KMEW

As of April 2017

Facade panels

Guide to design and mounting of the panels Ceradir *V*

Mounting with brackets

Long-lasting quality and beauty

KMEW Co., Ltd.

CONTENTS

Safety during preparation and execution of works

⌘ Mounting works should provide for a set of measures of safety precautions including fire safety.
⌘ Mounting should be done by persons who had been specially trained and have experience of mounting of ventilated facades.
⌘ When performing the work, installers are obliged to follow the plans of work (technological maps or notes).
⌘ Each installer should be provided with special clothing, means of individual protection intended for the type of performed work, as well as a safety belt.
⌘ The tool used during mounting of the panels must be operable and used only for its intended purpose.
⌘ Mounting should not be carried out during strong wind, bad weather conditions and also icing.
⌘ Workplaces and approaches to them must meet requirements of safety precautions and should be checked before each use.
⌘ Cutting, drilling and other mechanical impacts on the panel must be carried out only in specially designated places.

Especially important

⌘ **Warning about panel silica dust Note: Do not inhale silica dust from the panel**

Facade panels contain silica. Inhaling of silica can cause a potentially dangerous lung disease silicosis. Please pay attention to the following points when drilling, cutting, mounting and transporting;

1. Work outdoors if possible, or use mechanical ventilation.
2. Wear a respirator.
3. Warn others in the vicinity. For further information please refer to the product safety data sheet. Ignoring the information given in the product safety data sheet and this guide can lead to serious illnesses.

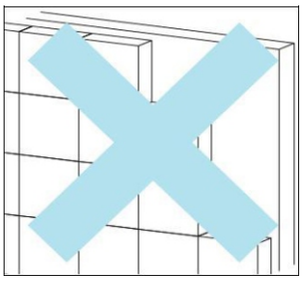
⌘ **Safety precautions**

1) When cutting the panels, inhaling a large amount of dust for a long time can be harmful to your health.
Follow the instructions below:
- Use a circular saw with a dust cover equipped with a vacuum cleaner or an aspirating device.
- Wear a dust mask and dust goggles. - Work in a well-ventilated place.
- After work rinse your throat and wash your hands.

2) When using solvent-based materials such as repair paint, waterproof sealant, silicone and primer, wear a mask and gloves and work in a well-ventilated place.

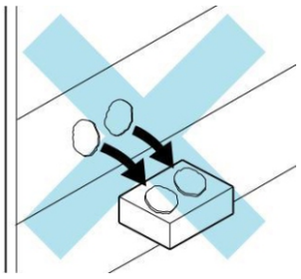
Actions that are prohibited or should be performed with caution, when installing panels

⌘ Laying of tiles, etc., directly on the facade panels



If the tiles are placed directly on the facade panels, they can fall off, crack or break.

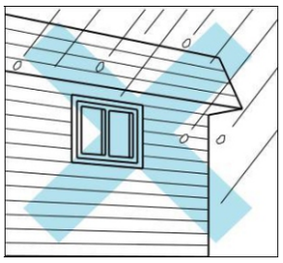
⌘ Fastening of structures on facade panels



Single attachment of objects to facade panels can lead to panel breakdown or falling of the object.

Facade panels do not provide sufficient adhesion. Objects should be attached to the metal substructure. Avoid places of attachment of panels, fix the objects taking into account not less than 40 mm from the edges of facade panels.

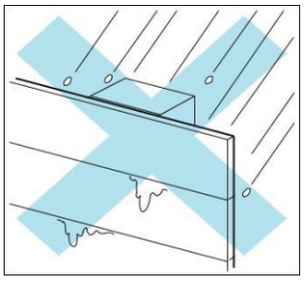
⌘ Mounting on inclined parapets



Parapets are subjected to the same significant loads as roofs, in contrast to vertical walls, which leads to damage of the coating, icing and rainwater penetration.

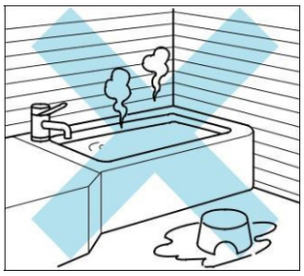
Use roofing materials.

⌘ Installation on fences and other similar objects, which get wet during a rain



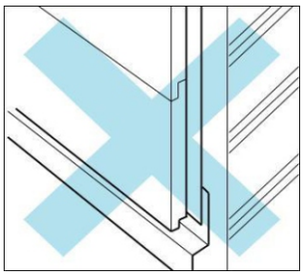
The back side of the front panels is protected only by the undercoat. Due to repeated wetting and drying as a result of water absorption from the rear, the panels can deform.

⌘ Installation in areas permanently exposed to water or steam



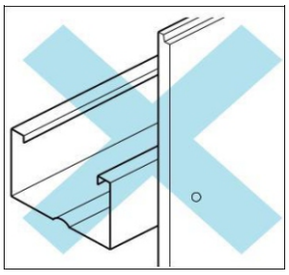
If the panel is exposed to water and steam, the panels and their coating will deform and crack.

⌘ Direct fastening of facade panels to cellular / reinforced concrete walls



It can cause damage to the mounting sites of the facade panels or their falling.

⌘ Direct fastening of facade panels to steel structures



It can cause damage to the mounting sites of the facade panels or their falling. Moreover, this does not comply with the standard mounting technique for ventilated structures.

⌘ Mounting on chimneys

The moisture formed inside the chimneys passes through the chimney wall and is absorbed by the rear part of the facade panels, which leads to deformation and icing.

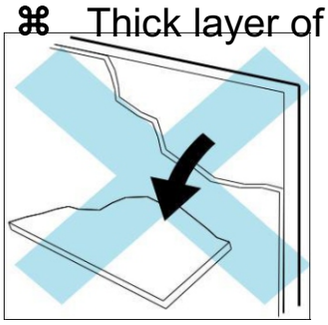
⌘ Mounting on convex sections of the wall

Mounting of the panel on the convex sections of the wall can be accompanied by a fuzzy fixation of the panel, which can cause cracks, as well as its falling.

⌘ Mounting on an incline section of the wall

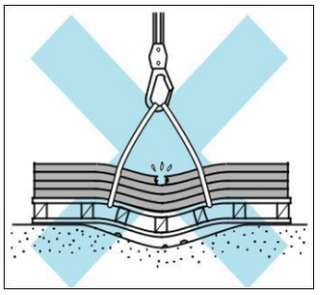
Mounting of the panel on an inclined section of the wall (wall tilting forward) can cause the panel to peel, deform and fall down.

⌘ Thick layer of a multi-layer finishing coating or plaster



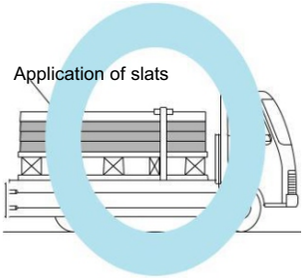
Application of a thick coating layer can lead to its detachment, formation of faults or cracks due to insufficient adhesion strength.

⌘ Products should be stored on a stable and level surface.



Storage of articles on uneven surfaces can lead to formation of cracks and faults.

⌘ Transport of panels in horizontal state

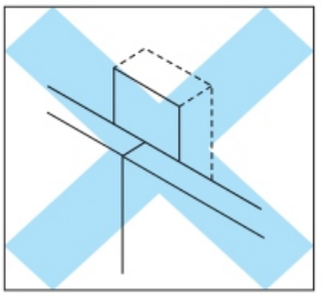


In order to prevent damage to the panels, which can be caused by an unexpected braking of the car, fix the panels with slings and insert the slats in the corners.

⌘ Lifting to a height without suitable support under the panels

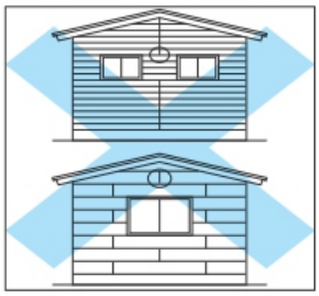
Set a solid support under the panels to avoid their bending. A strong bend can result in cracking pf panels and getting surface deformations.

⌘ Mounting without a Joint Bar



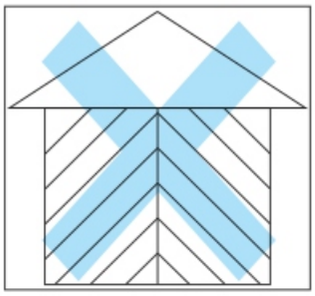
In case of butt mounting of the panels without application of a docking bar, there may be a risk of their cracking and deformation.

⌘ Mounting in a staggered order, in which vertical joints are not in a straight line



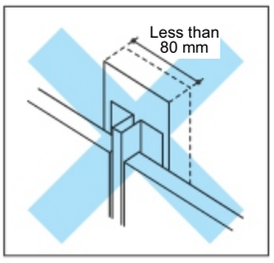
The water flowing along the seam can accumulate in a panel beneath it, which will lead to penetration of rainwater and icing.

⌘ Diagonal mounting



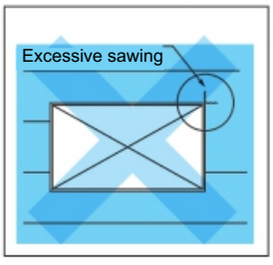
This type of mounting does not reliably fix the panels and can lead to their displacement, deformation, and falling. Moreover, such layout can not effectively remove water from the facade surface.

⌘ Application of a guide, the width of which is less than 80 mm in the joints



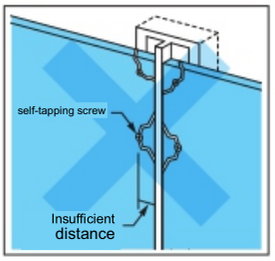
Application a guide, the width of which is less than 80 mm does not provide a secure fixation of a bracket.
It can also lead to cracking of the panel, while fixing its edge with a self-tapping screw.

⌘ Excessive over-sawing of the panel used near the window opening. Mounting of a cut panel of lesser size than required one without separation.



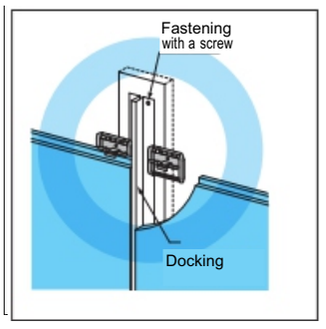
It can cause formation of cracks. Excessive over-sawing can also cause rainwater to penetrate panels and, as a result, damage them while freezing.

⌘ Fastening of a panel with a self-tapping screw close to the edge



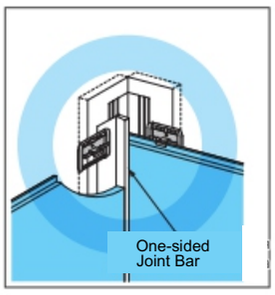
Insufficient distance from the edge can lead to cracks.
The distance from the self-tapping screw to the edge of the panel must be at least 40 mm

⌘ Docking bars should be fixed on the profile with an interval of approximately 1 m



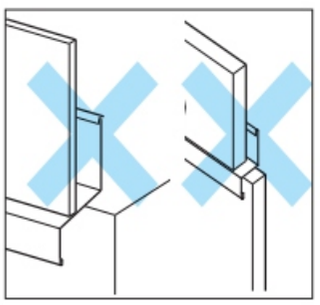
If the docking bars are not secured, lateral displacement of the facade panels can occur.

⌘ Application of one-sided docking bars on inner corners and around openings



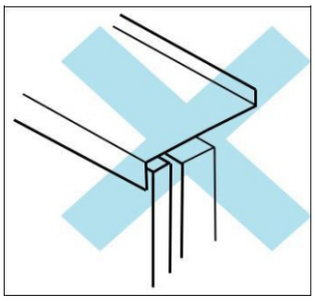
If you do not use the docking bars, the lateral displacement of the facade panels can occur.

⌘ Mounting the panel closely to the ebb



In the docking joints between the drainage bar and the facade panel water can accumulate as a result of the capillary effect, which leads to damage to the base material or icing. Moreover, it does not comply with the standard technique of mounting of ventilated structures.

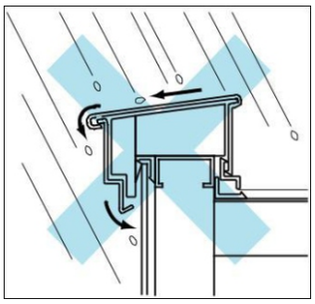
⌘ Mounting of panels under window ebbs with overhang less than 30 mm



It can lead to deformation and cracking of the facade panels as a result of flowing of large amounts of water to the surface of the panels

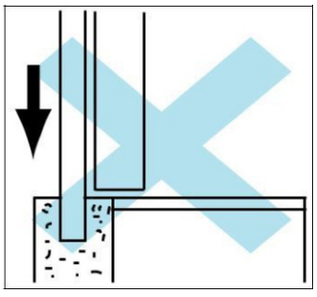
To prevent flowing of water from the window frame to the surface of the facade panels, the overhang should be 30 mm or more.

⌘ Covers of parapets with a slope outwards



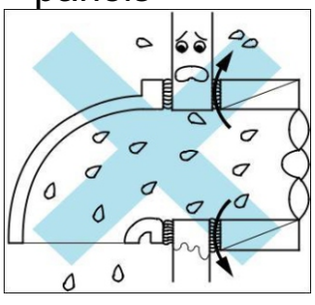
If the parapet covers are in a horizontal position or tilted outwards, a large amount of rainwater gets to the outside of the wall, which can lead to contamination and icing of the panels.

⌘ Mounting in a foundation or a butt-end mounting with a plinth



Facade panels absorb water in the places of joining with the foundation, which can lead to peeling of the coating, damage to the base material, icing, etc. Moreover, there will be no ventilation gap, which is necessary to remove moisture.

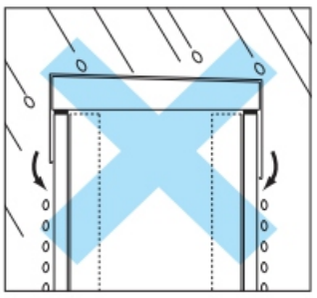
⌘ Installation of ventilation elements after mounting of facade panels



If installation of ventilation elements is carried out after mounting of facade panels, it can cause subsequent penetration of moisture into the walls and lead to formation of condensation, rainwater leakage, icing, etc.

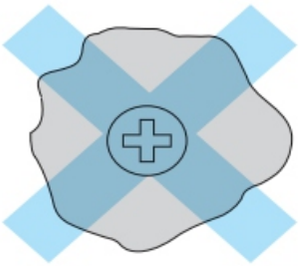
Ventilation hoods and connecting pipes should be installed before mounting of the facade panels, and the edges of the wing and moisture protection membrane shall be sealed with a waterproof film, etc. to prevent water penetration

⌘ Covers of parapets with insufficient overhang or installation preventing ventilation



B As a result of water flowing the panels may be exposed to contamination and icing. In the absence of ventilation in the facade structure, a condensation forms on the back of the panels, which will lead to deformation of the panel

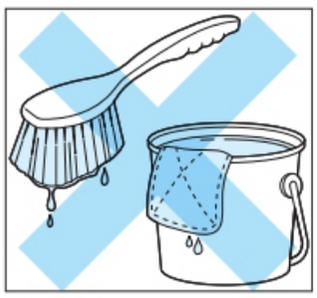
⌘ Too big area of repair paint application



If, when painting the heads of screws and chips, the paint is applied to a too large area, the paint will begin to peel off over time.

The repair paint should be applied minimally to the heads of screws

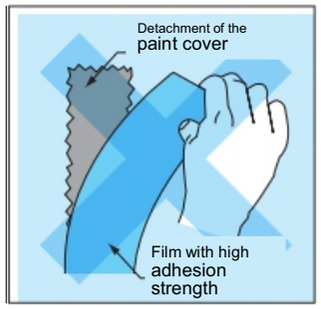
⌘ Cleaning the dust from the surface of the facade panels with water



If water is used to clean the surface, bright areas may appear on it. Clean the panel with a soft dry cloth or brush

Completely remove water from the surface, by drying it with air or a dry and clean cloth, a soft brush, etc.

⌘ Application of a film with high adhesion strength to the surface of facade panels

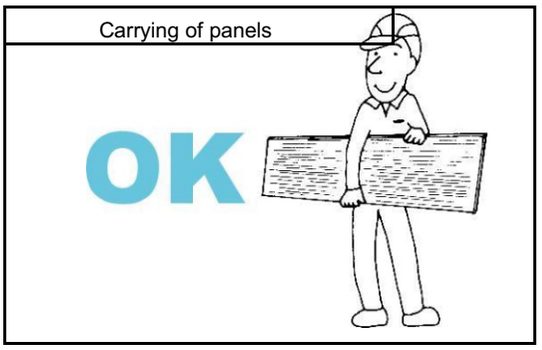


If films with high adhesion strength are applied to the surface of the facade panels (for example, fabric tapes or scotch tape), the coating may peel off, or a binder may remain on the surface.

Try not to apply the film to the surface of the facade panels

Transportation and storage

Rules of handling and transportation



- ⌘ Carry the panel, taking it by the middle under your arm, as shown in the picture on the right to avoid damage
- ⌘ Be extremely careful: the corners of the panel can be easily damaged during transportation, therefore try not to hit and drop the panel
- ⌘ Do not touch the panels with dirty hands

When lifting and transporting panels on height, try not to damage them

Rules for lifting panels on height

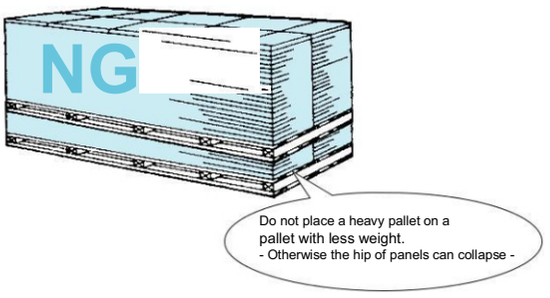
⌘ Pay attention to these points when lifting panels

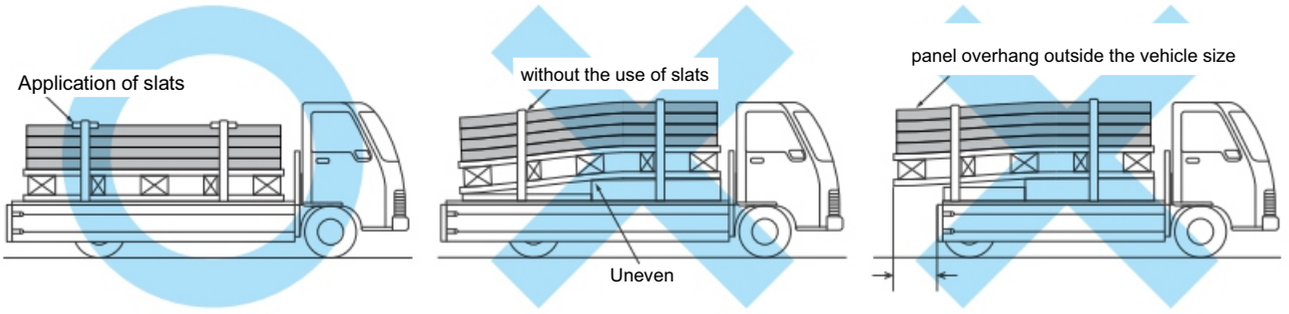
1. Avoid strong bending of the panels
2. Watch the lifting carefully to avoid bumping into foreign objects
3. When lifting with a crane, strengthen the pallet in order to avoid deformation of the panels

Example of reinforcement: draw steel reinforcement bars through the pallet to strengthen it or use a reinforced pallet with sufficient strength.

Transportation of panels by car

- ⌘ 1 pallet weighs about 2 tons
- ⌘ When transporting the panels by the car, place the panels horizontally
- ⌘ To avoid accidental damage to the panels, fix them with straps and insert slats to prevent the straps from shifting during transportation
- ⌘ When loading and unloading the panels, be careful not to damage them
- ⌘ To prevent damage to the panels when lifting, insert the slats between them and the straps
- ⌘ Do not place a heavy pallet on a pallet with less weight.





Storage rules

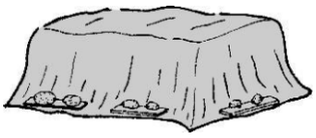
⌘ Store the facade panels in a horizontal position closed with a film.
Before mounting the facade panels should be stored dry and above the ground to prevent penetration of moisture, which can affect the quality of panels.

