THORHELICAL® AUSTRALIA

Service-Load Test Meter Model HEL3700

The information provided in this document is given in good faith and is believed to be correct at the time of issue.

When carrying out tensile load tests on fixings secured to construction materials the loads applied usually exceed the design service load for the fixing system. Users must take care to protect themselves and others from the effect of sudden failures.

TEST METER

The HEL3700 Test Meter is designed specifically for testing precise pitch helical wall tie systems. The unit comprises an integral bridging unit that houses a mechanical pulling arrangement, which is fitted through a hydraulic load cell. The Meter has a displacement indicator marked in 1/8" and 5mm increments and an 800lbf (3.56kN) pressure gauge, such that directly measures the load applied to the helical tie (Fig 1).

Fig 1

A purpose designed test key, (Fig 2), which fits into one of two available profiled apertures, winds on to the tie to provide means of testing. The key jaws bite into the tie when the arrangement is subjected to an axial load. The biting engagement of the key upon the tie is approximately $^{1}/_{16}$" (1.6mm) deflection at normal service loads

Fig 2

TEST PURPOSE

Pre-Contract wall tie testing enables an Engineer or other specifying professional to examine the compatibility of a tie or a connection method with the materials of a building. Testing of the anchorage at both inner and outer wall layers identifies the connection with the least resistance to load, this connection being the governing factor in the design or approval of a wall tie system.

In-process tie testing is preferably focussed on connection of the ties to the governing wall layer. The tests enable a tie installer or a site supervisor to verify the performance of the installation, such as is required to monitor quality control and/or to identify variations within the structure. Sampling rates, commonly between 10% and 2½ % - decreasing upon the quantity of ties installed, are usually identified in Contract/Tender documents and are often as advised by the tie manufacturer or by recognised national advisory institutions, such as the UK's Building Research Establishment (ref BRE Digest 401).

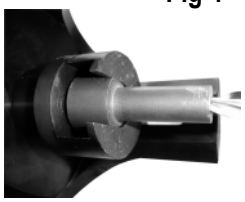
TEST SET-UP

Near wall layer: To connect the Meter to the tie, the tie is driven to the full depth of the near layer, leaving at least 3½" (90mm) protruding. The Test Meter is placed over the protruding tie such that the tie extends into its central bore. The shaft of the test key is inserted into the top end of the Test Meter, to windingly engage the tie, and the keys head is seated into the upper aperture to prevent rotation under load conditions (Fig 3).

Fig 3

Remote wall layer: To connect the Meter to the tie, the tie is driven to a pre-selected depth into the remote wall layer via a clearance bore provided to the near wall layer. The shaft of the test key is passed into the clearance bore to windingly engage the tie, and the keys head is seated into the Test Meters lower profiled grabber to prevent rotation under load conditions (Fig 4).

Fig 4



TEST PROCEDURE

The knurled nut is turned clockwise by hand such that the Meter is secured squarely to the wall and a 'bedding–in' load of about 50lbf (0.22kN) is applied to the tie. The 'Tommy Bar' is used to further tighten the knurled nut and slowly increase the tensile force on the tie up to the desired load, whereby the gauge reading is recorded. The knurled nut is wound counter clockwise to release the load thereby permitting withdrawal of the test key.

Following testing the tie is connected to the other wall layer so as to be functional. Ties tested to the near wall layer are driven fully into the remote layer to complete installation and ties tested to the remote layer are provided with a resin grouted connected to the near layer.

Ties that, for any reason, fail to meet serviceable test loads are not to be relied upon as being a functional tie or as being part of a functional tie system. A correctly installed replacement tie must be fitted close by.

DISPLACEMENT

Upon applying a bedding-in load to the tie - the position of the pointer upon the deflection indicator markings is recorded. Some indication of deflection, under service load conditions, is obtained by comparing this first position to the position of the pointer while the fixing is under load.

Fig 5

For a more detailed measurement and analysis of loaded deflection - such as may be required for product approvals or to establish characteristic load values for ties fixed to generic types of construction material - a precision Dial Test Indicator Gauge (not supplied) is fitted to the side of the Test Meter.

The stem of the DTI gauge sits in the Tommy Bar holder and is held in place with a 5/32" UNC (M4) grub screw. The extending telescopic DTI needle sits onto, and is activated by, the top surface of the deflection indicator pointer (Fig 6).

Fig 6

TEST KEY ENGAGEMENT

A significant force is applied to the tie/test key engagement during testing such that the key bites into the tie in order to accumulate load. To prevent permanent damage to the tie, or to the test key, the recommended maximum load should not be exceeded, irrespective of the load capacity of the hosting construction material into which the tie is connected. These loads are shown below

NOMINAL TIE ∅		TEST KEY	RECOMMENDED MAXIMUM LOAD	
METRIC	IMPERIAL		METRIC	IMPERIAL
6mm	¼"	M6*	2.5kN	560lbf
9mm	3/8"	M9	3.5kN	800lbf

SPECIFICATION	METRIC	IMPERIAL
Load Capacity	3.5kN	800lbf
Nominal Base Diameter	90mm	3 1/2"
Nominal Height	152mm	6"
Lower Grab Aperture (d x h)	25.4 x 12mm	1" x 0.472"
Bore Diameter	16mm	0.630"
Displacement Indicator Increments - Small	3.17mm	0.125" (1/8")
Displacement Indicator Increments - large	5.0mm	0.197"
Piston Area	6.45mm^2	2"^{2}
Stroke	38.1mm	1.5"
Oil Type	EP32 Hydraulic Fluid	
Gauge Type	60mm Bourdon Tube 400 PSI	
Gauge Accuracy	+/- 1% FSD	

CARE & ATTENSION

The Test Meter is a precise measuring unit, which is supplied in a robust protective case. Critical to the reliability and accuracy of this compact measuring apparatus is user care and routine maintenance.

- ✓ Keep piston rim and load stud free from detritus.
- ✓ Keep central load stud lightly lubricated.
- ✓ Keep Test Meter boxed when not in use.
- ✓ Service and re-calibrate the Test Meter at least once in every 12month period - sooner if the gauge or Meter is damaged.

N.B. Test Meter Serial No. is located on underside of unit.

Gauge Batch No. is located on brass nut

- Do not exceed maximum load capacity.
- Avoid continuous loading for periods greater than half an hour.
- Do not expose the Test Meter - when under maximum load - to extreme temperature increase (e.g. avoid prolonged exposure to intense sunlight.

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