EQUITONE® by etex®

Face Fixed on Metal Frame
Planning & Application Guide

Introduction

General information

This Planning and Application Guide serves only as a general guide providing basic design considerations and information in relation to the application and installation of EQUITONE façade panels for common external applications. This guide illustrates that the installation of EQUITONE fiber cement façade materials is straightforward, provided some simple rules are followed.

EQUITONE typical construction details are available as separate documents which **must be read** in conjunction with this Planning and Application Guide.

About EQUITONE

EQUITONE is a high strength cement rainscreen panel of high-density fiber cement material. Fiber cement is a mineral composite with outstanding physical and aesthetic properties. Our company, Etex, has led development and innovation of this versatile architectural building material for more than a century, , and offers a full range of exterior solutions including aesthetic fiber cement panels, sidings for the residential and architectural sectors under various brands. EQUITONE high density fiber cement is available globally and manufactured in state-of- the -art facilities in Belgium, Germany and Poland.

Disclaimer

This guide provides comprehensive information, but it is not exhaustive. Readers should ensure that the contents are appropriate for their intended use. It is the responsibility of the project consultants (designer, architect, and engineers) to ensure that the information and details provided in this document are appropriate for the project.

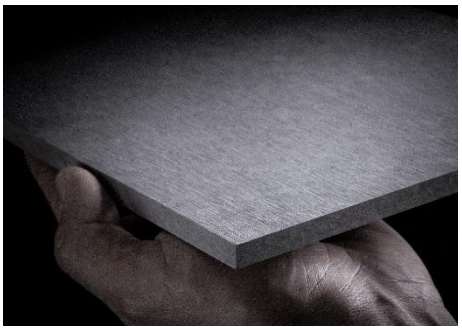
The information in this document is correct at the time of issuing. However, due to our committed program of continuous material and system development, we reserve the right to amend or alter the information contained in this document without prior notice. Please visit www.equitone.com to ensure you have the most current version.

This document is supplied in good faith, and no liability can be accepted for any loss or damage resulting from its use. Images and construction details contained in this document are not to a specific scale, are indicative and for illustration purposes only, and should not be used as construction drawings.

EQUITONE materials

Materials

For detailed information about EQUITONE materials, manufacturing tolerances and their technical properties, refer to their Material Information Sheet available from the EQUITONE website. EQUITONE finishes are available in a variety of colors. For all available colors refer to the EQUITONE website.

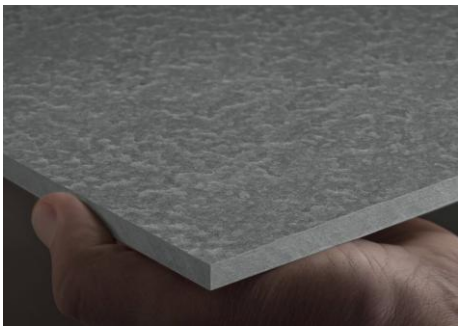


EQUITONE [tectiva] is a through-colored, uncoated fiber cement façade material, characterized by a sanded surface and naturally occurring hues within the material. Every [tectiva] panel is unique, expressing the raw texture of the core fiber cement material.

Thickness	Weight
5/16 in (8 mm)	3.05 psf (14.9 g/m^2)
3/8 in (10 mm)	3.81 psf (18.6 kg/m^2)

EQUITONE [linea] is a unique 3D-shaped, through-colored fiber cement façade material that plays with light and shadow. Its surface with longitudinal grooves displays a linear structure that highlights the raw inner texture of the core fiber cement material. Throughout the day, the shifting angles of light and shadow transform the facade material, revealing a dynamic and ever-changing character.

Thickness	Weight
3/8 in (10 mm)	3.44 psf (16.8 kg/m^2)



EQUITONE [lunara] is a through-colored, uncoated fiber cement façade material, that embodies an honest and pure appearance. Featuring a unique texture, the surface of the panel is determined by a randomized surface treatment, which means no recurring pattern ensuring each panel is unique. Naturally occurring color differences are accentuated by the surface, as the extraordinary look and feel emphasizes the originality of the fiber cement material.

Thickness	Weight
3/8 in (10 mm)	3.81 psf (18.6 kg/m^2)

EQUITONE materials

EQUITONE [natura] is a through colored fiber cement base board, with a semi-transparent colored finish, subtly displaying the raw texture of the core fiber cement material. The rear face has a transparent sealing coating.

Thickness	Weight
5/16 in (8 mm)	3.15 psf (15.4 kg/m²)
15/32 in (12 mm)	4.67 psf (22.8 kg/m²)

EQUITONE [natura] PRO is comprised of a UV-hardened, anti-graffiti, and high abrasion-resistant surface coating. This coating offers protection against common spray paints and scratches, making it an ideal choice for internal and high-traffic areas.

Thickness	Weight
5/16 in (8 mm)	3.15 psf (15.4 kg/m²)
15/32 in (12 mm)	4.87 psf (22.8 kg/m²)

EQUITONE [pictura] is a fiber cement façade material with ultra matte finish comprised of a UV-hardened, anti-graffiti, and high abrasion resistant surface coating. This coating offers protection against common spray paints and scratches, making it an ideal choice for internal and high-traffic areas.

Thickness	Weight
5/16 in (8mm)	3.15 psf (15.4 kg/m²)
15/32 in (12 mm)	4.87 psf (22.8 kg/m²)

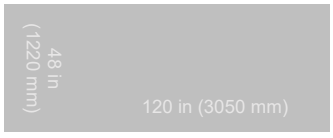
EQUITONE [inspires] is a fiber cement facade material designed to reflect nature's palette. Its smooth, matte surface features a digitally printed design protected by a UV-resistant finish, offering the look of natural materials with the durability of cement. [inspires] brings bold visual impact to facades without compromising on performance.

Thickness	Weight
5/16 in (8mm)	3.44 psf (16.8 kg/m²)

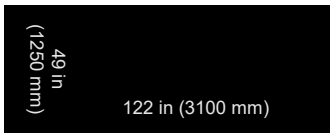
EQUITONE rainscreen façade

Maximum usable panel sizes

EQUITONE [linea]
EQUITONE [lunara]
EQUITONE [tectiva]



EQUITONE [natura]
EQUITONE [natura] PRO
EQUITONE [pictura]
EQUITONE [inspires]



Ventilated rainscreen

EQUITONE fiber cement materials have been developed for an open-joint ventilated rainscreen system. A rainscreen is an assembly applied to an exterior wall which consists of, at minimum, an outer layer, an inner layer, and a cavity between them sufficient for the passive removal of liquid water and water vapor. What makes a rainscreen ventilated is allowance for air openings at the top and bottom of the rainscreen system.

For this manual, we will use the terms of cladding system or rainscreen to mean the complete system whereas facade or cladding will refer to just the outer most aesthetic layer.

The cladding shields the backup wall from direct rain. However, depending on the nature of the joints between panels some water penetration may occur. The cavity and water barrier combine to limit this penetration. The cavity space can evaporate or drain this moisture away safely.

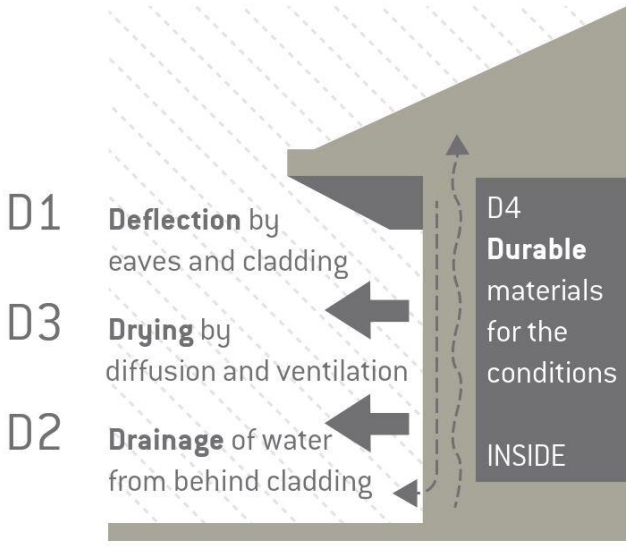
The concept of the 4 D's of weather tightness is simple way of explaining a ventilated façade. This principle is gaining popularity as it draws particular attention not only to the weather tightness of a building envelop with the proper application of a suitable weather barrier but also to the application of appropriate flashings and the like for the deflection and directing of any moisture, entering the ventilated facade cavity, out and away from the building envelope rather than over-relying on any exposed sealants and sealing of cladding skin.

Deflection: Proper detailing of the façade and flashings for deflection, with the aim of keeping water out

Drainage: Allowance for clear paths for the water to drain outside, should water get in

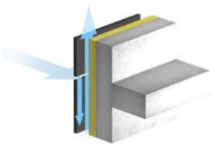
Drying: Adequate provision for ventilation and vapor diffusion within the cladding cavity to eliminate remaining water

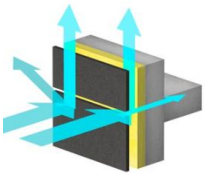
Durable: Use of components with adequate durability appropriate to the project location

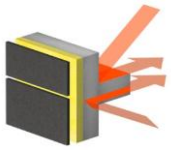


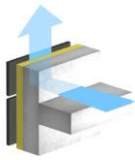
EQUITONE rainscreen façade

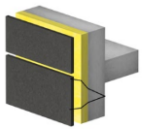
Allowance for adequate ventilation is paramount in ensuring a successful EQUITONE rainscreen. A ventilated façade provides several added benefits to the building and its occupants, compared to non-ventilated systems. These may include but are not limited to the following:











- Drained and ventilated systems are provided with openings that provide both ventilation and a drainage escape route. This combination allows air to circulate in and dry the cavity between the inner and outer layers.
- In the wintertime, a ventilated facade helps keep the building warmer via the air acting as a moderating insulation; protecting the actual insulation from rapid temperature swings.
- In the summer convection causes air to rise and exit the facade while pulling in cooler air in at the bottom.
- Rainscreen cladding helps dissipate radiant heat through reflection or absorption. Energy absorbed by the cladding is then dissipated by the ventilation effect in the cavity.
- Positive contribution to energy savings because the continuous insulation is placed on the outer face of the structure.
- Can minimize the buildings thermal bridges when designed to minimize interruptions through external continuous insulation.
- Assists with condensation management. Any risk of interstitial condensation occurs in the ventilated cavity. The breathable structure allows water vapor to pass from the inside into the ventilated cavity.
- Reduces thermal movement of the building structure and cladding support frame.
- Provides improved sound insultation.
- Proven to be a healthier facade construction.

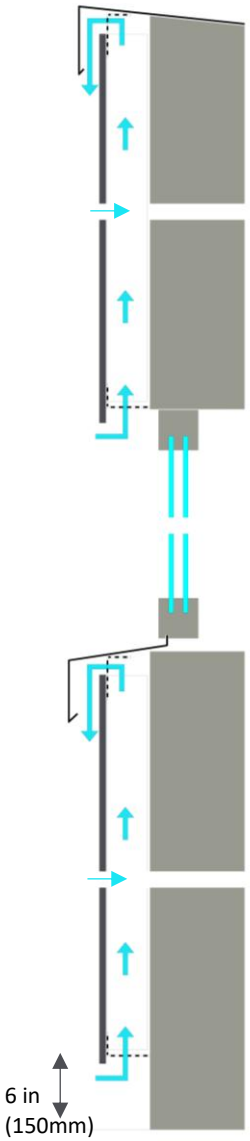
Besides the typical building physics advantages, a ventilated façade with High-Strength fiber cement:

- Unlike other facade materials, high density eliminates the need for exposed caulking and sealant, therefore reducing maintenance requirements.
- Unlike other facade materials, it does not need repainting to maintain its aesthetic appeal.
- Provides opportunities for concealing external services such as downpipes within the cavity.
- Offers architectural design flexibility.
- Can be installed in various weather conditions.
- Can deal with tolerances of the building (e.g., renovation of old building).
- Is non-combustible.
- Can be dismantled into its individual components and re-used.

EQUITONE rainscreen façade

Air inlets and outlets

Air must be allowed to enter the cavity from the bottom of the panels, window head, soffit, slab junctions, and the like, and exit at the top of the panels, capping, windowsill, slab, and soffit interfaces, and the like.



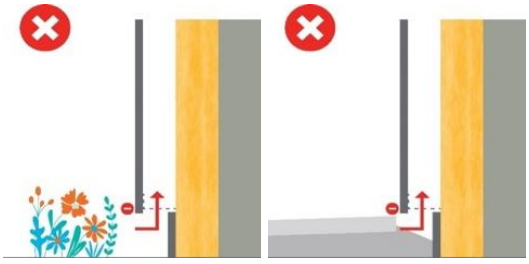
The size of air inlets and outlets depends on the continuous height of the facade panels. For effective ventilation, the size of the air outlet should always be greater than or equal to the size of the air inlet.

Open Joint System		
Height from Façade Inlet to Outlet	Min. Air Inlet/Outlet Unobstructed Opening	Min.Inlet/Outlet Open Air Area
0-16 ft [0-5 m]	3/8 in [10 mm]	4.5 in^2/ft [100 cm^2/m]
>16-33 ft [> 5-10 m]	1/2 in [13 mm]	6 in^2/ft [130 cm^2/m]
>33-44 ft [> 10-13.5 m]	3/4 in [20 mm]	9 in^2/ft [200 cm^2/m]
>44-66 ft [> 13.5-20 m]	3/4 in [20 mm]	9 in^2/ft [200 cm^2/m]
>66-99 ft [> 20-30 m]	1 in [25 mm]	12 in^2/ft [250 cm^2/m]
>99-134 ft [> 30-41 m]	1 1/4 in [32 mm]	15 in^2/ft [320 cm^2/m]
>134-165 ft [> 41-50 m]	1 1/2 in [38 mm]	18 in^2/ft [380 cm^2/m]

Closed Joint System		
Height from Façade Inlet to Outlet	Min. Air Inlet/Outlet Opening	Min. Inlet/Outlet Open Air Area
0-16 ft [0-5 m]	3/8 in [10 mm]	4.5 in^2/ft [100 cm^2/m]
>16-28 ft [> 5-8.5 m]	3/4 in [20 mm]	9 in^2/ft [200 cm^2/m]
>38-44 ft [> 8.5-13.5 m]	1 in [25 mm]	12 in^2/ft [250 cm^2/m]
>44-77 ft [> 13.5-23.5 m]	1 1/4 in [32 mm]	15 in^2/ft [320 cm^2/m]
>77-99 ft [> 23.5-30 m]	1 1/2 in [38 mm]	18 in^2/ft [380 cm^2/m]
>99-137 ft [> 30-42 m]	2 in [51 mm]	24 in^2/ft [510 cm^2/m]
>137-165 ft [> 42-50 m]	2 1/2 in [64 mm]	30 in^2/ft [640 cm^2/m]

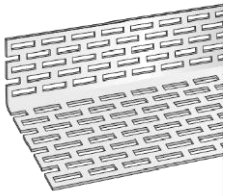
The air inlets and outlets must be kept open and unobstructed to maintain drainage and ventilation of the cavity. No planting or garden, decorative or ornamental plants should be allowed near the air inlets as over time these may block the air inlets

At the base of the façade, typically a minimum clearance of 6 in (150 mm) above the finished ground/floor level is suggested. This will help prevent rain splash-back from the ground while maintaining sufficient space for the air to enter the cavity. Where rain splash-back effect is not a concern, e.g., in covered areas, the ground clearance may be reduced with respect to the above recommended minimum air inlet sizes.



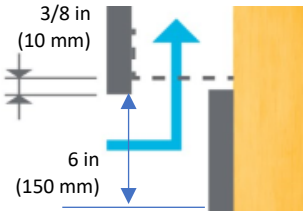
EQUITONE rainscreen façade

Ventilation with perforated closure



If by local regulations, or architectural design, the use of a perforated closure is required e. g. to vermin-proof the cavity then the size of the inlet and outlet must be increased depending on the open area percentage of the used profile to achieve a bare minimum open area listed in the tables above. E.g., in the case of a 35% perforated closure, the minimum open gap should be a minimum of 1 3/32 in [27.8mm] to achieve a minimum open area of 4.5 in2/ft [100cm^2/m].

The perforated angle should be less than 23 gauge (0.8mm) in thickness when placed between EQUITONE and the support frame.



The perforated angle shall be positioned to allow an adequate drip edge to the cladding panel. Preferably the façade panel overhangs more than 3/8 in (10 mm) below the perforated closure.

Cavity

The cavity is a primary feature of a ventilated façade. It is designed to act as a pressure cushion to prevent water from reaching the backing wall. By ventilating the cavity, moisture that arises from water passing the panel, moisture migrating from the inner surface of the wall, or the action of condensation will be removed either by evaporation or simply running down the back of the panel and draining out of the cavity.

Cavity width

It is generally considered that the minimum cavity width should be at least 3/4 in (20 mm) immediately behind the back of the panel. This minimum width is only suitable for open jointed systems on mid-rise buildings up to 44 feet (13.5 m) high. As the façade gets higher, the cavity width needs to increase accordingly.

