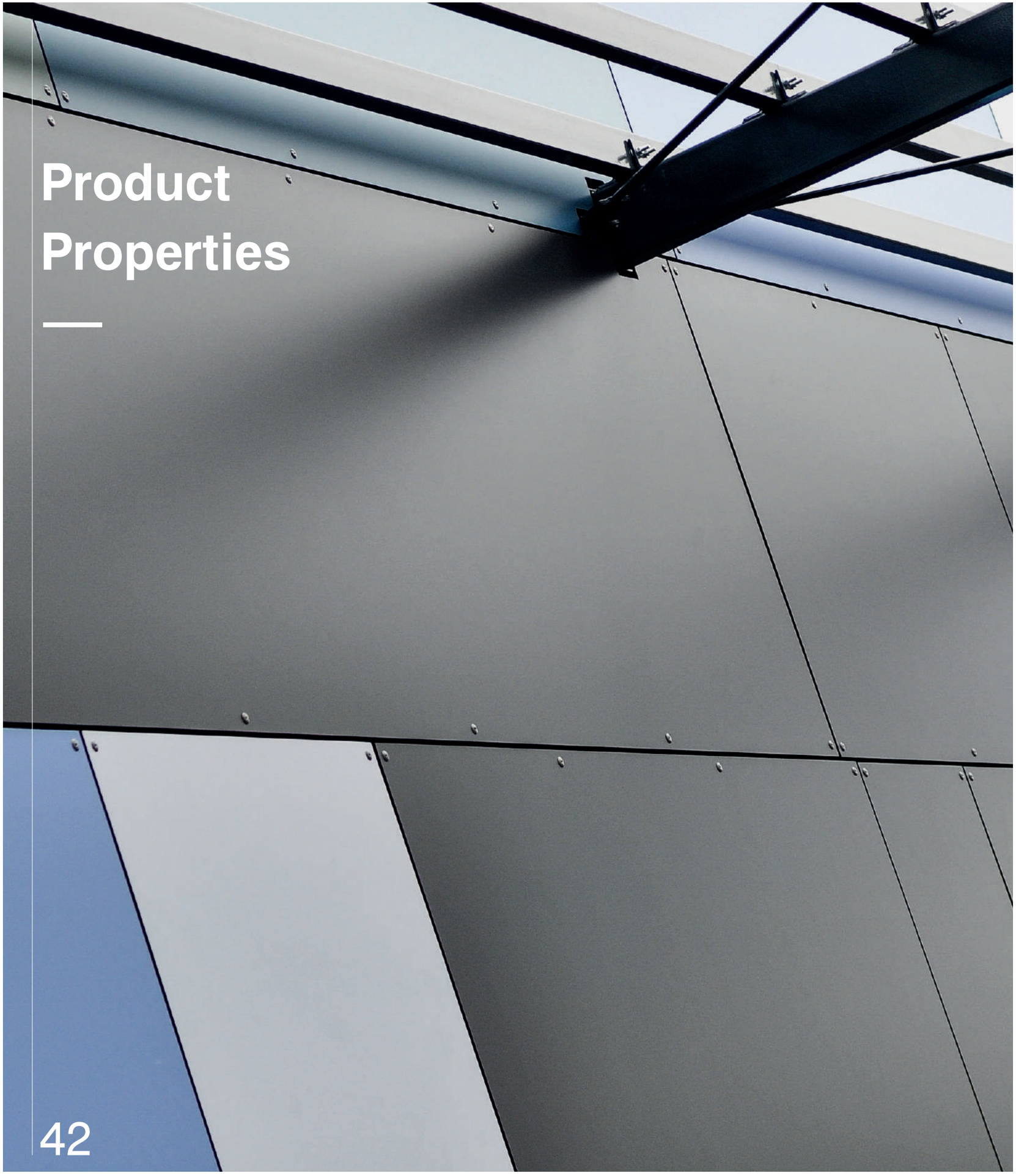
Kronoart® high-quality architectural facade cladding is the ideal mix of next generation technical performance twinned with new levels of aesthetic freedom. It's a HPL board that's built to last, easy to work, immensely weatherproof, fire and UV resistant... Equally, Kronoart® offers inspiring creative scope. Whatever the character, size or function of the building, Kronoart® makes realising your idea a liberating and affordable process.

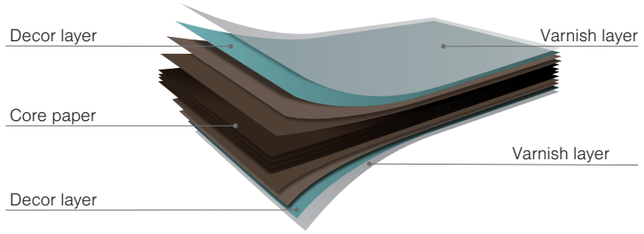


# Product Properties





Kronoart®'s unrivalled performance is due to its closed surface properties, topped by a layer of very durable varnish. This structure translates into high resistance to staining, impact damage and the effects of adverse environmental conditions - so Kronoart® is consequently extremely easy to clean and maintain. It's a winning combination; superior aesthetics paired with long-lasting, low maintenance characteristics. And naturally, Kronoart® panels are covered by a 10 year comprehensive guarantee, and provide fire retardancy in line with EN 13501-1 standards.




## Technical Data

| Parameter | Unit | Standard | Requirements value | Kronoart® |
|---|---|---|---|---|
| Thickness | mm | EN 438-2.5 | 6.0 ≤ t < 8.0 ± 0.40<br>8.0 ≤ t < 12.0 ± 0.50<br>12.0 ≤ t < 13.0 ± 0.60 | 6.0 ≤ t < 8.0 ± 0.40<br>8.0 ≤ t < 12.0 ± 0.50<br>12.0 ≤ t < 13.0 ± 0.60 |
| Legth | mm | EN 438-2.6 | + 10 / -0 | + 10 / -0 |
| Width | mm | EN 438-2.6 | + 10 / -0 | + 10 / -0 |
| Flatness | mm/m | EN 438-2.9 | 6.0 ≤ t < 10.0 ≤ 5.0<br>t ≥ 10.0 ≤ 3.0 | 6.0 ≤ t < 10.0 ≤ 5.0<br>t ≥ 10.0 ≤ 3.0 |
| Straightness of edges | mm/m | EN 438-2.7 | ≤ 1.5 | ≤ 1.5 |
| Squareness | mm/m | EN 438-2.8 | ≤ 1.5 | ≤ 1.5 |
| Resistance to aging in artificial conditions, including UV | Grey scale rating | EN 438-2.29 | ≥ 3 (3000 h) | ≥ 3 (3000 h) |
| | Appearance, grade | | ≥ 4 (3000 h) | ≥ 4 (3000 h) |
| Resistance to impact with large diameter ball | Drop height (mm) | EN 438-2.21 | ≥ 1800 | ≥ 1800 |
| Resistance to wet conditions | Mass gain (%) | EN 438-2.15 | ≤ 8 | ≤ 8 |
| | Appearance, surface | | ≥ 4 | ≥ 4 |
| | Appearance, edge | | ≥ 3 | ≥ 3 |
| Dimension stability at elevated temperature | Cumulative dimensional change (%) | EN 438-2.17 | ≤ 0.30 (along)<br>≤ 0.60 (across) | ≤ 0.30 (along)<br>≤ 0.60 (across) |
| Flexual modulus | mPa | EN ISO 178 | ≥ 9000 | ≥ 9000 |
| Flexual strength | mPa | EN ISO 178 | ≥ 80 | ≥ 80 |
| Tensile strength | mPa | EN ISO 527-2 | ≥ 60 | ≥ 60 |
| Density | g/cm$^3$ | EN ISO 1183-1 | ≥ 1.35 | ≥ 1.35 |
| Fire class | Classification | EN 13501-1 | B-s1, d0 | B-s1, d0 |

***Tab**. Technical parameters of facade panels*

# Product Features





## Weather resistance

Sun, wind, rain, snow, humidity – Kronoart® remains unaffected by the elements both on its surface and within the panels. It's resistance to the effects UV exposure is particularly high. Extremes and rapid changes in temperature don't adversely affect Kronoart®.

## Moisture resistance

Kronoart®'s fixing method helps dissipate moisture from the supporting structure, so with minimised condensation there's no opportunity for mold or fungi to gain a hold.

## Fire resistance

Kronoart® panels comply with EN 13501, DIN 4102 and NRO. Under the influence of flame it does not melt or drip, there's no potential for explosion or flaking, and the panels maintain stability through prolonged exposure to fire. When eventually fire takes hold, smoke emission is low and presents no dangerous toxins.

## Fire resistance rating

| Standard | Fire resistance class |
|---|---|
| EN 13501 | up to the class B-s1,d0 |
| DIN | up to the class B1 |

***Tab**. Fire resistance rating for Kronoart® panels*

## Sound insulation

Kronoart® panels can contribute to noise reduction. The extent of this is dependent on the thickness of the panels, their size and the number of holes made for fixing.

## Vandal resistant

The ability of the panels to absorb impact without damage makes Kronoart® an ideal option in locations where there's a risk of vandalism.

## Graffiti resistance

By use of an appropriate solvent, graffiti can be removed easily from the panels without compromising the highly durable finish.

# Maintenance



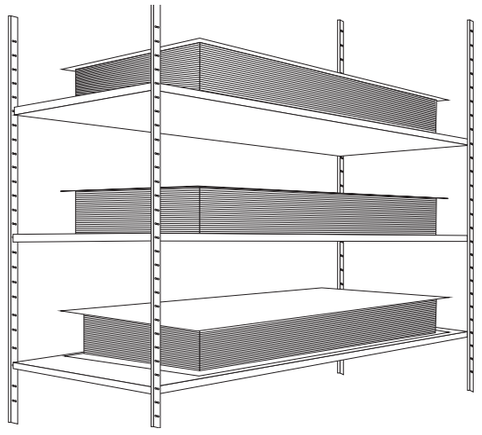


## Cleaning

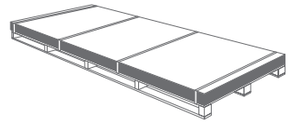
It's very easy to maintain Kronoart® panels – most dirt can be removed simply by wiping with a dampened cloth or sponge. More stubborn staining can be handled with a suitable household detergent. The UV resistant panels may be cleaned with alcohol-based cleaners, but it's always good practice to test-clean an unobtrusive area before undertaking complete cleaning. Products containing abrasives are not recommended for use with Kronoart®. Pressure washing presents no problems, the jet should be directed from the bottom to top of each panel then laterally at a distance of 20-30 cm, finishing with a rinse of clean water. Jet wash pressure should not exceed 100 bar and water temperature should be no higher than 90-100°C.

## Transport and handling

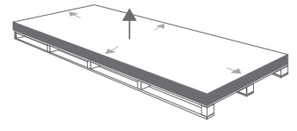
Once installed, Kronoart® panels offer exceptional durability, but in storage and handling surfaces and edges can be damaged if handled without care. The panels are supplied with foil protection covering, but it's recommended that when stacking dust and larger particles should be removed from between the boards. Panels should be stacked with thicker ones at the bottom, lighter panels towards the top, and care should be taken not to over-load the stack. The boards should be secured against slipping against each other in transit and handling, and the protective foil should not be exposed to continual direct sun or heat.



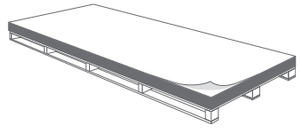
## Storage



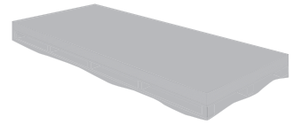
*The Kronoart® panels must be stacked horizontally on flat, stable supporting panels. In order to keep the surface untouched, the covering plates must be left on the top of stack. Incorrect storage can lead to permanent deformation of the boards.*



*When loading and unloading, the panels must be lifted. Do not push or pull them over the edge.*



*Do not stack the panels with faulty protection foil. Do not remove the foil before mounting or cutting if the panels will be stored.*



*Keep the pallet securely covered to ensure no dust or dirt can get on or between the panels.*

# Processing





## Safety precautions

The usual best-practice rules apply when operating machinery – appropriate personal protection and hi-vis clothing must be used and tools must be in good condition. The edges of unbevelled boards are sharp, so suitable anti-slip gloves should be worn. Cutting will create dust; protective eyewear and a dust mask are required. Ear defenders must be worn when operating machinery.

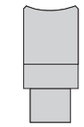
## Preferred tools

Kronoart® panels are highly durable. Good quality tools are required to ensure clean cutting and drilling – diamond tipped drills and sharp, hardened metal blades are recommended. When machining boards they must be laid on clean, flat well-supported surfaces. Chips and particles should be removed to avoid marking the panels.

## Tooth forms

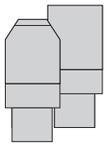
HZ/FA (Beveled concave tooth)

Similar to WZ/FA and HZ/DZ
but providing a higher machine longevity.



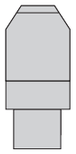
FZ/TR (Flat tooth/ Trapezoid tooth)

Suitable for cutting Kronoart® panels
as well as laminates.



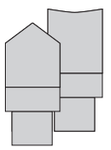
TR/TR (Trapezoid tooth/ Trapezoid tooth).

Best for cutting hard, abrasive laminates.



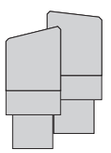
HZ/DZ (Pendulum tooth/ Concave tooth).

Useful when cutting on machines
where scoring unit is not available.



WZ/FA (Variable beveled tooth)

This type can be used interchangeably
with the Pendulum/Concave tooth.



## Machining of panels

To achieve optimal results when cutting an optimal feed rate (Vf) and cutting speed (Vc) ratio has to be maintained. Keeping the proper ratio is both beneficial for the final result of the cutting process as well as machine lifespan. To further increase cutting effectiveness we advise using diamond tipped tools. Moreover, cutting a single board will cause it to vibrate therefore precautions have to be taken in order to maintain a stable, fixed position.

### Cutting speed formula

Vc = D ● π ● n/60
Vc - cutting speed
D - tool diameter [m]
n - tool rotational speed [min.-1]

### Feed speed

Vf = fz ● n ● z/1000
Vf - feed rate [m/min.]
fz - tooth feed
n - tool rotational speed [min.-1]
z - number of teeth

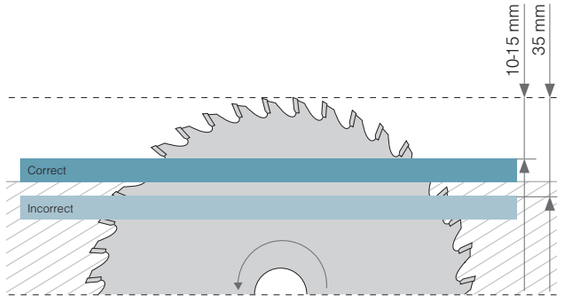



***Fig.*** *Circular, positive rake angle sawblades with a saw shaft under the workpiece.*

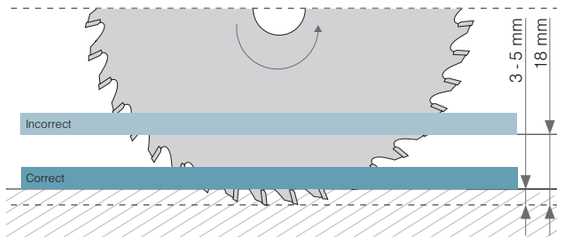



***Fig.*** *Circular, negative rake angle sawblades with a saw shaft under the workpiece.*

## Cutting with handheld tools

If a single cut is required you can use hard metal handheld saws. Blades should be sharp and have low set teeth. To make cutting easier and more precise use guiding rails.
Depending on the type of cut you want to achieve use a blade with an appropriate type of teeth. To find out which type is suitable for you follow the saw tooth guide we provided for you in this section.

## Cutting with table saws

Splitting the board with a table saw might result in a jagged edge therefore we advise using a machine with a scoring unit and a device for applying pressure. This way the scoring blade will clear the outer layer of the board's surface ensuring a clear cut of the main saw blade. Because the scoring blade is thicker it prevents the main blade from directly touching the edges of the cut. Additionally, using a pressure device along with a scoring unit ensures a clean cut by securing the board in place. In order to perform maintenance of a circular saw with a conical scoring unit both widths need to be properly aligned.

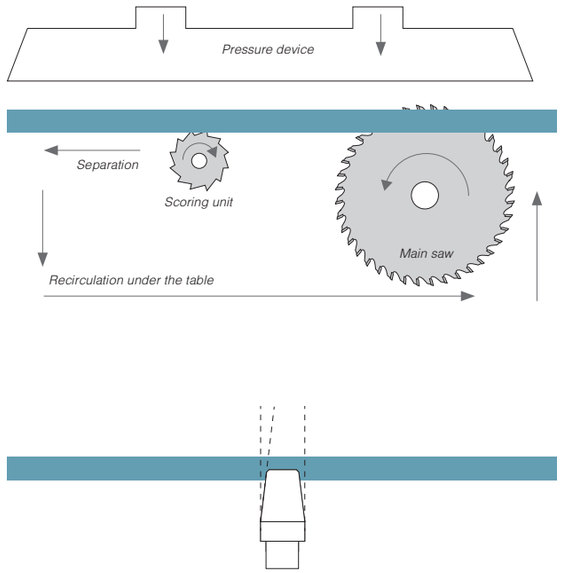



***Fig.*** *Cutting width rate of the scoring saw equals main saw's cutting width.*

## Drilling

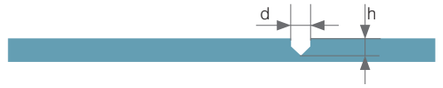
For drilling either blind or through-holes it's best to use high durability twisted metal drills. Optimal drilling parameters oscillate between 2000 - 4000 RPM with a 1 - 3 m/min. feed rate. While drilling make sure the board is secured and properly aligned. Because a high speed drill might damage the board's surface coating you should reduce RPM's by 50% when pulling out the drill.

### Parallel mounting holes

Maintain a minimum hole depth of 25 mm for parallel connections.
Distance between the edge of the hole and the edge of the board should be at least 3 mm thick (b - 2 ● a).

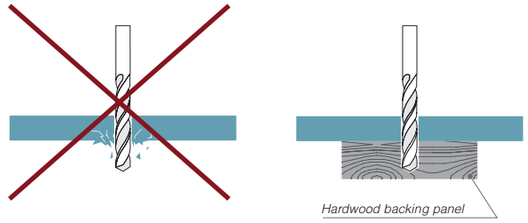

### Perpendicular blind holes

h - hole depth (board thickness - 1-1.5 mm)
d - hole diameter
(optimal size = 1 screw diameter - ~1 screw channel depth)
Correct screw placement depth = drilling depth - 1 mm.




### Manual drilling

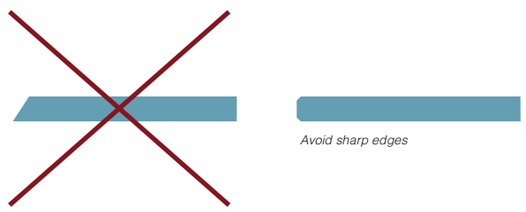
Make sure the rotation speed is at the maximum to avoid chipping and heating. Advance the drill smoothly. It is recommended to work on a backing panel that can be drilled (e.g. dense Particleboard or MDF).




## Finishing the edges

The edges do not require any special treatment but they can be machined for a special finish.

- The edge of the compact can be used by calibration, chamfering or beveling.
- It is essential to grind down sharp edges to avoid cuts when installing and after installation is complete.



# Facade Installation





## General information

Aesthetics aside, the technical purpose of ventilated facades is to protect the structure from weather and environmental conditions while providing effective thermal insulation.
Kronoart® is proven to meet these challenges over a long working life, without demanding maintenance schedules. Forming elevations from Kronoart®, you have the ability to insulate to the defined specification by selecting boards from a range of thicknesses, and create buildings with the desired levels of energy efficiency and $CO_2$ emissions. Winter heat retention can be maximized with Kronoart®, as can temperature control in summer or in high ambient heat locations.
Ventilated facades utilizing Kronoart® optimize the combined performance of structure and facade, protecting against moisture accumulation, while delivering thermal and acoustic insulation.

