

1. Introduction

This technical note give specific recommendations for the fastening of EQUITONE panels to facades using EQUITONE UNI-screws fixed to a sub construction of wooden framing. These recommendations apply to the most common areas of application.

Area of Application

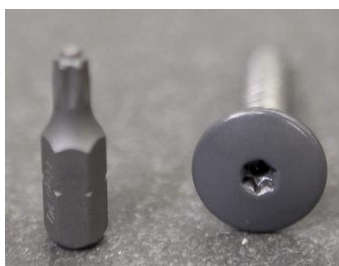
This Guidance Note gives recommendation for screw fixing EQUITONE [tectiva], EQUITONE [linea], EQUITONE [natura], EQUITONE [pictura], EQUITONE [textura], EQUITONE [materia] and EQUITONE [lunara] to a vertical facade. For sloping facades please contact your local EQUITONE Technical Support.

2. Design Advice

The following advice must be followed.

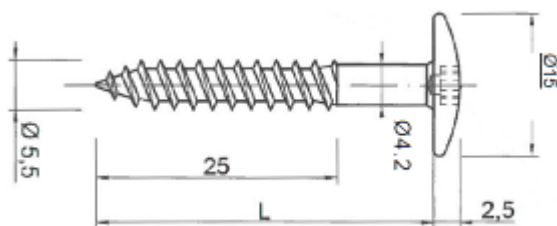
- Only use EQUITONE Uni-Screws
- Respect the material when storing, handling and installing
- Respect the panel edge distances when screw fixing

3. EQUITONE UNI-Screw

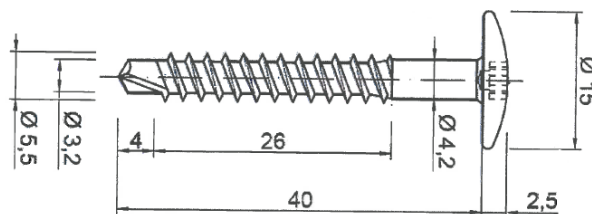


EQUITONE UNI-screw for Wood are EN 14567 or A2 (304) Stainless Steel ISR T20 Torx TTAP® socket cap screw with a 15 mm diameter head. The head of the UNI-screw is available coloured to match the panels. An uncoated UNI-screw is also available.

The UNI-screw is available as a standard thread screw and a drilling point for wood screw.



Standard UNI-Screw
5.5 x 35 mm for 8 mm façade panels,
5.5 x 45 mm for 12 mm façade panels.



Drilling Point UNI-Screw
5.5 x 40 mm for 8 mm façade panels,
5.5 x 50 mm for 12 mm façade panels.



For EQUITONE [natura] PRO and [pictura] panels, the screw collar should be inserted into all holes before screw fixing. This collar offers extra protection to the PU top coat to prevent coating damage.

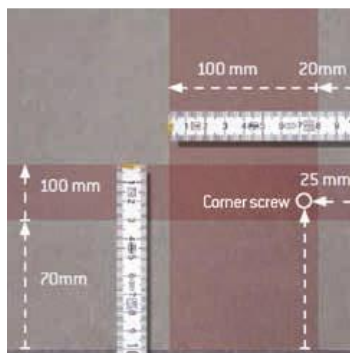
Screw Centres

As a guideline for initial design purposes the maximum centres for the UNI-screws should be maximum 610 mm.

However, many factors influence the design when considering the UNI-screw position. Factors such as:

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

Most regions around the world have their own unique standard for structural calculations and these need to be adhered to. In Europe all calculations have been based on Eurocode guidance. However each country has its own unique annex to the standard. This may affect the calculations. Therefore it is vitally important that the final number of fixings per panel is to be calculated and specified by the project engineer.



Position for Corner EQUITONE UNI-screw

From the horizontal edges of the panel the dimension is 70 mm -> 100 mm.
From the side edges of the panel the dimension is 20 mm -> 100 mm.

Placing the corner UNI-screws 80 mm from the horizontal edge 25 mm from the vertical edges visually is the preferred location.

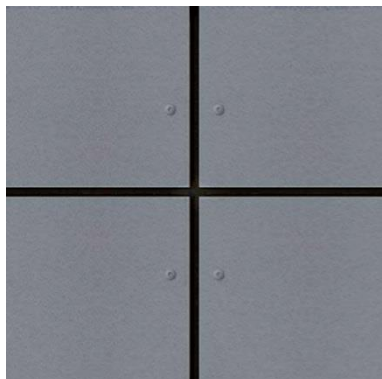
The centres for the rest of the UNI-screws are determined based on the engineers wind load calculations.

4. Joints between Panels

Joint Width

The optimum width of the joints between panels is 10 mm. Aesthetically a 10 mm joint is the best. 10 mm also offers the installer a greater level of tolerance when fitting the panel.