Generally, the recommended cavity width is as below:

Open Joint System							
Height from Façade Inlet to Outlet	0-16 ft [0-5 m]	>16-33 ft [>5-10 m]	>33-44 [>10-13.5m]	>44-66 ft [>13.5-20 m]	>66-99 ft [>20-30 m]	>99-134 ft [>30-41 m]	>134-165 ft [>41-50 m]
Min. Air Cavity	3/4 in [20 mm]	3/4 in [20 mm]	3/4 in [20 mm]	1 in [25 mm]	1 in [25 mm]	1 1/4 in [25 mm]	1 1/2 in [38 mm]
Closed Joint System							
Height from Façade Inlet to Outlet	0-16 ft [0-5 m]	>16-28 ft [>5-8.5 m]	>28-44 [>8.5-13.5m]	>44-77 ft [>13.5-23.5m]	>77-99 ft [>23.5-30 m]	>99-137 ft [>30-42 m]	>137-165 ft [>42-50 m]
Min. Air Cavity	3/4 in [20 mm]	3/4 in [20 mm]	1 in [25 mm]	1 1/4 in [25 mm]	1 1/2 in [38 mm]	2 in [51 mm]	2 1/2 in [64 mm]

NOTE: When designing the width of the cavity, it is important to make allowance for tolerance. Building irregularities, especially uneven backing walls, external insulation, and/or weather barriers, must never compromise the effective width of the cavity required for a clear airflow behind the panels. This is critical when a horizontal support frame is incorporated into the cavity space. The airflow within the cavity must not be hindered by any horizontal member e.g., framing, pipes, services, and the like.

Cavity Fire barriers

Fire regulation may require fire barriers to be incorporated into the cavity.
Only fire barriers that allow for an uninterrupted airflow in the cavity are suitable.

More elaborate information on fire barriers in the specific chapter further in the document.

General components

Cladding components

UNI-Rivet

EQUITONE is face fixed to metal support frame using color matched proprietary UNI-Rivets. The rivet includes a green gasket which controls the connection depth which is approximately 0.089 in (2.25mm) more than the panel thickness.

With an 11 mm panel hole size and rivet centered in the panel hole, EQUITONE UNI-Rivet system provides a 0.089 in (2.25mm) 3-way movement allowance within the connection, providing a stress-free panel fixation.

UNI-Rivet is available in the following materials:

- Stainless Steel 304 (A2) – Material number 1.4567
- Stainless Steel 304 (A2) – Material number 1.4567 with additional protective coating (recommended for C5 corrosion zones acc. ISO 12944-2)
- Stainless Steel 316 (A4) – Material number 1.4578 (used where higher corrosion resistance level is required)
- Stainless Steel 316 (A4) – Material number 1.4578 with additional protective coating (recommended for C5 corrosion zones acc. ISO 12944-2)
- Aluminium 5056A [AlMg5] **[Not recommended for use with galvanize or stainless girts]**
- Aluminium 5056A [AlMg5] **[Not recommended for use with galvanize or stainless girts]** with additional protective coating (recommended for C5 corrosion zones acc. ISO 12944-2)

For further information about EQUITONE UNI-Rivets and their technical properties, refer to their Material Information Sheets.

Rivet sizes

For 8mm EQUITONE Panels and EQUITONE [linea]

Rivet Description	Rivet Diameter	Rivet Lengths	Sleeve Lengths	Support Frame Thickness [1]
4x18 K15 Aluminium UNI-Rivet	5/32 in [4 mm]	23/32 in [18 mm]	13/32 in [10.25 mm]	0.070 – 0.146 in [1.7 – 3.75 mm]
4x18 K15 Stainless Steel UNI-Rivet				0.043 - 0.138 in [1.1[2] - 3.5 mm]
4x20 K15 Stainless Steel UNI-Rivet		25/32 in [20 mm]		0.138 - 0.217 in [3.5 - 5.5 mm]

For EQUITONE [lunara]

Rivet Description	Rivet Diameter	Rivet Lengths	Sleeve Lengths	Support Frame Thickness [1]
4x20 K15 Aluminium UNI-Rivet	5/32 in [4 mm]	25/32 in [20 mm]	15/32 in [12.25mm]	0.067 – 0.146 in [1.7 – 3.75 mm]
4x20 K15 Stainless Steel UNI-Rivet				0.043 - 0.138 in [1.1[2] - 3.5 mm]
4x22 K15 Stainless Steel UNI-Rivet		7/8 in [22 mm]		0.138 - 0.217 in [3.5 - 5.5 mm]

For 12mm EQUITONE panels

Rivet Description	Rivet Diameter	Rivet Lengths	Sleeve Lengths	Support Frame Thickness [1]
4x25 K15 Aluminium UNI-Rivet	5/32 in [4 mm]	1 in [25 mm]	9/16 in [14.25mm]	0.067 – 0.265 in [1.7 – 6.75 mm]
4x22 K15 Stainless Steel UNI-Rivet		7/8 in [22 mm]		0.043 - 0.138 in [1.1[2] - 3.5 mm]
4x24 K15 Stainless Steel UNI-Rivet		15/16 in [24 mm]		0.138 - 0.217 in [3.5 - 5.5 mm]

[1] EQUITONE requires a minimum of either 6063-T5 grade aluminum or 33ksi steel depending on the rivet chosen.

[2] For aluminum connections with stainless steel rivets we recommend a minimum of 0.067 in [1.7 mm] instead.

UNI Rivet must be used in conjunction with the recommended compressible foam tape.
There are only two STOP points per panel.
Location of STOP points in a panel is very important.
Refer to Panel Fixing Principle and STOP Points Selection Guide for information and guidance on the correct selection of the STOP Points in a panel.
Panel hole size for both GO & STOP points is 11 mm, drilled with 11 mm EQUITONE drill bit.
Please reach out to your local EQUITONE representative if installing the UNI-Fixing systems into fiber reinforced polymers or other plastic girts.

General components

UNI-Metal Screw

The UNI-Metal Screw provides a secure and precise fastening solution for affixing panels directly to metal supporting frames. The 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.

Designed primarily for use with 8 mm thick panels, the UNI-Metal screw is compatible with EQUITONE [linea], EQUITONE [natura], EQUITONE [natura] PRO, EQUITONE [pictura], EQUITONE [tectiva] and EQUITONE [inspires] to a vertical façade soffit or ceiling.

UNI-Metal Screw is available in the following materials:

- Bi-Metal screw featuring AISI 304 stainless steel body with carbon steel drill point.

Screw Sizes

For 8mm EQUITONE Panels and EQUITONE [linea]

Screw Description	Screw Diameter	Screw Lengths	Sleeve Lengths	Support Frame Thickness [1]
5.8x36 K15	0.228 in [5.8 mm]	1 7/16 in [36 mm]	13/32 in [10.25 mm]	0.043 – 0.138 in [1.1[2] - 3.5 mm]

[1] EQUITONE requires a minimum of either 6063-T5 grade aluminum or 33ksi steel depenind on the rivet choosen.

[2] For aluminum connections with stainless steel rivets we recommend a minimum of 0.067 in [1.7 mm] instead.

For further information about EQUITONE UNI-Metal Screws and their technical properties, refer to their Material Information Sheets.

General components

UNI-Fixing STOP point-sleeve

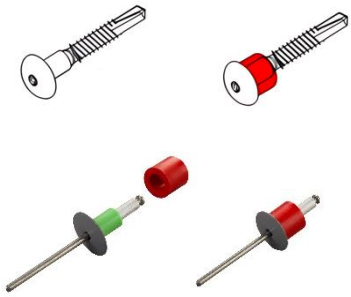
UNI-Fixing system is based on a GO (gliding) and STOP (fixed) point principle. The red UNI-Fixing STOP point-sleeve is used to form STOP fixing points.

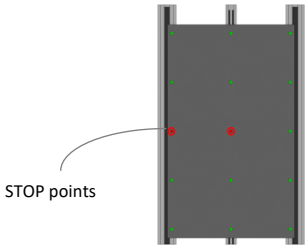
Both the UNI-Rivet and UNI-Metal Screw use the same red sleeve to create STOP (fixed) points in the panel. For the UNI-Rivet it is slide over the green GO (gliding) sleeve, whereas for the UNI-Metal Screw it is simply slide onto the fastener.

Only two STOP points must be used per panel.

There is a specific size of the STOP point sleeve for each panel thickness as shown in the above table.

To allow for 3D movement of the panel, the sleeves are always 0.089 in [2.25 mm] longer than the nominal panel thickness.





For information about technical properties of the accessories refer to their Material Information Sheets available on request.

Self-adhesive foam tape

A compressible foam tape is used as part the UNI-Rivet fixing system.

Optional Components

Optional: Horizontal joint profile (baffle)

Black coated aluminium baffle is used to close the panel horizontal joints. The profile has a thickness of 1/32 in (0.6mm).

Optional: Perforated closures

Aluminum perforated profile used to close the cavity entry and outlet to prevent the entry of birds and vermin. Available in four different widths to suit a range of cavity thicknesses and two different colors: uncoated aluminum and black coated aluminium. The perforation rate is approximately 35%.

Accessories

General accessories

EQUITONE saw blades

These blades have been designed especially for cutting high-density fiber cement panels, and when correctly used, result in a high level of finish. The blade is unique with its minimal diamond-tipped teeth which are shaped to give a tear-free edge, and its vibration-damping composite body construction. These blades can remain good for up to 5,000 m of cutting provided it is correctly used.

Blade Diameter	Bore Diameter	Number of Teeth
6 5/16 in [160 mm]	3/4 in [20 mm]	4
7 1/2 in [190 mm]	3/4 in [20 mm]	4
7 1/2 in [190 mm]	1 3/16 in [30 mm]	4
8 27/32 in [225 mm]	1 3/16 in [30 mm]	6
11 13/16 in [300 mm]	1 3/16 in [30 mm]	8

Jigsaw blade

Bosch T141HM jigsaw blade is recommended for curved cut-outs. It is available in a pack of three.

EQUITONE 11 mm drill bit

These are specially designed fiber cement drill bits for drilling the holes in the panels. This drill bit is a fully hardened steel bit with a cutting edge to suit fiber cement. This drill bit reduces risk of sliding on the panel surface, provides a clean cut with no burrs and does not cause burning. This results in a drill bit with a very long life.

EQUITONE centralising tool (For UNI Rivets)

This tool is used to ensure the 4.1 mm rivet hole in the support frame is centred in the 11 mm panel hole. This ensures the best allowance for any frame movement. The tool has a guide that neatly fits into the panel hole. The 4.1 mm drill bit then extends to drill the profile. The drill bit can be easily replaced at the end of their functional life. This accessory fits any standard manual or electrical drill and is used with all EQUITONE panels which are to be fixed to a metal supporting frame with UNI-Rivet.

EQUITONE centralising tool 4.1 mm replacement bit(For UNI Rivets)

Centralising tool replacement bits are available in a pack of 5.

EQUITONE rivet setting tool *

This accessory fits onto rivet gun and helps prevent scratching rivet head and panel during fixing operation, and it ensures the correct placement of rivet perpendicular to supporting frame and panel. It is available in the following options:

- Rivet setting tool for stainless steel UNI-Rivet
- Rivet setting tool for aluminium UNI-Rivet

* Not appliable to EQUITONE [linea]

Accessories

Material specific accessories

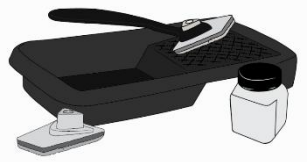
EQUITONE [linea] mill and drill tool

This accessory has been designed for milling and drilling EQUITONE [linea] when face fixed. The tool is equipped with built-in 11 mm bit and milling blades to both drill an 11 mm panel hole and mill the panel ridge in one operation.

LUKO edge sealer for EQUITONE [natura] & EQUITONE [natura] PRO[1]

LUKO is a translucent liquid sealer that is applied to the cut edges of [natura] and [natura] PRO panels to help prevent moisture ingress in the panel. It is available in 0.5, 1, and 10 liter containers. Depending on the application, 0.5 L of LUKO could cover up to 500 linear meters of panel edge.

LUKO applicator kit for EQUITONE [natura] & EQUITONE [natura] PRO1

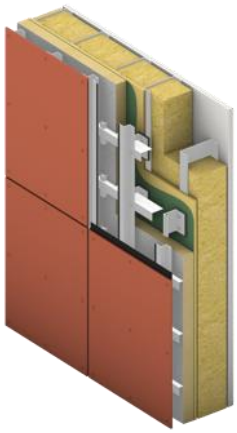


A LUKO applicator kit, including an applicator and tray, is available to assist with the correct application of LUKO. Replacement sponges are also available.

[1] It is also possible to apply LUKO to the cut edges of [pictura] to prevent any possible risk of whitening of the edges (efflorescence).

Subframing

General Subframing options



EQUITONE may be face fixed to any engineered metal subframe. For purposes of this section, we will call the framing elements that EQUITONE is direct attaching to as the panel rail or cladding support frame. The common frame types are galvanised or stainless steel, and aluminum profiles. Generally, wider profiles are used behind panel joints while a narrower profile is used as intermediate profiles in the middle of the panel. The following provides general minimum specifications for the panel rails.

General specifications of cladding support frame:

Recommended minimum profile thickness (Base Metal Thickness)	Steel	≥ 0.043 in [1.1 mm]
	Aluminum	≥ 0.067 in [1.7 mm]
Minimum width of intermediate profile		1 in [25.4 mm]
Minimum width of vertical joint profile		4 in [100 mm]
Recommended maximum length of profile		10 ft [3.05 m]

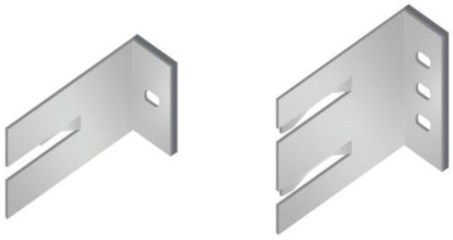
EQUITONE does not recommend the use of horizontal perforated panel rails as the sole source of ventilation within the cavity space as most systems are not designed with fiber cement in mind. It is important to ensure the entire system (i.e. perforations and open-air space) is equal to the same amount of area as the minimum recommended air cavity.

Please reach out to your local EQUITONE representative for additional information on installing EQUITONE onto fiber reinforced polymers or other plastic panel rails.

It is advisable to use a vertical panel rail system that allows for some degree of installation tolerance. Subframing should have adequate corrosion resistance appropriate to the location of the project. It is the responsibility of project engineer or designer to determine the level of corrosion resistance and suitable support frame with adequate corrosion resistance required for the intended application. Additionally, double rail systems should be designed to avoid corrosion from dissimilar metals coming in contact. Maximum deflection of the entire subframe assembly must be limited to Span/300 with a maximum of 5/32 in [4 mm].

Thermally broken clip and rail

This type of subframe generally comprises vertical or horizontal rails and brackets, featuring proprietary thermal isolator gaskets, that are connected back to the building structure. Typically, a panel rail must then be installed overtop for the EQUITONE panel to attach to. Adding this secondary framing layer ensures adequate ventilation for the fiber cement while decoupling the façade from the building structural connections. In some cases (i.e. masonry, structurally insulated sheathing, etc.) a single vertically oriented rail and bracket system may be possible to also act as the panel rail.



Different thermally broken clip and rail suppliers make their brackets from a variety of materials (i.e. aluminum, steel, fiber reinforced polymers, etc.). These brackets are generally available as fixed-point brackets and sliding point brackets and in various depths suiting different or varying cavity widths from 2 to 13 1/2 in [50 to 342 mm]. However, this might not always be the case. The system should allow for thermal expansion of both the bracket system and panel rails if necessary to prevent panel damage.

Subframing

The primary rails are generally available in a variety of shapes.

Most suppliers also offer a proprietary thermal isolator gasket, suiting the brackets to reduce thermal bridging.

Instances where a thermally broken clip and rail system may be used include, but are not limited to, the following:

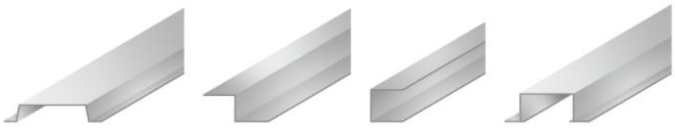
- Where cladding cavity width varies either due to design or uneven substrate
- Where a wider cavity is required
- Where external insulation is intended to be used
- Where vertical movement allowance within the connection of cladding framing and substructure is required e.g., where cladding framing bridges over a horizontal control joint, for instance at floor junctions, and needs to be fixed to the substructure on both sides of the joint. In this case, this type of framing may be used provided that the size of the elongated holes of the brackets suits the required movement allowance.

Standard Girts

This type of support frame generally comprises of primary vertical or horizontal girt connected to the building structure with a secondary panel rail installed on top to hold the panel. The secondary framing layer ensures adequate ventilation for the fiber cement while decoupling the facade from the building structural connection. In some cases (i.e. masonry, structurally insulated plywood, etc.), a single vertically oriented girt may be possible to also act as the panel rail system.

Different girt suppliers offer a variety of materials (i.e. aluminum, steel, fiber reinforced polymers, etc.) in various depths. It is important that these girts be installed to accommodate the thermal expansion of both the girt system and panel rails, if necessary, to prevent panel damage.

The following are examples of the common girt profiles available.



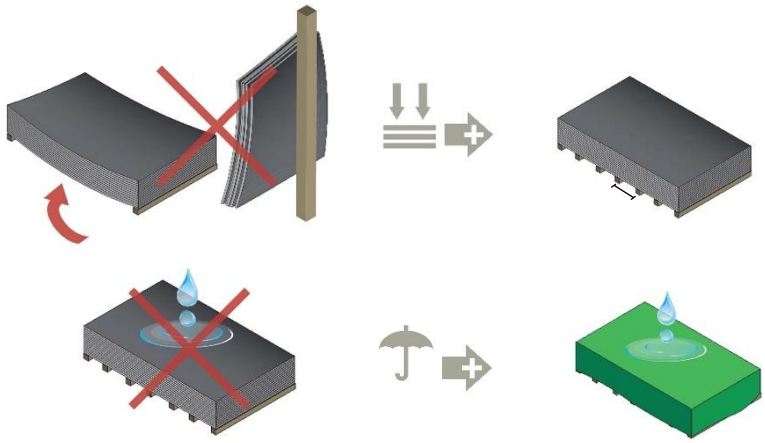
Instances where a girt subframe system may be used include, but is not limited to, the following:

- Where cladding cavity width does not vary due to design or uneven substrates.
- Where external insulation is not intended to be used.
- Where budget maybe of a concern.

