

LOK-KLIP®

END/EXPANSION JOINT SOLUTION
FOR KLIP-LOK 700 HI-STRENGTH®

LYSAGHT



LYSAGHT LOK-KLIP® AND KLIP-LOK 700 HI-STRENGTH® (KL-700HS)

The new LOK-KLIP® system provides installers with a quick and easy end joint/expansion joint solution between overlapping sheets of KLIP-LOK 700 HI-STRENGTH®.

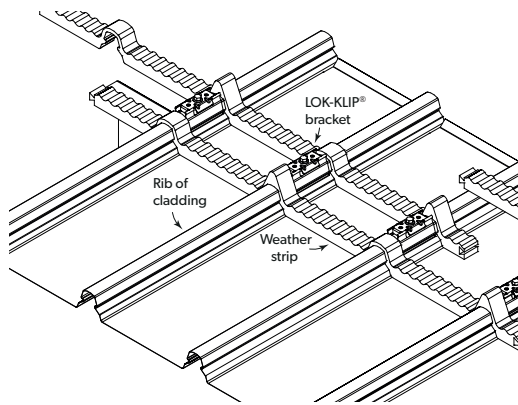
The LOK-KLIP® system comprises a fully engineered ZINCALUME® steel bracket and a custom shaped weather resistant polyethylene foam weather strip. The LOK-KLIP® bracket replicates the role of a standard concealed fix bracket and is secured to the ribs of the bottom sheet using standard roofing fasteners.

BENEFITS OF LOK-KLIP®

- Low profile system maintains clean, long run roof lines of KLIP-LOK® cladding.
- A cost effective way to achieve a long-length roofing design, even when using shorter roof sheets.
- Fast and easy to install – minimal change to current KLIP-LOK® installation practice.
- Tested and proven in our NATA-accredited testing facility. If installed correctly, will preserve all existing roofing warranties.
- Safe and effective weather resistant seal.
- Suitable in cyclonic locations.
- Allows thermal movement.
- No special purlin detailing required - saves you time and money.
- Fully designed and engineered quality components.
- As a stand alone solution, compatible with translucent sheeting.

Figure 1

LOK-KLIP® is comprised of brackets which are fixed to the ribs and two separate weather strips.



BACKGROUND ON THERMAL EXPANSION

All metals expand and contract with changes in temperature. Although steel is by far the least affected of all the metals commonly used for roof and wall cladding, the changes in length experienced in very long runs of roofing are significant.

Consequently in very long runs of roof a traditional expansion joint is included thus reducing the impact of thermal movement.

For clip-fixed roofing an expansion joint is not normally required. However for KL700HS, when sheet lengths are shorter than the roof run then the shorter lengths need to be joined end-to-end. It is common for the joint to be a traditional expansion joint. The spacing of the joint is commonly 12m (nom.) or greater. For joint spacing closer than 12m contact your nearest service centre for advice.

LOK-KLIP® is an alternative to the traditional expansion joint.

LOK-KLIP® IS AN EXPANSION JOINT/LAP JOINT HYBRID

An expansion joint involves overlapping the ends of the upper sheets over the ends of the lower sheets. With LOK-KLIP®, no extra purlin is needed at the joint.

A weather strip provides protection from wind-blown rain and is made from closed cell polyethylene foam. It is used between the upper and lower sheets and laid in pairs, one either side of the LOK-KLIP® bracket to provide a weather resistant barrier from wind driven rainwater. It also provides air flow to reduce likelihood of condensate build-up.

The LOK-KLIP® bracket is a pressed metal component that saddles the rib of the KLIP-LOK® roofing by engaging the “S” bends of the lower sheet and is clipped into place. The bracket is fixed to the lower sheet by fasteners through the pre-punched holes however this allows the upper sheet to move relative to the bracket due to thermal expansion. The resulting step from the top of the lower sheet to the top of the upper sheet is only 20mm (nom.). Compare to the traditional expansion joint step of 60mm (nom.)

TESTING

Made from Australian-made G550 AZ150 ZINCALUME® steel, LOK-KLIP® is strong. LOK-KLIP® has been tested for performance in wind uplift and weather-resistance at Lysaght’s NATA-accredited materials science testing laboratory. This means you can be confident that LOK-KLIP® will perform to specification when installed according to our design limitations and installation guidelines.

Figure 2

Wind uplift tests were performed to ensure LOK-KLIP® clips met the performance standards required.