The minimum permissible joint is 8 mm while the maximum would be 12 mm.



Vertical Joints

Vertical joints are mostly backed with a continuous batten. This batten is faced with a strip of EPDM which makes the open joint visually more pleasing. This strip also gives added protection to the battens.

Horizontal Joints

Horizontal joints can be either left open or baffled. By leaving them open the likelihood of dirt spoiling the facade reduces as the joint remains clean. The open joints also function as additional ventilation openings. An open joint also has the effect of reducing the wind-load on the façade panel. Therefore, it may be possible to reduce the number of fasteners.

Should it be required to baffle the horizontal joint, an aluminium joint profile is inserted behind the panels. By using a baffle the majority of water is prevented from entering the cavity. Before final fixing of the lowest screws the profile is slid up under the panel. When the fasteners are tightened the profile is held in place.

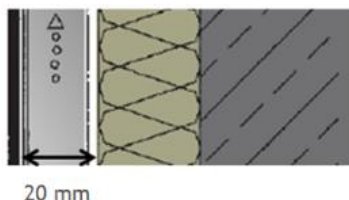
The maximum thickness permitted for this profile is 0.8mm to prevent distortion of the panel. Aesthetically, it is best not to continue the profile across the vertical joints but to cut it approximately 4mm narrower than the width of the panel, leaving the profile 2mm shorter at each side. To prevent the joint profile moving sideways and showing at the vertical joints, cut and bend the top or bottom edge of the profile at both sides of one of the vertical support battens.

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

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

5. Air Space Cavity

Cavity Width



The minimum cavity width air space should be 20 mm direct behind the panel. However this depends on the height of the cavity, local driving rain index and local regulations.

Tolerances

Allow for a tolerance of 20 mm when designing a cavity. Building irregularities, especially uneven backing walls, insulation holders and the supporting frame must never compromise the width of the cavity.

Ventilation

A through flow of air is achieved by utilising the stack-effect, in which a current of air enters at the base of the cladding and exits at the top. As well as cavities being ventilated at the top and bottom of the façade, it is also important that air is allowed to enter and exit under and over openings such as windows.

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

6. Timber Framing/Battens

Not all types of timber can be used for the battens. Timber battens of Class C24 in accordance with EN 14081-1 are to be used for the support frame. However, each country may also have its own specific requirements for the grade, strength and preservation requirements which must be adhered to.

The vertical battens to which the panels are fixed are to be planed on one face and one edge to ensure the correct levelling. A small gap of 5 mm should be left between the batten ends where they join.

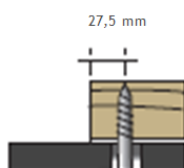
Batten Sizes

The minimum thickness of batten to accommodate the panel standard UNI-screw (without the drilling point) is 30 mm. Where the batten is required to span from support to support the batten will need to be thicker, up to 50 mm may be required. This table gives a suggestion of thickness of batten to span given dimensions. All sizes must be approved by the project design engineer.

While the minimum batten width behind the vertical joints is 105 mm, it is however recommended that a batten width of 110 mm is used, as this would allow tolerance for adjustment.

The minimum width of the intermediate battens is 55 mm (with sharp point screw) and 33 mm with the drill point screw. However, in some countries the minimum local requirement can be more.

The batten must be adequately sized so that the UNI-screw sharp point screw is a minimum of 27.5 mm in from the edge of the batten, where for the drill point screw 16.5 mm is the minimum.



Distance between the horizontal support	Minimum thickness of supporting batten
<1000 mm	40 mm
>1000 mm	50 mm

The alignment of the battens shall be true in both planes. Any variation shall not exceed 1 in 300 (2 mm over 600 mm non accumulative).

Note: in some countries there are standard timber sizes that may not match the dimensions given here. If this is the case then use the next bigger size. Using standard sizes may result in a more economical solution than having the battens specially milled.

Wood Preservation

Timber battens can be treated with a wood preservative in accordance with local regulations. Some countries insist that all timber used in external applications should be treated against fungi and insect attack. However, in some countries, when certain species of timber is used then it may be possible to dispense with the chemical treatment of timber. This is an important consideration when the building is being designed with the environment in mind. Untreated timber is easier to recycle or dispose of at end of its life.

Where preservative is used, the cut ends of the batten should be retreated with extra preservative.



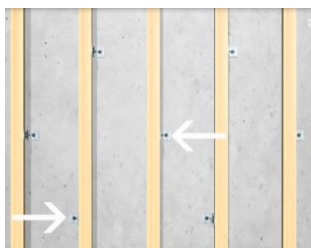


Adjustable Brackets

Where adjustable brackets are used they are alternately placed to the left and the right of the vertical batten. This helps to prevent the batten twisting and keeps a straight supporting frame.

The brackets of two adjacent battens located next to each other are also staggered.

The batten should not overhang the bracket by more than 100 mm.



