Earthing & lightning protection
Solutions for trapezoidal cladding systems
Today many buildings use trapezoidal cladding systems for their roofs and exterior elevations. Where this cladding is punctured by a lightning strike, the building and its contents below may be at significant risk of damage.

Repair costs to the roof and contents, as well as any unnecessary downtime incurred, would be considered unacceptable to companies and public service institutions.

Historically though, protecting metallic roofs against lightning has presented a challenge for lightning protection designers and installers. The need for protection, and how to secure protection measures to a metal roof, especially in hot and humid climates, has been much debated.

Lightning protection standard, IEC/BS EN 62305, identifies minimum thicknesses for metals which can be used as an air-termination, to avoid the risk of damage through puncture or hot spot, as per Table 1, right.

The vast majority of trapezoidal cladding systems do not meet these minimum thickness requirements, so would risk puncture or hot spot in the event of a lightning strike.

More so, trapezoidal cladding systems vary substantially in both profile shape and finish, and often include insulation beneath, making the installation of traditional lightning protection systems difficult.

These challenges can be overcome by installing the new Furse range of holdfast assemblies specifically designed to help protect trapezoidal cladding systems.

This new solution enables secure connection of air rods and conductors on to trapezoidal cladding systems using an innovative holdfast base and industry standard stitching screws.

Table 1. Minimum thickness of metal sheets in air-termination systems (extract from IEC/BS EN 62305-3 Table 3)

<table>
<thead>
<tr>
<th>Class of Lightning Protection System</th>
<th>Material</th>
<th>Thickness to prevent puncture or hot spot</th>
</tr>
</thead>
<tbody>
<tr>
<td>I to IV</td>
<td>Lead</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Steel (stainless, galvanized)</td>
<td>4 mm</td>
</tr>
<tr>
<td></td>
<td>Titanium</td>
<td>4 mm</td>
</tr>
<tr>
<td></td>
<td>Copper</td>
<td>5 mm</td>
</tr>
<tr>
<td></td>
<td>Aluminium</td>
<td>7 mm</td>
</tr>
<tr>
<td></td>
<td>Zinc</td>
<td>–</td>
</tr>
</tbody>
</table>
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Solutions for trapezoidal cladding systems

The new Furse trapezoidal holdfast range offers air rod bases, conductor clips and square clamps suitable for securing the most common conductor types, 25 x 3 mm tape and 8 mm diameter solid circular, to trapezoidal cladding systems.

All components are secured to a stainless steel holdfast which is connected to the trapezoidal cladding via two stitching screws. These screws meet the general industry requirements for securing trapezoidal panels together. Additionally, the holdfast base includes synthetic seals which ensure a lasting weatherproof connection when these stitching screws are tightened.

This approach is designed to maintain the ongoing integrity of the weatherproof nature of the trapezoidal cladding long after lightning protection system installation.

Additional key features of this trapezoidal holdfast range of lightning protection products include:
- The holdfast base fits on to all commonly available trapezoidal profiles over 20 mm width
- Manufactured from stainless steel, the holdfast base eliminates risk of galvanic corrosion, whilst being used with both copper or aluminium Furse components
- Stitching screws equivalent to those recommended by roofing manufacturers ensure comparable fixings are used as would be installed to fix the cladding itself
- Through combining a stainless steel holdfast base with our quality lightning protection components, the resulting solution has high mechanical strength to withstand the force of lightning strikes
- Bonding the lightning protection system across the trapezoidal cladding system improves current sharing across conductors

Figure 1. Installation of Furse lightning protection components on to trapezoidal cladding
The Furse trapezoidal range is designed for fast, straightforward installation on to trapezoidal cladding systems.

All air rod bases, clips and clamps are supplied ready assembled to a holdfast base, using an M6 countersunk screw, and all packs include stitching screws to enable installation.

