



# Symmetrical Cladding.

Laying instructions

## PREFACE

These laying instructions describe the application of **InterSIN®** slate, SIN 970 and **ColorSIN®**, CS 35 or CS 50 together with the aluminium substructure included with delivery and the corresponding mounting materials as a complete system. The instructions are the basis for appropriate planning and application-oriented technical solutions in usual situations. The detail drawings found in the laying instructions depict some of the standard details of the symmetrical cladding.

The following pages contain technical information about the curtain-type, rearventilated facade and practical guidelines for construction and implementation.

The symmetrical cladding facade system with natural stone works well for new buildings as well as for renovation in terms of aesthetics, design and cost. These instructions serve as an orientation for the planner and the implementing firm.

They are based on current, state-of-the-art construction technology. However, the planner and the implementing firm must consider the effects of the system application on the respective structure as well as local and climatic conditions, and demands related to construction physics.

Using these laying instructions does not imply an exemption from individual responsibility. We reserve the right to make revisions resulting from further development of the facade system.

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## 1. CONSTRUCTION REQUIREMENTS

### 1.1. Weather protection

The curtain-type, rear-ventilated facade guarantees long-lasting protection against effects of the weather. The building stays warm in winter and cool in summer, and the climate indoors remains comfortable. The load-bearing external walls and the insulation stay dry and therefore remain fully functional. The circulation of air in the ventilation space quickly dries up any rain that penetrates through open joints in a downpour.

### 1.2. Thermal insulation

**1.2.1.** The structural thermal insulation for energy conservation is governed by the Energy Conservation Ordinance (EnEV) of 2002, an amendment of the fundamental Energy Conservation Law of 1976. Reducing energy consumption and minimizing CO<sub>2</sub> emissions are among the most important goals of the Energy Conservation Ordinance (EnEV). In addition to the construction design advantages offered by the curtain-type, rear-ventilated facade, the high quality thermal insulation required by the Energy Conservation Ordinance (EnEV) contributes to environmental protection and pays for itself in a short period of time, due to lower heating costs.

#### 1.2.2. Insulation

Mineral fibres, water-proofed according to DIN/EN Standard 13162, with thermal conductivity 035 (0.035W/mK) or 040 (0.040W/mK) provide thermal insulation for the curtain-type, rear-ventilated facades. The aluminium substructure of the symmetrical cladding can accommodate insulation of the thickness required by the Energy Conservation Ordinance (EnEV). Install the facade insulation boards between the substrate and the insulation layer in a tightly adjoining arrangement, leaving no space, in conformity with the standards. Affix them mechanically with insulation fasteners - on average 5 fasteners per m<sup>2</sup>. Mount them tightly to the abutting components.

#### 1.2.3. Thermal bridge

Thermal bridges are locations in the building sheath where there is an increased heat flow. Installing an insulating underlay between the supporting structure and the wall holders (Thermostopp) weakens thermal bridges considerably. Installing the insulation layer properly reduces the occurrence of thermal bridges.

### 1.3. Sound-proofing

To prove that a facade design is sound-proof, the entire wall structure and components (windows, etc.) must be defined. Curtain-type, rear-ventilated facades have an extremely positive influence on the sound-insulating effect of the external wall.

### 1.4. Fire prevention

The symmetrical cladding with aluminium substructure and the corresponding mounting materials meet the highest requirements for non-combustibility (Building material class A1, DIN 4102).

### 1.5. Rear ventilation, ventilation (air intake and exhaust)

#### 1.5.1. Rear ventilation

Rear ventilation is essential for reducing moisture, for draining any rain that may penetrate during a downpour, for capillary separation of the facade cladding from the insulation layer, and for draining water that condenses on the internal surface of the facade cladding. The cross-section to be kept clear for ventilation between the facade cladding and the layer behind it must measure at least 20 mm. Construction tolerances and possible inclined alignment of the building must be taken into account. This space for rear ventilation may be decreased to 5 mm in some places, e.g. due to the substructure or wall unevenness.

#### 1.5.2. Ventilation openings (air intake and exhaust)

The space for rear ventilation requires openings for air intake and exhaust. These openings are designed such that their operational reliability is guaranteed over the entire lifetime of the building. They may not be damaged by contaminants or other external influences. The openings are located at the lowest and highest point of the facade cladding, in the windowsill/lintel area and where there are penetrations. In order for the rear ventilation to function, air intake and exhaust openings of at least 50 cm<sup>2</sup> per m of wall length must be present. Constrictions in the cross-section must be taken into consideration (e.g. air inlet grill).

