

EQUITONE UNI-rivet

Fixing to Metal Supporting Frames

SUMMARY RECOMMENDATIONS

Only use Aluminium EQUITONE UNI-rivet to fixing to Aluminium Support Frame.

Ensure correct position for the 2 STOP points in each panel.

Respect the panel edge distances for the rivets.

This Guidance Note to be read in conjunction with the current EQUITONE Planning & Application Guide.

1.0 INTRODUCTION

EQUITONE may be face fixed to a metal supporting frame using the EQUITONE UNI-rivet. The rivets have colour matched heads to match the panel. Aluminium rivets can only be used with aluminium supporting frames. Stainless steel rivets can be used with, aluminium, galvanised or stainless steel supporting frames.

The thermal expansion and contraction is many times greater for the metal supporting frame than for EQUITONE. Therefore, a fixing system that accommodates the movement of the metal is highly recommended. Failure to do so could result in causing cracking in the panels.

2.0 AREA OF APPLICATION

This Guidance Note gives recommendation for rivet fixing EQUITONE [tectiva], EQUITONE [linea], EQUITONE [natura], EQUITONE [pictura], EQUITONE [textura], and EQUITONE [materia] to a vertical facade.

For sloping facades please contact your local EQUITONE Technical Support.

3.0 EQUITONE UNI-RIVET

With its unique design the EQUITONE UNI-rivet fixing system provides EQUITONE with 3-way movement to ensure minimum strain is placed on the panel when fixing to metal supporting frames.

EQUITONE UNI-rivet is available for:

8 mm thick panel	4x18 K15 AlMg5 Aluminium rivet
	4x18 K15 A2 (304) Stainless Steel rivet
	4x20 K15 A2 (304) Stainless Steel rivet

12 mm thick panel 4x25 K15 AlMg5 Aluminium rivet
 4x22 K15 A2 (304) Stainless Steel rivet
 4x24 K15 A2 (304) Stainless Steel rivet

