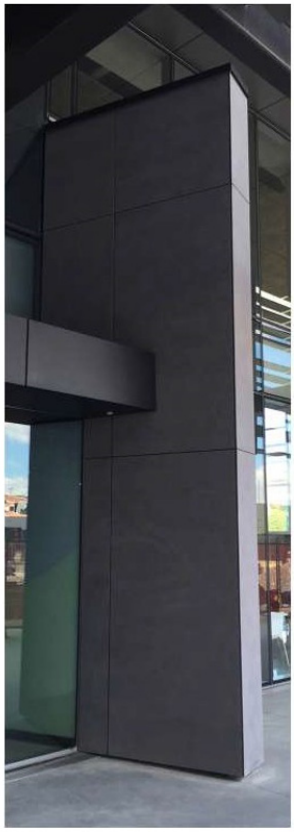
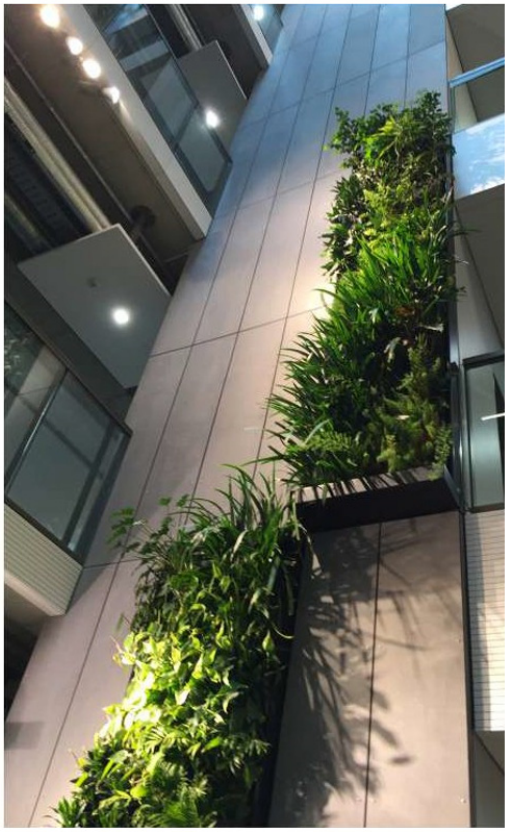
SPS BUILDING

ROOFING & BUILDING PRODUCTS

Equitone & T50 Support Structure Installation Manual

Rev.20190616





The SPS Building T50 system consists of an aluminium ventilated rain screen support structure for various cladding products. This support system creates a ventilated structure in aluminium, fixed back to the building substrate, and has been developed specifically to allow for thermal insulation to be located within the system's cavity. The depth of the cavity can vary between a minimum of 55mm to maximum 255mm.

These instructions cover useful information and typical details for installing Equitone high density fibre cement panels on the T50 system, using either structural bonding or mechanical fixing.