A secure, weatherproof connection can be achieved by screwing the stitching screws into the trapezoidal cladding to a torque of 2 Nm (aluminium cladding) or 2.5 Nm (steel cladding).
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Solutions for trapezoidal cladding systems

Air rod

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Rod length (mm)</th>
<th>Rod diameter (mm)</th>
<th>Thread size</th>
<th>Conductor material</th>
<th>Weight each (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA400-FU</td>
<td>500</td>
<td>Ø 10</td>
<td>M10</td>
<td>Copper</td>
<td>0.33</td>
</tr>
<tr>
<td>RA402</td>
<td>1,000</td>
<td>Ø 10</td>
<td>M10</td>
<td>Copper</td>
<td>0.65</td>
</tr>
<tr>
<td>RA080</td>
<td>500</td>
<td>Ø 10</td>
<td>M10</td>
<td>Aluminium</td>
<td>0.11</td>
</tr>
<tr>
<td>RA085</td>
<td>1,000</td>
<td>Ø 10</td>
<td>M10</td>
<td>Aluminium</td>
<td>0.22</td>
</tr>
</tbody>
</table>

- Manufactured from high conductivity hard drawn copper or aluminium, with rolled threads
- Supplied complete with locknut
- Air rods up to 1 metre in height are recommended on trapezoidal roofs to avoid risk from excessive wind loading on the air rod

Trapezoidal holdfast with air rod base

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Conductor</th>
<th>Weight each (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZ405</td>
<td>25 x 3 mm bare copper tape, Ø 8 mm bare copper solid circular conductor</td>
<td>0.14</td>
</tr>
<tr>
<td>TZ407</td>
<td>25 x 3 mm bare aluminium tape, Ø 8 mm bare aluminium solid circular conductor</td>
<td>0.08</td>
</tr>
</tbody>
</table>

- Holdfast manufactured from stainless steel 304
- Designed for excellent corrosion resistance and high pull off loads
- Provides secure clamping of either 25 x 3 mm bare tape or 8 mm diameter solid circular conductor
- Suitable for use on both straight runs and intersections of conductor
- Simple to install to trapezoidal cladding systems using stitching screws provided
- Holdfast torque 2 Nm (aluminium cladding), 2.5 Nm (steel cladding)
- Boxed in 10’s

Standards

IEC/BS EN 62561-1

Class H

(air rod base)

IEC/BS EN 62561-2

(air rod base)
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Trapezoidal holdfast with conductor clip

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Conductor</th>
<th>Weight each (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZ210</td>
<td>25 x 3 mm bare copper tape</td>
<td>0.09</td>
</tr>
<tr>
<td>TZ110</td>
<td>25 x 3 mm bare aluminium tape</td>
<td>0.05</td>
</tr>
<tr>
<td>TZ040</td>
<td>25 x 3 mm grey PVC covered tape</td>
<td>0.03</td>
</tr>
<tr>
<td>TZ805</td>
<td>Ø 8 mm bare copper solid circular conductor</td>
<td>0.11</td>
</tr>
<tr>
<td>TZ806</td>
<td>Ø 8 mm bare aluminium solid circular conductor</td>
<td>0.05</td>
</tr>
<tr>
<td>TZ815</td>
<td>Ø 8 mm PVC covered copper solid circular conductor</td>
<td>0.12</td>
</tr>
<tr>
<td>TZ816</td>
<td>Ø 8 mm PVC covered aluminium solid circular conductor</td>
<td>0.06</td>
</tr>
<tr>
<td>TZ871</td>
<td>Ø 8 mm grey PVC covered solid circular conductor</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Standards

IEC/BS EN 62561-4 (clip)

– Conductor clip manufactured from high quality alloy (TZ210, TZ805, TZ815) or aluminium alloy (TZ110, TZ806, TZ816), or grey high grade polypropylene (TZ040, TZ871)
– Holdfast manufactured from stainless steel 304
– Metallic clips designed for excellent corrosion resistance and high pull off loads
– Simple to install to trapezoidal cladding systems using stitching screws provided
– For air-termination, the use of metallic clips with bare conductor is recommended for effective current sharing across the roof.
  Non-metallic clips may be used as part of a down-conductor system
– Holdfast torque 2 Nm (aluminium cladding), 2.5 Nm (steel cladding)
– Boxed in 25’s
– Clips for use with other colour PVC covered down-conductors are available on request

Trapezoidal holdfast with square tape clamp

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Conductor</th>
<th>Weight each (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZ105</td>
<td>25 x 3 mm bare copper tape</td>
<td>0.14</td>
</tr>
<tr>
<td>TZ205</td>
<td>25 x 3 mm bare aluminium tape</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Standards

IEC/BS EN 62561-1 Class H (clamp)

