

Architectural Facade Systems
CEME Division

Evolution Assembly guideline



Radiatym headquarters

Gliwice, Poland

–
Product
Evolution



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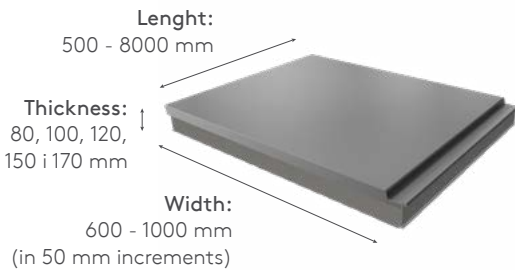
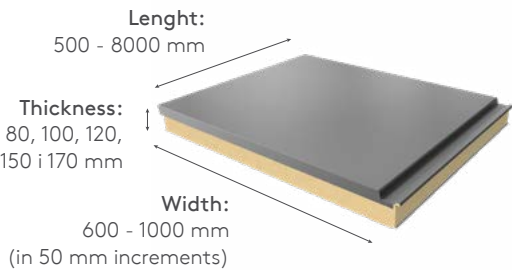
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Evolution: Introduction to the system

Evolution is a prefabricated, modular façade system with steel cladding and an IPN foam insulation core, where all the components of the envelope are integrated into a single element. The flat panels are available in a range of module sizes and thicknesses, allowing complete freedom in façade design.

System highlights:

- Finish aesthetics: modern façade appearance thanks to smooth and flat panel surfaces.
- Design flexibility: panels are offered in a wide range of widths, lengths and thicknesses.
- Installation speed: prefabricated panels and fully compatible system components reduce assembly time.
- Fixing: a solution that provides an aesthetically pleasing façade finish with hidden fixing.
- Structural durability: steel coating provides long term weather resistance.
- High insulation performance: minimisation of thermal bridges, thanks to special locks and IPN or QuadCore® foam core.



