DESIGN AND INSTALLATION MANUAL

BRIX Classic & BRIX Klinker

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1 General

Our cladding is authentic brick or clinker architecture down to the details. As a product, it is a forerunner in its field in terms of both technicality and architectural freedom. There is no need for separate foundations or lintels above openings, and BRIX with its mounting system can be installed on all wall structures, as it is a facade solution that is truly separated from the wall structure. The advanced modular mounting system guarantees a ventilated brick cladding and therefore a healthy wall structure long into the future. The service life of BRIX is at least 70 years, and we provide our product with a 20-year weather resistance warranty.

The light and lean BRIX facade is well suited for sites of all sizes in both new and renovation construction, and the new facade can also be installed on top of the old one. BRIX is truly separated from the wall structure, meaning that the cladding panels hang on the installation rails, allowing for movement caused by temperature variations in the wall structure without the stresses being transferred directly to the facade. The cladding panels are screwed together, forming a continuous floating structure. Only genuine fired tiles are used in our product.

The BRIX brick cladding system has a product certificate issued by Eurofins. BRIX brick cladding can be used in all sites where the substrate can support the weight of the cladding, approximately 45 kg/m². The fastening points to the substrate are determined by the selected mounting system. The maximum fastening spacing for the cold cladding system is c/c 600 or c/c 400, and for the insulation system c/c 600 or c/c 720. The project designer determines the fastening screw to the substrate according to the substrate material, and the load-bearing capacity of the substrate can be verified by pull-out tests. When fastening to concrete, a concrete screw or wedge anchor can be used. A lag screw can be used for timber, a frame anchor for brick, and a self-drilling screw for PAROC walls, for example. When selecting the fastening screw, both the weight of the new cladding and the wind loads of the site, among other factors, must be taken into account. Subject to the required load-bearing capacity, each wall bracket can be installed with one fastener.

The installation of the mounting system does not require a separate site-specific installation plan, as the mounting system can be installed according to the limit values specified in these instructions. The limit values specified in these instructions for the system, including the c/c spacing, apply when the standard wind load of the site is below 1.97 kPa. In areas where the wind load exceeds this limit value, smaller c/c spacing must be used when installing the mounting system. The cladding is installed according to the element plan prepared by BRIX based on the measurement drawings of the site.

Picture 1: An example of a BRIX structure

1.1 Architectural possibilities

With our system, the architectural possibilities are almost endless. With BRIX, different colour combinations, brick sizes and bondings can be freely implemented. At the same time, a traditional brick masonry can be perfectly represented, i.e. external corners, window openings etc. can be realized with corner slips. In this way, the original or desired architecture can be achieved effortlessly. Genuine burnt brick slips from Tiileri, Feldhaus, Wienerberger and several other reliable European manufacturers are used in our brick cladding. All the brick tiles used in our products go through

strict quality testing, e.g. in terms of strength and frost resistance before accepting them for production. The joints are flush joints with stone granules on the surface. The stone granules sprayed on the surface ensure that the quality is uniform between the factory and construction site joints. The joint colour is selected from the supplier's colour chart.

Our system can also be used for clinker slip cladding. Slips used in clinker panels come from e.g. ABC-Klinker, which manufactures clinker slips with 125 years of experience. The clinker slips used in our cladding are 18 mm thick, and thus the thickness of the clinker slip panel is approximately 20 mm. In clinker buildings, the design is also project-specific, and with our product, clinker cladding that matches the original architecture very closely can be realized, for example in repair sites, where the colour of the tiles of the new cladding can be tinted during slip production according to the original. In these cases, slips are engobed, that is, coloured before burning, so that during burning the colour mixed with clay merges as part of the slip.

The standard BRIX products consist of the most commonly used combinations of brick sizes and bondings, for which the required production components already exist. In addition to standard products, special products can also be implemented, whereby the required production components and frame designs are produced on a project-specific basis. The following table shows the standard products of BRIX brick cladding.

Table 1: The most common brick sizes, dimensions and bonding

Slip code	Slip length	Slip height	Pistol dimension	Horizontal progression	Vertical progression	Bonding
MTL85	**285**	**85**	**85/135**	**300**	**100**	**1/2, 1/3, stack**
MTL60	**285**	**60**	**85/135**	**300**	**75**	**1/2, 1/3, stack**
NTL75	**270**	**75**	**85/130**	**280**	**87,5**	**1/2, stack**
MTL75	285	75	135	300	90,909	1/2
WDF	215	65	102,5	225	75	1/2
NOR	226	62	104	240	75	1/2
SWE	250	62	120	265	75	1/2, stack
DNF	228	54		240	66,67	1/2

1.2 Technical information

Table 2: Technical specifications of BRIX system

Facade surface	Burnt brick slip or clinker slip
Joint	Polymer-modified cement-based mortar
Elasticity of joint mortar	4 %
Joint surface material	Micro stone
Temperature for seaming	> +5 °C …+25°C, drying time 3 days
Frame	Hot-dip galvanized steel Z600 g/m^2, magnelis or stainless steel, thickness 0,7 mm
Cladding panel size	0,72 m^2*
- height	600 mm*
- width	1200 mm*
- thickness	approx. 21 mm (handmade brick approx. 25mm)
Weight	Standard approx. 40 kg/m^2 (38…50 kg/m2, brick dependent)
Bonding	Standard 1/2, 1/3 and stack, all bondings are possible
Thermal expansion	0,5 mm/m (-20°C- 50°C)
Minimum cavity	Without insulation 35 mm, insulated 35 mm

Expansion joints	7,5 m intervals when length/height exceeds 12 m
Insulation capacity	0–300 mm
Wall brackets	Hot-dip galvanized steel Z600 g/m^2 , Magnelis or stainless steel, thickness 2,0 mm
Rails	Hot-dip galvanized steel Z600 g/m^2 , Magnelis or stainless steel, thickness 1,25 mm
Facade fire class	A2-d1, d0

*The maximum size of the brick cladding panel, delivered brick cladding panels according to the cladding plan of the site

2 The BRIX system

The system includes the brick cladding panels and an advanced modular mounting system, with which the panels are attached to the back wall. The standard BRIX mounting system includes horizontal rails on which the panels hang, as well as vertical rails to which the horizontal rails are attached. When more depth is needed in the structure, for example for insulation, a pair of brackets is also used with vertical J-rails.

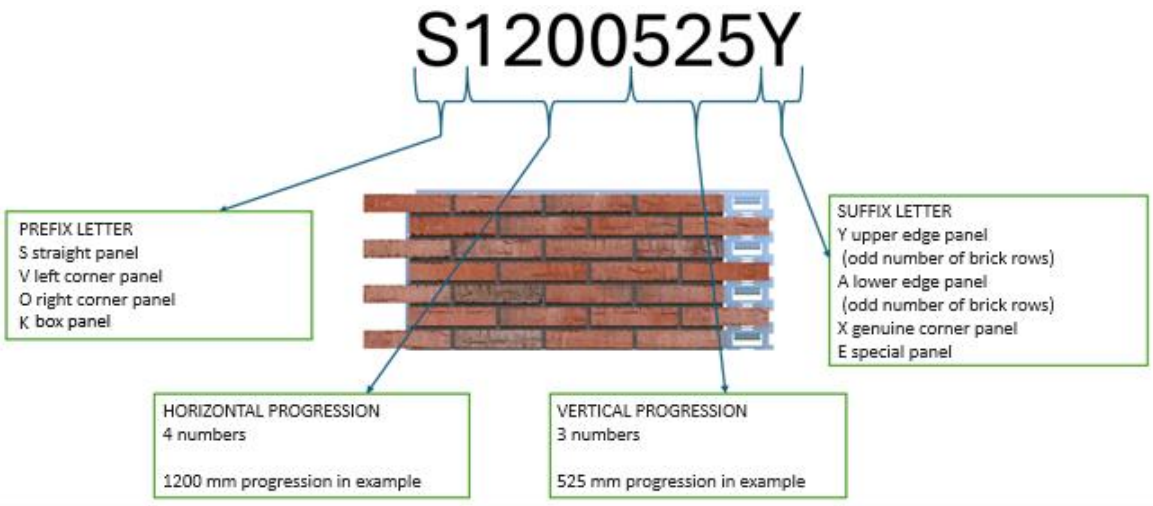
2.1 BRIX panels

The BRIX brick cladding panel consists of a pressed steel frame, burnt brick/clinker slip and a polymer-modified, cement-based joint compound containing an adhesive additive, developed specifically for the product in cooperation with Fescon. The slips are integrated into the frame through the joints, and the cladding can be ventilated directly from the backside of the slips. The pressed steel frame has joint anchors through which the frame is attached to the joints, as well as clips behind each brick row, on which the cladding panel rests on the horizontal rails.

Picture 2: An example of a BRIX-cladding panel from the front and back

2.1.1 Identification of cladding panels

Cladding panels are always marked with panel codes on the cladding panels, in the element plan and in the packing lists. The panel code tells you what type of brick cladding panel it is. An individual brick cladding panel can be a straight, corner, genuine corner or box panel. In addition, the panel code indicates the dimensions of the cladding panel, i.e. the vertical and horizontal progression of the panel on the finished wall, which also makes it easy to check the installation. The definitions and meanings of the letters and numbers appearing in the panel codes are illustrated in the following picture.

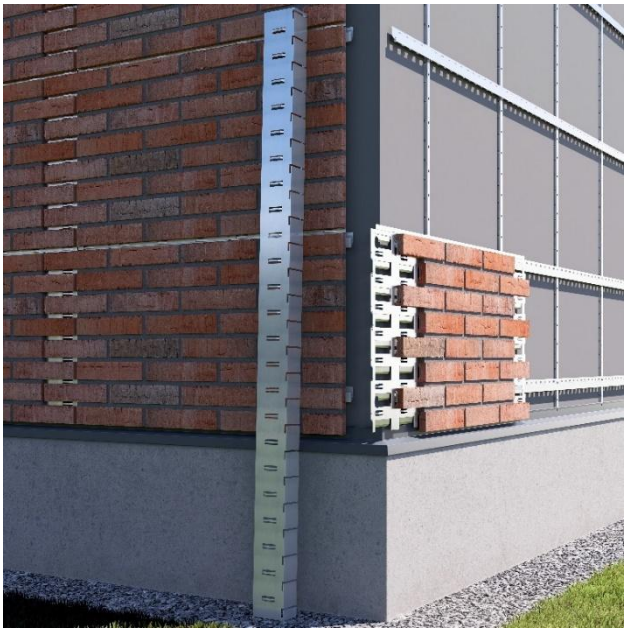


Picture 3: Panel code of brick panel

2.1.2 Corner options and corner panel

Corner cladding panels for both external corners and window cheeks can be manufactured either at the factory or on site. The factory-made corner panels come ready-made according to the panel design (Figure 7). In this case, the accuracy of the site measurements is more important, because there is no room for adjustment on site, and modifying possible dimensional errors in the cladding is more challenging.

