EQUITONE Fixed with UNI-Metal Screw to Metal Subframe Installation Guide

1. Introduction

EQUITONE may be face-fixed to a metal supporting frame using the EQUITONE UNI-Metal Screw. This screw has color-matched heads to match the panel. The Bi-Metal screw can be used with aluminum, galvanized, or stainless steel supporting frames.

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

Area of Application

This Technical Note gives recommendations for screw fixing EQUITONE [tectiva], EQUITONE [linea] and 8 mm thick EQUITONE [natura], and EQUITONE [pictura] to a metal subframe on a vertical facade.

For sloping facades please contact your local EQUITONE Technical Support.

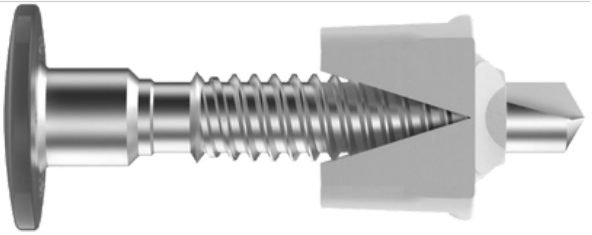
2. Design Advice

The following advice must be followed:

- **EQUITONE Bi-Metal UNI-Metal Screw must be used.**
- **All holes to be 11 mm in diameter.**
- **2 STOP fixing points per panel positioned as shown in this note.**
- **All other fixing points are to be GO points.**
- **No panel is to span over a metal support frame joint or building expansion joint.**
- **Respect the material when storing, handling, and installing.**

3. EQUITONE UNI-Metal Screw

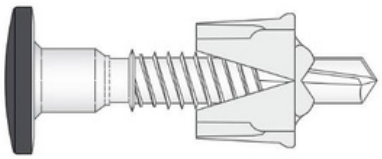
With its unique design, the EQUITONE UNI-Metal Screw fixing system provides EQUITONE with 3-way movement to ensure minimum strain is placed on the panel when fixing to metal supporting frames.



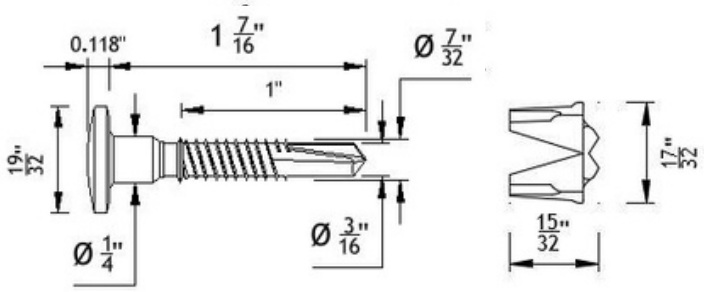
EQUITONE UNI-Metal Screw 5.8x36 for metal subframe are A2 (304)

Stainless Steel Torx T25W socket cap screw with a 19/32" diameter head. The head of the UNI-Metal Screw is available colored to match the panels.

Use only the included special T25W bit.



The standard UNI-Metal Screw is 1 17/16” long and suited for 8 mm EQUITONE panels.



The screw is suited for:

- Steel frame with thickness from 33ksi 18 ga – 55ksi 16ga.
- 6063-T5 Aluminum frame with thickness from 0.071" to 0.125".

Biodegradable

The ‘centering tip’ is fabricated of biodegradable raw materials according to test standard DIN EN ISO 14855.*

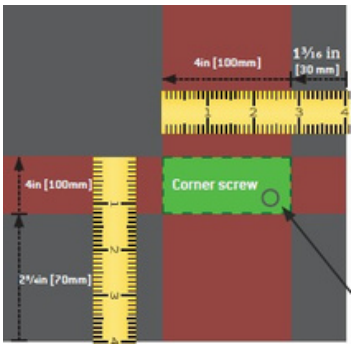
Fixing Centers

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

- Height of Building – Normally the higher the panels are on the façade, the greater the number of fixings. However, some country’s calculation methods will treat a façade the same using the highest value only. Panel
- Layout – The fixing centers commonly differ between vertical and panels.
- Thickness of Panel – Thicker panels provide higher resistance values and, in some circumstances, can result in greater fixing centers.
- Wind Loading – The factor which influences the number of fixings per panel the most is the wind load the panel is expected to be subjected to. Site Location – The building's 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 the façade such as the corners can require closer fixing centers.

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.

