrete)

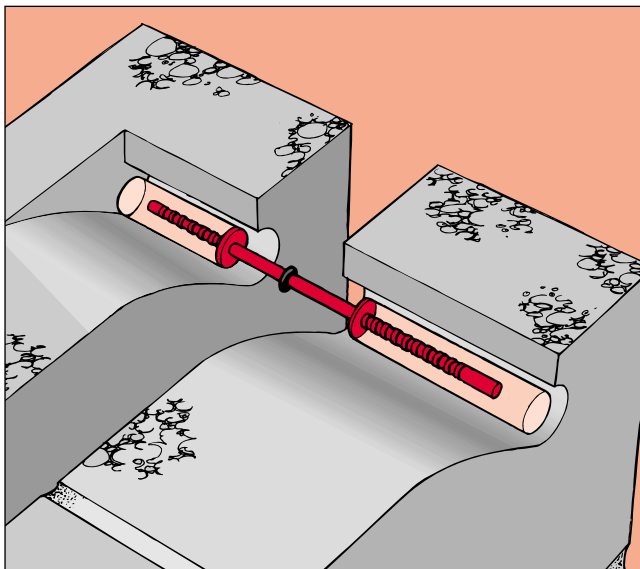
Grade A2 stainless steel body, 6mm Ø with 12mm stainless steel shells to BS 970 Part 1 1991.

The Griptie is a high quality versatile fixing for use in solid base materials and for high rise applications, where ultra high performance is required.

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**DRILL 13mm**

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### **RESITIE** (Brick to block)

Grade A2 stainless steel rods, 5 or 6mm Ø with a unique end profile for enhanced resin bond.

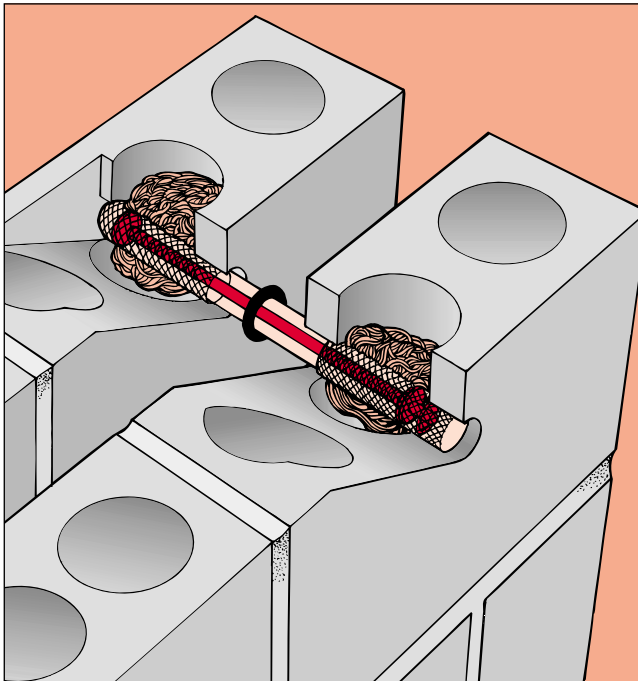
The Resitie is designed to be used in conjunction with Clan GP3 resin. The absence of expansion forces makes this tie an ideal choice where fragile substrates are encountered.

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**DRILL 10mm**

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SEE PAGE 14 - 17 FOR RESIN FIXING SYSTEMS



### **SIEVE TIE** (Hollow brick to hollow brick)

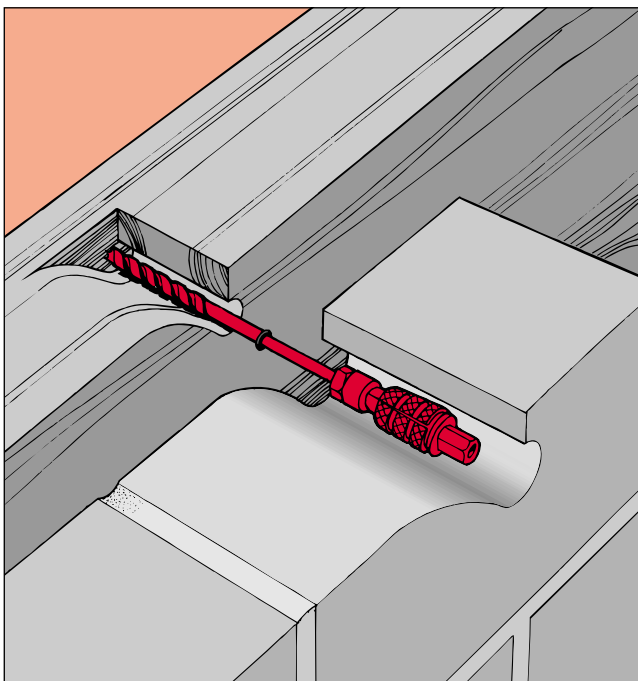
Grade A2 stainless steel body, 5mm or 6mm Ø with concentric rings at either end and plastic piston rings. Plastic mesh with polypropylene solid centre piece.