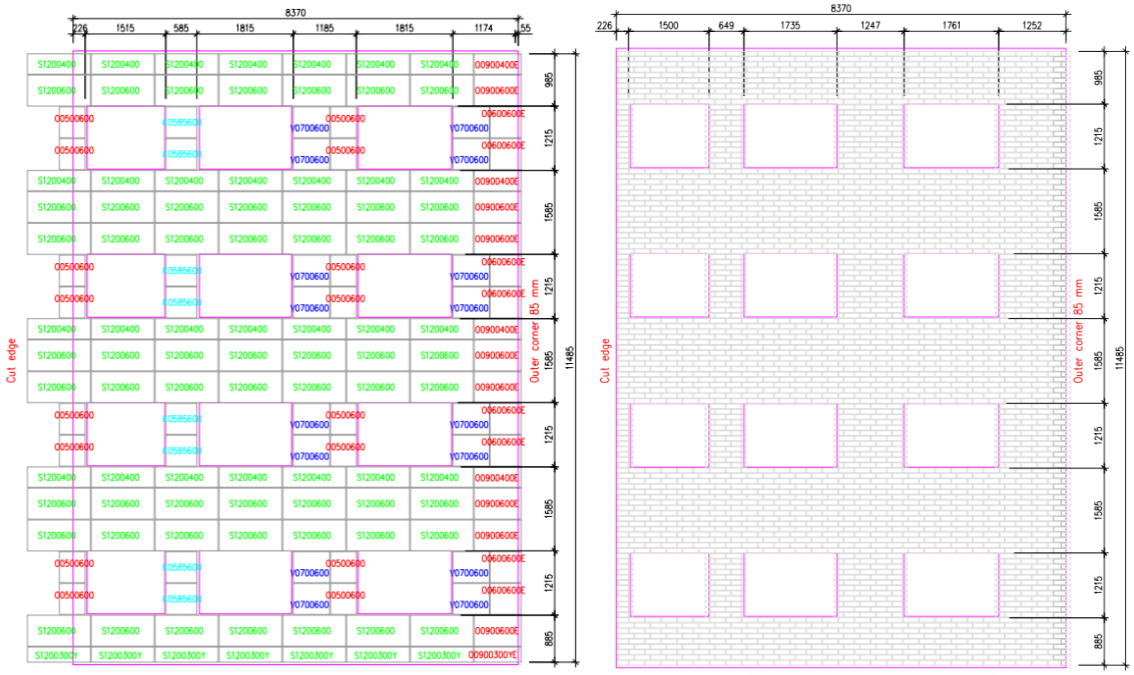
Corners can also be designed to be done on site. In this case, the cladding panels are produced without corner slips, and the corner slips and corner metal sheets are delivered separately with the panels (Figure 8). On the construction site, the corner sheet is first installed on the corner panels, and then the corner slips are glued on the corner sheet. Corner slips are jointed along with normal jointing work. When the corners are made on the construction site, there is more room for adjustment in the measurements, because the corner can be made to the desired dimension on site.



Picture 4: Making a corner on-site with a corner element

2.1.3 Panel design

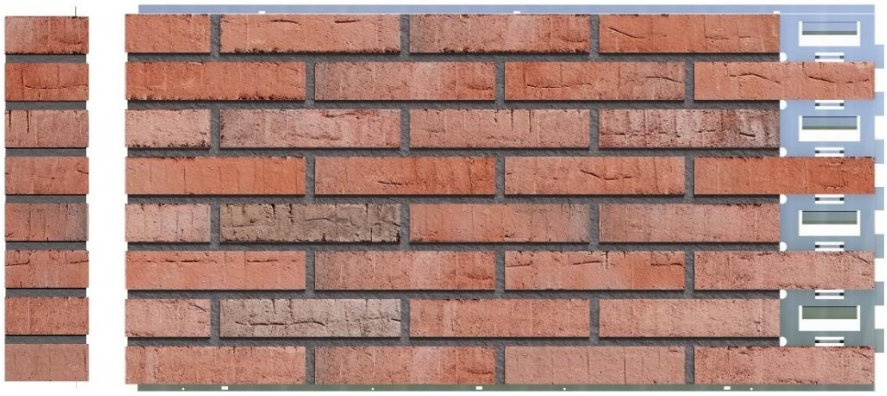
Brick cladding panels are always produced project-specific and based on the site-specific panel design. The panel design shows which panels are needed for the site, and the panels are also installed according to the plan. Panel design is made based on measurements of the building facades, which also indicate the design solution used in corners and window cheeks. The pictures below show an example of a panel design and the corresponding brick layout.



Picture 5: An example of a panel design and brick layout

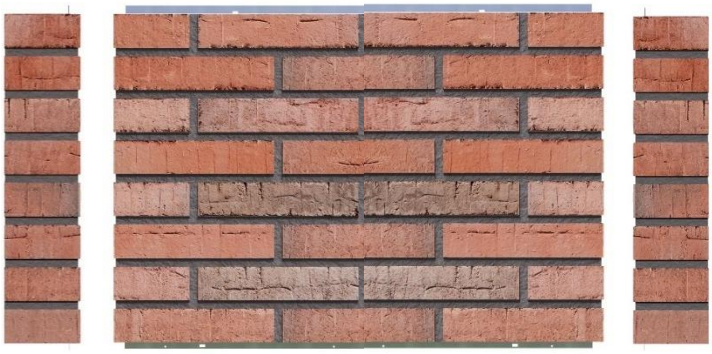
The images below show examples of panels.

Picture 6: Straight panel S1200600



Picture 7: Left corner panel V1200600

Picture 8: Left corner panel V1200600E



Picture 9: Box panel K0885600

2.2 Components of the mounting system

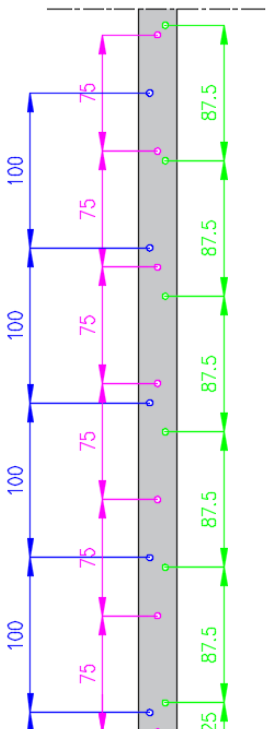
2.2.1 Mounting rails

The mounting rails are 3-meter-long horizontal rails on which the cladding panels are hung. There are two types in use, the AK15 and the AK25. They are otherwise identical, but the depth of the AK15 is 15mm, and the depth of the AK25 is 25mm. The choice of mounting rail affects the size of the ventilation space and the depth of the overall structure.

Picture 10: Mounting rail

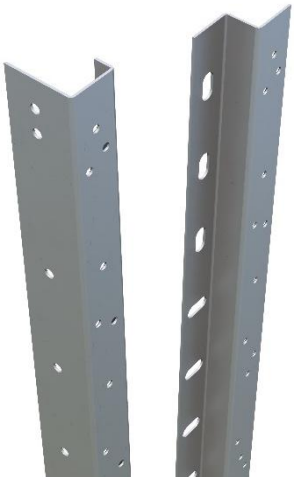
Structural depths and system adjustment allowances are discussed in section 2.3. The rear surface of the mounting rails has 6.5 x 16 mm oval holes every 50 mm, from which the rail is attached to the vertical rails of the system, meaning that the spacing of the vertical rails should preferably always be divisible by 50.

2.2.2 Vertical rails



Picture 12: Prefabricated holes on vertical rails

There are two basic models of vertical rails, of which the Z20 vertical rail is used in the cold cladding system and the J35 insulation rail is used in the insulation system. Both rails are 2970 mm long as standard, and the rails have pre-stamped holes on the front surface for the installation of mounting rails for the vertical progression of the cladding tile of 100, 75 and 87.5 mm. The mounting rails are installed in these pre-existing holes, so that the vertical progression of the cladding panels is automatically correct, and the dimensional accuracy required for a high-quality installation is maintained.



Picture 11: J-insulation rail and Z-vertical rail

In the extensions of the rails, it should be noted that the rails are installed on the right progression depending on the progression of the brick. With a vertical progression of 100 and 75 mm, the rails are installed with a progression of 3000 mm, and with an 87.5 mm vertical progression, the rails are installed with a progression of 2975 mm (see Figure 31). In addition to the standard rails, rails with, for example, a 2.8 m progression can also be used, provided that the rails used always have the correct front hole progression for the site. For other progressions, the right site-specific front hole progression rail type is used.

The depth of the Z rail used in the cold cladding system is 20 mm. The installation points of the Z-rail to the back frame with a max. k400 division, the designer of the site determines the fastener. In the insulation structures, the J-model insulation rail is used, which is fastened to the extension bracket. In addition, the selection includes a 2795 mm long L-rail (2800 mm for the front), which does not have pre-stamped holes on the front surface. It is used in a double facade structure on the insulation space side. More about the double facade in chapter 2.3.3.

2.2.3 Brackets and screws

There are two types of brackets: wall brackets, from which the insulation system is attached to the back frame, and extension brackets, which are used between the wall bracket and the insulation rail. Extension brackets provide more depth and room for adjustment in the structure.

There are five different sizes of wall brackets: SK50, SK70, SK100, SK150 and SK200. There are two types of extension brackets: JK75 and JK125. With different combinations of wall and extension brackets, a structure depth suitable for the site is obtained. The adjustment allowances and structural depths of the different combinations are presented in chapter 2.3.2.

All parts of the mounting system are attached to each other using the supplier's 6.3 x 16 mm sharp-point screws.

Picture 13: Wall- and extension brackets

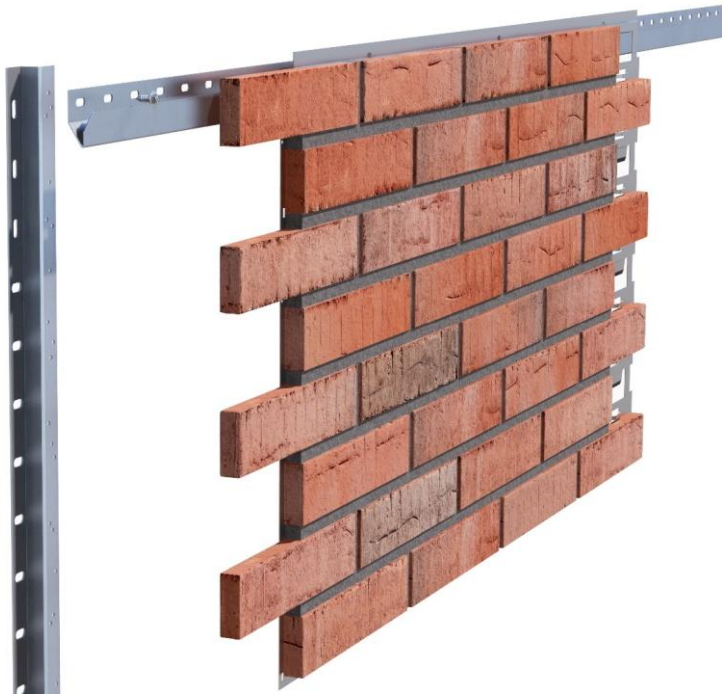
2.3 Mounting system options and adjustment allowances

The mounting system is chosen according to the site, so that the structure is technically functional, and the installation is as simple as possible. The choice of mounting system is influenced by the distance to which the brick cladding is desired from the background structure, considering the thickness of the insulation that may come in between.

The basic types of mounting system are the cold cladding system and the insulation system. The cold cladding system is used in areas where insulation is not needed, and the structure is desired to be as thin as possible. The insulation system can be used on facades where insulation is installed and in this case the combination of wall and extension brackets is selected according to the depth of the desired structure. In addition, some sites use a double facade structure, where the insulation layer and the ventilation gap are limited by a wind protection board, raincoat sheet or something similar.

2.3.1 Cold cladding system

Cold cladding structures use a combination of Z20 vertical rail and mounting rail (AK15 or AK25).