Panel storage

General requirements

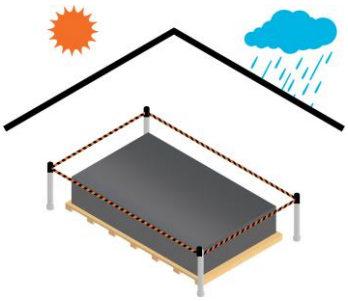
EQUITONE panels must be stored flat on pallets, inside and undercover in dry conditions, protected from weather and potential influence of other trades. Store panels clear of the ground and on level bearers at a maximum of 23 5/8 in (600 mm) centers.



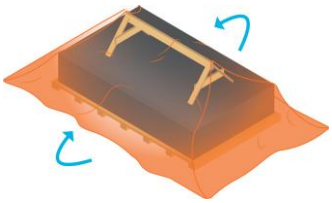
Before installation, EQUITONE panels must not get wet. Do not deliver any panels to a site that cannot be installed immediately or unloaded into a suitable well protected storage area.
EQUITONE is a prefinished material; poor or inadequate storage will increase the risk of damage to the finished surfaces.

Outside storage

Where panels must be stored outside, extra care and attention is needed to protect them from rain and direct sun. Remove the outer plastic protection as this may cause condensation if left in place, especially in direct sunlight. Direct sunlight is to be avoided as this leads to uneven drying of the panels and can lead to the sticking of the protective film.



Protect the pallet from rain or condensation by covering the pallet with an opaque waterproof cover like tarpaulin. This cover must be provided with a slope, so all moisture runs off quickly, and must not be allowed to pond on the pallets. This will also allow the air to circulate around the panels. Use only opaque coverings. Clear plastic is not recommended.



If moisture can penetrate between the stored panels, permanent surface staining in the form of efflorescence may occur and may prevent the panels from being used.

Other trades

Be aware of other trades on the job site as they may not respect the material in the same way.

Do not leave material in such a way that allows people to walk over the panels as this will leave footprints on the surface. These prints may scratch the panels or leave an oily residue on the surface, which could permanently stain the panels.

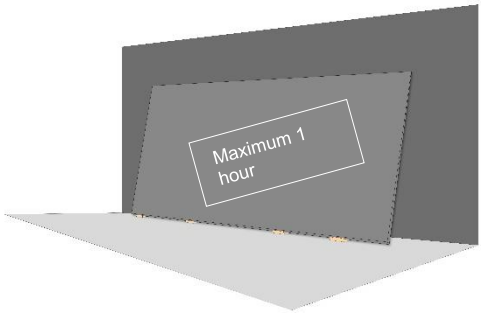
It is advisable to barricade the storage area and workstation around the panels to reduce any risk of damage by other trades.

Panel storage

Panels on edge

When storing EQUITONE panels on their edges, use soft supports such as pieces of insulation or rubber-faced timber battens to rest the edge on. This can help prevent chipping or edge damage.

Only leave panels stored on their edge for a short time (maximum 1 hour) and never in wet weather. Standing the panel on its edge is not a long-term method of storage and may cause deformation.



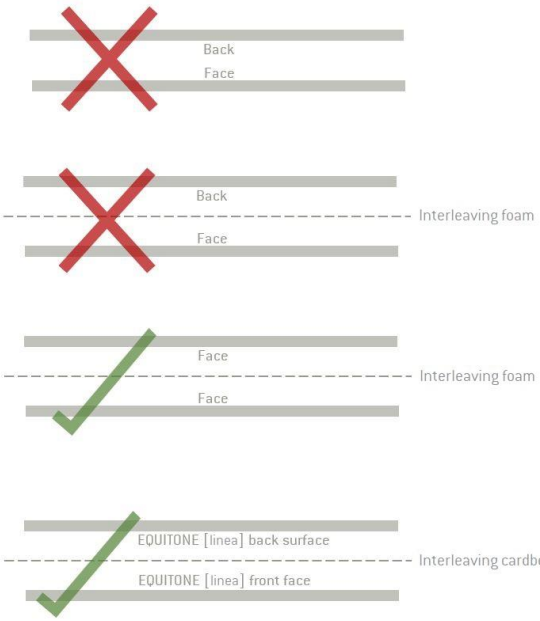
Stacking panels

EQUITONE [natura], [natura] PRO, & [pictura]

These EQUITONE panels are supplied with interleaving foam between the decorated faces. This foam must not be removed.

When restacking these panels:

- Stack the panels front-face-to-front-face or back-surface-to-back-surface. The panels should not be placed face-to-back.
- Reuse the interleaving foam between each layer which is face-to-face to prevent scratches.



EQUITONE [linea]

EQUITONE [linea] panels are stacked front-face-to-back-surface with interleaving cardboard in between. Only the first two top panels on a pallet are positioned front-face-to-front-face to reduce the risk of damage to the top panel face during transport and storage, while the rest of the panels on a pallet must be stacked front-face-to-back-surface.

EQUITONE [tectiva] & [lunara]

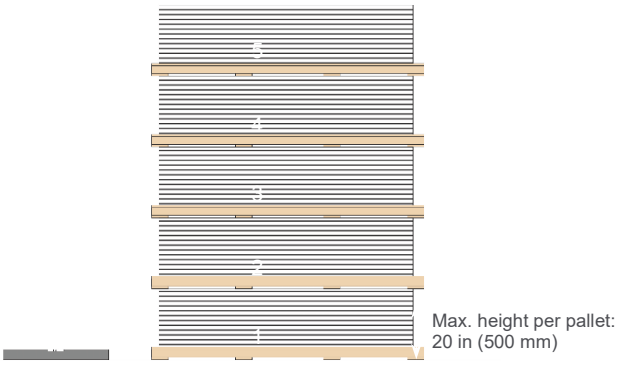
EQUITONE [tectiva] and [lunara] panels are stacked front-face-to-back-surface with no interleaving spacer or foam in between the panels. Only the first two top panels on a pallet are positioned front-face-to-front-face to reduce the risk of damage to the top panel face during transport and storage.

Pallets

Pallets are to be kept in good condition. Damaged or broken pallets increase the risk of damage to the panels.

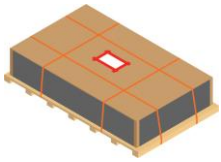
When sorting from one pallet to another ensure that the timber pallets are oversized or larger than the panels to prevent possible damage to the panel edges.

Individual pallets can be 20 in (500 mm) high, and not more than 5 pallets can be put on top of one another provided the ground is flat and level.



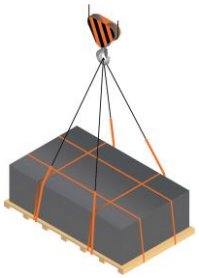
Panel moving

Lifting



Only move stacked panels that are stored on pallets.

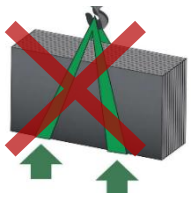
Ensure the panels are secured to the pallet in a way that will not cause damage. Soft protection is needed where straps touch the panels.



Stacks should be transported under a waterproof cover.

Panels should only be moved when stacked on a pallet and secured on the pallet from all 4 sides.

Moving panels that are stacked on pallets should be done with a forklift or a crane.

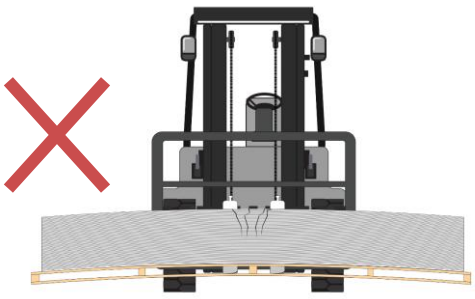


Lifting panels, that are not on a pallet, with straps is not recommended.

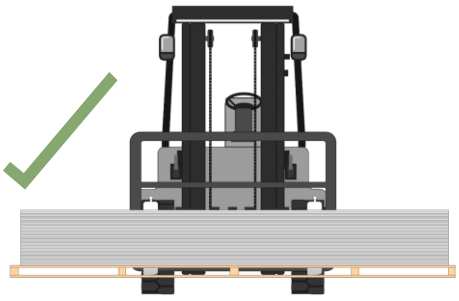
Forklift

When moving the pallets with a forklift, it is recommended that a multi-fork attachment (4 forks) is used.

If using the standard 2-fork attachment, these must be positioned with a wide setting. This will stop the pallets from bending when lifted.



Wrong forks setting (too close)

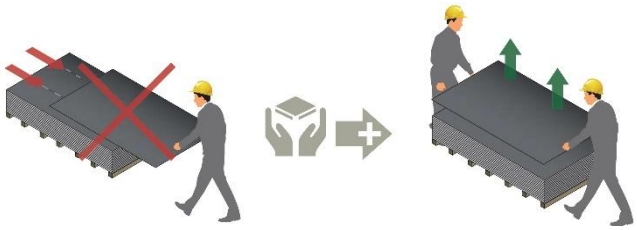


Wide forks setting

Panel handling

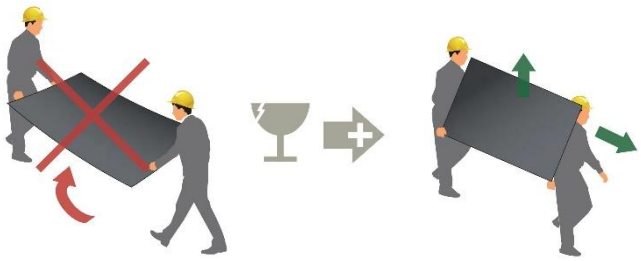
Handling

Carefully plan how the panels will be handled. Decide on a suitable route for moving the panel from the storage area to the façade and then up the façade. Be aware of obstacles such as scaffolding, temporary supports, or uneven walking surfaces.



Always lift panels off each other, and never slide them over one another, since scratching may occur on the surface.

To carry the panels, stand them on their back edge on soft bearers and lift with two people, one person at each end, protecting the panel face from scratching or damage.



Always lean the panel towards its back edge to avoid damaging the visible front edge.

Always abide by the Health & Safety guidelines in all aspects of manual handling.

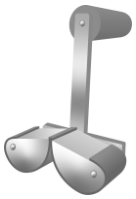
Suction lifters

The use of suction lifters is strongly discouraged because there is a high risk of leaving marks on the panel.

If suction cups are to be used, a test should be carried out to ensure that the suction cups do not leave marks on the panel surface. When suction lifters are used to lift and move panels, it is important to ensure they are strong enough. Only suitable with the smooth surface panels.

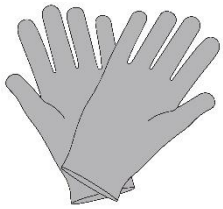
Carrying straps and panel lifters

To ease the lifting of large panels, carrying or manual lifting straps can be used. Make sure the strap material will not damage the panel edges. Take care when removing the straps.



Gloves

Clean gloves must be used to prevent fingerprints on the panels. Gloves should be of a type that ensures good grip and are easily cleaned. Make sure the gloves are waterproof if working in damp or wet weather and will not cause any risk of cement dust reaching the skin as this may cause irritation.



At times when working with white EQUITONE panels wearing cotton work gloves prevents staining. Make sure gloves are always clean.

Panel preparation

Tools & accessories

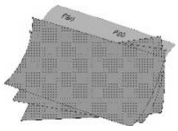
General tools and accessories required for panel preparation are as follows. The following list is by no means exhaustive.

EQUITONE blade for manual cutting

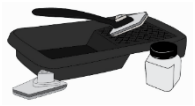
Bosch T141HM jigsaw blade for curved cuts

EQUITONE 11 mm bit for panel drilling

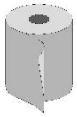
EQUITONE drill & milling tool for drilling **EQUITONE [linea]**



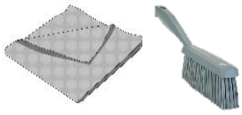
80 grit sandpaper for sanding panel edges (to be affixed to a timber block)



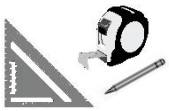
LUKO sealer & LUKO applicator kit for edge sealing of **EQUITONE [natura] & EQUITONE [natura] PRO**



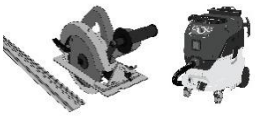
Paper towel for removing any LUKO residue



Soft brush and clean microfiber cloth for dust removal



Measuring tools & pencil for marking



Saw, guiderail, & vacuum for panel cutting

Jigsaw for curved cut-outs

Drill for panel drilling

Health & safety

The released dust during the mechanical machining of EQUITONE panels may contain quartz particles. Inhalation of high concentrations of dust may irritate the airways, and dust may also cause irritation of eyes and/or skin. Inhalation of dust containing quartz, especially fine (respirable size) particulate matter, in high concentrations over prolonged periods of time, can lead to lung disease (silicosis) and an increased risk of lung cancer.

Avoid dust inhalation with the use of cutting/sanding equipment fitted with dust extraction/suppression accessories wherever practical.

Ensure adequate ventilation of all work sites.

Avoid contact with eyes and skin by wearing an approved respirator (a dust mask type FFP2 or better compliant with EN149:2001) together with appropriate personal protective equipment (safety glasses, hard hat, boots, and protective clothing).

Refer to EQUITONE Material Safety Information Sheet (SIS) for more information about health and safety, including common hazards associated with working with EQUITONE, and measures to minimise risk.

Panel preparation

Panel cutting

It is recommended that cutting of the panels is carried out off-site as much as possible. In situations where this is not possible, on-site cutting may be done.

Where factory untrimmed [natura], [natura] PRO, and [pictura] is used, at least 15 mm needs to be trimmed from each of the untrimmed (raw) edges. The final cut edges must then be sealed with Luko edge sealer before panel installation.

Where factory untrimmed [tectiva], [linea], and [lunara] is used, at least 10 mm needs to be trimmed from each of the untrimmed (raw) edges.

Untrimmed and treated factory edges must NOT be used on a façade. Any untrimmed panel used on a façade will render the EQUITONE warranty void. Any claim or complaint relating to the use of untrimmed panels will not be accepted.

Cutting procedure

EQUITONE saw blades are recommended to be used for cutting the panels. Review the EQUITONE Saw Blade Material Information Sheet for document for more information.

When using portable saws, EQUITONE panels must be positioned so that cutting is conducted into the panel face to reduce the risk of chipping the edges. This may imply the panel is placed face down. Therefore, it is important that the workbench has a clean and soft material covering it to prevent scratching and marking of the panels.

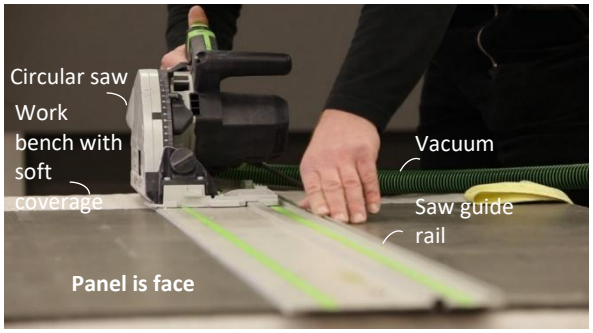
Only use a portable saw with an enclosed blade to prevent the escape of dust and a guide rail to ensure that the saw stays steady and gives straight cuts.

The blade should be set to extend approximately 13/64 in (5 mm) below the panel to allow the debris material to escape.

Only one panel should be cut at a time. Do not cut multiple panels together at the same time.
The panel should be held firmly in place to avoid vibration.
Do not cut the panel by allowing the panel to overhang the edge of the workbench as this will damage the edge.

When cutting the panel, it is advisable to place the panel on a solid workbench preferably indoors or under cover. This will reduce the risk of staining from damp/wet weather and make dust cleaning easier.

Ensure the level of the workbench is set at a comfortable height to allow safe use of the saw and to prevent over-stretching by the operatives. Due to the large number of variables, trial cutting on a waste piece of panel should be carried out to determine the optimum saw setting and movement speed of the saw.



EQUITONE saw blades

The following table as the recommended speed when it comes to blade sizing.

Blade Diameter	Saw Speed (rpm)
6 5/16 in [160 mm]	4,000
7 1/2 in [190 mm]	3,200
8 27/32 in [225 mm]	3,200
11 13/16 in [300 mm]	2,800
6 5/16 in [160 mm]	2,000

Panel preparation

Cutting equipment

Various types of equipment or machinery may be used for cutting EQUITONE panels. These may include portable saws e.g., circular saw, flat-bed horizontal or vertical (wall) saw, and CNC and waterjet machines. The following needs to be noted when considering different types of cutting equipment or machinery.

- Each cutting procedure, equipment, or machinery may produce a different edge finish.
- Where waterjet is used for panel cutting, panels must be fully dry before they can be stacked or packed.
- The panel must be positioned such that cutting is conducted into the panel face to reduce the risk of chipping the edges.

Poorly maintained cutting tools or incorrect saw speed as opposed to blade speed can result in localised heating/ burning of panel edges.
Do not use grinder tools as these usually have a high cutting speed. This produces higher than average pressure on panel edges. Most grinding tools also produce excessive, unwanted dust.