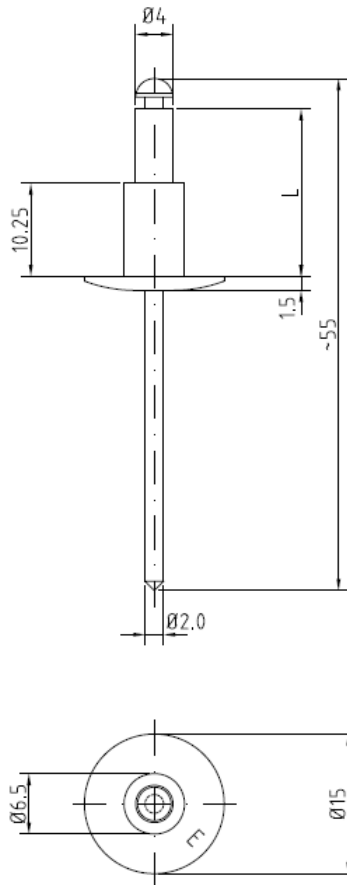


Figure 1: Aluminium Rivet Profile

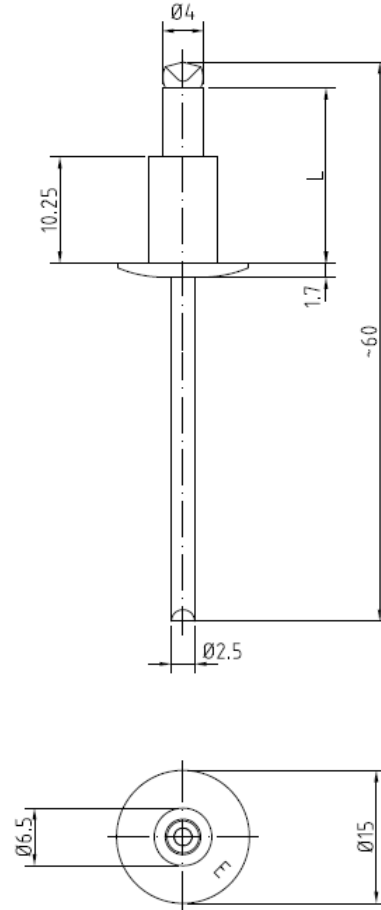


Figure 2: Stainless Steel Rivet Profile

3.1 GRIP RANGE OF RIVETS

8mm Panel

Rivet Type	Suitable for Support Frame thickness
4x18 K15 AlMg5 Aluminium rivet	1.7mm to 2.75mm
4x18 K15 A2 (304) Stainless Steel rivet	1.15mm to 3.75mm
4x20 K15 A2 (304) Stainless Steel rivet	3.75mm to 5.75mm

12mm Panel

Rivet Type	Suitable for Support Frame thickness
4x25 K15 AlMg5 Aluminium rivet	1.7mm to 3.75mm
4x22 K15 A2 (304) Stainless Steel rivet	1.7mm to 3.75mm
4x24 K15 A2 (304) Stainless Steel rivet	3.75mm to 5.75mm

4.0 SUPPORTING STRUCTURE

The guidelines for the construction of a ventilated aluminium and galvanized supporting structure can be found in the EQUITONE Planning and Application Guidelines, Section 5, page 59-71.

The most common arrangement for the panel's support is onto metal vertical rails. Vertical rails ensure that the air flow in the cavity space is not disrupted and that there is free drainage of any moisture.

While fixing EQUITONE panels to a horizontal support frame can be done, the designer needs to consider that

- a) Any moisture running down the back of the panel may become trapped and will rest on the horizontal rail. This may cause the profile to deteriorate over time or cause temporary staining to the panel.
- b) The cavity between the insulation and the panel will be wider to accommodate the horizontal profile. A double support frame system may be needed to form the cavity.
- c) The air in the cavity will not be as smooth flowing.

Where possible all structural connections should be facing “down-and-out” to minimise the risk of moisture travelling along them back towards the wall.

4.1 Rivet Centres

Many factors influence the design when considering the rivet position. Factors such as:

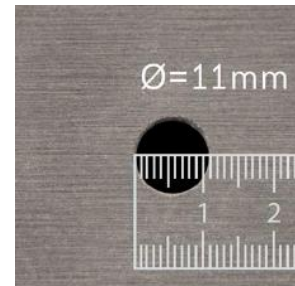
- Height of Building - Normally the higher the panels are on the façade, the greater the number of rivets. However some country's calculation methods will treat a façade the same using the highest value only.
- Panel Layout - The rivet centres commonly differ between vertical and horizontal orientated panels.
- Thickness of Panel - Thicker panels provide higher resistance values and in some circumstances can result in greater rivet centres.
- Wind Loading - The factor which influences the number of rivets per panel the most is the wind load the panel is expected to be subjected to.
- Site Location - The buildings location will play a major factor in determining the number of fixings. Is the building in an urban or rural setting, close to the sea or at altitude.
- Panel position on the façade - Certain zones on façade such as the corners can require closer rivet centres.

Most regions around the world have their own unique standard for structural calculations and these need to be adhered to. In Europe all calculations have been based on Eurocode guidance. However each country has its own unique annex to the code. This may affect the calculations.

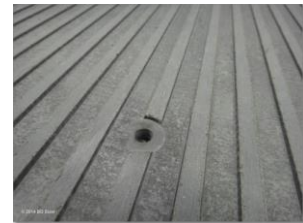
Therefore it is vitally important that the final number of fixings per panel is to be calculated and specified by the project engineer.

5.1 PROCEDURE

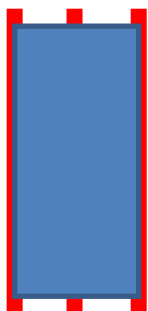
The panel must be pre-drilled with an 11 mm diameter size hole. The EQUITONE fibre cement drill bit must be used. Accurately mark the hole positions on the face of the panel. Please note that it helps to use a coloured pencil to mark a grey tone panel as a grey pencil mark can cause confusion. Drill one panel at a time face side up.