The maximum distance between the brackets is 1500 mm depending on wind loading and the quality of the timber.

7. Panel Preparation

Storage



Store flat on a pallet in dry conditions, clear of the ground and not more than 5 stacks high. Panels are to be ventilated to prevent staining.

Panels delivered to site to be installed immediately or unloaded into a suitable protected storage area.

The protection foil must always be replaced where panels are re-stacked following fabrication. Stack the panel's front face-to-front face or rear surface-to-rear surface.

Handling

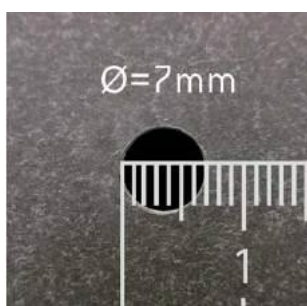


Always lift panels off each other, never slide. Carry the panels on their back edge. Protect the face from scratching or damage.

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

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

On-Site Panel Fabrication



The panel must be pre-drilled with a 7 mm diameter size hole. The EQUITONE fibre cement drill bit must be used. Accurately mark the hole positions on the face of the panel. Please note that it helps to use a coloured pencil to mark a grey tone panel as a grey pencil mark can cause confusion. Drill one panel at a time face side up.



EQUITONE [linea]

To ensure the head of the UNI-screw sits flat on the [linea] the ribs at the location of the UNI-rivets have to be removed. This accessory has been designed to mill the high ridges or ribs of the [linea] panel and drill the 7 mm diameter hole in one operation. The tool is fully adjustable to stop over-milling. The debris is allowed to escape via holes in the side.



From an aesthetic point of view when drilling the EQUITONE [linea] it is recommended to align the screws with the ribs of the panel. Doing so, the head of the UNI-screw are the least visible. This will result in a wider timber support of up to 140 mm being used behind the vertical joints. Immediately remove all dust from the panel surface using a micro-fibre or micro-soft cloth.

All EQUITONE materials

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



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



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



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



Edge Treatment
Sand the edges of panels after cutting using 80-grit sandpaper.

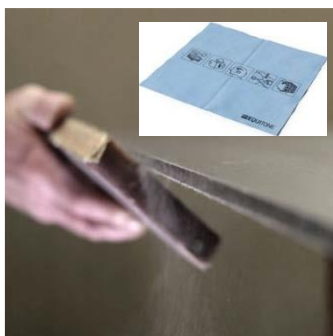


Remove all dust with a soft micro-fibre cloth, soft brush or compressed air duster gun.

8. Edge treatment procedure - Luko.

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

Edge treatment procedure - [natura] and [natura]pro



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



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



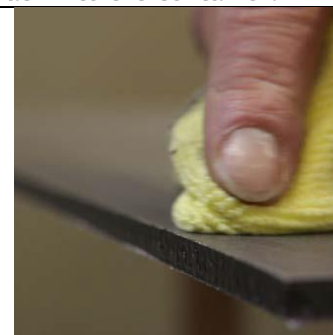
Simply pour only enough Luko into the clean tray that can be used within 30 mins.
Do not pour any leftover Luko back into the container.



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 process if necessary.



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

9. Installation Procedure



All vertical support battens are to be covered with a UV resistant EPDM strip material. This strip must be wide enough to cover the batten and overhang each side by at least 5 mm. Staple the strip to the battens towards the side edge of the strip away from the middle.

It is preferred that a ribbed EPDM strip is used as this will help guide infiltrating water downwards. It is preferred that the strip is laid continuously with no laps. If a lap occurs then to prevent the panel from distortion the surface of the batten needs to be rebated to allow the underlying strip to be recessed.

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

Starting with the central holes and working outwards to the panel edges, place the EQUITONE UNI-screw centrally in the pre-drilled hole. Ensure the screw is perpendicular to the panel's surface. Do not over tighten the screw as this can damage the panel's surface.

10. Other Considerations

Use of different materials

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

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

Marine Environment

It is acceptable to use timber in marine and coastal location. The European Standard EN 335-1:1992 groups the end-uses of timber according to the biological decay hazard they are exposed to, thus providing a useful framework within which to summarise the decay risks described above. All exterior joinery including timber cladding is normally in Hazard Class 3 and as such, likely to be exposed to some risk of fungal decay and possibly insect attack. However, providing cladding is well designed, regularly maintained and made from suitable timber, the occurrence of rot or insect attack is often preventable. Conversely, very poor detailing or maintenance can significantly enhance the risks and place parts of the cladding in Hazard Class 4.

Do not allow aluminum, aluminum-coated, and galvalume-coated panels and trim to come into direct contact with wood preservatives containing copper, mercury, or fluorides. Avoid direct contact between bare metal and treated timber where condensation will frequently form on the metal surface in contact with the timber. Use an appropriate barrier to separate metal panels and treated timber.

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