⌘ Do not put more than 2 pallets of facade panels on one another.
Load and unload the pallets with a forklift or a load-lifting crane.

⌘ During works on the site, it is necessary to maintain the cleanliness of the facade panels, since certain types of contamination, for example, cement or dust from cutting of panels are difficult to remove in future.

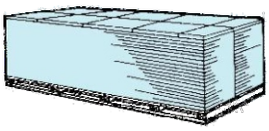
⌘ If before mounting it becomes necessary to put the panels on the edge, make sure that there is no contact with uneven or abrasive surfaces that can damage the factory coating or plaster.

Temporary storage of the panel in the open area

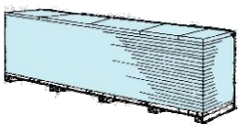


Storage of the panel indoors

a) On a pallet



b) On a gasket



● Don't put the panels on the ground.

Example of a ventilated facade of panels of the Ceradir V series

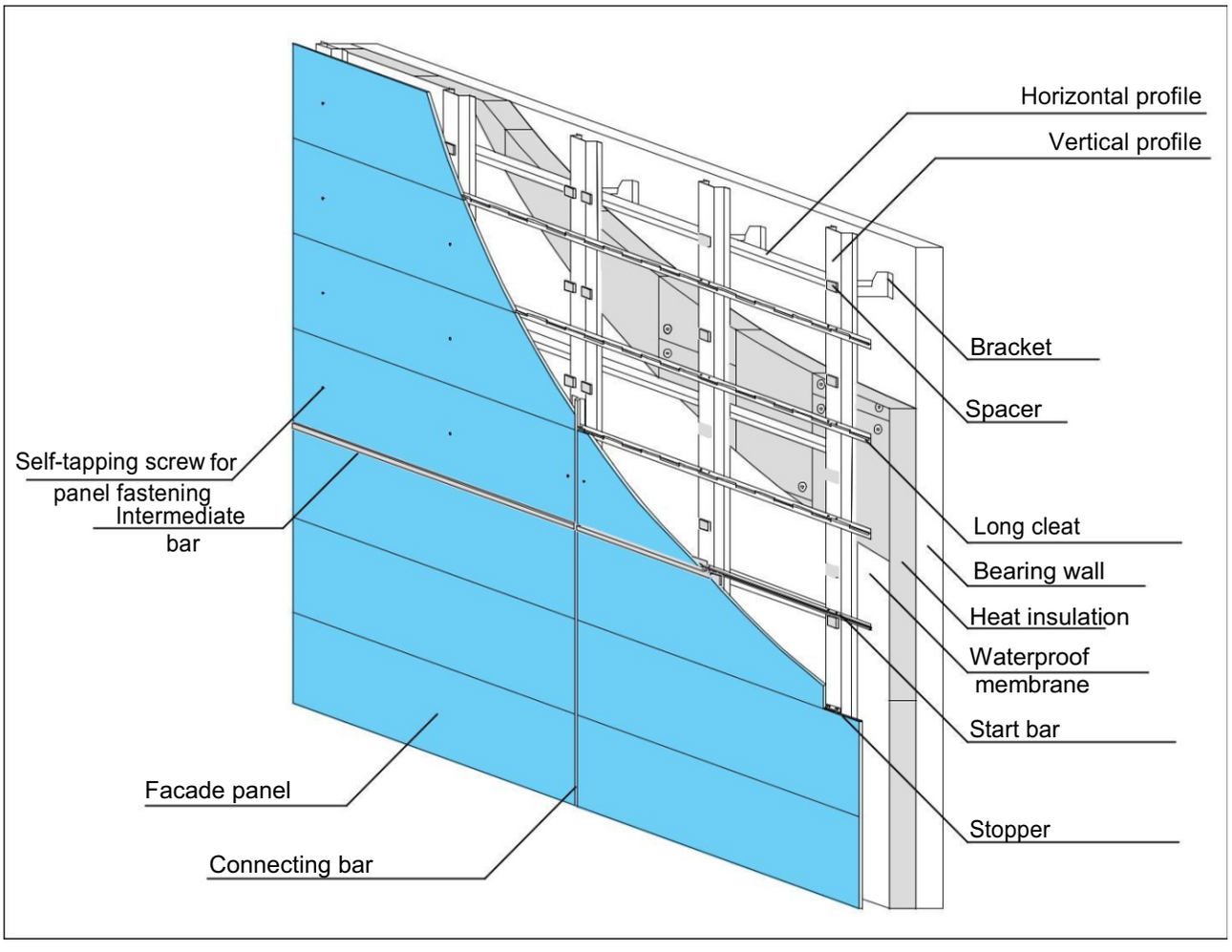
The figure shows the method of mounting the Ceradir V panels on a typical subsystem used in Russia.

Ceradir V are high-quality products with excellent design, imitating natural materials, manufactured with a strict quality control.

Ceradir V is specially designed for the Russian market. Panel mounting is done without silicone; instead of it special separation bars are used. There are no wet works in the mounting process and it can be performed at any season of the year.

Ceradir V differs from the Ceradir and Neorock series in its ability to withstand increased wind loads and can be used in buildings up to 75 m high.

For detailed information on design and mounting, read this guide.



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Design conditions

＜1＞ Conditions for application of facade panels

⌘ The metal subsystem should have characteristics suitable for use with KMEW panels. The building's height should be no more than 75 m.

⌘ Make sure that the conditions for using the panels do not contradict the building codes of Russia (wind load, seismic zone, etc.)

＜2＞ Maximum wind load for different types of panel fastenings (kgf / m$_2$)

Mounting method		Subsystem step (mm)						
		600	550	500	450	400	350	300
1	Bracket	100.0	108.6	120.0	133.1	149.1	172.1*	199.7*
2	Bracket + self-tapping screw	203.5	220.9	244.2	270.9*	303.4*	350.1*	406.3*
3	Long Stopper + self-tapping screw	225.3	268.1	300.1	333.0	372.9	430.3	499.5

⌘ The designer is responsible for choosing the method of fastening based on the height of the building and the wind load given in the table.

⌘ The data given in the table were obtained by testing in an accredited Russian laboratory. The data in the fields marked with an asterisk were obtained from the calculated formulas in accordance with the obtained data.

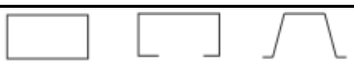
⌘ If you have any questions, please contact the Moscow office of KMEW.

＜3＞ Specification of metal substructure

When the panel is mounted on a metal substructure that does not meet the conditions listed below, the panels can hover, deform and appear not exactly on the plane.
KMEW is not responsible for the damage caused to panels as a result of mounting of the substructure.

① Standard specification of metal substructure

⌘ The table below lists the requirements for the specifications of the metal substructure for mounting of KMEW panels.

Material	Steel, Anticorrosive painted steel ※ The components must be made of materials with sufficient strength.	
Thickness	1.2 mm - 2.3 mm	
Form (For example, a widely used form of substructure)	 ※ In all areas of fastening, use elements with appropriate dimensions. ※ Do not use steel without molding.	
Required force to pull out the screw and rivet for fastening of the cleat (Pull out force) ※ 1	When fastening with one screw or rivet	Not less than 2,500 N/pcs
	When fastening with two screws or rivets	Not less than 1,250 N/pcs

※ 1 Force to pull out the rivet, when mounting the KMEW cleat on a metal substructure. Cleat B1205 (Galvanized steel/0.8 mm thickness).
The tests were conducted according to ISO 14589, the average indicator N is determined at least 10.
Also it is necessary to choose a screw and rivet made of a fairly strong material.

② The property that a substructure must have

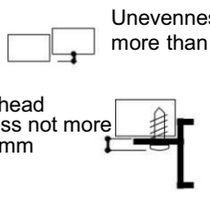
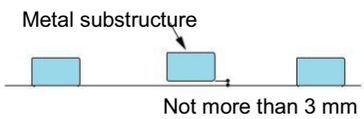
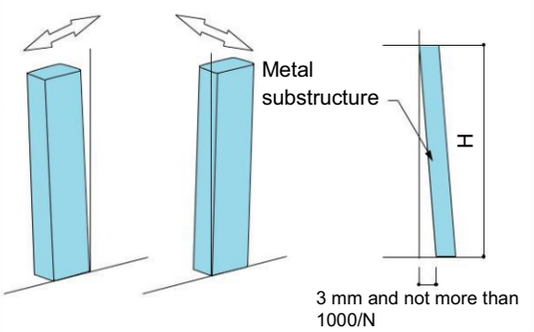
⌘⌘ The table below lists the requirements for the specifications of the metal substructure for mounting of KMEW panels.

(for the tests shown in the following page④Test methods for the metal system)

Points to be prooved	Evaluation criteria	Test method
Substructure should not be subject to warpage	Panel displacement step: Not more than 4 mm	Test No. 1
	Substructure displacement step: Not more than 3.5 mm	
Substructure should not be subject to inclination	Substructure displacement step: No more than 1.5 mm	Test No. 2
Substructure should not sag	Overhang of the panel and substructure: Not more than 1 mm	Test No. 3
Substructure should be fixed	Panel and substructure must be immovable	Test No. 4

③ Accuracy of mounting of the substructure

⌘ For mounting of KMEW panels it is necessary to provide accuracy of mounting of the metal substructure in accordance with the conditions below.
⌘ Installation of metal substructure in the interval no more than 600 mm
⌘ Absence of excessive unevenness of the metal substructure and the screw cap is more than 2mm.
⌘ Deviation of the metal substructure from the wall in the transverse direction (no more than 3 mm).
⌘ Deviation of a metal substructure from a straight axis not more than 3 mm / 1000
⌘ Presence of necessary substructures for mounting of panels in various places.

Excessive unevennesses of the substructure and screw heads	Deviation of the substructure from the wall in the transverse direction	Substructure location
		

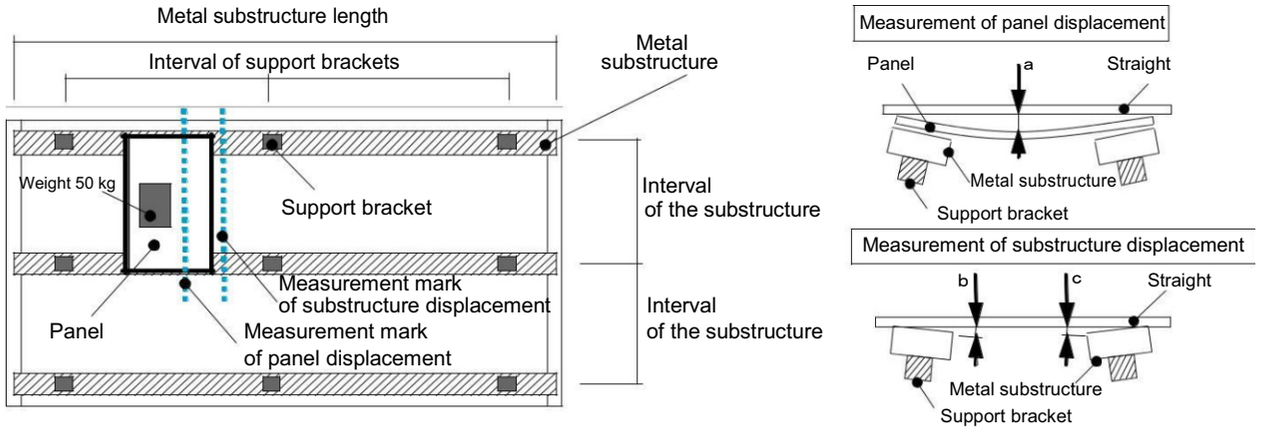
④ Metal system test methods

■ Test No. 1 Checking the substructure for warpage (curvature)

⌘ A test stand is made ready on the plane, prepared on the basis of the support bracket and profiles. Insert the panel between the two support brackets. See the drawing below.

⌘ The panel weighing 50 kg is set in the middle and the step of panel displacement (a) and the step of displacement of the substructure (b and c) are measured.

Test stand	Measurement method

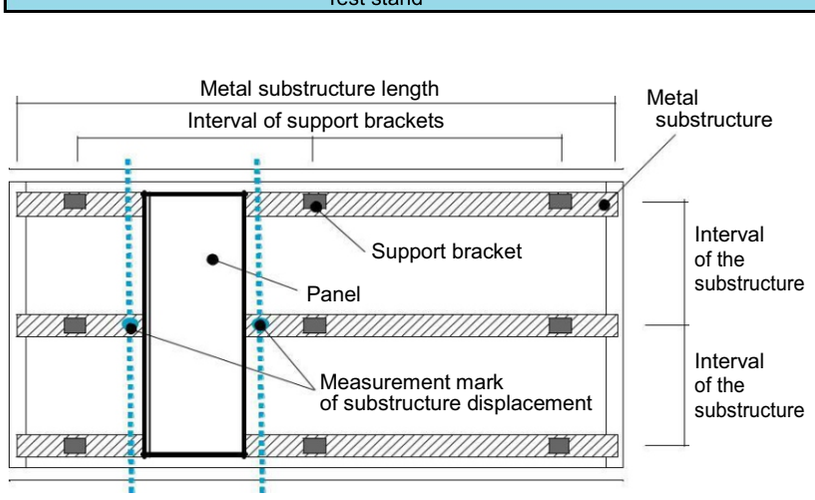


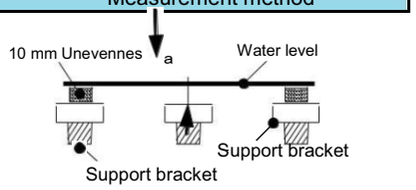
■ Test No. 2 Checking the substructure for deviation

⌘ Use the stand that was used in Test No. 1. Put the panel between the two support brackets. In this case it is necessary to create an uneven height of 10 mm from two sides of the substructure (insert a 10 mm thick lining).

⌘ The panel is fastened with a 5 mm bracket in 6 places and the step of panel displacement (a) is measured.

Test stand	Measurement method





Measure the step difference before and after mounting of the panel (a) and set this step difference as the step of the substructure displacement

■ Test No. 3 and No. 4 Check the substructure for immobility

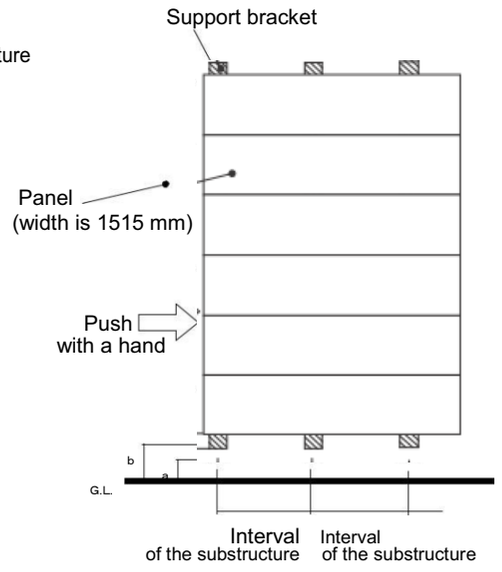
⌘ Place the support bracket on the front side of the wall and mount the panels (width is 1515 mm) in 6 rows in height.

Test No. 3

⌘ Measure the overhang of the support bracket (a) and the panel (b) before and after mounting of the panel.

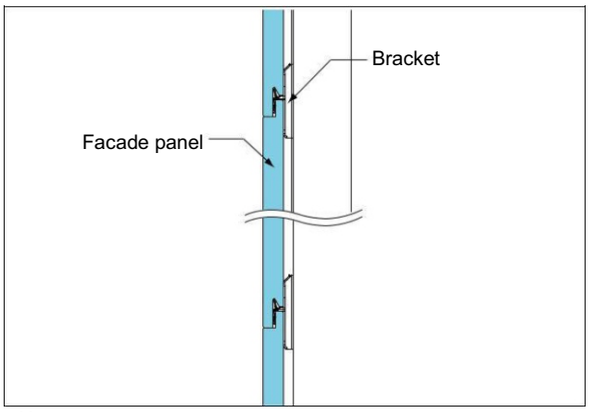
Test No. 4

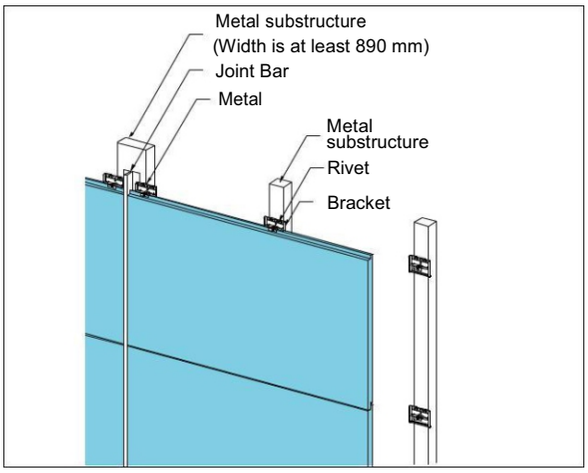
⌘ After mounting of the panel push the panel laterally horizontally with your hand.



＜4＞ Panel mounting methods

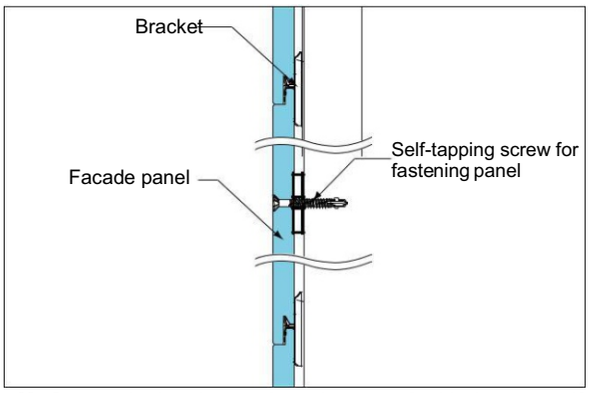
① Bracket

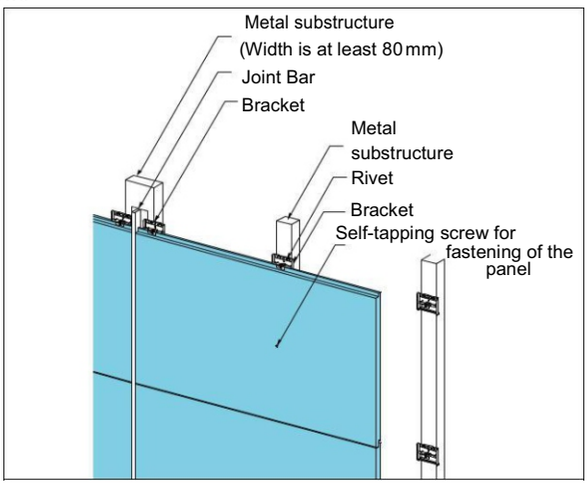




⌘ Secure the bracket on the subsystem 2 with rivets or self-tapping screws

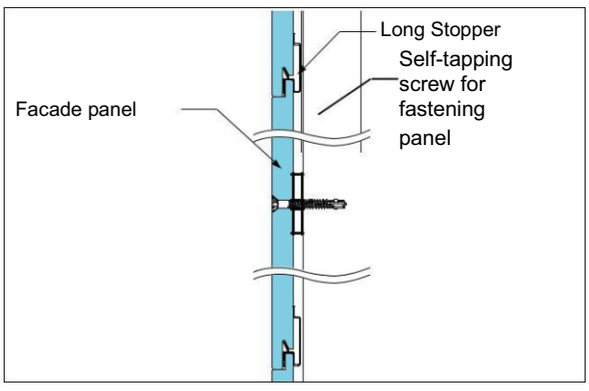
② Bracket + Self-tapping screw

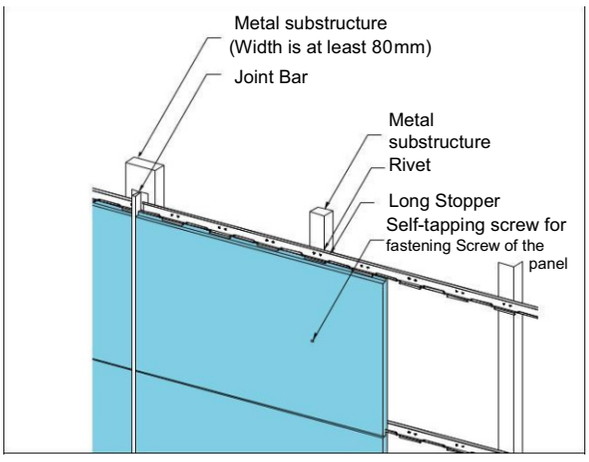




⌘ Secure the bracket on the subsystem 2 with rivets or self-tapping screws
⌘ Secure the panel with an original 50 mm self-tapping screw to each vertical profile. Place a spacer on the profile in the place of fixation to avoid bending of the panel.
⌘ Do not fix the self-tapping screw to the profile, on which the docking bar is located, due to impossibility to keep the required distance, excluding the possibility of damage to the panel.

