Ancon®

Low Thermal Conductivity Wall Ties
Helping to deliver sustainable, energy-efficient buildings
Leviat is a world leader in connecting, fixing, lifting and anchoring technology. From the build of new schools, hospitals, homes and infrastructure, to the repair and maintenance of heritage structures, our engineering skills are making a difference around the world.

We provide technical design assistance at every stage of a project, from initial planning to installation and beyond. Our technical support services range from simple product selection through to the development of a fully customised project-specific design solution.

Every promise we make locally, has the commitment and dedication of our global team behind it. We employ almost 3,000 people at 60 locations across North America, Europe and Asia-Pacific, providing an agile and responsive service worldwide.

Leviat, a CRH company, is part of the world’s leading building materials business.

We imagine, model and make engineered products and innovative construction solutions that help turn architectural visions into reality and enable our construction partners to build better, safer, stronger and faster.
Industrial Technology
Mounting channels, pipe clamps and other versatile framing systems that provide safe fixing in a wide range of industrial applications.

Formwork & Site Accessories
Non-structural accessories that complement our engineered solutions and help keep your construction environment operating safely and efficiently, including moulds for casting standard and special concrete elements and construction essentials such as reinforcing bar spacers.

Anchoring & Fixing
Systems for fixing secondary fixtures to concrete, including anchor channels, bolts and inserts; also tension rod systems for roofs and canopies.

Lifting & Bracing
Systems for the safe and efficient transportation, lifting and temporary bracing of cast concrete elements and tilt-up panels before permanent structural connections are made.

Façade Support & Restraint
Systems for the safe and thermally-efficient fixing of the external building envelope, including brick and natural stone, insulated sandwich panels, curtain walling and suspended concrete façades, and also the repair and strengthening of existing masonry installations.

Structural Connections
Systems to form robust, efficient connections, and continuity of concrete reinforcement as necessary, between walls, slabs, columns, beams and balconies, providing structural integrity as well as enhanced thermal and acoustic performance.

Other areas of expertise:
- Masonry Support Systems
- Windposts
- Lintels
- Brick Slip Systems
- Wall Ties & Restraints
- Masonry Reinforcement
- Natural Stone Façade Systems
- Cavity Trays
- Sandwich Panel anchor
- Suspended concrete façade
- Masonry Repair
- Masonry Support Systems
- Windposts
- Lintels
- Brick Slip Systems
- Wall Ties & Restraints
- Masonry Reinforcement
- Masonry Repair
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Low Thermal Conductivity Wall Ties

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### 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. Leviat has met this challenge with its innovative range of Ancon 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-BF Wall Ties
Ancon Teplo Basalt Fibre Cavity 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. The unique ribbed shank of these ties provides an effective moisture drip.

Plain-ended Ancon Teplo-R ties, inspired by the original basalt fibre wall tie, are ideal for resin-fixed remedial/retrofit projects.

The Ancon 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 Ancon 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.

The range has been independently tested and is BBA approved; a British Board of Agrément certificate is available to download online.

Ancon Stainless Steel Cavity Wall Ties
Ancon Stainless Steel Wall Ties are value-engineered to provide high performance at a competitive price. The effect that the 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 450mm

| Ancon Teplo-BF1 (Type 1) | Lengths available: 200, 225, 250, 275mm |
| Ancon Teplo-BF2 (Type 2) | Lengths available: 200, 225, 250, 275, 300, 325, 350, 375, 400, 425mm |
| Ancon Teplo-BF3 (Type 3) | Lengths available: 450, 500, 525mm |
| Ancon Teplo-BF4 (Type 4) | Lengths available: 200, 225, 250, 550, 575mm |
| Ancon Teplo-BFR (Tie type dependent on resin-end/substrate) | Lengths available: 210 - 585mm |
| Ancon Teplo-R (Tie type dependent on resin-end) | Lengths available: 215 - 590mm |

For cavities from 50mm to 175mm

| Ancon ST1 (Type 1) | Lengths available: 200, 225, 250, 275, 300, 325, 350mm |
| Ancon Staifix RT2 (Type 2) | Lengths available: 200, 225, 250, 275mm |
| Ancon Staifix HRT4 (Type 4) | Lengths available: 200, 225, 250, 275, 300mm |

Suitable for use in internal separating walls to Approved Document E

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

Product Marking
Ancon Stainless Steel Wall Ties are UKCA & CE marked to BS EN 845-1 in accordance with the Construction Products Regulation. Basalt fibre Ancon Teplo Wall Ties are outside the scope of UKCA & CE marking.
Ancon Teplo-BFL-Basalt Fibre Frame Cramps
The Ancon Teplo-BFL-Tie is ideal where a low thermal conductivity restraint fixing is required between a masonry outer leaf and an in-situ structure. It offers the same thermal benefits as a Teplo-BF cavity wall tie, with an additional stainless steel upstand which is mechanically fixed to one end of the tie to allow for a secondary fixing. The range has been independently tested and is BBA approved; a British Board of Agrément certificate is available to download online.

For cavities from 76mm-400mm
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 or contact us 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

Ancon Teplo-BF, Teplo-BFR and Teplo-R 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.

