

KLIP-LOK CLASSIC[®] 700

DESIGN AND INSTALLATION GUIDE

LYSAGHT

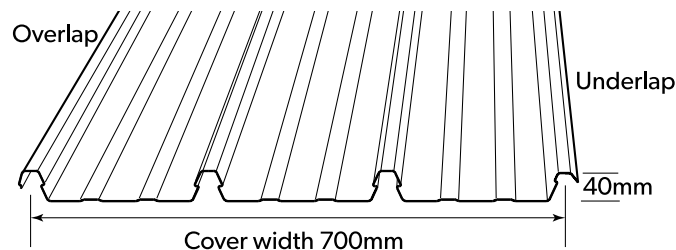


LYSAGHT KLIP-LOK CLASSIC® 700

LYSAGHT KLIP-LOK CLASSIC 700 (KLIP-LOK CLASSIC) features a strong rib for excellent spanning capacity. Visually, the strong rib makes a bold statement rising from flat pans with longitudinal fluting. Clips permit thermal expansion of long, straight runs, and because there are no piercings through the cladding; the long, straight lines of KLIP-LOK CLASSIC 700 remain crisp and clean. And no piercings means superb weatherproof performance.

Our new fixing clip can be laid in place and fixed quickly and easily. This is because the KLIP-LOK CLASSIC 700 clip is fixed with hex. head screws, which are easier to drive.

Long lengths of KLIP-LOK CLASSIC are available subject to state delivery guidelines.



Material specifications

- Next generation ZINCALUME® aluminium/zinc/magnesium alloy coated steel complies with AS1397:2011 G550, AM125 (550 MPa minimum yield stress, 125 g/m² minimum coating mass)
- COLORBOND® is prepainted steel for exterior roofing and walling. It is the most widely used. The painting complies with AS/NZS 2728:2013 and the steel base is an aluminium/zinc alloy-coated steel complying with AS1397:2011. Minimum yield strengths are G550 (550MPa). Minimum coating mass is AM100 (100g/m²)
- COLORBOND® METALLIC is prepainted steel for superior aesthetic qualities displaying a metallic sheen.
- COLORBOND® ULTRA is prepainted steel for severe coastal or industrial environments (generally within about 100-200 metres of the source). The painting complies with AS/NZS 2728:2013 and the steel base is an aluminium/zinc alloy-coated steel complying with AS 1397:2011. Minimum yield strength is G550 (550MPa). Minimum coating mass is AM150 (150g/m²)
- COLORBOND® Stainless is a pre-painted steel for severe coastal or industrial environments. The painting complies with AS/NZS 2728:2013 and the steel base is a stainless steel complying with AISI/ASTM Type 430; UNS No. S43000.

Material and Colour Availability

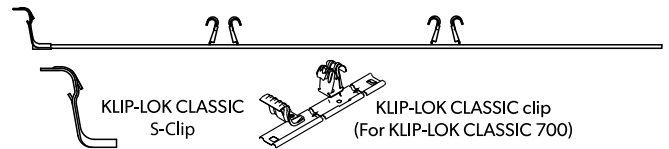
For local availability of KLIP-LOK CLASSIC in the base metal thicknesses or the large range of available finishes (from plain ZINCALUME® steel to COLORBOND® pre-painted steel), contact your nearest Lysaght service centre.

For the local availability of colours, metallic finish or stainless steel for KL-CLASSIC please enquire at your nearest Lysaght branch.

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%.

Many 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.



Masses: KLIP-LOK CLASSIC 700

BMT		kg/m	kg/m ²	m ² /t
0.42	ZINCALUME® steel	3.23	4.61	217
0.42	COLORBOND® steel	3.26	4.65	215
0.48	ZINCALUME® steel	3.67	5.24	191
0.48	COLORBOND® steel	3.70	5.28	189

Tolerances

Length: + 0mm, - 15mm; Width: + 4mm, - 4mm

Make allowance for thermal expansion or contraction for long length roofs at sheeting ends.

The equation $\Delta L = \alpha \times \Delta T \times L$ gives an indication of the sheeting extent or contraction (ΔL).