③ Long Stopper + Selftapping screw





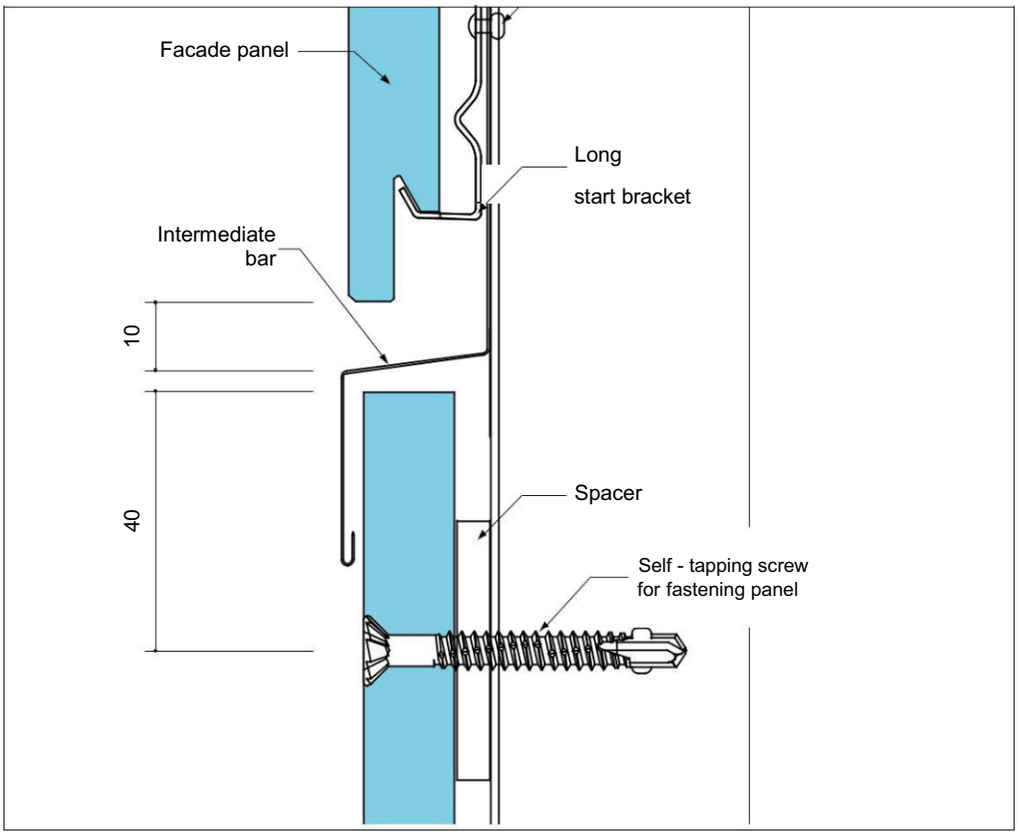
⌘ Secure the bracket on the subsystem 2 with rivets or self-tapping screws
⌘ Secure the panel with an original 50 mm self-tapping screw to each vertical profile. Place a spacer on the profile in the place of fixation to avoid bending of the panel.
⌘ Do not fix the self-tapping screw to the profile, on which the docking bar is located, due to impossibility to keep the required distance, excluding the possibility of damage to the panel.

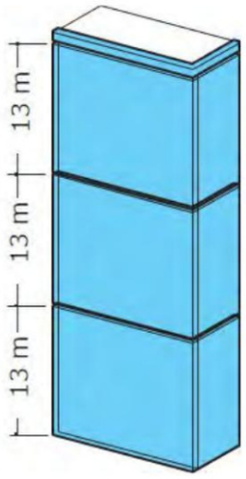
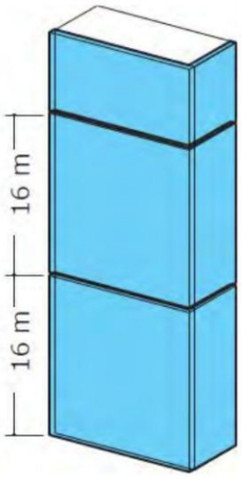
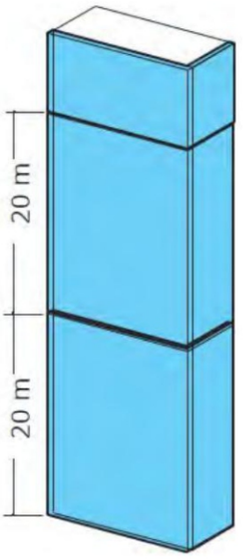
Conditions of application of an intermediate bar according to the height of the building

Installation of an intermediate bar

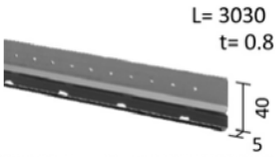
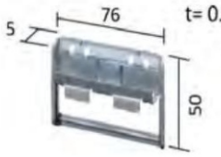
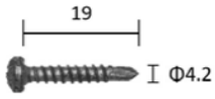
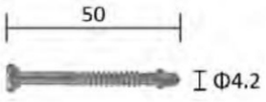
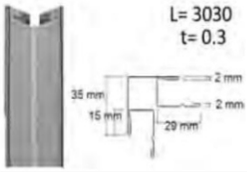
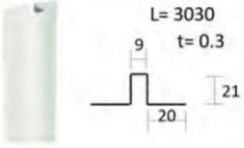
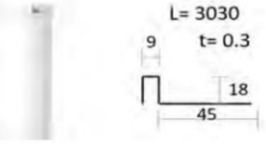
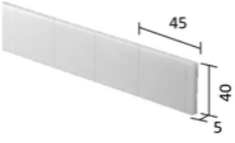
● To disperse the load applied to the holding elements (brackets) of the panels, install intermediate bars for each specified height.
● Specified heights vary depending on the method of mounting of the panels. See table below.
● To fix the top of the panel under the intermediate bar, install the spacer, step about 40 mm from the edge of the panel and secure it to the metal substructure using self-tapping screws to secure the panels.
● The start bracket is placed on top of the intermediate bar.

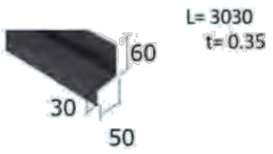
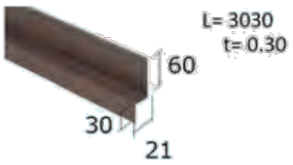
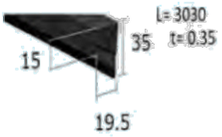
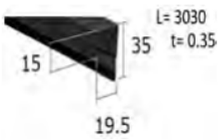
	Intermediate bar installation frequency
① Bracket	Every 13 m
② Bracket + Self-tapping screw	Every 16 m
③ Long Stopper + Self-tapping screw	Every 20 m



①Bracket	②Bracket + Self-tapping screw	③Long Stopper + Self-tapping screw
		

Description of original products used in the mounting process

Name (ID)	Photo	Material	Places of application
Long Starter Bar (B10052)		Painted galvanized steel	Provide a support for first panels
Bracket (B1205)		Steel with ZAM coating (Zn, Mg, Al)	Used for fastening of the panel to the metal system
Long Stopper (B12055)		Steel with ZAM coating (Zn, Mg, Al)	Used for fastening of the panel to the metal system in case of increased wind loads
Self-tapping screw for brackets (RY8840)		Stainless steel	Used for fastening of brackets to the metal system
Self-tapping screw for fastening of the panel (B88501)		Stainless steel	Used for fastening of panel in places, where application of brackets is impossible or reinforcement is required
Metal corner (B211***)		Painted galvanized steel	Used at outer corners of the building
Joint Bar (B2712***)		Steel with Galvalume coating (Zn, Al)	Used in the vertical joints of panels
One-sided docking bar (B2712K***)		Steel with Galvalume coating (Zn, Al)	Used in the inner corners, between window slopes and the panel
Spacer 5 mm (RY82S05)		Polypropylene	Used to eliminate the bending of the panel, while fixing it to a metal profile with a self-tapping screw

Name (ID)	Photo	Material	Places of application
Ebb (B238***)		Painted galvanized steel	Used in the basement part
Intermediate bar (RE224***, B224***)		Painted galvanized steel	Used for making of deformation seams
Finishing bar (B254**)		Painted galvanized steel	Used in the ceiling part
Inner drainage corner (RCILK)		Painted galvanized steel	Used in the inner corners
Repair putty (B4901)		Acrylic emulsion	Applied to the scratches, notches and holes for self-tapping screws
Repair paint Individual for each type of panels			Applied on the putty

Tool required for mounting

Name	Photo	Places of application
Circular saw		Necessary for cutting of panels (it is recommended to use the saw for discs with diamond coating, for example, Makita 4105KB)
Vacuum cleaner		Required to remove the products of cutting of the panel
Disc for fiber cement		Special disc with diamond coating (it is recommended to use Makita A-50027)
Battery impact screwdriver		Used for drilling holes in panels and installation of self-tapping screws (it is recommended to use DTD129RFE/SHE/Z)
Manual saw		Necessary for cutting of panels
Metal scissors		Necessary for cutting of ebbs, corners and connecting bars
Rasp		Used for leveling of butt-ends of panels after cutting
Plumb-line		Necessary to determine the vertical
Setsquare		Necessary to perform a markup with strict perpendicularity
Roulette		Necessary for measuring and marking

Material calculation table

Accessory	Required quantity	Calculation	Reserve %	Multiplicity	Note
Facade panel	1 pcs/1.38 m2	Facade area	20	2 pcs/pack.	
Outer corner	1 pcs/3.03 m	Total length of outer corners	10	5 pcs/pack.	
Bracket	6 pcs/panel	-	10	70 pcs/ pack.	With the subsystem step of 600 mm
Long Stopper	1 pcs/panel	-	-	6 pcs/pack.	
Self-tapping screw for fastening panel	6 pcs/panel	-	10	200 pcs/ pack.	Used in the places of panel cutting, above and below openings and for reinforcement of fastening
Spacer	1 pcs/self-tapping screw	-	-	440 pcs/ pack.	
Self-tapping screw for fastening of brackets	1 pcs/bracket	-	-	500 pcs/ pack.	
Inner corner	1 pcs/3.03 m	Total length of inner corners	10	1 pcs/pack.	
Ebb	1 pcs/3.03 m	Perimeter of the facade of the building	10	5 pcs/pack.	
Start bracket	1 pcs/3.03 m	Perimeter of the facade of the building	10	4 pcs/pack.	
Final bar	1 pcs/3.03 m	Perimeter of the facade of the building	10	5 pcs/pack.	
Intermediate bar	1 pcs/3.03 m	Perimeter of the facade of the building X quantity of wraps	10	5 pcs/pack.	
Docking bar	1 pcs/3.03 m	Total length of vertical joints	10	15 pcs/ pack.	
One-sided docking bar	1 pcs/3.03 m	Perimeter of all openings, length of inner corners	10	15 pcs/ pack.	
Dripper	1 pcs/2 m	Balcony length	10	4 pcs/pack.	
Repair paint	1 pcs/200 m2	-	-	1 pcs/pack.	
Putty	1 pcs/300 m2	-		1 pcs/pack.	

Mounting steps

Studying of the structure

- ⌘ There should be no excessive unevenness (more than 2 mm)
- ⌘ Preparation of the structure with sufficient place for fastening of screws and installing of brackets

Panel layout

- ⌘ Consider the appearance, material consumption and practicality

Installation of start bars

- ⌘ Mark the horizontal reference line

Tagging

- ⌘ Mark the horizontal / vertical reference line

Installation of additional elements (outer/inner corners, vertical joints, etc.)

- ⌘ Ensure that the elements are installed at the correct angle.
- ⌘ Mounting of the Joint Bar is made on a metal substructure. The step of fixing the docking bar to the metal substructure is not more than 1 m.
- ⌘ One-sided docking bars should be fixed in the inner corners and on the sides of window frames

Cutting and fastening of facade panels

- ⌘ To fix the screws, use 5 mm spacers; ensure that there is sufficient distance from the edge of the panel.
- ⌘ Erratic tights and lifting should be absent.
- ⌘ Fastening with screws can be carried out in one of the following methods:
  Mounting with self-drilling screws (Stainless steel, L=50 mm)
  Pre-drilling of the facade panel and fastening with a screw (Hole diameter: screw diameter plus 1 mm. Self-drilling screw, stainless steel, L=50 mm)

Repair paint, checking

- ⌘ Apply repair paint to the screw cap and partial surface defects
- ⌘ Check the areas of paint application on the screws and clean the front panels

Cleaning of unused materials

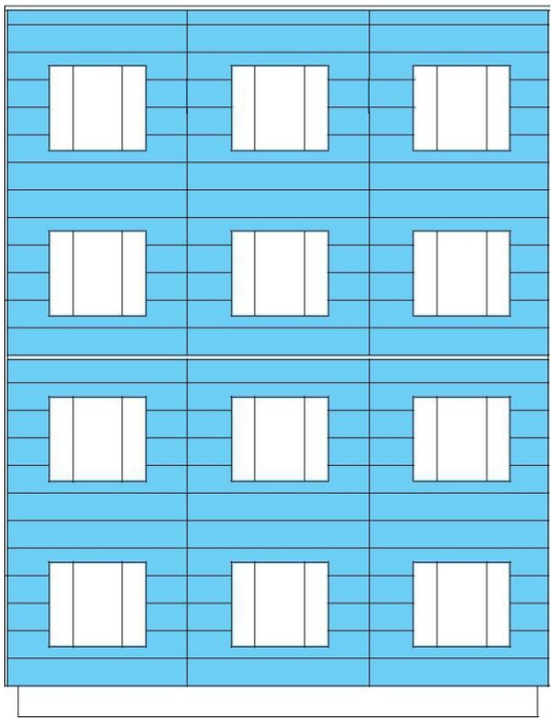
Inspection of the substructure

- Check the step of the metal substructure. The distance between the profiles shall not exceed 600 mm.
- Make sure that the panels are fixed on the profile with width of at least 80 mm in place of the vertical joint.
- Make sure that the metal substructure is mounted on the outer and inner corners with possibility of attaching the accessories and the panel.
- Make sure that a metal substructure is installed around the window opening.
- Make sure that the substructure is not uneven. The substructure unevenness should be less than 2 mm.
- If the unevenness of the substructure is more than 2 mm, insert the spacer and adjust the unevenness.

Panel layout

- When planning the layout of facade panels, it is necessary to determine the location of joints, taking into account the architecture, the plan of supporting structures and frameworks, the appearance, the size of additional elements, the left / right balance and material consumption.
- The places of vertical joints should be determined in advance with the help of drawings so that mounted facade panels looked nice.
- On the vertical joints docking bars are used, so when planning the layout of the panels, the width of joints (10 mm) should be taken into account.
- In order not to use narrow facade panels around the openings in walls and cornices, the window scheme and the height of cornices should be designed so that the width of the facade panels at the top and bottom of the windows and the height of the last panel exceed 150 mm.

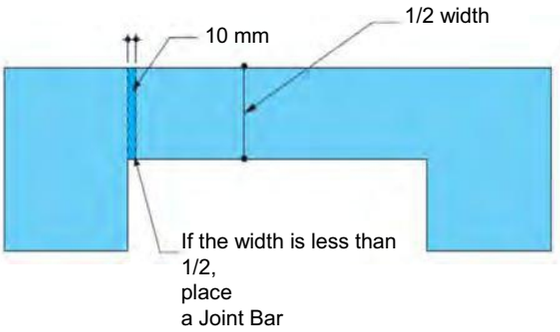
Layout example



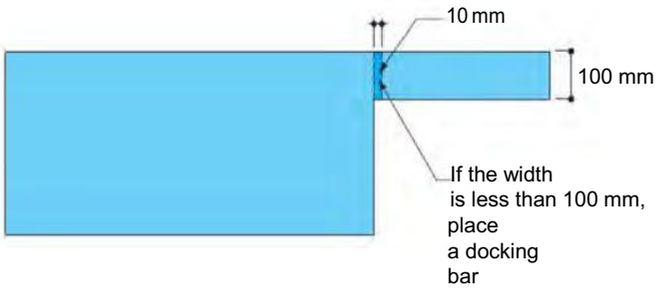
Panel cutting features

- If the width of the cut panels is less than that shown in the figures, cut off parts of the panels and connect them through the Joint Bar.
- In case of Figure A, the cut off part must have a width of at least 1/2 width of the panel.
- In case of Figure B, the cut-off part must have a width of at least 100 mm.
- Fix the cut-off part of the panel with the self-tapping screws.

A

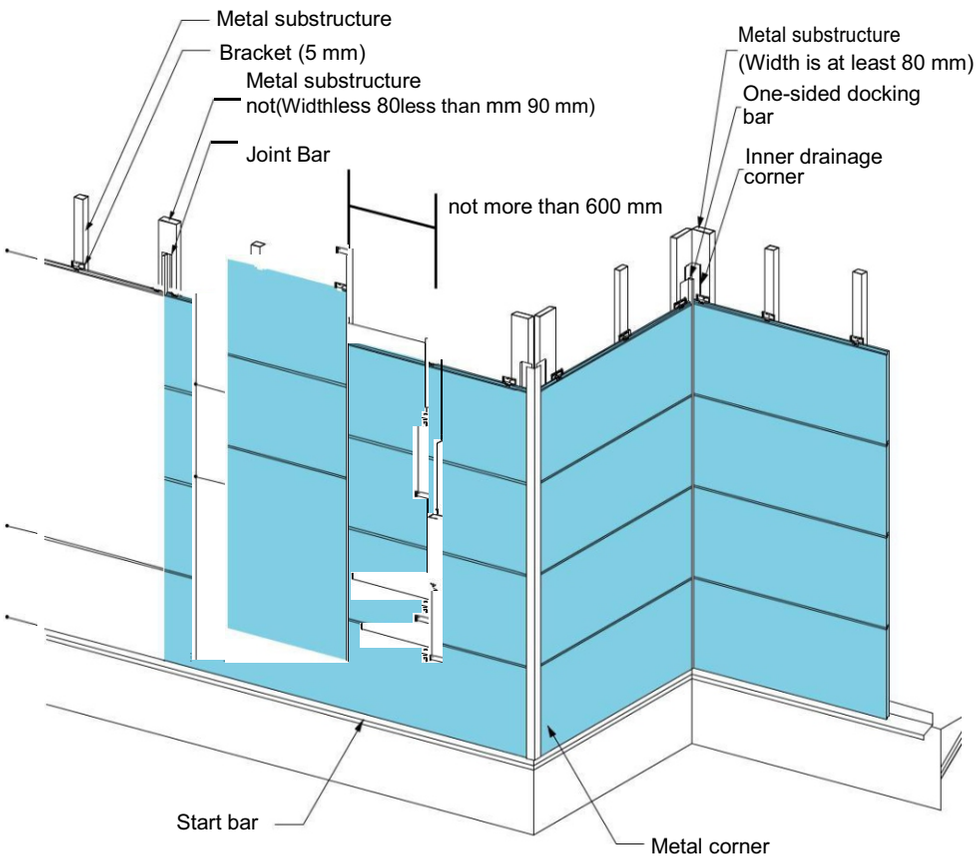


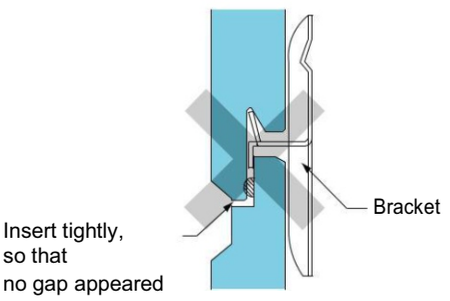
B



Main features of mounting (mounting with brackets)

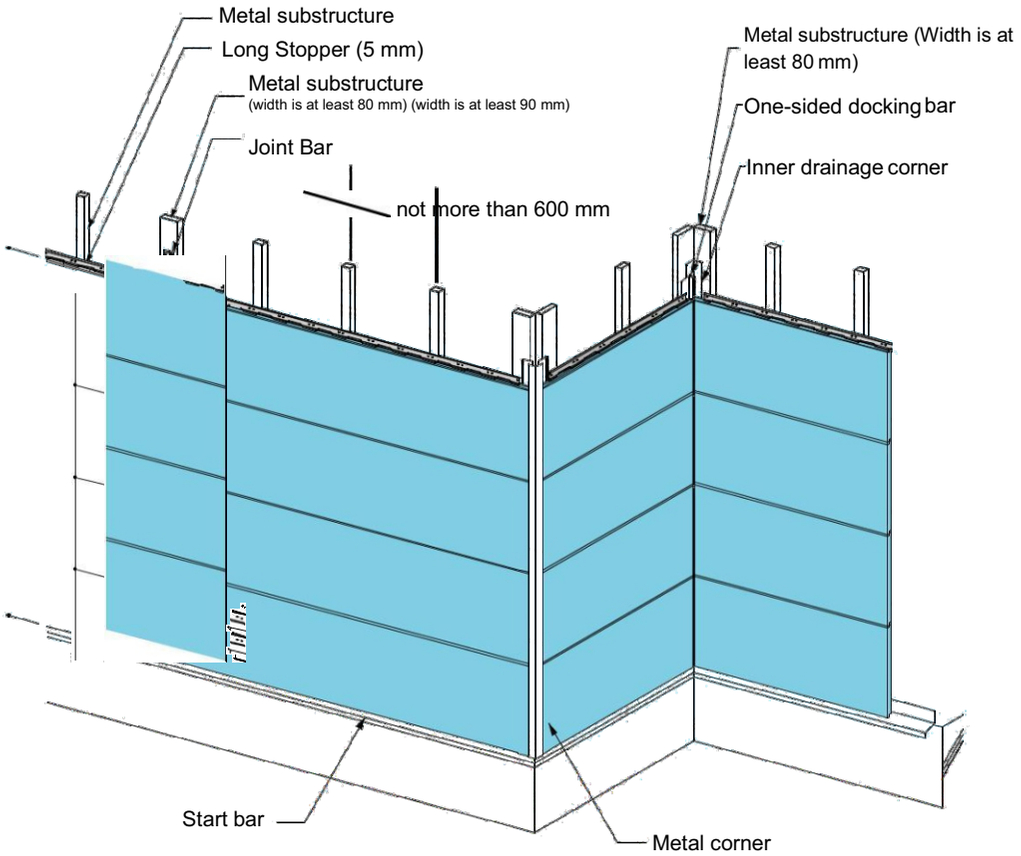
- ⌘ Panel mounting begins with installation of a start bracket.
- ⌘ Panels are fixed with brackets.
- ⌘ Braces are fixed with rivets or self-tapping screws according to the scheme in page 16
- ⌘ The brackets can not be installed in places of cutting of panels, above and below the openings, so in these places fix the panel with self-tapping screws according to the information in pages 31-34.
- ⌘ Mount the panel on the previous one so that their locks tightly converge without forming a gap.
- ⌘ The vertical profile interval must be no more than 600 mm.