Picture 14: Mounting system for cold cladding

Table 2: Structural depths of the cold cladding system

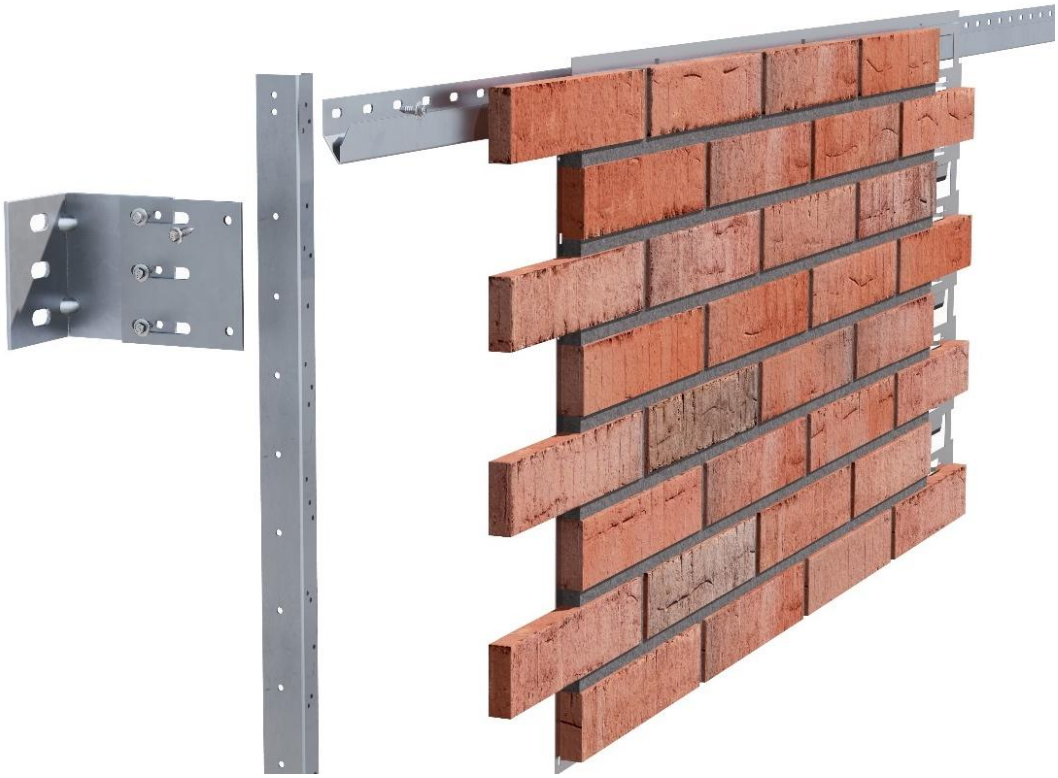
Combination	**Insulation thickness**	**System depth** (ventilation gap)	**Total depth** +22 mm (cladding panel)
Z20+AK15	No insulation	35 mm, not adjustable	57 mm
Z20+AK25	No insulation	45 mm, not adjustable	67 mm

The thing to note in the cold cladding system is that the system cannot be adjusted, therefore any need for adjustment is taken care of with wedge blocks or the like, as the cladding must always be installed straight.

2.3.2 Insulation system

The insulation system includes five parts: wall bracket, extension bracket, insulation rail and mounting rail, as well as the screws that connect them. There are five different sizes of wall brackets: SK50, SK70, SK100, SK150 and SK200. There

are two types of extension brackets: JK75 and JK125. There are differences in the depth dimensions of the components, so the combination to be used for the mounting system is selected according to the desired depth and insulation thickness.



Picture 15: Insulation system

The adjustable mounting system brings ease and speed of installation and helps with the straightening of the system, especially in areas where the base is uneven. The adjustment allowance of the insulation system with extension bracket JK75 is 30 mm, and up to 80 mm with bracket JK125. The table below shows the maximum insulation thickness of the most common combinations of different components and the total depth of the structure with adjustment allowances.

Table 3: Structural depth and adjustability of the insulation system

Combination	**Insulation thickness**	**Adjustability** (to outer face of insulation rail)	**Total depth**
SK50+JK75+J35	80 mm	85–115 mm	From outer face of insulation rail **+47 mm** (AK25+cladding panel) OR **+37 mm** (AK15+cladding panel)
SK70+JK75+J35	100 mm	105–135 mm	
SK100+JK75+J35	130 mm	135–165 mm	
SK70+JK125+J35	150 mm	135–185 mm	
SK100+JK125+J35	150–200 mm	135–215 mm	
SK150+JK75+J35	200 mm	185–215 mm	
SK150+JK125+J35	200–250 mm	185–265 mm	
SK200+JK75+J35	250 mm	235–265 mm	
SK200+JK125+J35	250–300 mm	235–315 mm	

2.3.3 Double facade structure

In the double facade structure, on the side of the insulation space, wall and extension brackets selected according to the insulation thickness are used according to the insulation system. The L-rail without holes on the front edge is used as a vertical rail. The insulation system is installed directly at the level of the insulation surface, so that the wind protection plate can be attached to the front surface of the L-rails.

A cold cladding system, presented in section 2.3.1, is installed on top of the wind protection board. The table below shows the bracket options for different insulation thicknesses, as well as the total depth of the structure.

Table 4: Double face structure depth

Combination	**Insulation thickness**	**Adjustability** (to outer face of L-rail)	**Total depth**
SK70+JK125+L	150 mm	125–175 mm	L-rail outer face **+ 66 mm** (TS9+Z20+AK15+cladding panel)
SK100+JK125+L	175 mm	125–205 mm	
SK150+JK125+L	200/225 mm	175–255 mm	
SK200+JK125+L	250/275 mm	225–305 mm	

3 Material demand and workload during installation

3.1 Material demand

The tables below show the average demand of the mounting system. The final demand for both the mounting system and the brick panels is affected by the total area of the site, the shape of the walls, the number and location of the openings on the wall and the efficiency of the installation (considering the minimization of waste).

Table 5: Demand for mounting system components in cold cladding

	Average demand pcs/m2
Vertical rails	0,8
Mounting rails	0,8
Screws 6,3x16	6

Table 6: Demand for mounting system components in insulation cladding

	Average demand pcs/m2
Wall brackets	4
Extension brackets	4
Screws 6,3x16	22
Insulation rails	0,8
Mounting rails	0,8

The amount of brick cladding is determined by the cladding plan.

3.2 Installation workload

The following tables show the average working time (man-hours = MHRS) for a simple continuous wall area where the work is done from a lift.

Table 7: Workload for the installation of the mounting system

Cold cladding system	Z+AK (vertical rail + mounting rail)	0,2	MHRS/m2
Insulation system	SK+JK+J35+AK	0,45	MHRS/m2

Table 8: Workload for insulation

First layer of insulation	0,25	MHRS/m2
Additional layer	0,05	MHRS/m2

Table 9: Workload for cladding installation

Cladding panel installation and fastening with screws	0,28	MHRS/m2
Cutting of cladding panel	0,15	MHRS/RMT
On-site corners	0,7	MHRS/RMT
On-site joints	0,3	h/m2

NOTE! The working time estimate does not include starting and finishing work, carrying the product to the destination and expansion joints. The variety of the site must be taken into account in the working hours.

4 Deliveries and storage

The aim is to deliver the product sets to the construction site in the largest possible batches, depending however, on the individual conditions of each construction site. Brick cladding panels are supplied in cladding panel boxes and the fixing system is supplied on disposable pallets, and the pallets should be stored on a flat surface at a suitable distance from the wall under work. The pallets are protected with plastic and tightened with plastic strap. The cardboard between the brick cladding panels must not get wet. It is therefore important that the protective plastic installed on top of the box at the factory remains intact.

The mortar must be stored in a dry place. Moisture may cause clumping, which affects the final result of the joint. Hardened mortar sacks must not be used for joints.

Unloading the load often requires a forklift or another similar work machine, which can be used to get the pallets to the storage location safely without breaking them. An alternative is to order a crane service as an additional service for the cargo, which can be used to unload the pallets at the construction site.

Moving cladding boxes must be minimized on the construction site. If the box has been opened, i.e. the transport supports (e.g. wedges for the panels) have been removed, moving them by machine is prohibited before careful re-attachment.

Full package sizes and weights:

- Rail bundles size 500 pcs, pallet weight 1000 kg. Pallet size 3.0 m x 0.6 m
- The box weights of facade panels are approx. 800–850 kg. Box size 1.5m x 1.2m x 0.75m
- Boxes approx. 50 pcs/1000 m2
- Pallet weights of joint accessories 1225 kg. Pallet size 1.2m x 1m
- Stone granules pallet weights 1250 kg. Stage size 1.2m x 1m

NOTE! The above-mentioned sizes and weights are averages and vary by site.

Cladding panels must be handled carefully during internal transportation, moving and storage, for example on scaffolding or a lift, as with all ceramic materials. The cladding panels must be stored so that the edges of the slips are not damaged, the overlapping slips cannot break and the backing sheets of the cladding panels do not bend. During storage and transportation, the cladding panels must be kept in a vertical position. The cladding panels must not be stacked horizontally on top of each other. If they are stored vertically leaning against each other, protective cardboard or similar material must always be placed between them. The cladding panels must be lifted by their edges so that the overlapping slips at the corners, in particular, are not subjected to stress during lifting.

5 Installation of the mounting system

When performing installation work, occupational safety instructions and site-specific structural plans must always be taken into account. The installation can be done from the ground, using scaffolding or lifting platforms. When choosing a suitable lift, it is good to consider the weight of the accessories (one full-size cladding panel approx. 30 kg). The rails are cut using tin snips.

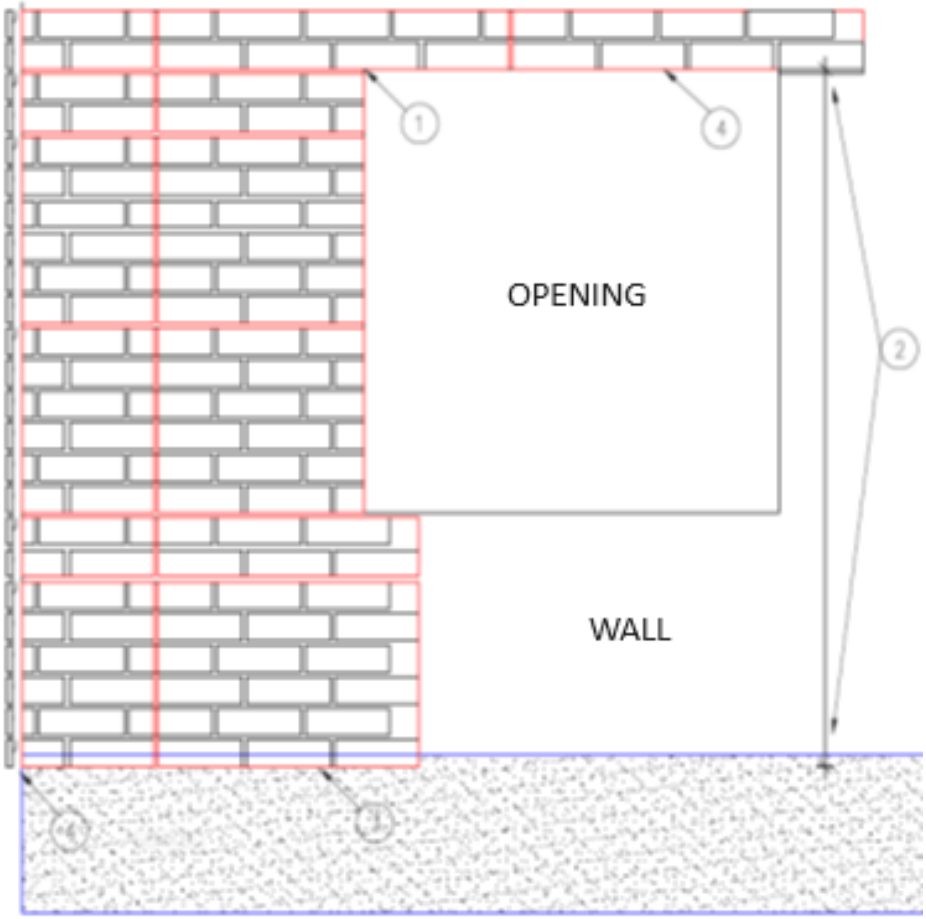
The installation uses e.g. the following tools:

- cordless drill
- impact drill
- tin snips
- hand circle with diamond blade + guide (e.g. Festool, Mafell)
  - blade diameter min. 150 mm
- measuring tape
- spirit level, laser or plumb-line

5.1 Positioning of the brick cladding

The installation work begins with dimensioning. To determine the position of the lowest wall bracket/rail, the desired height of the bottom edge of the brick cladding must be known.