$\alpha = 12 \times 10^{-6}$ (coefficient of linear expansion for steel)

ΔT = temperature change in °C

L = sheet length in mm

Minimum roof pitch

Our unique anti-capillary side lap allows you to use KLIP-LOK CLASSIC 700 on roof pitches from as low as 1 degree (1 in 50) for 0.48 BMT, and 2 degrees (1 in 30) for 0.42 BMT.

Maximum roof lengths for drainage measured from ridge to gutter (m)

Penetrations will alter the flow of water on a roof. For assistance in design of roofs with penetrations, please seek advice from our information line.

KLIP-LOK CLASSIC Maximum roof lengths for drainage

Intensity p (mm/hr)	Roof Slope (degrees)					
	1°	2°	3°	5°	7.5°	10°
100	247	308	361	449	536	616
150	165	205	241	300	357	411
200	124	154	181	225	268	308
250	99	123	144	180	214	246
300	82	103	120	150	179	205
333	74	93	108	135	161	185
500	49	62	72	90	107	123

LYSAGHT KLIP-LOK CLASSIC 700: Limit State wind pressure capacities (kPa)

Span Type	Limit State	Span (mm)							
		900	1200	1500	1800	2100	2400	2700	3000
Base Metal Thickness 0.42mm									
SINGLE	Serviceability	2.24	2.15	1.75	1.26	0.93	0.73	0.57	0.44
	Strength	5.15	4.78	3.28	2.48	1.91	1.50	1.18	0.93
END	Serviceability	2.03	1.91	1.87	1.61	1.37	1.16	0.97	0.82
	Strength	4.67	3.23	3.17	2.75	2.34	1.93	1.57	1.28
INTERNAL	Serviceability	1.94	1.70	1.70	1.70	1.70	1.59	1.46	1.32
	Strength	3.69	3.17	3.15	2.93	2.66	2.35	2.03	1.78
Base Metal Thickness 0.48mm									
SINGLE	Serviceability	3.00	2.60	2.26	1.72	1.31	1.02	0.77	0.57
	Strength	6.22	5.20	3.86	3.25	2.68	2.15	1.65	1.20
END	Serviceability	2.89	2.68	2.68	2.62	2.55	1.80	1.26	0.95
	Strength	5.88	4.49	3.76	3.23	2.79	2.31	1.86	1.50
INTERNAL	Serviceability	2.58	2.54	2.54	2.34	2.14	1.90	1.68	1.47
	Strength	4.78	4.29	3.96	3.30	2.93	2.68	2.52	2.22

Table data are based on minimum support G550 steel with BMT of 1.0mm.

Maximum support spacings

The maximum recommended support spacings are based on testing in accordance with AS1562.1:1992, AS4040.0:1992 and AS4040.1:1992.

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

Wall spans consider resistance to wind pressure only.

These spacings may be governed by serviceability and strength limit states for particular projects.

The pressure considered is based on buildings up to 10m high in Regions A & B, Terrain Category 3, $M_s=0.85$, $M_t=1.0$,

$M_t=1.0$ with the following assumptions made:

Roofs:

$C_{pi}=+0.20$, (Region A: $C_{pe}=-0.65$) (Region B: $C_{pe}=-0.90$),

Walls:

$C_{pi}=0.20$, $C_{pe}=-0.65$

Region B: $K_f=2.0$ for single and end spans, $K_f=1.5$ for internal spans. Region A: $K_f=2.0$ for all spans

Maximum Support Spacing (mm)

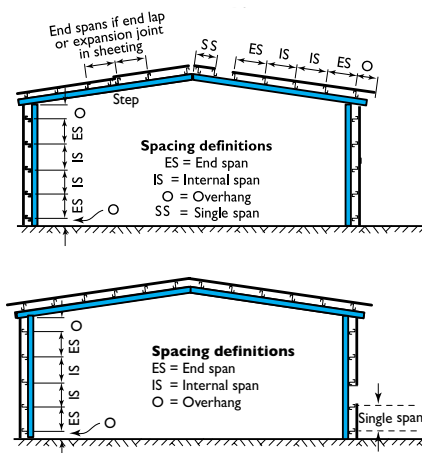
Type of span	BMT			
	0.42	0.48	0.42	0.48
Roofs*	Region A		Region B	
Single span	1600	2000	1600	2000
End span	2000	2600	1800	2100
Internal span	2700	3000#	2600	3000#
Unstiffened (eaves overhang)	200	250	200	250
Stiffened (eaves overhang)	500	600	500	600
Walls**	Region A		Region B	
Single span	2150	2550	2000	2450
End Span	2900	3000#	2300	2550
Internal span	3000#	3000#	3000#	3000#
Overhang	300	400	300	400

Table data is based on supports of 1mm BMT.

