Lysaght Klip-lok® 406

Superior waterproofing performance from a concealed-fixed cladding

- Strong, durable, versatile, long spanning, concealed-fix roof and wall cladding with exceptional waterproofing characteristics.
- Smart fluted pans and a lock-action rib design enables use on low pitched roofs.
- Fixing with our clips is quick and easy providing extra economy.
- Not available in Vic. or S.A., Qld & W.A. by enquiry only
Simple, low-cost fixing
Long, straight lengths of KLIP-LOK 406 can be laid in place and easily aligned. Fixing with our clips is simple and fast. The smaller number of clips for a given area provides extra economy.
KLIP-LOK 406 is available in long lengths, therefore on most jobs you can have one sheet from ridge to gutter without end laps.
Concealed-fixing
Fixing clips effectively secure KLIP-LOK 406 to steel or timber supports without puncturing the sheet. With no exposed fasteners, the straight lines of your roof remain clean and smooth.

Colours
KLIP-LOK 406 is available in an attractive range of COLORBOND® steel colours and plain ZINCALUME® (zinc/aluminium alloy coated steel). Other finishes in a more limited range of colours may be available subject to enquiry.
(Refer to your local BlueScope Lysaght branch.)

Masses

<table>
<thead>
<tr>
<th>BMT (mm)</th>
<th>kg/m</th>
<th>kg/m²</th>
<th>m²/t</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4# ZINCALUME®</td>
<td>2.28</td>
<td>56.2</td>
<td>178</td>
</tr>
<tr>
<td>0.4# COLORBOND®</td>
<td>2.32</td>
<td>57.1</td>
<td>175</td>
</tr>
</tbody>
</table>

Material specifications
The base metal thickness is 0.48mm
KLIP-LOK 406 is made from:
- ZINCALUME® aluminium/zinc alloy-coated steel complying with AS 1397—2001 G550, AZ150 (550 MPa minimum yield stress, 150 g/m² minimum coating mass);

Lengths
Sheets are available custom cut.

Tolerances
Length: + 0mm, – 15mm
Width: + 4mm, – 4mm

Walking on roofs
Always walk in pans and over the supports if possible. Generally, keep your weight evenly distributed over the soles of both feet to avoid concentrating your weight on either heels or toes. Always wear smooth soft-soled shoes; avoid ribbed soles that pick up and hold small stones, swarf and other objects.

Minimum roof pitch
You can use KLIP-LOK 406 on roof pitches from as low as 1 degree (1 in 50). It can also be used on walls.
Maximum roof lengths for drainage measured from ridge to gutter (m) Penetrations will alter the flow of water on a roof.
Refer to the Lysaght Roofing & Walling User Manual for more information.

Maximum roof lengths for drainage

<table>
<thead>
<tr>
<th>Peak rainfall intensity mm/hr</th>
<th>1°</th>
<th>2°</th>
<th>3°</th>
<th>5°</th>
<th>75°</th>
<th>10°</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>375</td>
<td>467</td>
<td>548</td>
<td>682</td>
<td>813</td>
<td>934</td>
</tr>
<tr>
<td>150</td>
<td>250</td>
<td>311</td>
<td>365</td>
<td>454</td>
<td>542</td>
<td>623</td>
</tr>
<tr>
<td>200</td>
<td>188</td>
<td>234</td>
<td>274</td>
<td>341</td>
<td>406</td>
<td>467</td>
</tr>
<tr>
<td>250</td>
<td>150</td>
<td>187</td>
<td>219</td>
<td>273</td>
<td>325</td>
<td>374</td>
</tr>
<tr>
<td>300</td>
<td>125</td>
<td>156</td>
<td>183</td>
<td>227</td>
<td>271</td>
<td>311</td>
</tr>
<tr>
<td>400</td>
<td>94</td>
<td>117</td>
<td>137</td>
<td>170</td>
<td>203</td>
<td>234</td>
</tr>
<tr>
<td>500</td>
<td>75</td>
<td>93</td>
<td>110</td>
<td>136</td>
<td>163</td>
<td>187</td>
</tr>
</tbody>
</table>

Adverse conditions
If this product is to be used in marine, severe industrial, or unusually corrosive environments, ask for advice from our information line.