Horizontal joint options



Reveal 0 mm Reveal 10 mm Reveal 20 mm Reveal 50 mm

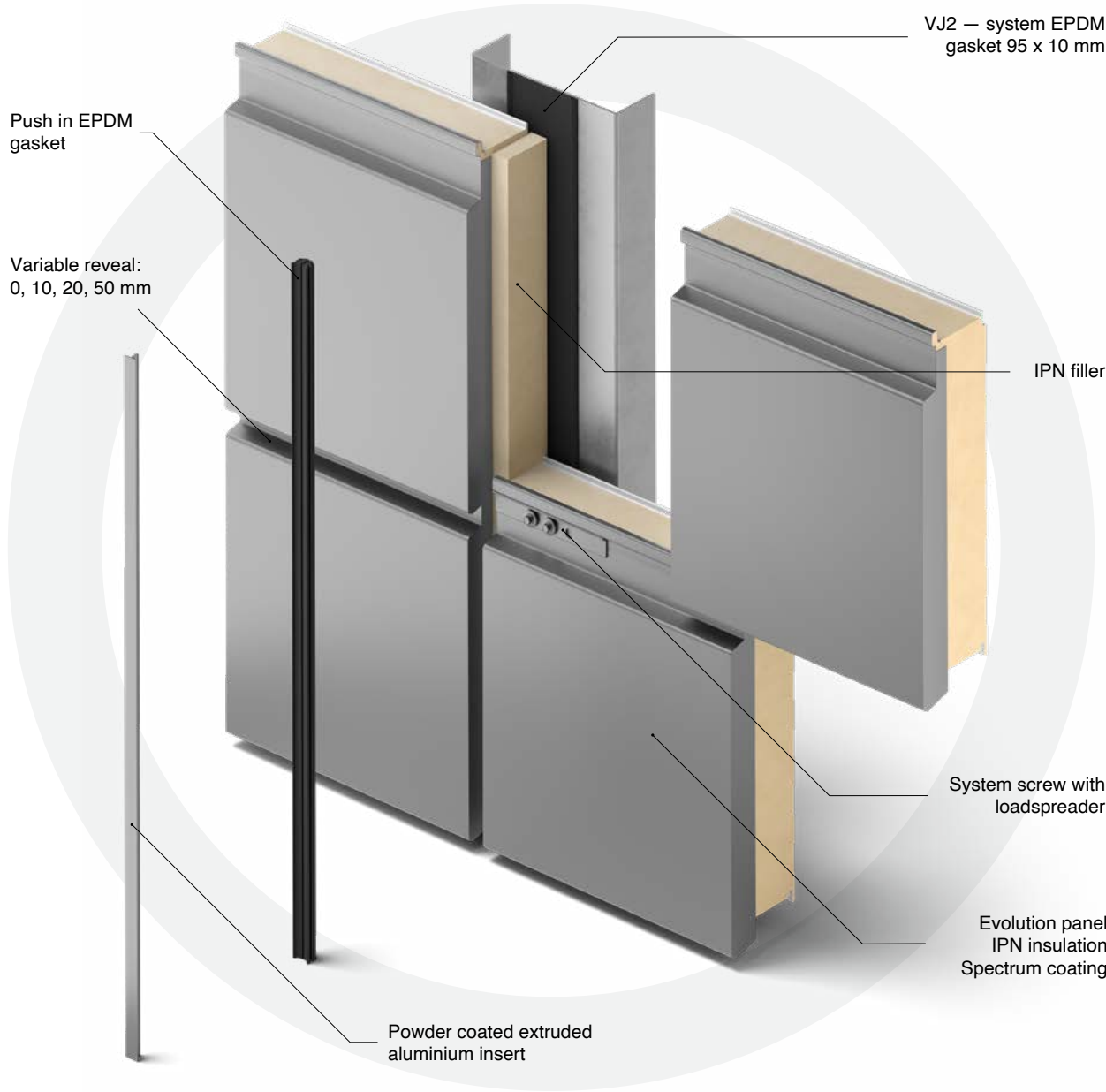
Vertical joint options



Inline Black Inline Silver

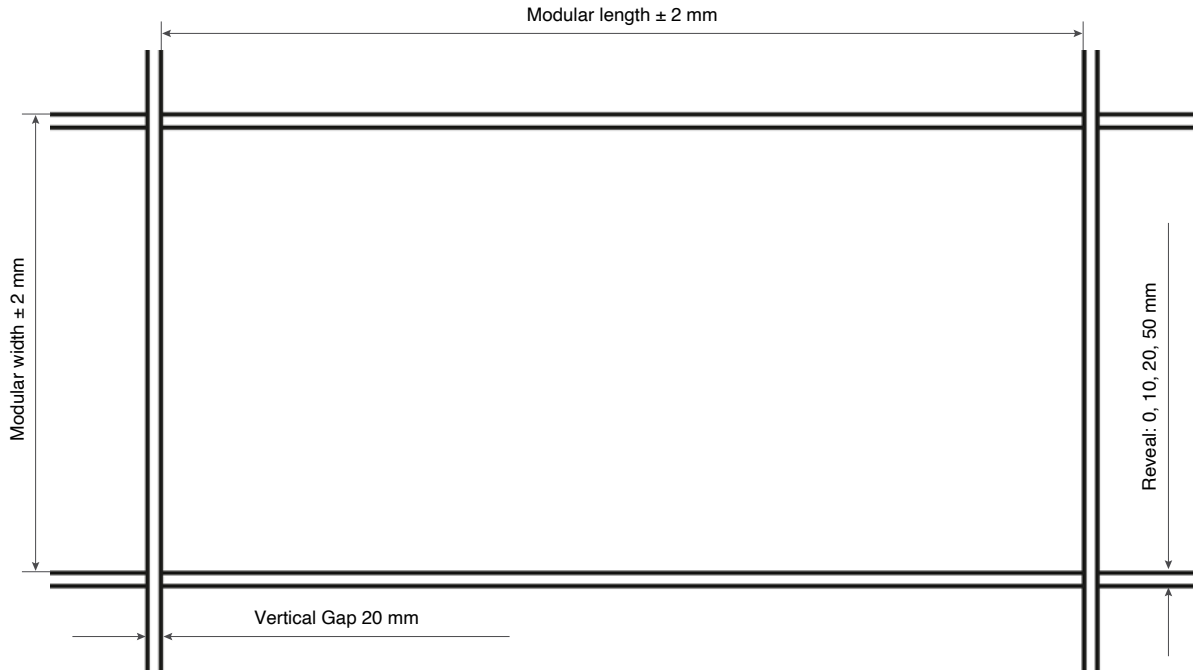
System composition

Evolution is a modern, tailor-made facade system dedicated to even the most demanding architectural projects. This system includes sealing tapes, system screws with dedicated loadspreader, EPDM gaskets and powder-coated extruded aluminium profiles.

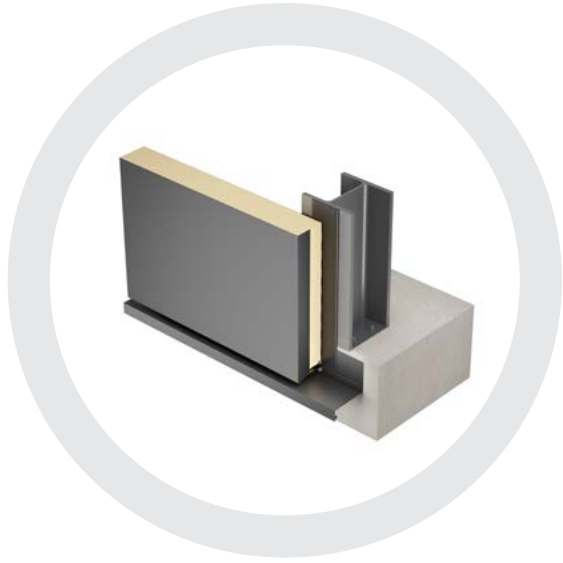


Modular dimensions

The Kingspan technical department defines the panel parameters by modular width and length. These dimensions are given in the cutting list. The modular dimensions of the panels are the dimensions that form the visible division of the facade.



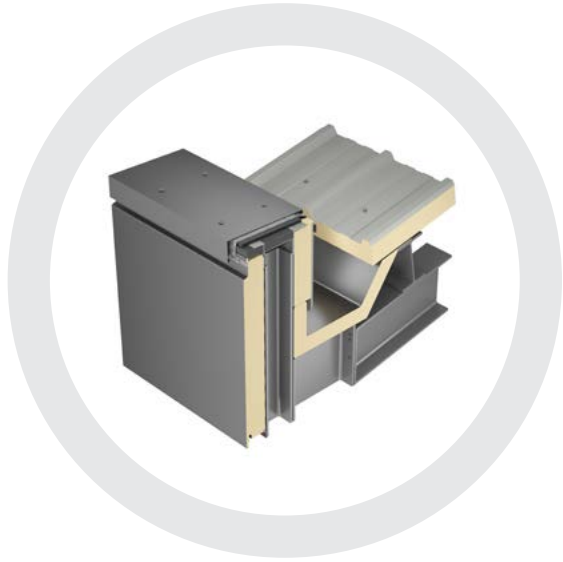
Standard solutions



Base



Window



Parapet



Corner

Assembly tools

It's strongly advised to use always heavy-duty, professional tools during the installation. There are several manufactures on the market. Please check the current situation and availability of the tools with your supplier. Detailing all the needed tools, measurement gage, etc. is impossible to list there. But basically, it needs to be considered the precision and performance individually for each job.

Levelling tools

It is commonly used during checking the sub-structure and panels installation.



Spirit level



Laser

Cordless driller-screwdriver

This tool is needed when installing self-drilling screws, flashings or other sheet metal work. The screwdriver must have sufficient power for drilling and threading, as well as a torque limiter to facilitate precise tightening of screws in the panel.



Cordless riveting machine with rivet standoff nosepiece

A high-performance riveting hand tool is needed the installation of flashings or other sheet metal work.



Panel cutting tools

Mini-saw, saw, jigsaw ect. are used to cut panels on site.



Mounting Spacer for joint finish Q2A

It is very important to maintain the required space between the installed panels with Q2A joint - 20 mm.