From an aesthetic point of view when drilling the EQUITONE [linea] it is recommended to align the fixing points with the ribs of the panel. Doing so, the head of the UNI-rivets are the least visible. This will result in a wider metal support rail of up to 140 mm being used behind the vertical joints.



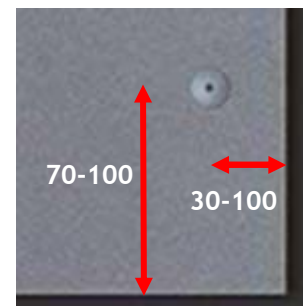
5.2 Hole Position



The position of the holes is as follows for a vertical support frame:

From the horizontal edges of the panel the dimension is 70 mm -> 100 mm.

From the side edges of the panel the dimension is 30 mm -> 100 mm.



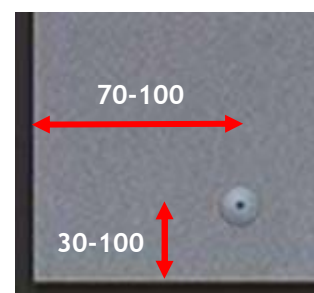
Placing the corner rivets 80 mm from the horizontal edge 30 mm from the vertical edges visually is the preferred location.



The position of the holes is as follows for a horizontal support frame:

From the side edges of the panel the dimension is 70 mm -> 100 mm.

From the horizontal edges of the panel the dimension is 30 mm -> 100 mm.



Placing the corner rivets with a 80 mm / 30 mm distance is visually the preferred location. For other hole positions please contact your local EQUITONE Technical Support.

The centres for the rest of the fixings are determined based on the engineer's calculations. Please note that the size of the supporting rails is influenced by the position of the holes in the panel.

6.0 EQUITONE FIXING PRINCIPLE

6.1 STOP Point

Each panel has two **STOP** points. The two **STOP** points are formed by using the **RED** rivet sleeve to fill the oversized hole. This sleeve is put on over the green spacer before inserting the rivet into the hole.



The **STOP** points are needed to hold the panel in place and prevent sagging. Having 2 **STOP** points prevents the any rotation in the panel.

6.2 GO Point

No **RED** sleeve is used for the **GO** points. Just use the EQUITONE UNI-rivet.



6.3 Centralising Tool

This tool fits into a drill and is used to drill the hole in the supporting frame for the rivet. This hole must be placed centrally with the larger hole in the panel. The drill bits can be replaced and adjusted to suit the supporting frame thickness.



6.4 Rivet Setting Tool

A rivet setting tool which fits to the end of the rivet gun can be used and this helps to prevent scratching the rivet head and the panel during the fixing process and it ensures the correct placement of the rivet perpendicular to the frame and panel.

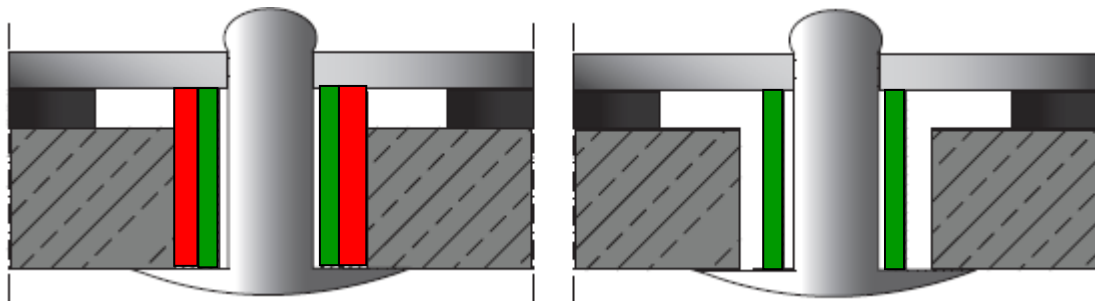


6.5 EQUITONE [linea] Milling Tool

To ensure the head of the UNI-riquet sits flat on the [linea] the ribs at the location of the UNI-riquets have to be removed. This accessory has been designed to mill the high ridges or ribs of the [linea] panel and drill the 11 mm diameter hole in one operation. The tool is fully adjustable to stop over-milling. The debris is allowed to escape via holes in the side.