Metal & timber compatibility
Lead, copper, free carbon, bare steel and green or some chemically-treated timber are not compatible with this product. Don’t allow any contact of the product with those materials, nor discharge of rainwater from them onto the product. Supporting members should be coated to avoid problems with underside condensation. If there are doubts about the compatibility of other products being used, ask for advice from our information line.

Maintenance
Optimum product life will be achieved if all external walls and roofs are washed regularly. Areas not cleaned by natural rainfall (such as the tops of walls or roof areas sheltered by eaves) should be washed down every six months.
KLIP-LOK 406: Limit state wind pressure capacities (kPa)

<table>
<thead>
<tr>
<th>Span</th>
<th>Limit state</th>
<th>900</th>
<th>1200</th>
<th>1500</th>
<th>1800</th>
<th>2100</th>
<th>2400</th>
<th>2700</th>
<th>3000</th>
<th>3300</th>
<th>3600</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE</td>
<td>Serviceability</td>
<td>2.69</td>
<td>2.38</td>
<td>2.07</td>
<td>1.78</td>
<td>1.49</td>
<td>1.20</td>
<td>0.92</td>
<td>0.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strength*</td>
<td>4.41</td>
<td>4.30</td>
<td>4.10</td>
<td>3.75</td>
<td>3.25</td>
<td>2.70</td>
<td>2.10</td>
<td>1.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>END</td>
<td>Serviceability</td>
<td>2.41</td>
<td>2.17</td>
<td>1.96</td>
<td>1.77</td>
<td>1.61</td>
<td>1.46</td>
<td>1.32</td>
<td>1.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strength*</td>
<td>3.60</td>
<td>3.45</td>
<td>3.30</td>
<td>3.05</td>
<td>2.70</td>
<td>2.35</td>
<td>2.00</td>
<td>1.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTERNAL</td>
<td>Serviceability</td>
<td>2.82</td>
<td>2.76</td>
<td>2.66</td>
<td>2.53</td>
<td>2.35</td>
<td>2.05</td>
<td>1.80</td>
<td>1.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strength*</td>
<td>4.10</td>
<td>3.55</td>
<td>3.05</td>
<td>2.65</td>
<td>2.35</td>
<td>2.05</td>
<td>1.80</td>
<td>1.65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* A capacity reduction factor of φ=0.9 has been applied to strength capacities. Table values are based on supports of G550 steel, 1mm BMT.

Limit states wind pressures

KLIP-LOK 406 offers the full benefits of the latest methods for modelling wind pressures. The wind pressure capacity table is determined by full scale tests conducted at BlueScope Lysaght's NATA-registered testing laboratory, using the direct pressure-testing rig.

Testing was conducted in accordance with AS 1562.1—1992 Design and Installation of Sheet Roof and Wall Cladding—Metal, and AS 4040.2—1992 Resistance to Wind Pressure for Non-cyclonic Regions.

The pressure capacities for serviceability are based on a deflection limit of (span/120) + (maximum fastener pitch/30). The pressure capacities for strength have been determined by testing the cladding to failure (ultimate capacity). These pressures are applicable when the cladding is fixed to a minimum of 1.0mm, G550 steel.

For material less than 1.0mm thick, seek advice from our information line.

Fasteners

Where insulation is to be installed, you may need to increase the length of the screws given below, depending on the density and thickness of the insulation. When the screw is properly tightened:

- into metal: there should be at least three threads protruding past the support you are fixing to;
- into timber: the screw must penetrate the timber by the same amount that the recommended screw would do if there were no insulation.

