SSTS and STS Thermally Insulated Balcony Connectors
For Steel-to-Steel Applications

Fully compliant with The Building (Amendment) Regulations 2018:
The Government’s ban on combustible materials in external walls, following a review of fire safety in high-rise residential buildings

Ancon
SSTS and STS Thermally Insulated Balcony Connectors
For Steel-to-Steel Applications
We are one team. We are Leviat.

Leviat is the new name of CRH’s construction accessories companies worldwide.

Under the Leviat brand, we are uniting the expertise, skills and resources of Ancon and its sister companies to create a world leader in fixing, connecting and anchoring technology.

The products you know and trust will remain an integral part of Leviat’s comprehensive brand and product portfolio. As Leviat, we can offer you an extended range of specialist products and services, greater technical expertise, a larger and more agile supply chain and better, faster innovation.

By bringing together CRH’s construction accessories family as one global organisation, we are better equipped to meet the needs of our customers, and the demands of construction projects, of any scale, anywhere in the world.

This is an exciting change. Join us on our journey.

Read more about Leviat at Leviat.com
Our product brands include:

Ancon®  
HALFEN  
HELIFIX

ISEDIO  
PLAKA


60 locations  
sales in  
30+ countries  
3000 people worldwide

Leviat.com
The connectors comprise tension and compression components within a single combined unit, wrapped in class A1 non-combustible mineral wool insulation. The fabricated compression component is manufactured from either 1.4301 (grade 304) stainless steel referenced SSTS or hot-dip galvanised S355 plain carbon steel referenced STS. Stainless steel offers the greater thermal efficiency and is essential for applications requiring enhanced corrosion protection such as coastal areas.

The fabricated elements are designed to EN 1993 (Eurocode 3) and UKCA and CE marked to BS EN 1090 Part 1.

Steel-to-Steel Balcony Connectors
Ancon SSTS and STS are compact thermal breaks, typically used for connecting steel balconies to structural steel frames but which are equally suitable for other steel-to-steel applications.

The system is available in three standard stud sizes to accommodate a wide range of loads. Manufactured to order, the vertical centres of the four A4 stainless steel fixing studs can be specified to suit the exact requirements of the application.

A thermal plate, with an independently verified European reaction-to fire classification of A2-s1,d0, is located at each steel interface. Design resistances are provided on page 4.

System Benefits
✓ Comprises materials of class A1/A2 combustibility only, ideal for high-rise construction
✓ Proven through thermal modelling to reduce heat loss and eliminate condensation risk
✓ Thermal pad located at each steel interface
✓ Bracket fabrication UKCA and CE marked to BS EN 1090-1
✓ Variable fixing heights to suit application
✓ In the case of SSTS, fully stainless steel components offer the ultimate corrosion protection and thermal efficiency benefits

Material Combustibility
Following a review of fire safety, the Government has banned the use of combustible materials in the external walls of high-rise residential buildings in England. The Ancon SSTS and STS connectors are fully compliant with the material combustibility requirements of The Building (Amendment) Regulations 2018. All components are either European classification A1 or A2-s1,d0. Contact Leviat for further information.

Thermal Performance
Thermal modelling of a typical application showed a reduction in heat loss of almost 50% compared to a direct steel connection. It also illustrated a temperature factor within the limits detailed in BRE document IP1/06 for eliminating condensation risks in buildings of any type, even those with high humidity e.g. swimming pools (0.90).
Installation Guidance

The SSTS/STS Balcony Connector is supplied in a single unit with thermal plates attached to both inner and outer faces. These plates should not be removed. The assembly features all necessary steel fixings. Care should be taken to avoid damaging any balcony connector components prior to and during installation. It is essential that the connector is orientated and installed correctly.

Prior to installation of the connector, it is important to check the product dimensions against the engineer’s drawings, specifically ensuring the mating parts match the connector stud centres.

The SSTS/STS Balcony Connector should be orientated so that the label indicating the uppermost face is correctly positioned and is facing out of the building.

Position the connector close to where it is to be installed. Ensure the connector is stable and not likely to fall. Carefully remove the nuts and washers from the studs on the inner face. Keep the steel nuts and steel washers close to hand. All non-metallic packing around the fixings should be discarded at this point, leaving the heat-shrunk isolation material on the stainless steel stud. Carefully lift and fit the exposed studs through the appropriate holes in the building structure. Do not force the connector into position. Re-fit the steel washers and steel nuts. Once the connector is fully aligned with the structure, torque up the nuts with a calibrated hydraulic torque wrench and suitable socket, referencing the table below.