Spans in excess of 3000mm may be available subject to enquiry.

* For roofs: the data are based on foot-traffic loading

** For walls: the data are based on pressures



Limit states wind pressures

KLIP-LOK CLASSIC 700 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 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 $(\text{span}/120) + (\text{maximum fastener pitch}/30)$.

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 1.0 mm thick, seek advice from our information line.

Walking on roofs

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.

Be careful when moving between supports. Don't walk on ribs, always walk in pans. Do not walk in the pan immediately adjacent to flashings or translucent sheeting. Walk at least one pan away.

Maintenance

Optimum product life will be achieved if all external surfaces are washed regularly. Areas not cleaned by natural rainfall (such as the tops of walls sheltered by eaves) should be washed down every six months.

Adverse conditions

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

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.

Metal & timber compatibility

Lead, copper, free carbon, bare steel and green or some other chemically-treated timbers 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.

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 on 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.

End Laps/Expansion Joints

End lapping is not recommended for KLIP-LOK CLASSIC. Expansion joints may be used for long roofs in some conditions. Call your local Lysaght service centre for advice on use of expansion joints and delivery of long length cladding.

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.

Sealed joints

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

Storage and handling

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

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

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 1170.2:2002.

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



KLIP-LOK CLASSIC 700 Fasteners

Suitable for no insulation or insulation up to 100mm

	Fix to Steel Single thickness steel ≥1.0mm BMT up to 3.0mm BMT	Fix to Steel Total Lapped thicknesses of ≥1.0mm BMT up to 3.8mm BMT	Fix to Timber Hardwood (J1-J3)	Fix to Timber Softwood (J4)
Clip Fixed	5.4-14x25, Vortex, HH 12-14x30 Concealed Hex Tek	5.4-14x25, Vortex, HH 12-14x30 Concealed Hex Tek	5.4-14x25, Vortex, HH	5.4-14x25, Vortex, HH

Notes: 1] For other steel thicknesses not specified please seek advice from screw manufacturer. 2] HH = Hex. Head 3] Use three screws per clip.

Installation

Preparation

Before starting work ensure that:

- The supports for your cladding are truly in the same plane, this is critical if the roof slope is $\leq 5^\circ$
- The minimum roof slopes conform to our recommendations
- The overhangs of sheets from the top and bottom supports don't exceed our recommendations.
- The first and last supports and clips should be at least 75mm from each end of the sheet to keep maximum holding power.

Make any necessary adjustments before you start laying sheets, because they will be difficult to rectify later.

Orient sheets before lifting

Consider which end of the building is best to start from. For maximum weather-tightness, start laying sheets from the end of the building that will be downwind of the worst-anticipated or prevailing weather (Figure 1).

It is much easier and safer to turn sheets on the ground than up on the roof. Before lifting sheets on to the roof, check that they are the correct way up and the overlapping side is towards the edge of the roof from which installation will start.

Place bundles of sheets over or near firm supports, not at mid span of roof members.

Klip-lok classic 700 Installation

- 1 Lay and fix wire mesh to the supports and glass wool insulation in accordance with the appropriate building requirements.
- 2 Position the first clips on each support by placing onto the support nearest the roof edge. (Figure 2)
- 3 Fix the first clip on the support so they point in the direction of laying. Ensure the clip is 90 degrees to the edge of the sheet.
- 4 Align the clips using a string line (Figure 3) or the first sheet as a straight edge to align the clips as you fix a clip to each support working towards the high end of the roof.
- 5 Drive hex-head screws through the top of the clip, into the support.
- 6 Work along the edge of the roof, ensuring it aligns correctly at its ends in relation to the gutter and ridge or parapet or transverse wall.