If there are openings, such as windows, in the wall, their upper edge defines the exact height of the brick cladding (Figure 14, point 1). The height should be dimensioned so that there is a full uncut brick above the windows. From the upper edge of the windows, the optimal height of the lower edge of the cladding is calculated according to the brick division (Figure 14, point 2). There will be a full brick at the bottom edge of the cladding (Figure 14, point 3). Depending on the site, the brick cladding panels can also extend over the plinth. The cladding can naturally be cut below the window sill flashing and at the eaves, as the cut edges will be concealed beneath the flashings.



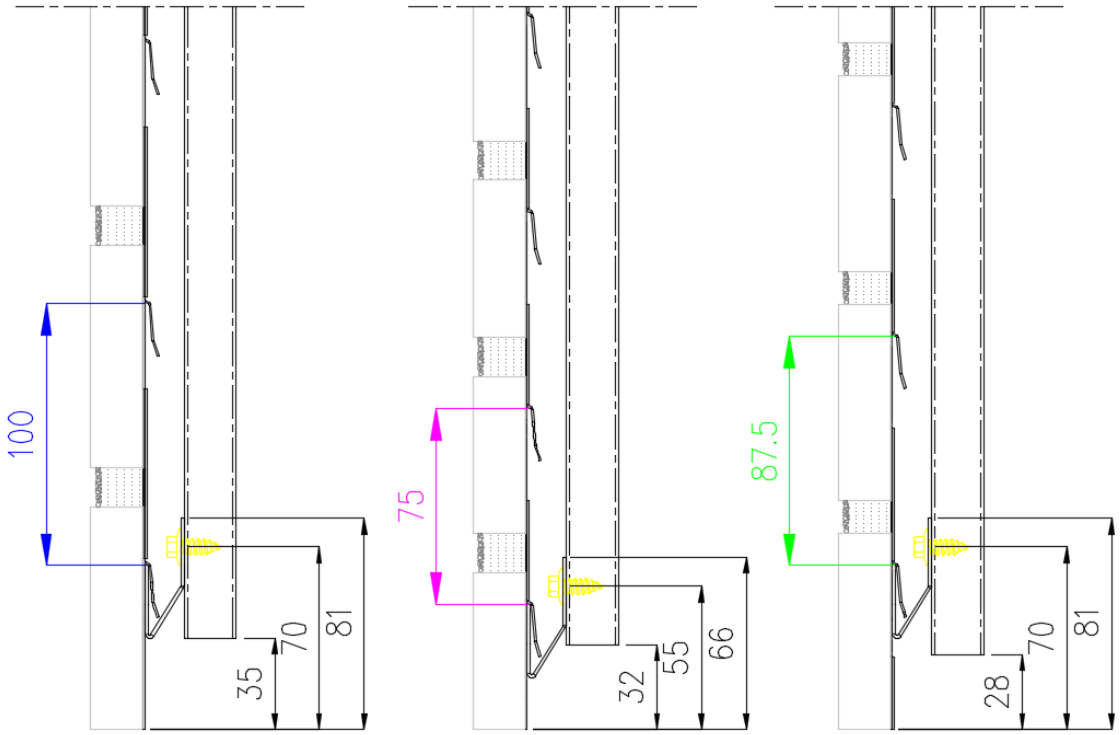
Picture 16: Determining the position of the bottom edge of the brick cladding

5.2 Installation of the cold cladding system

5.2.1 Installation of the Z-vertical rail and dimensioning of the bottom edge

The surface of the final brick cladding must be completely vertical, i.e. the initial situation of the installation of the cold cladding system must be a straight surface. The cold cladding system is not adjustable, so if there are irregularities in the base, wedges or risers must be placed under the Z-rail before fastening to ensure the verticality of the rail.

The installation work of the fastening system always begins with determining the starting height of the brick cladding, which is presented in the previous chapter 5.1. The following pictures show dimensioning instructions for the bottom edge of the Z-rail in relation to the height of the bottom edge of the desired brick cladding. When the height of the bottom edge of the Z-rail is known, it is aligned on the entire wall with the help of a laser. It is important that the starting height line is exactly horizontal. It ensures the horizontality of the entire brick cladding. The installation height of the Z-rail is not affected by whether AK15 or AK25 is used as the mounting rail.



Picture 17: Dimensioning of the bottom edge of the cladding for the cold cladding system for different progressions

If you need a drawing with dimensions of the bottom edge for a different brick layout, than in the pictures above, a target-specific bottom drawing will be delivered together with the other plans.

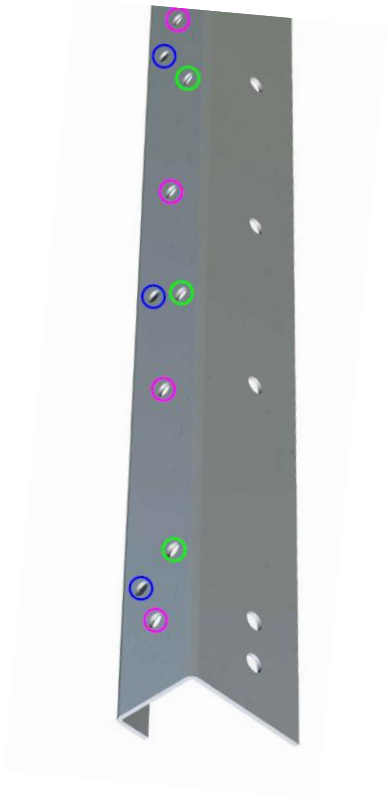
Picture 18: Z-vertical rail k600 distribution, attachment points to the base max. k400

Z-vertical rails are installed with a maximum horizontal division of 600 mm, considering however, that the distance between the rails is dividable by 50 mm, because the attachment points of the installation rails are every 50 mm. In addition, it must be noted in the peripheral areas that the overhang of the mounting rail from the outermost vertical rail may be a maximum of 200 mm. The site's designer specifies a fixing screw or anchor to fit the Z-rails to the back structure, but so that the fixing points are max. 400 mm apart. Vertical rails are recommended to be installed with a k600 distribution around the building, regardless of the openings in the wall. For example, in the case of a window, the section of rail that goes over the opening is cut to the size of the window and moved to the edge of the window (if the vertical rail next to the opening is more than 300 mm from the edge of the opening).

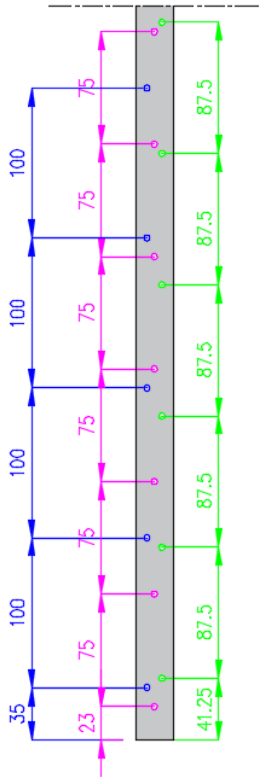
In the vertical extensions of Z-rails, it must be noted that a gap must be left between the rails for thermal movements and to maintain the correct progression. With vertical rails of standard size 2970 mm, the rails are installed at a distance of 3000 mm (30 mm gap), if the brick progression is 100 or 75 mm. With a progression of 87.5 mm, the rails are installed at a distance of 2975 mm (5 mm gap between them). In this way, the hole progression on the front surface of the rail for mounting rails remains exactly correct (see picture 31). If rails with another progression, such as 2.8 m, are installed, it must similarly be ensured at the rail joints that the front hole progression remains correct.

5.2.2 Installation of the mounting rails

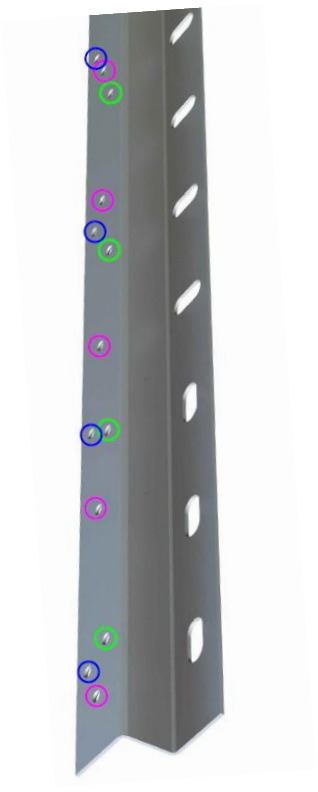
The mounting rails are installed in the pre-stamped holes in the vertical rails so that the height of the mounting rails is correct. This is important, as discrepancies in the height position of the mounting rails would directly affect the sizes of the joints between the cladding panels. The vertical progression of the brick is taken into account in the installation, i.e. which row of holes on the front surface of the vertical rails is used for the mounting rails**.** The images below show which row of holes is used with which vertical progression. In addition, the direction of the rail must be considered, as it affects whether the 100 mm or 87.5 mm hole progression is on the right or left side when installing.



Picture 20: J-rail frontal holes



Picture 19: Distribution of holes on the front surface of rails

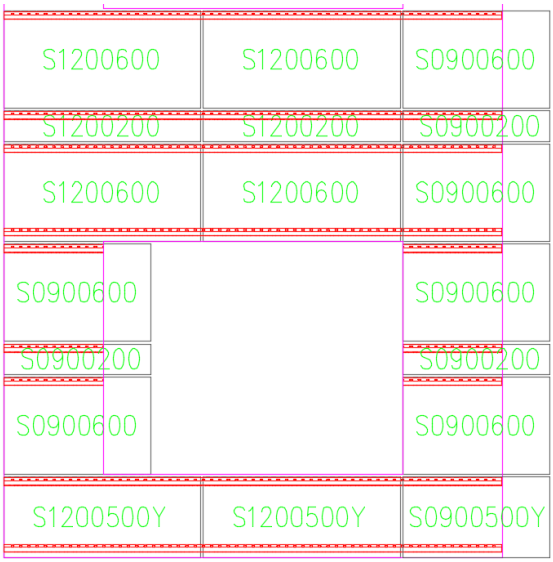


Picture 21: Z-rail frontal holes

The mounting rail distribution is dependent on the size of the cladding panels planned for the wall, so to install the mounting rails you need the cladding plan of the site. The basic principle is that the brick panel at the bottom of the wall will hang on two rails (from the top and bottom row of attachment flanges), and the following ones will always hang on one rail (from the top row of attachment flanges). The same principle applies to the first row of tiles above windows and other openings, as well as to horizontal movement joints. As an exception, at the top or bottom edges of the wall, the cladding panel can be hung from the second-top or second-bottom row of attachment flanges, e.g. due to cappings.

Align the mounting rail with the holes in the vertical rail (pay attention to the right row of holes) and fasten it with the supplied 6.3 x 16 mm sharp-point screws.