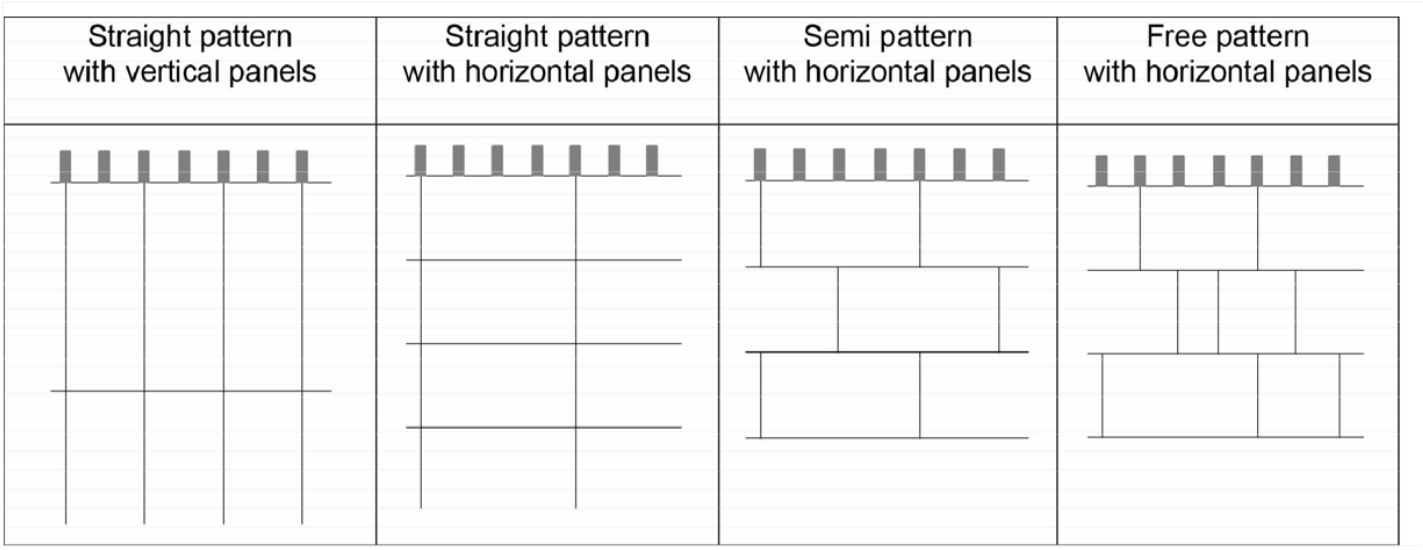
1. Area of application

These instructions apply for non-load bearing external and internal wall claddings. Specifically designed for buildings up to two floors which are subjected to a maximum actual wind load (ULS) of 2.5 kPa. The maximum intermediate distance of the supporting structure is determined in relation to the occurring wind load as calculated with NZS1170.2 Structural design actions - Wind actions.

When the façade panels are exposed to weather conditions (rain, sun) they may only be assembled on a vertical supporting structure. For inclined facades or ceiling applications specific application guidelines need to be developed.

2. Patterns with large-size Equitone façade panels

The following patterns with large-size façade panels are possible.



3. Supporting structure

This document only explains several general principles. Every project must be revised and approved by SPS Building

- The vertical aluminium profiles T50VR carry the dead load of the cladding. The aluminium horizontal closer T50HR will provide safety from rain blown directly into the cavity and will not generate a risk of corner breaks in the cladding sheets due to multi-directional movements in the support structure.
- The vertical aluminium profiles T50VR create a cavity with a width of 55-73mm to cater for optimal air flow and safety against water bridging the cavity. Cavity widths can vary between 50 and 255mm by using T50, T90, T120, T150, T180 or T220 brackets. Using larger brackets allows for thermal insulation to be located within the cavity.
- Using adjustable aluminium brackets T50BR, the vertical aluminium profiles T50VR are easily aligned and fixed. The brackets have a self-healing butyl base, to avert water penetrating through the fixing, and come standard with a perforation for a fixed and a sliding point.
- Tests with brackets fixed to horizontal nogs (with 3 nails per side) give the brackets unrivalled flexibility in fixing, and in most cases standard NZS3604 timber framing is sufficient to fix the system.
- Distance between brackets may vary depending on loading, standard acceptable solutions are given later in the document.
- The supporting structure is calculated to resist the wind forces exerted on the building and the load of its own weight. Max allowable deflection is limited to L/250.
- All parts of the aluminium supporting structure are made of a high quality aluminium alloy and have a typical thickness of 2 mm.
- Necessary ventilation openings are provided on the bottom, top and around windows to guarantee sufficient ventilation behind the Equitone cladding.

4. Building Wrap

Specified to requirements set forth in E2/AS1 Table 23

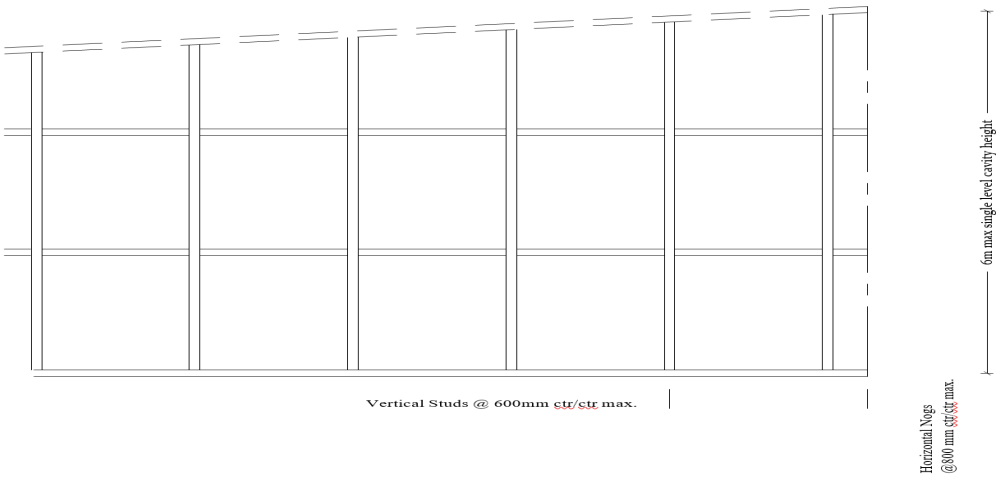
Where a Rigid Wall Underlay is required the schematic will ensure that there is also a flexible membrane applied over the rigid element.