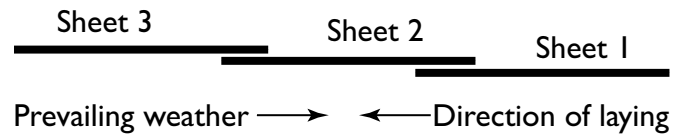


Figure 1
Lay sheets towards prevailing weather

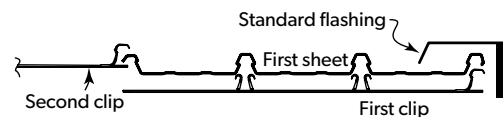


Figure 2
Sequence of laying

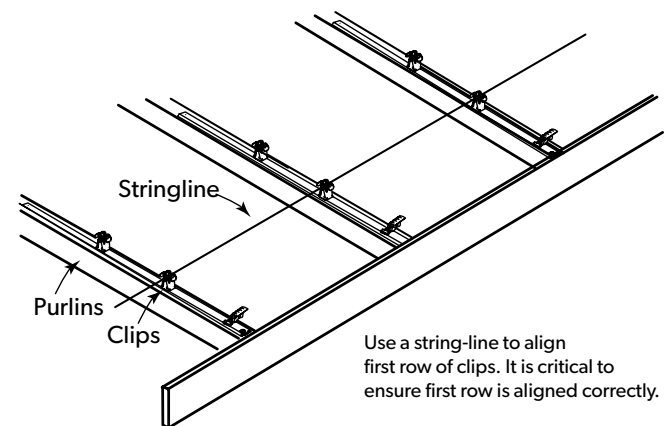


Figure 3
Use a stringline to ensure first row of clips is aligned. Fix first row of clips.

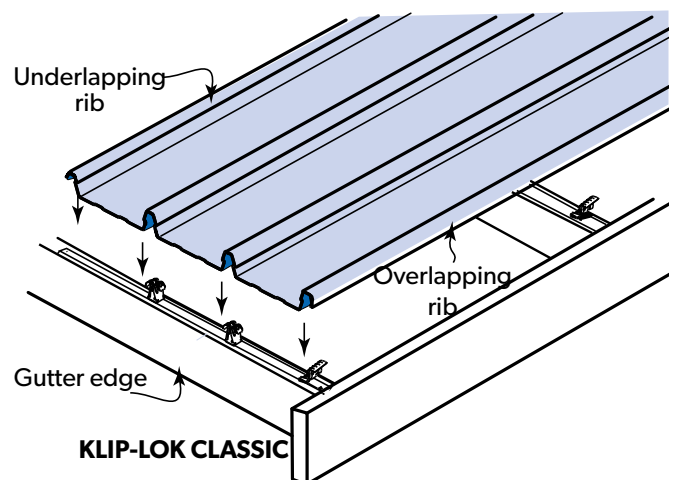


Figure 4a
Placing the first sheet



Figure 4b
Position the 'S' clips over the male lapping rib of the cladding.

- 7 Position the first sheet so that it overhangs the desired amount (minimum 50mm) to the gutter. It is important to ensure this first sheet is placed square to adjacent edges. (Figure 4a)
8. Engage the sheet with clips using vertical foot pressure on all the ribs over each clip.
9. Fix the initial overlapping rib of the first sheet using an 'S' clip. (For laying sequence, see Figure 4b.)
10. Fix each next row of clips one to each support by engaging the front of the clip assembly onto the underlap rib of the preceding sheet engaging the spur of the clip to the leading edge of the previous sheet. (Figures 5 & 6) Be sure the clip is at 90° to the edge of the sheet.
11. As before, place the next sheet over its clips ensuring you also engage the edge of the preceding sheet.
12. Fully engage the two sheets along the overlapping rib. You can do this by walking along the full length of the sheet with one foot in the centre pan of the previous sheet and the other foot applying vertical pressure to the top of the interlocking ribs at regular intervals. It is recommended that you don't walk in the unsupported pan beside the underlapping rib. (Figure 7)

With long spans, additional care may be required to ensure the overlapping rib adequately engages onto the underlapping leg. Care should be exercised due to the potential instability of the side lap when it is not adequately engaged (interlocked).

13. Similarly, engage all the clips by applying vertical foot pressure to the top of the other two ribs over each clip. It is essential that the sheets interlock completely. It is important that your weight is fully on the sheet you are installing.
14. Fit an 'S' clip at the last rib of the profile (similar to Step 9 when the sheet was started). Both starting and finishing requires an 'S' clip.