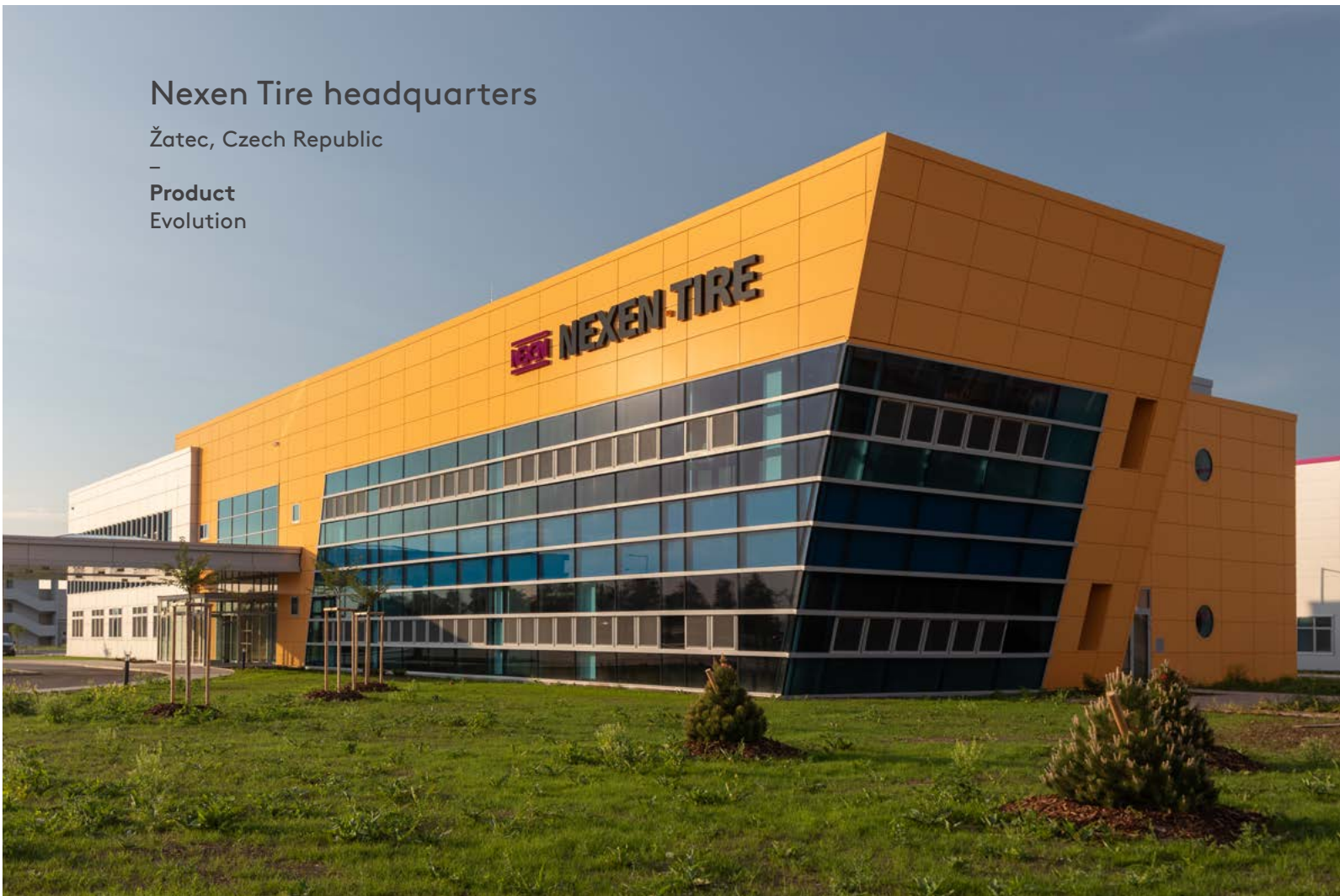
This element will help you to maintain the correct distance between panels in the vertical joint.



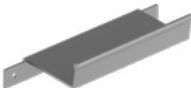
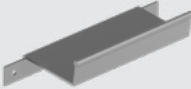
Nexen Tire headquarters

Žatec, Czech Republic

Product
Evolution

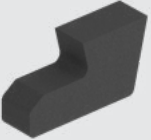


Elements for assembly

Picture	Code	Description	Unit
	BJSAQ2A020XXXXX	Powder coated extruded aluminum T-profile Q2A	3 lm/pc.
	BGAEPDMQ2A020A1N	EPDM gasket (20 mm) for vertical joint - Q2A	40 lm/roll
	BGAEPDMQ2X010A1	EPDM gasket (10 mm) for vertical joint - Q2	20 lm/roll
	BGAEPDMQ2X020A1	EPDM gasket (20 mm) for vertical joint - Q2	20 lm/roll
	AGAEPDMOBX095A1	VJ2 - EPDM gasket behind vertical joints Q2 & Q2A 95x10 mm	25 lm/roll
	AGAEPDMOBX060A1	VVJ2 - EPDM gasket behind vertical joints Inline Silver & Inline Black 60x10 mm	100 lm/roll
	ALAZ15AWJIGXXXX	Z15 - stainless steel load spreader for hidden fixing	1 pc.
	ALAZ03080X20XXX	Z03 starting profile, galvanised steel, for panel thickness 80 mm	1 pc.
	ALAZ03100X20XXX	Z03 starting profile, galvanised steel, for panel thickness 100 mm	1 pc.
	ALAZ03120X20XXX	Z03 starting profile, galvanised steel, for panel thickness 120 mm	1 pc.

Picture	Code	Description	Unit
	ALAZ03150X20XXX	Z03 starting profile, galvanised steel, for panel thickness 150 mm	1 pc.
	ALAZ03170X20XXX	Z03 starting profile, galvanised steel, for panel thickness 170 mm	1 pc.
	BFOVEEVOQ2AX080 BFOVEEVOQ2AX100 BFOVEEVOQ2AX120 BFOVEEVOQ2AX150 BFOVEEVOQ2AX170	PIR filler to 20 mm vertical joint Q2A for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	BFOVEEVOQ2A24X080 BFOVEEVOQ2A24X100 BFOVEEVOQ2A24X120 BFOVEEVOQ2A24X150 BFOVEEVOQ2A24X170	PIR filler to 24 mm vertical joint Q2A for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	BFOVEINSQ210080 BFOVEINSQ210100 BFOVEINSQ210120 BFOVEINSQ210150 BFOVEINSQ210170	PIR filler to 10 mm vertical joint Q2A for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	BFOVEINSQ214080 BFOVEINSQ214100 BFOVEINSQ214120 BFOVEINSQ214150 BFOVEINSQ214170	PIR filler to 14 mm vertical joint Q2A for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	BFOVEINSQ220080 BFOVEINSQ220100 BFOVEINSQ220120 BFOVEINSQ220150 BFOVEINSQ220170	PIR filler to 20 mm vertical joint Q2 for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	BFOVEINSQ224080 BFOVEINSQ224100 BFOVEINSQ224120 BFOVEINSQ224150 BFOVEINSQ224170	PIR filler to 24 mm vertical joint Q2 for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	BEFV080IL28X057 BEFV100IL28X077 BEFV120IL28X097 BEFV150IL28X127 BEFV170IL28x147	PIR filler to Inline Silver & Inline Black joints for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	QC1XXEVOQ2AX080 QC1XXEVOQ2AX100 QC1XXEVOQ2AX120 QC1XXEVOQ2AX150 QC1XXEVOQ2AX170	QuadCore® filler to 20 mm vertical joint Q2A for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.

Elements for assembly

Product	Code	Description	Unit
	QC1XXEVOQ2A24080 QC1XXEVOQ2A24100 QC1XXEVOQ2A24120 QC1XXEVOQ2A24150 QC1XXEVOQ2A24170	QuadCore® filler to 24 mm vertical joint Q2A for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	QC1XXINSQ210080 QC1XXINSQ210100 QC1XXINSQ210120 QC1XXINSQ210150 QC1XXINSQ210170	QuadCore® filler to 10 mm vertical joint Q2 for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	QC1XXINSQ214080 QC1XXINSQ214100 QC1XXINSQ214120 QC1XXINSQ214150 QC1XXINSQ214170	QuadCore® filler to 14 mm vertical joint Q2 for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	QC1XXINSQ220080 QC1XXINSQ220100 QC1XXINSQ220120 QC1XXINSQ220150 QC1XXINSQ220170	QuadCore® filler to 20 mm vertical joint Q2 for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	QC1XXINSQ224080 QC1XXINSQ224100 QC1XXINSQ224120 QC1XXINSQ224150 QC1XXINSQ224170	QuadCore® filler to 24 mm vertical joint Q2 for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	QC1X080IL28X057 QC1X100IL28X077 QC1X120IL28X097 QC1X150IL28X127 QC1X150IL28X147	QuadCore® filler to Inline Silver & Inline Black joints for panel thicknesses of 80, 100, 120, 150 and 170 mm	1 lm/pc.
	AIGXP26AWXXXXXX	P26 - neoprene sealing element for horizontal joint 0 Inline Silver & Inline Black	1 pc.
	M-SEALIN00000059	Neoprene sealing element for horizontal joint 10 Inline Silver & Inline Black	1 pc.
	M-SEALIN00000060	Neoprene sealing element for horizontal joint 20 Inline Silver & Inline Black	1 pc.
	M-SEALIN00000061	Neoprene sealing element for horizontal joint 50 Inline Silver & Inline Black	1 pc.