Once all connectors are correctly positioned and fitted to the building structure, the balcony beams can be installed.

Remove the nuts and washers from the outer face of the connector and keep close to hand. Discard all non-metallic packing around the fixings to expose the heat-shrunk isolation on the stud.

Carefully lift the balcony fabrication, ensuring the balcony is horizontal. Align the balcony and carefully push over the exposed studs. Do not force it into position.

When positioned, re-fit the steel washers and steel nuts. Once the balcony is fully aligned with the connector and structure, tighten the nuts to the correct torque. Remove all lifting straps.

<table>
<thead>
<tr>
<th>Connector</th>
<th>SSTS/STS 16A</th>
<th>SSTS/STS 20A</th>
<th>SSTS/STS 24A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrench Size</td>
<td>24</td>
<td>30</td>
<td>36</td>
</tr>
<tr>
<td>Torque (Nm)</td>
<td>148</td>
<td>288</td>
<td>438</td>
</tr>
</tbody>
</table>

The SSTS/STS Balcony Connector is supplied in a single unit with thermal plates attached to both inner and outer faces. These plates should not be removed. The assembly features all necessary steel fixings. Care should be taken to avoid damaging any balcony connector components prior to and during installation. It is essential that the connector is orientated and installed correctly.

Prior to installation of the connector, it is important to check the product dimensions against the engineer’s drawings, specifically ensuring the mating parts match the connector stud centres.

The SSTS/STS Balcony Connector should be orientated so that the label indicating the uppermost face is correctly positioned and is facing out of the building.

Position the connector close to where it is to be installed. Ensure the connector is stable and not likely to fall. Carefully remove the nuts and washers from the studs on the inner face. Keep the steel nuts and steel washers close to hand. All non-metallic packing around the fixings should be discarded at this point, leaving the heat-shrunk isolation material on the stainless steel stud. Carefully lift and fit the exposed studs through the appropriate holes in the building structure. Do not force the connector into position. Re-fit the steel washers and steel nuts. Once the connector is fully aligned with the structure, torque up the nuts with a calibrated hydraulic torque wrench and suitable socket, referencing the table below.

Once all connectors are correctly positioned and fitted to the building structure, the balcony beams can be installed.

Remove the nuts and washers from the outer face of the connector and keep close to hand. Discard all non-metallic packing around the fixings to expose the heat-shrunk isolation on the stud.

Carefully lift the balcony fabrication, ensuring the balcony is horizontal. Align the balcony and carefully push over the exposed studs. Do not force it into position.

When positioned, re-fit the steel washers and steel nuts. Once the balcony is fully aligned with the connector and structure, tighten the nuts to the correct torque. Remove all lifting straps.

<table>
<thead>
<tr>
<th>Connector</th>
<th>SSTS/STS 16A</th>
<th>SSTS/STS 20A</th>
<th>SSTS/STS 24A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrench Size</td>
<td>24</td>
<td>30</td>
<td>36</td>
</tr>
<tr>
<td>Torque (Nm)</td>
<td>148</td>
<td>288</td>
<td>438</td>
</tr>
</tbody>
</table>
### Known requirements:

The Factored Ultimate Shear Force per connector, $V_{Ed}$, is 58kN.
The Factored Ultimate Moment per connector, $M_{Ed}$, is 35kNm.

Vertical bolt centres are limited to a maximum of 150mm.

### From the tables:

- **STS 16A** at 150mm centres gives $V_{Ed} = 60.75kN$ and $M_{Ed} = 180.9kNm$.
  - This connector meets the project requirements.

#### Leviat occasionally supply:

- Special units with compression components top and bottom to accommodate uplift forces.
- Special heavy duty units with multiple tension components and / or compression components.

### Known requirements:

The Factored Ultimate Shear Force per connector, $V_{Ed}$, is 75kN.
The Factored Ultimate Moment per connector, $M_{Ed}$, is 45kNm.

Vertical bolt centres are limited to a maximum of 150mm.

### From the tables:

- **STS 20A** at 150mm centres gives $V_{Ed} = 60.75kN$ and $M_{Ed} = 198.2kNm$.
  - This connector meets the project requirements.