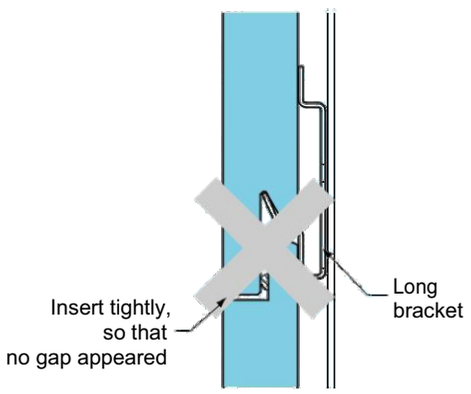




Main features of mounting (Long Stopper + Self-tapping screw)

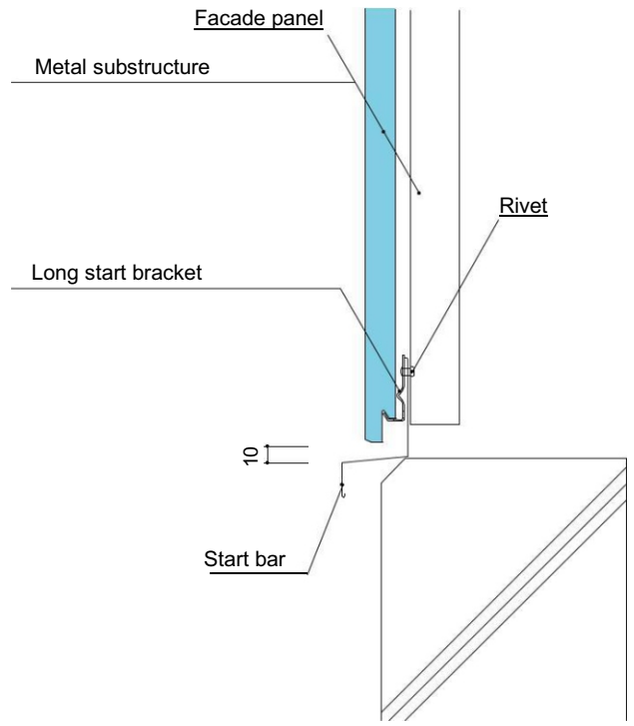
- ⌘ Panel mounting begins with installation of a start bracket.
- ⌘ Panels are fixed with brackets, fixation is strengthened by self-tapping screws.
- ⌘ Braces are fixed with rivets or self-tapping screws according to the scheme in page 16
- ⌘ The brackets can not be installed in places of cutting of panels, above and below the openings, so in these places fix the panel with self-tapping screws according to the information in pages 31-34.
- ⌘ Mount the panel on the previous one so that their locks tightly converge without forming a gap.
- ⌘ The vertical profile interval must be no more than 600 mm.





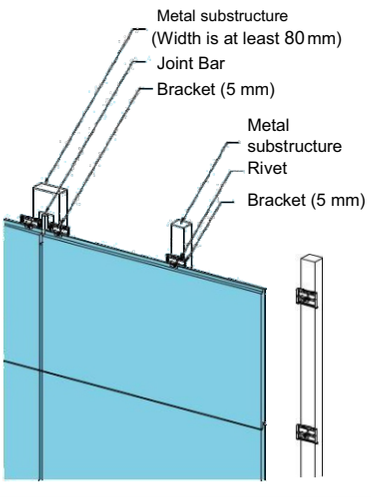
Mounting of the basement part

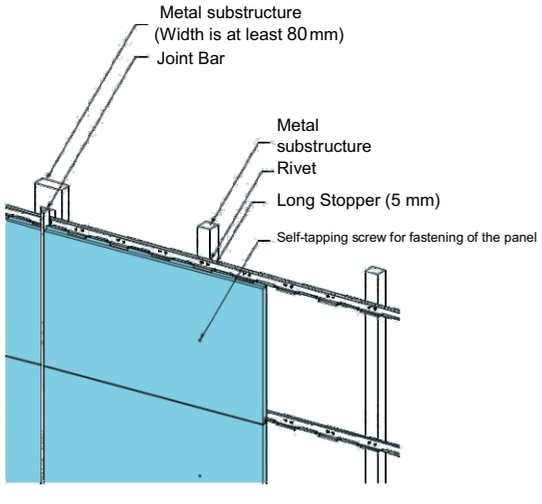
- To mark the position of the first panel, a contour line is drawn on the basement with a level or a water level.
- Long start brackets should be fastened to the structure at intervals of 606 mm or less, using rivets or self-tapping screws.
- Leave a 10 mm gap between the bottom of facade panels and the start bar.
- It is necessary to check the horizontalness of seams, when assembling the panels, after each row.



Installation of brackets

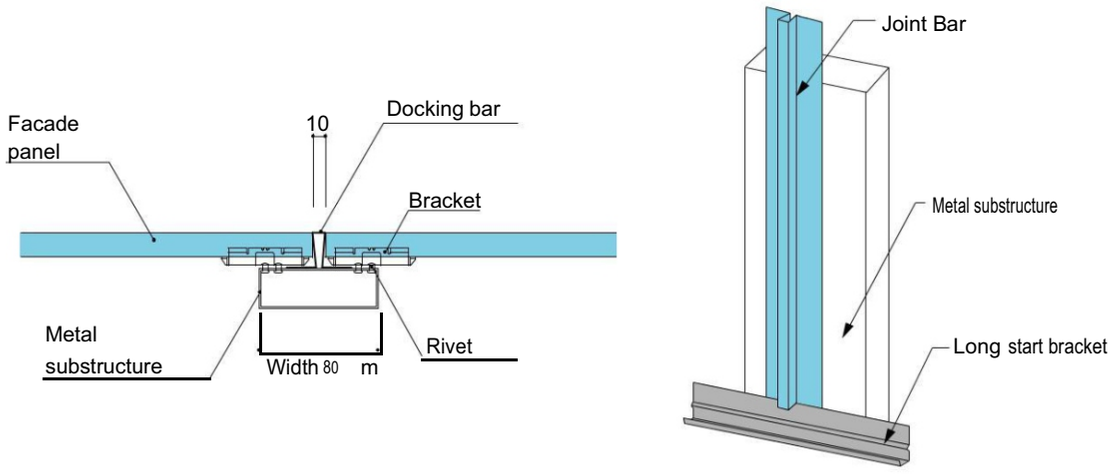
- Brackets should be fastened to the substructure with an interval of no more than 606 mm, using 2 rivets or 2 self-tapping screws.
- Location of the long bracket is determined on the substructure, then it is fixed with 2 rivets or self-tapping screws 2
- The brackets are secured with a rivet through the screw hole.





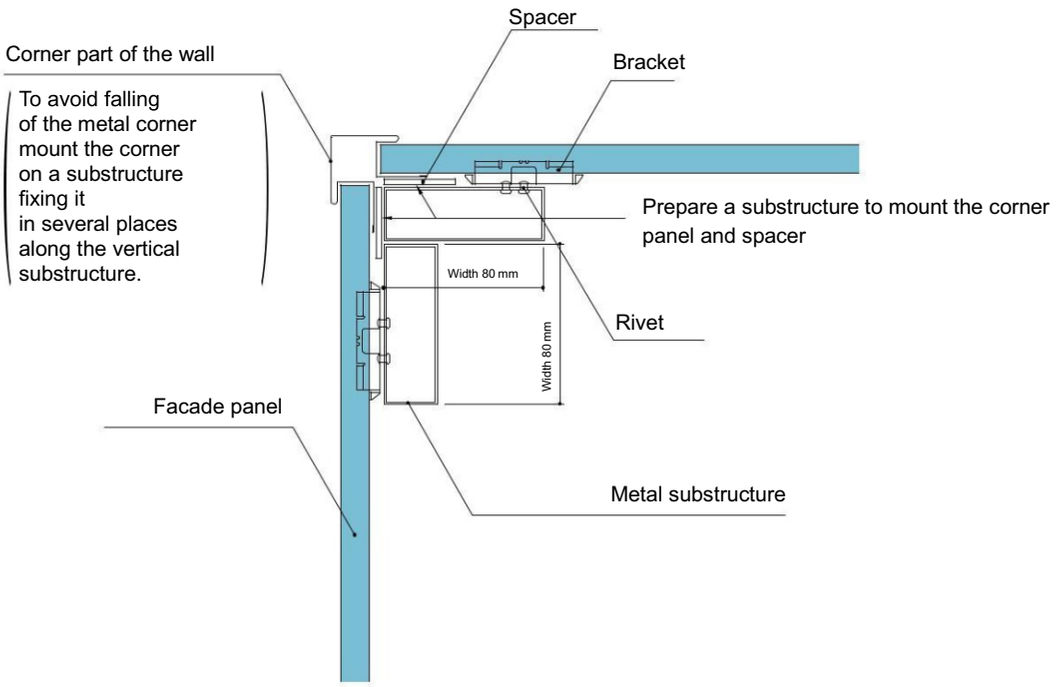
Mounting of vertical joints

- ⌘ On the vertical joints docking bars are used.
- ⌘ To prevent the lateral displacement of the facade panels, the docking bar is mounted on the metal substructure. The step of fixing the docking bar to the metal substructure is not more than 1 m.
- ⌘ One bracket is attached to facade panels from both the right and left sides.
- ⌘ The facade panel is installed in a dense manner to the Joint Bar and then mounting is carried out.
- ⌘ It is allowed to fix the bracket on the wing of the docking bar.

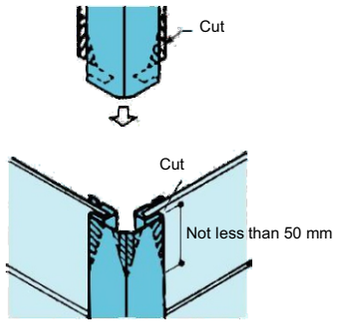


Metal framing of outer corners

- ⌘ Mounting of the metal corner is made as follows: the spacer 5 is fixed on two sides of the corner at a distance of no more than 500 mm along the entire height, then a metal corner is fixed through the spacer to the metal substructure.
- ⌘ Install the lower part (edge) of the metal corner under the facade panel and leave a 10 mm gap between the start bar.
- ⌘ Mounting of the panel in the metal corner is made in such a way that the corner closes at least 10 mm of the panel from each side and is fixed to the substructure by means of 2 rivets or 2 screws.

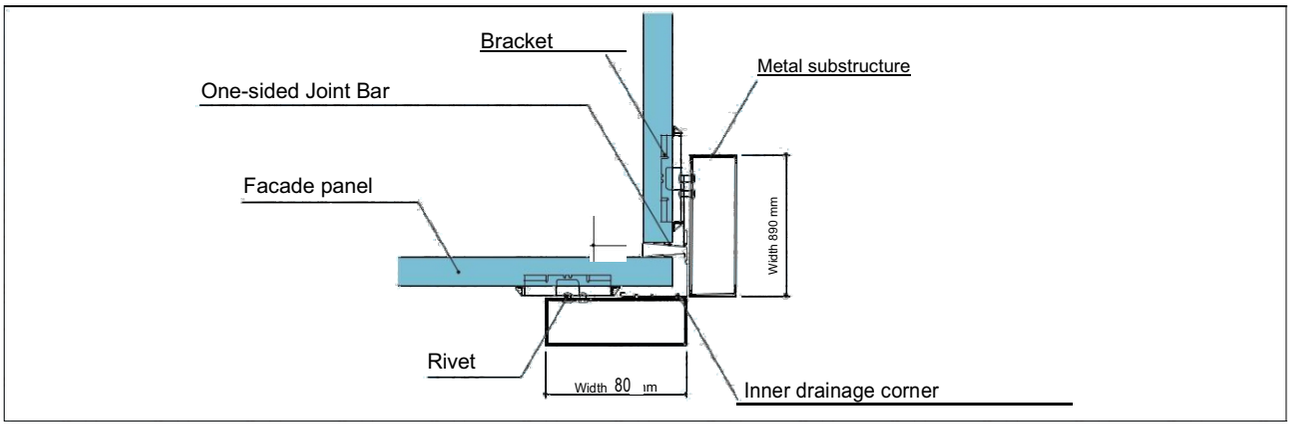


Method of docking the metal corner frame



Finishing of inner corners

- ⌘ Install hidden drainage on metal substructures.
- ⌘ To prevent lateral displacement of the front p anels, insert a one-sided Joint Bar.
- ⌘ The facade panel is installed in a dense manner to the one-sided Joint Bar and then mounting is carried out.
- ⌘ Pay attention to the seams at the corner joints of the panels on both sides so that they are even.



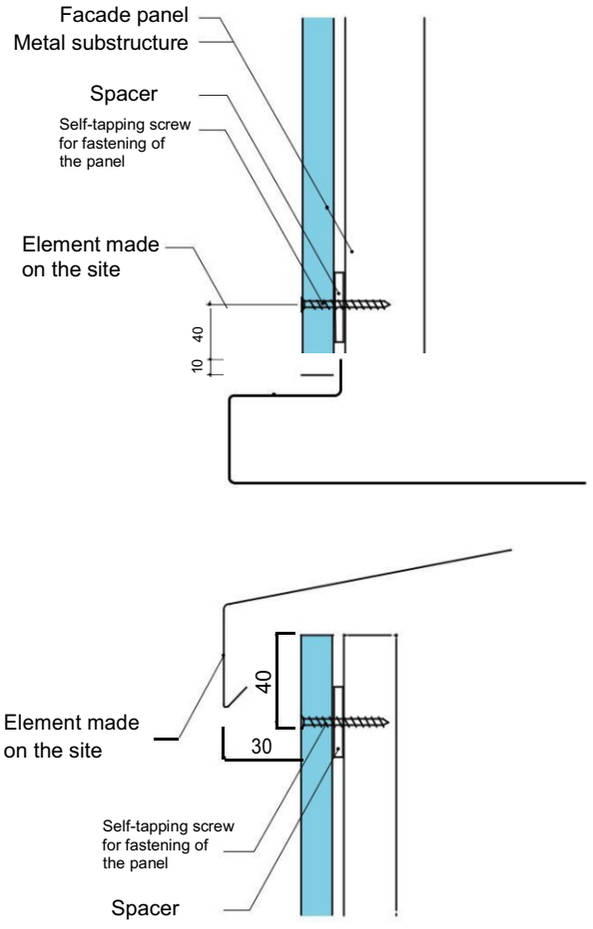
Around openings, doors and windows

Mounting around openings

- Making of ebbs for openings of appropriate sizes is made locally.

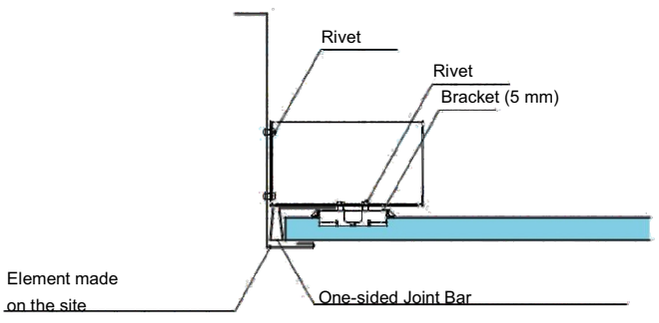
① Finishing of the bottom and top parts of openings

- When mounting the panels on the top of the openings, leave a 10 mm clearance.
- When mounting the panels on the top and bottom parts of openings, doors and windows, use a 5 mm spacer and secure the panel with a self-drilling screw to the structure 40 mm from the edge of the panel.
- In case of a conventional screw, drill a hole in the size of the screw diameter plus 1 mm in advance and secure it to the substructure.
- It is necessary to apply a repair paint on the screw head.



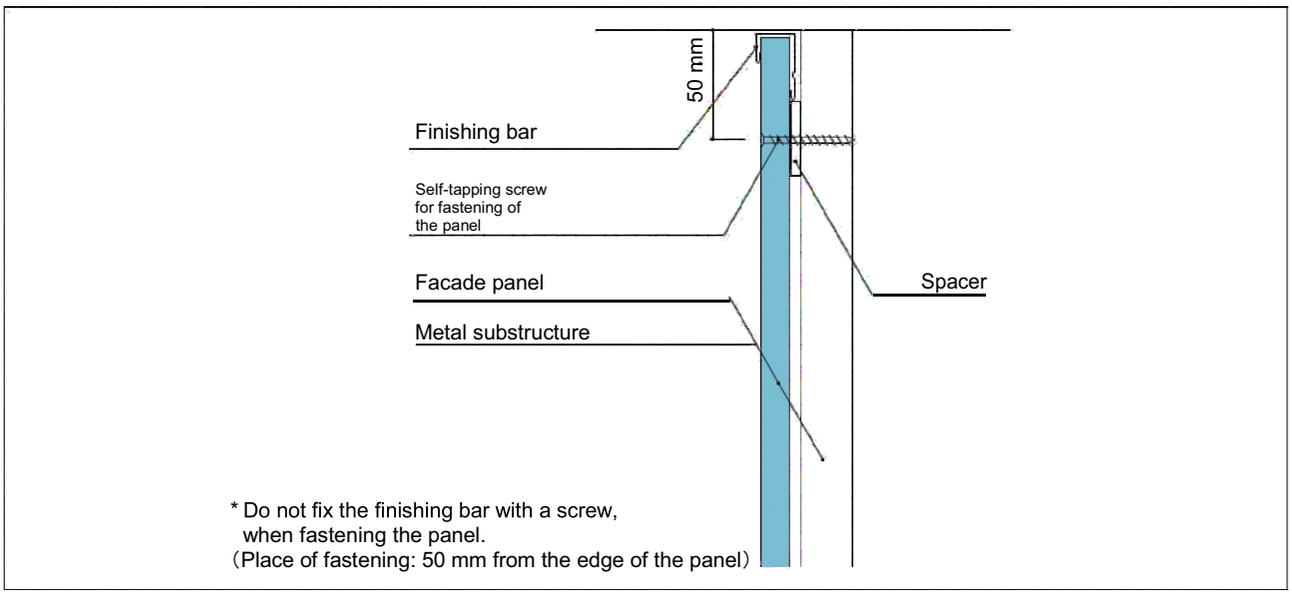
② Right and left sides of the opening

- To prevent lateral displacement of the facade panels, insert a one-sided Joint Bar into vertical joints of the window frame and in the places of adjoining of panels.
- The facade panel is installed in a dense manner to the one-sided Joint Bar and then mounting is carried out.