Refer to Proclima Solitex Extasana/Adhero installation manuals for details on advised flexible membranes.

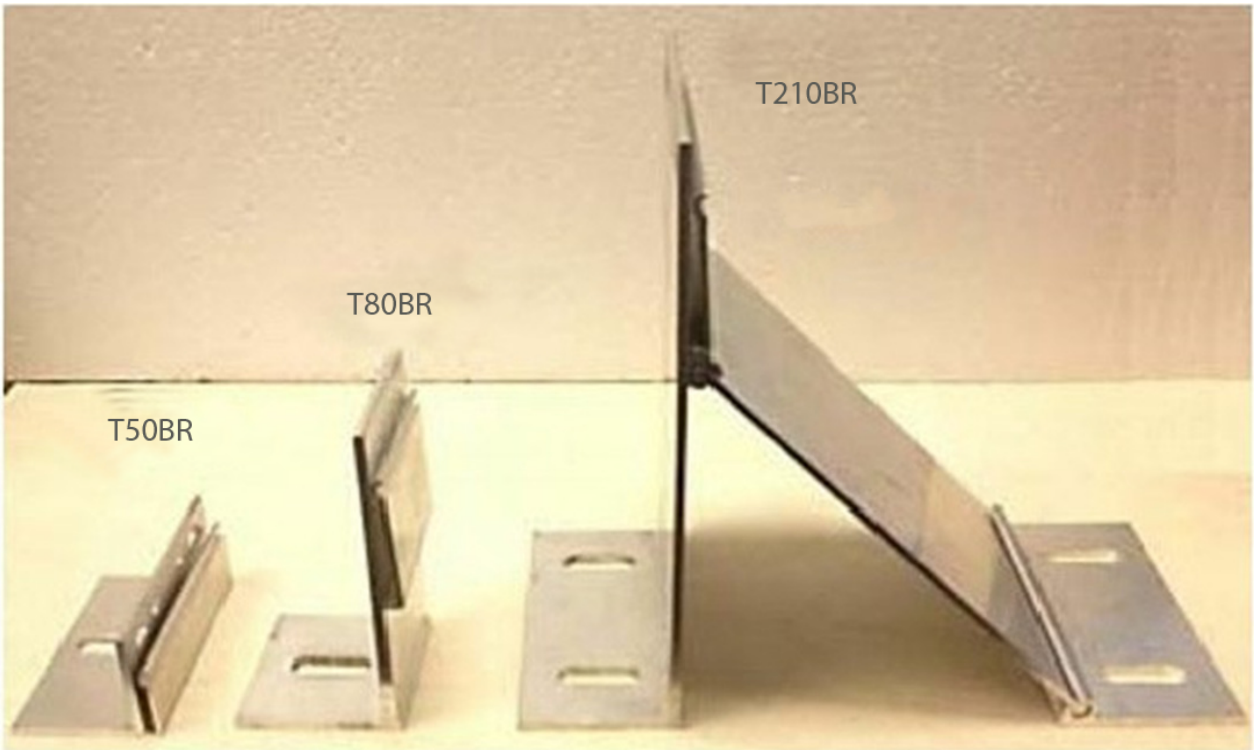
5. FRAMING

Framing must comply with NZS3604: 2011

- Studs at 600 mm centres.
- Nogs at 800 mm maximum centres.
- Fixings of nogs to studs to comply with NZS3604:2011 table 8.19.



