

# Low Thermal Conductor



Orchestrate improvements to wall U-values  
with Ancon Low Thermal Conductivity Wall Ties



**Ancon**<sup>®</sup>

# Helping to deliver sustainable, energy-efficient buildings

Wall Ties are an essential element in the strength and stability of a cavity wall, but by crossing the insulated cavity they act as a thermal bridge, providing a path for heat to escape from the building. Generally speaking, the wider the cavity, the more substantial the Wall Tie needs to be and the greater the effect the tie will then have on the thermal efficiency (U-value) of the wall.

The challenge for the Wall Tie industry was to reduce the thermal conductivity of its products whilst continuing to meet the structural performance requirements of wide cavity construction.

Ancon has met this challenge with an innovative range of low thermal conductivity wall ties.

Ancon low thermal conductivity wall ties suit cavities up to 450mm and minimise heat loss through thermal bridging, improving the energy efficiency of a masonry cavity wall. Ideal for today's super-insulated building envelopes, they are suitable for both new-build and retrofit.

## Ancon Teplo Basalt Fibre Wall Ties

Ancon Teplo wall ties comprise pultruded basalt fibres set in a resin matrix which offers a thermal conductivity of just 0.7W/mK. The thermal efficiency of this innovative material means these ties are excluded from U-value calculations to BS EN ISO 6946, minimising insulation thickness and wall footprint. A heavy duty rubber o-ring prevents water crossing the cavity.

The original plain-ended **TeploTie** can be used in new-build cavity walls or be resin-fixed into an existing structure during retrofit.

The **Teplo-BF** new-build wall tie, with its moulded safety ends, offers improved buildability and mortar bond strength, making it more user-friendly and suitable even in slow drying lime mortars.

The **Teplo-BFR** features a plain end for resin anchoring into an existing structure and a moulded safety end for building into a new bed joint.

### For cavities from 50mm to 450mm



**Ancon Teplo-BF1** (Type 1)

**Ancon TeploTie1** (Type 1)

Lengths available:  
200, 225, 250, 275mm

**Ancon Teplo-BF2** (Type 2)

**Ancon TeploTie2** (Type 2)

Lengths available: 200, 225, 250,  
275, 300, 325, 350, 375, 400, 425mm

**Ancon Teplo-BF3** (Type 3)

**Ancon TeploTie3** (Type 3)

Lengths available: 450, 475,  
500, 525mm

**Ancon Teplo-BF4** (Type 4)

**Ancon TeploTie4** (Type 4)

Lengths available: 200, 225, 250,  
550, 575mm

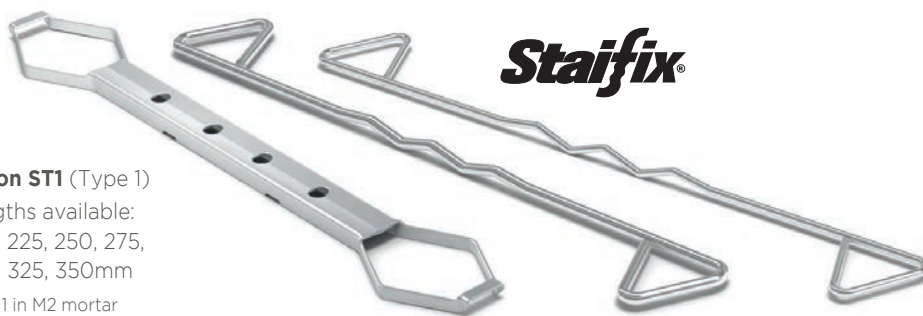
**Ancon Teplo-BFR** (Tie Type dependent on resin-end/substrate)

Lengths available: 210 - 585mm

## Ancon Stainless Steel Wall Ties

These stainless steel wall ties are value-engineered to provide high performance at a competitive price. The effect Ancon's slender high tensile wire wall ties have on heat transfer is negligible and so, like the Teplo range, they are generally excluded from U-value calculations to BS EN ISO 6946.