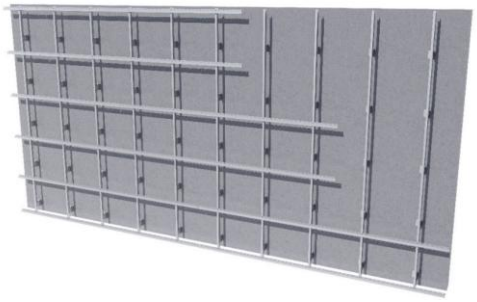
Picture 22: The distribution of the installation rails is according to the height progression (the last part of the item number), except at the bottom edges



Picture 23: Mounting rails around a window

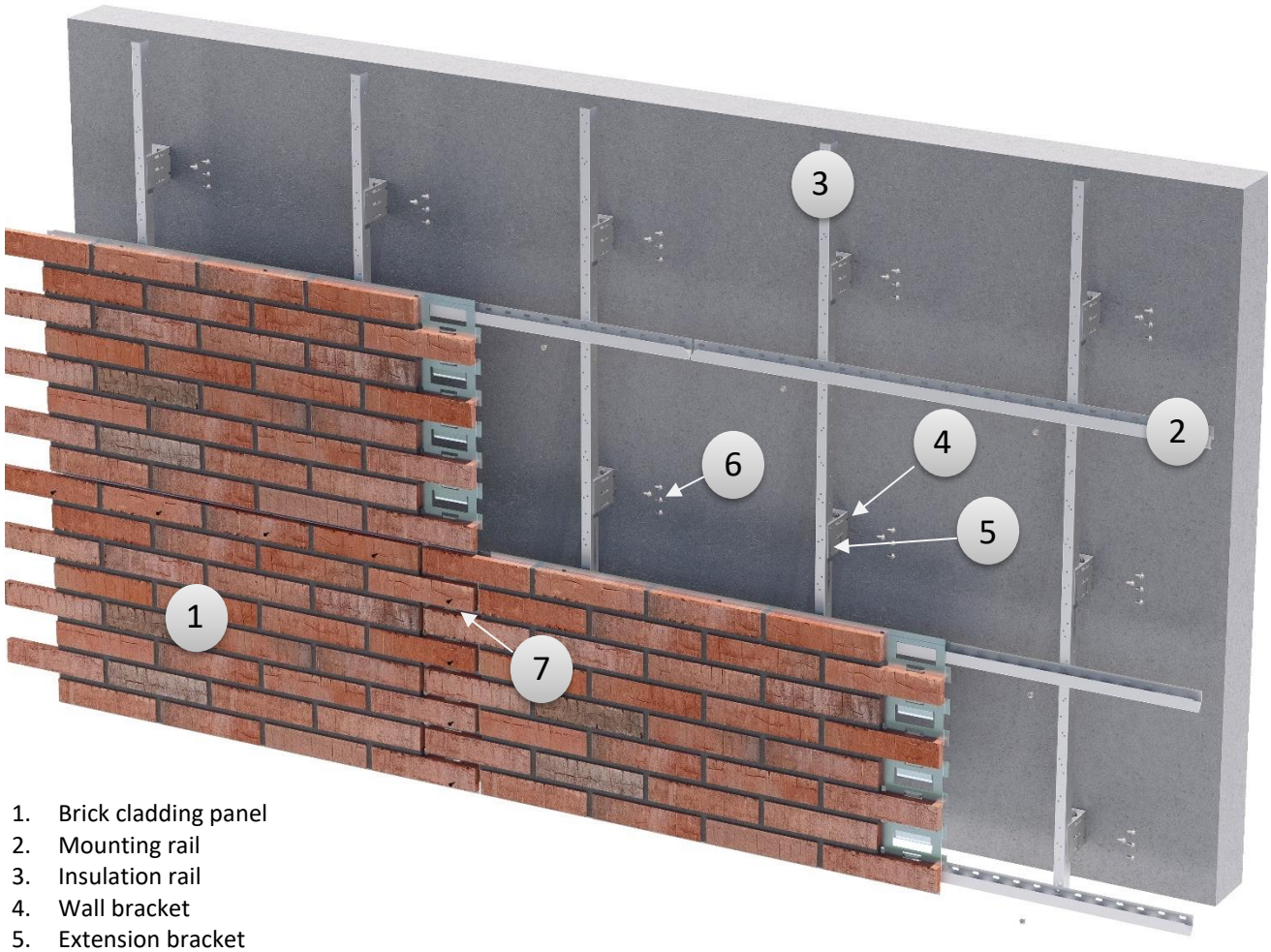
Picture 24: Installation of mounting rails

The mounting rails measure 2995 mm, and they are installed 3000 mm apart, i.e. there is a 5 mm gap between the mounting rails. These extensions are in the so-called "wild" between the vertical rails. The extension of the mounting rail over the vertical rail max 300 mm. The extension location must be changed every two rails, see the picture below.



Picture 25: Mounting rail "wild" distribution

5.3 Installation of the insulation system



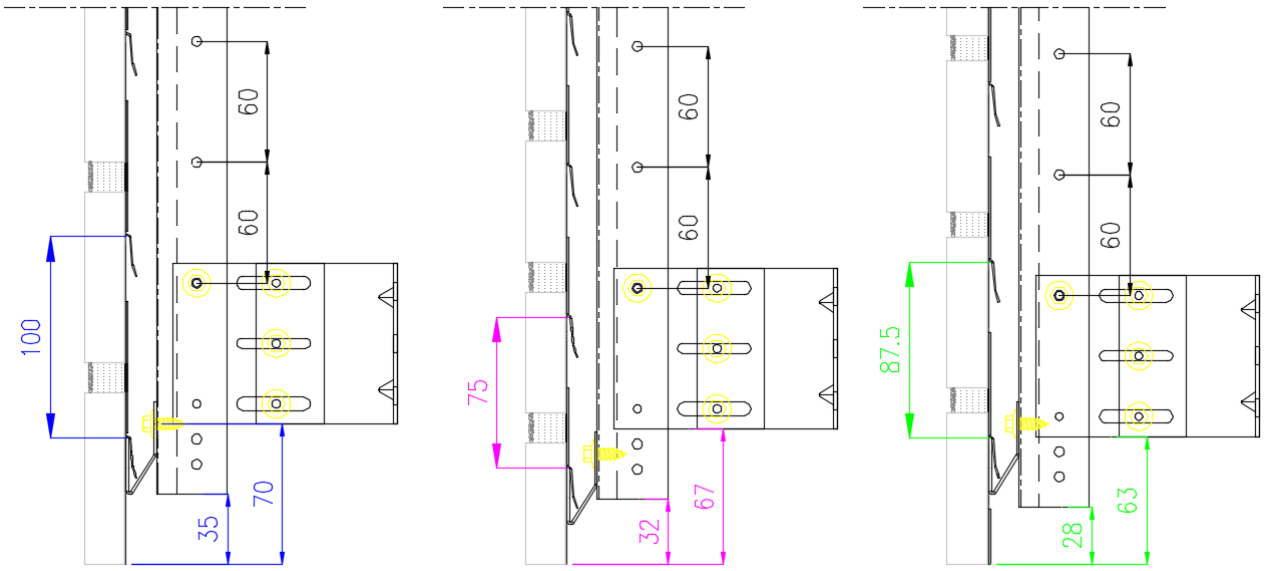
1. Brick cladding panel
2. Mounting rail
3. Insulation rail
4. Wall bracket
5. Extension bracket
6. Screw 6,3x16
7. Plate screw 4,2x13

Picture 26: BRIX-cladding with the insulation system and its parts

5.3.1 Installing the wall bracket line

The installation work of the mounting system always begins with determining the height of the brick cladding, which is presented in chapter 5.1. When the location of the bottom edge of the brick cladding is clear, mark the location of the lowest wall bracket on the wall. When the location is marked, the height line of the lowest fasteners of the entire wall is aligned with a laser. It is important that the height line is exactly horizontal, because it ensures the horizontality of the entire brick cladding.

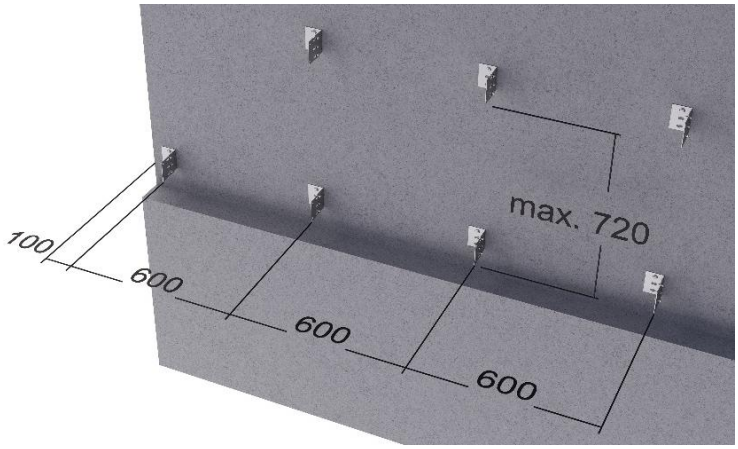
The following pictures show dimensioning instructions for the lowest wall bracket for different types of bricks.
If you need a dimension drawing of the bottom edge for a brick layout other than the one in the pictures below, a target-specific drawing will be delivered together with the other plans.



Picture 27: Dimensioning instructions for the lowest wall bracket

When the height of the wall bracket is known according to the above instructions, align the height line of the bottom bracket of the entire wall with a level laser. It is very important that the bottom wall bracket line is exactly straight. This is essential for the installation of the mounting rails and for the high-quality end result of the entire cladding.

When the height line is marked, you can start installing the wall brackets. The screw for attaching the wall brackets to the back structure is not included in the mounting system. The choice of the fastening screw is up to the designer of the site, and it should be chosen according to the background structure of the specific site. The location of the first bracket is approx. 100 mm measured from the corner of the load-bearing structure. The maximum extension of the mounting rail from the vertical rail is 300 mm, but please note that the maximum extension used especially in the outer corners is 200 mm. Fasten the lowest wall brackets in place with a horizontal division of 600 mm according to the following picture.



Picture 29: Wall bracket distribution

Picture 28: Fastening of mounting system parts to each other

NOTE!
Wall and extension brackets are installed to each other with three screws (the middle one tightens the straightened wall), but always with one screw to the insulating rail!

The extension brackets are first attached to the wall brackets with two screws from the top and bottom holes. The middle oval of the extension bracket, where the wall bracket is attached, is slightly narrower and acts as a tensioner for the bracket pair after the insulation rail line is fully straightened. The connection between the extension bracket and the insulating rail is made with one screw, generally from the upper hole of the extension bracket whenever possible, but from the lower hole at the bottom of the wall. The brackets are fastened with the supplier's 6.3 x 16 mm sharp-point screws.

5.3.2 Installation and adjustment of the insulation rail

When the lowest wall and extension brackets are in place, the installation of the insulation rails begins. The insulating rails are installed on the lowest pair of brackets already attached to the wall. Attach the insulating rail to the extension brackets with one sharp-point screw from the upper hole, or from the lower hole at the bottom edges.

The insulating rails should be adjusted to the correct depth so that the rails only have the lower and upper brackets in place. After this, it is easy to install the remaining wall and extension brackets in between. Bracket distribution in the vertical direction max. 720 mm. Before straightening the insulating rail, you must know the position of the finished surface of the new wall in relation to e.g. the plinth. The position of the surface of the front edge of the insulation rail is determined by subtracting the depth of the brick tile sheet (22 mm) and the mounting rail (15 or 25 mm) from the finished surface of the wall.

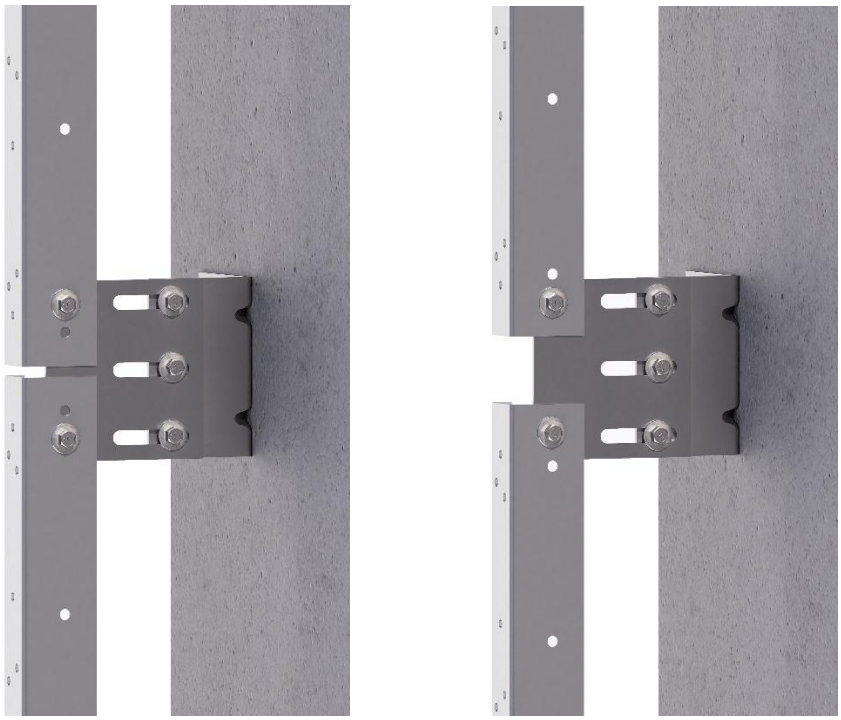
The insulation rails are adjusted so that the new facade is vertical. Correcting is a very important step, because even small unevenness can be seen in the finished wall. Straighten the rails using a laser and a ruler or string line.