5.1 SUPPORTING BRACKETS



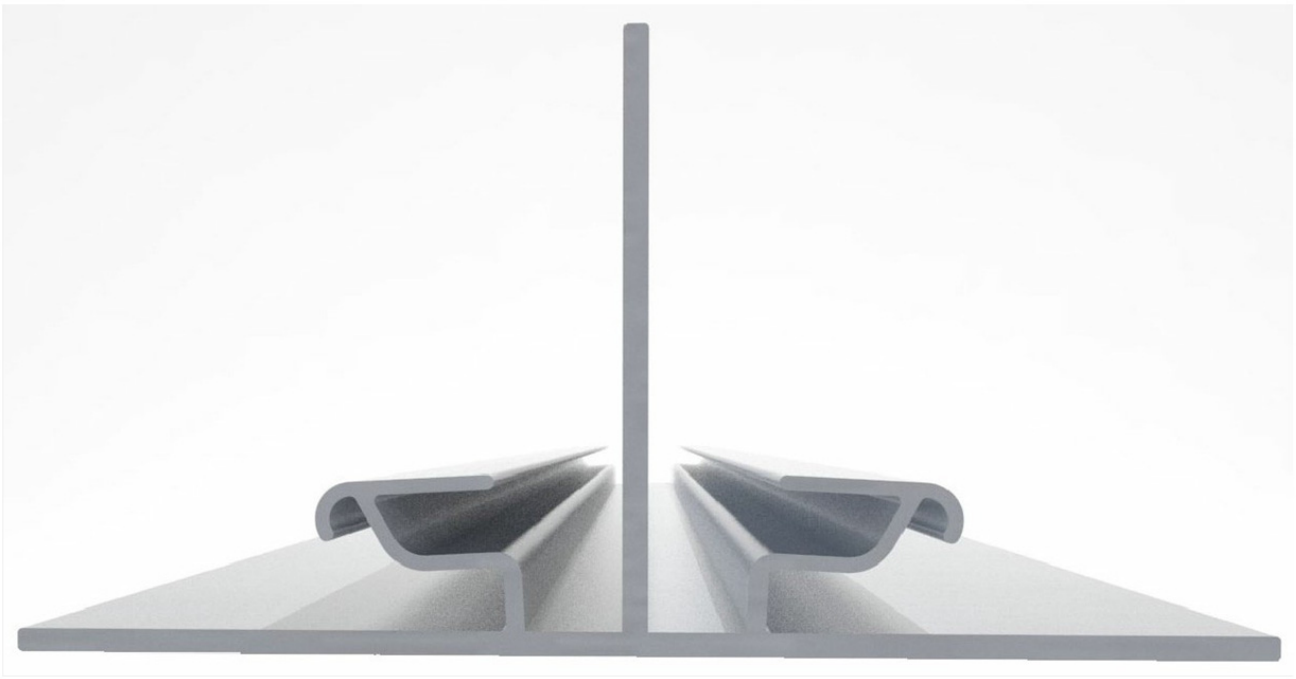
	T50BR	T80BR	T120BR	T140BR	T170BR	T210BR	T310BR
Bracket Size	42	80	120	140	170	210	310
Cavity (Clear Space)	65	95	135	155	185	225	325

The distance between the brackets is calculated by the load exerted (as a result of the wind load and force of gravity) and the distance between the vertical supports (typically 400 or 600 mm). The adjustable brackets are fixed to timber framing using class 4 hot dipped galvanised 14g x 75mm Timber Tek screws (hexagonal head). Each bracket comes with a Self-Healing Butyl Backer pad to maintain a weathertight seal around the screw. An insulation pad can be installed between the bracket and the timber framing to improve the thermal performance of the cladding system (especially when thermal insulation is placed within the cavity). To improve the resistance to twisting of the T50VR, the supporting brackets T50BR are alternately fitted left and right of the aluminium section.