Check alignment occasionally

Occasionally check that the sheets are still parallel with the first sheet, by taking two measurements across the width of the fixed sheeting. At about half way through the job, perform a similar check but take the measurements from the finishing line to aim for the final sheet to be parallel with the end of the roof. If the measurements are not close enough, lay subsequent sheets very slightly out of parallel to gradually correct the error. (Figure 8)

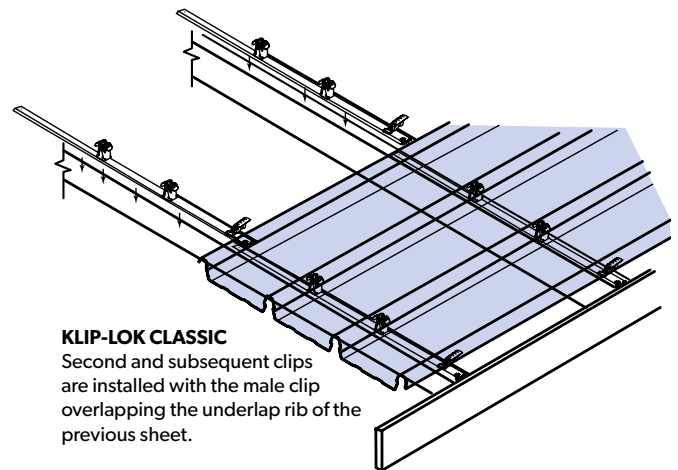


Figure 5
Fix the next (and subsequent) clips and sheets

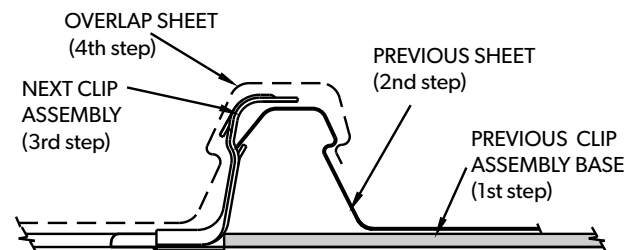


Figure 6
Engaging the next clip to the first sheet

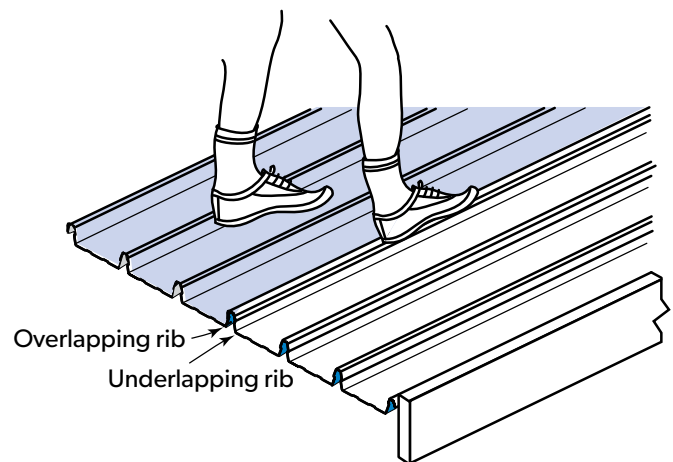


Figure 7
Engaging the lapping ribs

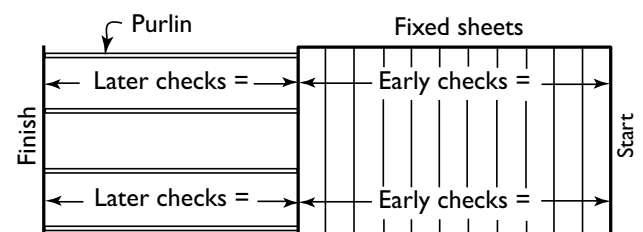


Figure 8
Check alignment occasionally

Fix the last sheet

If the final space is less than the full width of a sheet, you can cut a sheet along its length and shorten the clips as appropriate.