### Additional points

The performance and installation parameters of the project should always be discussed with Kronoart® as part of the specification process, and the fixing system providers should also be involved at this stage. The relevant static calculations for the elevations must be completed. All subsequent installation operations should be performed by appropriately trained personnel.

### Panel joining

The joining solution favored in most projects incorporates expansion gaps of 8 mm minimum. All fixings must be moisture and corrosion resistant, and gaps should be windproofed from the inside of the cavity.
If the panels utilized are of 8 mm thickness or more, they can be connected by tongue and groove joints, with the horizontal joints overlapped for a closed arrangement, as shown below.

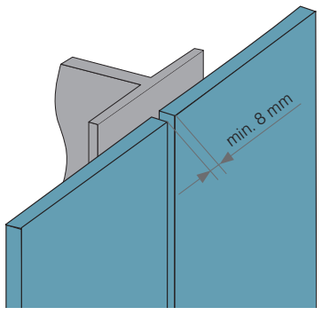



***Fig.*** *Open arrangement of gaps.*

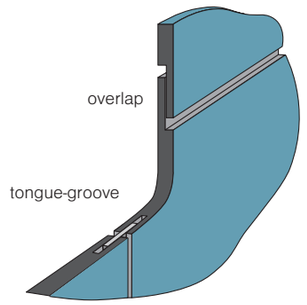



***Fig.*** *Closed arrangement of gaps.*

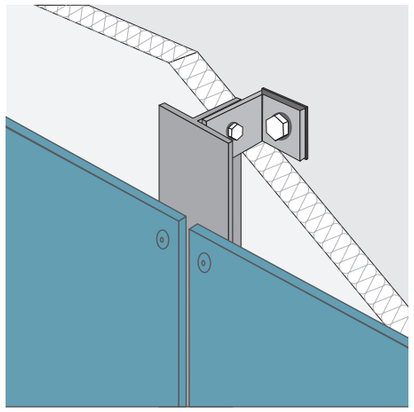
| Type of tongue | HPL | Aluminium |
|---|---|---|
| Dimension of tongue [mm] | 3.0 x 30 | 2.0 x 30 |
| Dimension of groove [mm] | 3.3 x 15 | 2.3 x 15 |
| Dimension of overlap [mm] | | 21 |

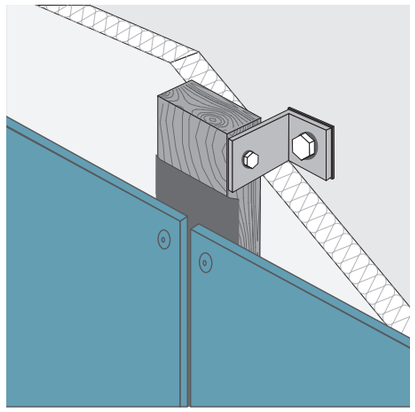
***Tab.*** *Close arrangement of gaps – recommended minimal parameters for tongue and groove*

# Rules of installation for elevation panels

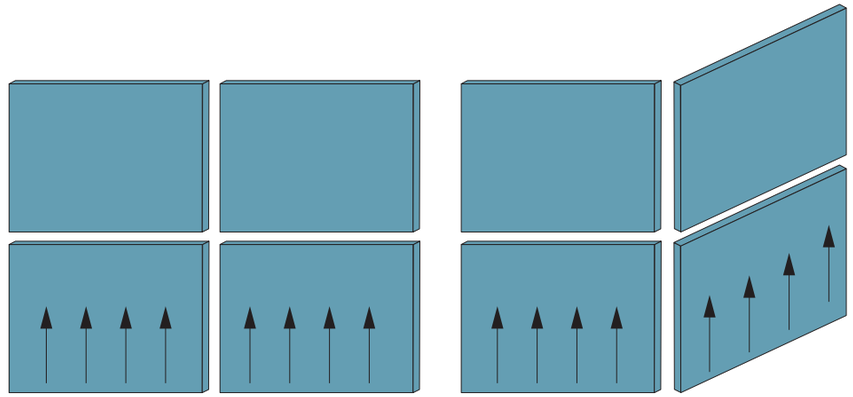
Installation of the panels should be carried out only by qualified persons.
The panels can be fixed to the bearing structure using rivets, bolts/elevation screws, adhesive systems or staples fixed to rear side (invisible mechanical fixing).
All joints of panels with other elements and the substrate should be made in firm manner.

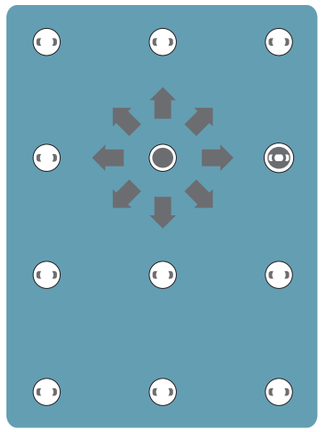
The Kronoart® panels can be fixed to metal substructure (aluminium, galvanized steel) or wooden substructure.



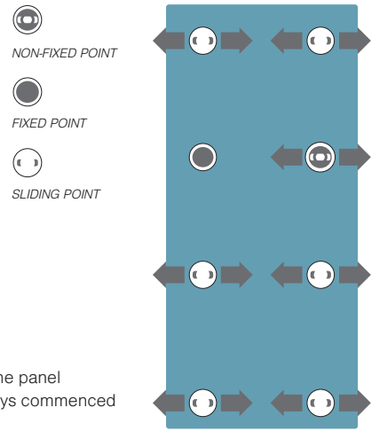


It's important to factor-in expected wind pressure exposure when selecting fixings, along with adhering to local building regulations. Calculations should be based on installation data for high pressure laminates.

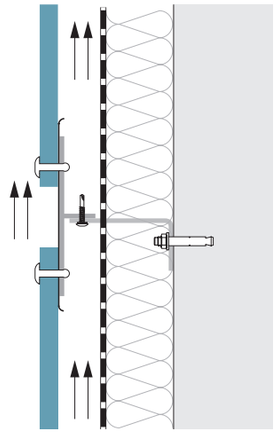




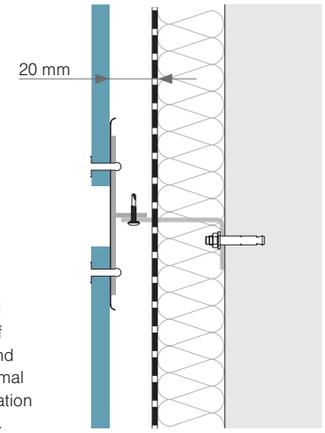
Fixing elements should be spaced so as to enable the panel moving (by appropriate arrangement of fixed and non-fixed holes).



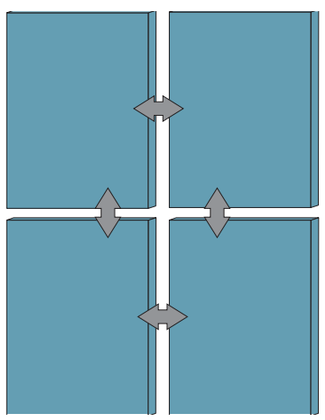

Installation of the panel should be always commenced from its center.



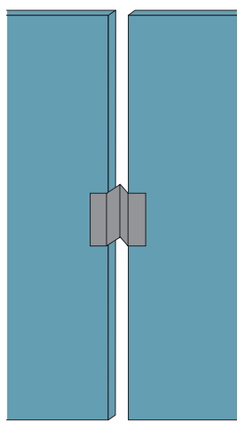
Installation of the lining from the Kronoart® panels should be carried out assuring constant ventilation of the elevation material from both sides.



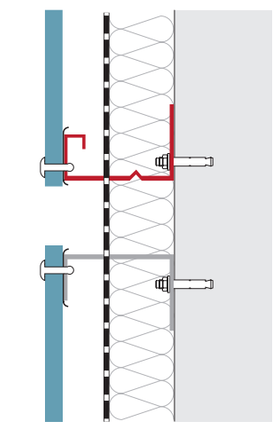

Recommended ventilation distance between thermo insulating board and the panel should be min. 20 mm. Lack of distance between the panel and the bearing structure and thermal insulation can cause condensation and deformation of the panels.



The line expansion crosswise and lengthwise should be taken into account when selecting the gap between subsequent formats assuming that the dimension of material can increase by about 2.5 mm per one current meter of the lining.



The spacers should be mounted only when necessary.



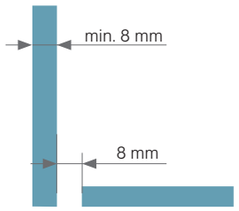
No panels should be fixed one on top of another to two differing substructure profiles – this is likely to compromise the expansion joint's effectiveness.

## Solutions for corners

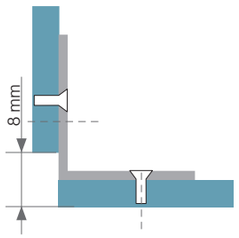
Selecting the best method of corner forming is dependent on the thickness of the panel used. We recommend a thickness of 8 mm or more, because this allows enough material depth to enable correct screw setting, or the machining of the groove for the tongue (the tongue should be 3 mm thick). The number of fixings and the distance between them will depend on the spacing of the substructure.

### Types of corner finishings

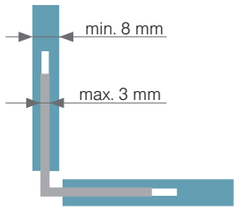
Open corner



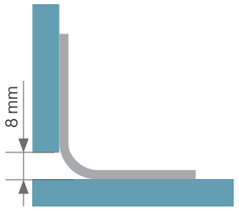

Closed corner, straight joining from inside by metal profile and rivets



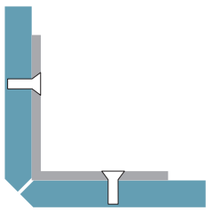

Corner with tongue and groove joint system



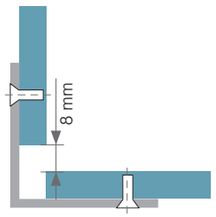

The corner joined using gap tape




Closed corner, slantwise connection from inside by metal profile and rivets

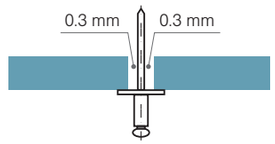


Closed corner, straight connection from outside by metal profile and rivets

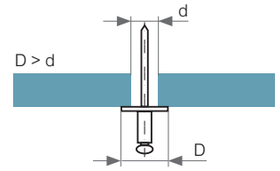



## Fixing and connector elements

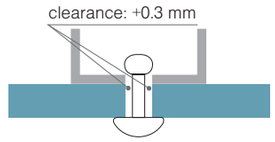
During installation and joining of elevation panels all elements should always be fixed observing one direction of fibres.



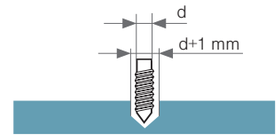

The head of the fixing element should be of such size that the hole in the panel is always covered. The fixing element of the non-fixed point should be positioned so as to enable movement of the panel.



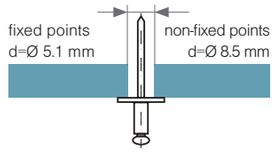

Rivets should be put using the articulated fixtures.
The set distance from rivet head should make possible movement of elements in the drilled hole (clearance: +0.3 mm).



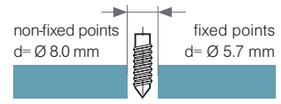

It is a good practice guaranteeing flexible fixing to make precise preliminary drilling with exactness to one millimeter.



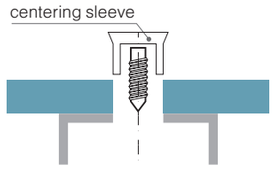

For rivets the recommended hole diameter in the facade panel for the fixed point is Ø 5.1 mm, and for the non-fixed point is Ø 8.5 mm. The diameter of the hole in the structure is Ø 5.1 mm.



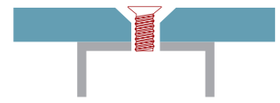

For torx screws the recommended diameters for:
non-fixed points are Ø 8.0 mm,
fixed points - Ø 5.7 mm.



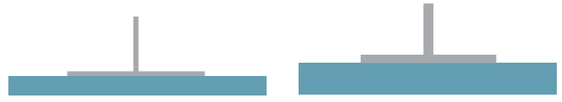

The center of the hole in the supporting structure should line up with the center of the hole in the panel. The holes should be drilled using the centering sleeve.



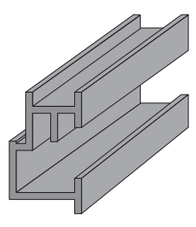

Do not use the sunk head screws!



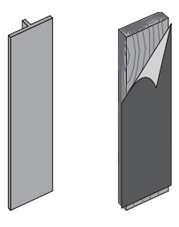
Dimensions of the profiles used depend on the thickness of panels (6, 8, 10 mm or more).



Only aluminium or from galvanized steel profiles should be used because of the resistance to corrosion and durability.
In the case of other material of the substructure, care must be taken to protect it appropriately against weather conditions.



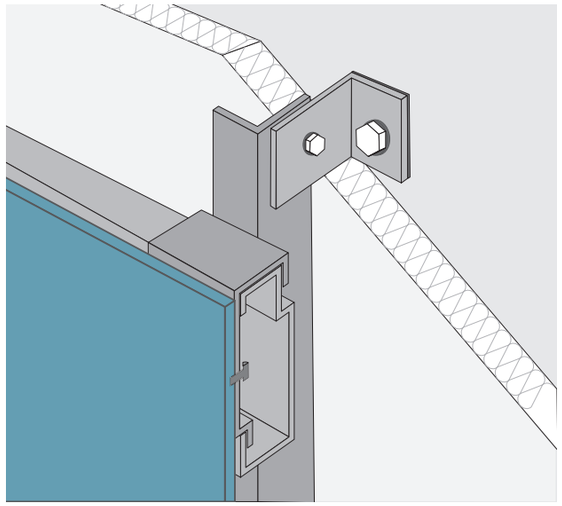
In order to obtain better cooperation in places of connections one can use rubber profiles from flexible EPDM.



# Installation via concealed fittings

## General information

Hidden mechanical fixing offers the advantage of delivering stronger, more uniformly distributed fixing forces. They achieve durable mounting, and optimize bonding with the substrate without expansion stresses.



### Thickness of panels

The ideal thickness is 10 mm, although as a minimum, 8 mm panels may be used. This is due to the perforation and method of fixing.

### Recommendations for installation

The length of lateral edge for every format should not exceed 3050 mm.

### Spacing of fixing holes

Follow the guidelines below to select the correct spacing for fixing holes. The centers recommended relate to one-span installation of panels.

| | Thickness [mm] | max. B, D [mm] | max. d [mm] | max. b [mm] |
|---|---|---|---|---|
| **One-span fixing** | | | | |
| | 10 | 740 | 125 | 150 |

***Tab.*** *Distribution of holes - one-span installation*

In the case of multi-span fixing of panel, it is recommended to distribute the installation holes as given in the table below.

| | Thickness [mm] | max. B, D [mm] | max. d [mm] | max. b [mm] |
|---|---|---|---|---|
| **Multi-span fixing** | | | | |
| | 8 | 740 | 20 - 80 | 20 - 60 |
| | 10 | 800 | 20 - 100 | 20 - 80 |

***Tab.*** *Distribution of holes - multi-span installation*

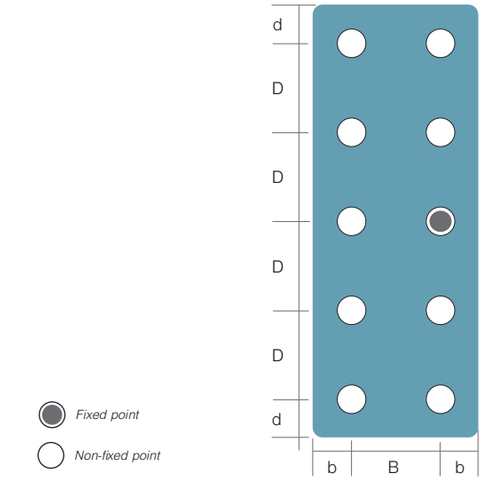



***Fig.*** *One-span fixing*

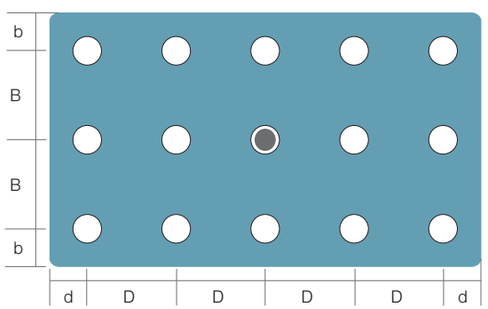


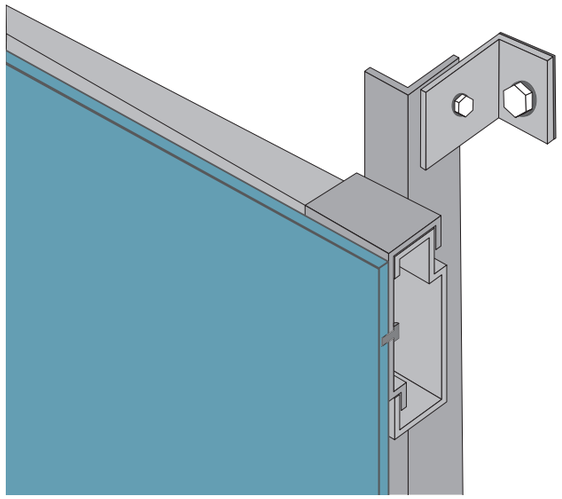

***Fig.*** *Multi-span fixing*

## Concealed fittings techniques

There are two options available:

- Vertical bearing elements fitted to the substrate which give a flat uniform installation surface.
- Horizontal elements fixed to the load bearing verticals. Special hanging connectors (hangers, safety pins and clips) are utilized.

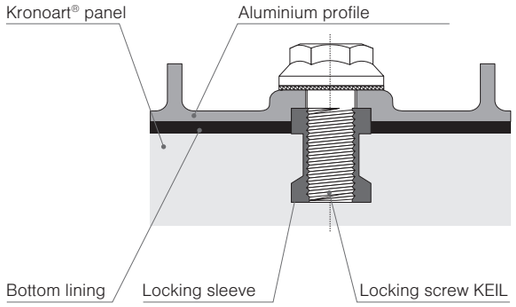
Fasteners such as screws, studs and clinch bolts are selected depending on the type and thickness of the panels, and the expected environmental conditions of the location.
Correctly installed according to guidelines, the construction should guarantee stress-free installation and weather resistance.



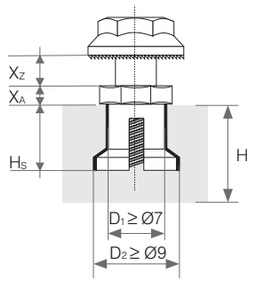
## Fitting connectors

### Connector KEIL

Basic connector consists of a sleeve and a locking screw.