Storage and handling

Keep the product dry and clear of the ground. If stacked or bundled product becomes wet, separate it and wipe it with a clean cloth to dry thoroughly.

Fasteners without Insulation

Fix to Steel

<table>
<thead>
<tr>
<th>Fix to Steel</th>
<th>Fix to Steel</th>
<th>Fix to Steel</th>
<th>Fix to Timber</th>
<th>Fix to Timber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single &amp; lapped steel thickness</td>
<td>Single thickness steel</td>
<td>Total lapped thickness of</td>
<td>Hardwood</td>
<td>Softwood</td>
</tr>
<tr>
<td>≥0.55 up to 1.0mm BMT</td>
<td>≥1.0mm BMT up to 3.0mm BMT</td>
<td>≥1.0mm BMT up to 3.8mm BMT</td>
<td>J1-J3</td>
<td>J4</td>
</tr>
<tr>
<td>Clip</td>
<td>10-16x16, Metal Tek, WH</td>
<td>10-16x16, Metal Tek, WH</td>
<td>10-16x16, Metal Tek, WH</td>
<td>10-12x25, Type 17, WH</td>
</tr>
<tr>
<td>Fixed</td>
<td>10-16x12, Metal Tek, WH</td>
<td>10-16x12, Metal Tek, WH</td>
<td>10-16x22, Metal Tek, WH</td>
<td>10-12x25, Type 17, WH</td>
</tr>
</tbody>
</table>

Side laps (If required)10-16x16, Metal Tek, HH or Roof Zips M6-11x25 or M5-16x25 Designer Head or Sealed blind rivet ø4.8mm aluminium

Maximum support spacings


Roof spans consider both resistance to wind pressure and light roof traffic (traffic arising from incidental maintenance) and assessment of ease of installation.

Wall spans consider resistance to wind pressure only and assessment of ease of installation.

The pressure considered is based on buildings up to 10m high in Region B, Terrain Category 3, M_s=0.85, M_i=1.0, M_t=1.0 with the following assumptions made:

- Roofs:
  - C_{p0}=+0.20, C_{pe}=-0.90, K_i=2.0 for single and end spans, K_i=1.5 for internal spans.
- Walls:
  - C_{p0}=+0.20, C_{pe}=-0.65, K_i=2.0 for single and end spans, K_i=1.5 for internal spans.

These spacings may vary by serviceability and strength limit states for particular projects.
Latest Testing Technology
State-of-the-art testing methods have been used to determine the performance of KLIP-LOK 406. The direct pressure testing rig at our NATA-registered testing laboratory has been used to develop the limit state performance tables of KLIP-LOK 406. This results in a much better modelling of wind loads, compared to traditional air bag testing methods.

Our LYSAHGT brand has held the lead in Australian building products for over 150 years. This position has been maintained through meticulous research and development. The data in this publication are obtained from our direct-pressure test rig which accurately reproduces the wind conditions experienced in the field.

Older air bag methods used by others distribute pressure unevenly, so that air bags can produce misleading results and inflated strengths (see diagram).

BlueScope Lysaght’s direct pressure rig uses no air bags and applies pressure uniformly over the entire profile—including the ribs.

Uniform pressure distribution of our direct pressure rig which accurately reproduces the wind conditions experienced in the field.

Handle materials carefully to avoid damage: don’t drag materials over rough surfaces or each other; don’t drag tools over material; protect from swarf.

New COLORBOND® steel with THERMATECH® technology
The next generation COLORBOND® steel incorporates THERMATECH® technology, which provides a new level of thermal protection by absorbing less heat. Average reduction in solar absorption across all standard colours is 5%.

Now 14 of the 20 standard COLORBOND® steel colours are ‘medium to light’ under the BASIX colour classification, which means reflective foil at the roof may not be required. It also means a drop of roof insulation R rating may be applicable. Refer to your local branch for colour availability for these products.