### Design Example

- **SSTS 16A** at 150mm centres gives $V_{Ed} = 39.36kN$ and $M_{Ed} = 27.14kNm$.
  - These connectors do not give the required capacity.

### Leviat occasionally supply:

- Special units with compression components top and bottom to accommodate uplift forces.
- Special heavy duty units with multiple tension components and / or compression components.

### Design Resistances

<table>
<thead>
<tr>
<th>Vertical Bolt Centres</th>
<th>STS 16A (Galvanised Steel)</th>
<th>SSTS 16A (Stainless Steel)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Design Shear Resistance $V_{d}$ (kN)</td>
<td>Design Resistant for Bending $M_{d}$ (kNm)</td>
</tr>
<tr>
<td>70mm</td>
<td>60.75</td>
<td>12.66</td>
</tr>
<tr>
<td>75mm</td>
<td>60.75</td>
<td>13.57</td>
</tr>
<tr>
<td>100mm</td>
<td>60.75</td>
<td>28.22</td>
</tr>
<tr>
<td>125mm</td>
<td>60.75</td>
<td>56.44</td>
</tr>
<tr>
<td>150mm</td>
<td>60.75</td>
<td>70.55</td>
</tr>
<tr>
<td>175mm</td>
<td>60.75</td>
<td>77.61</td>
</tr>
<tr>
<td>200mm</td>
<td>60.75</td>
<td>91.72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vertical Bolt Centres</th>
<th>STS 20A (Galvanised Steel)</th>
<th>SSTS 20A (Stainless Steel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>70mm</td>
<td>60.75</td>
<td>19.87</td>
</tr>
<tr>
<td>75mm</td>
<td>60.75</td>
<td>28.22</td>
</tr>
<tr>
<td>100mm</td>
<td>60.75</td>
<td>56.44</td>
</tr>
<tr>
<td>125mm</td>
<td>60.75</td>
<td>70.55</td>
</tr>
<tr>
<td>150mm</td>
<td>60.75</td>
<td>77.61</td>
</tr>
<tr>
<td>175mm</td>
<td>60.75</td>
<td>91.72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vertical Bolt Centres</th>
<th>STS 24A (Galvanised Steel)</th>
<th>SSTS 24A (Stainless Steel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>70mm</td>
<td>78.1</td>
<td>304</td>
</tr>
<tr>
<td>75mm</td>
<td>78.1</td>
<td>39.36</td>
</tr>
<tr>
<td>100mm</td>
<td>78.1</td>
<td>43.45</td>
</tr>
<tr>
<td>125mm</td>
<td>78.1</td>
<td>49.66</td>
</tr>
<tr>
<td>150mm</td>
<td>78.1</td>
<td>55.87</td>
</tr>
<tr>
<td>175mm</td>
<td>78.1</td>
<td>62.08</td>
</tr>
<tr>
<td>200mm</td>
<td>78.1</td>
<td>68.28</td>
</tr>
<tr>
<td>225mm</td>
<td>78.1</td>
<td>74.49</td>
</tr>
<tr>
<td>250mm</td>
<td>78.1</td>
<td>80.70</td>
</tr>
<tr>
<td>275mm</td>
<td>78.1</td>
<td>86.91</td>
</tr>
</tbody>
</table>

### Design Example

- **STS 24A** at 150mm centres gives $V_{Ed} = 83.46kN$ and $M_{Ed} = 68.28kNm$.
  - This connector meets the project requirements.

### Known requirements:

The Factored Ultimate Shear Force per connector, $V_{Ed}$, is 58kN.
The Factored Ultimate Moment per connector, $M_{Ed}$, is 35kNm.

Vertical bolt centres are limited to a maximum of 150mm.

### From the tables:

- **STS 16A** at 150mm centres gives $V_{Ed} = 39.36kN$ and $M_{Ed} = 27.14kNm$.
  - These connectors do not give the required capacity.

### Leviat occasionally supply:

- Special units with compression components top and bottom to accommodate uplift forces.
- Special heavy duty units with multiple tension components and / or compression components.

Ancon standard balcony connectors are designed to offer innovative solutions for a variety of load cases and construction geometries.