*The self-centering tip will break down biologically if exposed to suitable conditions like soil and sunlight. However, it is unlikely to decompose quickly if disposed of in a normal waste stream.



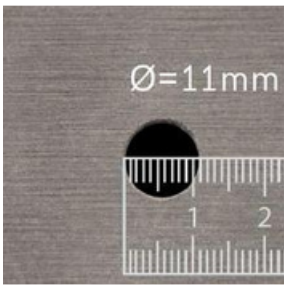
Position for Corner UNI-Metal Screw

The recommended dimension measured from a panel edge, which runs perpendicular to the direction of framing, to the center of the fixing should be between 2 3/4 " - 4".

The recommended dimension measured from a panel edge, which runs parallel to the direction of framing, to the center of the fixing should be between 1 3/16" - 4".

Placing the corner screws 3 1/8" from the perpendicular edge and 1 1/2” from the vertical edges visually is the best location.

The centers for the rest of the fixings are determined based on the engineers’ wind load calculations.



Holes in the Panel

The panel must be pre-drilled with an 11 mm diameter size hole. It is highly recommended that the EQUITONE fiber cement drill bit be used for optimal results. Accurately mark the hole positions on the face of the panel. Please note that it helps to use a colored pencil to mark a grey tone panel as a grey pencil mark can create confusion. Drill one panel at a time face side up.

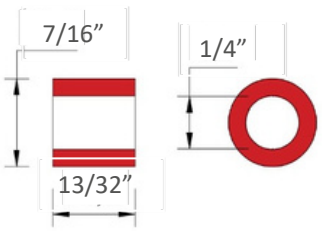
From an aesthetic point of view when drilling the EQUITONE [linea] it is recommended to align the fixing points with the ribs of the panel. Doing so, the head of the UNI-Metal Screw is the least visible. This will result in a wider metal support rail of up to 5 1/2” being used behind the vertical joints.

Selection of STOP Point for UNI-Metal Screw system

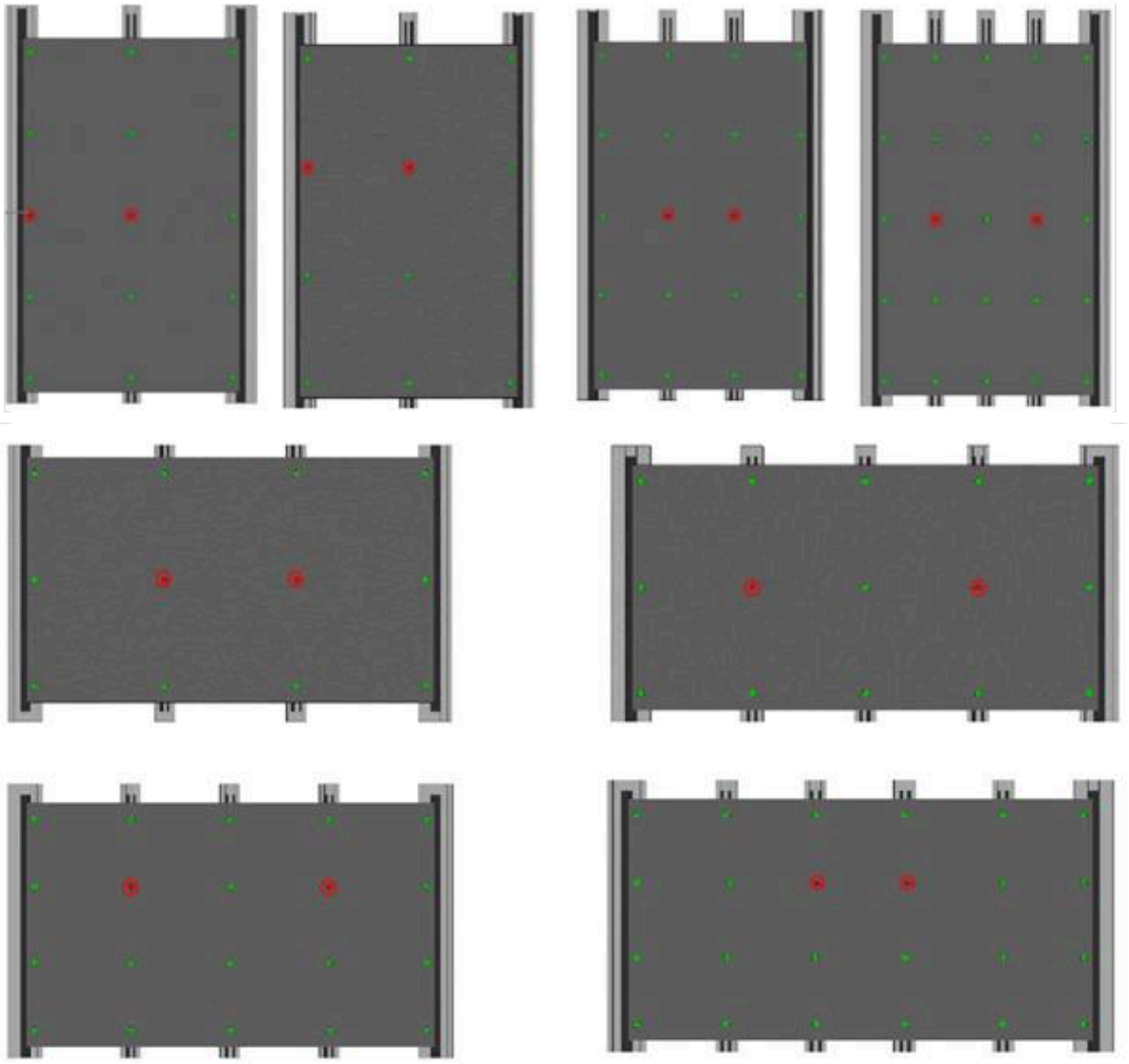
The selection of STOP points is critical. The general principles are:

- **2 STOP points per panel, the rest are GO points.**
- **STOP points are fixed on adjacent supporting rails.**
- **One STOP point is located in the middle and the second STOP point can be either to the left or the right of the center STOP point.**
- **It is very important that whichever option is chosen that the location of STOP points on all panels are the same.**
- **STOP points are located as close as possible to the central area of the panel.**

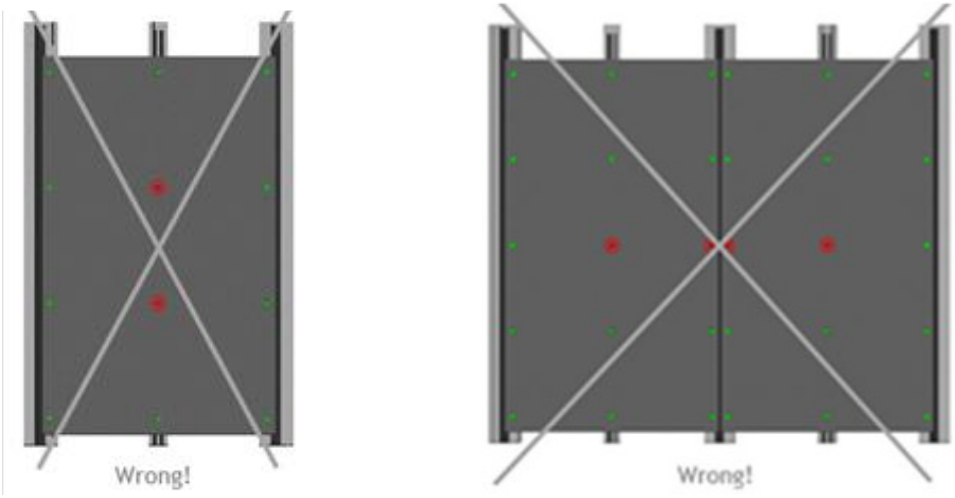
The screw is compatible with the 13/32” long RED sleeves of the UNI-Rivet system. The two STOP points are formed by inserting the RED sleeves in the oversized 11 mm holes. No RED sleeve is used for the GO holes.



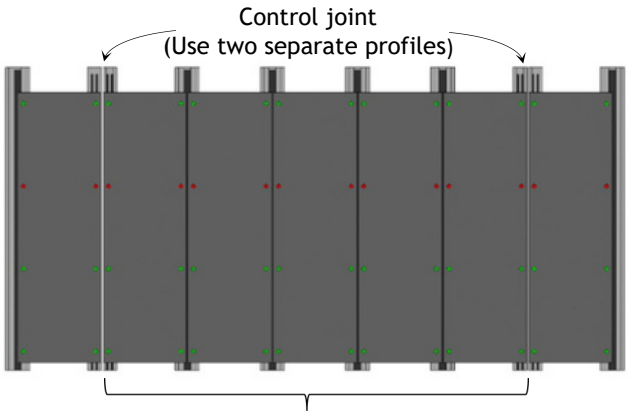
Typical Examples of the Recommended Location of STOP Points