### For cavities from 50mm to 175mm



**Staifix**



**Ancon ST1** (Type 1)

Lengths available:  
200, 225, 250, 275,  
300, 325, 350mm

Type 1 in M2 mortar

**Lambda value (W/mK) and cross-sectional areas are given overleaf to aid U-value calculations.**

**Staifix RT2** (Type 2)

Lengths available:  
200, 225, 250, 275mm

**Staifix HRT4** (Type 4)

Lengths available:  
200, 225, 250, 275mm  
Suitable for use in internal  
separating walls to  
Approved Document E

### CE Marking

Ancon stainless steel wall ties are CE marked to BS EN 845-1 in accordance with the EU Construction Products Regulation. The basalt fibre Teplo range is outside the scope of CE marking.



## Ancon Teplo-L-Tie Basalt-Fibre Frame Cramp

The Ancon Teplo-L-Tie is ideal where a low thermal conductivity fixing is required between new masonry and in-situ steel, timber, concrete or masonry. It offers all the same benefits as a Teplo cavity wall tie with an additional L-shaped stainless steel upstand, mechanically and chemically bonded to one end, with a 7mm diameter hole to allow surface fixing. A British Board of Agrément certificate is available to download online.

**For cavities from 100mm to 300mm**



Chi values (W/K) are given overleaf.

### Suitable Fixings

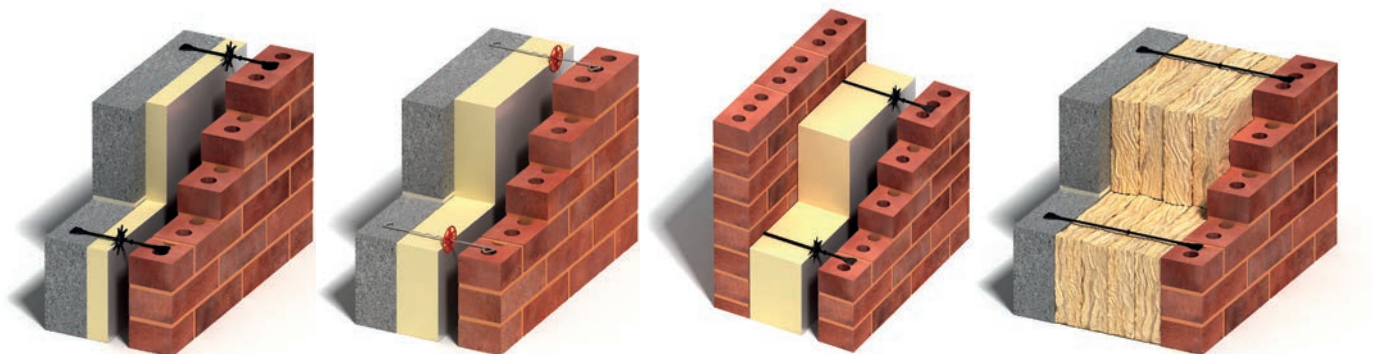
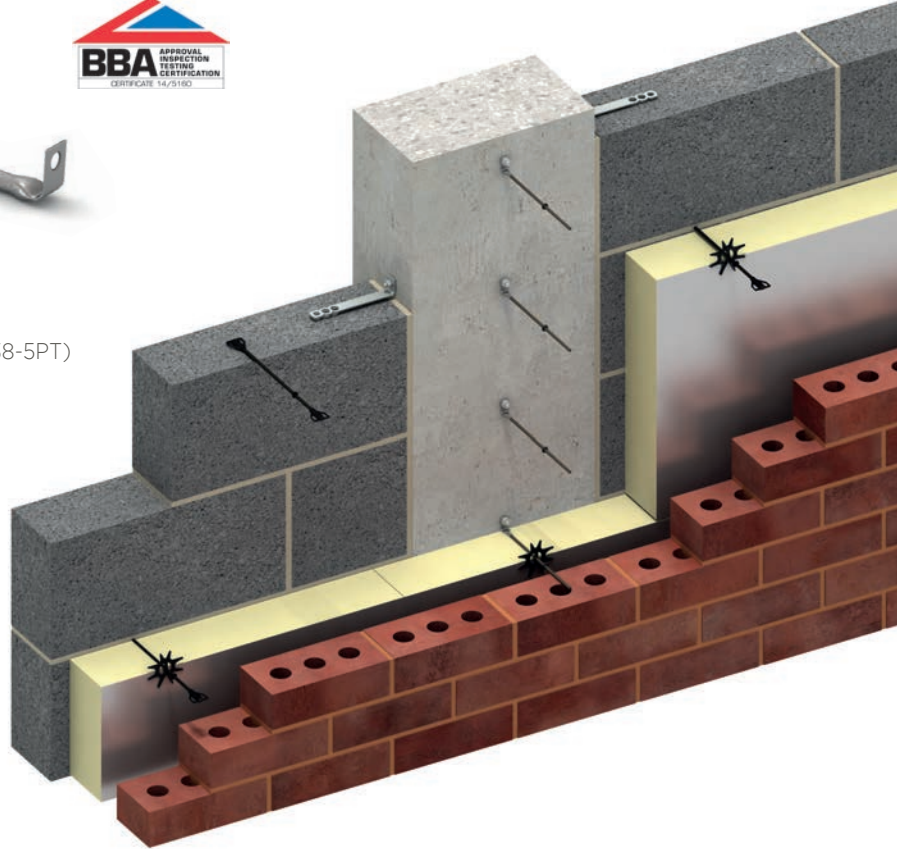
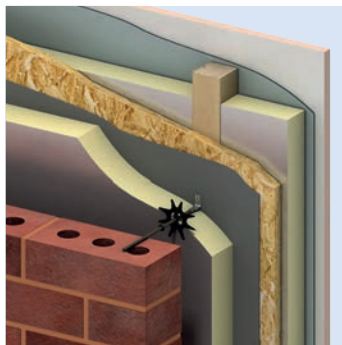
Masonry: Plug and Screw