6.6 Uni-riquet STOP and GO points



STOP point utilizes the RED sleeve placed over the green part of the rivet 11 mm Ø hole in the panel and a 4.1mm Ø hole in the metal frame

The **GO point** uses only the rivet 11 mm Ø hole in the panel and a 4.1mm Ø hole in the metal frame

7.0 SELECTION OF STOP POINTS

The selection of the STOP points is critical in ensuring a successful façade. In general the principle is that the STOP points are located along the centre lines of the panel.

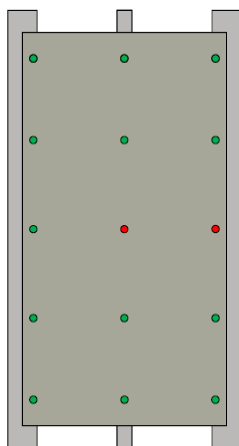


Figure 3

One STOP point is in located in the middle point and the second STOP point can be either to the left or the right of the centre STOP point. It is very important that whichever option is chosen that all panels are the same.

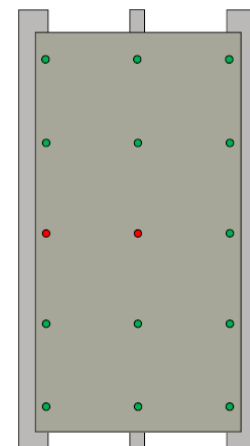
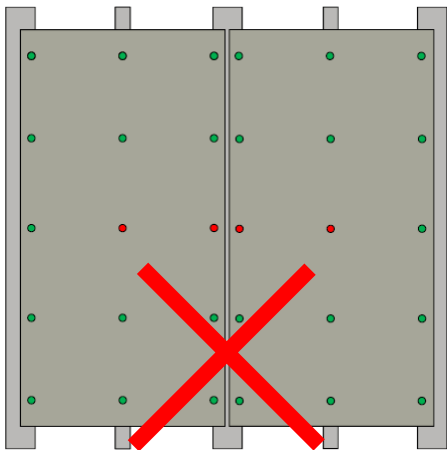


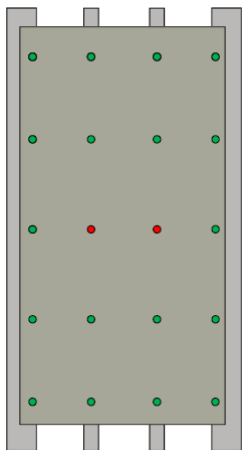
Figure 4



WARNING

At no time should the STOP points be aligned like this with two adjacent STOP points on the same vertical rail. It is advised that on large projects where more than one team of installers are working that a common fixing arrangement is agreed before fixing commences to prevent situations like this.

Figure 5



In instances where there is no central support rail or for panels with an even number of rivet rows then use the row closest to the centre line of the panel. Same warning applies as Figure 5.

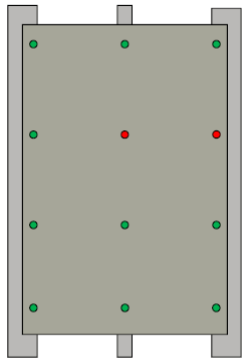


Figure 6

Figure 7

Where the support frame runs perpendicular to the long edge of the panel, position the STOP points along the centre lines or as close to the centre as possible. For long panels as in figure 8 the STOP points can be placed symmetrically.