$D_1$ Hole diameter (≥ 7 mm)
$D_2$ Undercut diameter (≥ 9 mm)
H Panel thickness (≥ 8 mm)
$H_S$ Anchorage depth
$X_A$ Bolt height (3 mm)
$X_Z$ Aluminium profile thickness in the structure




### Connector SFS

The sleeve is made from austenitic stainless steel (AISI 316, grade 1.4401 acc. to PN-EN), whereas the stem is from carbon steel (stem is completely removed during setting).

| Type | Material S = steel | Ø | L | Panel thickness | Thickness of joined elements |
|---|---|---|---|---|---|
| TUF- | S- | 6.0x | 9 | 8 | 2.5 - 3.5 |
| | | | | 10 - 13 | 0.5 – 3.5 |
| TUF- | S- | 6.0x | 11 | 8 | 4.5 – 5.5 |
| | | | | 10 | 2.5 – 5.5 |
| | | | | 13 | 0.5 – 5.5 |
| TUF- | S- | 6.0x | 13 | 10 | 4.5 – 7.5 |
| | | | | 13 | 2.5 – 7.5 |

***Fig***. *Dimensions and designations of connectors (all dimensions in mm)*

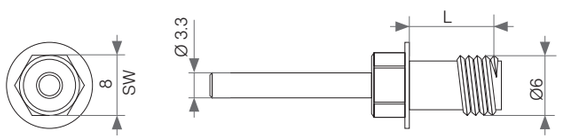



***Fig***. *Clinch bolt TU-S6.0x9 – Construction and dimensions (mm).*

# Invisible fixing on metal substructure

*horizontal cross-section*

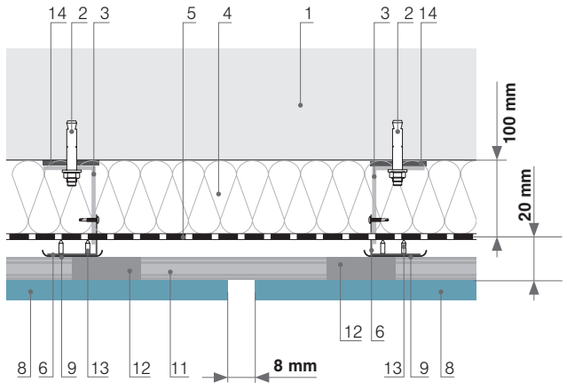



**Fig. Draft A-A**
I-Beam connector

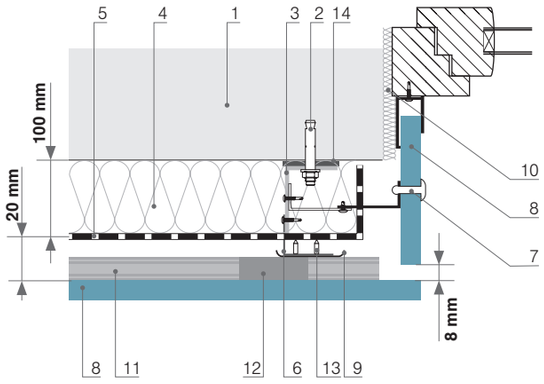



**Fig. Draft C-C**
Connector with window elements (internal)




**Fig. Draft H-H**
Connector at the inner corner

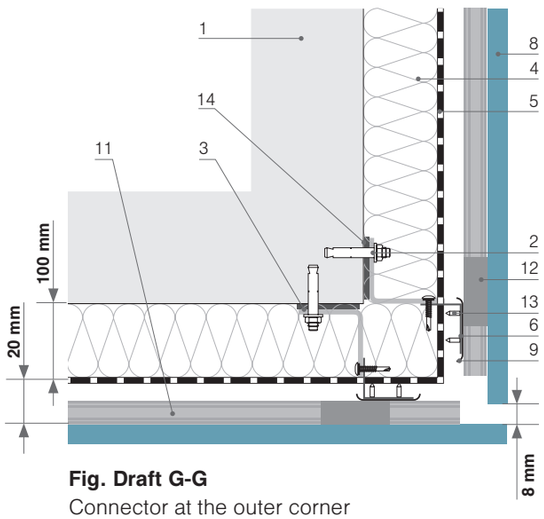
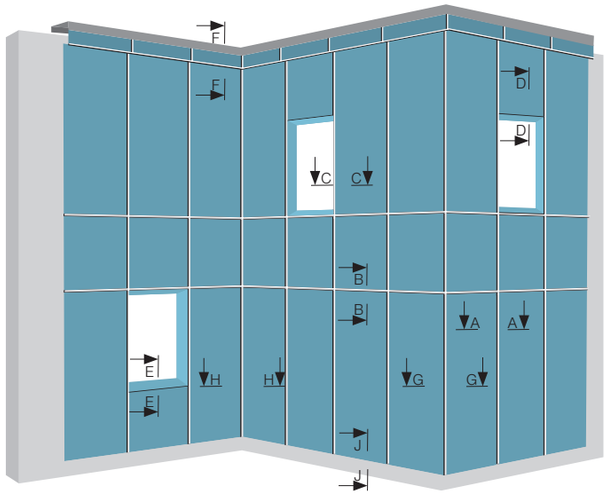



**Fig. Draft G-G**
Connector at the outer corner




*vertical cross-section*

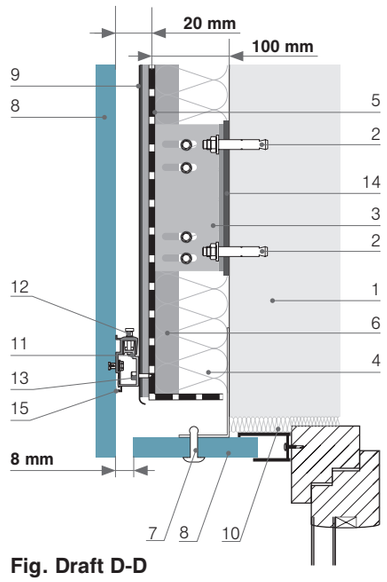



**Fig. Draft D-D**
Connector with window element (external)

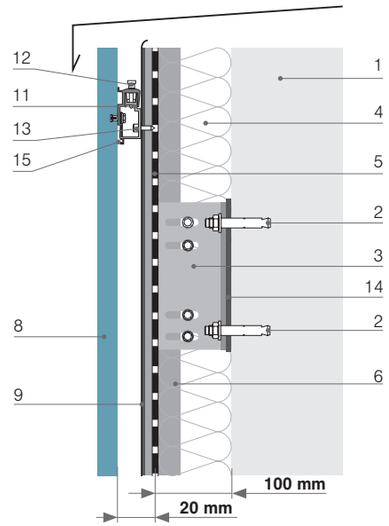



**Fig. Draft F-F**
Upper part of the wall with closing frame

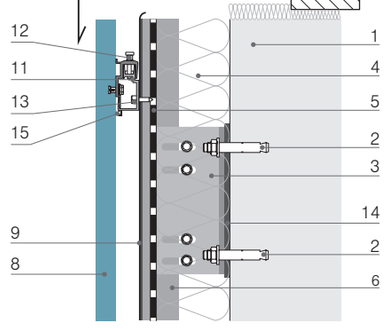



**Fig. Draft E-E**
External window sill

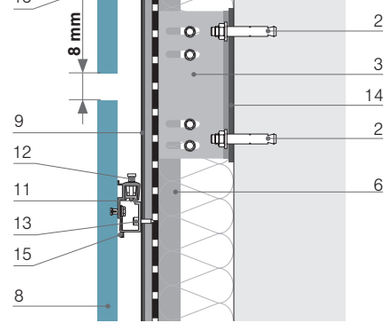



**Fig. Draft B-B**
Beam connector

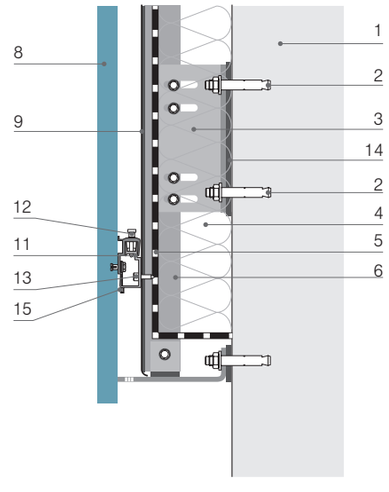



**Fig. Draft J-J**
Bottom part of the wall

1. Supporting wall
2. Fixing anchor
3. Double aluminium console
4. 100 mm mineral wool
5. Windproofing
6. Facade profile L - 60x45
7. Rivet fastening in the color of the panel
8. Kronoart® panel
9. EPDM tape
10. Weather silicone
11. Facade profile of the invisible assembly system
12. Regulation clip for invisible INV-system round hole assembly
13. Screws 4.8 x 19 A2
14. Insulation washer 80/50
15. Rubber for INV-system profile

# Installation through adhesive

## General information

PanelTack is a moisture curing, highly elastic adhesive based on SMP (Silyl Modified Polymer). PanelTack is solvent- and isocyanate free.

### Product advantages

- Reliable blind fixing method
- Simple and fast installation
- Optimal tension distribution

### Application

Bonding of panels for:

- Facade cladding.
- Fascias and soffits.
- Ceilings, canopies, awnings.
- Wall covering panels in a.o. porches.

### Features PanelTack bonding system

- Durable and highly elastic with an optimal tension distribution.
- Suitable for the bonding of larger panels up to panels.
- Excellent mechanical strength.
- Good moisture- and weather resistance.
- Quick and easy mounting.

Bostik bonding system consists of:

| | |
|---|---|
| PanelTack | highly elastic adhesive |
| Primer Paneltack | for pre-treatment of the bonding side of the cladding panel. |
| Primer Paneltack | primer for metal support construction |
| Foam tape 12 x 3 mm | for the initial bonding of the panels and a spacer to obtain a sufficient thick adhesive layer. |

### Reaction to fire

Within Europe wall cladding constructions should comply to class D according to EN 13501-1.
As demands and requirements in other countries may differ we advise to consult local authoritative test institutes for detailed information.

### Maximum panel size

PanelTack is highly elastic, therefore possible deformations of the Kronoart® panels can be absorbed in the adhesive layer. When mounting Kronoart® panels a maximal occurring displacement of 2.5 mm/m[1] has to be taken into account. The maximal elastic deformation which the PanelTack system practically still can absorb, may not exceed 4.3 mm. This means that the maximal diagonal length of the panels may not exceed 3440 mm. Panels must be evenly flat prior to bonding. In this aspect large panels are more critical than small panels, therefore extra care regarding correct handling and storage is inevitable.

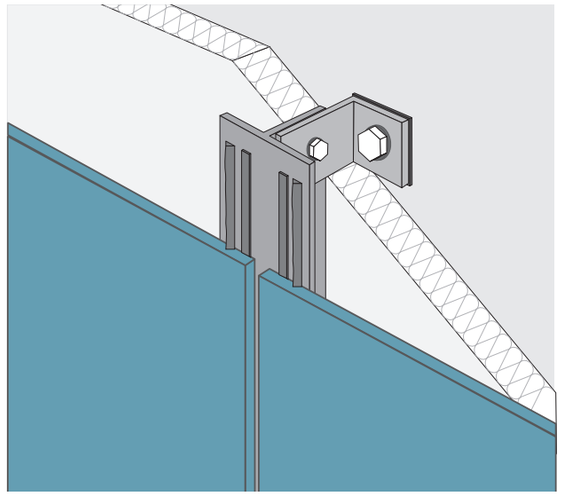


***Fig.*** *Invisible fixing on metal substructure*

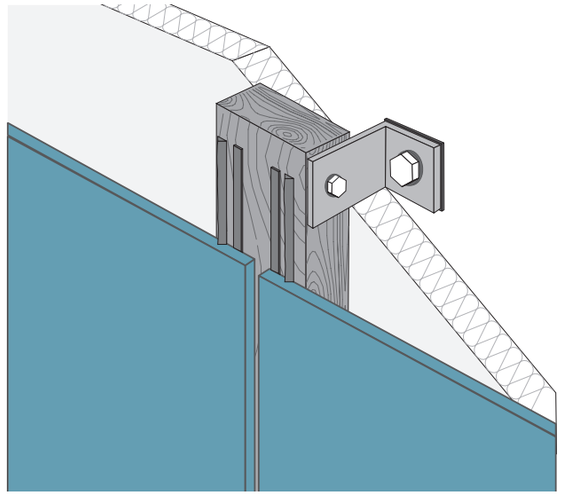


***Fig.*** *Invisible fixing on wooden substructure*

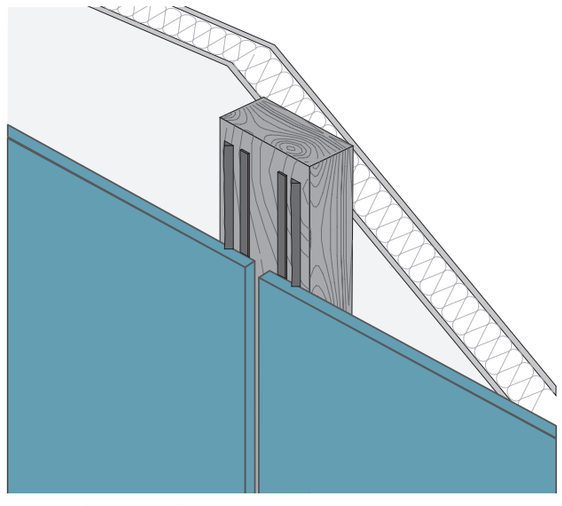


***Fig.*** *Invisible fixing on timber frame buildings*

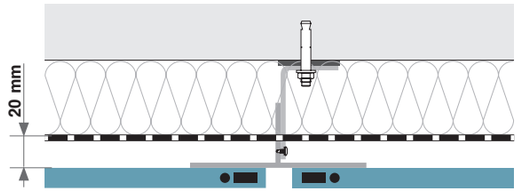
## Support construction

### Choice of material

Dry and smooth (galvanized) steel or (anodized) aluminium. These metals must be rustproof and after fixing they must conform to relevant standards. Enamelled metals are suitable as well, however different instructions for use may apply.

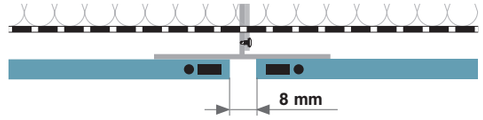
### Ventilation

The support battens or profiles must only be mounted vertically. Behind the panels there has to be an open ventilated cavity of minimal 20 mm. Furthermore ventilation openings/slots of art least 50 cm²/m¹ at both the top and the bottom of the bonded panels. For horizontal applications preferably apply the battens perpendicular to the facade in order to ventilate over the short end.




### Minimal joint width

A joint between the panels with a width of min. 8 mm is recommended.




### Dimensions and distances

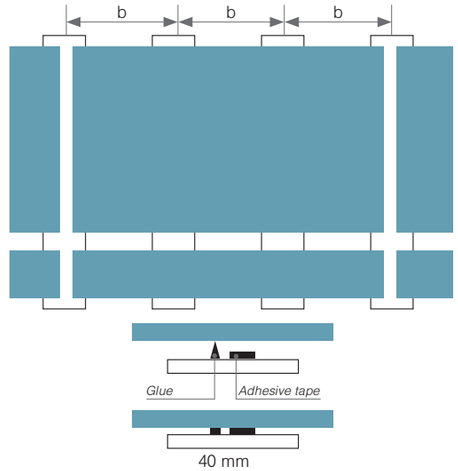
The minimal widths of supports in the support construction depend on the function of the supports:

- support for joints – aluminium – 100 mm
- end-and intermediate support – aluminium – 40 mm

The distances between the support battens or profiles as indicated by the panel manufacturer.

| Panel thickness [mm] | 6 | 8 | 10 |
|---|---|---|---|
| 2 fixings in one direction | 440 | 590 | 640 |
| 3 or more in one direction | 540 | 640 | 640 |

For horizontal applications (ceilings) these distances must be multiplied with 3/4.




*Multispan example*

### Consumption per 100 m² surface panel

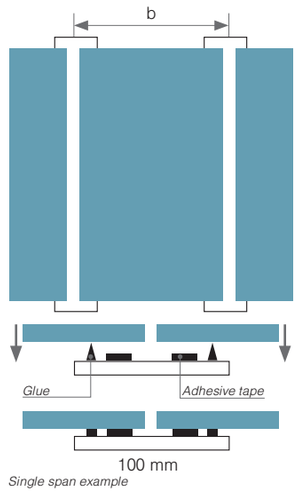
Foam tape 12 25 metre role
Paneltack 50 290 ml cartridge
Primer Paneltack (panel) 3 500 ml tin
Primer Paneltack (metal) 3 500 ml tin

### Application conditions

The cladding panels can be bonded indoors (in a factory) or on the building site.
The following conditions apply:

- Do not pre-treat or bond in case of rain.
- Do not pre-treat or bond in case of very high air humidity for instance during dense fog.
- Avoid condensation on both the panels and support construction: the dew point must be 3 °C above substrate temperature.
- Apply between +5 °C and +30 °C.

Prevent warping of the panels due to the influence of moisture.

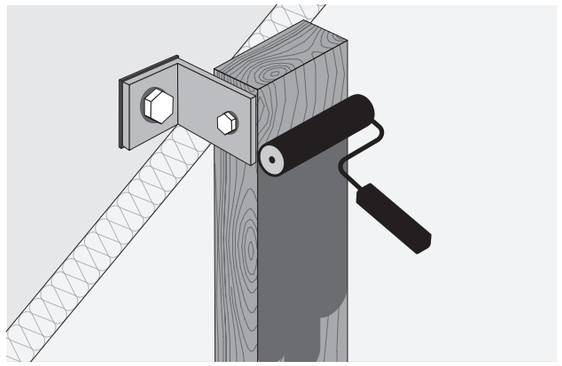



*Single span example*

# Installation instructions

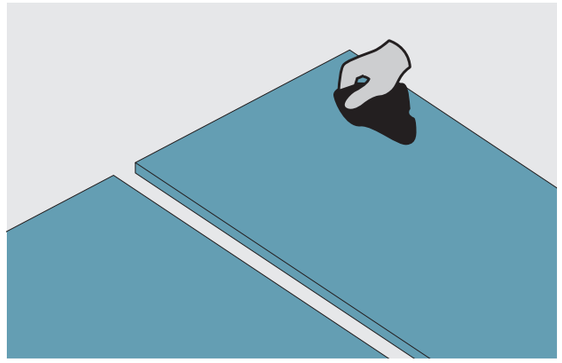
## Pre-treatment support construction

The support construction must be primed before or after mounting. The primer can be applied both in and outdoors. Use Primer SX Black for wood and Primer Paneltack for metal. One (continuous and closed) coat of primer is sufficient. Residues of primer should not be used. Avoid contamination of the support construction with dust and grease after application of primers.
Metal support construction: Apply Primer PanelTack straight from the tin on a clean, lint free and pigment free cloth or tissue paper. Firmly rub the supports with the primer-soaked cloth. Minimal drying time after application 10 minutes. Replace cloths regularly by new ones. Do not treat more surface than can be bonded within 6 hours.



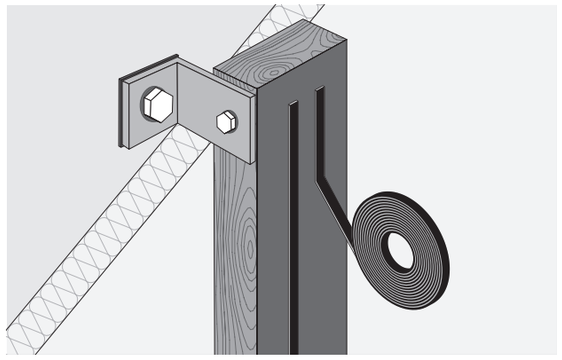
## Pre-treatment cladding panel

Apply Primer PanelTack straight from the tin on a clean, lint free and pigment free cloth or tissue paper. Firmly rub the supports with the primer-soaked cloth. Minimal drying time after application 10 minutes. Replace cloths regularly by new ones. Do not treat more surface than can be bonded within 6 hours.