Product	Code	Description	Unit
	ATI030X020PEXX1	Sealing tape P16 PE 20x3 mm	30 lm/roll
	ATI050X020PEXX1	Sealing tape P17 PE 20x5 mm	15 lm/roll
	ATI040X020PEXX1	Sealing tape P18 PU 20x4 mm	20 lm/roll
	AJSALOBSP8XXXXX	Aluminium profile SP8 (painted) Inline Silver & Inline Black	6 lm/pc.
	AJSALOBSP9XXXXX	Aluminium profile SP9 pressed into profile SP8 (painted) Inline Silver	6 lm/pc.
	AGAEPDMOBX010A1	EPDM gasket SP10 pressed into profile SP8 Inline Black	25 lm/roll
	ATIXX025SAXXXXXX	Sealing tape between the SP8 profile and the top sheet of the panel Inline Silver & Inline Black	22 lm/roll
	BMTROLLERQ210MA	Application roller for Q2 gasket (10 mm)	1 pc.
	BMTROLLERQ220MA	Application roller for Q2 gasket (20 mm)	1 pc.
	BMTROLLERQ220XX	Application roller for Q2A gasket	1 pc.

Screws for substructures

For steel substructure

Support thickness	Fastener		Panel thickness				
			80	100	120	150	170
1.5-5 mm	JT3-D6H-5.5/6.3x87	E16					
	JT3-D6H-5.5/6.3x107						
	JT3-D6H-5.5/6.3x127						
	JT3-D6H-5.5/6.3x147						
	JT3-D6H-5.5/6.3x167						
	JT3-D6H-5.5/6.3x197						
5-12 mm	JT3-D-12H-5.5/6.3x95	E16					
	JT3-D-12H-5.5/6.3x115						
	JT3-D-12H-5.5/6.3x135						
	JT3-D-12H-5.5/6.3x155						
	JT3-D-12H-5.5/6.3x175						
	JT3-D-12H-5.5/6.3x195						

For concrete substructure

Support thickness	Fastener		Panel thickness				
			80	100	120	150	170
Concrete	BS-R-6.3x120	V16					
	BS-R-6.3x140						
	BS-R-6.3x160						
	BS-R-6.3x180						
	BS-R-6.3x200						



Fire Station
Äänekoski, Finland
Product
Evolution

Steel subconstruction

The local/regional regulations for fixing can be different. For example, some countries allow only stainless-steel screws, or don't allow a direct fixing into concrete. All the local rules must be considered by the architect.

However, the standard tolerances for the steel work construction are more open, for sandwich panels must it be kept tighter and more accurate for Evolution. The Kingspan products like Evolution has end lap folding creating a cassette like prefabricated tailor-made product here the vertical joints will not be covered by flashings, every deviation in the cladding are visual.

For Evolution panels, the substructure must maintain deviations within tolerances in all three directions.

Deviation

The maximal allowed tilting of the subconstruction is depending on the height of the cladding but cannot exceed 8 mm in both directions (please see Fig. 1 - Deviation).

A deviation can cause difficulties or impossibility the solving corner panel area because there meets two (altogether 3 perpendicular) planes and makes leveling issue of the corner panels in one, two or all three directions.

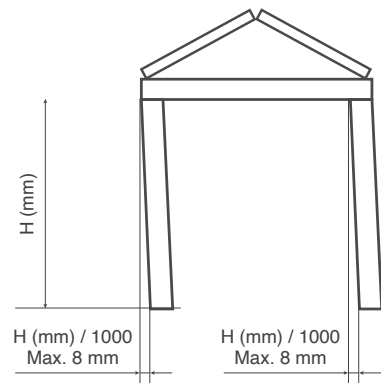


Fig. 1 - Deviation

To avoid/reduce this issue, it is advised about 6 m height buildings to design short sided corner panels (max. 500 mm) or corner flashings when it is possible.

Deviation to plane

The maximal deviation to the plane is in dependent to the distance of the column (please see Fig. 1 - Deviation to plane).

Since tilting and deviation to plane are in close relation, the maximal limits cannot be added together. It means that the assembly surface generally cannot be out from two limit planes as border which are 8 mm far away and back of the ideal plane.

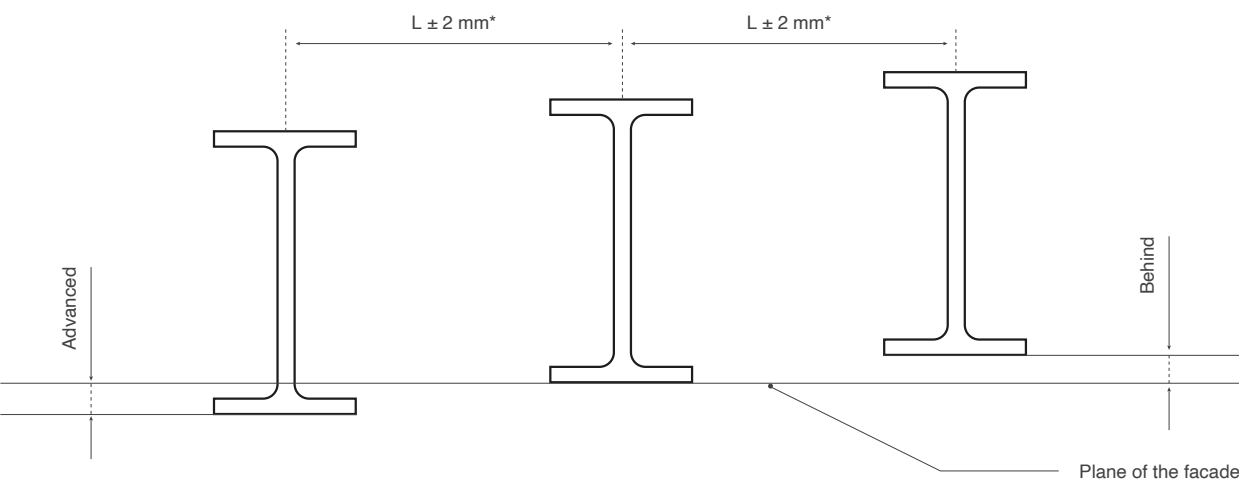


Fig. 1 - Deviation to plane

Deviation in front view of facade

The vertical direction is the most important for the cladding because Kingspan Facades products require certain position of the fixing on the column (please see Fig. 1 - Deviation in front view of facade). In front view of the facade there are two deviations to be considered.