<table>
<thead>
<tr>
<th>Tie Reference</th>
<th>Tie Type</th>
<th>Tie Length (mm)</th>
<th>Cavity Range (mm)</th>
<th>Cross-Sectional Area (mm²)</th>
<th>Thermal Conductivity (W/mK)</th>
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</thead>
<tbody>
<tr>
<td>HRT4-200</td>
<td>4</td>
<td>200</td>
<td>50 - 75</td>
<td>3.5</td>
<td>17.0</td>
</tr>
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<td>HRT4-225</td>
<td>4</td>
<td>225</td>
<td>76 - 100</td>
<td>4.2</td>
<td>17.0</td>
</tr>
<tr>
<td>HRT4-250</td>
<td>4</td>
<td>250</td>
<td>101 - 125</td>
<td>6.2</td>
<td>17.0</td>
</tr>
<tr>
<td>HRT4-275</td>
<td>4</td>
<td>275</td>
<td>126 - 150</td>
<td>6.2</td>
<td>17.0</td>
</tr>
<tr>
<td>HRT4-300</td>
<td>4</td>
<td>300</td>
<td>151 - 175</td>
<td>7.6</td>
<td>17.0</td>
</tr>
<tr>
<td>RT2-200</td>
<td>2</td>
<td>200</td>
<td>50 - 75</td>
<td>7.5</td>
<td>17.0</td>
</tr>
<tr>
<td>RT2-225</td>
<td>2</td>
<td>225</td>
<td>76 - 100</td>
<td>7.5</td>
<td>17.0</td>
</tr>
<tr>
<td>RT2-250</td>
<td>2</td>
<td>250</td>
<td>101 - 125</td>
<td>8.6</td>
<td>17.0</td>
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<tr>
<td>RT2-275</td>
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<td>126 - 150</td>
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<td>ST1-200</td>
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<td>ST1-250</td>
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<td>101 - 125</td>
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<td>17.0</td>
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<td>ST1-275</td>
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<td>126 - 150</td>
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<td>ST1-300</td>
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<td>300</td>
<td>151 - 175</td>
<td>23.4</td>
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<td>201 - 225</td>
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</table>

Ancon Teplo-BFL-Tie

The Ancon Teplo-BFL-Tie with a stainless steel upstand has been thermally modelled by a third party expert, allowing us 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 Ancon Teplo range is such that it is unlikely ever to be taken into account in U-value calculations as a thermal bridge.

<table>
<thead>
<tr>
<th>Tie Reference</th>
<th>Tie Type</th>
<th>Tie Length (mm)</th>
<th>Cavity Range (mm)</th>
<th>Chi value (W/K)</th>
<th>$\Delta U_f$ 2.5 ties/m² (W/m²K)</th>
<th>$\Delta U_f$ 4.4 ties/m² (W/m²K)</th>
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<td>Teplo-BFL-5-155</td>
<td>3 &amp; 6</td>
<td>155</td>
<td>76 - 100</td>
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<td>180</td>
<td>101 - 125</td>
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<td>0.00075</td>
<td>0.00132</td>
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<tr>
<td>Teplo-BFL-5-205</td>
<td>3 &amp; 6</td>
<td>205</td>
<td>126 - 150</td>
<td>0.000250</td>
<td>0.00063</td>
<td>0.00110</td>
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<td>230</td>
<td>151 - 175</td>
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<td>176 - 200</td>
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<td>76 - 100</td>
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<tr>
<td>Teplo-BFL-7-330</td>
<td>2 &amp; 6</td>
<td>330</td>
<td>251 - 275</td>
<td>0.000175</td>
<td>0.00044</td>
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<tr>
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<td>3 &amp; 6</td>
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</table>

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.

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 Levat for details. Type 6 timber-to-masonry wall ties should be installed at a minimum of 4.4 per square metre.
**Ancon Teplo-Channel Basalt Fibre Wall Ties**

The Ancon Teplo-Channel Tie range uses the same innovative combination of basalt fibres set in a resin matrix to provide a low thermal conductivity wall tie for use with our popular Ancon Omega 21/18, 25/14 and 28/15 channel profiles. These channel ties have a profiled stainless steel head at one end, shaped to suit each individual channel and mechanically fixed in place. A moulded safety end is provided for building the tie into the outer leaf bed joint.

Ancon Teplo-Channel Ties provide unlimited adjustment along the length of the channel and are ideal for use with SFS and concrete frames. The range has been independently tested and is BBA approved; a British Board of Agrément certificate is available to download online.

For cavities from 70mm to 344mm Chi values (W/K) are given overleaf.

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**For sales and technical enquiries call: +44 (0) 114 275 5224**

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**Ancon Teplo BF-CT-21 Wall Tie with 21/18 Cast-in Channel**

**Ancon Teplo BF-CT-28 Wall Tie with 28/15 Cast-in Channel**
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 (ΔU) 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-Channel Basalt Fibre Wall Ties

The range of basalt fibre channel ties have been thermally modelled by a third party expert to provide accurate Chi values for each tie length and channel end type. 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 Ancon Teplo range is such that it is unlikely ever to be taken into account in U-value calculations as a thermal bridge.

<table>
<thead>
<tr>
<th>Tie Reference</th>
<th>Tie Type</th>
<th>Tie Length (mm)</th>
<th>Cavity (mm)</th>
<th>Chi Value (W/K)</th>
<th>ΔU, 2.5 ties/m² (W/m²K)</th>
<th>ΔU, 3.7 ties/m² (W/m²K)</th>
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Data based on thermal modelling using 100mm thick mineral wool in a full fill cavity with channel cast into concrete and Teplo-BF-CT ties bridging the insulation zone. Cavity range values refer to cast-in channels. For surface-fixed 28/15 applications, cavity range values should be increased by 15mm.

Note: Thermal values will vary for other wall build-ups. For more information please contact Leviat.
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