Installing KLIP-LOK CLASSIC 700 walls

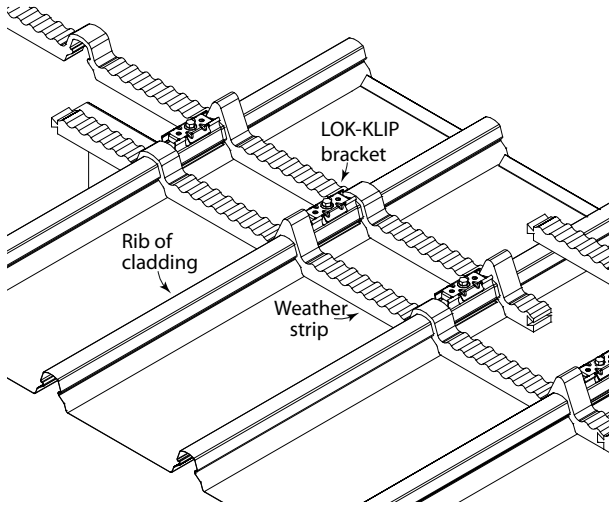
In walling applications, horizontal pressure will need to be applied locally to the sheets to engage the ribs. Use body pressure (torso, hand or foot) or use a rubber mallet if required. Care should be exercised due to the potential instability of the temporary worker access equipment.

To prevent KLIP-LOK CLASSIC 700 from sliding downward in the fixing clips, you should pierce-fix through each sheet under the flashing or capping, along the top of the sheets.

LOK-KLIP and KLIP-LOK CLASSIC 700

The new LYSAGHT LOK-KLIP® system provides installers with quick and easy end joint/ expansion joint solution between overlapping sheets of KLIP-LOK CLASSIC.

For more details refer to the LOK-KLIP brochure available on our website www.lysaght.com



LOK-KLIP and KLIP-LOK CLASSIC 700

Installing translucent sheets with KLIP-LOK CLASSIC 700

Because of its greater thermal expansion, translucent cladding should be fixed and sealed using screws and washers recommended by the cladding manufacturer. When used with concealed fixed claddings, ensure the fasteners do not penetrate the steel cladding. There are translucent products available that easily accommodate this.

Note: Don't exceed the maximum support spacing specified by the translucent cladding manufacturer. Use of translucent sheeting may result in lower limit state capacities.

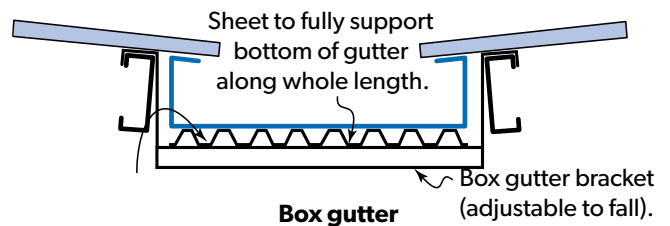
For installation with translucent sheets with LYSAGHT LOK-KLIP, refer to the Ampelite Clearslide installation guidelines on LOK-KLIP.

Commercial/industrial drainage systems

There is a standard procedure for designing the drainage of a roof using an eaves & gutter system. It is assumed that the gutters will have a gradient steeper than 1:500. Box gutter systems can be more complex and are thoroughly treated in AS/NZS 3500.3:2003.

We manufacture the perfect guttering system for your structure, whichever type is appropriate.

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.



Product Descriptions

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

They are intended by Lysaght to be a general description for information and identification purposes and do not create a sale by description. 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.

Disclaimer, warranties and limitation of liability

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.

Terms and conditions of sale available at local Lysaght sales offices.

Except to the extent to which liability may not lawfully be excluded or limited, BlueScope Steel Limited will not be under or incur any liability to you for any direct or indirect loss or damage (including, without limitation, consequential loss or damage such as loss of profit or anticipated profit, loss of use, damage to goodwill and loss due to delay) however caused (including, without limitation, breach of contract, negligence and/or breach of statute), which you may suffer or incur in connection with this publication.

© Copyright BlueScope Steel Limited 20 March, 2014

WWW.LYSAGHT.COM

Technical enquiries: steeldirect@bluescopesteel.com
or call 1800 641417

LYSAGHT, KLIP-LOK CLASSIC, LOK-KLIP, NOVALINE, TRIMLINE, SHEERLINE, THERMATECH, COLORBOND and ZINCALUME are registered trademarks of BlueScope Steel Limited, ABN 16 000 011 058. Vortex® is a registered trademark of Bremick Ltd. The LYSAGHT® range of products is made by or for BlueScope Steel Limited trading as Lysaght. 20/3/14