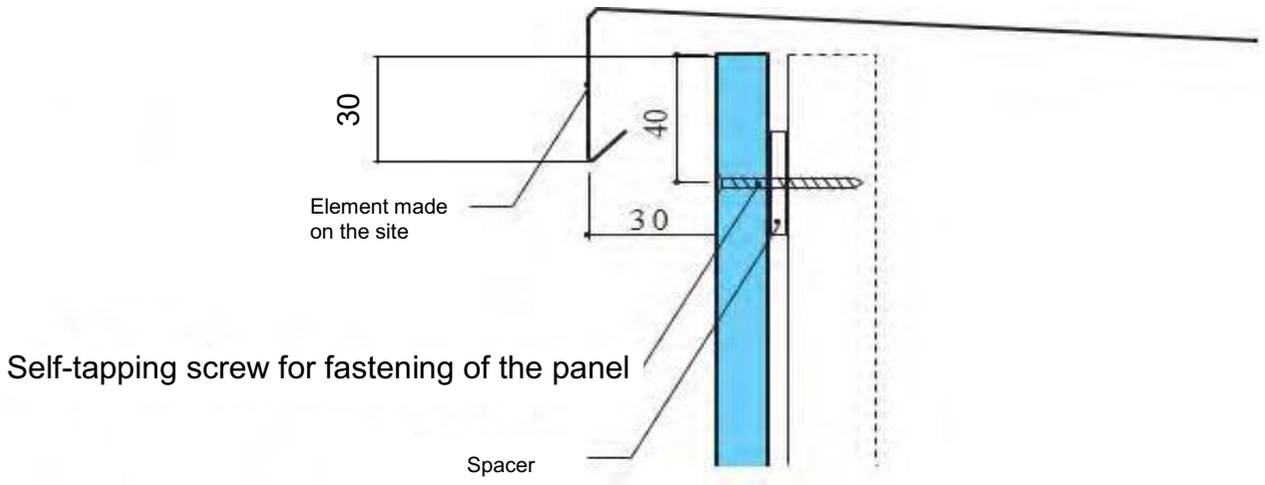
Adjoining of facade panels to the roof cornice

- ⌘ Fix the vertical guides before mounting soffits on the ceiling, leaving an air gap.
- ⌘ Insert the panels into the finishing bar so that the cut-off places of the panel remain invisible.
- ⌘ In the places where the panels are adjacent to the roof cornice insert a 5 mm spacer and fix the panel on the substructure with a self-drilling screw. When attaching the panel with a screw to the spacer, avoid direct attachment to the finishing bar. If using a conventional screw, pre-drill a hole of the screw diameter plus 1 mm then fix the panel to the substructure.
- ⌘ It is necessary to apply a repair paint on the screw head.



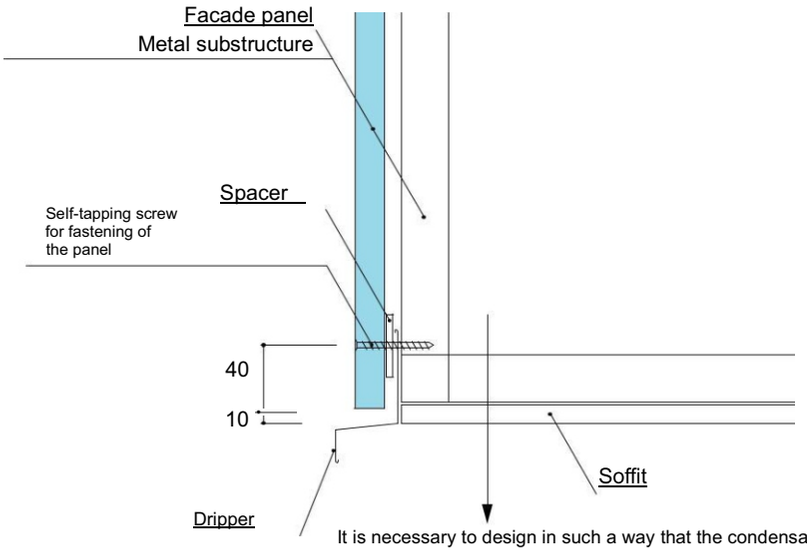
Parapet covers

- ⌘ Mounting of the panel with a ventilating gap is made, then the parapet cover is installed. The height of the parapet should be 30 mm. The parapet cover is made on the site.
- ⌘ The upper part of the panel is fixed with a 5 mm spacer and a self-drilling screw on the metal substructure. When fastening the panel, the distance from the top edge of the panel should be at least 40 mm.

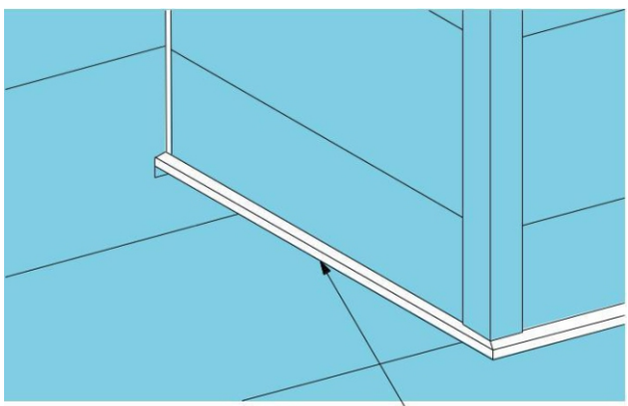


Mounting of the dripper

⌘ Leave a 10 mm gap between the panel and the dripper.

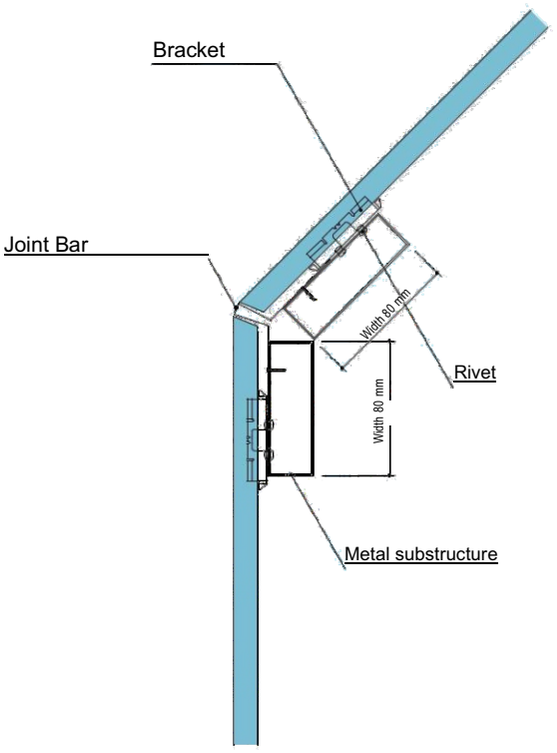


It is necessary to design in such a way that the condensate formed in the air layer can freely flow out.



Mounting on obtuse angles

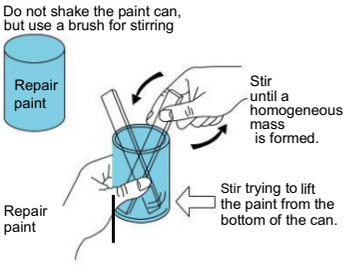
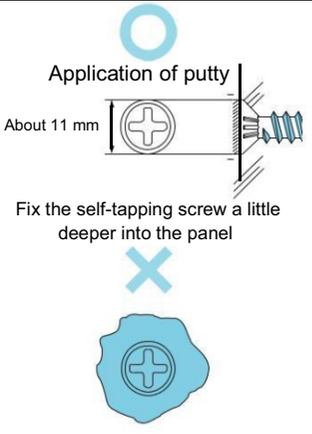
- ⌘ Insert the drainage element from the inside and fix the panel.
- ⌘ Mounting of the panel is done by a bracket. The bracket is fastened with 2 screws or 2 rivets. While mounting the panel, avoid direct attachment to the drainage element.
- ⌘ Installation of the docking bar on the joints. The facade panel is placed in a dense manner to the docking bar and then mounting is carried out.



Application of repair paint

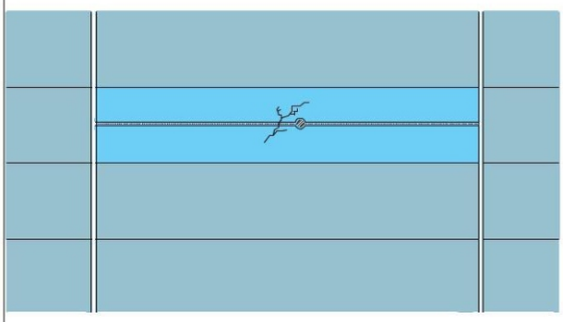
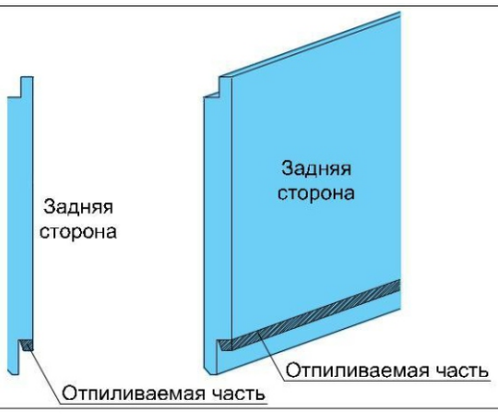
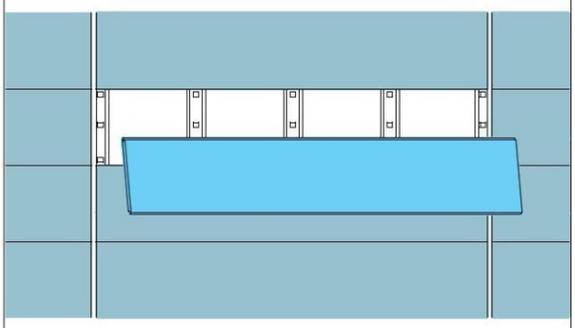
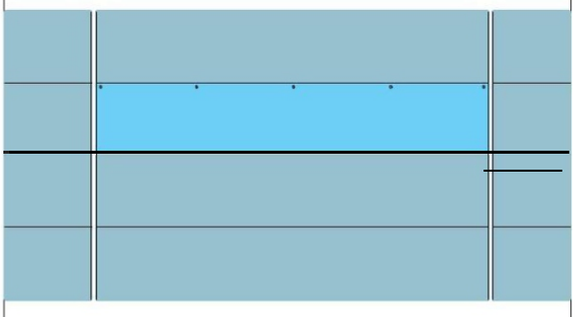
Notes	⌘ Apply special repair paint to the damaged areas that occurred during mounting of the panel. ⌘ Store at a temperature not higher than 40 C. (Storage at high temperature is dangerous. The cover can shoot, while opening). ⌘ Do not use silicone to paint the screws heads. In case of using silicone for painting of screw heads the painted area will be soiled and it can lead to discoloration of the panels. ⌘ When using the repair paint, observe the application rules given below. In case of non-observance of the above rules and notes over time the painted areas can stand out against the general background. In this case, KMEW company bears no responsibility. Please use silicone as instructed. ⌘ If there is a large scratch on the panel, it is better to replace it, instead of painting it.

Repair paint application procedure

Order	Order and main work	Figure
1) Preliminary inspection	⌘ It is necessary to check the lining face of the panel for humidity. Do not apply repair paint in rainy weather, or when the air temperature is 5 °C or less. ⌘ Do not use it in the areas where frost or dew appeared. ⌘ It is necessary to clean the place, to which the repair paint will be applied.	
2) Stirring repair paint	Stir the paint carefully with a special rod, lifting it from the bottom of the can (2 min or 200 times). Apply repair paint without diluting. **Notes** ⌘ When mixing the paint, be careful not to create foam. ⌘ Before painting, stirr the paint so that the hard pigments don't sink down. ⌘ In case of insufficient stirring of the paint the color may differ from the general background.	Do not shake the paint can, but use a brush for stirring 
3)Procedure of application of the repair paint	⌘ Using the rest of the paint, make test smears and adjust the color intensity. ⌘ Gently paint with a special paintbrush only those parts and screw heads requiring repair. Paint with a thin layer so that no drops of paint collect on the surface. The diameter of the repair paint application is 11 mm or less. ⌘ As for products painted in different colors, the intensity of coloring of different parts is different, so adjust the intensity of painting, focusing on the location of screws. ⌘ Repair of the self-tapping screw head Fix the self-tapping screw a little deeper into the panel. After applying putty, wait for completely drying, then apply repair paint. **Notes** ⌘ To avoid appearance of gloss, do not apply a thick layer of paint. ⌘ Too wide paint surface willstand out against the background. Apply the paint minimally.	
4)End of work Inspection	⌘ Check if any unpainted surfaces are left.	

Replacement of damaged panel

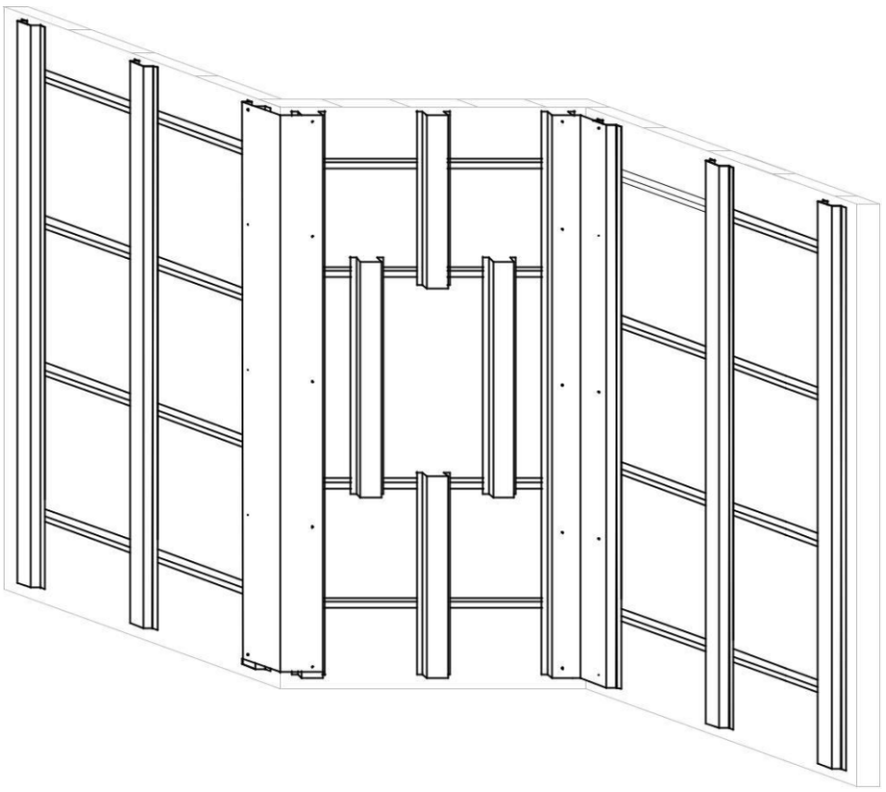
The panel to be replaced is fixed with self-tapping screws.

Order	Actions	Figure
Dismantling of damaged panel	⌘ Make a hole in the center of the panel, which will be useful for pulling the panel in future ⌘ Set the length of the blade in the circular saw so that it is equal to the panel thickness ⌘ Neatly make a cut through the panel without hurting other parts of the system ⌘ Pull out the two resulting pieces without touching other panels	
Preparation of a new panel	⌘ Cut the panel to the same length as the damaged one ⌘ Set the length of the blade in the circular saw so that it is equal to the thickness of the back parts of the slot on the panel ⌘ Saw off the back of the slot, carefully making sure not to damage the front part	
Mounting of a new (replacing) panel	⌘ Glue spacers on the metal system in places where self-tapping screws will be installed ⌘ Install the panel by inserting first the top part and then the bottom one	
	⌘ Secure the panel with self-tapping screws with step of at least 600 mm, at the sides (indent from the edge of the panel at least 30 mm) and in the center	

Mounting order

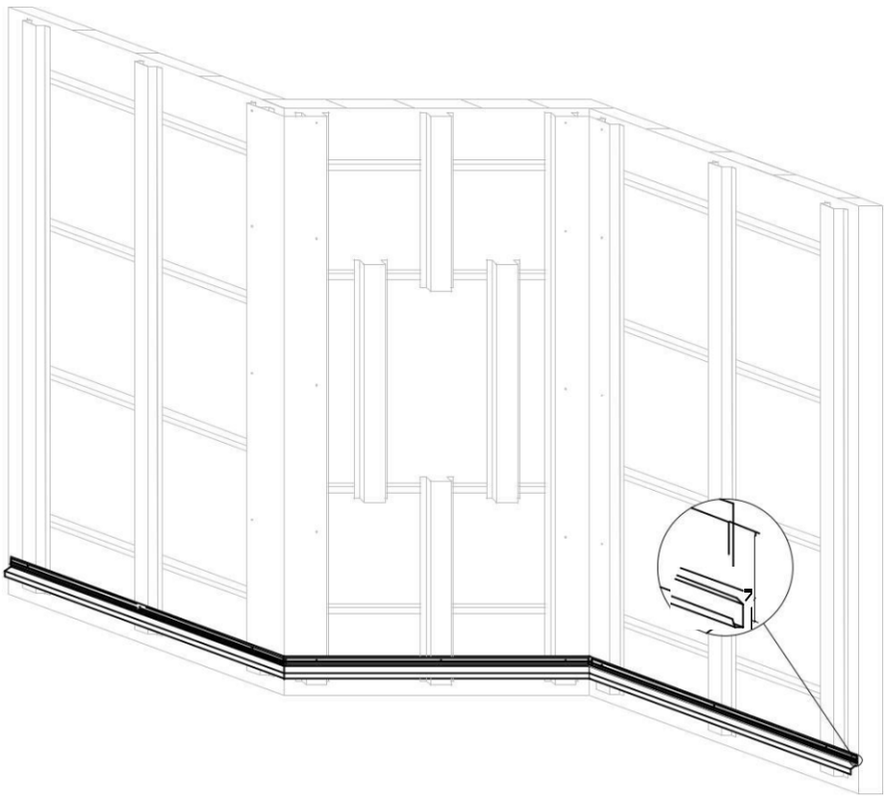
Facade panels are mounted with brackets.