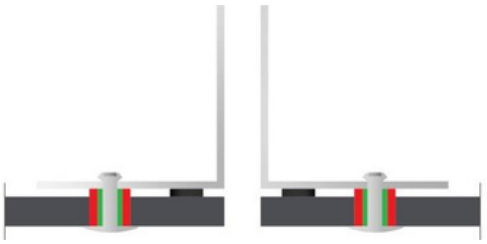


Note: The distance between the 2 RED STOP points must never be more than 24”. STOP points should not be located on the same support frame profile.



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 every 10-feet. Also, note that the maximum panel width is 24”. Please contact your local EQUITONE Technical Support.



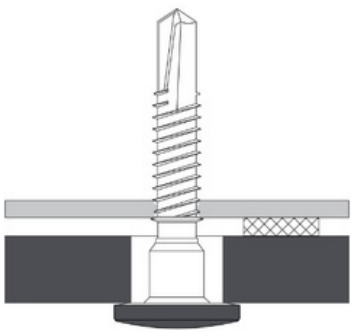


Control joints every 10-feet where there are narrow panels with STOP points located on common profiles.

Foam Tape

UNI-Metal Screw controls the depth of the connection. It provides an approximate 0.089" between the panel and support frame.

The recommended compressible foam tape is applied to the face of the framing system to allow for movement of the material and to prevent rattling. It prevents condensation lines from the framing from occurring on the front of the panel during cold weather. When conditions are unfavorable, such as very cold or wet weather, it is advisable to either apply the tape onto the profiles indoors and then fix the profiles, or alternatively, warm or dry the profiles. The foam tape should be trimmed at horizontal panel joints so that it is not visible once installed.



4. Joints Between the Panels

Joint Width

A 3/8” joint is recommended.

The minimum permissible joint is 1/4" while the maximum would be 1/2”.

Joints

Vertical joints are backed with a continuous T rail. With standard aluminum rails, the grey or silver color can be prominent especially when used with dark-colored panels. To eliminate this, the best solution is to use black-coated rails.

Horizontal joints can be left open or baffled with a horizontal joint profile. Closing off the horizontal joints with baffles may require additional ventilation openings depending on the facade height. See EQUITONE's Planning and Application Guide for minimum air cavity sizes.

The supporting frame is also visible with open horizontal joints as well as insulation and the supporting wall, they may need to be covered with a black lining-type material, especially at ground level.

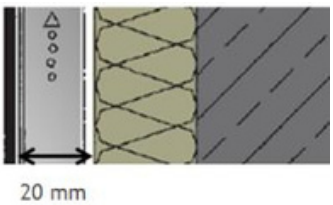
To baffle the horizontal joint, an aluminum joint profile is inserted behind the panels. By using a baffle, the majority of water is prevented from entering the cavity. Before the final fixing of the lowest UNI-Metal Screw, the profile is slid up under the panel. When the UNI-Metal Screw is fixed, the profile is held in place.

Aesthetically, it is best not to continue the profile across the vertical joints but to cut it approximately 5/32” narrower than the width of the panel, leaving the 5/64” shorter at each side. To prevent the joint profile from moving sideways and showing at the vertical joints, cut and bend the top or bottom edge of the profile at both sides of one of the vertical support rails.

In some buildings, it is advisable to have baffled joints, such as the low areas of Public or Educational Buildings. The baffles will prevent debris from being deposited behind the panels. In the case of nurseries, the baffles will prevent small fingers from getting stuck in the joints.

When a building is of lightweight construction, some countries have a regulation that insists that the joints should be baffled to reduce moisture ingress.

5. Air Space Cavity



Cavity Width

The minimum cavity width air space should be 3/4" directly behind the panel. However, this depends on the height of the façade, local driving rain index, and local regulations.

Tolerances

Allow for a tolerance of 3/4" when designing a cavity. Building irregularities, especially uneven backing walls, insulation holders, and the supporting frame must never compromise the width of the cavity.

Ventilation

A through flow of air is achieved by utilizing the stack effect, in which a current of air enters at the base of the cladding and exits at the top. The amount of air current required to effectively travel through the facade is dependent upon the unbroken facade height. Refer to EQUITONE's Planning and Application Guide for minimum air inlet and outlet sizes.