Turn up-down tools
On all roofs of pitches less than 15 degrees, the high end of all sheets must be turned up to stop water from being driven under the flashing and into the building.

Similarly, the pans at the gutter end must be turned down to stop water running back along the underside of the sheets.

Tools are available for both applications.

Notching tool
A tool is available for on-site notching of transverse flashings and cappings.

Cutting
For cutting thin metal on site, we recommend a circular saw with a metal-cutting blade because it produces fewer damaging hot metal particles and leaves less resultant burr than does a carborundum disc.

Cut materials over the ground and not over other materials.

Sweep all metallic swarf and other debris from roof areas and gutters at the end of each day and at the completion of the installation. Failure to do so can lead to surface staining when the metal particles rust.

Sealed joints
For sealed joints use screws or rivets and neutral-cure silicone sealant branded as suitable for use with galvanised, ZINCALUME® or COLORBOND® steel.

Non-cyclonic areas
The information in this brochure is suitable for use only in areas where a tropical cyclone is unlikely to occur as defined in AS/NZS 1170.2—2002.

For information on the use of LYSAHGT products in cyclonic conditions, refer to the Cyclonic Area Design Manual which is available by download on our website: www.lysaght.com.
Installation

Figure 1
Lay sheets towards prevailing weather

General Installation Notes

1. Check that the top faces of all purlins or battens are lying in one plane, adjusting as necessary by packing or easing between these members and their supporting structure. Under no circumstances should packing be used directly under the fastening clips to adjust fall or alignment of roof.

Accurate alignment ensures efficient locking of sheets and clips. Conversely, misalignment can interfere with the locking action, particularly on close support centres.

2. To maintain maximum holding power the first and last supports and clips should be at least 75mm from each end of the sheet.

3. Make spot checks for the alignment of sheets during laying to control fanning or creep (5 sheets = 2030mm coverage). To rectify alignment, sheets may be adjusted 2mm by pulling the clip away or pushing towards the sheet while fastening the clip.

4. For very steep roof or vertical wall applications, a positive fastener (screw or bolt) is required in each sheet length to prevent movement down the fastening clips. This is best positioned under or through the flashing or capping at the top end.

5. KLIP-LOK 406 can be fastened over insulation wool blankets up to 50mm thick when the blanket is draped over supports before installation of clips.

6. Sheets should project a minimum 50mm into the gutter line.

Installation Procedure

Step 1
When lifting sheet lengths onto the roof frame ready for installation, make sure all sheets have the overlapping ribs facing towards the side where fastening is to commence.

The first run of clips must be located and fastened, one to each support, so that they will correctly engage in the overlapping and centre ribs of the first sheet when it is located and locked over them. To do this, fasten clips to the purlins at each end of the sheet, having positioned them so that the first sheet will be in correct relation to other building elements. Align and fasten the remainder of the first run of clips using a string line or the first sheet as a straight edge.

Step 2
Position the first sheet longitudinally in relation to gutter overhang and locate it over the fastened run of clips, positioning the centre rib first, and engage the centre and overlapping ribs onto all clips by foot pressure.

Step 3
Position and fasten the next run of clips, one to each support, with the short return leg of the clip over the underlapping rib of the installed sheet.

If the clip fouls one of the spurs spaced along the outer free edge of the underlapping rib, the spur can be flattened with a blow from a rubber mallet to allow the clip to seat down over the rib.
Step 4a
Place the second sheet over the second run of clips, again positioning the centre rib first. A string line stretched across the bottom alignment of the sheets can be used to check that the ends of the sheets are in line.
Fully engage the interlocking ribs and the centre rib over each clip.
This can be achieved by walking along the full length of the sheet being installed with one foot in the tray next to the overlapping rib and the other foot applying pressure to the top of the interlocking ribs at regular intervals.
Also apply foot pressure to the top of the centre rib over each clip. For complete interlocking, which is essential, the spurs of KLIP-LOK 406 along the underlapping rib must be fully engaged in the shoulder of the overlapping rib.