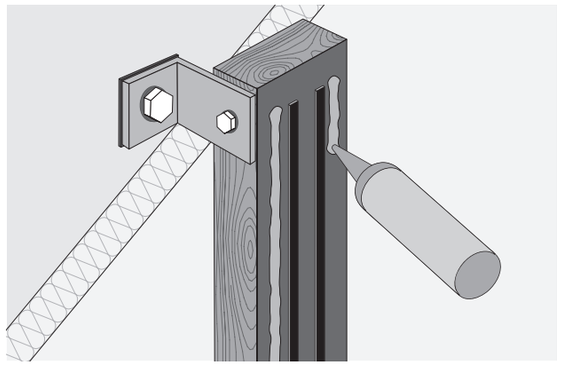
## Application of foam tape

Once the primers have dried, foam tape is applied only vertically to the support construction without any interruption. Press foam tape firmly onto the support construction and cut it with a sharp knife. When deciding on the correct position and length of the tape also bear in mind the dimensions of the supports, the dimensions of the panels and the necessary space for the adhesive. Do not immediately remove the protective layer after application of the foam tape.



## Application of adhesive with special nozzle

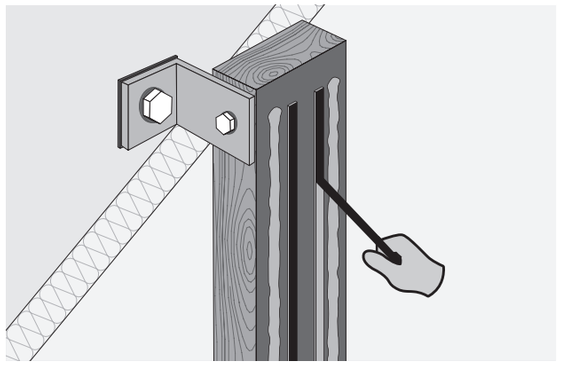
Apply PanelTack only vertically and without interruption after the application of the foam tape. Use a hand- or an air pressure caulking gun. A special V-shaped nozzle has been packed with every cartridge PanelTack. This enables to apply a triangular adhesive bead with a width and height of 9 mm. Using this special nozzle prevents the enclosure of air bubbles and unnecessary loss of adhesive. Opposite the V-cut one can cut the nozzle obliquely.

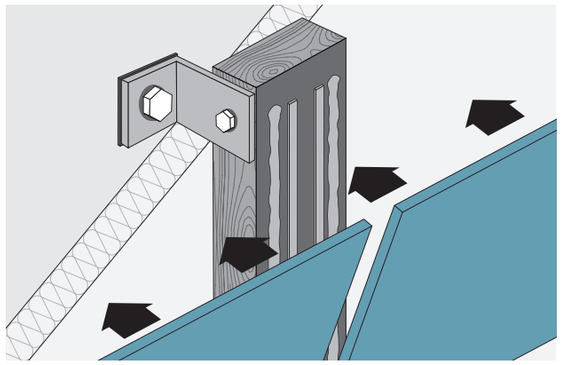




## Placing the panel

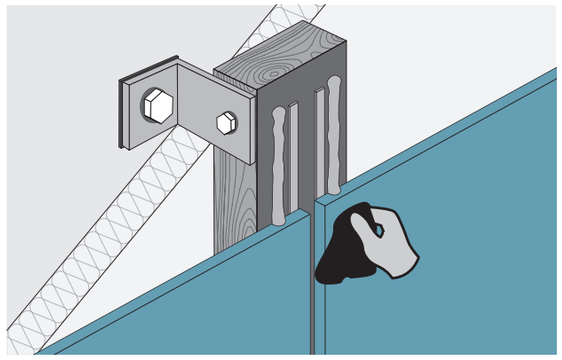
Now remove the protective layer from the foam tape. Apply the cladding panel within 10 minutes of adhesive application. Fix the panel by gently pressing it onto the adhesive beads and, if necessary, correct its position. Correction is still possible until the panel touches the foam tape. For accurate, easier positioning of the panel use a joint spacer, supporting blocks or horizontal supporting rails. For easier handling a glass suction clamp can be useful. Once the panel is positioned correctly, the panel must be pressed down by gently rubbing over the entire length of the foam tape. Avoid pressing the foam tape together. At this stage it's no longer possible to correct the panel position. See the detail drawings.





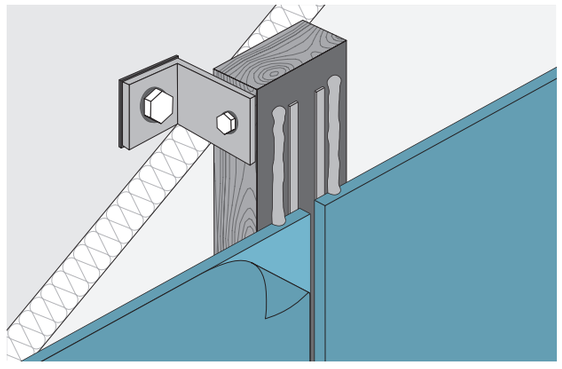
## Cleaning

Avoid contamination of the front side of the panels with primer or adhesive. Uncured primer or uncured adhesive residues can be removed with a suitable cleaner such as Liquid 1. Use a clean, lint free and pigment free cloth or tissue paper. Test first on a small unobtrusive area to check that the cleaner does not attack or contaminate the panel.



## Removing the protective foil from the front face

Immediately after bonding, if the protective foil is still present, it should be removed from the front face of the panel.



# Invisible fixing on metal substructure

*horizontal cross-section*

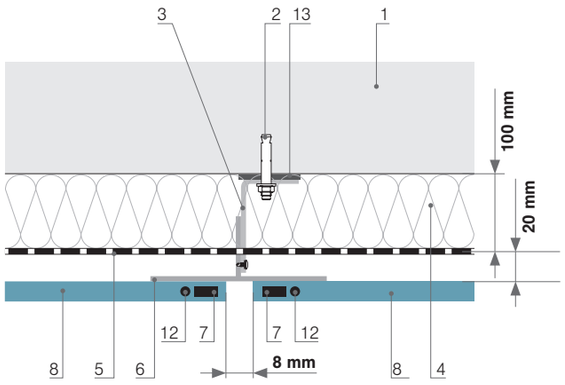



**Fig. Draft A-A**
I-Beam connector

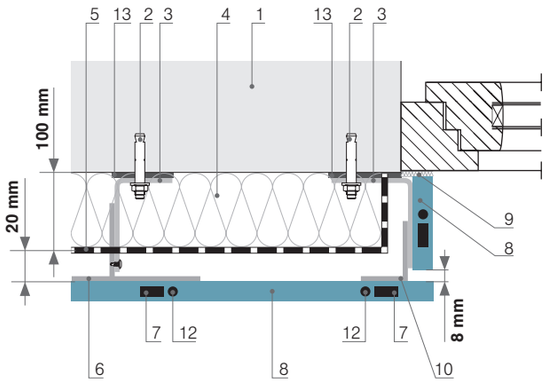



**Fig. Draft C-C**
Connector with window elements (internal)




**Fig. Draft H-H**
Connector at the inner corner

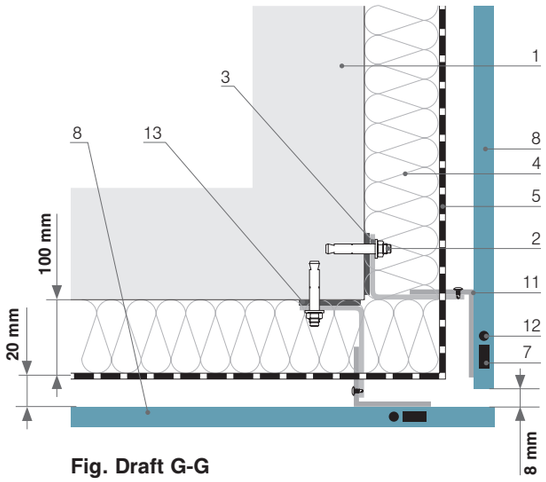
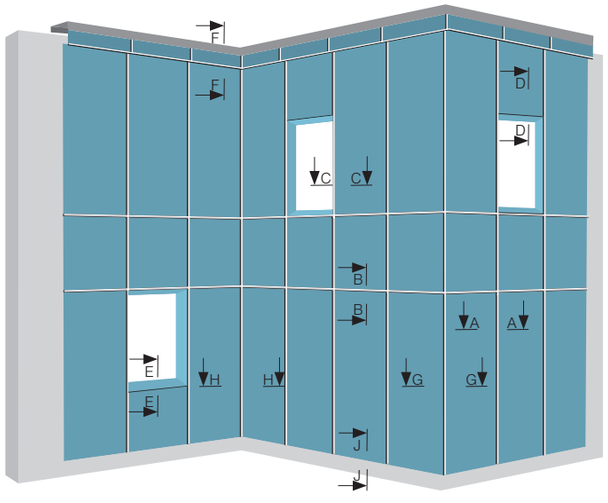



**Fig. Draft G-G**
Connector at the outer corner




1. Supporting wall
2. Fixing anchor
3. Fixing angle L120 x 60 x 3, length 60 mm
4. 100 mm mineral wool
5. Windproofing
6. T90 x 70 x 4 fixing tees
7. Foam tape
8. Kronoart® panels
9. Weather silicone
10. Perforated angle
11. 40 x 40 x 3 angle
12. Adhesive
13. Insulation washer 80/50

*vertical cross-section*

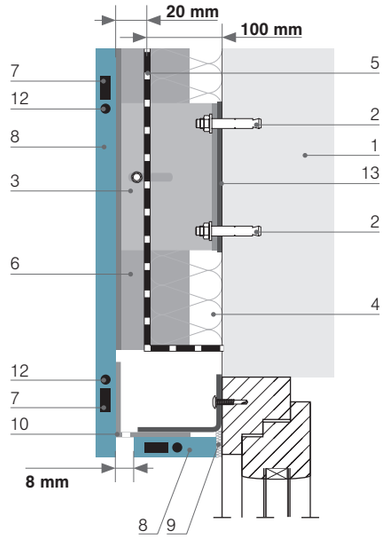



**Fig. Draft D-D**
Connector with window element (external)

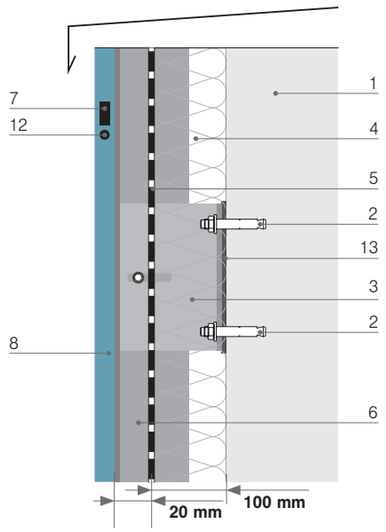



**Fig. Draft F-F**
Upper part of the wall with closing frame

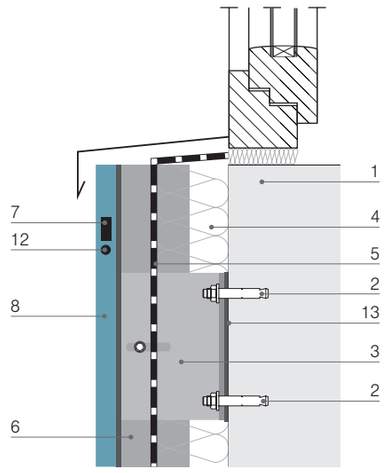



**Fig. Draft E-E**
External window sill

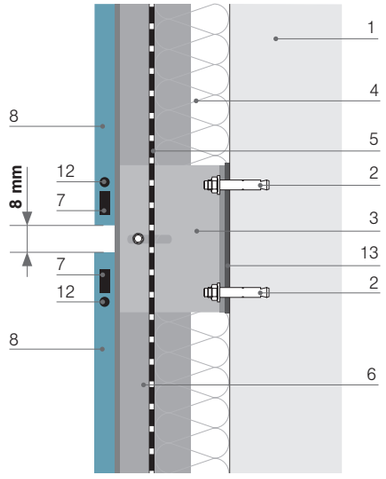



**Fig. Draft B-B**
Beam connector

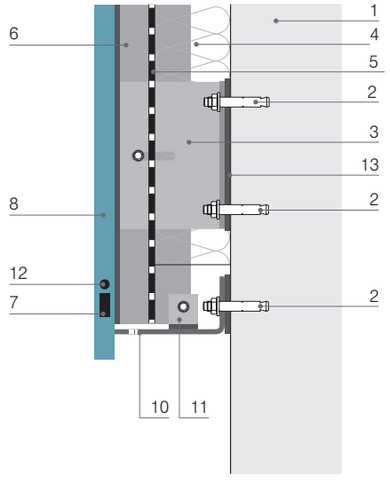



**Fig. Draft J-J**
Bottom part of the wall

## Invisible fixing on wooden substructure

*horizontal cross-section*

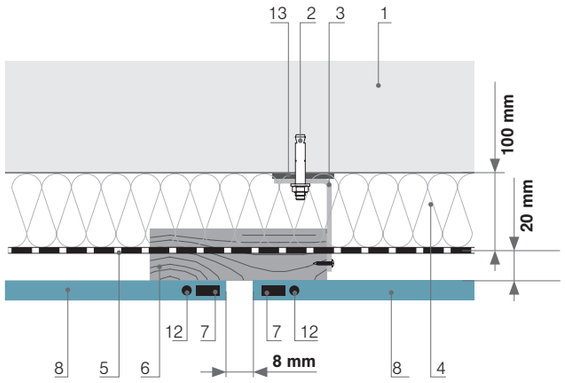



**Fig. Draft A-A**
I-Beam connector

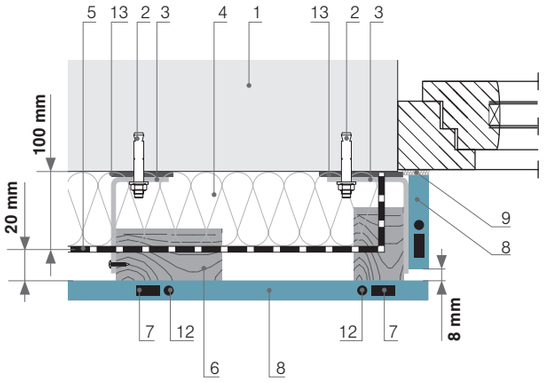



**Fig. Draft C-C**
Connector with window elements (internal)

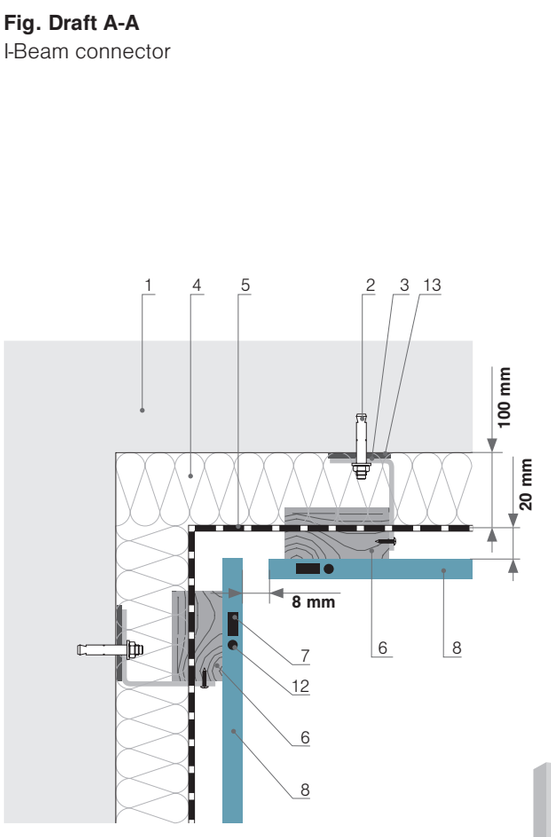



**Fig. Draft H-H**
Connector at the inner corner

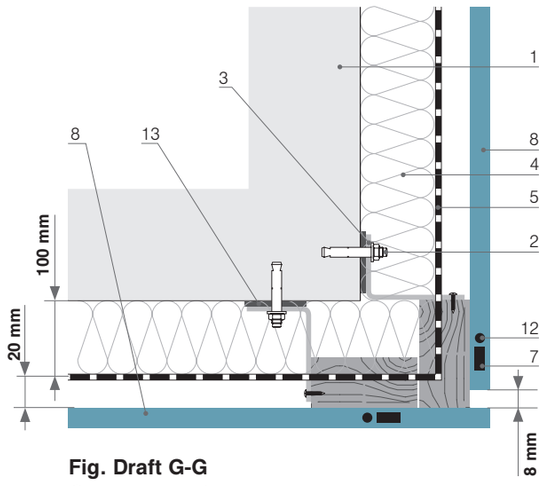
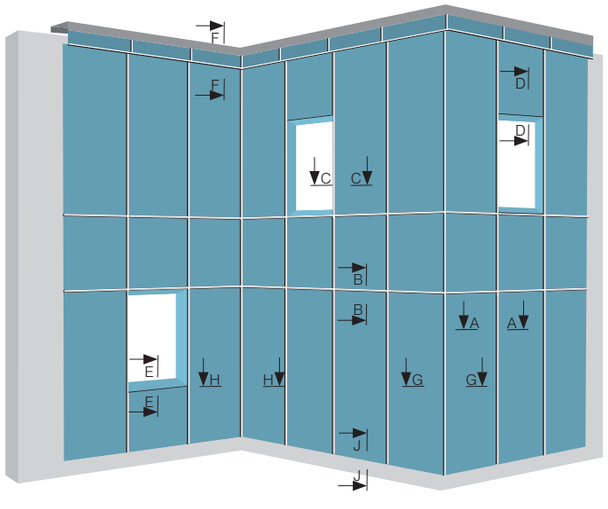



**Fig. Draft G-G**
Connector at the outer corner




*vertical cross-section*

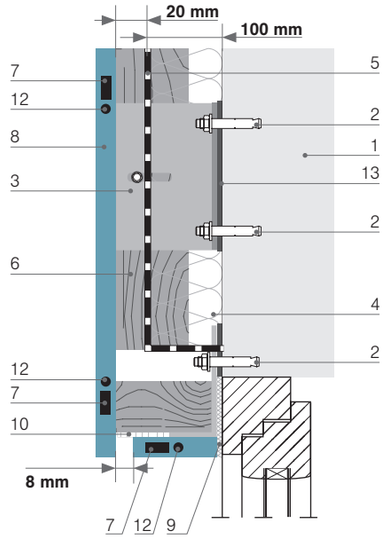



**Fig. Draft D-D**
Connector with window element (external)

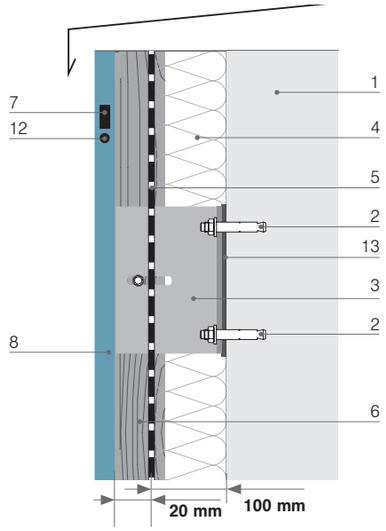



**Fig. Draft F-F**
Upper part of the wall with closing frame

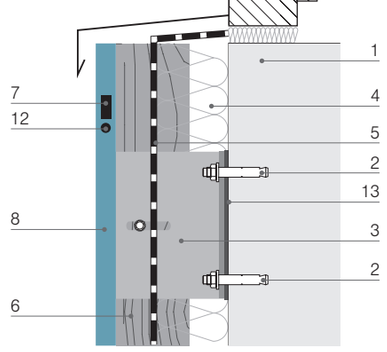



**Fig. Draft E-E**
External window sill

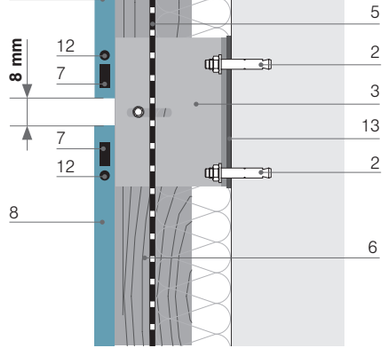



**Fig. Draft B-B**
Beam connector

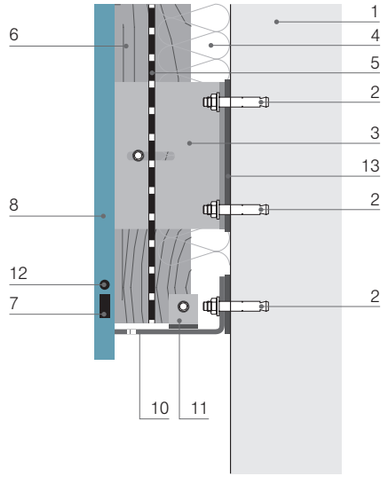



**Fig. Draft J-J**
Bottom part of the wall

1. Supporting wall
2. Fixing anchor
3. Fixing angle L120 x 60 x 3, length 60 mm
4. 100 mm mineral wool
5. Windproofing
6. Vertical timber batten
7. Foam tape
8. Kronoart® panels
9. Weather silicone
10. Perforated angle
11. 40 x 40 x 3 angle
12. Adhesive
13. Insulation washer 80/50