Curved cut-outs

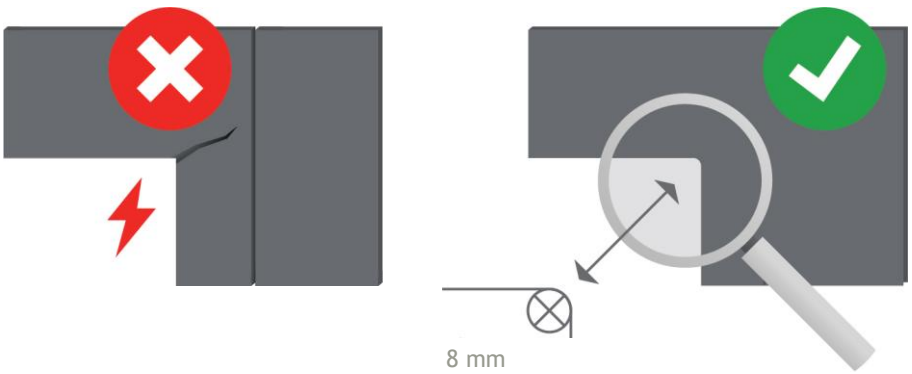
For curved cuts or cut-outs

- place the panel face down (ensure there is a soft coverage on the workbench to protect the panel face),
- drill a hole in the panel at the edge of the intended curved cut-out area,
- ensure the jigsaw pendulum function is switched off, and
- insert Bosch T141HM jigsaw blade and proceed to cut.

Due to the length of the blade, space must be provided under the panel to allow the blade to work.

Notching a panel

Notching fiber cement panels should not be at a sharp angle. Sharp-edged cut-outs form so-called "notches", which are often the starting point for crack formation. Cracks that have formed “grow” over time and the result can be material breakage. The risk of occurrence of notch cracks can be reduced if a hole 5/16 in (Ø8 mm) is drilled at the corner when notching, creating a slight rounding. Then start or end the cut into this hole. If using a hand router on-site or an offsite CNC machine, most of these machine drillers will result in this curved corner.



Panel preparation

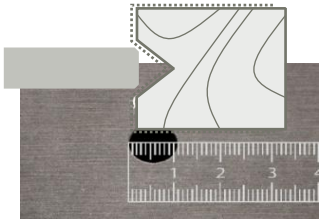
Penetrations

Where the panels need to be drilled on-site for holes for cables, use the EQUITONE fiber cement drill bits. On-site drilling of the panel to be drilled face up on a solid workbench that supports the full panel. At no time should drilling the panel be carried out in the rain. Immediately after drilling clean off all dust with a soft brush and compressed air.

Finishing cut edges

Panel edges must always be sanded after cutting them. This reduces the possibility of damage and improves their appearance. To help prevent this phenomenon from occurring, the edges of all factory trimmed panels come pre-sanded.

Use 80-grit sandpaper secured to a block of wood, approx. 15 3/4 x 3 15/16 in (400 x 100 mm) in size. Using a small timber block may result in uneven sanding.

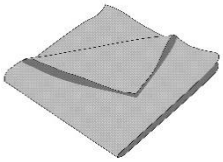


Do not use sanding pads, sponge blocks, or sandpaper without a hard backing, as these may cause curving of the edge finish.

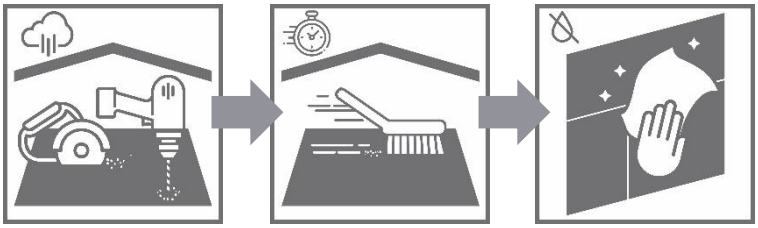
To speed up the sanding process and chamfer the edges at the same time, cut an angled groove from a block of timber and carefully wrap sandpaper into the groove.

Cleaning after cutting and sanding

Immediately after cutting or sanding clean off all dust from the panel surface with a soft brush



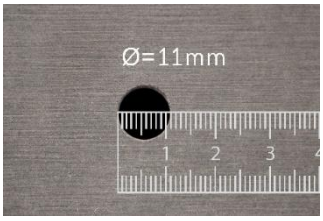
Then wipe the entire panel clean using a dry, clean microfiber cloth. Do not use a wet cloth as staining may occur. It is important to change out the cloth frequently to prevent grit buildup from staining the panels. Only use cloth for cement dust removal.



A special cleaning toolset including a brush and microfiber cloth is available from Etex.

Panel preparation

Panel drilling



Panels should be drilled using the EQUITONE 11 mm drill bit.

Ensure the panel is positioned face up, and that the drill is held perpendicular to panel face.

When drilling a panel, it is advisable to place it on a solid workbench preferably indoors or under cover. This will reduce the risk of staining as a result of damp/wet weather.

Drill only one panel at a time. Do not drill multiple panels at the same time to ensure accurate positioning of panel holes.

The panel should be held firmly in place to avoid vibration. Turn off the hammer-action function on the power-drill as this can cause the drill to move and slip.

Do not drill any panels in situ on a façade.

Other machinery

Panel holes may be drilled with other machinery such as CNC machines provided that the hole size is ensured to be 11 mm. Smaller size holes reduce the movement allowance within the connection, and larger holes reduces the pull-through (structural) capacity of the connection.

Waterjet is not recommended for drilling panel holes.

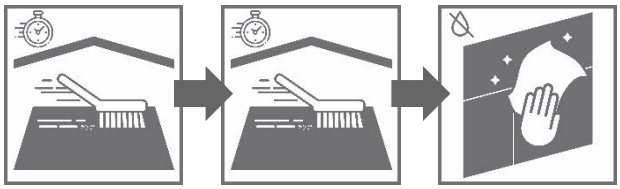
Marking the position of holes

When marking the position of the panel holes, being accurate and using small crosses will reduce cleaning time.

Use a colored pencil which is different from the panel such as white or red to highlight the hole position on grey or dark grey panels. It is possible that a grey pencil mark will be lost in the fiber pattern on the panel's surface.

Do not use chalk line and permanent markers.

Cleaning after drilling



Immediately after drilling, clean off all dust from the panel surface with a soft brush.

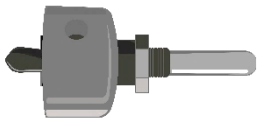
Then wipe the entire panel clean using a dry, clean microfiber cloth. Do not use a wet cloth as staining may occur. It is important to change out the cloth frequently to prevent grit buildup from staining the panels. Only use cloth for cement dust removal.

A special cleaning tool set including a brush and micro fiber cloth is available from Etex.

Panel preparation

Drilling EQUITONE [linea]

EQUITONE [linea] features a grooved surface. For face fixing of the panel with UNI-Rivet, the ridges need to be milled where the rivet will be located so that the rivet sits flat on the base of the groove.

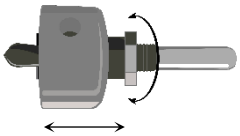


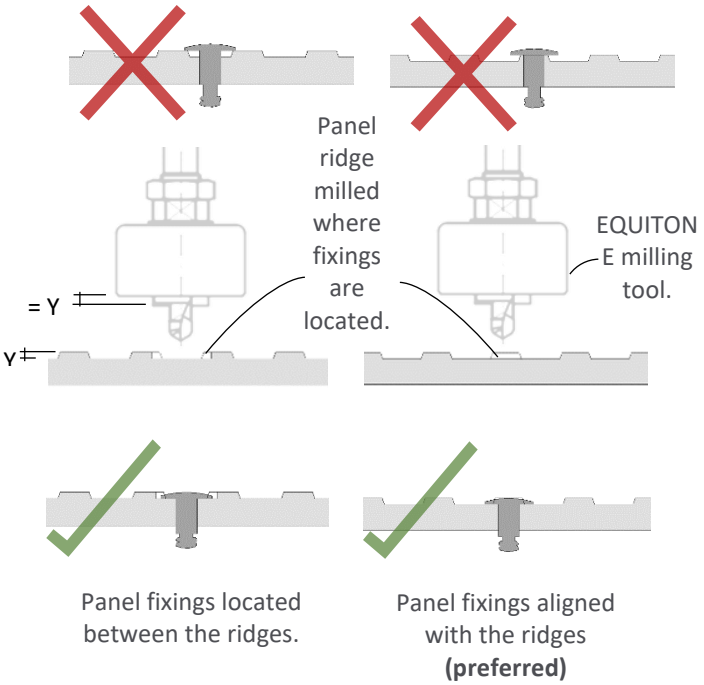
EQUITONE [linea] drill and mill tool (EQUITONE milling tool) must be used for drilling and milling the panel. The tool is equipped with built-in 11 mm bit and milling blades to both drill the panel hole and mill the ridge in one operation.

The panel hole and fixings can either be in between or aligned with the panel ridges.

From an aesthetic point of view, when drilling the EQUITONE [linea] it is recommended to align the fixings with the ridges of the panel for the panel fixings to be the least visible.

The depth of the panel ridge (Y) is approximately 2 mm. The black plastic ring part of the tool is adjustable in depth. Adjust so that the milling blades protrude out of the ring by as much as the depth of the ridges to not over- or under- mill the panel.



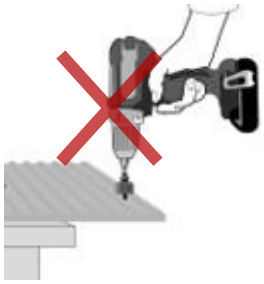


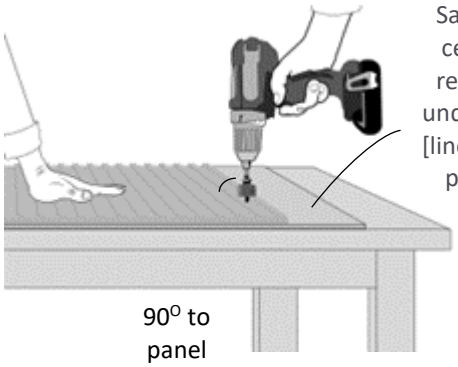
Panel fixings located between the ridges.

Panel fixings aligned with the ridges **(preferred)**

Application of EQUITONE milling tool

- Place a sacrificial fiber cement sheet on a solid, stable workbench.
- Lay EQUITONE [linea] panel flat on the sacrificial fiber cement sheet (face up)
- Mark the location of the holes.
- Place the milling tool on the hole position.
- Ensure holding the drill perpendicular to panel face during the operation.
- Hold the panel firmly in place to prevent panel movement during the process.
- Start drilling while applying and maintaining consistent gentle pressure (it is recommended to start drilling with a low-speed setting of the drill to engage the bit with the panel before increasing the speed to approx. 650-850 RPM for milling the ridges)

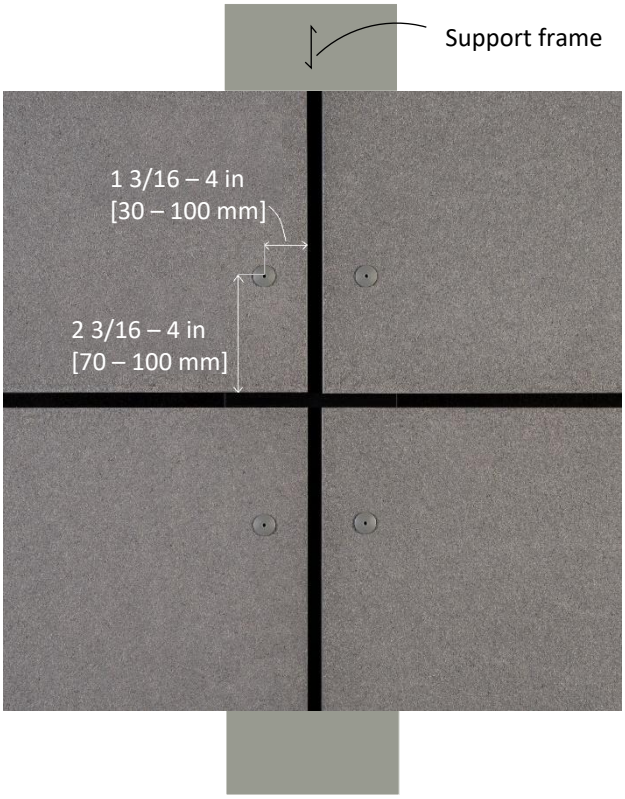




Note that depending on the consistency of the application, some minor chipping of the ridges may be expected.

Panel preparation

Panel holes edge distance



For information about spacing of panel holes or fixings, refer to EQUITONE Span Tables.
Do not drill panels on a façade. Drilling must be conducted on a solid workbench prior to positioning the panel on façade.

Distance from the panel edge parallel to support frame profile:

(On a vertical support frame, this means the distance from the vertical panel edges. Where horizontal support frame is allowed, this means the distance from the panel top/bottom or horizontal edges)

- 1 3/16 to 4 in (30 to 100 mm)

Distance from the panel edge perpendicular to support frame profile:

(On a vertical support frame, this means the distance from the panel top/bottom or horizontal edges. Where horizontal support frame is allowed, this means the distance from the panel vertical edges)

- 2 3/4 to 4 in (70 to 100 mm)

Notes:

- All measurements are from the centre of the panel hole.
- To allow for some degree of tolerance for drilling it is recommended to use slightly bigger edge distances, 1 1/2 and 3 3/8 in (40 and 80 mm).
- Corner fixings should not have equidistance edge distances as this could lead to cracking.
- The recommended panel fixings edge distances provided in this section apply to both wall and soffit/ceiling applications.

Panel preparation

EQUITONE [natura] and [natura] PRO edge treatment

With semi-transparent coatings like those used on EQUITONE [natura] and [natura] PRO panels, moisture ingress at the panel edges and predrilled holes can become apparent. In wet weather, edges can assume a darker shade (picture framing).

This coloration will fade and disappear over time. It is unlikely to reoccur, but the length of time depends on seasonal weather trends.

To help prevent this phenomenon from occurring, the edges of all factory trimmed EQUITONE [natura] and EQUITONE [natura] PRO panels are impregnated with LUKO edge sealant at the factory. The edges of EQUITONE [natura] and EQUITONE [natura] PRO panels cut on-site must then also be impregnated with LUKO.

Do not apply LUKO in wet conditions or after the panel has been fixed.

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

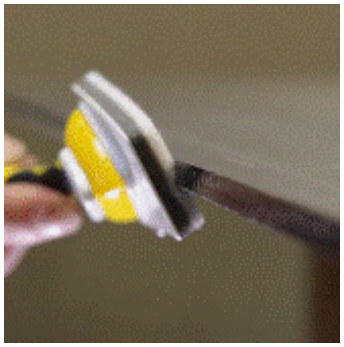
Cut, sand, clean, and LUKO.

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.

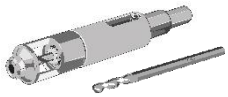
Immediately wipe away any excess that appears on the panel surface. Failure to do so will result in a stain that cannot be removed.
Use a different color cloth or recyclable paper towels - Do not use the microfiber cloth that was used to remove the dust.
Do not reuse a cloth as it may cause permanent streak marks and staining. Allow the applied LUKO to dry before the manual handling of the panel.

Ensure the cut edges are sanded and free of any dust before the application of LUKO.
LUKO must be applied with the appropriate recommended applicator.
The panel must be positioned flat and face up for LUKO edge treatment.
Any LUKO excess on the panel face must be carefully and thoroughly wiped away. Failure to do so will result in a stain that cannot be removed.
Allow for the applied LUKO to dry before manually handling the panel.
For Health and Safety, refer to LUKO Material Safety Data Sheet prior to using LUKO.
Do not re-use a cloth to wipe away any LUKO excess as otherwise it may cause permanent streak marks on the panel face. Use a clean microfiber cloth or a soft paper towel.

Panel installation

Tools and accessories

General tools and accessories required for panel installation are as follows. The following list is by no means exhaustive.

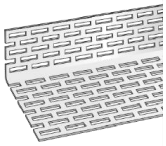


EQUITONE centralising tool & 4.1mm replacement bit

EQUITONE UNI Rivet setting tool

UNI Rivet & STOP point gasket. (2 STOP points per panel)

Recommended foam tape



Perforated closure

Baffle for baffled horizontal joints

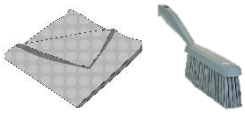
Battery operated rivet gun e.g., Gesipa Accubird (pro)

Drill

Metal snips for cutting perforated profile, baffle, and flashings

Leveling tools

Shims & packers as required



Soft brush and clean microfiber cloth for dust removal

Measuring

Pencils for marking

Knife

Panel installation

Panel horizontal joints

Depending on the project design requirements and weather barrier type, the horizontal joints may be open or closed (baffled).

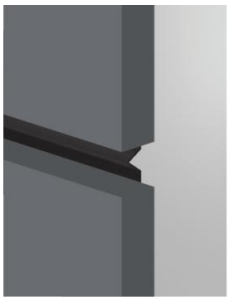
Open joints

By leaving the horizontal joints open, the likelihood of dirt spoiling the façade reduces as the joint remains clean. The open joints also function as additional ventilation openings.

Consider the color choice of the support frame, any external insulation, and/or weather barrier as these may be visible through the open joints. These components may need to be concealed using appropriate black profiles, paint, tape, or membrane.

The exposed façade elements behind the panel, e.g., insulation or weather barrier should be of adequate UV resistance.

Optional: Baffled joints



When a horizontal joint is required to be closed, an aluminium joint profile (baffle) of maximum 1/32 in (0.8 mm) thickness can be inserted behind panels. The baffle should have adequate corrosion resistance appropriate to the project location.

By using a baffle, most of the water is prevented from entering the cavity. In some buildings it is advisable to have closed joints, such as the low areas of public or educational buildings. The joint profile will prevent debris from being deposited behind the panels. In the case of kindergartens, 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.