Concrete: Plug and Screw, Expansion Bolt (M6)

Steel: Set screws (M6), Self-Drilling Screws (SDTSS-38-5PT)

Timber: Countersunk Wood Screw (5mm x 30mm)

### Example Wall Profiles



### Project References

Ancon's low thermal conductivity wall ties have been used on numerous exemplary low energy construction projects, including certified zero carbon and PassivHaus developments. Visit [www.ancon.co.uk](http://www.ancon.co.uk) or contact Ancon for further information.

# Information for U-value Calculations

For the accurate calculation of a wall's U-value, it is important to use the correct information for the wall ties, rather than allowing a program to apply a default value as this will over-estimate the effect of an Ancon Wall Tie. BS EN ISO 6946 permits the corrections due to wall ties ( $\Delta U_f$ ) and air gaps between insulation boards etc to be omitted if the corrections amount to less than 3% of the uncorrected U-value of the wall.

## Ancon Teplo Basalt Fibre Wall Ties

Teplo-BF, Teplo-BFR and TeploTie cavity wall ties have a thermal conductivity of less than 1.0W/mK and so are excluded from U-value calculations to EN ISO 6946, irrespective of tie diameter.

## Ancon Stainless Steel Wall Ties

The thermal conductivity and cross-sectional areas of Ancon's stainless steel wall ties are shown below for use in U-value calculation programs.