1 Inspection and preparation of the metal system



- Before mounting check the verticality and deviation from the plane of the metal system. If defects are found, they must be repaired
- Secure the sheet metal strips bent at an angle of 90° on the profiles of inner and outer corners, if the structure of the metal system does not allow to install a cleat close enough to the corner
- Make sure that the step of vertical profiles is not more than 600 mm

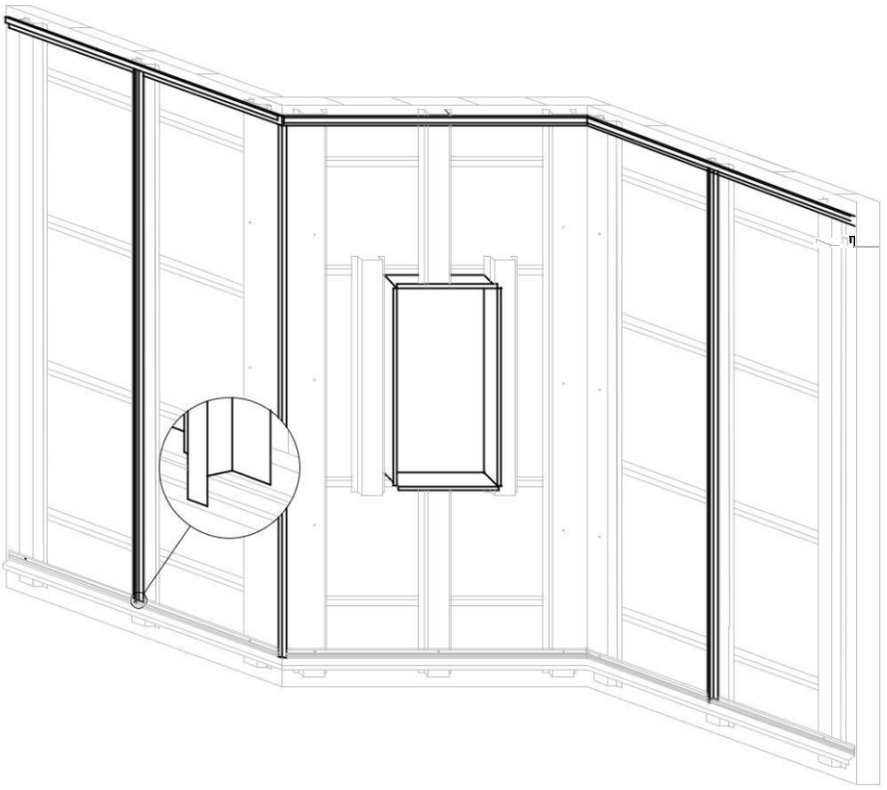
2 Installation of a start bracket



- After inspection of the system install the ebb strictly horizontally and secure it with self-tapping screws to the profiles
- Install the start bar on the ebb so that the top of the bar is at least 64 mm from the bend of the ebb, fix it with a step no more than 600mm

The ebb should be installed at least 40 cm from the ground to avoid contact with melting snow

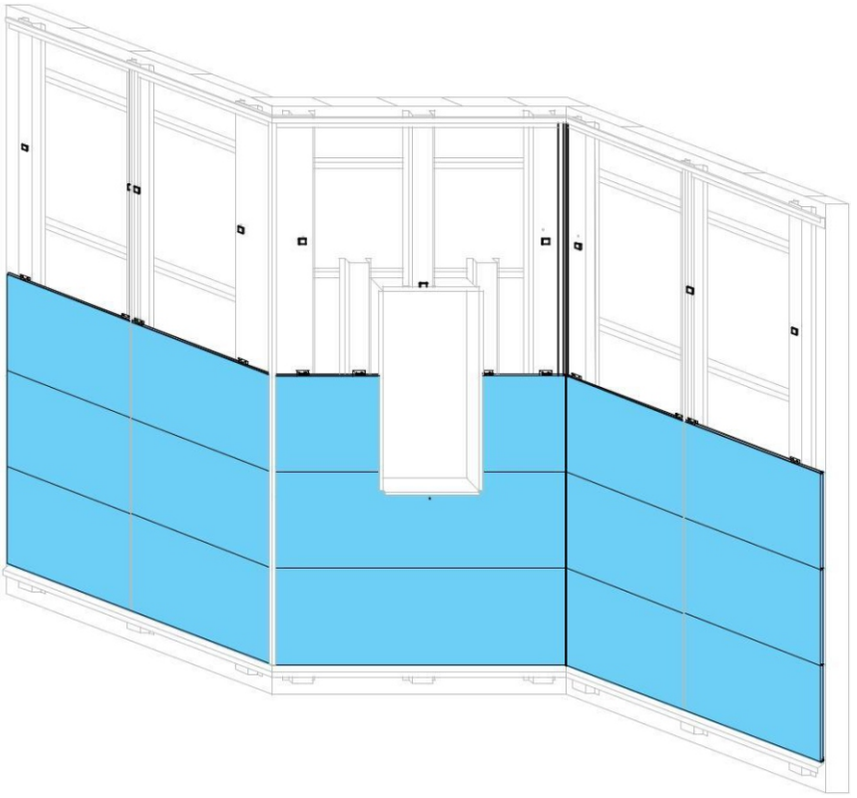
3 Installation of a docking bar, a corner and a finishing bar



- Install the double-sided docking bars strictly vertically at the points of future panel joints in accordance with the design. Fastening is made with self-tapping screws with a step of 1 m
- To ensure installation of the Joint Bar in level with the bottom butt-end of the panel (the shape of the start bar prevents this), the side part of the bar is cut and only the front part is left
- Install the slopes in accordance with the design
- Install inner drainsge corners in the inner corners

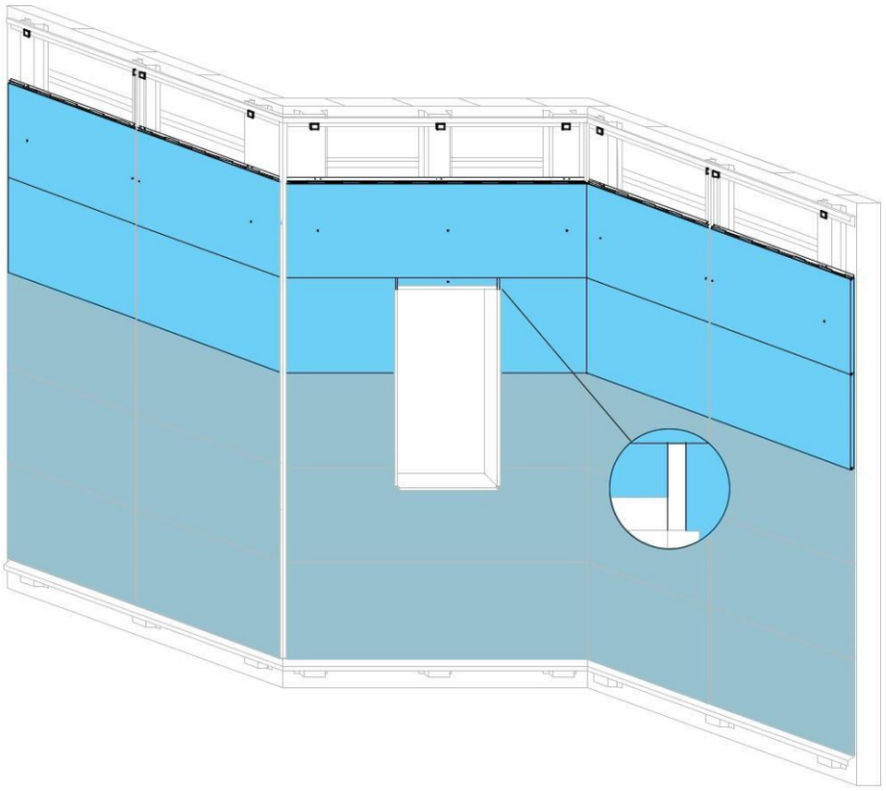
It is not allowed to make window slopes of the panels

4 Placing panels on brackets



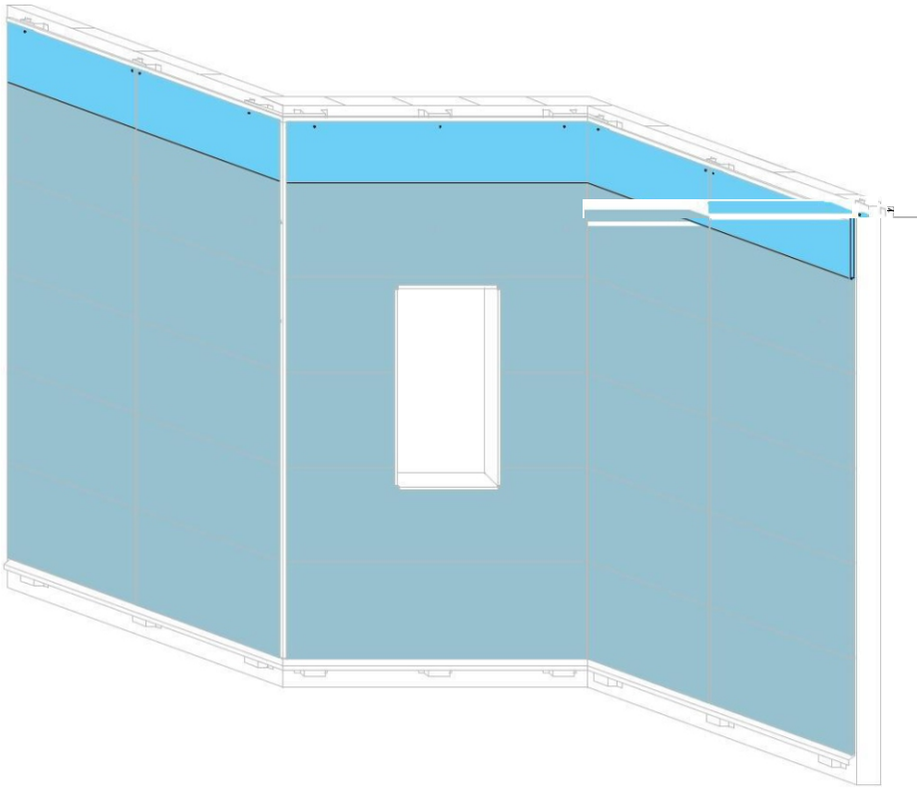
- Make measurements, mark out panels and cut them
- Glue spacers, where it will be necessary to place self-tapping screws (below and above the window, in places of reinforcement and below the finishing bar)
- Make sure there are no horizontal gaps between the panels. If necessary, lightly hit the panel tangentially from above with the palm of your hand to adjust it
- Install the brackets on the panel, check the tightness of fitting and then fix them with self-tapping screws
- Having closed one wall with panels, install one-sided connecting bars in the inner corners with a 10 mm step from the corner

5 Installation of panels on long brackets, reinforcement of fastening



- In the case of mounting a cut and processed panel around the window opening do not attach it entirely, but cut the panel inserting between the parts a Joint Bar
- For instructions on cutting and processing of the panel see page 24.

6 Completion of mounting



- When installing the top panels, you must first bring the panel to the finishing bar and then install it on the bracket

Make a 10 mm step from the cover of the finishing bar during the measurement

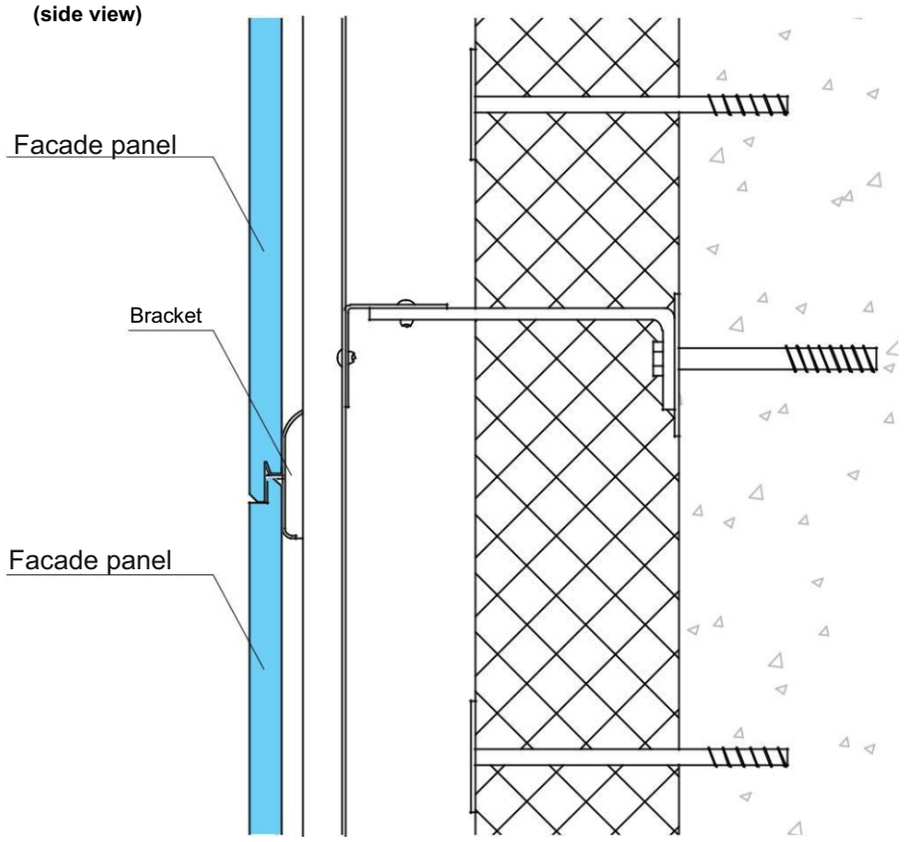
- Before fastening the self-tapping screw for fastening of the panel place a spacer on the subsystem in the place of attachment
- Select the desired fastening method in page 32
- After completing the mounting works, seal all the chips and screw heads with putty and cover with paint (come with the kit)

Typical nodes

This part shows typical nodes that need to be adhered to in order to mount the facade and avoid negative consequences.

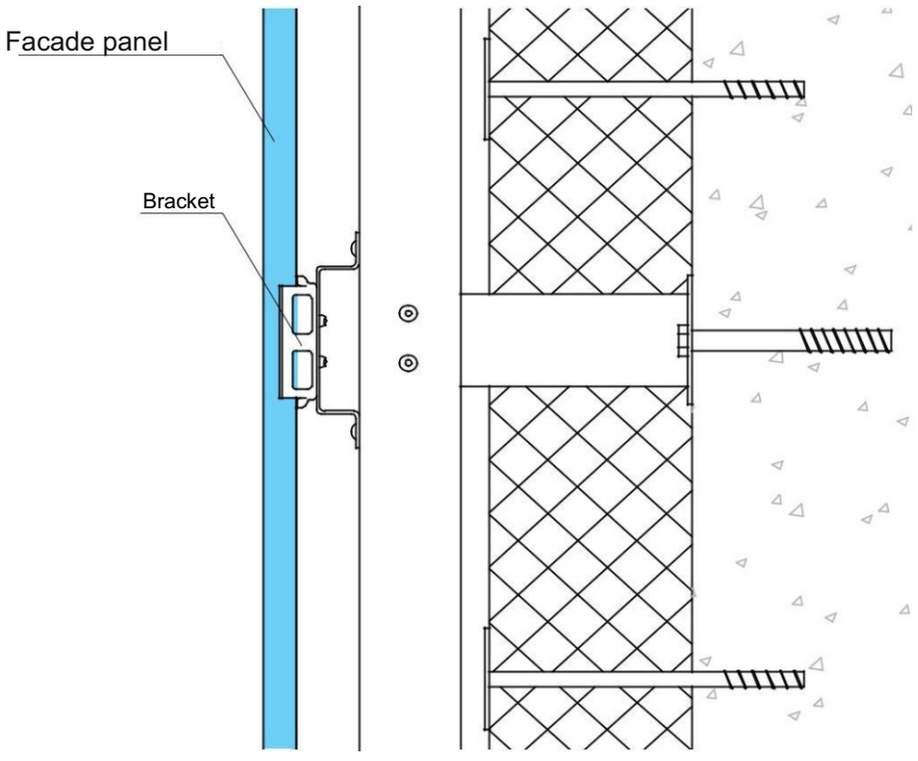
1 Fastening of the panel with a bracket

(side view)



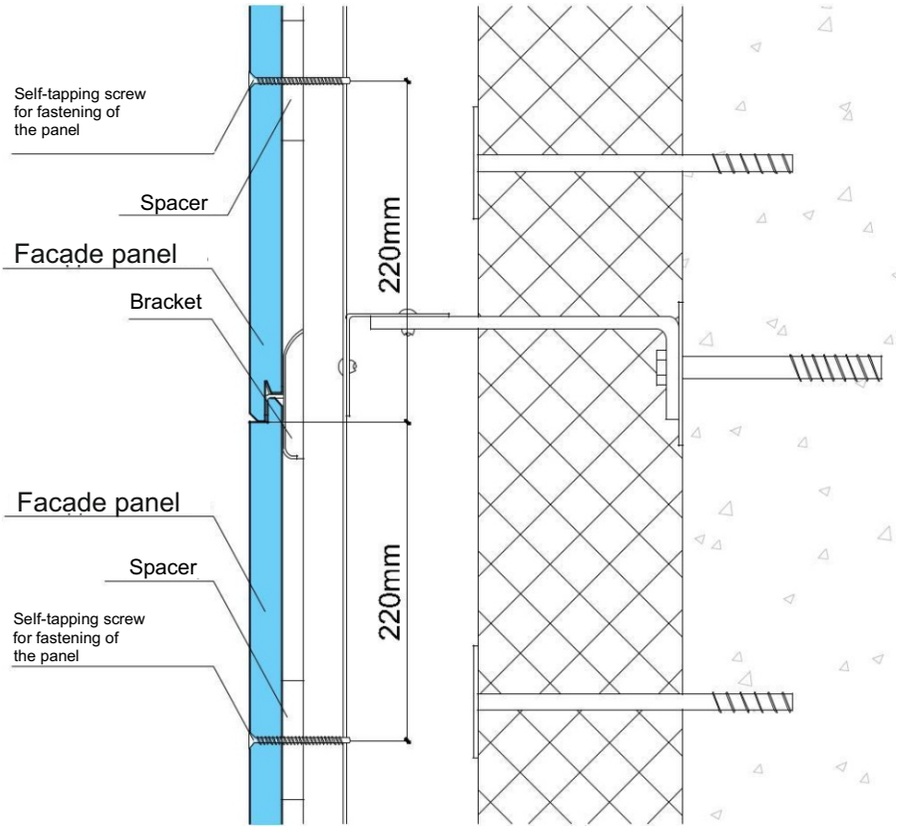
*** the drawing is not drawn to scale**

(top view)



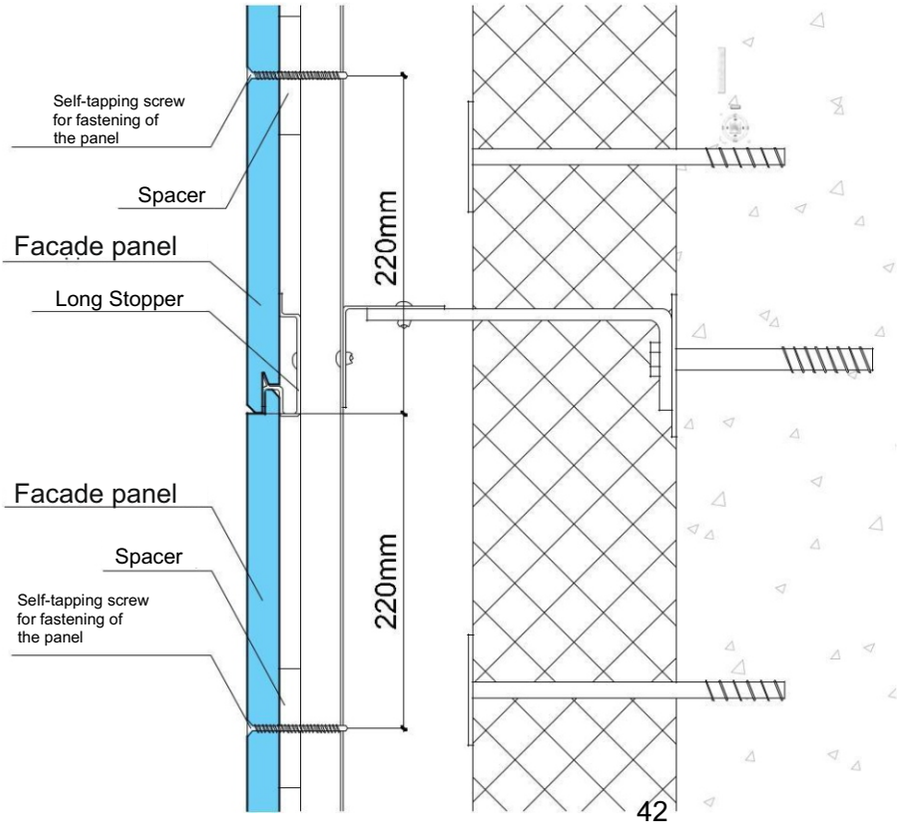
*** the drawing is not drawn to scale**

2A **Fastening of the panel with a bracket reinforced with a self-tapping screw**