# Invisible fixing on timber frame buildings

*horizontal cross-section*

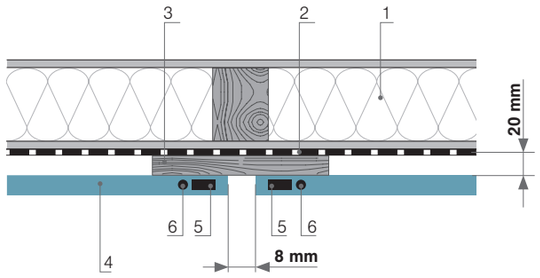



**Fig. Draft A-A**
I-Beam connector

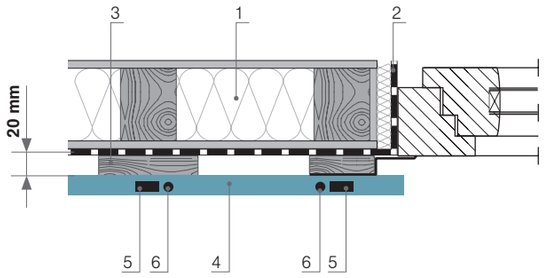



**Fig. Draft C-C**
Connector with window elements (internal)

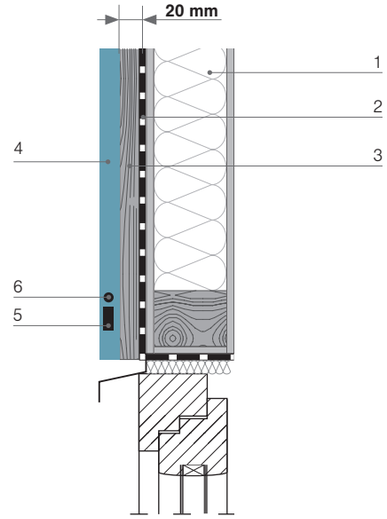



**Fig. Draft D-D**
Connector with window element (external)

*vertical cross-section*

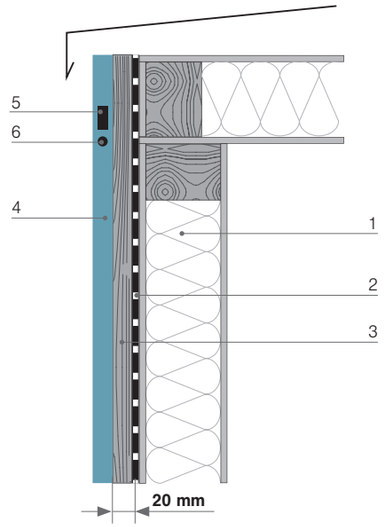



**Fig. Draft F-F**
Upper part of the wall with closing frame

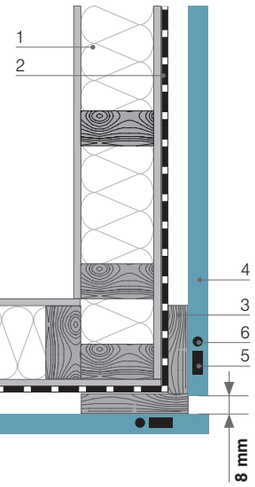



**Fig. Draft G-G**
Connector at the outer corner

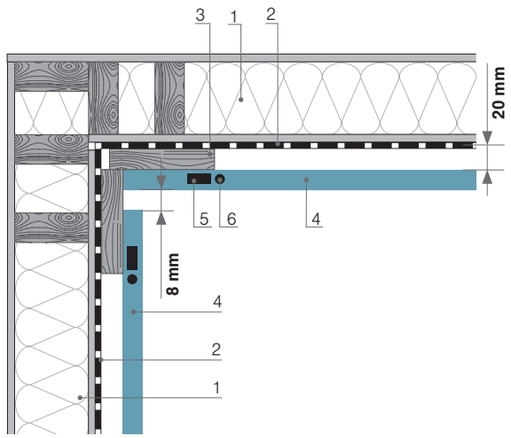
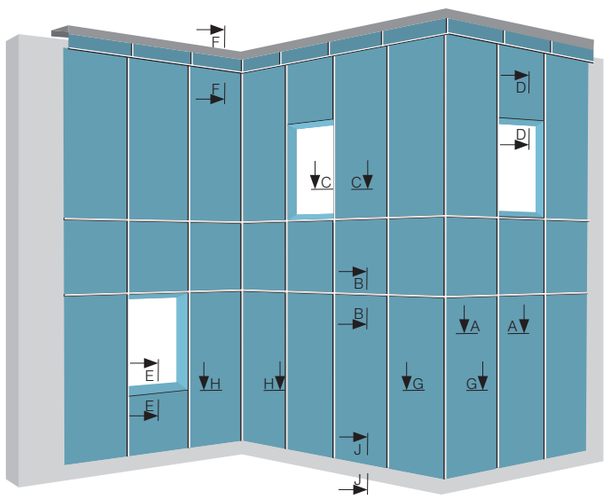



**Fig. Draft H-H**
Connector at the inner corner




1. Load bearing wall
2. Windproofing
3. Vertical timber batten
4. Kronoart® panels
5. Foam tape
6. Adhesive




**Fig. Draft E-E**
External window sill




**Fig. Draft B-B**
Beam connector

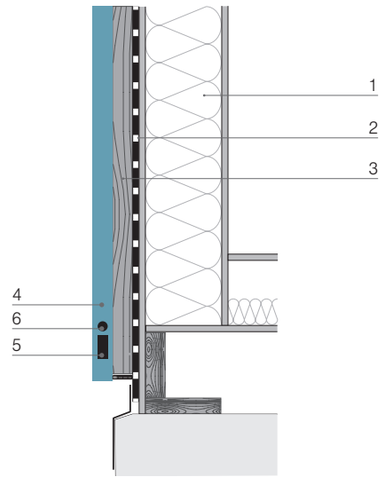
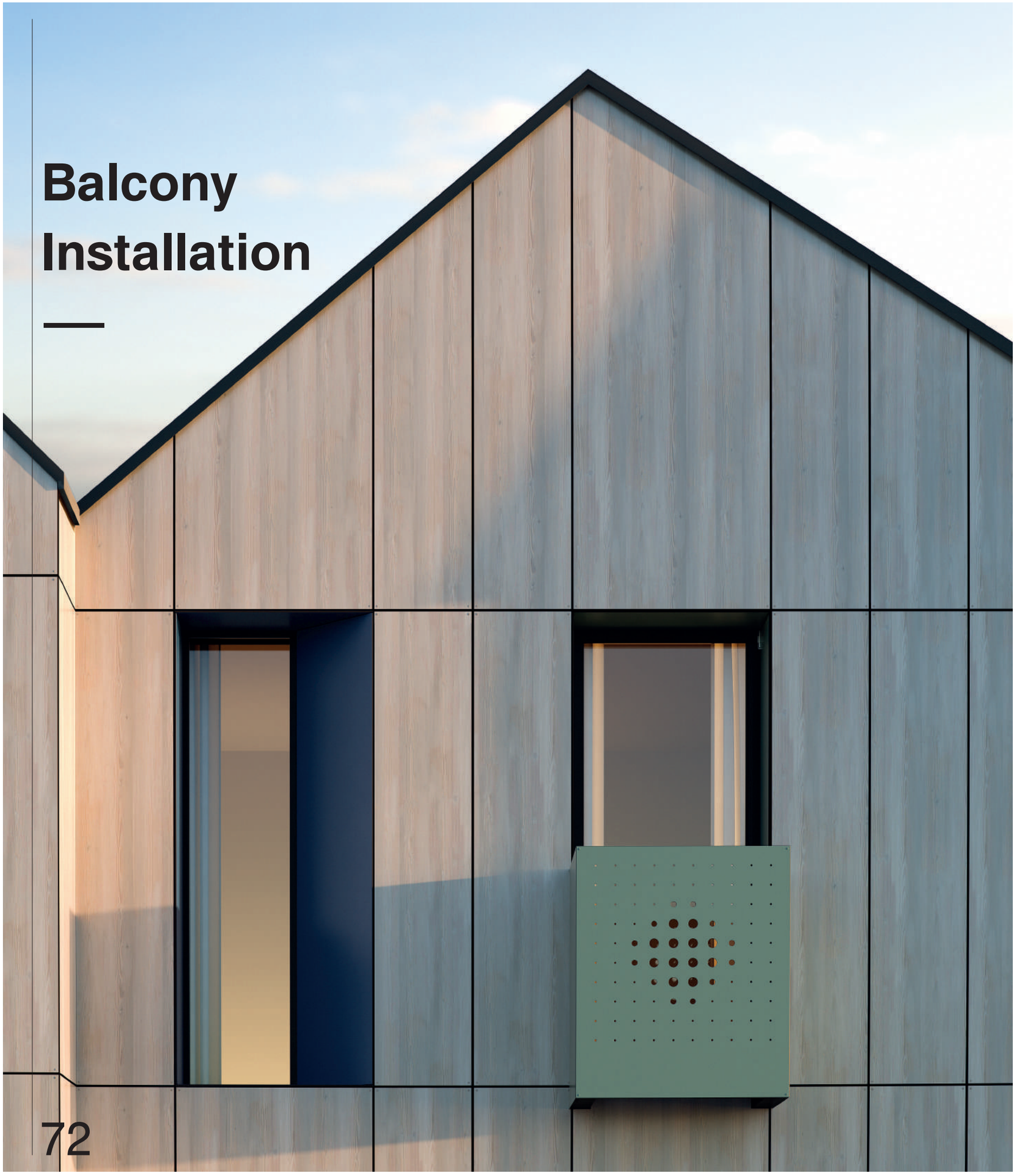



**Fig. Draft J-J**
Bottom part of the wall

# Balcony Installation







## General information

Kronoart® is highly suited to forming balustrades, from both the aesthetic and safety perspectives. It's an excellent alternative to concrete or glass in these applications, as both those materials have low impact strength, less durability and limited color options compared to Kronoart®.
Kronoart® panels are also easily maintained and keep their good looks over the long term.
There are many fixing options available, which adds greater flexibility in your specification process:

- Fitting to posts using fasteners of clamps
- Fitting to posts - in modules
- Fitting to posts - continuous
- Fitting to posts using profiles

Installation is generally performed using bolts, screws, self-drilling connectors or blind rivets affixed to aluminum or steel profiles.

## Fixed point / Non-fixed point

To ensure uniform arrangement of panels, one fixed point should be made in the center of the panel. Other attachment points should be made as non-fixed-points. This mode of installation guarantees an even panel face in both lengthwise and crosswise planes.
The diameter of the fixed-point hole should be the same as the fastener used. The diameters of holes for non-fixed points should be 1.5 times larger than the diameter of the respective fasteners.
The fixed point for one-span fixing should be in the centre of the panel edge.

| | Thickness [mm] | max. D [mm] | max. B [mm | a [mm] | b [mm] |
|---|---|---|---|---|---|
| **One-span fixing** | | | | | |
| | 6 | 400 | 400 | 20 - 40 | 20 |
| | 8 | 550 | 500 | 20 - 40 | 20 |
| | 10 | 700 | 600 | 20 - 40 | 20 |

***Tab.*** *Distribution of joints - one span fixing*

The fixed point for multi-span fixing should be made in the center of the panel.

| | Thickness [mm] | max. D [mm] | max. B [mm] | a [mm] | b [mm] |
|---|---|---|---|---|---|
| **Multi-span fixing** | | | | | |
| | 6 | 550 | 400 | 20 - 60 | 20 - 50 |
| | 8 | 700 | 500 | 20 - 80 | 20 - 60 |
| | 10 | 800 | 600 | 20 - 100 | 20 - 80 |

***Tab.*** *Distribution of joints - milti span fixing*

## Bending

Kronoart® panels can be formed into a curve without any special preparation – the physical and chemical properties of its laminate structure make this possible. The minimum bend radius achievable is: R = 2 m.

## Compensating for dimensional variance

Kronoart®'s base material means some dimensional variance is expected according to changes in humidity and temperature – it behaves in much the same way as wood. It's therefore necessary to incorporate suitable expansion gaps between panels.

- Minimum 8 mm, 2.5 mm per every meter of the panel both lengthwise and crosswise
- 5 mm around the panel for installation in profiles.

If joining profiles are used, allow for the thickness of their body.

## Balustrades

A balustrade system incorporating Kronoart® panels should have strength and be sufficiently durable. The height of balcony balustrades should conform to local building regulations. Its height should be not less than 100 cm, and for buildings over 12 m, it should be at least 110 cm high.

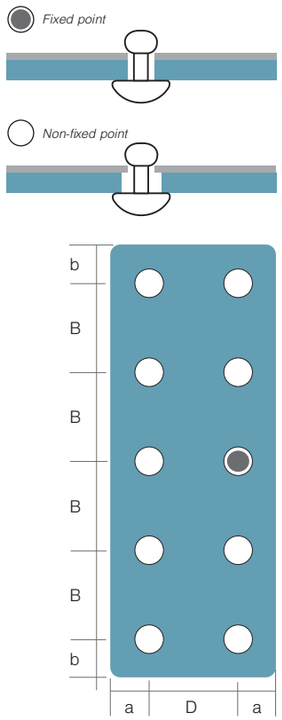



***Fig.*** *One-span fixing*




***Fig.*** *Multi-span fixing*

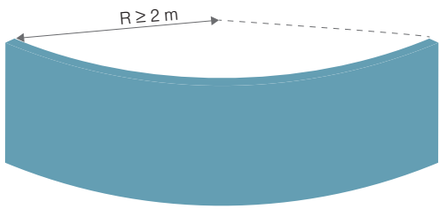


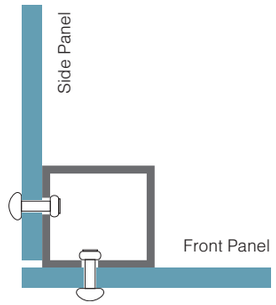

***Fig.*** *Bending of balcony panels*

## Balcony corners

With many corner form options, Kronoart® can fulfil different aesthetic and technical demands.

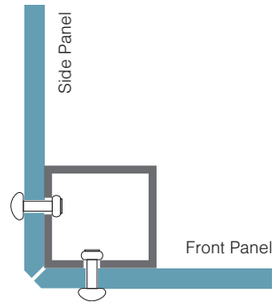
**Open corners**

The front panel is positioned over the side panels, revealing the natural color of the board at its vertical edges.



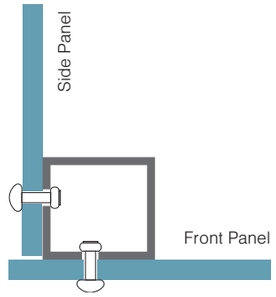

**Corners joined slantwise**

With precise cutting of the panels at 45°, this method delivers a neat, uniform appearance.



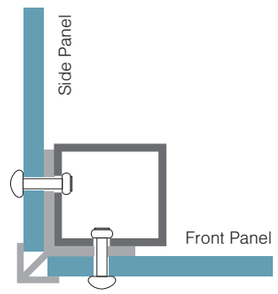

**Masking uneven substructures**

If supports are running out of true, by over-projecting the facing panel by around 10 mm each end it's possible to achieve a neat straight appearance.




**Corners finished with profiles**

The open edges of the side and front panels are concealed by a powder-coated profile, in any RAL color.



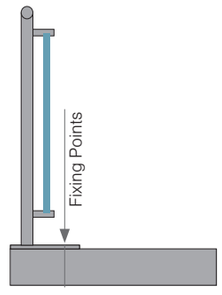

## Fixing of supporting posts

Suitable balustrade supports must be firmly fixed to the floor of the balcony. These are usually tubes or profiles of a rectangular cross section. The fasteners utilized to secure the posts must ensure the safety of the construction and its stability

## Banisters can be mounted three ways

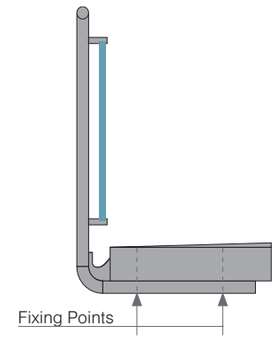
**Upper mounting**

Fixing the frame to the balcony floor is a common method.



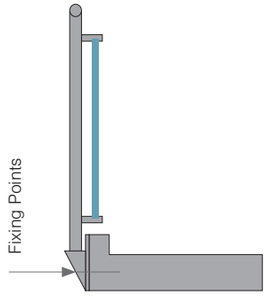

**Lower mounting**

As the balcony floor is untouched, there's no potential for water ingress to the structure, and optimal use is made of the floor area.




**Side mounting**

The frame can be mounted to the outer face of the balcony floor, eliminating the risk of leaks and thermal bridges.