– Square tape clamp manufactured from high quality alloys of either copper or aluminium
– Holdfast manufactured from stainless steel 304
– Designed for excellent corrosion resistance and high pull off loads
– Simple to install to trapezoidal cladding systems using stitching screws provided
– Holdfast torque 2 Nm (aluminium cladding), 2.5 Nm (steel cladding)
– Boxed in 10’s
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**Square clamp for solid circular conductor**

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Conductor</th>
<th>Weight each (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS605</td>
<td>Ø 8 mm bare copper solid circular conductor</td>
<td>0.17</td>
</tr>
<tr>
<td>CS610</td>
<td>Ø 8 mm bare aluminium solid circular conductor</td>
<td>0.07</td>
</tr>
</tbody>
</table>

- Manufactured from high quality alloys of either copper or aluminium
- Designed for excellent corrosion resistance and high pull off loads
- Permits cross and tee joints to be formed
- Square clamp does not connect to cladding. Support using appropriate conductor clips

**Standards**
BS EN 62561-1 Class H

**Conductor**

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Conductor</th>
<th>Coil size (m)</th>
<th>Weight per metre (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape conductor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC030</td>
<td>25 x 3 mm bare copper tape</td>
<td>25</td>
<td>0.67</td>
</tr>
<tr>
<td>TC030/50</td>
<td>25 x 3 mm bare copper tape</td>
<td>50</td>
<td>0.67</td>
</tr>
<tr>
<td>TC115-FU</td>
<td>25 x 3 mm PVC covered copper tape, grey</td>
<td>25</td>
<td>0.77</td>
</tr>
<tr>
<td>TC115/50</td>
<td>25 x 3 mm PVC covered copper tape, grey</td>
<td>50</td>
<td>0.77</td>
</tr>
<tr>
<td>TA030</td>
<td>25 x 3 mm bare aluminium tape</td>
<td>50</td>
<td>0.21</td>
</tr>
<tr>
<td>TA115</td>
<td>25 x 3 mm PVC covered aluminium tape, grey</td>
<td>50</td>
<td>0.30</td>
</tr>
<tr>
<td>Solid circular conductor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD035</td>
<td>Ø 8 mm bare copper solid circular</td>
<td>50</td>
<td>0.44</td>
</tr>
<tr>
<td>CD038</td>
<td>Ø 8 mm PVC covered copper solid circular, grey</td>
<td>50</td>
<td>0.49</td>
</tr>
<tr>
<td>CD080</td>
<td>Ø 8 mm bare aluminium solid circular</td>
<td>50</td>
<td>0.12</td>
</tr>
<tr>
<td>CD083</td>
<td>Ø 8 mm PVC covered aluminium solid circular, grey</td>
<td>50</td>
<td>0.18</td>
</tr>
</tbody>
</table>

- The use of bare conductor is recommended for air-termination systems. Down-conductors may be PVC covered for improved aesthetics
- Tape and solid circular conductor sold in full coil lengths only
- Tinned copper variants available
- Other PVC colours available on request
- Every precaution has been taken to ensure the UV stability of PVC coverings, but as with all plastics, colour variation will occur over time

**Standards**
BS EN 13601 (copper)
BS EN 755-5 (aluminium)
BS 5252 (PVC colour)
Contact us

ABB Furse
UK Office
Wilford Road
Nottingham
NG2 1EB
Tel: +44 (0) 115 964 3700
Fax: +44 (0) 115 986 0071
Sales Tel: +44 (0) 333 999 9900
Sales Fax: +44 (0) 333 999 9901
E-Mail: enquiry@furse.com

ABB Industries LLC
P.O. Box 11070
Al Quoz
Industrial Area 3
Dubai, UAE
Tel: +971 3 314 7500
E-Mail: furseenquiryme@tnb.com

Kuwait
Kuwait City, Tel: +965 222 77888

Oman
Muscat, Tel: +968 24 66 6500

Qatar
Doha, Tel: +974 4 425 3888

Saudi Arabia
Al Khobar, Tel: +966 13 806 3777
Riyadh, Tel: +966 11 484 5600
Jeddah, Tel: +966 12 224 2700
E-Mail: Enquiryksa@tnb.com
E-Mail: Furseenquiryme@tnb.com

UAE
Abu Dhabi, Tel: +971 2 4938000

www.furse.com

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