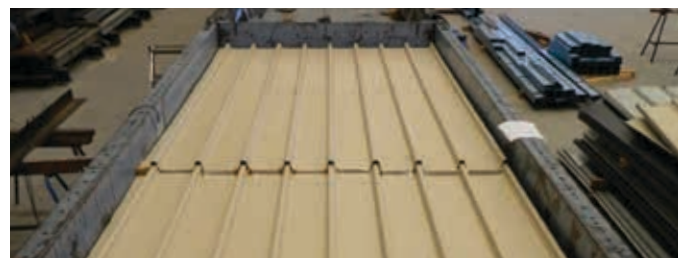


Figure 3

Weather test rig is used to test weather-resistance by blowing simulated wind borne rain.



LOK-KLIP® JOINT LAYOUT AND FIXING

This will allow normal concealed fastening at the support and thus allowing thermal movement to occur at the LOK-KLIP®. To install the LOK-KLIP® bracket, locate each LOK-KLIP® bracket as per Figure 5, then hand press to snap fit each LOK-KLIP® bracket to the KL-700HS rib (Figure 4a, 4b). For non-cyclonic areas, using a low torque setting on the drill to ensure the cladding is not stripped, secure through the top hole of the LOK-KLIP® and also through the crest of the lower sheet (Figure 4a). For cyclonic areas, use two fasteners by fixing through the sides of the LOK-KLIP® bracket into the sides of the rib (Figure 4b).

Figure 4

Weather strips are laid either side of the LOK-KLIP® brackets and offset (see installation steps).

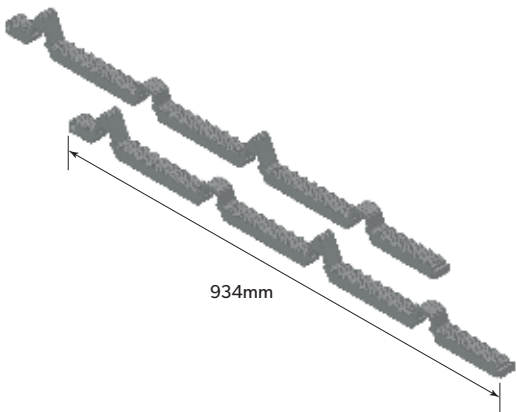


Figure 4a

Fixing of LOK-KLIP® brackets to cladding.

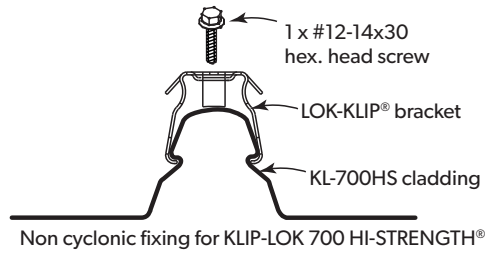


Figure 4b

Fixing of LOK-KLIP® brackets to cladding.