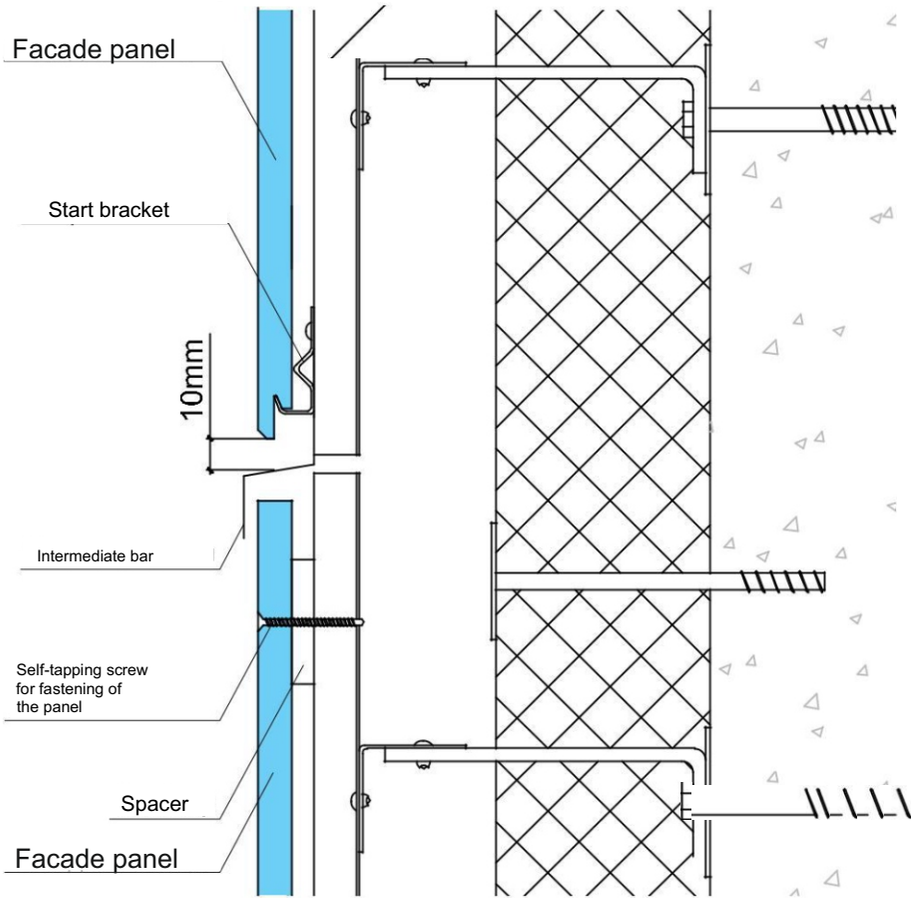
*** the drawing is not drawn to scale**

2B **Fastening of the panel with a Long Stopper reinforced with a self-tapping screw**



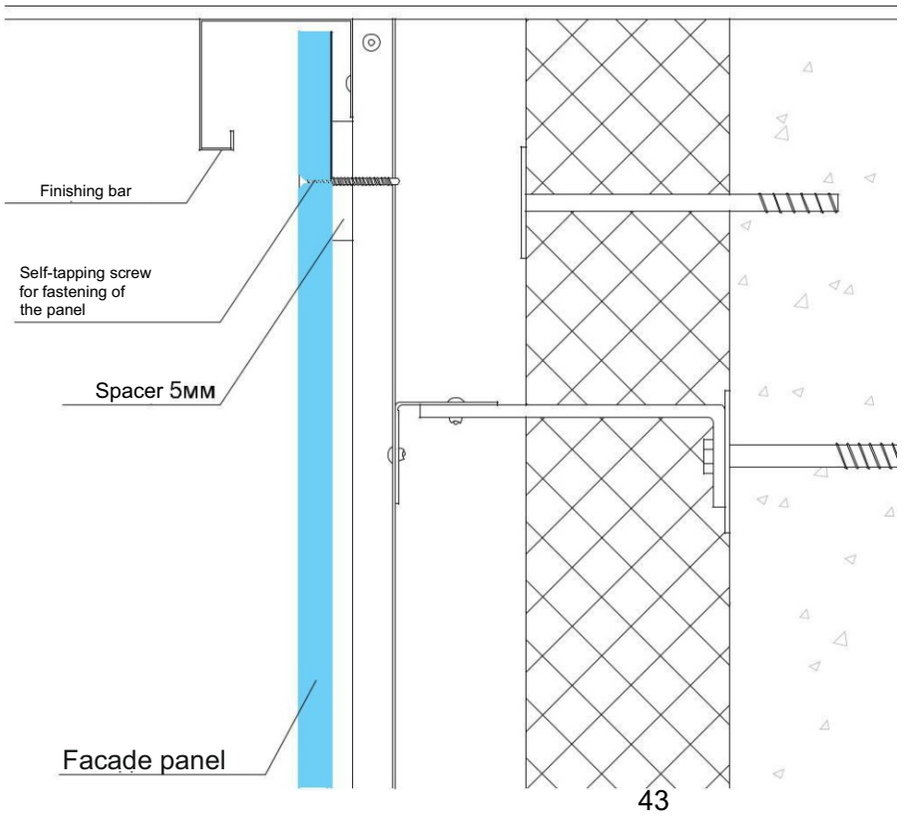
*** the drawing is not drawn to scale**

3 Fastening of panels in a place of joining of vertical profiles with a thermo rupture



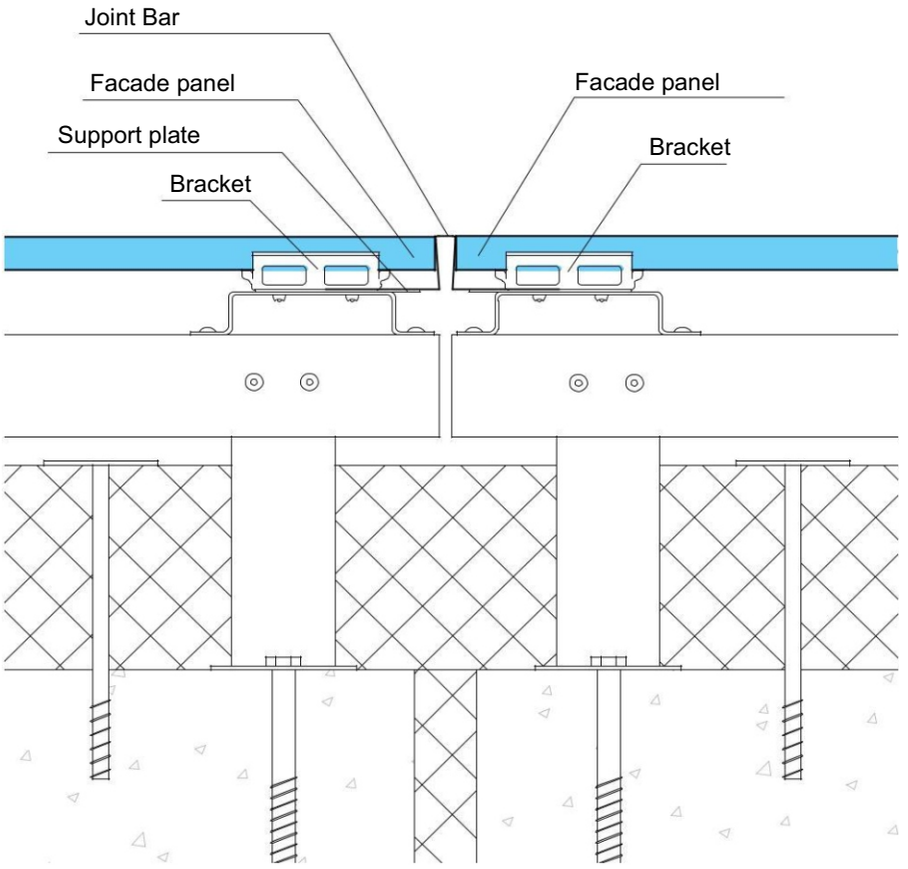
* the drawing is not drawn to scale

4 Fastening of panels in a place of joining of vertical profiles with a thermo rupture



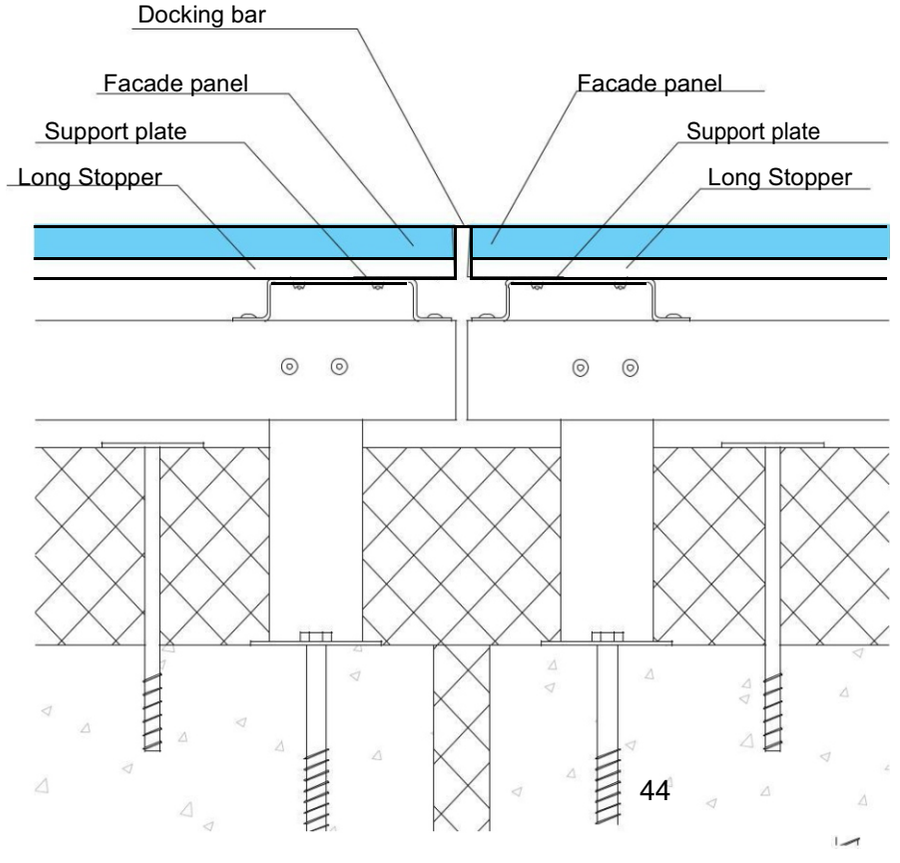
* the drawing is not drawn to scale

5A **Fastening of panels with a bracket near the expansion joint of the building**



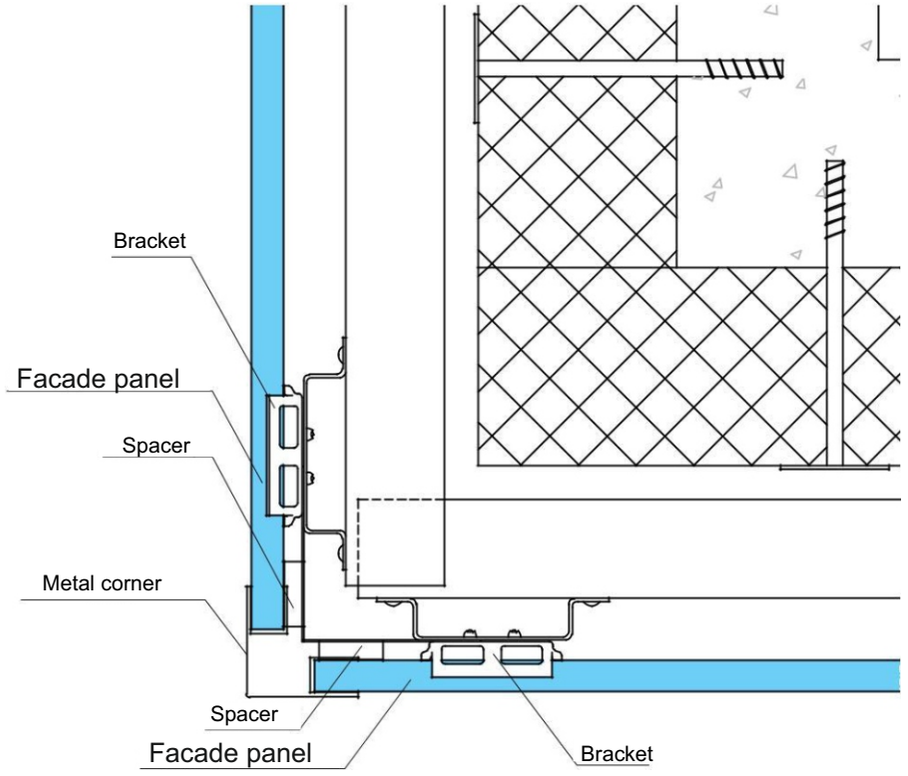
*** the drawing is not drawn to scale**

5B **Fastening of panels with a Long Stopper near the expansion joint of the building**