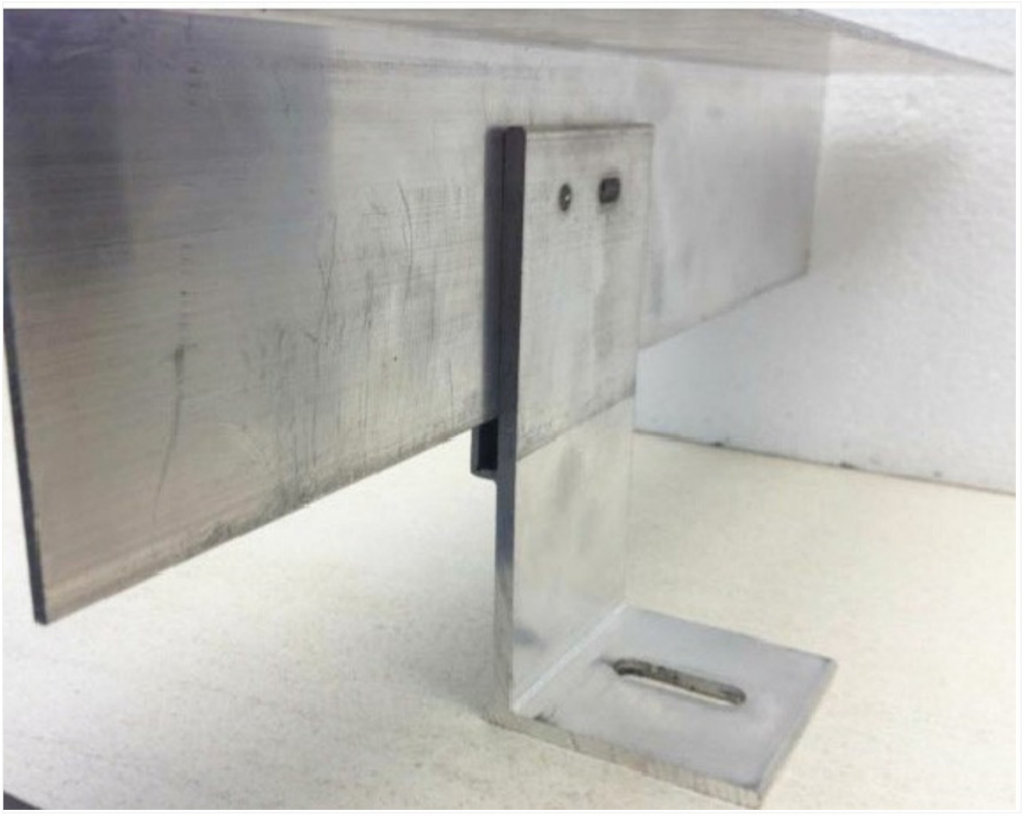
The brackets contain a clip at the side to receive and clamp the T50VR vertical runners temporarily while aligning the system. Once the required alignment has been met, the T50 profiles are fixed onto the brackets using the method of fixed and floating points (see Sec.5.2.)

5.2 ALUMINIUM SUPPORTING PROFILES

The profile behind the vertical joints is shaped like a 'T' and is used as an end support for the cladding panels. Supporting profiles are always installed vertically. These aluminium supporting profiles are sufficiently wide for mechanical fixing and can accommodate some variations in alignment.

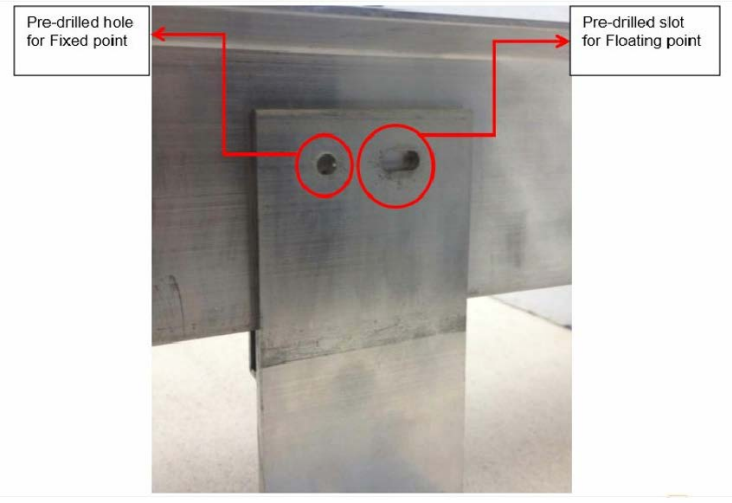


ABOVE: T50VR profile for Equitone sheets.