Note: Caulking or sealing the joints with sealant is not recommended as the applied sealant may deteriorate in time and cause staining and maintenance issues.

Cut the baffle approximately 5/32 in (4 mm) shorter than the panel width, leaving the profile 5/64 in (2 mm) shorter at each side so that it does not cross and become visible at the vertical panel joints.

To prevent sideways movement of the baffle, and exposing that movement at vertical joints, cut and bend top or bottom edges of the profile at both sides of one of the vertical support frame profiles. Alternatively, the baffle may be fixed to one of the support frame profiles with a flat head screw sitting flush with the profile face.

If the baffle is to be mechanically fixed e.g., over a control/movement joint, it shall be fixed to either and not both of the top/bottom profiles. Allowance for thermal movement of the baffle is also important if mechanically fixed. All connections must be executed with gliding points.

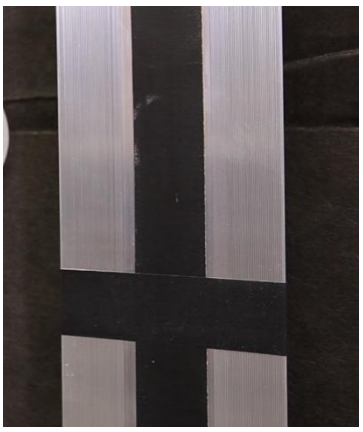
Panel installation

Panel vertical joints

Vertical joints are mostly backed with a continuous profile.

When a metal supporting frame is used, the grey or silver color can be prominent especially when used with dark colored panels. This could be an unappealing feature. To eliminate this, the best solution is to use black coated metal profiles, such as anodised aluminium. Alternatively, the visible areas can be painted on site prior to fitting the panels.

Another solution is the use a good quality external black tape. Make sure the profiles are prepped correctly before painting or taping as new metal profiles can have an oily surface. Note, the painting or taping of the profiles on site will not endure as long as the anodised metal profiles.



A colored metal strip with maximum thickness of 0.8 mm may be alternatively used to form an expressed joint.

Typical joint width

Many years of practice have shown that the optimum width of the joints between large panels is 3/8 in (10mm). This also offers the installer a reasonable level of tolerance when setting out the frame and fitting the panel.

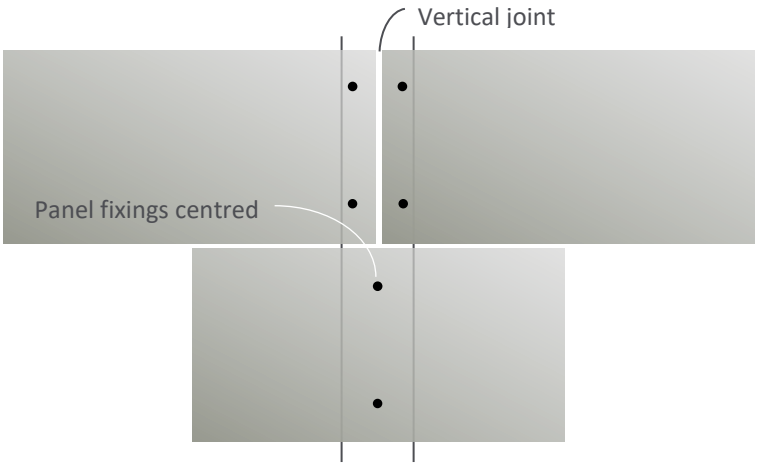
- The minimum recommended joint width: 5/16 in (8 mm)
- The maximum recommended joint width: 1/2 in (12 mm)

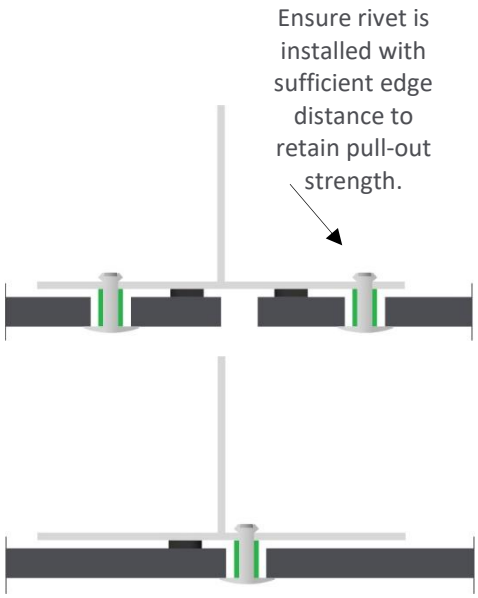
Where smaller or larger joint width is required, consult with your Etex Exteriors technical department.

Panel installation

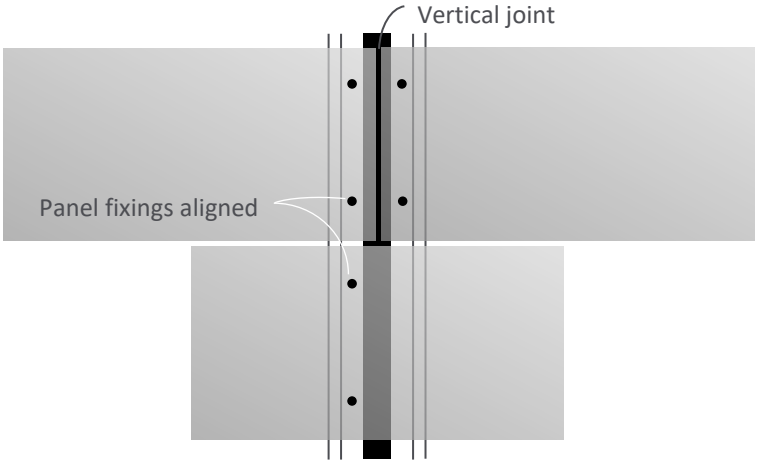
Staggered vertical joint.

For staggered joints on aluminium T-profiles the intermediate panel fixings can be centred.





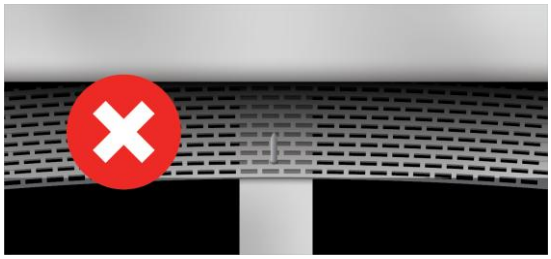
Where the profiles have a central recessed part on the face, it is important to align the intermediate panel fixings with the edge fixings of one of the top/bottom panels. Panel fixings must not be positioned in the recessed part of the support frame profile.



Panel installation

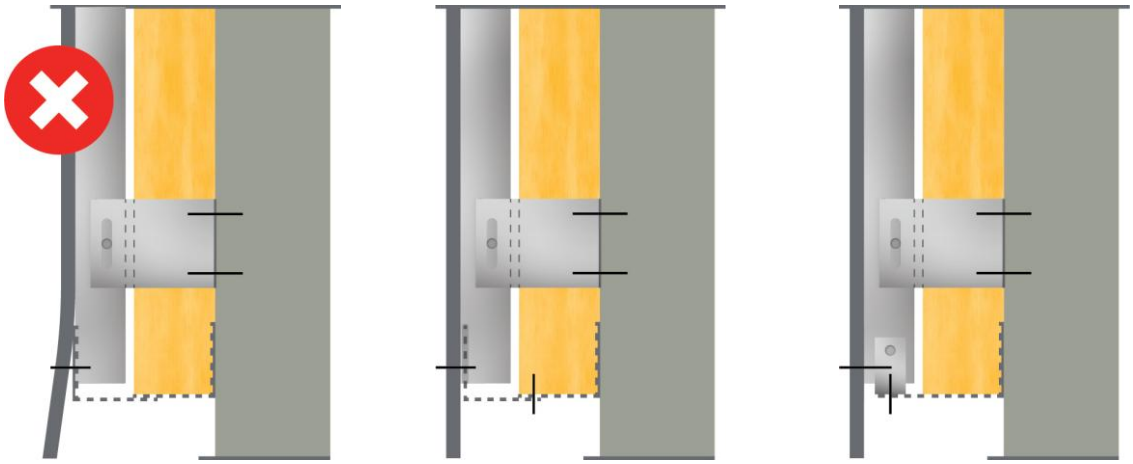
Stress caused by thermal expansion.

Aluminium is a material with a high thermal expansion coefficient. If elements such as support frame profiles and aluminium ventilation profiles are arranged at 90° angles to one another, it is imperative that the design ensures compensation of thermal expansion is possible, otherwise there is a risk that the entire support frame will warp, and cladding panels will be damaged. All connections must be executed with gliding points.



Stress must be avoided.

Stresses caused by components that are located between the support frame and the cladding, e.g., perforated closures, joint profiles and flashings, are to be avoided in particular by constructive measures by fixing the profile to the side of the support frame as shown below. Where the profiles are fixed to the face of the support frame, the thickness of the profiles, including their fixings, must not exceed 1/32 in (0.8 mm).



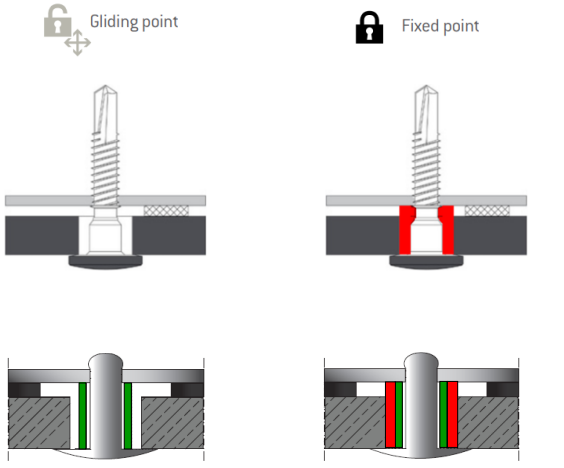
Some suppliers offer purpose designed accessories to fix the perforated closures stress free to the aluminium framing.

Panel installation

UNI-Fixing movement principle

The UNI-Fixing system is based on GO (gliding) & STOP (fixed) point principle.

The following images show how GO (gliding) and STOP (fixed) points are achieved with the various UNI-Fixing options.



Compressible foam tape (gasket)

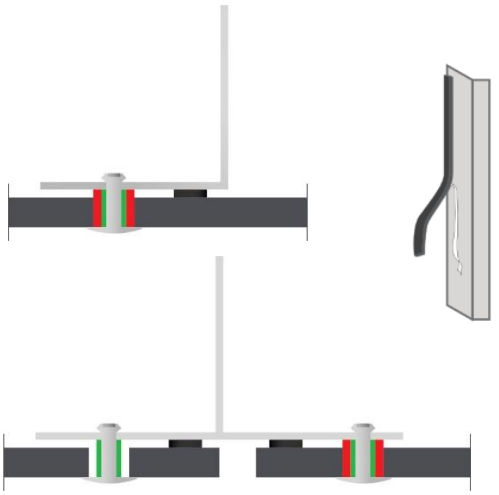
The UNI-Rivet green sleeve and the UNI-Metal Screw ring shank controls the depth of the connection. It provides an approximate 0.089 in (2.25 mm) gap between the panel and support frame. The recommended, compressible foam tape is applied in between the panel and support frame to prevent rattling while allowing for movement in depth within the connection.

GO point allows for approx. 0.089 in (2.25 mm) movement allowance around the green sleeve of the rivet as well as in depth within the connection.

STOP points carry the self-weight of the panel and stops panel

On the intermediate support frame, the compressible foam tape is applied to one side of the support frame face, away from the panel hole, to allow moisture entering the panel hole to drain down.

On the support frame located at vertical joints, two compressible foam tapes are used, 1 behind each panel.

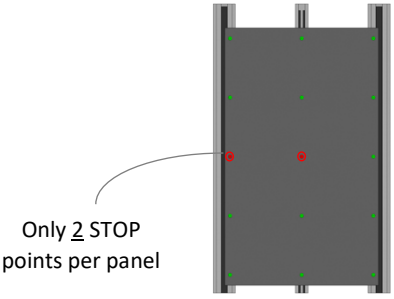


Location of STOP points

The location of STOP points is critical in ensuring a successful façade.

The general principles are:

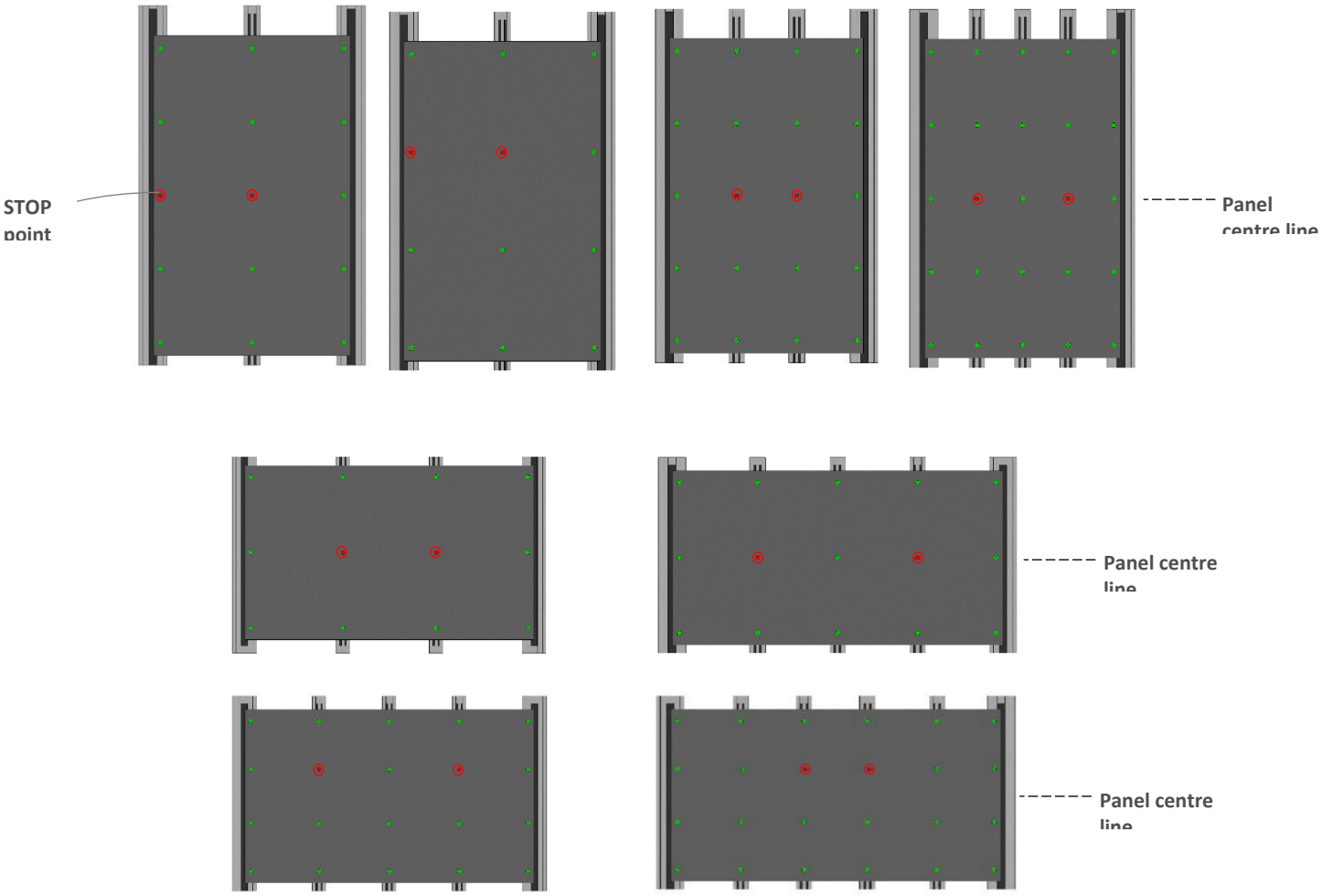
- Only two STOP points per panel; the rest are GO points.
- STOP points are fixed on adjacent supporting frame; never place the 2 STOP points on same support frame profile.
- STOP points are located as close as possible to the horizontal centreline of the panel.
- STOP points of a panel should be located at the same level; do not position the STOP points diagonally.
- Where possible, position the STOP points away from the panel edge.
- Where there are more than three lines of fixings position the STOP points symmetrically in relation to the vertical centreline of the panel to balance the panel.



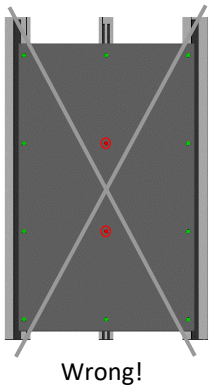
Only 2 STOP points per panel

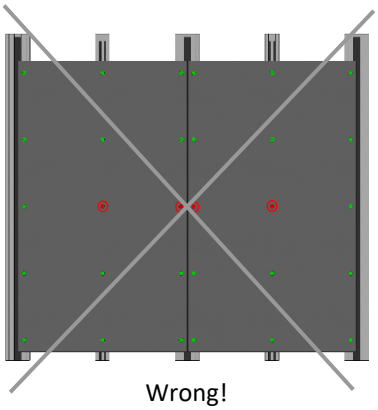
Panel installation

Typical examples of the recommended location of STOP points:



At no time located on profile.


Wrong!