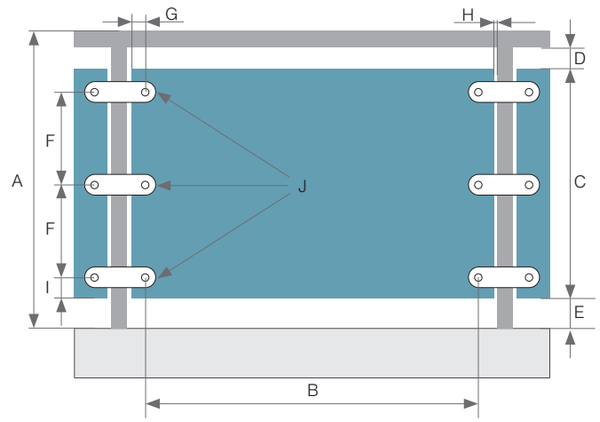




# Installation of balcony panelling

## Visible fixing to posts using fasteners of clamps

**A** Balustrade height
**B** Fixing distance
**C** Panel height
**D** Upper limit distance
**E** Lower limit distance
**F** Distance between connectors
**G** Panel projections
**H** Limit distance
**I** Free projections
**J** Fixing points

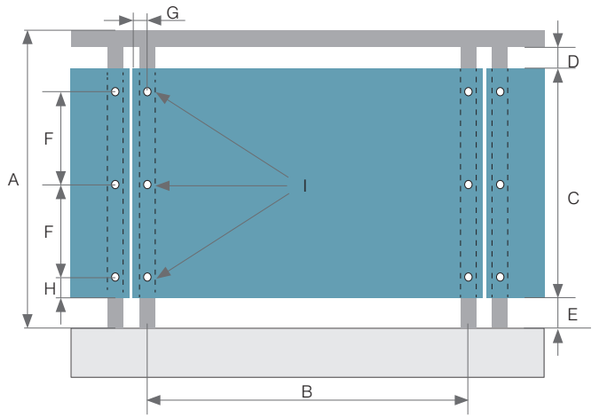



| Panel thickness [mm] | A [cm] | B max. [mm] | C min./max. [mm] | D min./max. [mm] | E [mm] | F max. [mm] | G min./max. [mm] | H min./max. [mm] | I min./max. [mm] | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 90 | 600 | 700 - 780 | 40 - 120 | 40 | 300 | 20 - 40 | 20 - 40 | 50 - 90 | 3 |
| | 110 | | 900 | | | | | | 20 - 150 | 3 |
| | 110 | | 905 - 980 | | | | | | 20 - 40 | 4 |
| 8 | 90 | 700 | 700 - 780 | 40 - 120 | 40 | 300 | 20 - 40 | 20 - 40 | 50 - 90 | 3 |
| | 110 | | 900 | | | | | | 20 - 150 | 3 |
| | 110 | | 905 - 980 | | | | | | 20 - 40 | 4 |
| 10 | 90 | 800 | 700 - 780 | 40 - 120 | 40 | 300 | 20 - 40 | 20 - 40 | 50 - 90 | 3 |
| | 110 | | 900 | | | | | | 20 - 150 | 3 |
| | 110 | | 905 - 980 | | | | | | 20 - 40 | 4 |

***Tab.*** *Spacing of connectors - recommendation*

## Visible fixing to posts - in modules

**A** Balustrade height
**B** Fixing distance
**C** Panel height
**D** Upper limit distance
**E** Lower limit distance
**F** Distance between connectors
**G** Panel projections
**H** Panel projections
**I** Fixing points

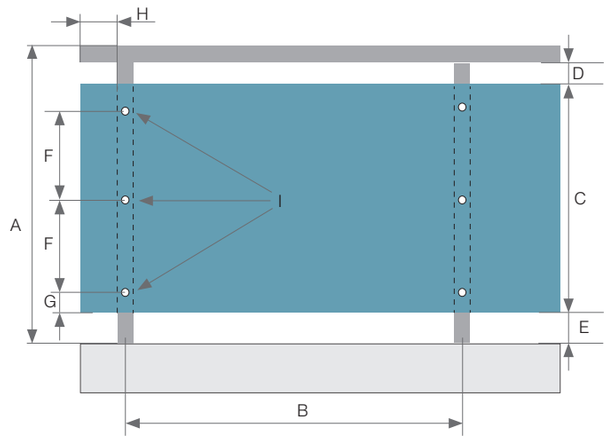



| Panel thickness [mm] | A [cm] | B max. [mm] | C min./max. [mm] | D min./max. [mm] | E [mm] | F max. [mm] | G min./max. [mm] | H min./max. [mm] | I |
|---|---|---|---|---|---|---|---|---|---|
| 6 | 90 | 600 | 700 - 780 | 40 - 120 | 40 | 300 | 20 - 40 | 50 - 90 | 3 |
| | 110 | | 900 | | | | | 20 - 150 | 3 |
| | 110 | | 905 - 980 | | | | | 20 - 40 | 4 |
| 8 | 90 | 700 | 700 - 780 | 40 - 120 | 40 | 300 | 20 - 40 | 50 - 90 | 3 |
| | 110 | | 900 | | | | | 20 - 150 | 3 |
| | 110 | | 905 - 980 | | | | | 20 - 40 | 4 |
| 10 | 90 | 800 | 700 - 780 | 40 - 120 | 40 | 300 | 20 - 40 | 50 - 90 | 3 |
| | 110 | | 900 | | | | | 20 - 150 | 3 |
| | 110 | | 905 - 980 | | | | | 20 - 40 | 4 |

***Tab.*** *Spacing of connectors - recommendation*

## Visible fixing to posts - continuous

**A** Balustrade height
**B** Distance between posts
**C** Panel height
**D** Upper limit distance
**E** Lower limit distance
**F** Distance between connectors
**G** Panel projections
**H** Limit distance
**I** Fixing points

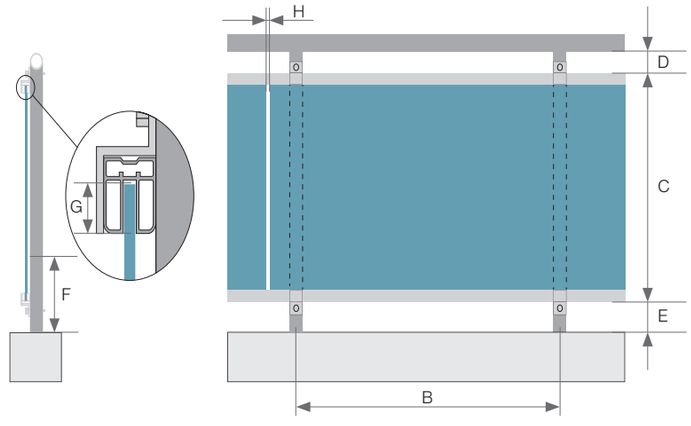



| Panel thickness [mm] | A [cm] | B max. [mm] | C min./max. [mm] | D min./max. [mm] | E [mm] | F max. [mm] | G min./max. [mm] | H min./max. [mm] | I |
|---|---|---|---|---|---|---|---|---|---|
| 6 | 90<br>110<br>110 | 600 | 700 - 780<br>900<br>905 - 980 | 40 - 120 | 40 | 300 | 20 - 40 | 20 - 40 | 3<br>3<br>4 |
| 8 | 90<br>110<br>110 | 700 | 700 - 780<br>900<br>905 - 980 | 40 - 120 | 40 | 300 | 20 - 40 | 20 - 40 | 3<br>3<br>4 |
| 10 | 90<br>110<br>110 | 800 | 700 - 780<br>900<br>905 - 980 | 40 - 120 | 40 | 300 | 20 - 40 | 20 - 40 | 3<br>3<br>4 |

***Tab.*** *Spacing of connectors - recommendation*

## Visible fixing to posts using profiles

**B** Distance between posts
**C** Panel height
**D** Upper limit distance
**E** Lower limit distance
**F** Support of balustrade posts
**G** Depth of insertion into profile
**H** Distance between panels



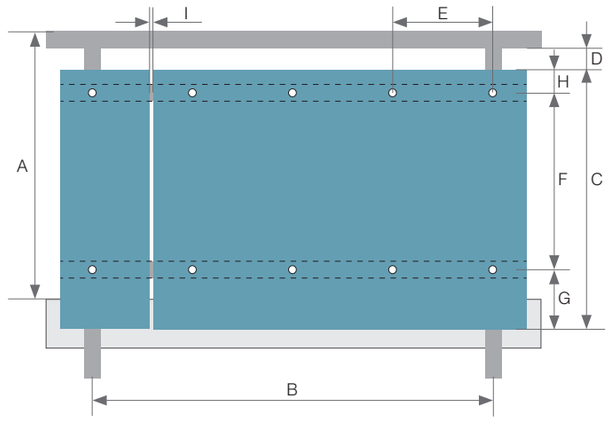

| Panel thickness [mm] | Height of balustrade elements max. [cm] | B max. [mm] | C min./max. [mm] | D min./max. [mm] | E [mm] | F max. [mm] | G min. [mm] | H min./max. [mm] |
|---|---|---|---|---|---|---|---|---|
| 6 | 131,5 | 1000 | 1045 | 120 | 40 | 300 | 20 | 6 |
| 8 | 156,5 | 1200 | 1100 | 120 | 40 | 300 | 20 | 8 |

***Tab.*** *Spacing of connectors - recommendation*



## Visible fixing to locks - continuous

**A** Balustrade height
**B** Distance between posts
**C** Panel height
**D** Upper limit distance
**E** Lower limit distance
**F** Distance between locks
**G** Panel projections
**H** Panel projections
**I** Distance between panels

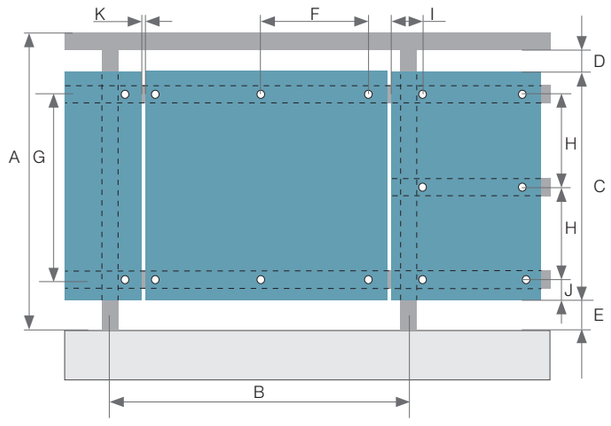



| Panel thickness [mm] | A [cm] | B max. [mm] | C min./max. [mm] | D min./max. [mm] | E [mm] | F max. [mm] | G max. [mm] | H max. [mm] | I [mm] |
|---|---|---|---|---|---|---|---|---|---|
| 6 | 110 | 1160 | 1050 | 40 - 120 | 300 | 820 | 150 | 80 | 6 |
| 8 | 110 | 1200 | 1180 | 40 - 120 | 300 | 950 | 150 | 80 | 8 |
| 10 | 110 | 1500 | 1280 | 40 - 120 | 300 | 1050 | 150 | 80 | 8 |

***Tab.*** *Spacing of connectors - recommendation*

## Visible fixing to locks - in modules

**A** Balustrade height
**B** Distance between posts
**C** Panel height
**D** Upper limit distance
**E** Lower limit distance
**F** Distance between connectors
**G** Distance between locks
**H** Distance between locks
**I** Panel projections
**J** Panel projections
**K** Distance between panels




| Panel thickness [mm] | A [cm] | B max. [mm] | C min./max. [mm] | D min./max. [mm] | E [mm] | F max. [mm] | G max. [mm] | H max. [mm] | I [mm] | J [mm] | K [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 90<br>110<br>110 | 600 | 700 - 780<br>900<br>905 - 980 | 40 - 120 | 40 | 300 | 600 | 430<br>470 | 20 - 40 | 50 - 90<br>20 - 150<br>20 - 40 | 3<br>3<br>4 |
| 8 | 90<br>110<br>110 | 700 | 700 - 780<br>900<br>905 - 980 | 40 - 120 | 40 | 300 | 700 | 430<br>470 | 20 - 40 | 50 - 90<br>20 - 150<br>20 - 40 | 3<br>3<br>4 |
| 10 | 90<br>110<br>110 | 800 | 700 - 780<br>900<br>905 - 980 | 40 - 120 | 40 | 300 | 700 | 430<br>470 | 20 - 40 | 50 - 90<br>20 - 150<br>20 - 40 | 3<br>3<br>4 |

***Tab.*** *Spacing of connectors - recommendation*

# Installation through visible fittings

## General information

The Kronoart® panels behave like wood in changing weather conditions - they expand when absorbing moisture and contract in dry air discharging moisture. Taking into consideration these properties, during installation the appropriate compensation clearance should be applied (the expansion gaps between panels 8-10 mm), assuring a possibility of uniform expansion of panels. To this end one fixed point should be made. The other fixing points can be made as non-fixed points.

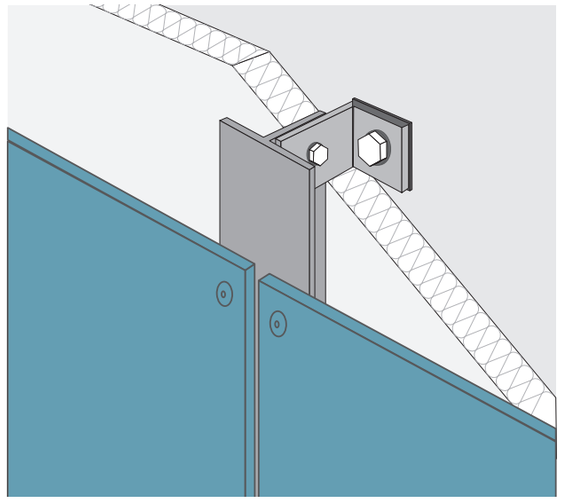


***Fig.*** *Visible fixing on metal substructure*

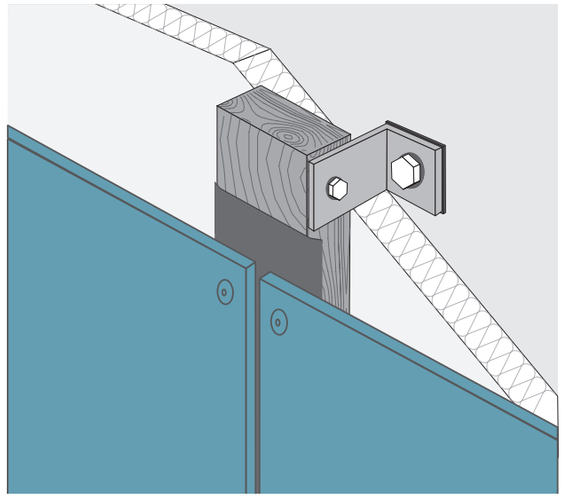


***Fig.*** *Visible fixing on wooden substructure*

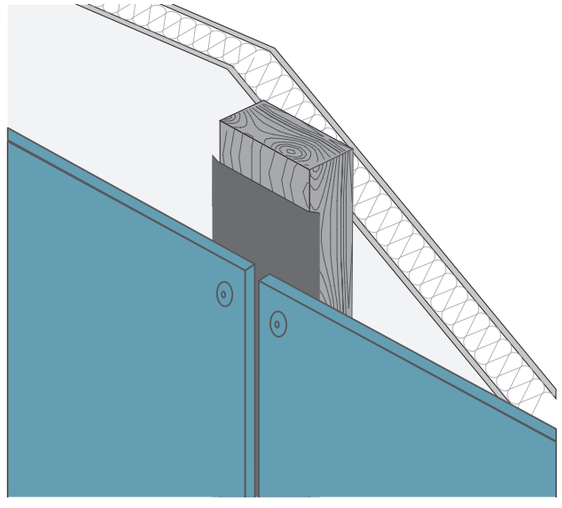
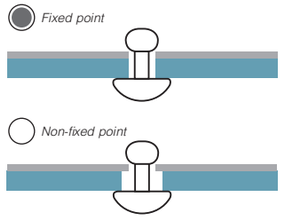


***Fig.*** *Visible fixing on timber frame buildings*

## Fixed point / Non-fixed point

Making a fixed point always guarantees even facing of panels both lengthwise and crosswise. For rivets the recommended diameter of a hole in the facade panel for the fixed point is Ø 5.1 mm, and for the non-fixed point is Ø 8.5 mm. The hole diameter in the construction: Ø 5.1 mm. For Torx screws the recommended diameters of holes for non-fixed points is Ø 8.0 mm, and for fixed points Ø 5.7 mm.




## Distribution of installation holes

Below are given the suggested distances of fixings for the one-span installation of elevation panels.

| | Thickness [mm] | max. D1 [mm] | max. D2 [mm] | a [mm] | b [mm] |
|---|---|---|---|---|---|
| **One-span fixing** | | | | | |
| | 6 | 400 | 400 | 20 - 40 | 20 |
| | 8 | 550 | 500 | 20 - 40 | 20 |
| | 10 | 700 | 600 | 20 - 40 | 20 |

***Tab.*** *Distribution of joints - one span fixing*

In the case of multi-span fixing of panel, it is recommended to distribute the installation holes as given in the table below.

| | Thickness [mm] | max. D1 [mm] | max. D2 [mm] | a [mm] | b [mm] |
|---|---|---|---|---|---|
| **Multi-span fixing** | | | | | |
| | 6 | 550 | 400 | 20 - 60 | 20 - 50 |
| | 8 | 700 | 500 | 20 - 80 | 20 - 60 |
| | 10 | 800 | 600 | 20 -100 | 20 - 80 |

***Tab.*** *Distribution of joints - multi-span fixing*

Generally, it can be assumed that the distance of joints from the panel edge should be maximum 10-fold of panel thickness and minimum 20 mm. For panels placed near the building corners the distance between the joints should be less than in the center part (taking into account the suction forces of wind).

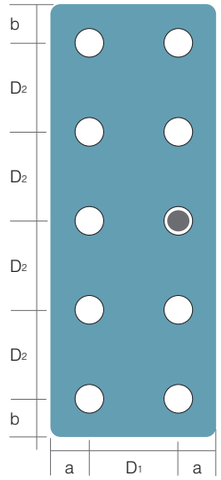



***Fig.*** *One-span fixing*

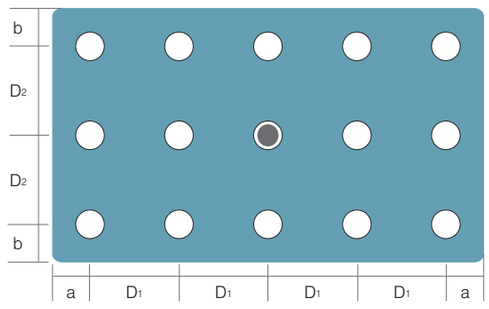



***Fig.*** *Multi-span fixing*

## Bending

Kronoart® panels can be formed into a curve without any special preparation – the physical and chemical properties of its laminate structure make this possible. The minimum bend radius achievable is: R = 2 m.

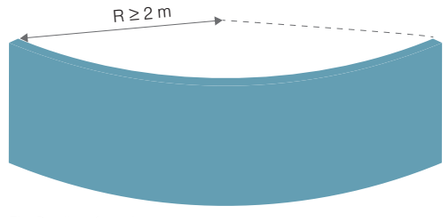



***Fig.*** *Bending of panels*

## Sizes of installation panels

It is recommended not to exceed the elevation format surface over 4 $m^2$, whereas the maximum acceptable side length should not exceed 3050 mm.

# Fixing elements

## Coated rivets

Large head powder-coat rivets should be used on systems with visible fixings, attached to aluminum framework according to certificated parameters.

| Element | Type of material | No of material |
|---|---|---|
| Sleeve | Al Mg 5 | 3.3555.10 |
| Stem | stainless steel | 1.4541 (Alfo®); 1.4301 (SFS) |

***Tab.*** *Parameters of blind rivets*

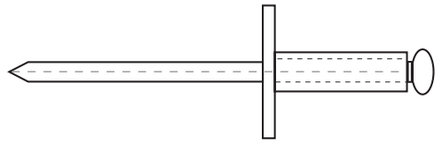


***Fig.*** *Blind rivet, closed from one side, painted*

| Diameter Ø d / Length L [mm] | 5/18 | 5/21 |
|---|---|---|
| Max. thickness of material [mm] | 12 | 15 |
| Diameter Ø d1 [mm] | 2.7 | 2.7 |
| Diameter Ø D [mm] | 14 | 14 |
| Catalogue no. (Alfo® ) | 12250180/14 | 12250210/14 |
| Catalogue no. (SFS) | AP14-50180-S | AP14-50210-S |
| Quantity | 500 / carton | 500 / carton |

***Tab.*** *Technical data of the recommended connectors*

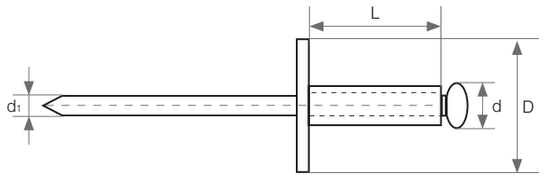



***Fig.*** *Blind rivet – construction and dimensions*

Breaking force of the rivets is 4.4 – 5.2 kN.
In the majority of cases the specifications listed above can be followed for adequate fixing. Riveting tools and accessories are available, including manual and machine riveting options, distancing tips, centering tools for drilling, and a positioning tip for centering the preliminary hole.