For arrangements not covered by the standard connectors, bespoke engineered solutions are available upon request. Please contact our technical team to discuss your requirements.
Worldwide contacts for Leviat:

Australia
Leviat
98 Kurrajong Avenue,
Mount Druitt Sydney, NSW 2770
Tel: +61 - 2 8808 3100
Email: info.au@leviat.com

Austria
Leviat
Leonard-Bernstein-Str. 10
Saturn Tower, 1220 Wien
Tel: +43 - 1 - 259 6770
Email: info.at@leviat.com

Belgium
Leviat
Industrialaan 2
1740 Ternat
Tel: +32 - 2 - 582 2945
Email: info.be@leviat.com

China
Leviat
Room 601 Tower D, Vantone Centre
No. A6 Chao Yang Men Wai Street
Chaoyang District
Beijing · P.R. China 100020
Tel: +86 - 10 5907 3200
Email: info.cn@leviat.com

Czech Republic
Leviat
Business Center Šafránkova
Šafránkova 1238/1
155 00 Praha 5
Tel: +420 - 311 - 690 060
Email: info.cz@leviat.com

Finland
Leviat
Vädursgatan 5
412 50 Göteborg / Sweden
Tel: +358 (0)10 6388781
Email: info.fi@leviat.com

France
Leviat
6, Rue de Cabanis
FR 31240 L’Union
Toulouse
Tel: +33 - 5 - 34 25 54 82
Email: info.fr@leviat.com

Germany
Leviat
Liebigstrasse 14
40764 Langenfeld
Tel: +49 - 2173 - 970 - 0
Email: info.de@leviat.com

India
Leviat
309, 3rd Floor, Orion Business Park
Ghodbunder Road, Kapurbawdi,
Thane West, Thane,
Maharashtra 400607
Tel: +91 - 22 2589 2032
Email: info.in@leviat.com

Italy
Leviat
Via F.lli Bronzetti 28
24124 Bergamo
Tel: +39 - 035 - 0760711
Email: info.it@leviat.com

Malaysia
Leviat
28 Jalan Anggerik Mokara 31/59
Kota Kemuning, 40460 Shah Alam
Selangor
Tel: +603 - 5122 4182
Email: info.my@leviat.com

Netherlands
Leviat
Oostermaat 3
7623 CS Borne
Tel: +31 - 74 - 267 14 49
Email: info.nl@leviat.com

New Zealand
Leviat
2/19 Nuttall Drive, Hillsborough,
Christchurch 8022
Tel: +64 - 3 376 5205
Email: info.nz@leviat.com

Norway
Leviat
Vestre Svanholmens 5
4313 Sandnes
Tel: +47 - 51 82 34 00
Email: info.no@leviat.com

Philippines
Leviat
2933 Regus, Joy Nostalg,
ABD Avenue
Ortigas Center
Pasig City
Tel: +63 - 2 7957 6381
Email: info.ph@leviat.com

Poland
Leviat
UL. Obornicka 287
60-691 Poznan
Tel: +48 - 61 - 622 14 14
Email: info.pl@leviat.com

Singapore
Leviat
14 Benoi Crescent
Singapore 629977
Tel: +65 - 6266 6802
Email: info.sg@leviat.com

Spain
Leviat
Polígon Industrial Santa Ana
c/ Ignacio Zuloaga, 20
28822 Rivas-Vaciamadrid
Tel: +34 - 91 632 18 40
Email: info.es@leviat.com

Sweden
Leviat
Vädursgatan 5
412 50 Göteborg
Tel: +46 - 31 - 98 58 00
Email: info.se@leviat.com

Switzerland
Leviat
Grenzstrasse 24
3250 Lyss
Tel: +41 - 31 750 3030
Email: info.ch@leviat.com

United Kingdom
Leviat
President Way, President Park,
Sheffield, S4 7UR
Tel: +44 - 114 275 5224
Email: info.uk@leviat.com

United States of America
Leviat
6447 S Falkenburg Rd.
Riverview, FL 33578
Tel: (800) 423-9140
Email: info.us@leviat.us

For countries not listed
Email: info@leviat.com
For more information on these products, contact:

Leviat
President Way
President Park
Sheffield, S4 7UR
United Kingdom
Tel: +44 (0) 114 275 5224
Fax: +44 (0) 114 276 8543
Email: info.ancon.uk@leviat.com

For sales and technical enquiries:
Email: reinforcement.uk@leviat.com

Ancon.co.uk
Leviat.com