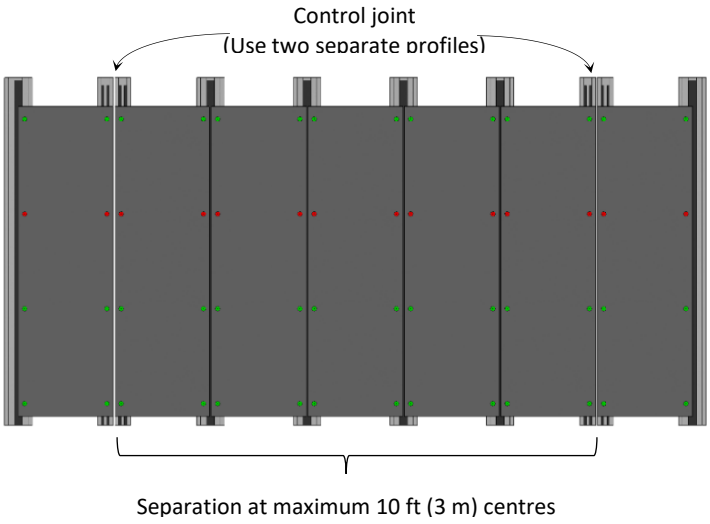

Wrong!

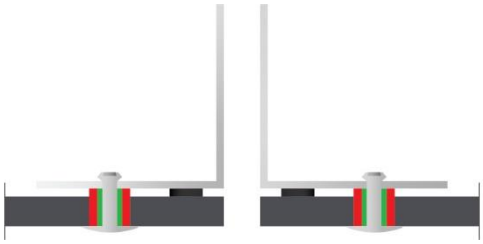
should STOP points be the same support frame

Panel installation

Narrow panels

When narrow EQUITONE panels are used with only two vertical lines of fixings, it is important that there is a vertical break in the supporting frame, so the panels are not locked together. This means using two separate profiles at joints e.g., 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 maximum every 10 ft (3 m). For horizontally oriented panels and panel rails (i.e. turning the below diagram 90 degrees) the system must be considered as close jointed and follow the appropriate corresponding ventilation guidelines. Furthermore, the horizontal break for expansion is not to be considered as an air outlet when referring to the ventilation charts.

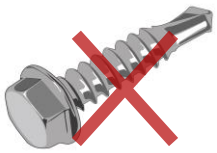




Control joints every 10 ft (3 m) where there are narrow panels with STOP points located on common profiles

Temporary panel fixing

Temporary screw fixing of the panel, using standard screws for metal, is not allowed during any stage of the panel installation process. Screw fixing of the panel is only allowed with the special UNI-Metal Fastener. Panels may be temporarily secured using clamps or rested on metal rails secured to the framing. Care should be taken to not mare the panel surface by not overtightening or periodically cleaning the grips.



Centralising tool application for UNI-Rivets

EQUITONE centralising tool is used to centre the 4.1 mm rivet hole within the 11 mm panel hole. The centralising tool must be held perpendicular to the panel face during the application.

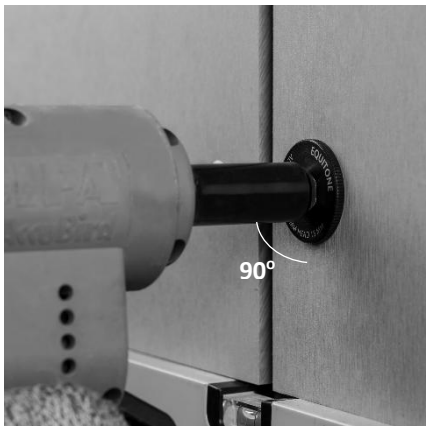
Panel installation

When using the centralizing tool, ensure to remove any metal from inside the panel hole before complete fixing installation. Otherwise, these shavings may prevent proper movement allowance as well rust causing panel staining.

UNI-Rivet fixing operation

Always ensure using EQUITONE rivet setting tool. This accessory helps prevent scratching rivet head and panel during fixing operation, and it ensures the correct placement of rivet perpendicular to the support frame and panel.

Rivet gun must be held perpendicular to panel face.



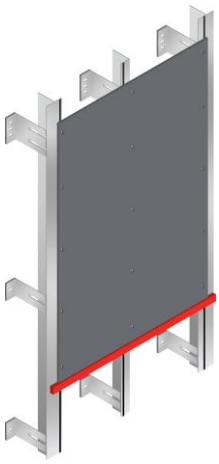
Incorrect application of the UNI-Rivet, riveting through the foam tape, oversizing the rivet hole in the support frame, and/or inadequate thickness of support frame may cause the mandrel of the rivet to break and not be completely pulled out of the rivet, which may result in partial engagement of the rivet with the support frame.

Panel installation

Panel fixing procedure with UNI-Rivet

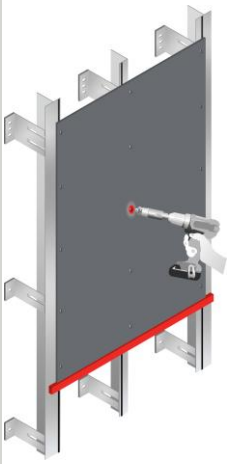
Following the below panel fixing procedure is very important for a successful installation.

1



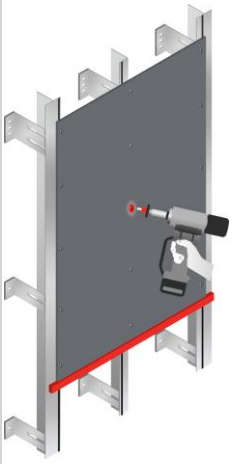
Place a pre-drilled panel on the façade.
Do not drill the panel holes when the panel is placed in position on the façade.
Generally, panel is placed on a temporary support angle, or packers as appropriate.
Ensure foam tape is applied on all the support frame profiles before placing the panel in position.

2



Determine the correct location of the two STOP points in the panel.
Using EQUITONE centralising tool, ONLY drill the rivet hole of the STOP point located close to the middle of the panel.
Do not yet drill the second STOP point rivet hole.
Clean the panel hole from any metal swarf.
Ensure holding the drill perpendicular to panel.

3

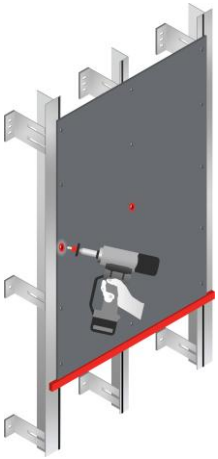


It is now the time to apply the first STOP point rivet.
Remove all metal swarf from the panel hole before applying the rivet.
Always ensure that rivet gun is held perpendicular to panel face.

4

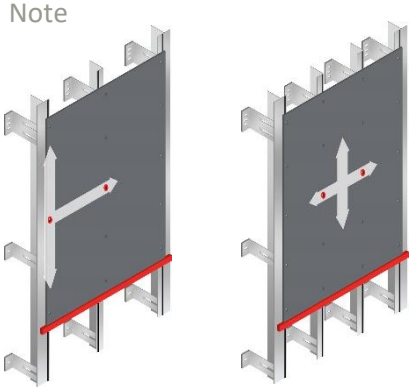
Now using EQUITONE centralising tool, drill the rivet hole for the second STOP point.
Do not drill the other rivet holes yet.
Clean the panel hole from any metal swarf.
Ensure holding the drill perpendicular to panel.

5



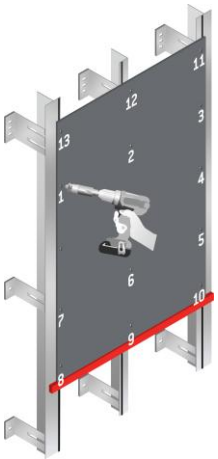
Apply the second STOP point rivet.
Remove all metal swarf from the panel hole before applying the rivet.

Note



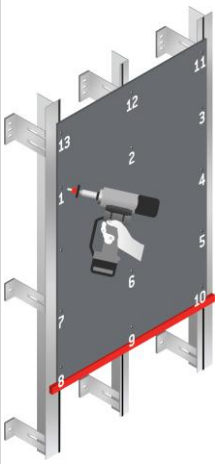
After applying the STOP rivets, the GO point rivet holes can be drilled. Always start with the holes located close to the centre of the panel and move outwards towards the panel edges; the very top and bottom holes are to be drilled last. This ensures panel is installed flat and stress free.

6



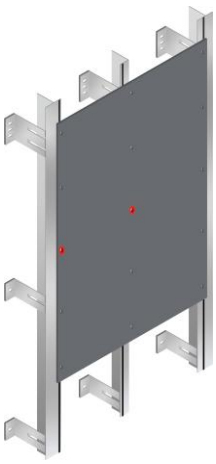
Now, start drilling the GO point rivet holes using EQUITONE centralising tool.
Always start with the holes located close to the centre of the panel and move outwards towards the panel edges.
Ensure holding the drill perpendicular to panel.

7



Apply the GO point rivets. Ensure all rivets sit flat on the panel surface.
Remove all metal swarf from the panel holes before applying any rivet.
Always ensure that rivet gun is held perpendicular to panel face.

8



Ensure all rivets are in place.

Panel installation

UNI-Metal Screw fixing operation

Always ensure the fastener is perpendicular to the surface of the panel by using either the STOP point sleeve (red) or the centering tip.

STOP point installation

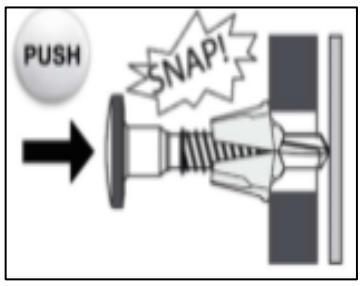
1. To install a STOP point, insert the red sleeve into the pre-drilled panel hole.

2. Insert the UNI-Metal Screw, without centering tip, into the hole with the red sleeve.

3. Use a screw gun or impact driver to complete the drilling of the fastener. The fastener is correctly installed when the shoulder hits the metal frame, and the fastener is overtightened.

GO point installation

1. Insert the UNI-Metal Screw with centering tip into the pre-drilled panel hole.



2. Apply pressure to the screw gun or impact driver, WITHOUT starting to screw, until the centering tip breaks.

3. After the centering tip snaps start screwing, using a screw gun or impact driver, slowly while continuing to apply pressure. The two halves of the centering tip will fall out. The speed up to set the screw.

4. The fastener is correctly installed when the shoulder hits the metal frame, and the fastener is overtightened.

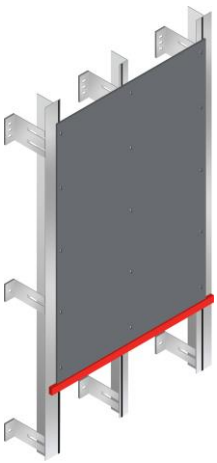
5. Incorrect application of the UNI-Metal Screw, out of plum framing, and/or fastening through the foam tape, can cause the fastener head to not sit flush to the panel face.

Panel installation

Panel fixing procedure with UNI-Metal Screw

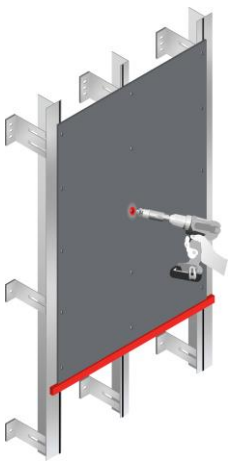
Following the below panel fixing procedure is very important for a successful installation.

1



Place a pre-drilled panel on the façade. Do not drill the panel holes when the panel is placed in position on the façade. Generally, panel is placed on a temporary support angle, or packers as appropriate. Ensure foam tape is applied on all the support frame profiles before placing the panel in position.

2

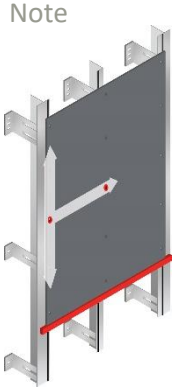


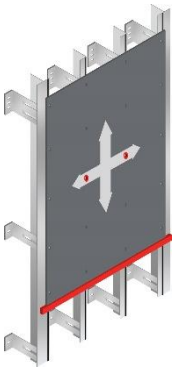
Determine the correct location of the two STOP points in the panel and put a red sleeve in the fixed-point holes. Using a power drill ONLY fix the first STOP point screw located close to the middle of the panel. Do not forget to remove the catering tip of the screw. Ensure holding the drill perpendicular to panel.

3

Now fix the second STOP point screw. Remove the centering tip of the screw. Ensure holding the drill perpendicular to panel.

Note



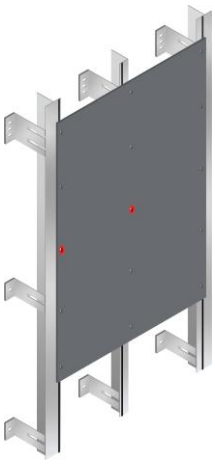


After applying the STOP screws, the GO point screws hcan be fixed. Always start with the holes located close to the centre of the panel and move outwards towards the panel edges; the very top and bottom holes are to be fixed last. This ensures panel is installed flat and stress free.

4

Now, start fixing the GO point screws using a power drill. Always start with the holes located close to the centre of the panel and move outwards towards the panel edges. Ensure holding the drill perpendicular to panel.

5



Ensure all rivets are in place.

Panel installation

Installation sequence general notes

A sequence or method of placing the EQUITONE panels on the façade must be put in place to ensure the risk of damage to the panels is minimised.

EQUITONE panels are a finished façade product and are generally the last major cladding material to be fitted. Thus, it important inspect the material, at various stages along the construction process, and clean and/or replace as necessary. This includes stages such as, but not limited to, pre-panel installation, post panel installation, and after the completion of finished façade area.

Furthermore, care and attention are required if other trades (e.g., painting or rendering) need to follow on after the panel is fitted. The panels must then be protected. Stains from colored renders cannot be removed, and replacement of the panels is the only remedy.

If the panels need to be protected from other trades, it is recommended to use waterproof materials, such as rigid plastic corflute sheets or opaque tarps. These materials can either be mechanically fixed to the support frame through the open joints or clipped to the outside edges of the panel. If using clips, care should be taken not to overtighten them as this can cause damage to the finish surface. A small gap should exist between the protective material and the panel surface to prevent sticking as well as water staining.

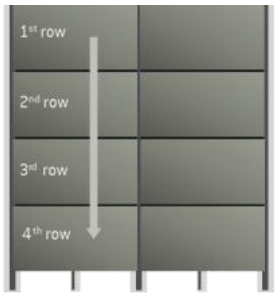
Due to nature of the panel surfaces, no adhesive tape should be applied to EQUITONE materials as it may leave traces of adhesive and/or lead to damage of the coating.

Top-down installation method

Experience has shown that the best sequence in placing the EQUITONE panels using EQUITONE UNI-Fixings is to start at the top of the façade and work downwards.

It is important to –

- prevent damage to the panel,
- provide an easy way to adjust the panel,
- provide a safe and secure way to temporarily hold the panel before fixing, and prevent the panel slipping down the façade.



This method brings several benefits to the installer:

- using a support rail (angle) ensures accurate joints,
- support rail acts as additional workman,
- reduces risk of panel staining as installer works away from installed panels,
- reduces risk of damaging panel by working on scaffold, and
- reduces the time required to clean the façade.

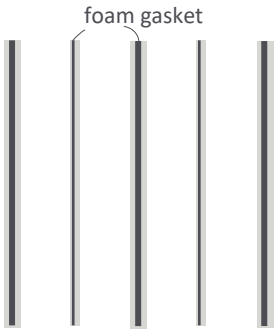
Panel installation

Installation sequence (top-down method)

1

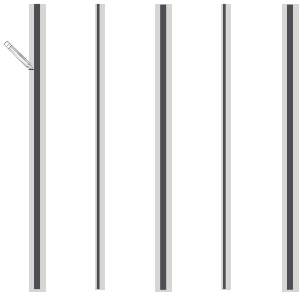
Ensure the support frame has been installed and set out correctly and is straight and plumb.

Apply the compressible foam tape onto the support frame profiles.



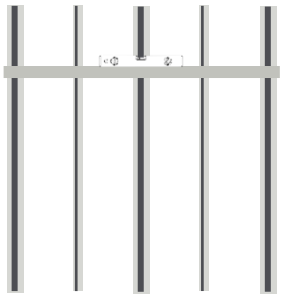
2

Starting at the top of the façade, mark the bottom edge of the top panel on the supporting rails. Align this position-mark across the façade.



3

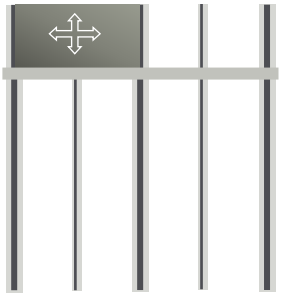
Temporarily apply a metal carrier (support angle) across the support frame profiles. This support angle will act as another workman and will carry the weight of the panel and allow easy adjustment prior to fixing.
In addition, the support angle will provide a wide ledge to stop the panel sliding down the façade before fixing.



4

Lift the first panel onto this support angle and position into place. Securely hold the panel in position. Using a packer on the support angle will allow ease of minor adjustment. For larger adjustments, the support angle needs re-setting.

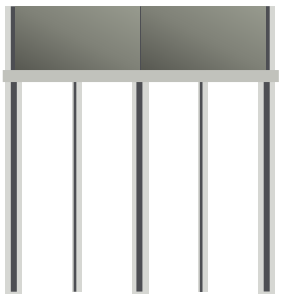
Install the panel. Always fix the STOP points first to hold the panel in place and then radiate outwards towards the edges with the other GO points.



Once installed, immediately clean the panels following our cleaning guidelines.