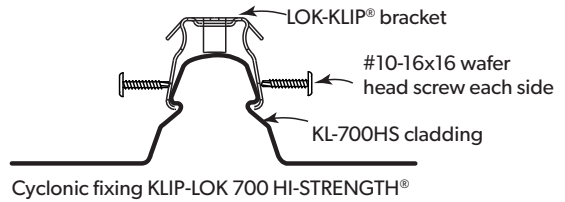


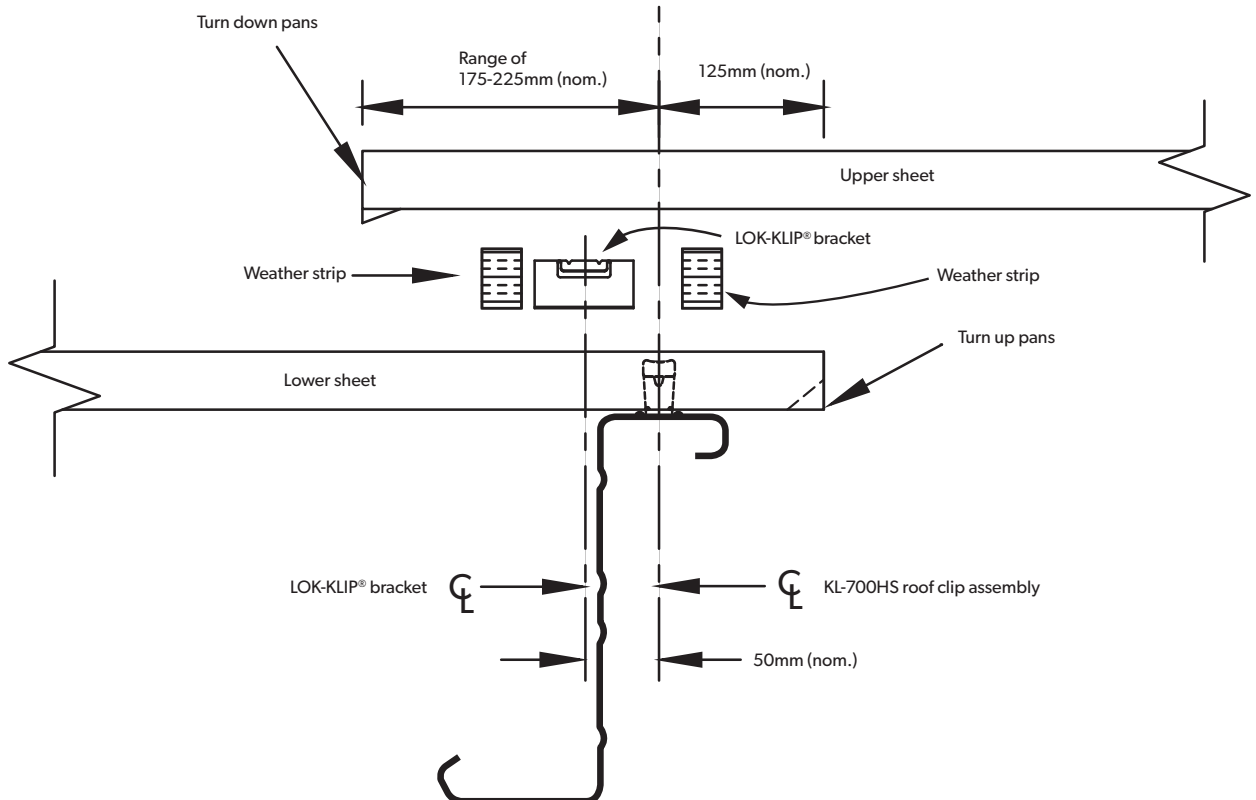
Table 1

Fasteners for LOK-KLIP® installation

KL-700HS	
NON-CYCLONIC	1 x #12-14x30 Hex head screw on top of bracket
CYCLONIC	2 x #10-16x16 Wafer head screw at each leg of bracket, 2 in total

Figure 5

Details of LOK-KLIP® at support.



NOTE: The installer must make allowance for added sheet length for upper and lower sheets or any intermediate sheet resulting from multiple joints to construct the joint.

INSTALLATION

ROOF DESIGN CONSIDERATIONS

The spans of the roofing at the joint must be kept within the following limits:

- The roofing sheets on either side of the LOK-KLIP® joint are not to exceed the maximum recommended END span of the roofing.
- The purlin spacing (roofing span) must be of a practical range – typically 900mm or greater.

Packers (10mm thick) may be required to achieve a more gradual change in the roof slope and to ensure drainage at the joint. The packer is positioned on the lowest purlin of the upper sheet for roofs at the LOK-KLIP® joint system (see Figure 12).

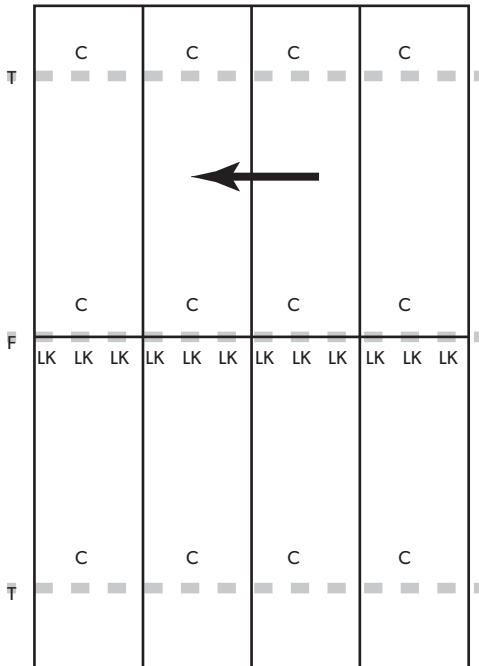
Packers would only be required on shallow roof slopes and when the purlin spacing for the end span is close. For roof slopes of 2.5° or more with the purlins spacing at a practical range then no packer is required. For roof slopes down to 2.0° with the purlins spacing at a practical range then a packer is preferred. For roof slopes down to 1.5° with the purlins spacing at a practical range then a packer is recommended. For roof slopes down to 1.0° then a packer is recommended and the purlin spacing must not be less than 1750mm (this is the maximum end span recommendation for 0.42mm BMT).

For advice on roof drainage, refer to the LYSAGHT® Roofing & Walling Installation Manual. It may be necessary to employ packers to provide a more gradual change in the slope of the roof.

When specifying or ordering, please refer to the layout schematic detailed below.