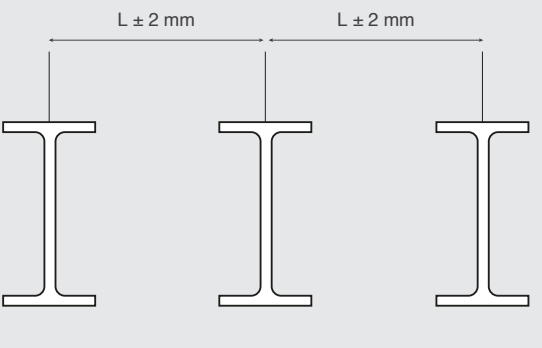


Fig. 1 - Deviation in front view of facade

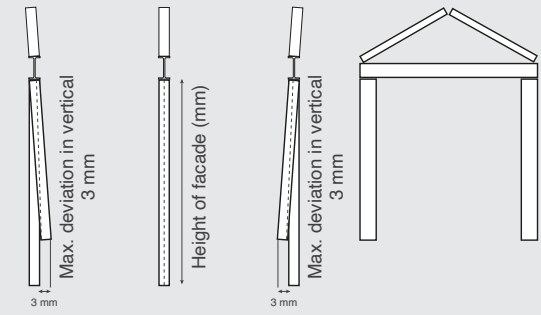


Fig. 2 - Deviation in front view of facade

First is the deviation of the distances of columns. Tolerance to apply +/- 2 mm must be measured both on the bottom and on the top of the columns.

Second is the angular column. It is measured in mm between the points of top and bottom columns. Limitation is 3 mm. The minimal support width is 200 mm (for 2 screwed panels). It is calculated for high precise installation. As the facade is high and/or has several numbers of the columns, it is advised to use wider supports (please see Fig. 2 - Deviation in front view of facade).

*Max deviation to plane: L (mm)/1000
Max. 8 mm

Assembly of panels

Check the subconstruction

Check the subconstruction to meet all the requirements. In case of deviation take actions to repair it. Make sure that the plinth is already finished (any work after cladding is risky from damages point of view).

Prepare an assembly plan

Create your own plan for cladding and consider the installation sequence and prepare the required panels nearby. The most important which is needed to be followed by designer and the installer is that all connections must:

- have good insulation,
- avoid thermal bridges,
- be waterproof,
- be done by materials and solutions to fulfill static requirements.

Do not start the installation until the main structure or adjustable rails have been properly adjusted. A basic prerequisite for a correct façade is the perfect installation of the substructure. The substructure must be flush. Correct vertical installation is very important. The maximum deviation from the plane depends on the distance between the columns. The maximum deviations are listed under "Steel substructure".

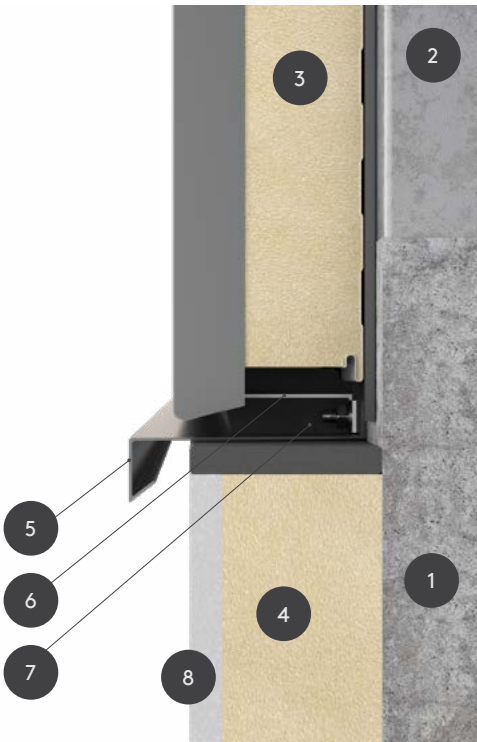


Start of assembly base

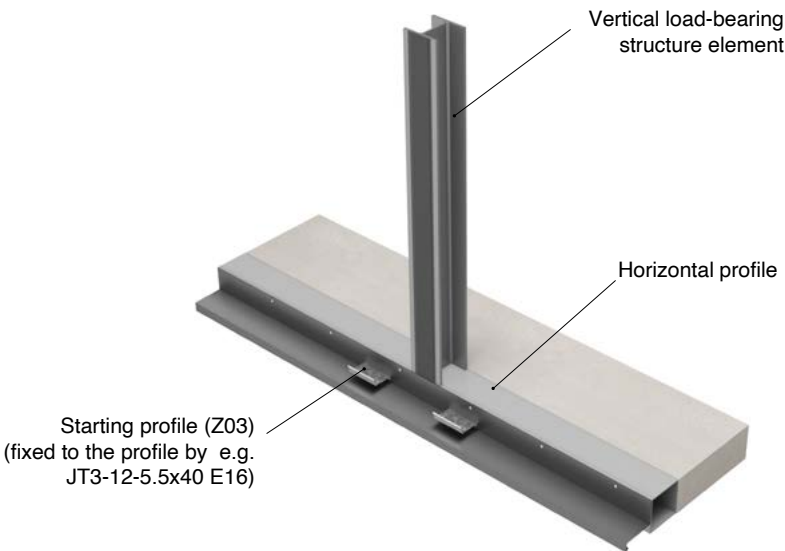
There are several different solutions available for the base and panel connection, which is always defined by the architect. In this case, the most typical detail illustrating the base solution is shown.

Base detail

1. Reinforced concrete plinth
2. Steel subconstruction
3. Evolution panel with IPN insulation core (horizontally laid)
4. Plinth insulation
5. Plinth profile / Drip-profile
6. Z03 starting profile
7. Site applied insulation
8. Rendered facade



Installation can only begin once the structure has been properly measured and its position both vertically and horizontally checked. It is advisable to use the best levelling tool available, such as a 1.5 m spirit level. It is advisable to use the best levelling tool available, such as a 1.5 m spirit level. All installation work should be carried out bearing in mind that the panel can be easily damaged and can be time-consuming and costly to replace.



When installing the Evolution façade panels, the following technological operations must be carried out in sequence:

1. The lower flashing should be fixed with self-drilling screws to the lower horizontal element of the support frame at the height indicated in the project (each time the flashing is specified for the building, so the solution may be different for each project).
2. Using a spirit level, mark the exact position of the Z03 starting profiles on the lower flashing.
3. The Z03 profiles are fixed to the lower support structure (transom) with self-drilling screws. The Z03 starting profile is the first support for the panels, it should be levelled very carefully before installation.