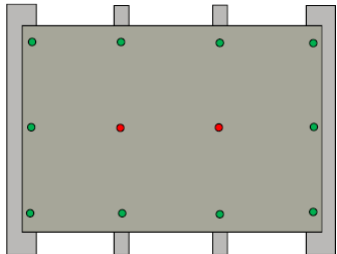
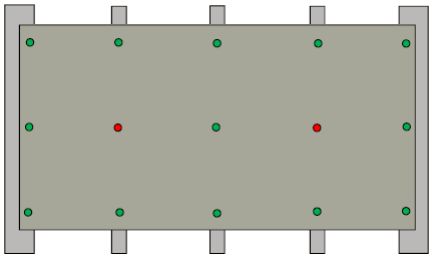


Figure 8

Figure 9

When narrow EQUITONE panels are used with only 2 lines of fixings it is important that there is a vertical break in the support frame, so the panels are not locked together. This means using two L profiles instead of a T profile. Depending on the panel arrangement and site conditions this could mean a separation at every joint or a separation at 3.0m centres.

Also note that the maximum panel width is 600mm.

Please contact your local EQUITONE Technical Support.

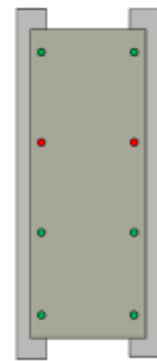


Figure 10

8.0 Joints between the Panels

The guidelines for forming the joints between the panels can be found in the EQUITONE Planning and Application Guidelines, Section 6, page 82-83.

9.0 Installation Procedure

9.1 Foam Tape

Place the foam tape (9mm x 6mm) continuously onto the support frame rails. The tape is self-adhesive strip to make placement easier. The foam tape is compressible and does not restrict movement of the panel. The tape can compress down to 1mm.



Figure 11

By placing the foam strips to the outside edges of the panel joint rail will help guide infiltrating water downwards. For this to remain effective then the foam tape should be overlapped at its joints.

For open jointed facades the tape can be cut short of the edges of the panel so it is not visible through the opening. Where horizontal joint profiles are used the tape is left in place as it will be hidden.

9.2 Mounting Procedure

Position the pre-drilled panel on a temporary support rail and against the supporting frame, adjust to correct line and clamp into place.

More detailed information on the top-down method, can be found in the EQUITONE Planning and Application Guideline, Section 4, page 56-57.



When drilling the smaller hole for the rivet it is essential that it is centred on the larger hole in the panel, like is shown here.

9.3 **RED STOP** POINTS

Starting with the **RED STOP** points, insert the 11 / 4.1mm EQUITONE centralising tool into the panel holes and drill through the support frame. Remove any loose debris from the hole. Leaving debris in the hole will make placing the STOP rivet very difficult.



Place the EQUITONE UNI-rivet into its **RED** sleeve collar (hole reducer) and place into rivet gun. Insert rivet with the sleeve collar (hole reducer) into predrilled hole and pop the rivet. Ensure the rivet is perpendicular to the panel face. Using the rivet setting tool can help. Failure to do this could result in the rivet head cutting into the panel surface. The rivet must lie flat on the facade panel.

9.4 **GREEN GO** POINTS

Continue with the **GO** points, insert the 11 / 4.1mm EQUITONE centralising tool into the holes and drill through support frame profiles. Remove any loose debris from the hole. Ensure all metal filings are removed from the hole in the panel. Filings or debris can reduce the movement allowance by reducing the hole size and in the case of a galvanized supporting frame cause future rust staining on the surface of the panel.

Insert only the EQUITONE UNI-rivet into the rivet gun and place perpendicular into the predrilled hole and pop the rivet. The rivet must lie flat on the facade panel. Using the rivet setting tool can help.

Fix **GO** points after **STOP** points are completed.

With galvanised frames failure to remove the drilling debris could result in rust staining at the base of the panel hole.

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