It is also important that air is allowed to enter and exit under and over openings such as windows. These openings need to be protected against the entry of birds and vermin into the cavity space. Failure to protect from these creatures will cause damage to the insulation, cavity space, and even the backing wall. This is normally achieved by fitting a perforated profile. It is important that the perforations are sized correctly to allow air in and out while stopping the entry of small creatures.

6. Supporting Frame

The guidelines for the construction of a ventilated aluminum and galvanized supporting structure can be found in the EQUITONE Planning and Application Guidelines.

The most common arrangement for the panel's support is onto metal vertical rails. Vertical rails ensure that the airflow 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 air cavity. c) The horizontal profiles may cause air to flow less efficiently.

Where possible all structural connections should be facing "down-and-out" to minimize the risk of moisture traveling along them back towards the wall.

7. Panel Preparation

Storage

Panels delivered to the site to be installed immediately or unloaded into a suitably protected storage area. Exterior packaging should be removed to prevent trapping moisture.

Store flat on a pallet in dry conditions, clear of the ground, and not more than 5 stacks high. Panels are to be ventilated to prevent staining. Pallets of panels, even covered via a tarp, should not be stored where they are exposed to prolonged direct sunlight. This will also mitigate the risk of staining.

Stack the panels in the same order as delivered in the pallet (i.e. front-to-front face or rear surface-to-rear surface). Always keep any protective films between materials.

Handling

Always lift panels off each other, and never slide. Carry the panels on their back edge.

Protect the face from scratching or damage.

Use soft bearers (carpet, foam, etc.) to rest the panel edge on to protect them.

Use clean textile gloves when handling the panels to help prevent fingerprint staining and eliminate cleaning time.

Always leave the factory-inserted protective foil between the panels when re-stacking.

On-Site Panel Fabrication

Where possible, off-site pre-cutting is preferred.

Use the EQUITONE fiber cement drill bits.
Drill the panel face up.
Clean off all dust.
Use a solid workbench indoors.
Drill 1 panel at a time.

Use only EQUITONE saw blades to cut the panels on site.
Cut Panels face down.
Clean off all dust.
Use a solid workbench indoors.
Cut 1 panel at a time.

Use a Bosch T141HM jigsaw blade.
Turn off the pendulum function.
Cut face down.
Clean off all dust.

For edge treatment, sand the edges of panels after cutting using 80-grit sandpaper.

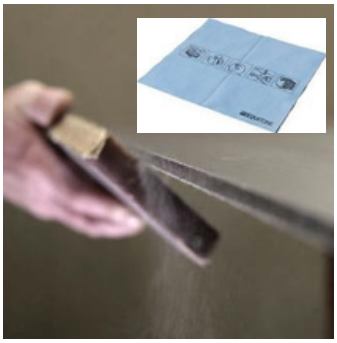
Remove all dust with a soft microfiber cloth, soft brush, or compressed air duster gun.

For cutting on-site, make sure a vacuum system is used to remove all cutting dust. Ensure good health and safety practice is enforced using correct personnel protective equipment for all operatives. For additional information refer to EQUITONE's guide for installers.

8. Edge treatment procedure - Luko

With clear coated EQUITONE panels, [natura], [natura] PRO, moisture ingress at the panel edges can become apparent as edge efflorescence or develop a darker shade in wet weather. This effect will disappear over time and stop occurring. The length of time depends on seasonal weather conditions. To help prevent this phenomenon from occurring, the edges of all coated panels should be impregnated with Luko edge sealant after cutting.

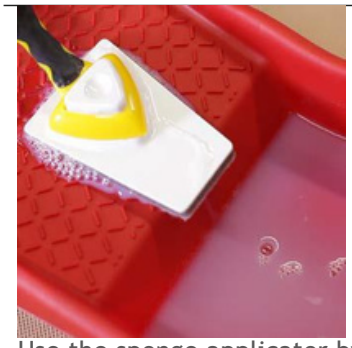
Edge Treatment Procedure – [natura] and [natura] PRO



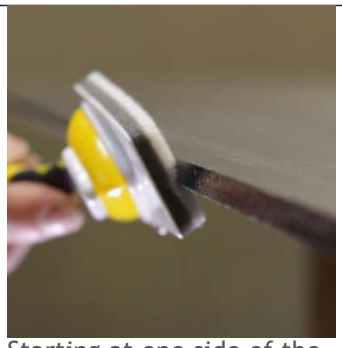
After sanding the edges of the panel remove all dust from the edges.