NOTE

The Z03 starting profiles should be fixed at a maximum of 500 mm intervals to reduce any deflection in the plinth area, where any deflection is easily visible and can affect the final aesthetic effect of the entire façade.

The maximum distance between the Z03 starting profile and the end of the Evolution panel is 150 mm.

NOTE

Z03 profiles are not intended to support the panel against long-term loads and should not carry vertical loads. Z03 profiles ensure that Evolution panels are positioned correctly and carry horizontal loads.

After installing the Z03 starting profile, check its horizontal position.



Sealing tape should be installed on the horizontal and vertical elements of the substructure.

Sealing of the walls is carried out with adhesive tapes. The system EPDM seal should be installed in the middle of the vertical joint between two panels.

To install the vertical seals correctly on the vertical elements of the substructure, the vertical joint axes must be marked. Fix the system EPDM sealant VJ1 (for Inline Silver and Inline Black) or VJ2 (for Q2 and Q2A) to the marked joint axis, aligning the centre with the marked axis.

Sealing tape P17 should be used on horizontal parts of the structure as well as in areas where the system sealant VJ1 or VJ2 was not attached.



The first Evolution panel is placed on the starter profile according to the design. Panel installation always requires levelling.



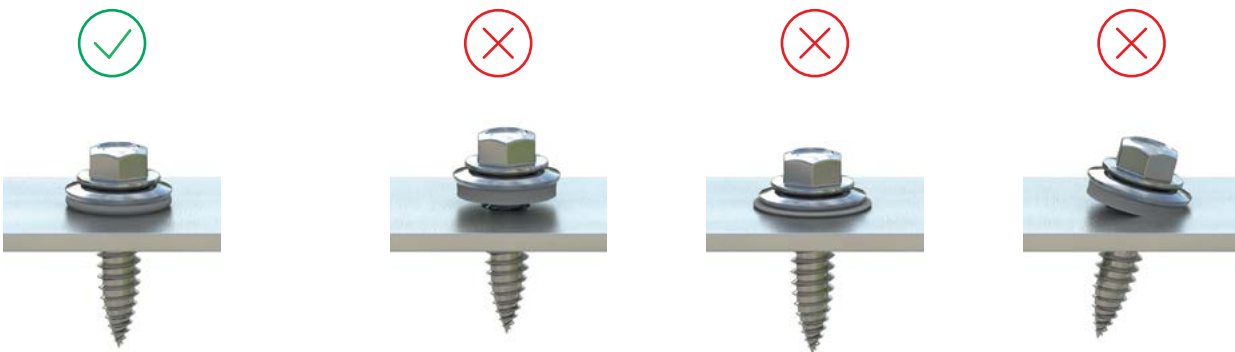
Assembly of the first panel

Once the levelling is complete, the panel must be fixed on both sides using screws and a Z15 load spreader. The length of the screws can be checked in the tables on page 14.

The Z15 load spreader enables the correct positioning of the self-drilling screws when fixing the corners of the panel. Cutting the Z15 element is not permitted and is considered detrimental to the manufacturer's requirements.



Self-drilling screws should be installed with sufficient force. The correct pressure of the screw can be checked when observing the behaviour of the EPDM gasket underneath the washer.



NOTE

It is very important to remove metal filings from the surface of the panel after the self-drilling screws have been installed. Wet metal filings can cause a rusting process to develop which will damage the surface of the panels.

The next panel should be fitted over the already fitted panel. The panel should rest on the panel below in such a way that the bottom edge of the upper panel with the groove is correctly aligned with the tongue of the upper edge of the lower panel. The height of the horizontal joint and its width across the panel must be checked.

Install the P26 neoprene sealant next to windows, doors and other openings at horizontal joints.

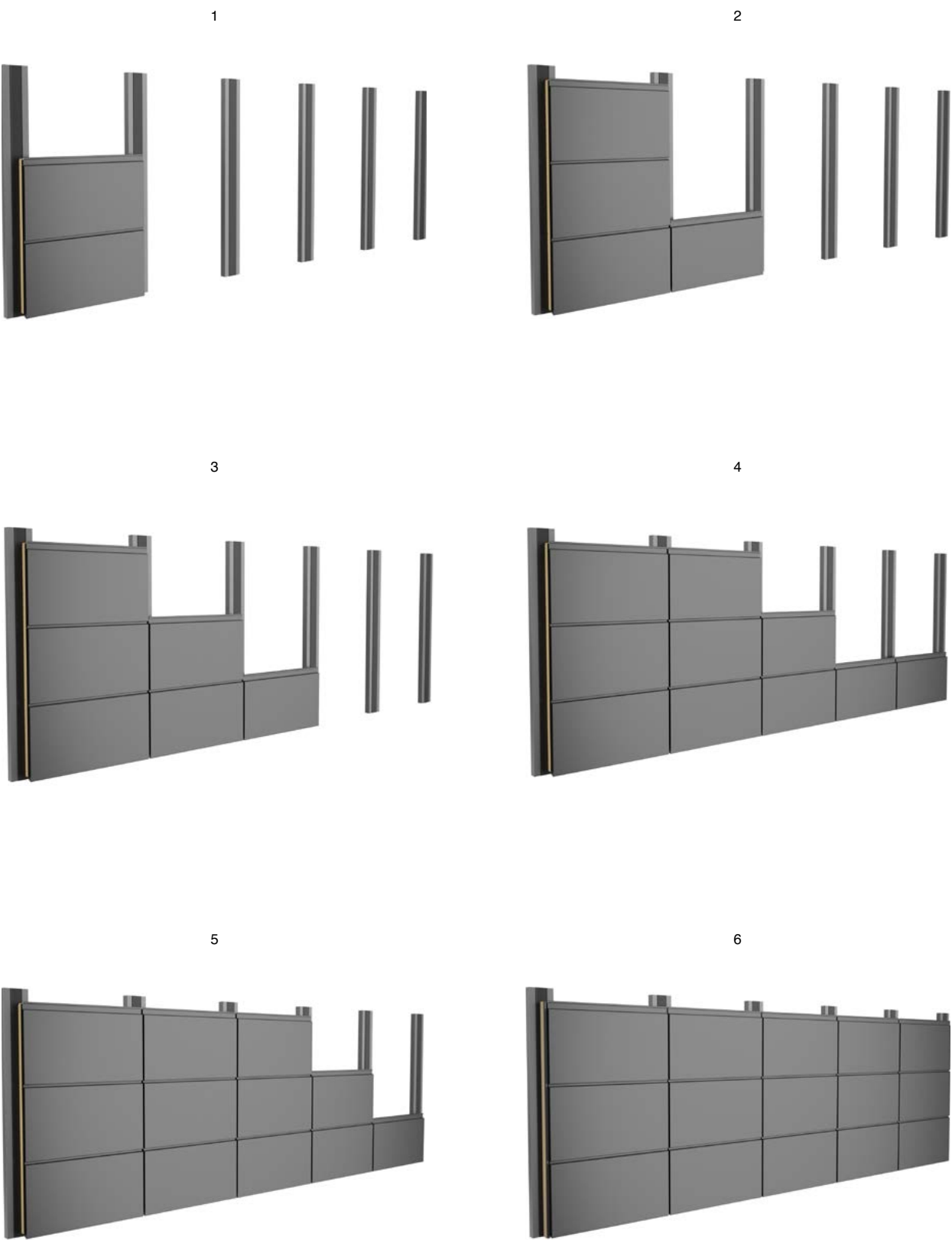


The position of the upper panel should be checked with a spirit level before fixing.