5

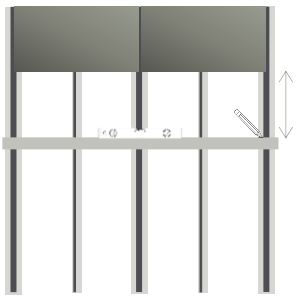
Lift and slide the next EQUITONE panel into place. Use spacers (3/8 in (10 mm) of a type not to cause damage when being removed, to give a constant vertical joint gap. Wrap a 1 mm EPDM strip around an 8 mm spacer and remove the spacer prior to the epdm to reduce the risk damaging the panel edges (see also next page). Fix this panel as the first panel. Continue across the façade, moving the support angle as the work progresses.



6

Now that the top row is in place remove the support angle.

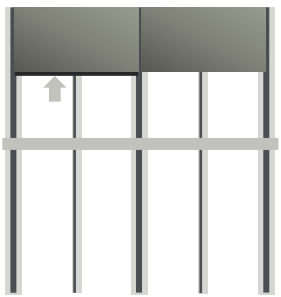
Fix in place the parapet capping or fix a temporary cover over the top of the façade to prevent water running down the back of the panels. This capping, whether permanent or temporary, must respect the ventilation gap.



Measure down from bottom edge of the upper fixed panel and mark the position of the bottom edge of the next row of panels. This measuremen is equivalent to the height of the panel plus the horizontal joint (panel +3/8 in (10 mm). Then fix the temporary support angle in this position.

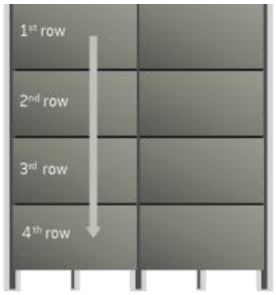
7

For baffled horizontal joint, cut the baffle to approx. 5/32 in (4 mm) shorter than the panel width and slide it into place and under the installed panel before installing the next row panel.



8

Then lift the first panel of this row onto the support angle and position it into place lining up the panel vertical edge with the edge above. Repeat the fixing sequence for the panel. Continue working across the façade. The whole procedure is then repeated down the façade of the building.

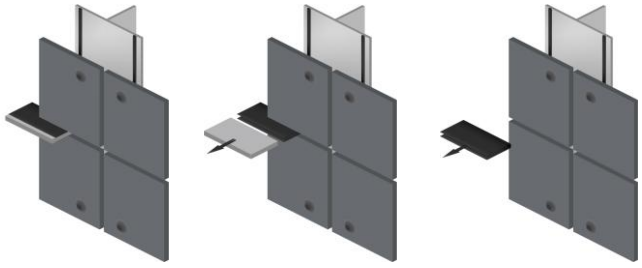


Panel installation

Installing the panels from ground level upwards

For certain projects, it may be necessary to commence cladding from the base of the façade. This can be done successfully but requires the installer to take extra care and attention to prevent damaging the edge of the panel as well as panel staining. The most likely damage will be the top edge of the lower panels. As the weight of the upper panel will be resting on the spacers which in turn will be resting on the lower panel. Therefore, removal of the joint spacers must be done with utmost care.

One suggestion is to use an 5/16 in (8mm) spacer and wrap a 1/32 in (1mm) rubber strip around the top face, back edge and bottom face of the spacer. Remove the spacer first and then the rubber strip. The rubber strip protects the edges of the panels as the spacer is being removed.



Alignment of the vertical joints

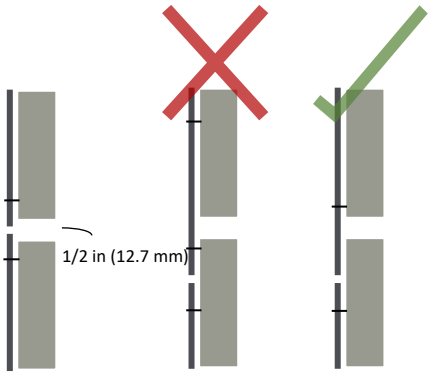
Whether installation is done from ground level upwards or as top-down method the above procedure of using wrapped spacers can be applied to maintain correct size of the vertical joint as well.

Support frame length & joints

It is recommended to limit the length of the vertical rail to 10 ft (3 m) (maximum panel height).

A minimum gap of 1/2 in (12.7 mm) shall be considered between support frame profiles.

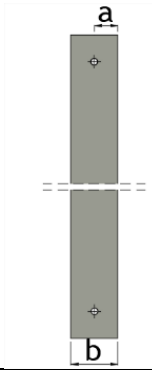
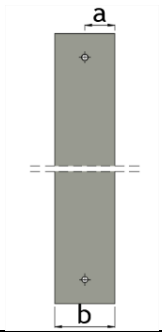
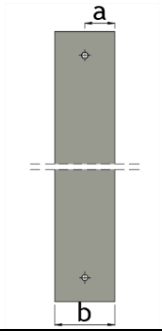
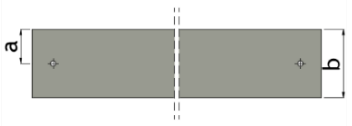
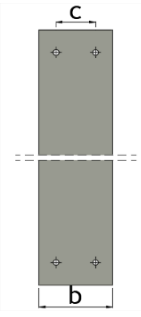
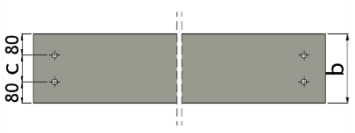
EQUITONE panel must not bridge this gap or any control/movement joints while fixed to both adjacent profiles.



Panel installation

Fixing of narrow EQUITONE panels

The number of fasteners, which is determined through project specific engineering, per row depends on the length of the strip and the height of the building.

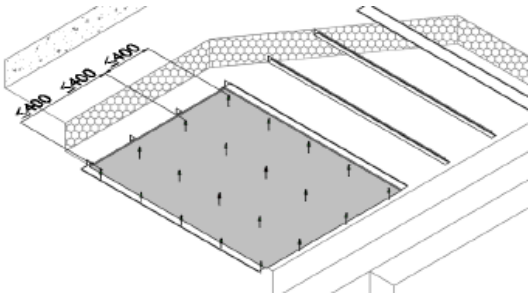
	Framing profile parallel to panel direction		Framing profile perpendicular to panel direction	
Narrowest panel, up to 49 in (1250 mm) in length, with one row of fasteners.	60 mm ≤ b ≤ 100 mm 2 3/8 in ≤ b ≤ 4 in Central fixing a = 1/2b			
Panel width limitations, up to 122 in (3100 mm) in length, with one row of fasteners	100 mm ≤ b ≤ 240 mm[1] 4 in ≤ b ≤ 9 1/2 in[1] Central fixing a = 1/2 . b		140 mm ≤ b ≤ 240 mm 5 1/2 in ≤ b ≤ 9 7/16 in Central fixing a = 1/2b	
Panels with limitations, up to 122 in (3100 mm) in length, with one row of eccentric fasteners	100 mm ≤ b ≤ 240 mm 4 in ≤ b ≤ 9 7/16 in 30 mm ≤ a ≤ 120 mm 1 3/16 in ≤ a ≤ 4 23/32 in		140 mm ≤ b ≤ 240 mm 5 1/2 in ≤ b ≤ 9 7/16 in 70 mm ≤ a ≤ 120 mm 2 3/4 in ≤ a ≤ 4 23/32 in	
Narrowest panel, up to 122 in (3100 mm) in length, with two rows of fasteners	b ≥ 5.5 in (140 mm) Fixing centers c ≥ 3 5/32 in (80 mm)		b ≥ 9 7/16 in (240 mm) Fixings centers c ≥ 3 5/32 in (80 mm)	

a=edge distance, b=width of panel, c=fixing centers

[1]Larger sizes, up to 300 mm (11 13/16"), may be possible based upon engineering but may be at risk for panel bowing.

Panel installation

Soffits and ceilings



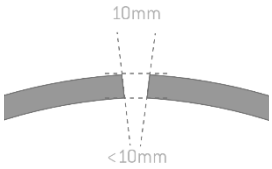
The same fixing principles apply on ceiling and soffit applications.

A fastening distance of max. 16 x 16 in (400 x 400 mm) must be observed.

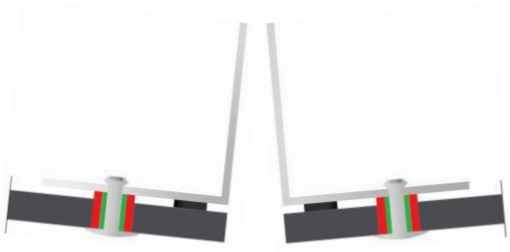
Curved façade

EQUITONE panels are flat. However, it is possible to ease them around a curved façade. Note that the orientation of the panel is also critical. A horizontal panel bends easier than one placed vertically. The minimum radius that an 5/16 in (8 mm) EQUITONE panel can be fixed to a curved façade is 40 ft (12 m). For 1/2 in (12 mm) boards is 50 ft (15 m).

When the panels are applied on a curved façade, the joint will not be square but is angled to accommodate the curve. Visually it is better to keep the outer edge of the joint gap at 3/8 in (10 mm) and allow the inner edge to be less than 10mm. If not, depending on the curve, the joint could be more than 1/2 in (12 mm) wide. To allow this to happen it is important that the setting out of the support frame reflects this. The opposite applies to an inner curving façade.



For smaller radiuses, the panel may be segmented into a series of narrow strips. Generally, two intermediate metal frame support profiles are used at vertical joints to prevent overstressing of the panel. The following is a typical vertical joint detail. For more details, refer to EQUITONE exposed fastener on metal subframes construction details.



Flashing's thickness

Flashings, trims, and the like must be designed in accordance with the relevant standards, regulations, project requirements, and wind loading.

The thickness of any flashings, perforated profiles, and the like placed in between EQUITONE panel and support frame profile must not exceed 1/32 in (0.8 mm).

Movement & control joints

Cladding and its support framing must not bridge over a building movement or control joint while fixed to both sides of the joint. Adequate separation in both cladding and its support framing is required at any movement or control joint and the like. Specific details can be found in the EQUITONE exposed fastener on metal subframes construction details.

Typical construction details

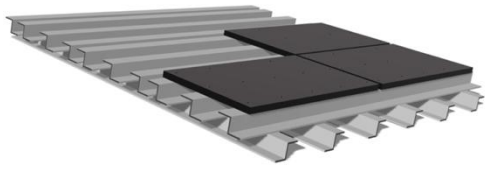
Refer to EQUITONE exposed fastener on metal subframes construction detail documents for a comprehensive set of typical details which must be read in conjunction with this Design and Installation Guide.

Special applications

For applications not listed herein, please reach out to your local EQUITONE distributor or technical department for further guidance.

Roof Systems

EQUITONE [natura] PRO and [pictura] panels can be considered for applications on a roof. Please bear in mind the panel is only decorative and therefore it is strongly recommended that a water-tight and UV-stable under-construction be installed beneath the EQUITONE material to prevent moisture ingress.



Some important notes to remember when using EQUITONE panels on a metal subframe roof structure:

Roofs with Open Horizontal Joints	Roofs with Closed Horizontal Joints
Roof pitch should be ≥25	Roof pitch should be ≥15
Minimum air and drainage cavity of 2 in	Panels must be overlapped horizontally between 4-8 in (102-204 mm) depending on roof
Follow air inlet/outlet guidelines for open jointed walls	Follow the closed-joined ventilation guidelines for walls

Roofs With Either Open or Closed Horizontal
The vertical joint between the panels must be protected with a hidden flashing.
System detailing must allow air and water to move freely under the panels. Follow the wall closed-joint ventilation charts on pages 8 and 9 for additional guidance.
The panels must be fastened to their own support frame which in turn needs to be secured to the roof structure.
The designer needs to consider the detailing of penetrations, skylights, extractor pipes, chimneys, etc. and how both the waterproof under-roof and the panel are flashed.

Where periodic maintenance of other roof elements is required, care should be taken to ensure the design of the framing behind EQUITONE can account for any applicable live loads. It is NOT permitted to walk on the EQUITONE panels or place any downward force onto the material without following the appropriate local safety regulations and procedures for working at heights. Our materials are not slip resistant but also has the potential to break which can lead to injury. Lastly, it should be noted that walking onto the material may cause damage to the surface such as staining or scratches.

Please reach out to your local EQUITONE distributor or technical department for further guidance.

Special applications

Louvers and brise soleil

EQUITONE [natura] PRO, [pictura] and [inspires] can be considered for applications within sunshade systems. Panels used in louver applications should be pitched at least 15 degrees, assuming that only one panel or row of panels is used to create the louver. Typically, these boards are finish coated only on one side. In designs where the back of the panel being seen is a concern, please contact technical for further guidance.

EQUITONE can also be used in vertical fin systems. We would suggest the sunshades be limited to an overall width of 8 1/4" (210 mm) with a minimum edge distance for the fixing of 2-3/4" (70 mm).

EQUITONE EPDM or foam tape should be used to protect the surface of the panel from scratching against any mounting hardware.

It is important to ensure our panels are properly ventilated and connected to the structure following the recommendations within our planning an application guide. The construction behind the louver system should be detailed and waterproofed appropriately to mitigate water intrusion into the building.

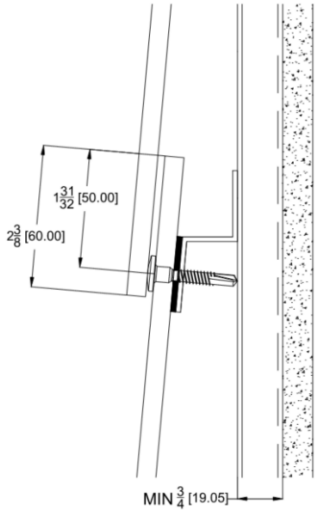
For additional guidance please contact your local EQUITONE distributor or technical department.

Ship Lap Patterns

An alternative to the flat façade is the shiplap appearance which emphasizes the horizontal lines created by the panels. All EQUITONE materials can be used in shiplap designs baring the panels are not angled less than 85 degrees.

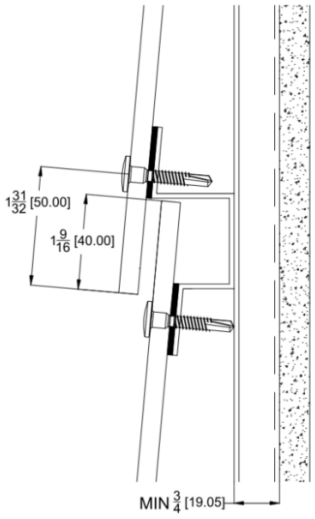
Below are two possible fixing options with corresponding overlaps. It is important that the fasteners are installed perpendicular to the panels, not to the framing. This will prevent applying additional stress to the panels which may cause cracking.

*Option 1. Panel fasteners hidden with the overlap**



*Panels 3 5/32 - 9 1/2 in (80 - 240mm)

*Option 2. Panel fasteners exposed***



**Panel larger than 240mm

Special applications

For panels wider than 11 13/16 in (300 mm), at least two rows of fasteners/rivets are required. Additionally, similar to standard façade applications, the maximum recommended distance between fasteners is 24 in (600 mm). All spacings should be verified by a professional engineer to meet the project-specific loading conditions.

The following minimum fastener edge spacings should be followed for ship-lap applications, which varies from the above recommendations for a standard flat façade.

Vertical subframe members

Distance from the panel edge perpendicular to framing: 2 - 4 in (50 - 100 mm)

Distance from the panel edge parallel to framing 1 3/16 - 4 in (30 - 100 mm)

Horizontal subframe members

Distance from the panel edge perpendicular to framing 2 3/4 - 2 in (70 - 100 mm)

Distance from the panel edge parallel to framing 2 - 4 in (50 - 100 mm)

All other guidelines mentioned previously in this document should be followed including but not limited to, leaving appropriate gaps between the ends of the panels, fastener installation sequence, etc.

Alternative detailing, then what is discussed within this guide, may be possible. In these cases, please reach out to your local EQUITONE distributor or technical department for further guidance and information.

Panel Perforation

It is possible to fabricate aesthetics, through the panel, features into the panel. Some simple rules apply to ensure the panel remains fit for purpose. Regardless of perforation geometry, it is recommended to leave a minimum of 4 in (100 mm) around all edges of the panel. In general, perforation designs should not remove more than 20% of the panel's area.

More specifically, for perforated hole diameters between 3/8 and 1 3/16 in (10 and 30 mm) the minimum center-to-center dimension between these holes should be 2 x (perf hole dia.) + 1 3/16 in (30mm). A minimum radius of 3 5/32 in (80 mm) should also remain intact around any fastener location.

In addition to the use of round holes, it is also possible to have slotted panels. The maximum size of the slot should be 1 3/16 in (30 mm). A minimum dimension of 3 5/32 in (80 mm) should remain between slot edges while 4 in (100 mm) is recommended between slot ends.

Special applications

Extra care and attention will be needed to protect the panel during storage, transport, and handling as the panel may be more prone to breaking.

Alternative detailing, then what is discussed within this guide, may be possible. Please see Perforating EQUITONE Panels Technical Note document for additional information or reach out to your local EQUITONE distributor or technical department for further guidance and information.

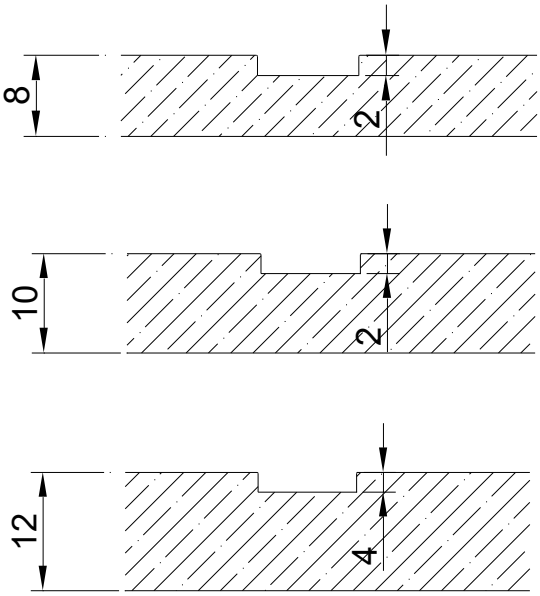
Panel Engraving

There are no restrictions on the size or shape of aesthetic features milled partially into the panel, however it is recommended to distribute the patterns throughout the panels instead of in localized concentrations.