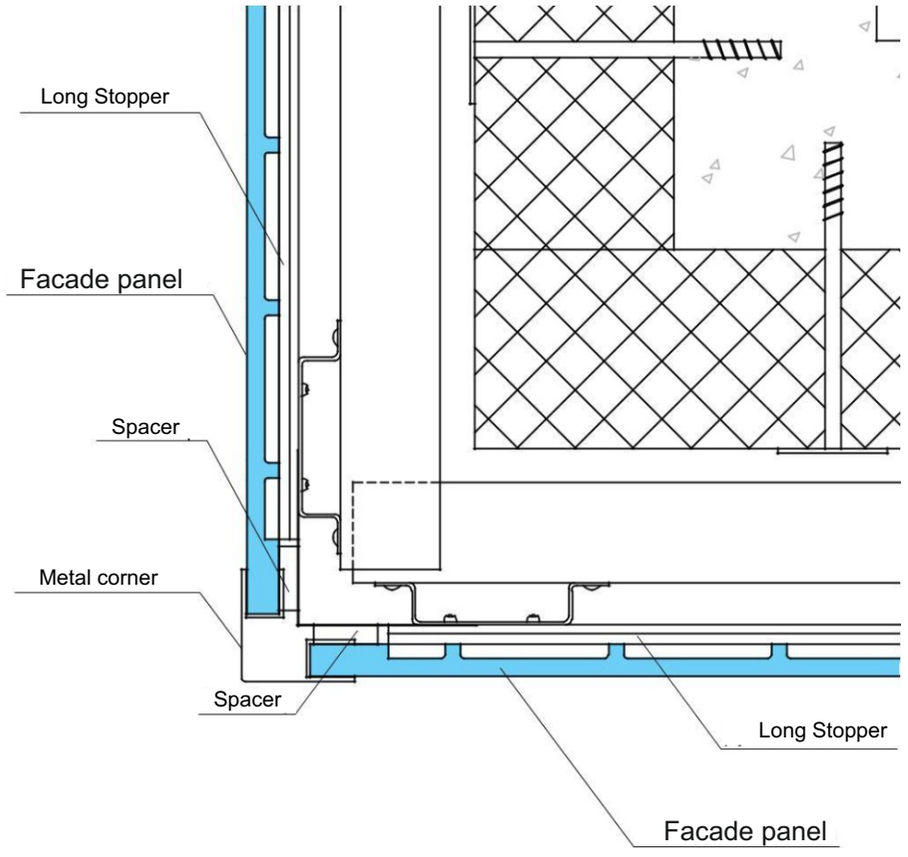
*** the drawing is not drawn to scale**

6A **Fastening of panels with a bracket on the outer corner**



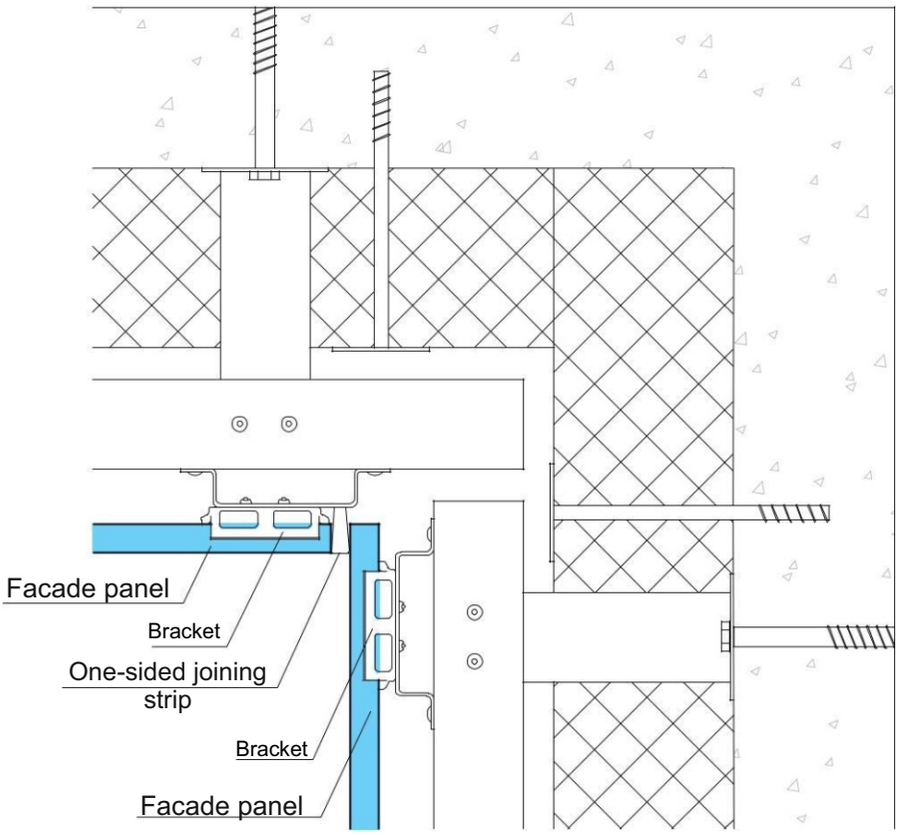
*** the drawing is not drawn to scale**

6B **Fastening of panels with a Long Stopper on the outer corner**



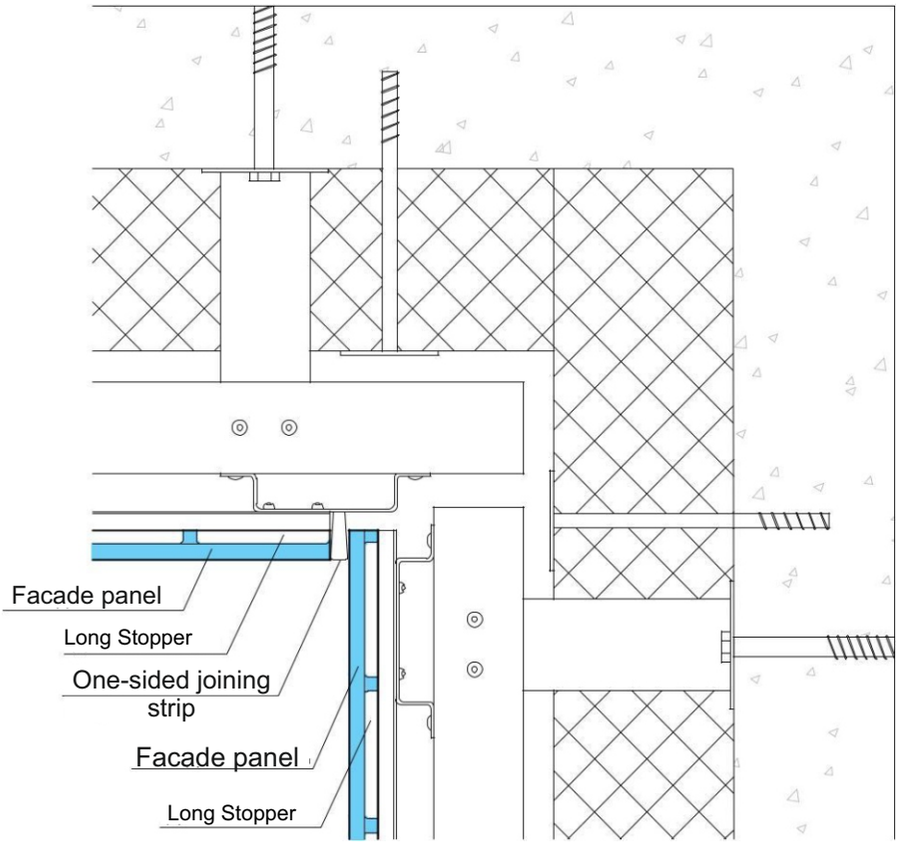
*** the drawing is not drawn to scale**

7A **Fastening of panels with a bracket on the inner corner**



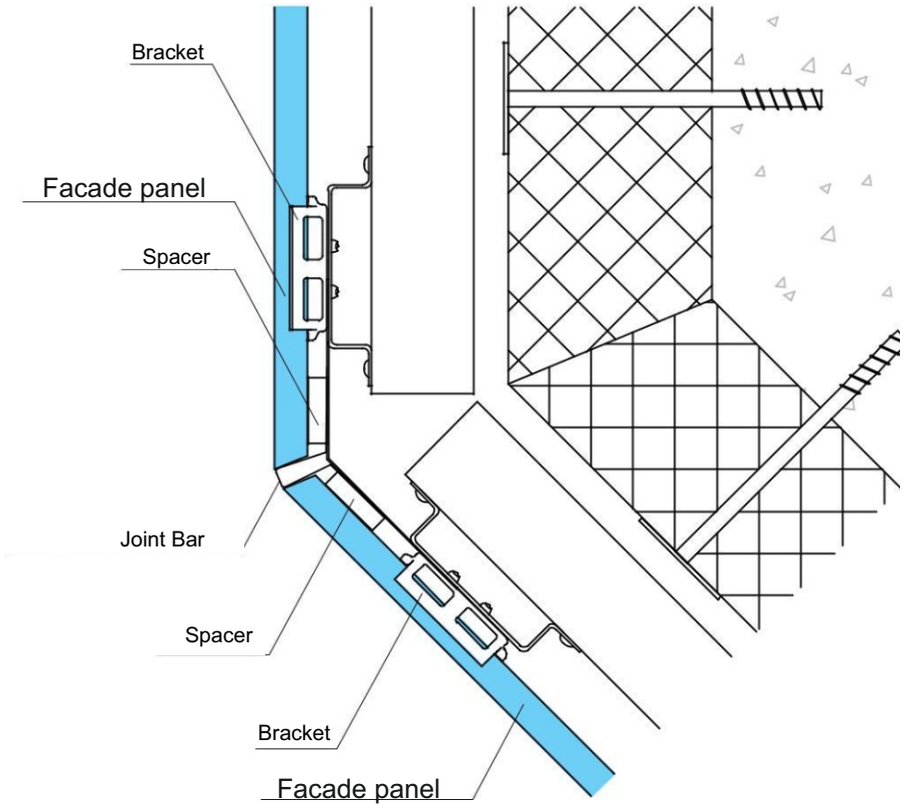
*** the drawing is not drawn to scale**

7B **Fastening of panels with a Long Stopper on the inner corner**



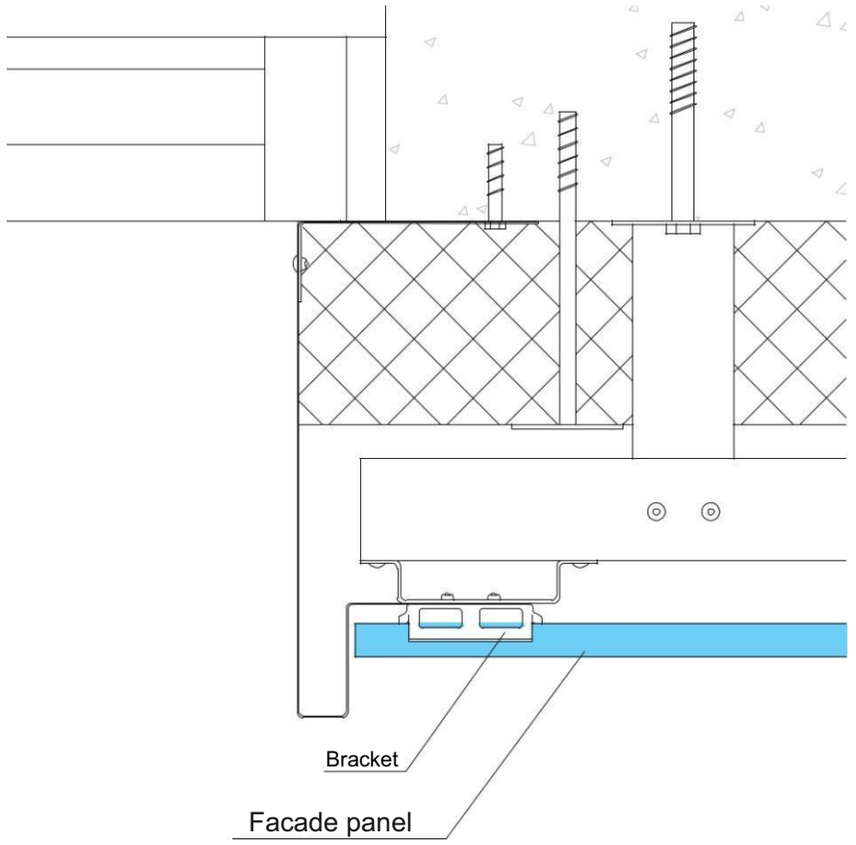
*** the drawing is not drawn to scale**

8 Fastening of panels with a bracket on the outer obtuse corner



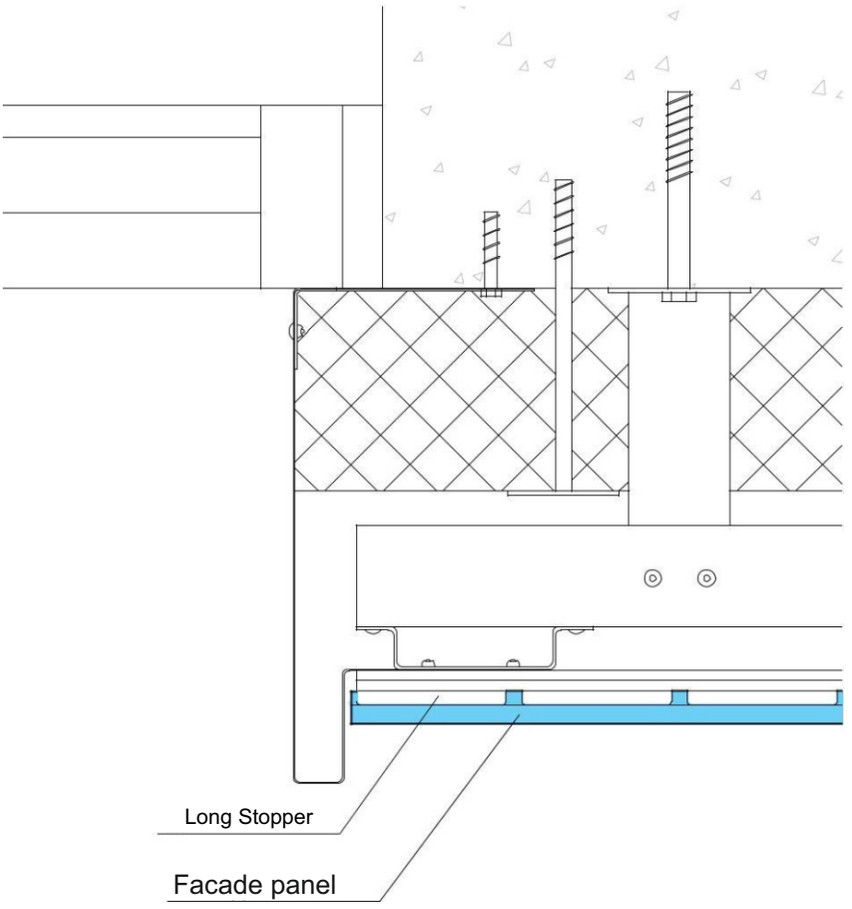
*** the drawing is not drawn to scale**

9A Fastening of panels near the side window slope



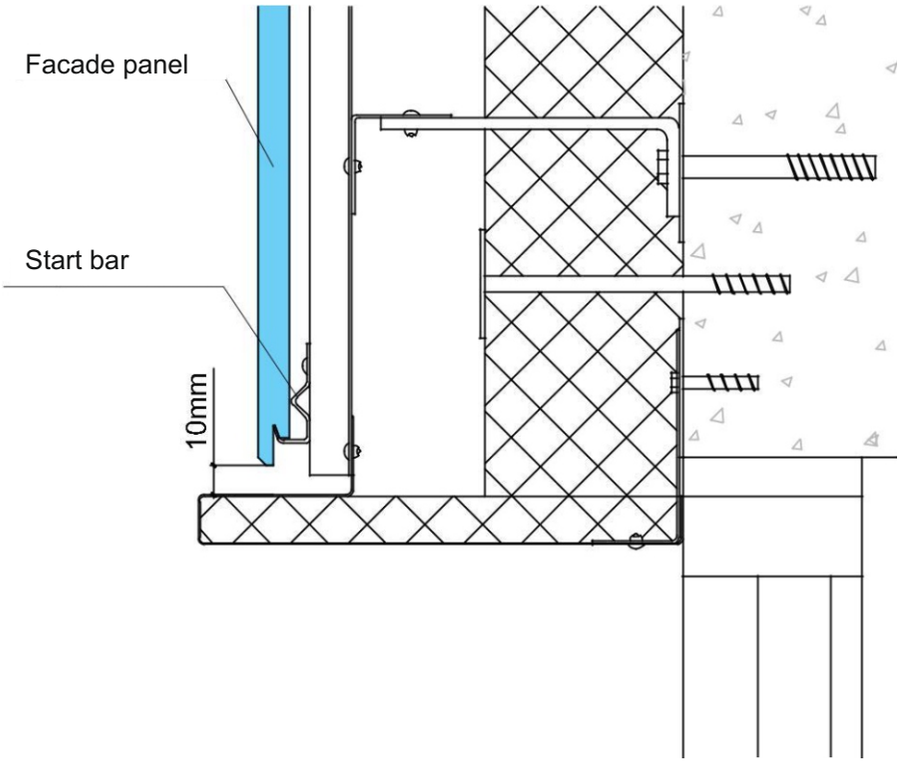
*** the drawing is not drawn to scale**

9B **Fastening of panels near the side window slope**



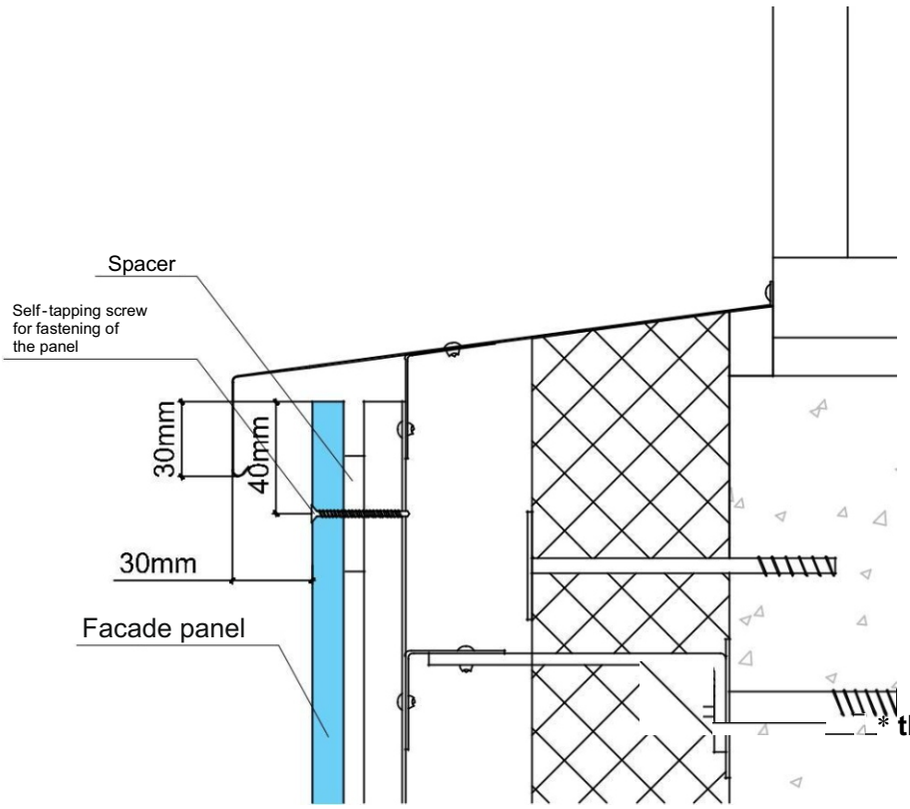
*** the drawing is not drawn to scale**

10 **Fastening of panels above the upper window slope**



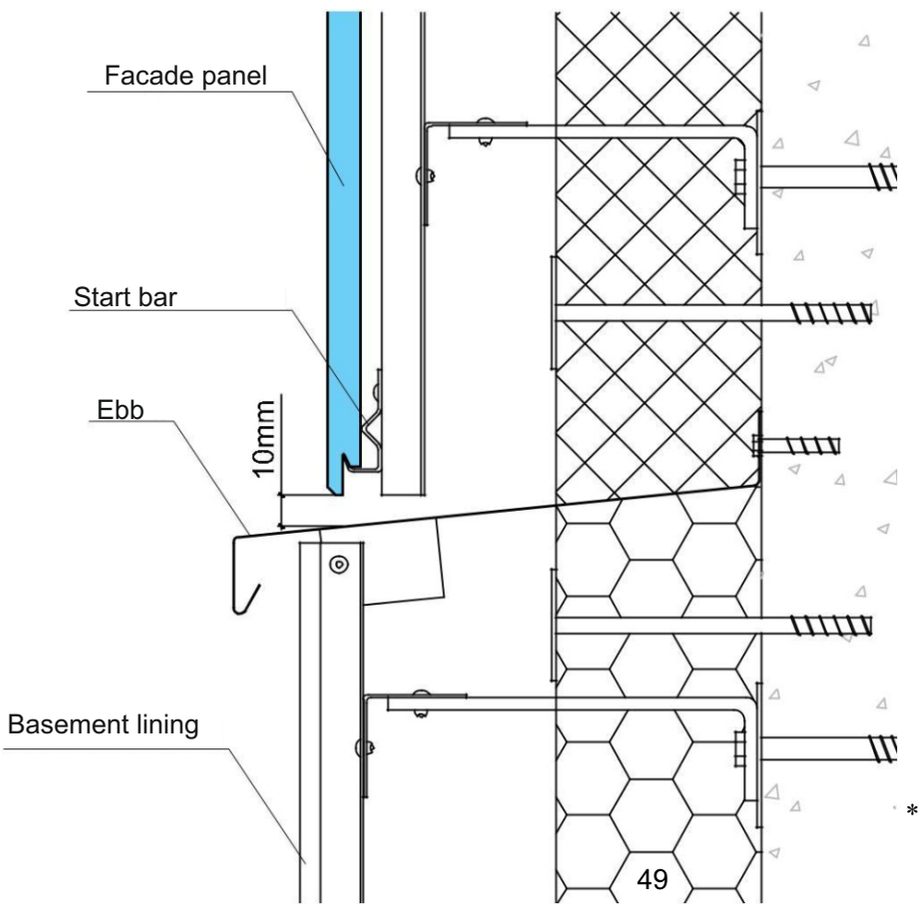
*** the drawing is not drawn to scale**

11 Fastening of panels below the window ebb



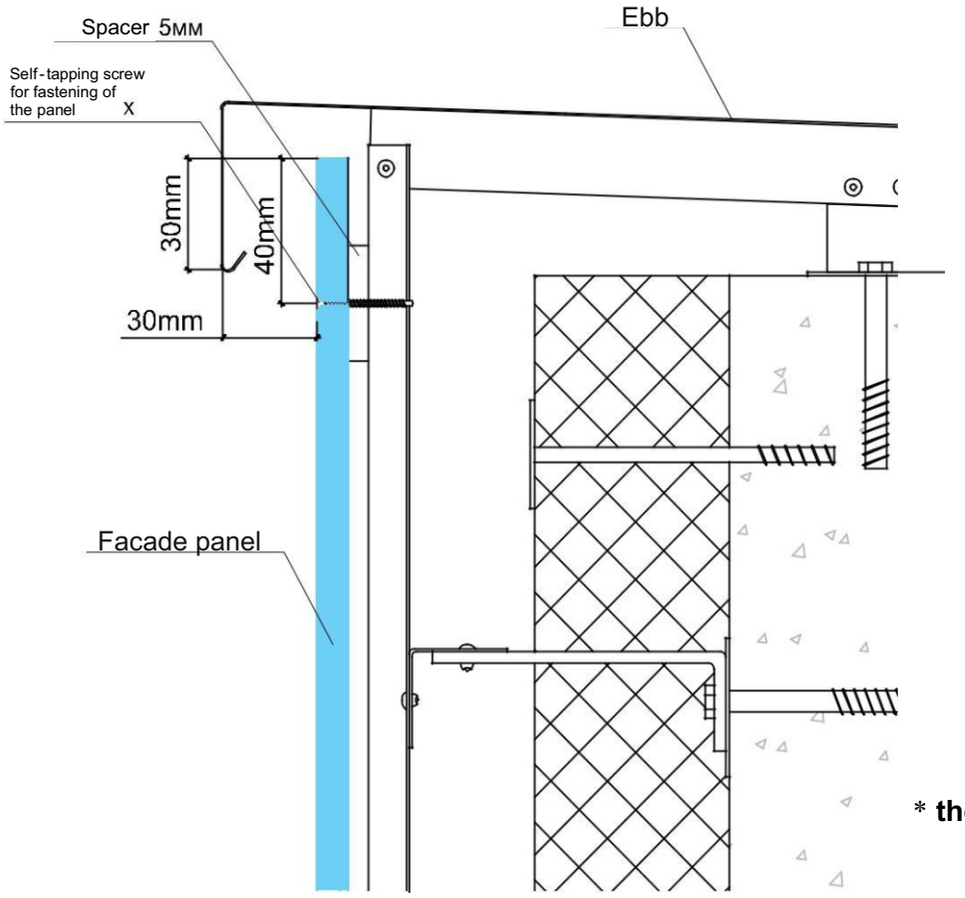
*** the drawing is not drawn to scale**

12 Fastening of panels above the lining of the basement part of the building



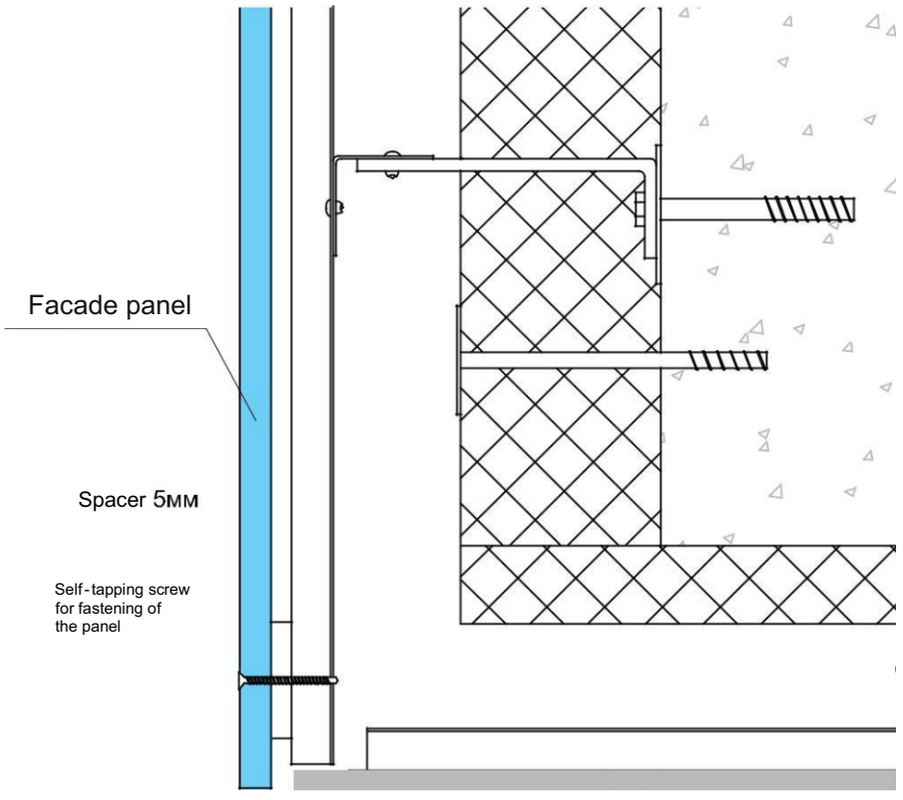
*** the drawing is not drawn to scale**

13 Fastening of panels on the parapet



*** the drawing is not drawn to scale**

14 Fastening of panels on the balcony



*** the drawing is not drawn to scale**