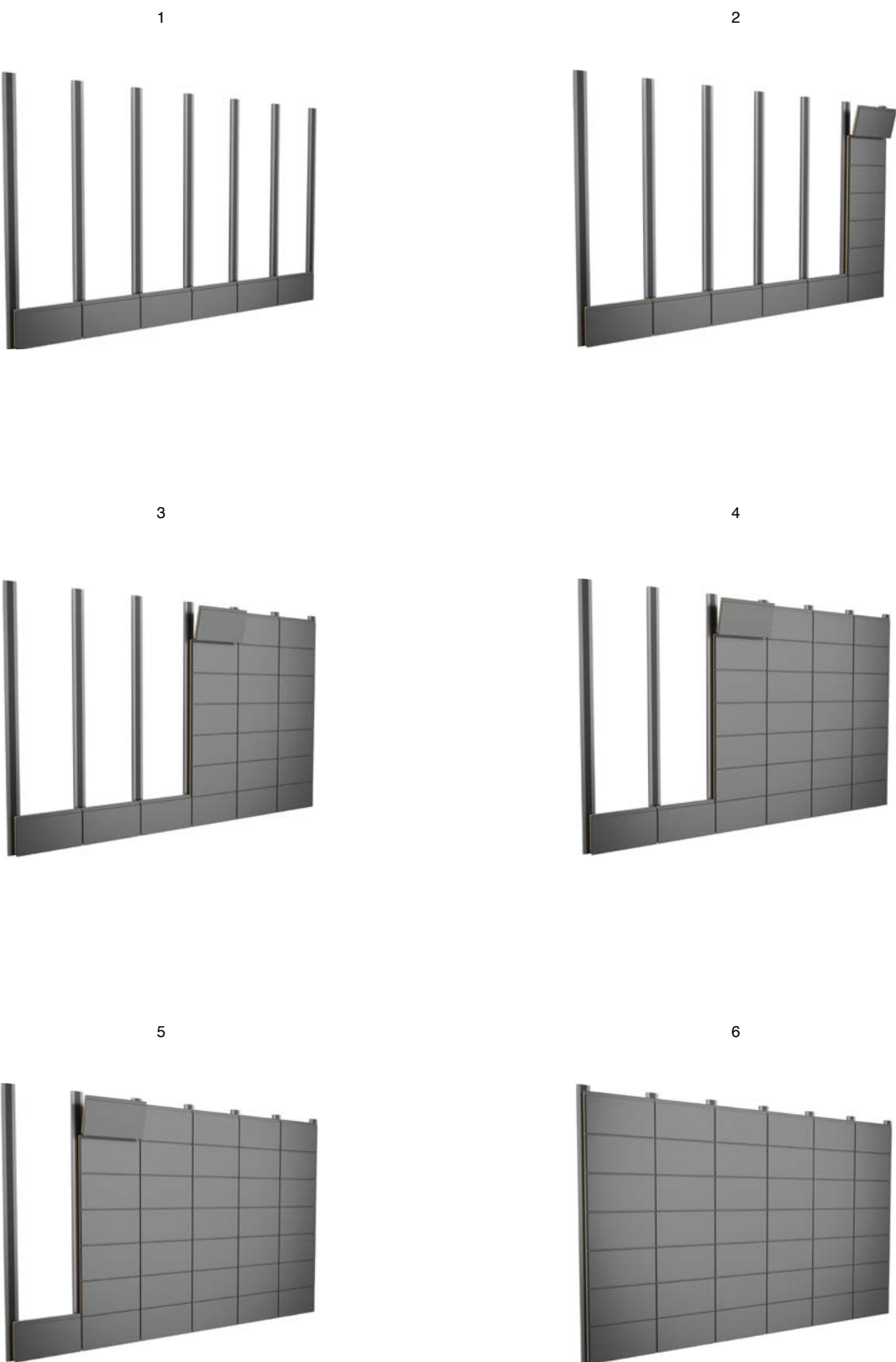
The panel is fixed to the supporting structure in the same way as the lower panel. Evolution panels are fixed from bottom to top. It is not necessary to start the installation from the left or right side. The most common installation methods for the Evolution panels are shown on the following pages.



Stepped assembly



Row assembly



Adjacent panels should be installed according to the procedure described in the previous sections. In the case of a vertical joint, gaps should be left between panels according to the design. Use a spacer wedge to verify the correct installation of the Q2A joint (20 mm).

The Evolution panels should be pressed against the IPN or QuadCore® foam infill after the polyurethane foam adhesive/insulation has been applied. The polyurethane foam adhesive/insulation will fill the gaps between the panel core and the IPN or QuadCore® foam infill. During installation, the panels should be pressed in such a way that a 20 mm vertical joint is maintained (Q2A solution).



When checking the width of the joints, the weather conditions prevailing during installation should be taken into account. In direct sunlight, the outer sheet of the panel is heated and may expand, so the joint width will be narrower. As the panel cools, the vertical width of the joint will increase. Keep this in mind when wishing to ensure a tight joint.



Using a roller, press an EPDM sealant for joint type Q2/Q2A with a painted T profile into the vertical joint between the panels.

When joining two T-profiles, a small gap (approx. 1.5 mm per 1 m) must be maintained to allow for thermal expansion. This will allow for a complete vertical joint type Q2/Q2A. We recommend installing both components (EPDM seal and T-profile) at the same time. This means joining the T-profile and the EPDM gasket and then placing them in the vertical joint.