Picture 30: Straightening the insulation rails so that the lower and upper brackets are in place

Insulation rails are recommended to be installed with k600 distribution around the building, regardless of the openings in the wall. For example, in the case of a window, the section of rail that goes over the opening is cut to the size of the window and moved to the edge of the window (if the insulating rail next to the opening is more than 300 mm from the edge of the opening).

Mounting rails can and should be used as an aid in installation. For example, in the case of a window, a rail that can be moved to the edge of the opening can be attached to a suitable position using the mounting rail, so that the 50 mm hole spacing in the mounting rail hits the right spot.

When the wall is high, the insulating rail must be extended. At each connection point of the insulating rails, there will be a pair of brackets as shown in the pictures below, to maintain the correct vertical progression of the holes on the front surface. With a vertical progression of 100 and 75 mm, the rails are installed in a pair of brackets from the outermost holes, leaving a 30 mm gap between the rails, and the rail progression is 3000 mm. With a vertical progression of 87.5 mm, the rails are installed from the inner holes, leaving a gap of 5 mm between the rails and the rails are 2975 mm. For other progressions, the target-specific rail type of the right front hole progression is used according to the target-specific instructions.

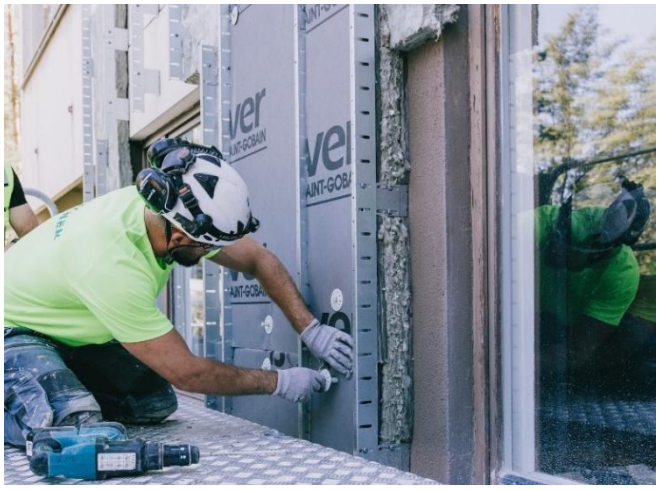


Picture 31: Extensions of insulating rails for different progressions (87.5 mm for the left extension and 75 and 100 mm for the right extension)

5.3.3 Insulation

The structural plans show the type and strength of the thermal insulation, and the details to be considered during installation. Soft thermal insulation is installed vertically between the insulation rails. When the insulating rails are installed with a k600 division, the width of the soft wool used should be 610 mm. The installation must be done carefully so that the wools are tightly against each other. Urethane insulation can also be used in between the system.

Either wind protection wool or wind protection board can be used as wind protection for brick cladding. The wind protection wool is installed on top of the soft insulation tightly against the insulation rails. The width of the wind protection wool should be 600 mm. Horizontal seams are carefully taped with seam tape intended for wind protection insulation, and insulation fasteners are used to ensure the tightness of the insulation, according to the structural plans. If the wind protection wool is tightly packed in between the rails, then taping the vertical seams is not necessary. The double facade structure made with a wind protection board is discussed in chapter 5.4.



Picture 32: Installation of wind protection insulation

5.3.4 Installation of the mounting rail

The installation of mounting rails is the same as in the cold cladding system, discussed in chapter 5.2.2.

5.4 Installing the double facade system

5.4.1 Installation of the wall brackets, vertical L-rails and insulation

The installation of wall brackets and L-vertical rails can be carried out in the same way as discussed in section 5.3., especially in terms of brackets, insulation rails and insulation. It should be noted that the height measurement of the L-rails is not exact, as the height of the cladding is determined during the installation of the cold cladding system to be installed on top of the wind protection board. Wall brackets with ak600/k720 split.

5.4.2 Installation of the wind protection board

The wind protection boards are installed according to the structural plans. In the fixing points, you can note that the drill screws for the installation of the Z-rail that comes on top extend through the board to the L-rail, and thus also participate in the fastening of the wind protection board.

5.4.3 Installation of the cold cladding system

The cold cladding system is installed on top of the wind protection board surface in the same way as the installation of the cold cladding system discussed in section 5.2. It should be noted that the Z-vertical rails are installed at the L-vertical rails below the wind protection board, so that the attachment of the Z-rail comes through the wind protection board to the L-vertical rail. Z-rail attachment points max. every 400 mm. Fastening through the wind protection board to the L-rail, for example with drill screws 6.3x25 (the designer of the site defines the fastening).

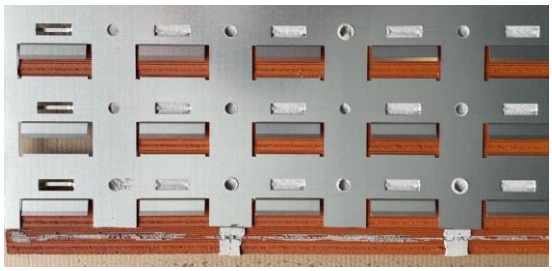
6 Installation of the cladding panels

When you start installing BRIX brick cladding panels, you should have wall-specific cladding plans. The mounting rails must be installed according to the cladding plan, as discussed in section 5.2.2.

As a rule, installation is started from the bottom left corner, from left to right and one row of cladding panels at a time from bottom to top. The cladding is recommended to be installed from left to right, as this allows the new cladding panel to always be slid over the previous one. In some special cases, it is worth installing the other way around, i.e. from right to left (e.g. if the right edge borders the inner corner). See the panel item numbers of the starting cladding panels in the plan and look for the corresponding cladding panels in the pallet boxes. All the cladding panels contained in the pallet boxes are listed in the shipping lists, and in addition, each box has a separate packing list from which you can see the cladding panels contained in the box. The item numbers of the cladding panels can be found marked both on the upper edge of the cladding panel and on the metal frame.

If there are windows or other openings in the wall, make sure when installing the first brick panel that their horizontal position is correct compared to the frame of the openings. If there are corner cladding panels in the wall area, their location in relation to the openings and corners makes it easy to determine the correct position of the cladding, but if the openings are made with cut edges, the size of the individual brick tiles and their placement in the recess should be considered. This is to prevent narrow brick slabs (<50 mm) from forming on the edges of the openings. If necessary, you can check the correct position from the brick pattern plans. Once the starting location is correct, the installation can begin.

Before installing the lowest brick panel, cut off the frame sheet from its bottom edge as shown in the picture below. This must also be done for the bottom edge of brick panels that are above openings.



Picture 33: The frame cut from a panel in the lowest cladding row

After that, lift the cladding panels of the lowest row onto the mounting rail so that the attachment flanges support the panel from the bottom and top edge. The following rows are installed in such a way that only the top row of attachment flanges is used to secure the panel to the mounting rail. Above openings (window, door, recess, etc.) and above horizontal movement joints, the brick panels are always installed on two rails (from the top and bottom).

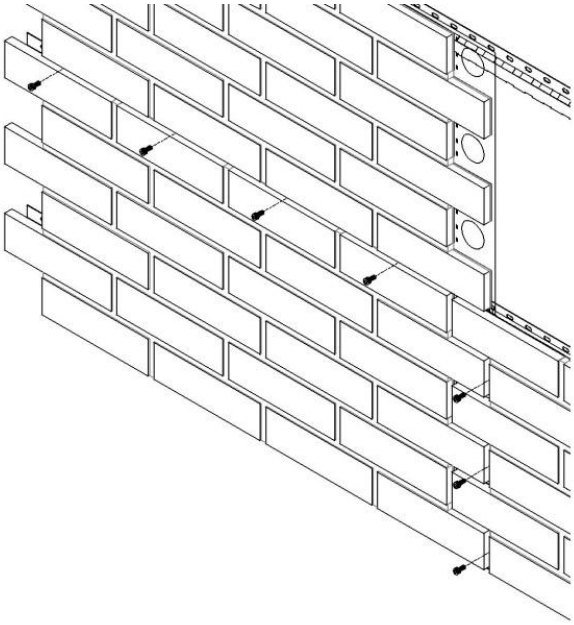
The vertical positioning of the cladding panels is always correct based on the mounting rail spacing, but when positioning the cladding panels horizontally, **take into account the horizontal progression indicated by their panel code.** The zero point of a cladding panel and its individual slips is always located at the bottom left corner. The cladding panels are positioned so that the distance between their zero points corresponds to the progression indicated by the panel code. For example, consecutive S1200600 cladding panels are positioned horizontally at distances of 1200, 2400, 3600, 4800… mm measured from the zero point. Use continuous measurement when checking the horizontal progression. This ensures that the joints between the cladding panels are, on average, the same width as the joints within the panels and that the facade has a uniform appearance. **Spreading the vertical joints between the cladding panels is prohibited in all situations!** If there is a need to widen the joints, contact the cladding supplier immediately.

6.1 Fastening the panels to each other

The cladding panels are attached to each other with the supplied drill screws 4.2x16, so that the panels form a uniform cladding panel surface. Before attaching the panels to each other, it is necessary to make sure that they are in the same line (in the lateral, vertical and depth direction). To ensure the adjustment of the depth direction, you can use e.g. vertical rail pieces to help, which are attached to the joint and thus ensure that the outer surface remains flat.

Picture 34: The evenness of the brick surface is ensured before the jointing

In full-size standard cladding panels (e.g. S1200600), there are 3 screws in the vertical joint and 4 in the horizontal joint as shown in the picture below. As a rule, the metal frame of the brick cladding panels has the necessary pre-drilled holes ready at the right places, but if they are missing, screws are added so that the number of screws mentioned above is realized. Brick cladding panels that differ from the standards, such as e.g. casings or those cut at the construction site, are attached to each other at approx. 150 mm intervals in the horizontal and vertical directions, however, with at least 2 screws in both the vertical and horizontal joints.