The Sieve Tie is designed specifically to re-tie hollow or perforated block/brick. Used in conjunction with Clan GP3 resin, the Sieve Tie will encapsulate resin within the outer casing. The plastic mesh ends control the flow of resin into the voids, providing a secure fix into virtually any problematic substrates.

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**DRILL 12mm**

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### **TIMBER TIE** (Brick to timber)

Grade A2 stainless steel rod with a formed timber thread one end and RT10 expansion anchor the other.

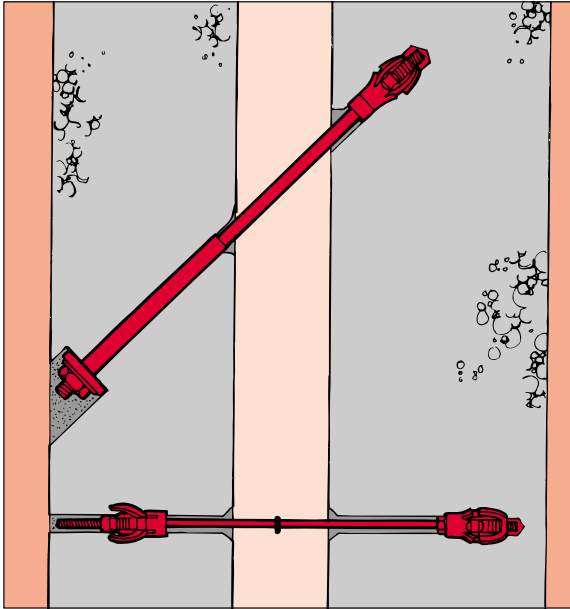
The Timber Tie is designed specifically to tie back masonry walls to timber framed buildings.

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**DRILL 10.5mm**

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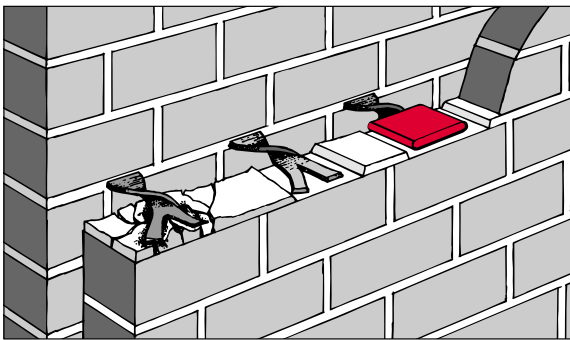


### PANEL TIE

#### (Concrete frame to concrete panel)

Many concrete frame structures have prefabricated panels attached to the outside of the buildings. These panels are fixed to the frame by steel pins or frame cramps. Fixings can fail due to corrosion, poor design or bad workmanship.

The panel tie has been designed as a remedial fixing, when failure of these fixings has been diagnosed. The system combines a large tie which suspends the panel and second fixing counteracts the lever arm and triangulates the system resulting in a strong economic fix.



### CLANSLEEVE

The addition of new remedial wall ties to stabilise the outer leaf is insufficient on its own where solid fishtail ties exist, as continued corrosion will result in further disruption of the wall. Insitu isolation of the existing wall tie was endorsed in BRE Digest 329. This treatment consisted of isolating the wall tie from the outer leaf of brickwork, using a simple and inexpensive method, patented by Clan. This method consisted of installing a PVC sleeve, containing a rust inhibiting compound over the end of the wall tie in the outer leaf and is widely recognised as the most economical way to treat existing ties to prevent further corrosion. The semi-rigid nature of the Clansleeve makes it easy to locate around the corroding tie and is pushed home by hand pressure. Sleeves can be installed over a wide area, awaiting inspection prior to the final process of repointing. This enables the supervising officer to approve the installation as part of on-going remedial work.

#### The cost effective treatment for corroded wall ties

- No need for brickwork removal
- No internal disruption
- Quality controlled isolation to ISO 9000



### CHISELS

#### Isolating Chisel - SDS Max end

This chisel has been designed to open up the mortar joints around existing ties before the insertion of the Clansleeve.

The Isolating chisel is only 25mm wide and 4mm thick allowing removal of mortar above, below and to each side of existing fishtail ties.

SEE PAGE 14 - 17 FOR RESIN FIXING SYSTEMS



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