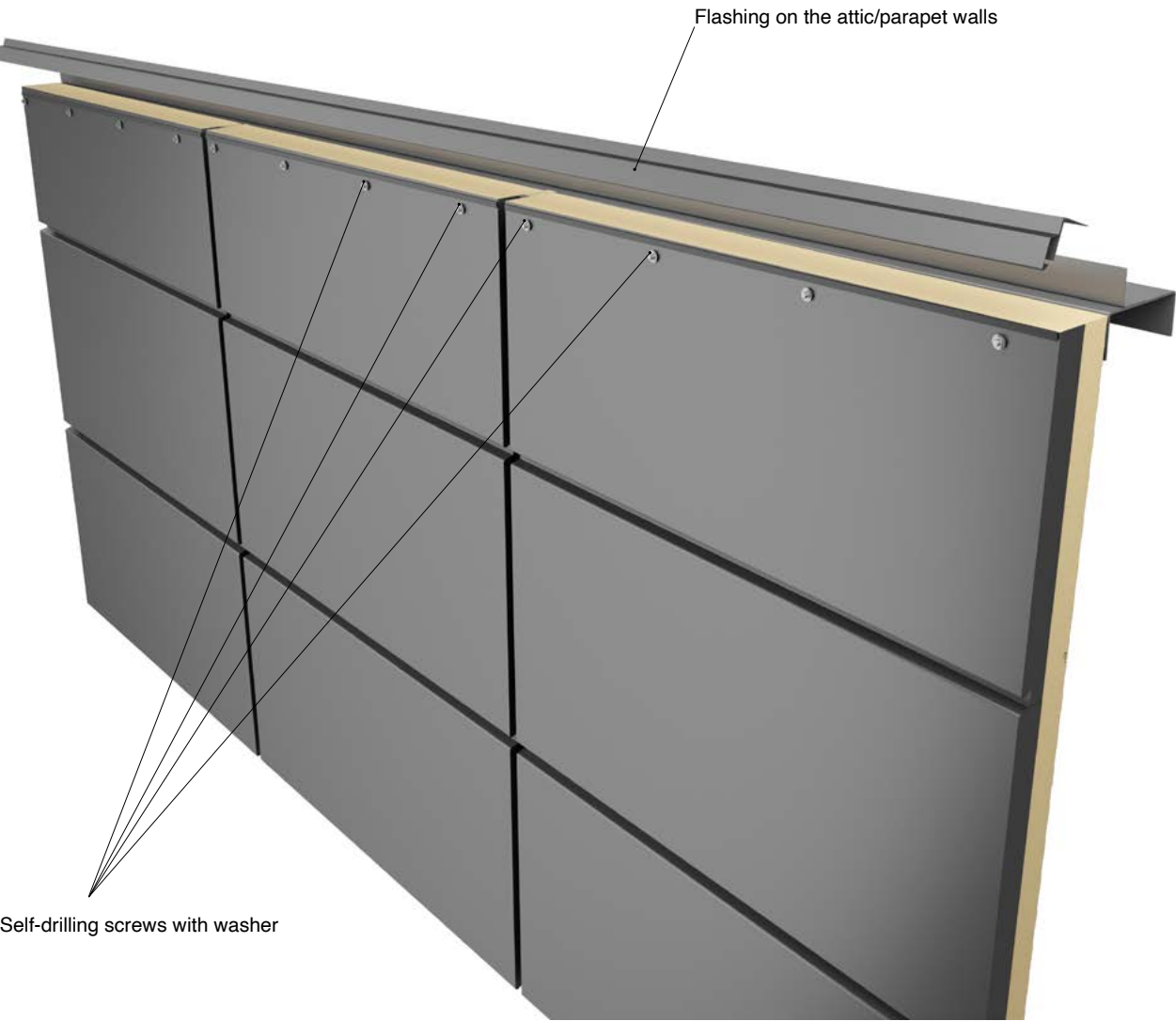


The other Evolution façade panels are installed according to the procedure in the instructions on pages 24 and 25.



The panels supplied should additionally be fixed to the substructure with self-drilling screws in 'wind load sensitive' areas, i.e. gable walls, roof eaves and jambs.

Where the panel edges are cut off, the centre of the screw in relation to the cut edges of the panel should be ≥ 50 mm. The distance between screws should not exceed 500 mm.



Corner panel assembly

After the installation of the straight panels on the façade, we move on to the installation of the corner panels.

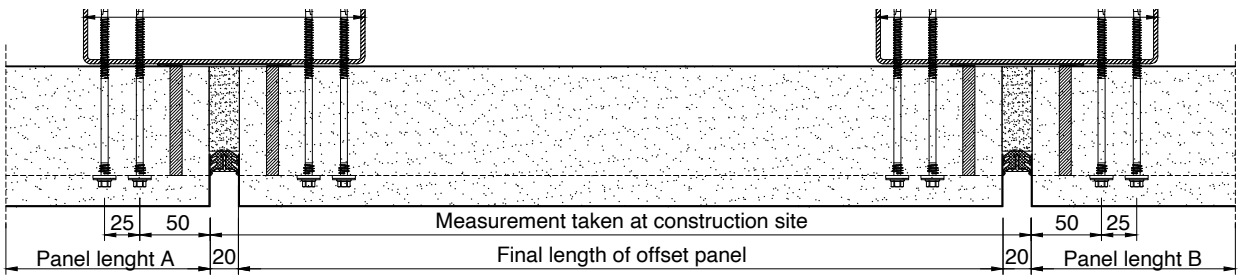
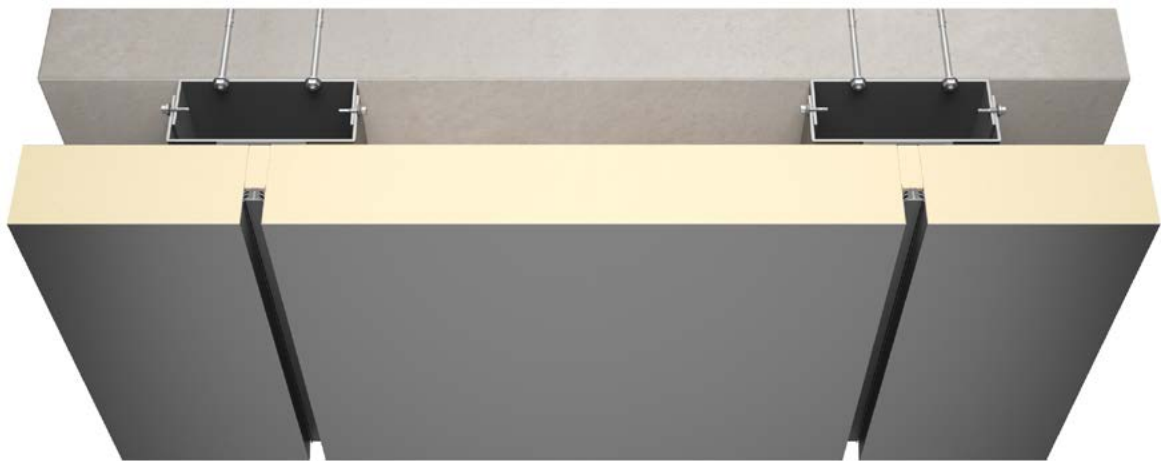
Correct installation and levelling of the substructure are essential for correct installation.

The corner panels must be flush with the rest of the panels. This requires a high degree of precision during installation. The installation can be considered correct when the spirit level indicates the ideal level.



Offset panels – measurement

The easiest way to measure the correct length of offset, straight panels is to measure on site according to the drawing. To obtain the length of a Q2A jointed panel, subtract 40 mm (20 mm on each side) from the measured length.



ATLAS co-living apartments

Vilnius, Lithuania

Product
Evolution



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