In addition, for both 5/16 in (8 mm) and 3/8 in (10mm) thick EQUITONE materials the engraving depth should be no more than 5/64 in (2 mm). 1/2 in (12 mm) thick material can be engraved as much as 5/32 in (4 mm).

A minimum radius of 3/4 in (20 mm) should remain intact around any fastener location.

Keep in mind that the panel characteristic strength may be reduced as a result of the engraving design. A professional engineer should verify the panel's capacity, per the project-specific conditions, as subframe support design may be affected as a result. Additionally, extra care should be taken when handling, transporting, or storing such materials.



Alternative detailing, then what is discussed within this guide, may be possible. Please see Engraving EQUITONE Panels Technical Note document for additional information or reach out to your local EQUITONE distributor or technical department for further guidance and information.

Design considerations

Open joints

A façade design with open horizontal joints significantly reduces the visible susceptibility to soiling of the façade surfaces. The open joints serve as additional ventilation inlets, which contribute to effective ventilation of the cavity.

The results of extensive investigations by recognized testing institutes and practice show that the function of the façade (protection against driving rain) is completely given with an open joint 5/16 - 3/8 in (8 - 10 mm). This also corresponds to the information on driving rain protection for exterior walls with rear-ventilated exterior wall cladding in accordance with DIN 4108-3.

The main part of the rainwater is discharged on the surface of the façade. Small amounts of water penetrate through open joints and condensation water are drained off in the rear ventilation space. Due to the permanent air circulation, these areas dry quickly.

Coordination with other trades

Proper coordination between the façade contractor installing EQUITONE panels and other trades with works around EQUITONE panels is crucial in ensuring all these trades are fully aware of the allowance for ventilation requirements.

For instance, the installation of capping/flashing over EQUITONE panels sometimes is carried out by a different trade than the façade contractor. In this case, a lack of coordination between the two trades may result in the required air outlets for EQUITONE being closed and blocked with an incorrect installation of these elements.

Another example is when the paving and landscaping works block the air inlet of EQUITONE at the bottom of the façade, or where windowsills/flashings hinder or block the ventilation at the interface with window heads and sills due to incorrect detailing or installation of these components.

Metal to Metal Corrosion

Care must be taken to avoid issues such as bimetallic corrosion when using dissimilar metals. In ventilated façades, there is always a risk of water being in contact with the metals. Therefore, this issue must be considered a risk, and the façade should be designed accordingly. for example, it is not advised to use aluminum rivets with a galvanized supporting frame as the risk of corrosion is high. Therefore, stainless steel rivets are needed.

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

Corrosion zones

EQUITONE panels may be used in all corrosion zones provided that all system components, including support frame, flashings, and fixings, are of adequate corrosion resistance appropriate for the project location. Corrosion zones are detailed in ISO 12944-2. In C5 corrosion zone, UNI-Rivet with the additional marine and coastal protective coating shall be used.

It is the responsibility of the project designer or engineer to ensure the project is designed in accordance with the national requirements for corrosion resistance, and that EQUITONE system is appropriate for the intended application. Ensure all façade components including capping and flashings are designed according to the project wind and corrosion category.

Design considerations

Thermal performance and energy efficiency

It is the responsibility of the project designer or engineer to ensure the building envelop including external walls are designed to meet the thermal and energy efficiency requirements of the project. The use of thermal separators between the load-bearing wall and the spacers reduces the effect of thermal bridges the metal substructure. Thermal separation elements are offered by the manufacturers of the substructures.

To benefit from all the advantages of a ventilated façade and to significantly reduce or even eliminate thermal bridging, appropriate external insulation may also be used. Refer to local EQUITONE technical department for further information on this type of application.

Aluminum to Cement

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

Fire safety

EQUITONE is a non-combustible fiber cement that has been tested in accordance with ASTM E136.

In multistorey buildings where fire cavity barriers may be required within the façade cavity, it must be ensured that the drainage and ventilation paths within the cavity are not blocked by the fire barriers. A minimum gap of 3/4 in (20 mm) or greater as recommended in the ‘Cavity width’ section of this document is required between the rear of the cladding and front face of the fire cavity barriers. To achieve this, open-state fire cavity barriers suitable for ventilated façade, which are usually intumescent type, may be used. In the event of direct exposure to fire, the intumescent strip rapidly expands to fill the air gap within the cavity.

Alternatively, if a solid or closed state fire barrier is used then provision needs to be given to allow the air to exit the cavity below the barrier and re-enter the cavity above the barrier. At times the horizontal joints between the panels are used for this. The joints must be positioned close enough to prevent any dead-end space with no air movement (ventilation) but not too close to allow any flames to exit and re-enter the cavity. Additionally, provision shall be made to allow free drainage of any water entering the cavity. Depending on the detailing of the façade at the interface with this fire barrier type, there may be some limitations on the type of EQUITONE materials that may be used with this option. Please refer to EQUITONE technical team for further information and assistance with designing the façade with this type of fire barrier. It is highly recommended to consult with your project designer or (fire) engineer to determine the need for the type and detailing of fire cavity barriers and panel layouts appropriate to your project and intended application.

External fixtures

Generally, no additional structural loads should be transferred to EQUITONE panels. Small surface-mounted features like small cameras and lights may be fixed to EQUITONE if they are fixed only to one panel and not bridged and fixed to two or more panels. Larger surface-mounted features, external fixtures, gutters, and downpipes must be fixed through an oversized hole in EQUITONE to structure or a dedicated support frame behind EQUITONE panels. The hole in EQUITONE should be oversized by at least 5-10 mm; the hole must be fully sealed with appropriate sealant. Services, e.g., pipes, and any additional support frame applied in the cavity for the support and fixing of any external fixtures must not block drainage and ventilation paths in the cavity. See the *Hanging Weights from EQUITONE* technical note for additional information.

Maintenance & warranty

Inspections

EQUITONE façade is low maintenance; however, it is recommended to regularly check the façade for any possible soiling and clean as required. All façades, irrespective of the material used, should be inspected and if necessary, serviced regularly. Regular periodic inspections and maintenance are recommended to ensure the long-term performance of the façade and to prevent costly repairs and rectifications in time. The building also retains its continuous and attractive appearance.

If general soiling is allowed to work into materials for too long, it is possible that it will penetrate so deeply that simple cleaning is no longer possible. More rigorous and thus more expensive cleaning methods may have to be employed.

For that reason, periodic and preventive inspection of façades is recommended, so that imperfections can be discovered and resolved or repaired in good time. All ventilation and drainage gaps must always be kept unobstructed. All flashings and seals should be regularly inspected, and any damage should be immediately repaired.

Soiling process on panels

Dust, soot, oils, greasy substances, atmospheric grime, etc. are ever present in the air and rainwater and can be deposited on most façades. If care is taken through considerate design and application, local soiling and runs can be avoided. This can be achieved by having adequate drip-molding, such as overhanging windowsills, good sealing, and attention to combat corrodible materials such as zinc, copper, aluminum, steel, etc.

Particular attention is needed around windowsills, parapets, and plinth areas as well as all openings/perforations and joint profiles. Water run-off can lead to efflorescence and/or concentrated soiling. The degree and speed at which materials become soiled largely depends on the surface, chemical stability, hardness, porosity, and ability to become electrostatically charged or not.

Where the façade is protected by a soffit or the like and hence not sufficiently exposed to rain, a more regular inspection and washdown may be required to prevent any salt and dirt build-up. Coastal projects may also require more regular inspections and washdowns.

In principle, perform the cleaning of the façade over the entire surface, from top to bottom because partial cleaning can result in color tonal differences.

Soiling process on glass

Alkali-enriched flow water from the façade can stain glass and unprotected metals (e.g., aluminum) especially when windows and façade are in the same plane. To prevent this, glass and metal surfaces should be covered during the entire construction period. If drilling/cutting dust do get on glass or metal surfaces, it should be removed by thoroughly cleaning immediately. It is recommended to use only coated metal parts (powder-coated or equivalent. The manufacturer's information on protection and cleaning must be observed.

Maintenance & warranty

Cleaning

There are three types of cleaning methods, mechanical, chemical, and power washing. Understand that shipping, handling, cutting, and drilling can all generate cement dust. Any moisture or humidity can essentially “re-cure” the cement dust resulting in extremely difficult removal. Thus, it is always important to use mechanical cleaning methods at various stages throughout construction and before proceeding with other cleaning methods.

Step 1: Mechanical Methods

- Micro-fiber cloth
- Compressed air
- Soft-bristle brush

The use of abrasive materials such as scourers, steel wool, and the like are not permitted, as these leave irreparable scratches on the surface. When mechanical cleaning is complete, proceed to chemical methods only if necessary. Normal stains can typically be removed with sponge and water.

Step 2: Chemical Methods

- Mildly acidic solution (diluted vinegar)
- Ammonia-free window cleaner
- Mild detergent
- Flush/clean with plenty of water

Any cleaning product used must be ammonia-free. Solvent-based cleaners such as acetone, white spirit, etc. attack the paint surface and are therefore not suitable. If there is doubt on the suitability of the cleaning product, use it first on a leftover piece of the façade or a less visible part of the façade (e.g., behind a rainwater drain) to check if the agent doesn’t damage the surface. There is a risk that the panel color coating may become cloudy.

Façade parts and other materials (metal parts, glass) on the building that can be affected by the cleaning agent used must be protected. Do not use tapes that leave glue residues on the surface or could potentially damage the surface when fixing protective cover plastic foils.

Only on EQUITONE [tectiva] and [linea] material can more stubborn stains and scratches be removed by sanding in the direction of the factory grain pattern using at least 80-grit sandpaper. Ensure all residual dust is thoroughly removed using mechanical cleaning methods. Follow with chemical cleaning methods if necessary.

In extreme circumstances, when the previous methods fail to clean to the desired effect, pressure washing can be performed. This must be done by experienced users. Incorrect use can lead to removal of the panel’s coating or additional staining. Always insure the nozzle is perpendicular to the panel surface.

Step 3: Power Washing Methods

- Air-cured Panels
- Pressure: 290-430 psi (20-30 bar)
- Nozzle distance from panel face: 24 in (60 cm)
- Autoclaved Panels
- Maximum Pressure: 1450 psi (100 bar)
- Maximum Flow Rate: 2.65 gallons/min (10 L/min)
- Nozzle distance from panel face: 10 in (25 cm)

Maintenance & warranty

In general, it is recommended to perform the chosen cleaning method over the entire façade surface as partial cleaning can result in color and tonal imbalance. Refer to EQUITONE's comprehensive cleaning and maintenance cleaning and maintenance documents for detailed information and guidance on cleaning and maintenance of EQUITONE façade.

Efflorescence

Small amounts of lime stains, cement splashes, or limescale deposits and light efflorescence can be removed with a 5% malic acid solution or commercial citric acid in a 10% concentration. The panels are treated with the solution using a paintbrush or a soft brush. After an exposure time of 2 to 3 minutes, the remaining solution is rinsed off thoroughly with plenty of water. If efflorescence is still visible after drying, the application must be repeated. The solution should never be allowed to dry on the surface. The solution must not be allowed to come into contact with the metal supporting frame as corrosion can occur.

When working with any acid solutions the operative must be fully trained and experienced in its application and removal. There is a risk that the panel color coating may become cloudy.

Graffiti

The EQUITONE [natura] PRO and EQUITONE [pictura] surface coating provides superior protection against common colors and spray paints. It is smooth and cleanable. Graffiti can be removed with dedicated graffiti removers. Cleaners with volatile solvents should not be used. The application instructions of the cleaning product manufacturers shall be strictly followed.

NOTE: The other EQUITONE finishes do not have graffiti-resistant protection. EQUITONE [tectiva], EQUITONE [linea], and EQUITONE [lunara] may receive an appropriate third-party graffiti-resistant coating, applied by others, prior to or after panel installation, in which case the appearance of the panel may change as the applied protection affects the light reflectance of the panel finish. Furthermore, warranty of the coating and its application onto the EQUITONE surface must come from the manufacturer of said coating system.

Warranty

EQUITONE is backed by a 20-year warranty covering durability and weather resistance. Refer to the *EQUITONE product warranty* document for further information.

Installation checklist

Checking the following items is recommended before starting the installation of EQUITONE cladding. The following list is by no means exhaustive.

Check the quality of EQUITONE panels and components for any visual defects or damage prior to installation. Contact your local EQUITONE organisation for any issues. DO NOT install any panels or components which are either damaged or not aligned with the project requirements and specifications.

Before installing EQUITONE

○ Ensure the building envelop is fully weatherproof, and all the junctions with openings and penetrations have been fully sealed as per relevant standards and regulations, and project requirements.	○ Confirm all the interfaces with EQUITONE, review architectural drawings as well as EQUITONE Construction Details and prepare accordingly.
○ Ensure all the windows/doors (or the like) and their associated components, including any sill tray or flashing, and head and jamb flashing, have been installed as per applicable standards and regulations, project requirements, and EQUITONE Construction Details.	○ Ensure panel sizes are correct, and all panel holes have been predrilled with 11 mm EQUITONE bit with correct spacing and adequate edge distances.
○ Ensure adequate ground clearance as per EQUITONE Construction Details and regulatory requirements. Determine and mark bottom of the cladding.	○ Ensure all panel edges are sanded and free of any dust. In case of EQUITONE [natura] and EQUITONE [natura] PRO, ensure all panel edges have been fully sealed with LUKO.
○ Ensure the cladding support frame has been installed correctly, straight, and plumb, and in accordance with project engineering design and relevant standards, and spaced as per engineering requirements and EQUITONE span tables.	○ Ensure allowance for adequate air inlets and outlets, and ventilation within the cavity has been made, and the perforated angles or profiles have been installed where required.
○ Ensure all the required flashings have been installed correctly and in accordance with applicable standards and regulations, project requirements and EQUITONE Construction Details.	○ Ensure the required compressible foam tapes have been applied on all support frame profiles as per the requirements outlined in this documents and EQUITONE Construction Details.
○ Confirm the need for any additional structural support required for accommodating any external fixtures or surface mounted features. Under no circumstances should EQUITONE panels receive any additional structural loads. Any applied additional supports must not block the airflow and drainage within the cavity.	○ Ensure full knowledge of the correct location of the two STOP points per panel, and correct sequence of panel fixings' application.

Installation checklist

The following list is by no means exhaustive. It needs to be used in conjunction with other relevant EQUITONE technical documents.

Installation checklist

○ Before placing any panel on the façade, check the size of the panel, location/spacing of the pre-drilled panel holes, and the edge distances are all correct. Ensure the panel is clean and free of any dust.	○ Ensure any metal debris is fully removed from the panel holes prior to the application of the appropriate UNI-Fixing.
○ Ensure allowance for control/movement joints e.g., under side of the slabs. Ensure panel and/or its support frame does not bridge any control/movement joint while fixed to both sides of it.	○ UNI-Rivet 1. Ensure EQUITONE centralising tool with 4.1 mm drill is used for drilling the rivet holes in the support frame. Centralising tool shall be held perpendicular to panel face. Temporary screw fixing is NOT allowed. 2. Ensure STOP points are first applied. STOP point fixings must be applied one at a time i.e. drill rivet hole using centralising tool and then apply the first STOP point UNI-Rivet; repeat the same for the second STOP point rivet. 2. Ensure GO point rivet are applied after the STOP point rivets. 3. Ensure correct application of rivet gun and use of EQUITONE rivet setting tool. Ensure all panel fixings are applied.
○ Ensure allowance for adequate ventilation is made. Ensure adequate air inlet and air outlet at the bottom/top of the façade, and at interface with windowsills and heads and the like.	○ UNI-Metal Screw 1. Ensure the Stop points are first applied. STOP point fixings must be applied one at a time i.e. drill the hole using the self-drilling fastener, without the centering tip on, until the fastener is fully engaged; repeat the same for the second stop point screw. Temporary screw fixing is NOT allowed. 2. Ensure GO point screws are applied after the STOP points. Start with the panel holes closest to the center and then move toward the panel edges. 3. Ensure you are following the correct procedure for correctly using the self-centering tip i.e. push to you hear a click and only use TE20 wedge style drive bits.
○ Ensure all necessary coordination is done with other trades to ensure allowance for adequate air inlets and outlets (ventilation) as per EQUITONE ventilation requirements.	○ Ensure the thickness of any perforated profile, flashings, and the like located between panel and support frame is not greater than 1/32 in (0.8 mm).
○ Ensure the location of the two STOP point fixings per panel is correct.	○ Adopt appropriate level of care to prevent any damage to panel finish and edges during panel installation.

After installation

○ Check the façade for any missing fixings, flashings, items, or defects.	○ Ensure panels are adequately protected after the installation where there is any risk of damage by other works.
○ Ensure the panels are cleaned after the installation in accordance with EQUITONE cleaning guidelines. The finished façade areas should be cleaned down following fixing of panels. Any partial cleaning may cause minor visual impairments.	

Notes

Information

Please visit www.equitone.com for contact details, further information, and technical documents.

www.equitone.com

USA/Canada
1731 Fred Lawson Dr. Maryville TN, 37801
Tel: +1 865 268 0654
E-mail: info.usa@equitone.com
www.equitone.com/en-us/
www.equitone.com/en-ca/