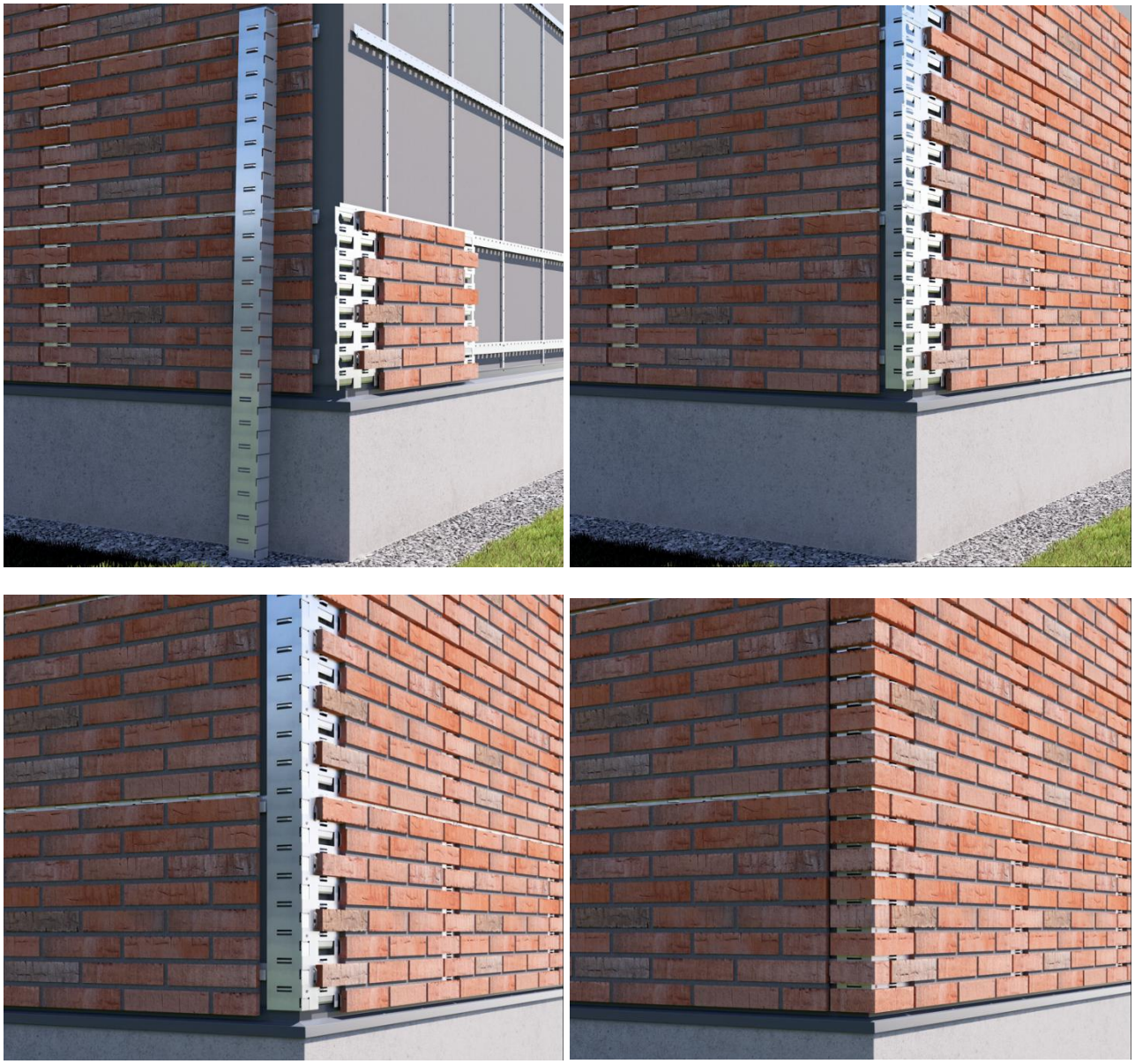


Picture 35: Locations of screws for the joints of brick cladding panels

6.2 Making corners at the construction site

The options for corner cladding panels are discussed in section 2.1.2. If the corners are planned to be done at the construction site, the cladding is delivered in such a way that the corner cladding panels are manufactured without corner slips, and the corner sheets and corner slips are delivered separately with the cladding. The corner sheets are supplied according to the cladding plan and the corner slips in a standard size. For example, Würth Power Tack or an equivalent adhesive is used, and it is not included in the delivery. Below is a step-by-step instruction for making corners at the construction site.

1. When installing the mounting system, note that the mounting rail is about 70 mm short in the corner where the corner sheet is installed on the cladding panel frame, because the mounting rail and the corner sheet cannot be in the same place behind the cladding.
2. Install the cladding according to the site's cladding plan and installation instructions.
3. Before installing the corner sheet, note that the cladding panels have been positioned on the wall in the correct lateral position and screwed together so that the long corner sheet can be installed.
4. Slide the corner sheet behind the clips of the mounting rails of the frames.
5. Make sure that the corner sheet comes in the right position as a base for the corner slips, taking into account their thickness and the thickness of the adhesive layer
6. Make sure the corner sheet is installed straight
7. Screw the corner sheet to the frames of the cladding panel at every other horizontal joint
8. Cut off the excess frame
9. Cut the corner slips to the required size and glue to the corner sheet, considering the correct positioning in all directions
10. If the slip does not stay in place during drying, you can support the slips during drying by screwing, for example, the vertical rail of the mounting system from the joint onto the brick surface
11. Joint the corner slips in conjunction with other jointing work



Picture 36: On-site construction of a corner using a corner element

6.3 Cutting and making holes

Cutting the brick cladding panel is done with a diamond bladed hand circular saw or a diamond disk:

- Draw the piece to be cut on the brick cladding panel.
- Cut the panel with the brick surface facing outwards using a guide.

When cutting, small pieces of tile (<30 mm) should be avoided. If very small pieces of tile remain at the cut location, their attachment to the backing frame through the joints must be checked and, if necessary, they must be additionally secured, for example by gluing.

Holes can be made in the brick cladding by drilling or cutting. Before cutting or drilling, you must make sure that there is no mounting rail at the location of the hole and that the mounting system will in no way be damaged. When drilling small holes, a normal concrete drill or stone drill can be used. The holes should ideally be drilled at the seams or in the middle of the brick. When making larger holes, diamond drills of different sizes can be used, in which case attention must be paid to the drilling speed.

6.4 Replacing a slip in the cladding panel

If, for example, a brick on the cladding panel breaks at the construction site, it is easy to replace. Together with the cladding delivery, a so-called service pack with individual bricks is delivered for possible site repairs.

The joints around the brick to be replaced are cut with a diamond disc using two cuts, one along each edge of the joint into the brick, taking care not to damage the back frame of the cladding panel. The brick can then be easily removed, and the surface of the back frame is cleaned of sawdust and possible adhesive.

The new brick slip is attached to the frame with Würth Power Tack adhesive or similar. If necessary, a vertical rail or similar is cut to support the brick while it dries and to ensure that its surface remains at the same level as the surrounding cladding. The vertical rail is attached to the cladding at the joints with drill screws so that the replaced brick remains under it (see picture). This presses the brick into place against the frame. After this, the surrounding joints are jointed again with BRIX vertical mortar, and stone grit is blown onto the surface.

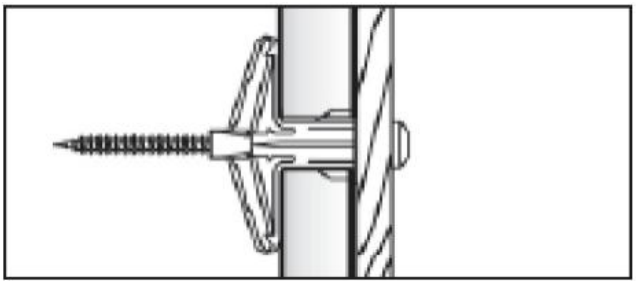
The drying time for the joints is approx. 1 day, after which the support rail can be removed. After that, the rail attachment points are jointed.

Picture 37: Support rail for brick slip being replaced

This repair method is suitable for individual brick slips, corner slips and upper skirting brick slips. It must be noted however, that the support rail should be attached from below the skirting when supporting the drying of the upper skirting.

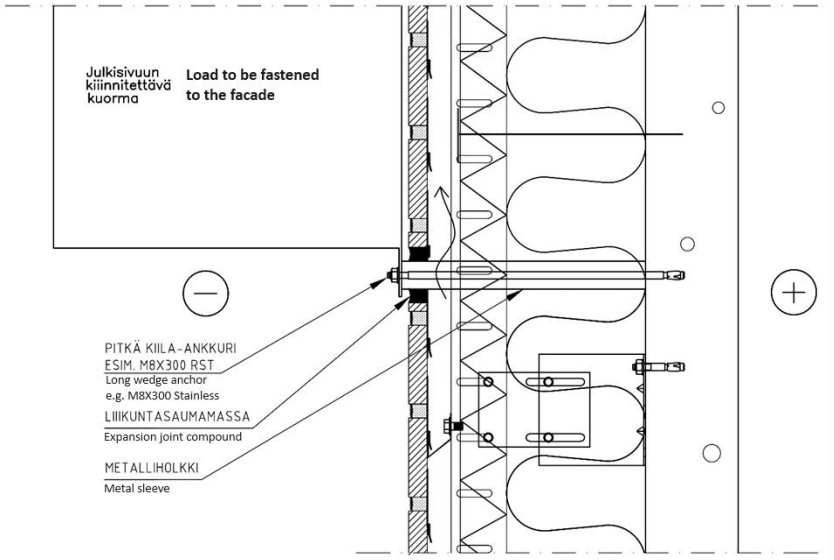
6.5 Fixing structures to the cladding

Individual light structures weighing less than 7 kg can be directly attached to the brick cladding with sheet metal anchors (other loads must also be taken into account), e.g. lights, shields, sensors, cables, antennas, etc., whose centre of gravity is close to the brick tile surface. Making holes in brick cladding has been discussed earlier in this instruction in section 6.2.



Picture 38: Fixing a light structure using a thin sheet anchor

Fixed structures heavier than 7 kg (e.g. house ladders, heat pumps, etc.) must be fixed through the brick cladding to the base structure or fastening system according to the structural plans.



Picture 39: Fixing the external load to the load-bearing structure

In all penetrations through the brick cladding, it should be noted that a hole or opening larger than the penetrating part must be made in the brick cladding so that possible movement of the structure does not damage the brick cladding. The brick cladding must not be compressed or subjected to stress by penetrating structures; the fastening must be secure and sufficient clearance must be provided for movement. The remaining gap can be sealed, for example, with expansion joint compound.

7 Sealing of on-site joints

7.1 Sealing conditions and accessories

ATTENTION! At the time of sealing, the air temperature must be +5...+25 C degrees and the sealing must be done in rainless conditions. The temperature must also not drop below +5 degrees during the next 3 days. This avoids possible freezing, cracking and calcification of the joints, as well as premature skinning of the surface.

If BRIX cladding is installed in late autumn or winter, when due to the weather it is often not possible to seal without additional heating, it is good to note that the facade is technically fully functional when the cladding panels are installed and screwed together. The BRIX wall can remain without site sealing over one winter.

Tools needed for joint work:

- Jumbo gun (supplied with the mortar delivery, in the picture)
- Funnel sprayer (an accessory must be a gravel nozzle, approx. 100mm long tube)
- Tuck pointer
- Mortar tub
- Compressor and compressed air hose
- Mortar mixer
- Mortar scoop
- Washing brush

Picture 40: Jumbo gun

The brick cladding delivery includes the necessary jointing materials, i.e. BRIX vertical mortar used in construction site jointing and micro stone granules blown onto the surface. For jointing work, electricity and water must also be reserved for the construction site.

7.2 Sealing work of on-site joints

Before starting the jointing work, make sure that the installed cladding panels are in the same plane with respect to each other, as discussed in section 6.1. The construction site joints must be consistent with the factory joints inside the cladding panels, so that it does not differ from them on the finished facade. It is necessary to have a separate inspection of the model joint, which states the quality of the performed joint and the follow-up measures. If necessary, you can order expert installation and sealing training through BRIX Facades Oy.

The work is started by mixing water and mortar in a mortar tub according to the instructions found on the bag. The finished mortar is allowed to stand for 10 min (In the meantime, you can prepare other tools such as the compressor and funnel sprayer, etc.), after which the mortar is mixed a little more. Post-mixing after 10 min extends the working time of the mortar. Adding excess water to the mortar after this must be avoided, as it breaks down the structure of the cement.

The jointing work is started by filling the jumbo gun with mortar. Air bubbles can be removed from the gun by pressing the trigger lightly and at the same time blocking the tip of the gun with your fingertip. The jointing is started from the least visible area of the wall and the jointing work is always done on the shadow side, so that the joint does not dry out too quickly due to the influence of sunlight. Joint mortar is extruded with the jumbo gun into the open joint so that the joint becomes tight and uniform. The mortar is extruded to the same depth as the factory joints in the brick tile sheets. When extruding, be careful of the surrounding bricks so they don't get cluttered by the mortar. During extrusion, the guiding hand is supported against the surface of the brick, which results in a neater and more precise joint.

After extrusion, the joint can be lightly smoothed with a tuck pointer, if there are any unevenness left after extrusion. In smoothing, however, we try to avoid unnecessary "rubbing". During the work phase, the aim is to achieve as smooth a joint as possible and thus to minimize the need for post-levelling.

Picture 41: On-site jointing

When doing jointing work, you should always monitor the new joint from many different directions, so that it matches the shape and colour of the surrounding factory joints. In this way, a uniform brick cladding facade is achieved. (Note: drying slightly changes the colour of the final joint). You should always wash the equipment before breaks. Even a small amount of drying hinders the flow of the mortar and slows down the progress of the work.