Tie Reference	Tie Type	Tie Length (mm)	Cavity Range (mm)	Cross-Sectional Area (mm <sup>2</sup> )	Thermal Conductivity (W/mK)
HRT4-200	4	200	50-75	3.5	17.0
HRT4-225	4	225	76-100	4.2	17.0
HRT4-250	4	250	101-125	6.2	17.0
HRT4-275	4	275	126-150	6.2	17.0
RT2-200	2	200	50-75	7.5	17.0
RT2-225	2	225	76-100	7.5	17.0
RT2-250	2	250	101-125	8.6	17.0
RT2-275	2	275	126-150	10.2	17.0
ST1-200	1	200	50-75	19.5	17.0
ST1-225	1	225	76-100	19.5	17.0
ST1-250	1	250	101-125	19.5	17.0
ST1-275	1	275	126-150	23.4	17.0
ST1-300	1	300	151-175	23.4	17.0
ST1-325	1	325	176-200	23.4	17.0
ST1-350	1	350	201-225	23.4	17.0

## Ancon Teplo-L-Tie Basalt-Fibre Frame Cramp

This basalt-fibre frame cramp with a stainless steel upstand has been thermally modelled by a third party expert, allowing Ancon to provide accurate Chi values for each product length. To understand the effect of these wall ties in a square metre, the Chi value (W/K) is multiplied by the number of wall ties. The exceptional thermal efficiency of the Teplo range is such that it is unlikely ever to be taken into account in U-value calculations as a thermal bridge.

Tie Reference	Tie Type	Tie Length (mm)	Cavity (mm)	Chi Value (W/K)	$\Delta U_f$ if 2.5 ties/m <sup>2</sup> (W/m <sup>2</sup> K)	$\Delta U_f$ if 4.4 ties/m <sup>2</sup> (W/m <sup>2</sup> K)
TEPLO-L-5-165	Type 3 and Type 6	165	100	<b>0.000335</b>	0.00084	0.00147
TEPLO-L-5-190	Type 3 and Type 6	190	125	<b>0.000260</b>	0.00065	0.00114
TEPLO-L-5-215	Type 3 and Type 6	215	150	<b>0.000215</b>	0.00054	0.00095
TEPLO-L-5-240	Type 4 and Type 6	240	175	<b>0.000175</b>	0.00044	0.00077
TEPLO-L-5-265	Type 4 and Type 6	265	200	<b>0.000150</b>	0.00038	0.00066
TEPLO-L-7-165	Type 2	165	100	<b>0.000515</b>	0.00129	N/A, not Type 6
TEPLO-L-7-190	Type 2	190	125	<b>0.000405</b>	0.00101	N/A, not Type 6
TEPLO-L-7-215	Type 2	215	150	<b>0.000340</b>	0.00085	N/A, not Type 6
TEPLO-L-7-240	Type 2	240	175	<b>0.000280</b>	0.00070	N/A, not Type 6
TEPLO-L-7-265	Type 2	265	200	<b>0.000245</b>	0.00061	N/A, not Type 6
TEPLO-L-7-290	Type 2 and Type 6	290	225	<b>0.000210</b>	0.00053	0.00092
TEPLO-L-7-315	Type 2 and Type 6	315	250	<b>0.000190</b>	0.00048	0.00084
TEPLO-L-7-340	Type 2 and Type 6	340	275	<b>0.000165</b>	0.00041	0.00073
TEPLO-L-7-365	Type 2 and Type 6	365	300	<b>0.000150</b>	0.00038	0.00066

## Wall Tie Types

Wall Ties are classified by the Types given in PD6697 (Types 1 to 4) and, specifically for timber frame construction, BS5268-6.1:1996 (Types 5 to 7). These documents should be consulted for complete information on wall tie use, such as altitude and wind speed restrictions, however, generally speaking, Type 1 ties are suitable for buildings of any height\*, Type 2 and Type 3 ties are suitable for buildings up to 15 metres, Type 4 ties are suitable for houses up to 10 metres and Type 6 ties are suitable for timber frame developments up to 15 metres. \*The original TeploTie is suitable for a maximum building height of 18 metres.

## Wall Tie Spacing

Wall Tie Types 1 to 4 should be installed at a standard spacing of 2.5 per square metre (900mm horizontal x 450mm vertical centres). Decreasing the centres can increase the performance e.g. Type 3 to Type 2. Contact Ancon for details. Type 6 timber-to-masonry wall ties should be installed at a minimum of 4.4 per square metre.