## Torx 20 screws

These are intended for use with timber supporting frames. They're made from corrosion resistant austenitic stainless steel, finished in powder coated colors. They can be used without washers, with single or double threads.

| No of material | 1.4301 |
|---|---|
| Diameter Ø d2 [mm] | 12 |
| Diameter Ø d1 [mm] | 5.2 |
| Length L [mm] | 24 |
| Screw driver tip | TORX T20W |
| Pitch of the screw P [mm] | 2.2 |

***Tab.*** *Technical data of fitting screws Torx*

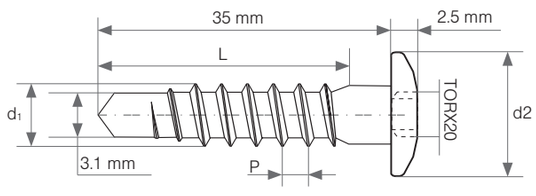



***Fig.*** *Fixing screw Torx - construction and dimensions*

d1 thread diameter
d2 head diameter
L length
P pitch of the screw

## Self-drilling stainless fasteners

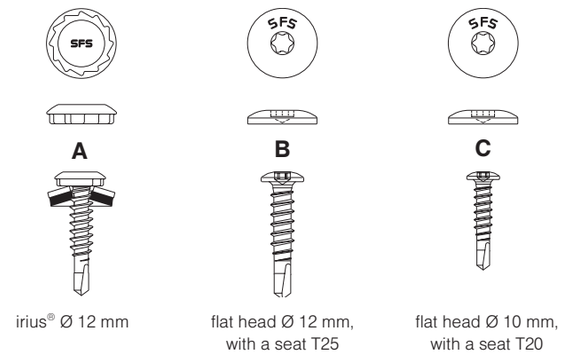
SX-L12 (SFS) fasteners achieve a neat, almost invisible finish, with the flat screw heads being powder coated in colors to match the panels. They may be utilized with steel or aluminum support structures.

| Element | Type of material | No of material |
|---|---|---|
| Connector SX | austenitic stainless steel | grade acc. to AISI 304 (1.4301 wg. PN-EN) |
| Washer S | austenitic stainless steel | grade acc. to AISI 304 (1.4301 wg. PN-EN) |

***Tab.*** *Self-drilling connectors – materials used.*

Heads of connectors, depending on version:

- L12 - irius® Ø 12 mm,
- D12 - flat head Ø 12 mm with a seat T25.
- D10 - flat head Ø 10 mm with a seat T20.




irius® Ø 12 mm | flat head Ø 12 mm, with a seat T25 | flat head Ø 10 mm, with a seat T20

| Product | Type | VD | KL | HD | W | d | L | Application |
|---|---|---|---|---|---|---|---|---|
| A | SX | 3/ | 15/ | L12 | S16 | 5.5x | 32 | VD max. steel: 3.0 mm<br>t max. steel: 2.5 mm |
| B | SX | 3/ | 15/ | D12 | | 5.5x | 30 | VD max. steel: 3.0 mm<br>t max. steel: 2.5 mm |
| C | SX | 3/ | 15/ | D10/ | | 5.5x | 25 | VD max. steel: 3.0 mm<br>t max. steel: 2.5 mm<br>t min. steel: 2.0 mm<br>t min. aluminium: 2.0 mm |

***Tab.*** *Symbols and parameters of connectors (SFS). All dimensions in mm.*

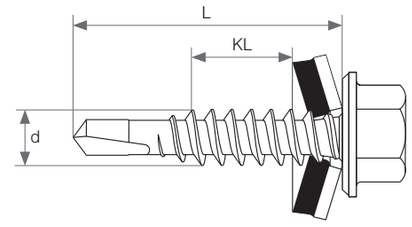



***Fig.*** *Self-drilling connector - construction.*

KL thickness of joined elements
d thread diameter
L total length
VD maximum drilling capability
HD type of head/ seat
W material and diameter of washer
t thickness of substrate

# Visible fixing on metal substructure

*horizontal cross-section*

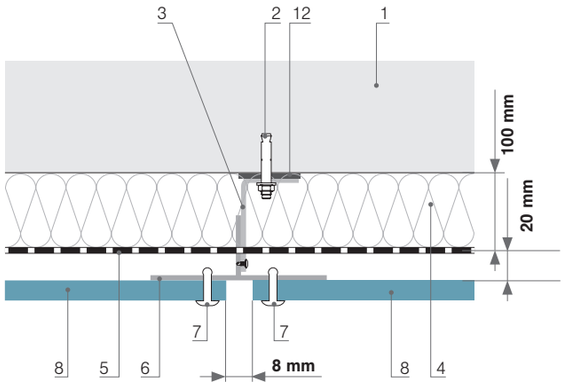



**Fig. Draft A-A**
I-Beam connector

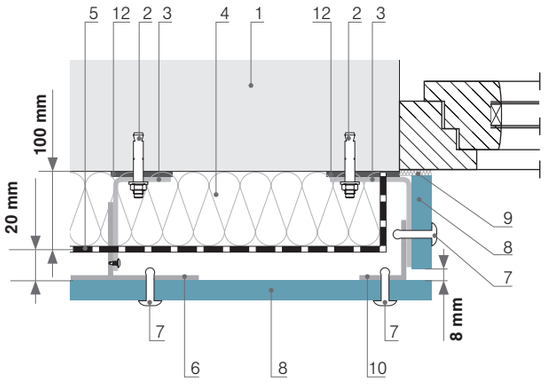



**Fig. Draft C-C**
Connector with window elements (internal)




**Fig. Draft H-H**
Connector at the inner corner

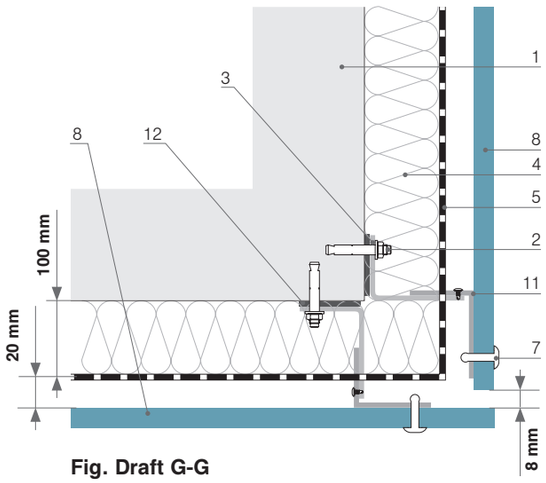
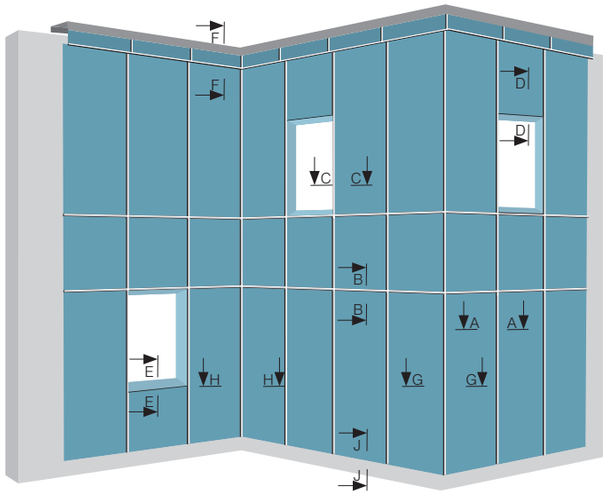



**Fig. Draft G-G**
Connector at the outer corner




1. Supporting wall
2. Fixing anchor
3. Fixing angle L120 x 60 x 3, length 60 mm
4. 100 mm mineral wool
5. Windproofing
6. T90 x 70 x 4 fixing tees
7. Rivet fastening in the color of the panel
8. Kronoart® panel
9. Weather silicone
10. Perforated angle
11. 40 x 40 angle
12. Insulation washer 80/50

*vertical cross-section*

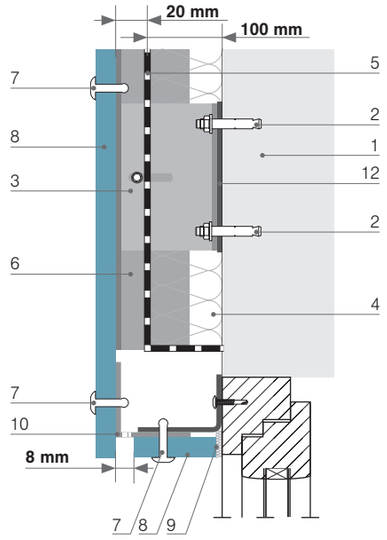



**Fig. Draft D-D**
Connector with window element (external)

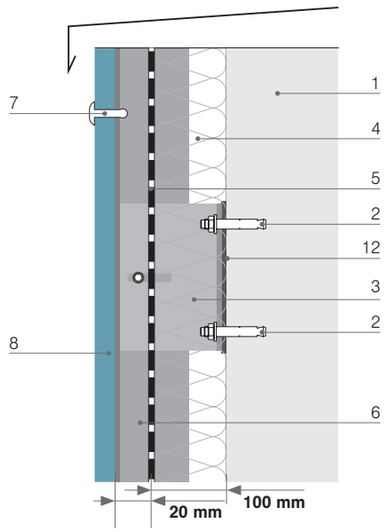



**Fig. Draft F-F**
Upper part of the wall with closing frame

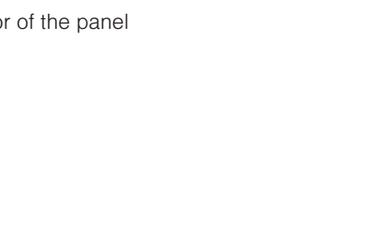



**Fig. Draft E-E**
External window sill

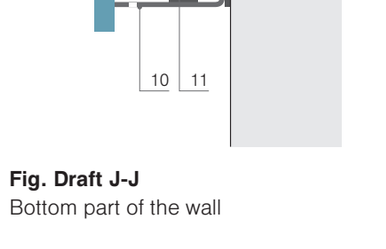



**Fig. Draft B-B**
Beam connector

**Fig. Draft J-J**
Bottom part of the wall

# Visible fixing on wooden substructure

*horizontal cross-section*

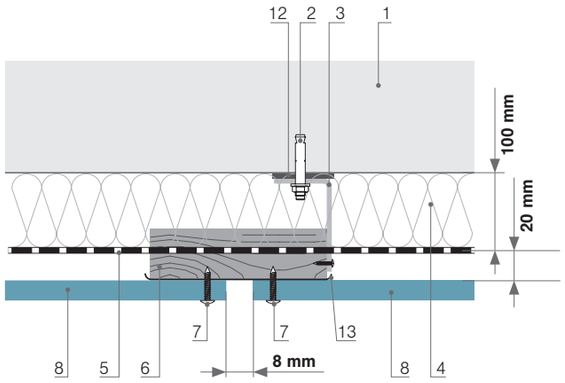



**Fig. Draft A-A**
I-Beam connector

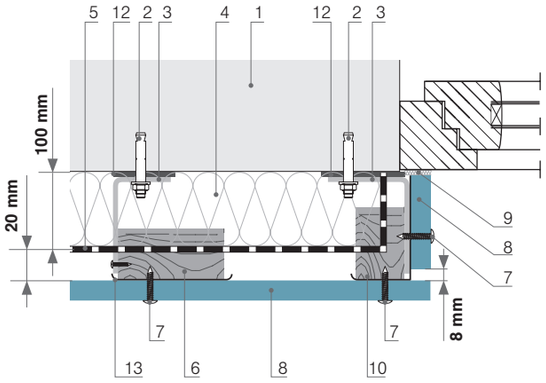



**Fig. Draft C-C**
Connector with window elements (internal)




**Fig. Draft H-H**
Connector at the inner corner

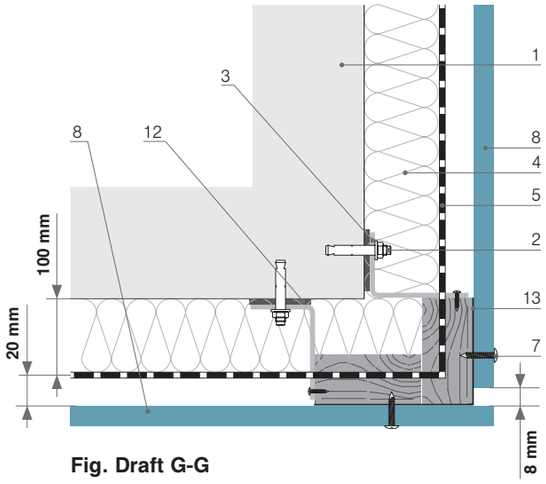
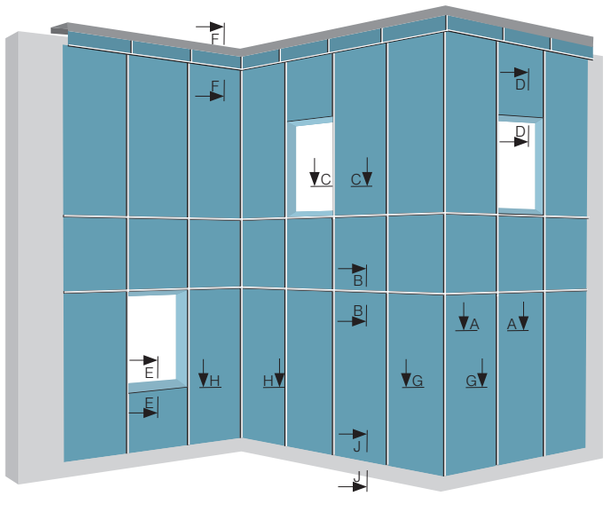



**Fig. Draft G-G**
Connector at the outer corner




1. Supporting wall
2. Fixing anchor
3. Fixing angle L120 x 60 x 3, length 60 mm
4. 100 mm mineral wool
5. Windproofing
6. Vertical timber batten
7. Rivet fastening in the color of the panel
8. Kronoart® panel
9. Weather silicone
10. Perforated angle
11. 40 x 40 angle
12. Insulation washer 80/50
13. EPDM tape

*vertical cross-section*

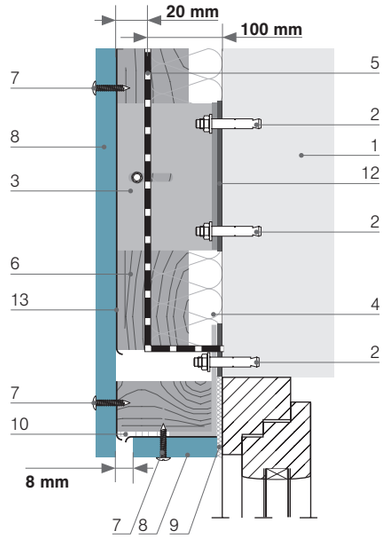



**Fig. Draft D-D**
Connector with window element (external)

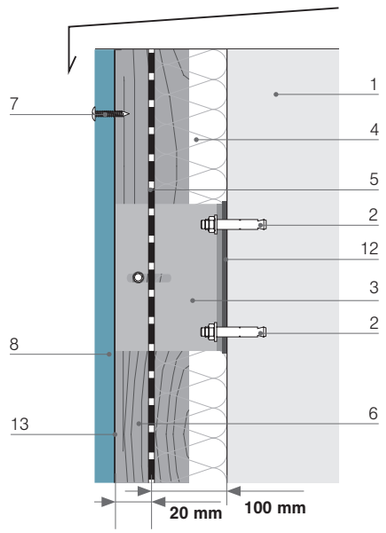



**Fig. Draft F-F**
Upper part of the wall with closing frame




**Fig. Draft E-E**
External window sill

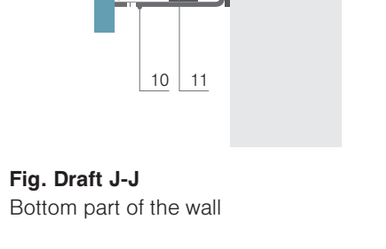



**Fig. Draft B-B**
Beam connector




**Fig. Draft J-J**
Bottom part of the wall

# Visible fixing on timber frame buildings

*horizontal cross-section*

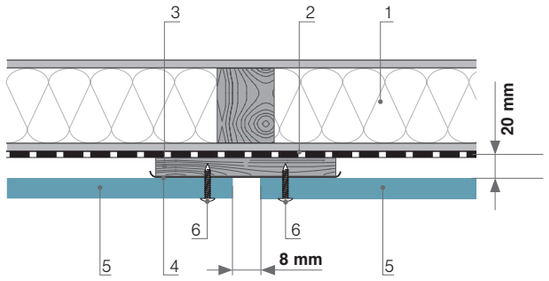



**Fig. Draft A-A**
I-Beam connector

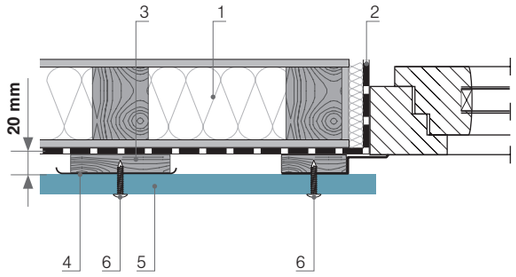



**Fig. Draft C-C**
Connector with window elements (internal)

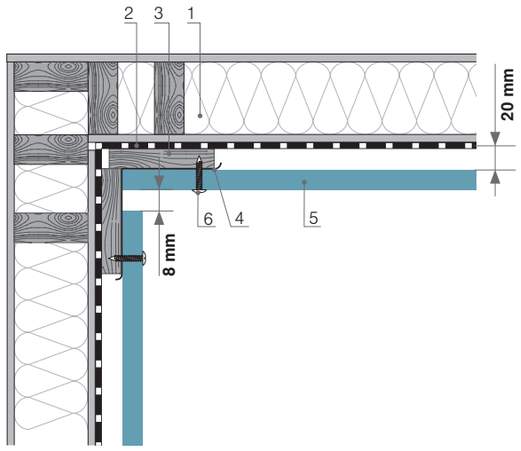



**Fig. Draft H-H**
Connector at the inner corner

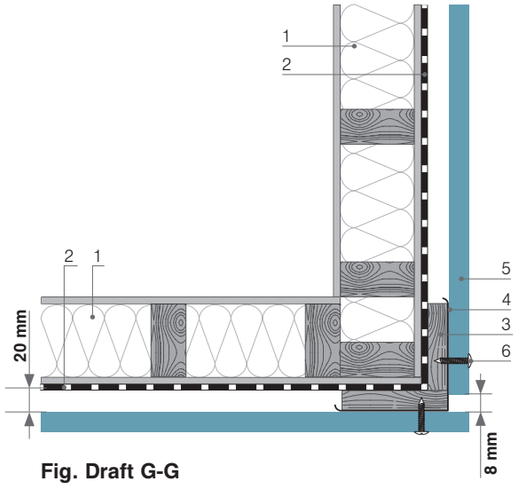
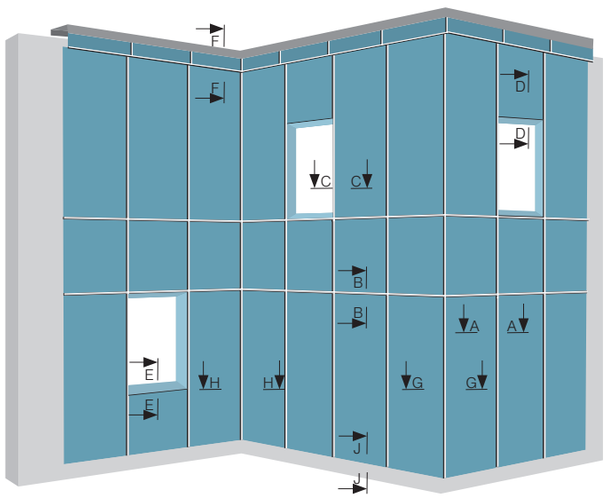