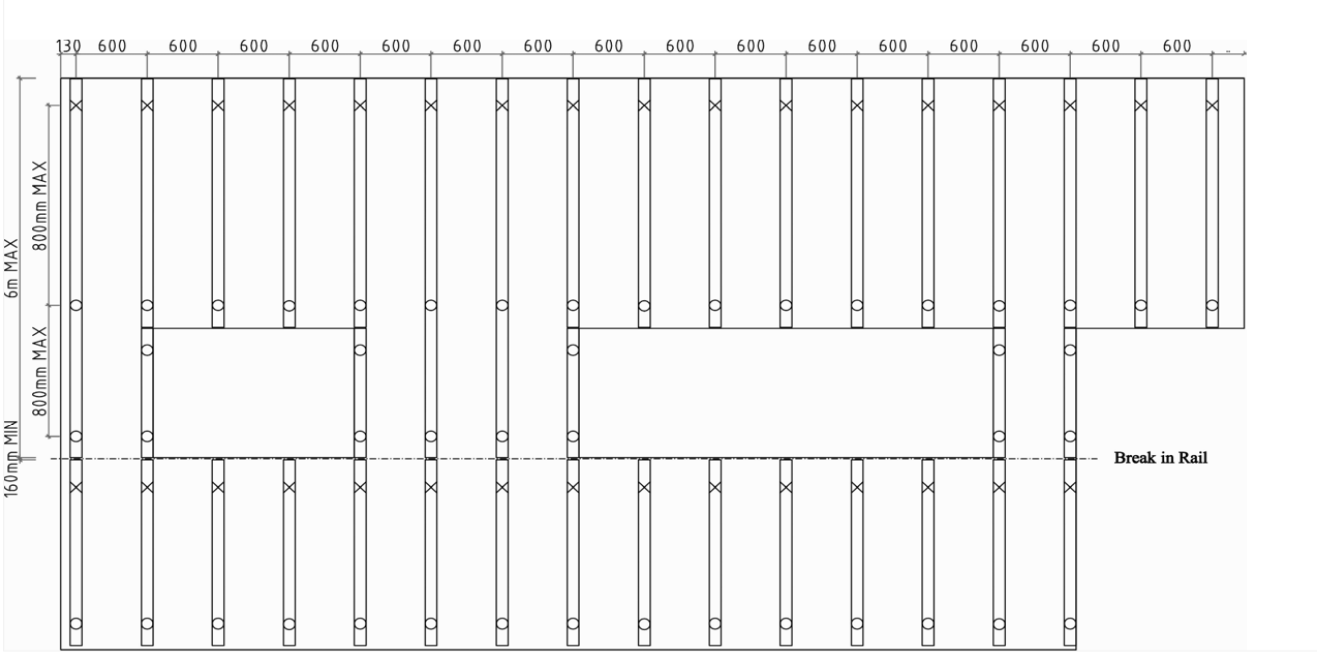
T50VR profile slides into the bracket T120 BR

In view of the high thermal coefficient of expansion of aluminium, the aluminium sections must be fixed in such a way that a small amount of controlled free movement is possible. The system for fixing the supporting brackets to the profile must accommodate the expansion of the aluminium sections. This is achieved by fixing the sections with one fixed fastening point (fixed point) and at all other places free fastening points (floating point). The brackets provide a tight pre-perforated hole for the fixed points, and a slot for the floating points.



The fixed fastening points on adjacent profiles are always located at the same height so that stress in the sheet is avoided. The fixed fastening point withstands both the wind loads and the dead load of the façade cladding system.

Expansion joints must be provided between the vertical aluminium sections by fitting a supporting bracket above and below the joint. No two vertical profiles can be fixed into the same bracket. It is recommended to leave the fixed points of the aluminium profiles at a horizontal joint between the cladding panels.



○
× Aluminium Bracket (Sliding Point)
▭ Aluminium Bracket (Fixed Point)
Aluminium T Profile

Example of bracket and profile set - up

5.3 CLADDING SHEETS

- EQUITONE TECTIVA is a through-coloured facade material, characterised by a sanded surface and naturally occurring hues within the material. Every Tectiva panel is unique, strongly expressing the raw texture of the core fibre cement material. The material comes in a large panel size and can be transformed into any size or shape in the workshop or on site.