Figure 6: Layout of clips

This layout shows the location and types of clips/brackets required to fit a KL-700HS using LOK-KLIP® end joint.



- — — = purlin
- ← = direction of laying
- C = Standard clip (3-tower)
- LK = LOK-KLIP® bracket
- T = Single clip KL-700HS tower
- F = LOK-KLIP® Underlap Rib Hold Down Clips

Table 2
LOK-KLIP® assembly components.

LOK-KLIP® brackets	43 per 10m
Weather strip	22 per 10m
LOK-KLIP® Underlap Rib Hold Down Clips (F) for each finishing end of the LOK-KLIP® joint	1

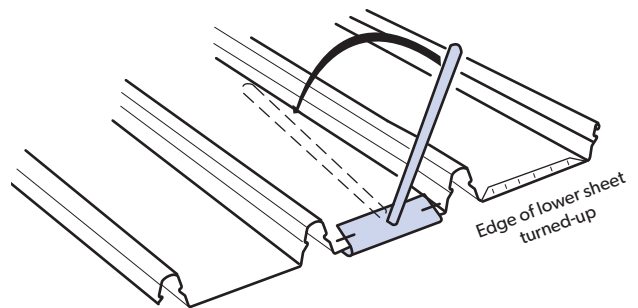
TURN-UP AND TURN-DOWN OF KL-700HS AT LOK-KLIP® JOINT

TURNING-UP

Turn-ups are performed on the upper end of the lower sheets using the turn-down tool. Holding the end of the tool against the end of the sheet, pull the handle until the handle bottoms out onto the pan, being careful not to tear the cladding.

Figure 7

Turn-up of lower sheet of KL-700HS at LOK-KLIP® end joint.



TURNING-DOWN

The upper sheet of a LOK-KLIP® joint requires the lower end of the upper sheet to be lipped prior to laying the sheets.

- Push the turn-down tool over the end of the tray, as far as it will go.
- Hold the tool hard against the end of the tray and pull the handle until the lipped edge bottoms out on the underside of the pan, resulting in a nominal 20 degrees lip (Figure 7.)

Again, be careful not to tear the sheet.

Figure 8

Turning-down the upper sheet at the LOK-KLIP® end joint.

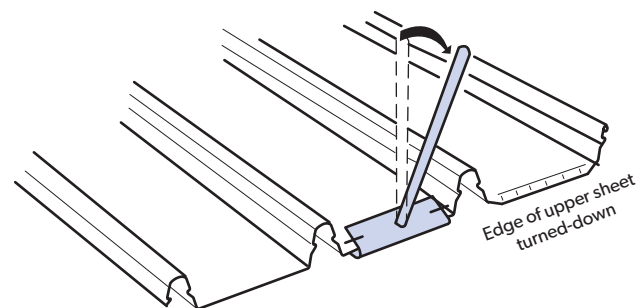
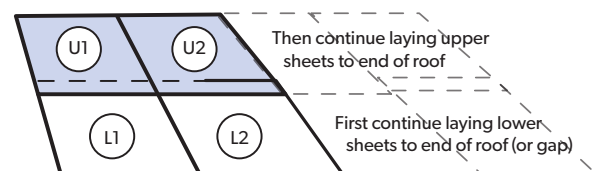


Figure 9

Laying sequence for KL-700HS end joint.



STEP 1:

The installation of KL-700HS should generally be in accordance to the instructions given in the LYSAGHT® Roofing and Walling Installation Manual.

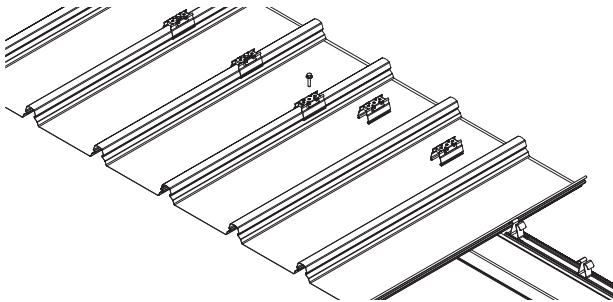
Install the lower sheets of the KL-700HS prior to installing upper sheets as per the above sequence. The number of sheets laid will depend upon the site conditions and installer programme. Packers (10mm thick) may be required on the lowest purlin of the upper sheet for roofs of less than 2° slope and less than 1400mm span. For further information contact your nearest Lysaght Service Centre.

STEP 2: TURN-UP OF PANS

The pans on the upper end of the lower sheet are to be turned-up as detailed prior to fitting LOK-KLIP® brackets.

Figure 10

Place LOK-KLIP® brackets.