Apply the Luko between +5°C and 25°C.
Treat one panel at a time.

Simply pour only enough Luko into the clean tray that can be used within 30 minutes.
Do not pour any leftover Luko back into the container.



Use the sponge applicator by dipping into the liquid and removing any excess.
Do not move the applicator over the surface of the panel as any drips will be seen and cannot be removed once dried.



Starting at one side of the panel, angle the applicator away from the face of the panel.
Simply run the applicator along the edge.
Ensure full coverage of the edge.
Repeat the process if necessary.

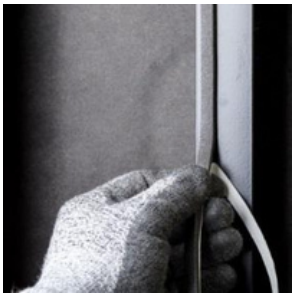
Immediately wipe away any excess that appears on the panel surface. Failure to do so will result in a stain that cannot be removed.
Use a different color cloth or recyclable paper towels – Do not use the microfiber cloth that was used to remove the dust.

9. Installation Procedure

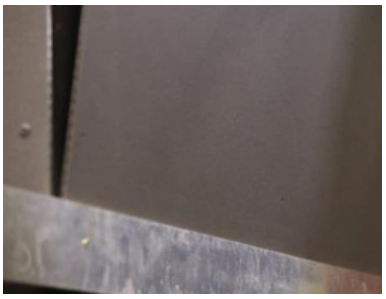
A sequence of placing the EQUITONE panels on the facade must be put in place to ensure the risk of damage to the panels is minimized.

Care and attention are required should other trades (i.e. painting, pouring concrete, etc.)to follow on after the panel is fitted. For example, tapes and adhesives are not recommended to be used on the finish face of our materials as a means to hang protective tarps. See EQUITONE's Planning and Application Guide for more information.

Experience has shown that the best sequence in placing the EQUITONE panels is to commence at the top of the façade and work downwards.

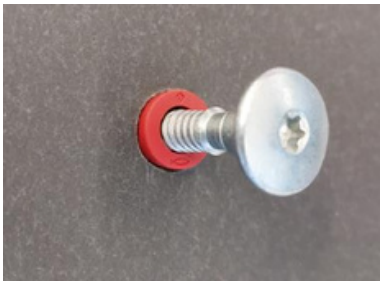


1. Place the foam tape onto the vertical rails. Ensure the tape is continuous. On each “T” rail place the tape on each side behind the 2 panels.

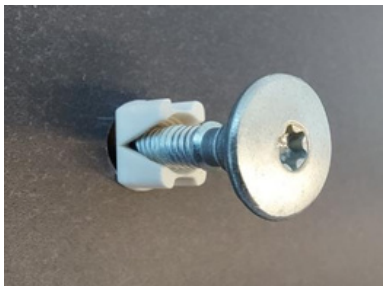


2. Position the pre-drilled panel on a support rail and against the supporting frame, adjust it to the correct line, and clamp it into place.

3. Start with the 2 RED STOP points, remove the centering tip from the screw, and insert a RED STOP sleeve in the screw hole. Only use the special included screw bit.