After applying the mortar, the micro stone granules are blown into the wet joint mass with a funnel sprayer with sufficient pressure. The joint cannot be modified after this. It should be noted that the micro stone granules do not stick to a dried surface or a surface where skin or crust has started to form. Therefore, according to the prevailing conditions, the most optimal amount of mortar to be applied before spraying the stone granules must be sought, to avoid skinning. The jointing work should be carried out by a pair of installers, with one applying the joint mortar and the other following behind, smoothing the surface and applying the stone granules. This avoids problems with the adhesion of the stone granules caused by skinning of the surface. Stone granules are blown evenly in one go. Back-and-forth movement dries out the joint unnecessarily, so the adhesion of the stone granules deteriorates.

Alternatively, stone granules can also be applied to the surface of the joint by hand. In this case, you should proceed as follows: Take a fair amount of stone granules in your hand, then place your hand, palm first, on the joint. After that, turn your hand to an angle of approx. 45 degrees and begin to slowly slide the hand upwards along the joint.

A model video of the jointing can be found on YouTube under the title Tile cladding post-joining on the construction site. You can watch it at the following link https://www.youtube.com/watch?v=t-w5DAMVsL8

7.3 Expansion joints

Expansion joints must be made every 7.5m, if the uniform length/width of the wall is more than 12m (e.g. a 12m wide and high wall does not need movement joints). Expansion joints must also be placed in the outer corners. Expansion joints are implemented on the same principle as construction site jointing. The difference, however, is that instead of a jumbo gun, there is a compound gun, and instead of mortar, there is expansion joint compound.

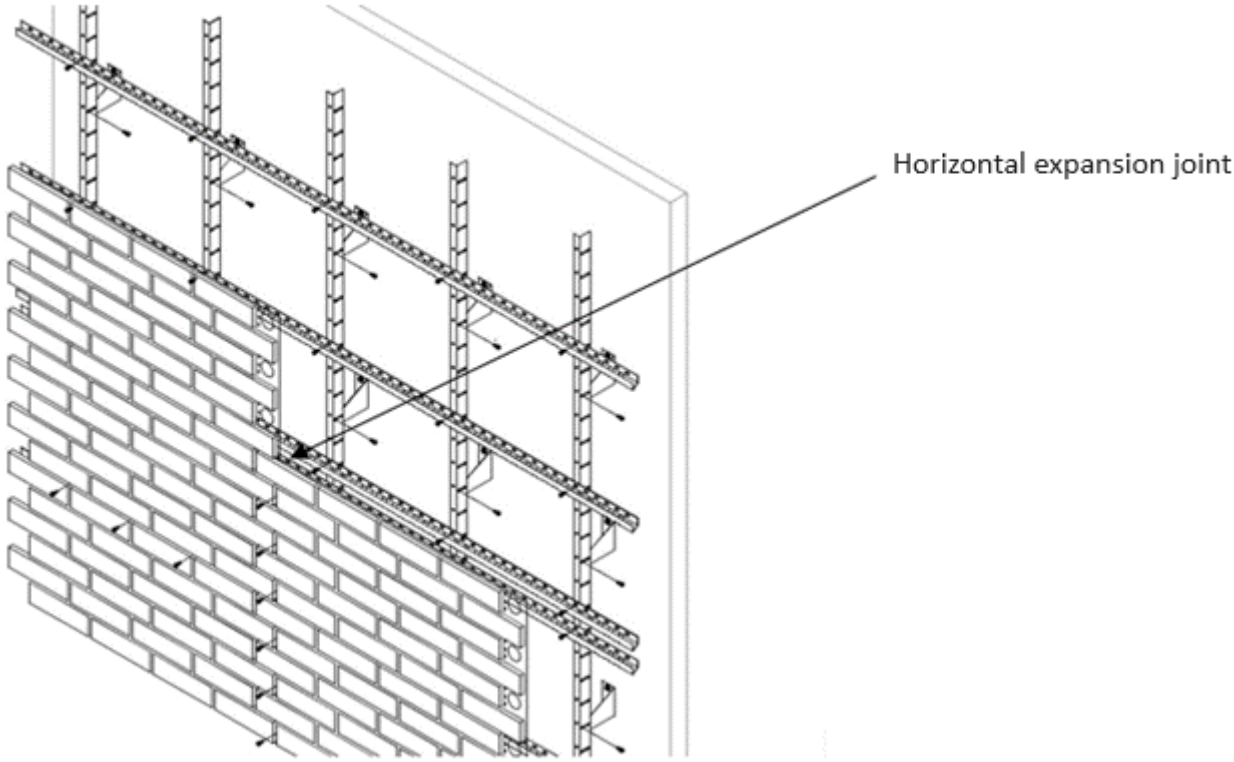
A closed-cell rubber strip is pressed onto the bottom of the joint. If necessary, the strip can be cut in half. The joint is sealed on top of the strip with the compound specified by the designer. The compound is levelled using e.g. soapy water and a wooden trowel or tuck pointer as an aid, so that the surface of the joint is at the same depth as the factory joints. Micro stone granules are blown onto the surface of the expansion joint in the same way as a mortar joint, in order to make the expansion joints as similar in colour as possible to other joints.

For example, Tremco/Illbruck SP520 can be used as expansion joint compound. Always use the manufacturer's installation instructions. Table 3 below shows the closest colours of Tremco expansion joint compounds to BRIX grout joint colours.

Table 10: Tremco expansion joint compound colours for BRIX-joints

Joint colour	Expansion joint compound
R250 light gray	Nordic Stone (RAL 7038)
R82 dark gray	Special Grey (RAL 7016) or Black
R80 black	Special Grey (RAL 7016) or Black
R222 white	Marble White
R160 brown	Chocolate Brown (RAL 8017)
R510 terra	Special Brown (RAL 8002)
R610 beige	Light Ivory (RAL 1015)

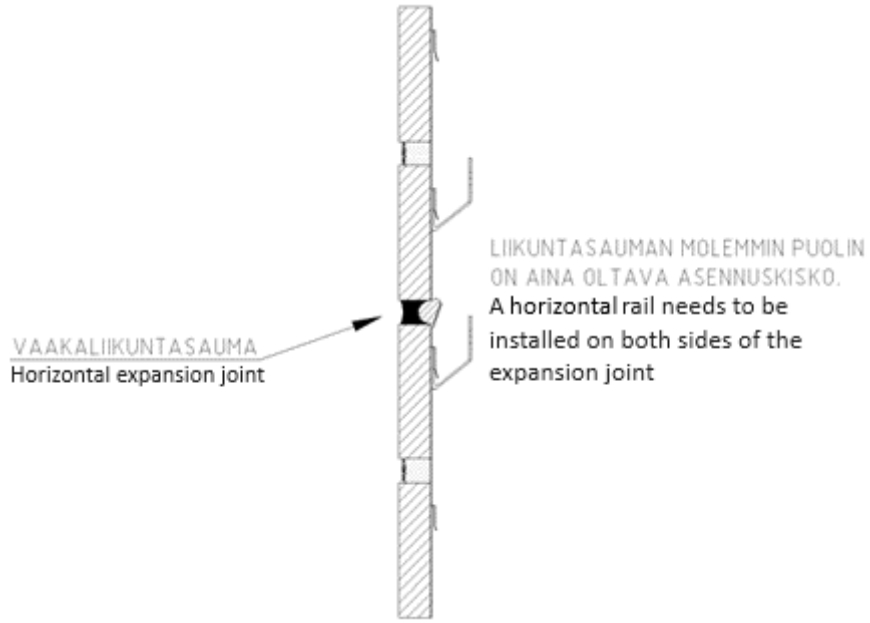
When using other expansion joint compounds, make sure that the colours of the compound and mortar match before starting work.



Picture 42: Horizontal expansion joint

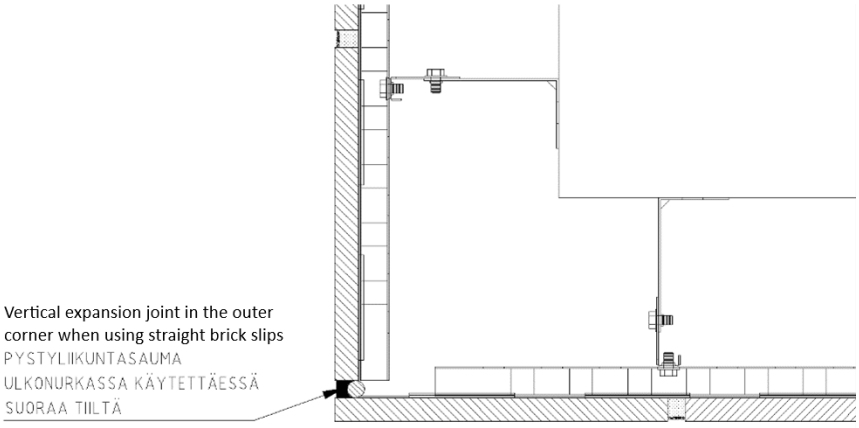
An example of a horizontal expansion joint is shown in the picture above (drill screws have been left out of the joint and the distribution of the mounting rail has changed). Going upwards after the horizontal expansion joint, the next brick panel is hung on two mounting rails and the following normally on one.

The bottom edge of the back frame of the brick panel above the horizontal expansion joint is cut in the same way as the lower most panels of the facade and the those on top of openings. The upper edge of the back frame of the brick panel below the expansion joint is bent backwards using sheet metal pliers. The following picture shows a cross-section of the horizontal expansion joint.

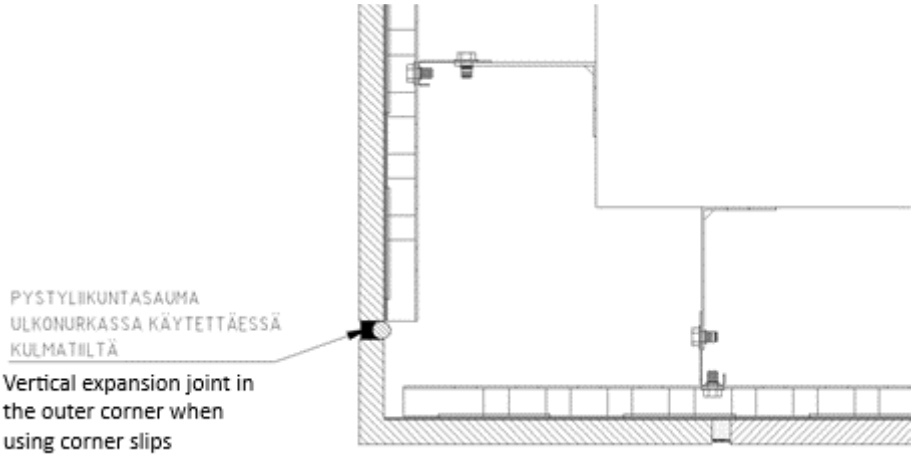


Picture 43: Cross-section of a horizontal expansion joint

An expansion joint is also placed when the outer edge is made by cutting using a straight brick or a corner brick.



Picture 44: Vertical expansion joint in the outer corner for straight slips



Picture 45: Vertical expansion joint in the outer corner for corner slips

8 Links to installation videos

We have produced various videos about both BRIX projects and the installation of the BRIX system. They are all available on our YouTube channel, BRIX Facades Oy, or via the link below.
All videos on our channel: https://www.youtube.com/@BRIXFacadesOy

Videos relating to the different installation stages can be found via the links below. The installation videos do not include all the instructions provided in this installation guide and therefore cannot be used as complete installation instructions for the product. However, they provide useful additional guidance for understanding the installation process and the matters that must be taken into account.

BRIX Mounting System Installation: https://www.youtube.com/watch?v=PSzw5Qd5FdA

BRIX Cladding Panel Installation: https://www.youtube.com/watch?v=PGVqW_Fff1g

BRIX Brick Cladding Jointing: https://www.youtube.com/watch?v=t-w5DAMVsL8

Replacing a Slip in BRIX Brick Cladding: https://www.youtube.com/watch?v=0apkYI5x8B8