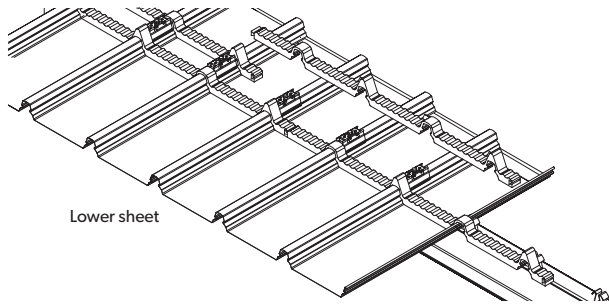


STEP 3: ATTACH BRACKETS TO CLADDING

Once the required number of lower sheets are installed position the LOK-KLIP® brackets on the ribs and fix as detailed in Figures 1 and 5. Use a stringline or straight edge to ensure clips are aligned.

Figure 11

Lay LOK-KLIP® weather strip either side.



STEP 4: PLACE WEATHER STRIPS

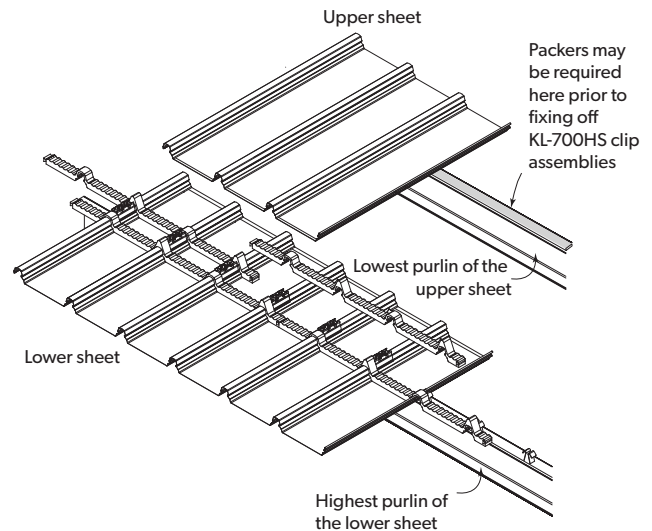
Interlocking weather strips are installed on top of cladding so they interlock to similar weather strips each side. The weather strips are placed on both sides and adjacent to the brackets.

The join on the weather strip should not be positioned adjacent to the male leg (underlap rib). Furthermore the two rows of weather strips must have the join in alternating pans (i.e. the joins are off-set).

Ensure the weather strips properly nest into the 'S' bends of the ribs and this allows for a staggered ventilation path.

Figure 12

Place upper sheet over LOK-KLIP® end joint.



STEP 5: LAY UPPER SHEET OVER LOK-KLIP®

Prepare the upper sheets by turning down the pans at the lower end of the sheet as detailed.

Position the upper sheets, taking care not to dislodge the previously installed weather strips.

While standing on the lower sheet, install the upper sheet onto the LOK-KLIP® brackets by first engaging the inner ribs and then the female side-lap rib (listen for the "snap" engagement). This engagement is done by foot pressure. Ensure correct engagement of the male leg onto the LOK-KLIP® bracket.

Install the remainder of the upper sheet onto the standard fixing clips using the standard process.

Figure 13

LOK-KLIP® Underlap Rib Hold Down Clips (F).

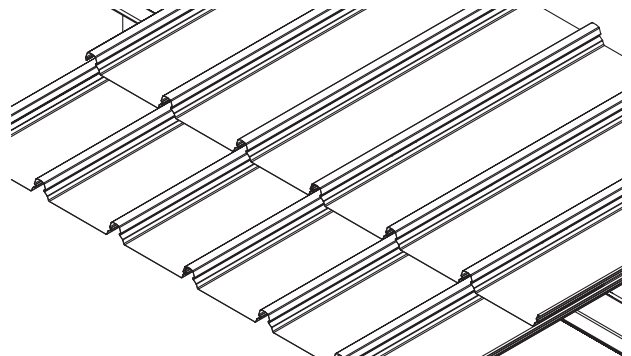


STEP 6: FINISHING

Continue the above process to the finishing edge/end of the roof. At the finishing edge of the roof, it is necessary to secure the two underlap ribs using Underlap Rib Hold Down Clips (F) screwed into position. The overhanging weather strips can be cut or torn off. It is now ready to receive barge flashing. Avoid walking at the roof edge.

Figure 14

Completed LOK-KLIP®.



NOTE: Care should be taken to avoid walking around the LOK-KLIP® overhang area. Use of LOK-KLIP® to our guidelines won't void any product warranties.

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