Step 4b
See illustration of ‘Step 4b’ above.
A distinct “click” will be heard as the interlocking ribs fully engage.
When engaging KLIP-LOK 406 interlocking ribs, stand only on the sheet being installed, that is the overlapping sheet, and not on the preceding sheet.
Install subsequent sheets by following Steps 3 and 4 and make periodic checks that the installed sheets are aligned with the roof perimeter.
On walling applications a rubber mallet must be used to fully engage the inter-locking ribs and engage the centre ribs over the clips.

Step 5
If the space left between the last full sheet and the fascia or parapet is more than a half sheet width, a sheet can be cut longitudinally, leaving the centre rib complete. This partial sheet can be fully clipped onto a row of clips as for a full sheet, before installing the capping or flashing. If the space left between the last full sheet and the fascia or parapet is less than a half sheet width, it can be covered by the capping or flashing. In this case, the last sheet should be secured by cutting sheet in halves and fastening the underlapping rib at each purlin with a half sheet.
Similarly, a half clip may also be used if required. In this case, where a partial sheet of less than two ribs is used, it is necessary to turn up the lip along the edge of the cut sheet. This can then be covered by the capping or flashing.

5a (Part sheet cut longitudinally leaving full centre rib.)

5b (Last rib fastened with half sheet and covered by capping or flashing.)
The Perfect finishing touch

LYSAGHT rainwater goods
Whether you’re renovating a classic Australian house or searching for a distinctive look for a new home, add the perfect finishing touch to your KLIP-LOK roof with our extensive range of rainwater goods. LYSAGHT rainwater goods provide the perfect finishing touch.

Our rainwater goods are manufactured from ZINCALUME® steel with COLORBOND® prepainted steel available, so they’ll stand up to years of the harshest Australian climate.

The choice of colours and styles is extensive, covering everything you could need from gutters and downpipes, to fascia, flashings and cappings, as well as fasteners and fixing clips.

Gutters and downpipes
We manufacture the perfect guttering system for your home, whatever the style. You can choose from QUAD, TRIMLINE® or SHEERLINE® gutters or a number of other designs.

All designs can be complemented with our complete range of square and round downpipes and rainwater accessories.

To ensure quick and easy installation there is also a full range of matching fixing clips.

Fascia
LYSAGHT NOVALINE® fascia is attractive and easy to install. It is strong, lightweight and can be used as a complete system. Special clips are also available to fix QUAD and TRIMLINE® gutters to the fascia.

Flashings and cappings
We supply flashings and cappings standard or custom made. The finish can be plain ZINCALUME® steel or COLORBOND® steel.

Mix and match
The wide choice of COLORBOND® steel colours and LYSAGHT profiles allows you to mix and match with ease.

One call gets it all
We provide everything you need, with one phone call, one order and no running around. So for your next project, it makes sense to insist on steel sheeting and rainwater goods from BlueScope Lysaght.

Why you should always insist on LYSAGHT
When you specify LYSAGHT products you have the added advantage of dealing with a company whose expertise and experience with steel stretches back for well over a century. A company with a reputation for consistently producing top quality products.

Our products are backed by a performance warranty which guarantees in writing that your products will perform exactly to specifications when installed in accordance with our recommendations.
Product Descriptions

All descriptions, specifications, illustrations, drawings, data, dimensions and weights contained in this catalogue, all technical literature and websites containing information from BlueScope Lysaght are approximations only.

They are intended by BlueScope Lysaght to be a general description for information and identification purposes and do not create a sale by description. BlueScope Lysaght reserves the right at any time to:

(a) supply Goods with such minor modifications from its drawings and specifications as it sees fit; and

(b) alter specifications shown in its promotional literature to reflect changes made after the date of such publication.

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This publication is intended to be an aid for all trades and professionals involved with specifying and installing LYSAGHT products and not to be a substitute for professional judgement.

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