Standard Colour Range

TE 90 **TE 00** **TE 10** **TE 60** **TE 20**

- EQUITONE NATURA is a through-coloured facade material. Every EQUITONE NATURA panel is unique, subtly displaying the raw texture of the core fibre cement material. The material comes in a large panel size and can be transformed into any size or shape in the workshop or on site. No matter what design options you explore, EQUITONE's through-coloured nature guarantees crisp, monolithic details.

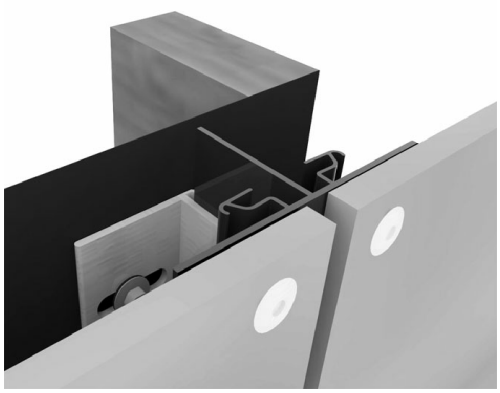
Standard Colour Range

N154 **N250** **N251** **N252** **N359**

- EQUITONE consists of Equitone MATERIA (soft surface), Equitone LINES (engraved linear pattern) and Equitone PICTURA (uniform UV hardened coating)

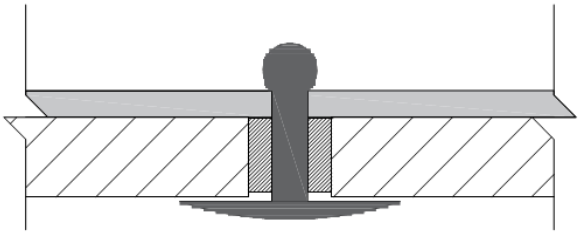
6. ***Fixing of the sheets***
6b **MECHANICAL FIXING**

The following procedure can be used for the fitting of large-size façade panels by means of rivets on the T50 aluminium supporting structure. SPS Building does NOT allow the use of countersunk screws on sheets. Due to hygric and thermal expansion stresses the fixing points can, over time, cause the sheets to crack (for instance at corners). For concealed fixing, we recommend the use of structural bonding (see 6.a)



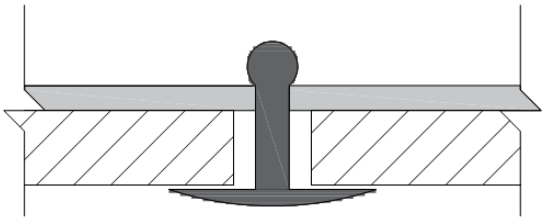
EQUITONE rivet for EQUITONE NATURA
Standard rivet for Aluminium sub-construction {quality AlMg5 4x23-K15mm} for 8mm panels. The head of the rivet is available coloured to match the panels. An uncoated rivet is also available. Failure to use this rivet voids the product warranty.

Fixed Point



Drill a 9.5mm diameter hole in panel, 4.1mm hole in rail. Rivet sleeve used in conjunction with rivet.

Floating Point



Drill a 9.5mm diameter hole in panel, 4.1mm hole in rail. Rivet use

The correct nose spacer tool must be used to ensure both the correct location of rivet and adequate compression of panel are reached.

EQUITONE Astro Rivet EQUITONE TECTIVA
The stainless steel (quality A2, AISI 304) ASTRO blind rivet has a coloured head to match the panel and built-in spacer (cylinder). The ASTRO stainless steel cylinder maintains a consistent gap between the panel and the metal frame and allows total free movement of the panel. An uncoated rivet is also available. Failure to use this rivet voids the product warranty.

Fixed Point

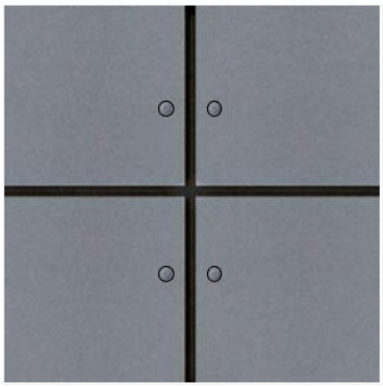
Drill a 11mm diameter hole in panel, 4.9mm hole in rail. Rivet sleeve used in conjunction with rivet.