**Fig. Draft G-G**
Connector at the outer corner




*vertical cross-section*

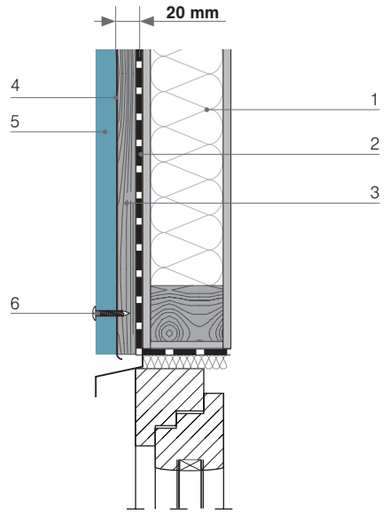



**Fig. Draft D-D**
Connector with window element (external)

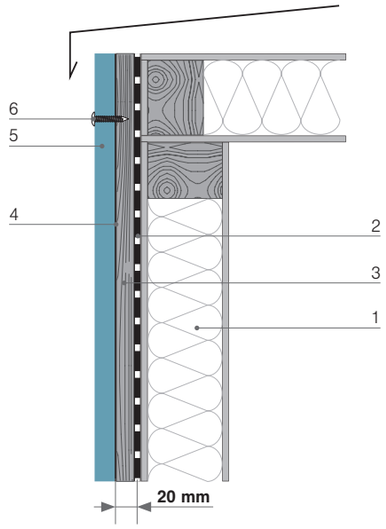



**Fig. Draft F-F**
Upper part of the wall with closing frame

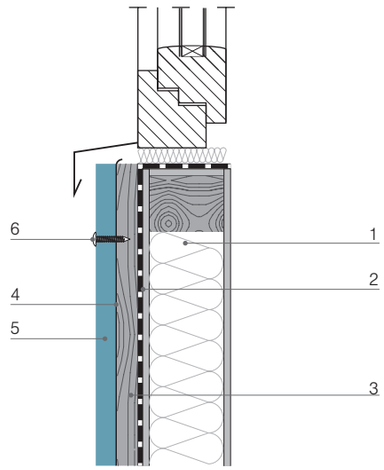



**Fig. Draft E-E**
External window sill

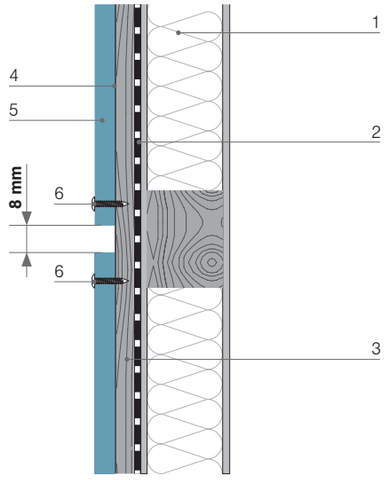



**Fig. Draft B-B**
Beam connector

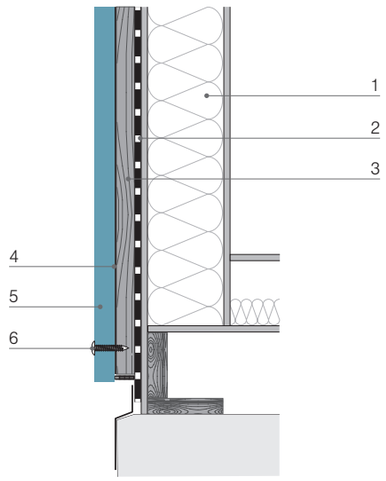



**Fig. Draft J-J**
Bottom part of the wall

1. Load bearing wall
2. Windproofing
3. Vertical timber batten
4. EPDM tape
5. Kronoart® panel
6. Rivet fastening in the color of the panel

# Balcony partitions

Fitting partitions within balcony spaces can solve a number of design issues – providing privacy, weather protection, sun shading, for example. Partitions can also form part of features such as pergolas, storage spaces and shelters, and also define access routes. Kronoart® panels are ideally suited to partitioning roles. The method of connecting the partition to the wall and the balustrade will vary according to the panel size, and what its function will be.

## Method of partition installation

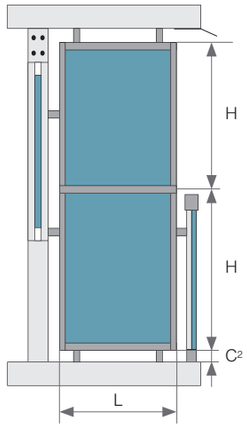
The following methods are recommended:

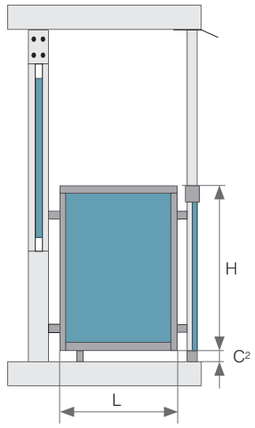
- Framing with a profile from all sides
- Framing to lacing from galvanized steel
- Fitting to profiles using rivets and screws

The Kronoart® panels may be fitted to profiles by rivets or balcony bolts.

### Framing profiles from all sides

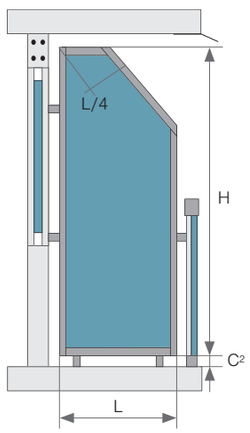
The dimensions of profiles should match the thickness of panels, taking into consideration the dimension tolerances and possible sealing with EPDM.
It is important to enable free panel movement by maintaining a distance from the side and upper profiles - minimum 5 mm. Suitable water drainage should be enabled, by matching the slotted holes or by drilling holes in the lower profile.
Below are recommendations for spacing of connectors where:
$L_{max}$ is the largest admissible spacing of fitting elements for given height to width ratio (H/L) of the partition under design and for the selected panel thickness.
$C_2$ is the distance between the profile edge and the floor; it should be 20-fold of laminate thickness (maximum value).

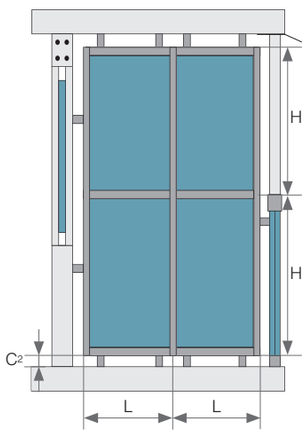



| | | Panel thickness [mm] | | | |
|---|---|---|---|---|---|
| | **H/L** | **6** | **8** | **10** | **13** |
| Framing from 4 sides | 0.98 | 765 | 1029 | 1284 | 1666 |
| | 1.18 | 725 | 960 | 1196 | 1558 |
| | 1.38 | 686 | 902 | 1127 | 1470 |
| | 1.58 | 647 | 853 | 1068 | 1392 |
| | 1.78 | 608 | 813 | 1019 | 1323 |
| | 1.98 | 578 | 774 | 970 | 1264 |
| Framing from 2-3 sides | > 2.48 | 559 | 745 | 931 | 1206 |
| | | **Max. spacing $L_{max}$ [mm]** | | | |

***Tab.*** *Spacing of bearing profiles, maximum distances*

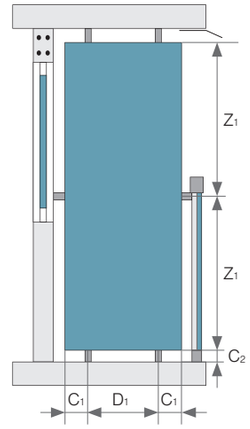


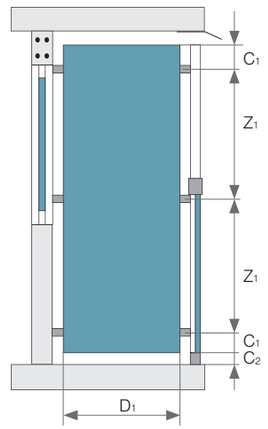



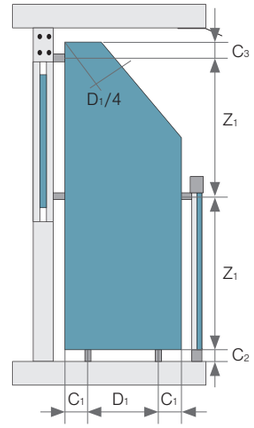

### Fitting to steel lacings

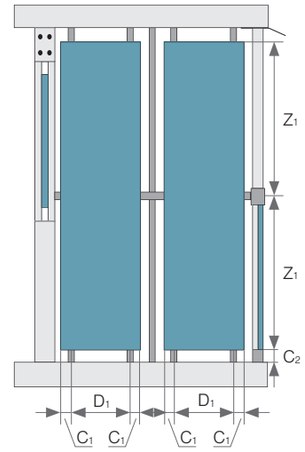
Below are given the recommended spacing for connectors where: $D_1$ is maximum distance between the fitting elements for one-span fitting, and $Z_1$ is the largest admissible spacing of fitting elements for multi-span fitting for the selected panel thickness:

- $C_1$ - distance between the holder and the laminate edge, 20 - 150 mm,
- $C_2$ - distance between the lower edge and the floor, min. 149 mm,
- $C_3$ - distance between the edge of upper profile and the holder, 20 - 150 mm.



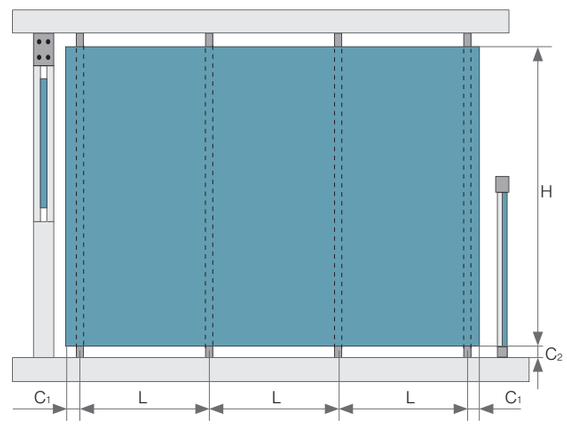

| **Panel thickness [mm]** | **6** | **8** | **13** |
|---|---|---|---|
| $D_1$ [mm] | 588 | 735 | 931 |
| $Z_1$ [mm] | 735 | 882 | 1176 |

***Tab.*** *Spacing of bearing profiles, maximum distances*

### Fitting to profiles with rivets or balcony bolts

Below are given the recommended spacing of connectors where $L_{max}$ is maximum distance between the fitting elements depending on the panel thickness and number of fitting spans.

- $C_1$ - 149 mm (minimum value),
- $C_2$ dimension = 20-fold of laminate thickness (maximum value).




| **Panel thickness [mm]** | **6** | **8** | **10** | **13** |
|---|---|---|---|---|
| $L_{max}$ (single span) [mm] | 539 | 539 | 931 | 1176 |
| $L_{max}$ (multi span) [mm] | 686 | 882 | 1127 | 1470 |

***Tab.*** *Spacing of bearing profiles, maximum distances*

# Fastenings for balconies

## Coated rivets

Large head, powder coated rivets can be used as visible fixings on balconies, secured to aluminum supporting elements in line with relevant regulations.

| Element | Type of material | No of material |
|---|---|---|
| Sleeve | Al Mg 5 | 3.3555.10 |
| Stem | stainless steel | 1.4541 (Alfo®); 1.4301 (SFS) |

***Tab.*** *Parameters of blind rivets*

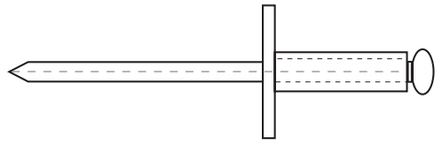


***Fig.*** *Blind rivet, closed from one side, painted*

| Diameter Ø d / length L [mm] | 5/18 | 5/21 |
|---|---|---|
| Max. thickness of material [mm] | 12 | 15 |
| Diameter Ø d1 [mm] | 2.7 | 2.7 |
| Diameter Ø D [mm] | 14 | 14 |
| Catalogue no. (Alfo®) | 12250180/14 | 12250210/14 |
| Catalogue no. (SFS) | AP14-50180-S | AP14-50210-S |
| Quantity | 500 / carton | 500 / carton |

***Tab.*** *Technical data of the recommended connectors*

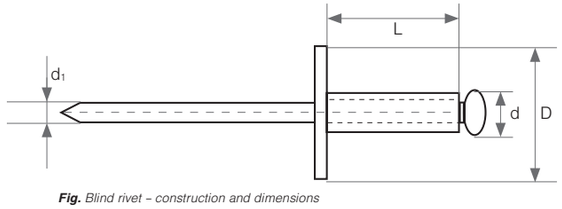



***Fig.*** *Blind rivet – construction and dimensions*

Breaking force of the rivets is 4.4 – 5.2 kN.
In the majority of cases the specifications listed above can be followed for adequate fixing. Riveting tools and accessories are available, including manual and machine riveting options, distancing tips, centering tools for drilling, and a positioning tip for centering the preliminary hole.

## Torx 20 screws

These are intended for use with timber supporting frames. They're made from corrosion resistant austenitic stainless steel, finished in powder coated colors. They can be used without washers, with single or double threads.

| No of material | 1.4301 |
|---|---|
| Diameter Ø d2 [mm] | 12 |
| Diameter Ø d1 [mm] | 5.2 |
| Length L [mm] | 24 |
| Screw driver tip | TORX T20W |
| Pitch of the screw P [mm] | 2.2 |

***Tab.*** *Technical data of fitting screws Torx*

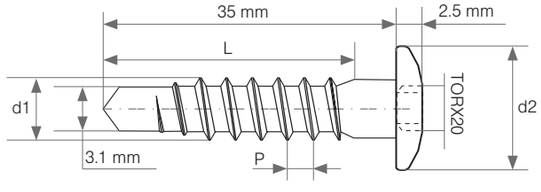



***Fig.*** *Fixing screw Torx - construction and dimensions*

d1 thread diameter
d2 head diameter
L length
P pitch of the screw

## Balcony screws

Our specialized screws enable fitting of Kronoart® panels with complete peace of mind. The joints are extremely secure, further enhanced by hermetic adhesive which locks the dome nuts in place.
The M5 screw has a stem of length (L) from 20 mm to 55 mm. The head with multi tooth seat is of the Phillips type, size 20, head diameter 16 mm. The screw, special nut and washer are made from stainless steel, blank A2.
They are shipped with self-adhesive polyamide pads, washer type "U", spring ring and special dome nut with a longer thread and a cap of the same color.
The fixings are packed in cartons containing 200 sets. Customized lengths are available on request.

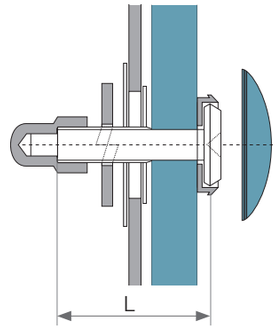



***Fig.*** *Construction and dimesions of balcony screw*

| Catalogue № of the screw | Stud length of the screw L [mm] |
|---|---|
| 120 50 44 20 | 20 |
| 120 50 44 25 | 25 |
| 120 50 44 30 | 30 |
| 120 50 44 35 | 35 |
| 120 50 44 40 | 40 |
| 120 50 44 45 | 45 |
| 120 50 44 50 | 50 |
| 120 50 44 55 | 55 |

***Supplier:*** *MBE GmbH (Moderne Befeistigungs-Elemente GmbH)*

## Self-drilling stainless steel fasteners

These SX-L12 (SFS) fasteners are designed to achieve a neat appearance for panels fitted to aluminum or steel bearing elements.
Special flat head L12 powder coated fasteners color match the facing and are almost invisible from a short distance away

| Product | Type | VD | KL | HD | W | d | L | Application |
|---|---|---|---|---|---|---|---|---|
| A | SX | 3/ | 15/ | L12 | S16 | 5.5x | 32 | VD max. steel: 3.0 mm<br>t max. steel: 2.5 mm |
| B | SX | 3/ | 15/ | D12 | | 5.5x | 30 | VD max. steel: 3.0 mm<br>t max. steel: 2.5 mm |
| C | SX | 3/ | 15/ | D10/ | | 5.5x | 25 | VD max. steel: 3.0 mm<br>t max. steel: 2.5 mm<br>t min. steel: 2.0 mm<br>t min. aluminium: 2.0 mm |

***Tab.*** *Symbols and parameters of connectors (SFS). All dimensions in mm.*

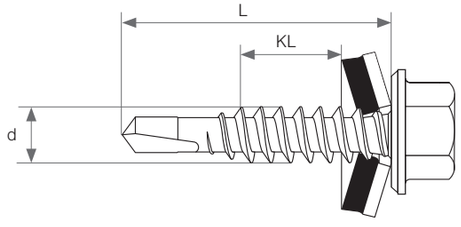
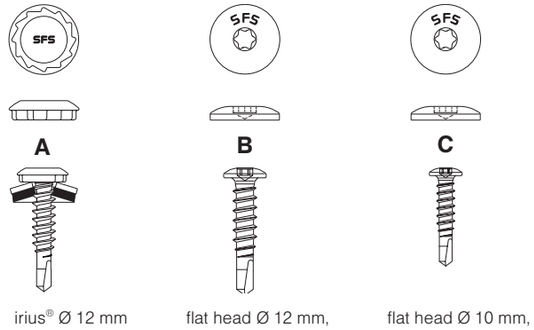



***Fig.*** *Self-drilling connector - construction*

KL thickness of joined elements
d thread diameter
L total length
VD maximum drilling capability
HD type of head/ seat
W material and diameter of washer
t thickness of substrate

Heads of connectors, depending on version:

- L12 - irius® Ø 12 mm,
- D12 - flat head Ø 12 mm with a seat T25,
- D10 - flat head Ø 10 mm with a seat T20.




irius® Ø 12 mm | flat head Ø 12 mm, with a seat T25 | flat head Ø 10 mm, with a seat T20

# Installation Accessories

## Balconies

### Profile U for framing of partition wall panels

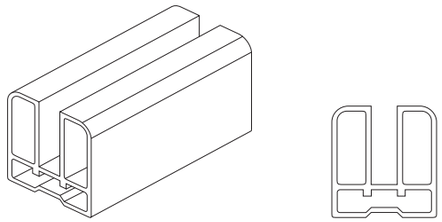


***Fig.*** *Profile U - cross section. Designation by the manufacturer (WIDO) - 00-100043.*

## Seals

Seal for the panels 6 mm

Profile A - 00-100076

Profile U - 00-100043

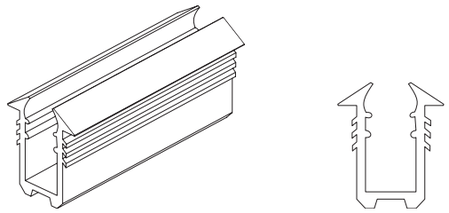


***Fig***. *Seal for the panels 6 mm, designation by the manufacturer (WIDO) - 30-600038.*

Seal for the panels 8 mm

Profile A - 00-100076

Profile U - 00-100043

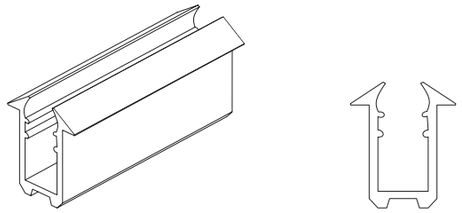


***Fig.*** *Seal for the panels 8 mm, designation by the manufacturer (WIDO) - 30-600039.*

## Facades

### EPDM

Installation tape made from elastomer on basis of the modified EPDM is used for sealing the contacting surfaces between facade elements. It is very resistant to weather conditions and highly flexible. It keeps stable shape in elevated temperatures.
It is also available as one-sided adhesive tape facilitating the installation.

| Item | DIN | Property |
|---|---|---|
| Class of building material | 4102 | B2 normally flammable |
| Water vapour diffusion resistance factor | | - 40°C - + 130°C |
| Temperature of use | | + 5°C - + 35°C |
| Durability | | two years |
| Storage temperature | | + 5°C - + 25°C |
| Color | | black |

***Tab.*** *Technical details of EPDM tape*

| Type | Width [mm] | Thickness [mm] | Length [m/roll] |
|---|---|---|---|
| EPDM | 70 | 0.8/1.2 | 25 |
| EPDM | 110 | 0.8/1.2 | 25 |
| EPDM - Adhesive | 70 | 0.8/1.2 | 25 |
| EPDM - Adhesive | 110 | 0.8/1.2 | 25 |

***Tab.*** *EPDM - examples of application*





# Supplier of Fittings

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