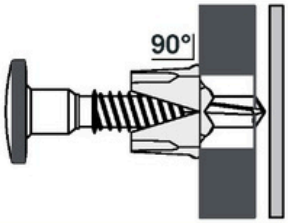
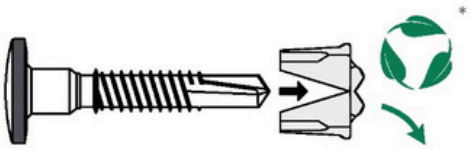
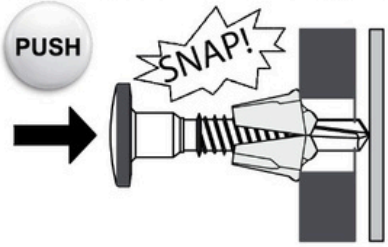
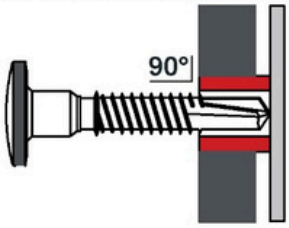
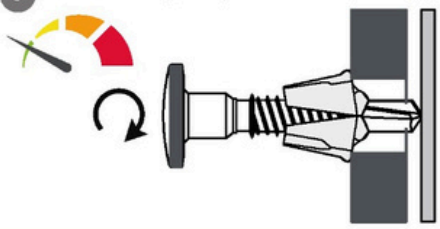
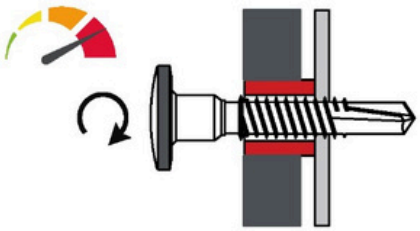
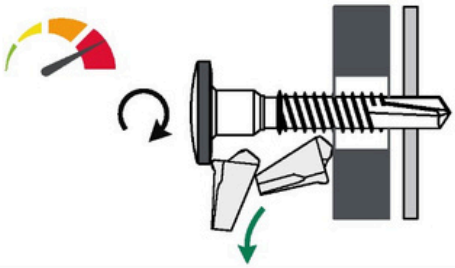
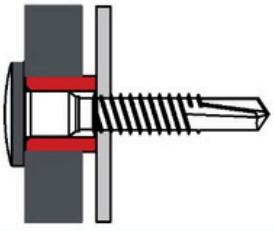
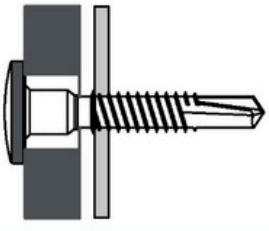


4. Insert the UNI-Metal Screw without centering tip in the hole with the RED sleeve and start screwing. The screw is inserted correctly when the screw shoulder hits the metal frame, and the screw is overtightened.



5. Continue with the UNI-Metal Screw with the centering tip to fix the GO (gliding) points and put the screw with its centering tip in the screw hole. Apply pressure to the screw gun WITHOUT starting to screw until the centering tip breaks. Always start with the holes close to the center of the panel and move outwards towards the edges.

6. After the centering tip snaps start screwing. The 2 halves of the centering tip will fall out. The screw is inserted correctly when the screw shoulder hits the metal frame, and the screw is overtightened.

Creating the RED STOP points:	Creating the GO GLIDING points:
1 Select which 2 holes will be the RED STOP points and insert a RED sleeve in those 2 holes. 	1 Position the UNI-Metal Screw with centering tip in place. 
2 Remove the white centering tip from the screw. 	2 Apply gentle pressure until the centering tip breaks. 
3 Insert the screw in the hole with the RED sleeve. 	3 Start screwing slowly until the screw attacks the metal. 
4 Set the screw and overtighten the thread. 	4 When the centering tip falls out, speed up to set the screw and overtighten the thread. 
5 Fixed point. 	5 Gliding point. 

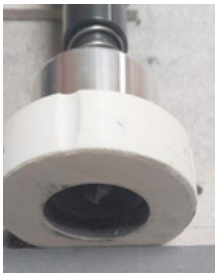
*The self-centering tip will break down biologically if exposed to suitable conditions like soil and sunlight. However, it is unlikely to decompose quickly if disposed of in a normal waste stream.

10. Tools

Impact Screwdriver or Cordless Drill

A normal cordless drill or impact screwdriver is the only tool needed to install the UNI-Metal Screw. Ensure to keep the screwdriver perpendicular to the panel surface and follow the installation procedure on the previous page. The screw head must sit flat on the surface of the panel.

Use only the included special T25W bit.



EQUITONE [linea] LT Milling Tool

To ensure the head of the UNI-Metal Screw sits flat on the [linea] the ribs at the location of the UNI-Metal Screw must 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.

11. Other Considerations

Use of different materials

When using different materials in combination or close proximity to each other care should be exercised to ensure compatibility. Water run-off from fiber cement is alkaline. Therefore, it is not recommended to allow this water to drain freely from fiber cement panels over glass or non-coated metals.

If windows and facades run on the same level, water flow from the façade onto normal glass is best avoided. For specific glass types, please contact your local glass producer.

Marine Environment

In severe marine-type environments, the use of uncoated aluminum supporting frames will need to be substituted with a suitable coated aluminum or stainless steel support frame.

Aluminum and Concrete

All uncoated aluminum components in direct contact with cement surfaces such as fresh concrete walls shall always be isolated with protective pads.

12. Additional Information

Additional information or other application guides can be found on the website or can be obtained from local support. Information about external suppliers can also be downloaded from the local websites.

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