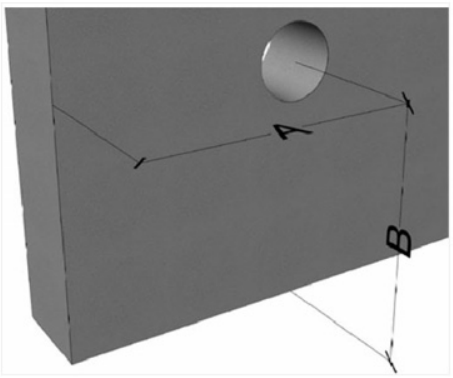
Floating Point

Drill a 11mm diameter hole in panel, 4.9mm hole in rail. Use only the rivet

The procedure for fixing all EQUITONE panels is very similar. The panel must be pre-drilled with the same size hole to allow for rivet fixing. Each panel has two fixed points. The two fixed points are formed by using the rivet sleeves to fill the oversized hole. No sleeve is used for the floating holes. A centralising tool is used to drill the rivet hole in the supporting frame. A rivet setting tool which fits to the end of the rivet gun can be used to prevent the rivet being fixed to tight.

From the horizontal edges of the panel the dimension is 70 mm - 100 mm.
From the side edges of the panel the dimension is 30 mm - 100 mm.
Placing the corner rivets 80 mm from the horizontal edge 30 mm from the vertical edges visually is the preferred location.
The centres for the rest of the fixings are determined based on engineered wind load calculations.





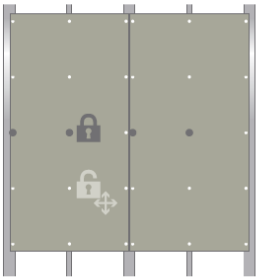
A=	**MIN 30 mm**
B=	**MIN 70 mm**
MAX=	**MIN 100 in any Direction**

Where panels are fastened to the supporting frame with a combination of fixed and gliding points. Each panel, regardless of size, will have 2 fixed points; with the rest left as gliding points.

Fixing and gliding points

To allow for expected movement in the supporting frame, panels are fastened to the supporting frame with a combination of fixed and gliding points. All sizes of EQUITONE panel come with two fixing points and a few gliding points in adjacent position.

Fixing point *Gliding point*



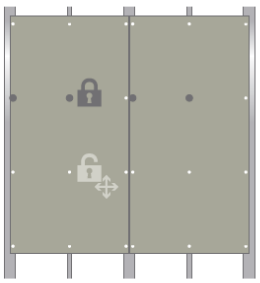
The two fixing points support weight of the panel and ensure panel stays in position and prevents rotation. The gliding or sliding points resist wind load while accommodating any panel or support frame movement.

The choice of where fixing points are located is important to minimise risk of panel cracking.

Selection of fixing points

Two fixing points should never occur on the same supporting frame (profile). The two fixing points must be located near the horizontal centre line of the panel. If there is no central fixing, use the next row closest to the centre line; the usual preference is for the higher line of fixing.

Example 1



Two profiles are therefore needed. This is straight forward where there are at least two profiles in the middle area of the panel.

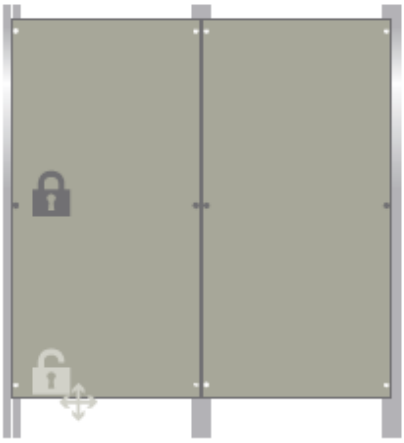
Most common, however, there is only one profile in the middle area of the panel. Hence, the rule of thumb is that fixing points are located in the centre of the panel and

Example 2

to the left joint profile. Alternatively they can be located to the centre and right joint profile. Which system is employed, all panels must be the same.

Under no circumstance should the fixing point of two adjoining panels occur on the same joint profile.

In situations where narrow panels with only two side fixings are used and the fixing points of adjacent panels will be next to each other, components of supporting frames will need to be changed. The metal frame behind the vertical joint which is usually a T or top hat profile will have to be substituted with two L-profiles or an omega profile. This will separate any panel connection.



Example 3