## 2. TECHNICAL NOTES

**The most current versions of these fundamental rules must be followed in principle:**

- ▶ Relevant local building regulations in each case
- ▶ Rules for cladding external walls with slate (Central Association of German Roofers)
- ▶ Notes on rear-ventilated external wall cladding (Central Association of German Roofers)
- ▶ VOB Part C, ATV DIN 18351 German Construction Contract Procedures – Part C: General Technical Contract Terms for Construction (ATV) – „Facade work“
- ▶ DIN 18516-1 External wall cladding, rear-ventilated, Part 1: Requirements, Inspection policies
- ▶ DIN 1055 Impacts on supporting structure, Part 4: Wind loads
- ▶ DIN 1745 Hinges and sheets made of aluminium und aluminium wrought alloy with thicknesses greater than 0.35 mm
- ▶ DIN 4102 Fire behaviour of building materials and components
- ▶ DIN 4108 Thermal insulation in building construction
- ▶ DIN 4109 Sound-proofing in building construction
- ▶ DIN 4113 Aluminium structures under predominantly stationary load
- ▶ DIN EN 13162 Insulation materials for buildings
- ▶ DIN 18202 Tolerances in building construction
- ▶ Energy Conservation Ordinance (EnEV)
- ▶ Proof that the slate is in conformity according to DIN EN 12572 and DIN 52104-A, issued by a neutral inspection and regulatory agency

**This is an excerpt from the rules and standards that are to be followed. This list does not claim to be complete.**

## 2. TECHNICAL NOTES

- ▶ The symmetrical cladding is a curtain-type, rear-ventilated facade cladding. It consists of **InterSIN®** slate, SIN 970 and **ColorSIN®**, CS 35 or CS 50, a rear ventilation gap, thermal insulation and an aluminium substructure.
- ▶ Only the aluminium substructure included with the delivery of the Rathscheck product(s) and the corresponding mounting materials may be used to assemble the symmetrical cladding. All of the mounted components must be fastened without constraint.
- ▶ The stone thickness measures 10 mm. The edges have been sawed around their perimeter. Stones measuring up to approx. 600 x 600 mm have been inspected and may be used.
- ▶ The horizontal joint width is approx. 8 mm, the vertical joint width should be approx. 10 mm, but at least approx. 8 mm.
- ▶ To ensure sideways clearance and to prevent clattering noises, insert the foam rubber strips included with delivery between the slate and the stainless steel mounting clips. Place 4 foam rubber strips per stone on the stainless steel mounting clips.
- ▶ All of the stones used have come from the same deposit. Colour fluctuations are possible. These nuances and the individual structure of each stone make up the natural charm of each slate roof and are deliberate. Slate stones from the various pallets are to be mixed before installation and mounting.
- ▶ Samples can only show the basic colour and structure of the stone. The natural stratification, veins, spots and colour fluctuations are part of the normal, individual character of the product and are therefore typical for the material.
- ▶ In order to avoid divergences during the presentation of samples between persons participating in the object, a marginal sampling can be carried out on the basis of an expert opinion. This shall then be legally binding for all the parties involved in an order or members of mining companies.
- ▶ Protect the slate from the effects of the weather until it is used.
- ▶ Check the slate stones before laying (visually, sound test and tests of this kind). After the completed final cleaning of the façade with clear water the slate stones have to be treated with a thin layer of ready-to-use impregnation (recommendation: Möller-Chemie HMK 34 or equivalent). Within the scope of this impregnation the edges sawn without interruption must also be treated with the special impregnation. For **ColorSIN®** CS 35 the impregnation does not apply. Furthermore the processing instructions of the producer continue to apply.
- ▶ It is recommended that the finished external cladding be washed with clean water.

### 3. PRODUCT TYPES

#### 3.1 Slate

Slate for symmetrical cladding is available in 3 colour variants and 2 surface variants:

- ▶ **InterSIN®**, SIN 970: blue-grey  
Surface natural or polished
- ▶ **ColorSIN®**, CS 35: dark green  
Surface natural
- ▶ **ColorSIN®**, CS 50: polar green  
Surface natural or polished

**Stone sizes:**

- ▶ 600 x 300 x 10 mm, sawed all around
- ▶ 600 x 600 x 10 mm, sawed all around

| Dimensions        | Weight/<br>Stone | Weight/m²       |
|-------------------|------------------|-----------------|
| 600 x 300 x 10 mm | approx. 4.95 kg  | approx. 27.5 kg |
| 600 x 600 x 10 mm | approx. 9.90 kg  | approx. 27.5 kg |

#### 3.2 Aluminium Subframe

**Wall bracket**   **Fixed point**   **HE132/150 3 x 10.5**  
Standard size projection (height)  
in 132 mm, 162 mm, 192 mm  
The wall bracket length is variable.

**Wall bracket**   **Sliding point**   **HE132/50 1 x 10.5**  
Standard size projection (height)  
in 132 mm, 162 mm, 192 mm  
The wall bracket length is variable.

**Starting clamp**                **HE130/11**  
**Mounting screw**           **Ejot JT4-4-4.8x25**  
**Double clamp**             **HE130/11**  
**Gesipa rivet**                **5x14K11**  
**Washer**                      **HE100**  
**Foam rubber underlayment**  
**Slide profile**                **HE105**  
**Teroson Spray**  
**Insulator**                    **150 mm**  
**Insulator**                    **50 mm**  
**Rail**                            **HE130**

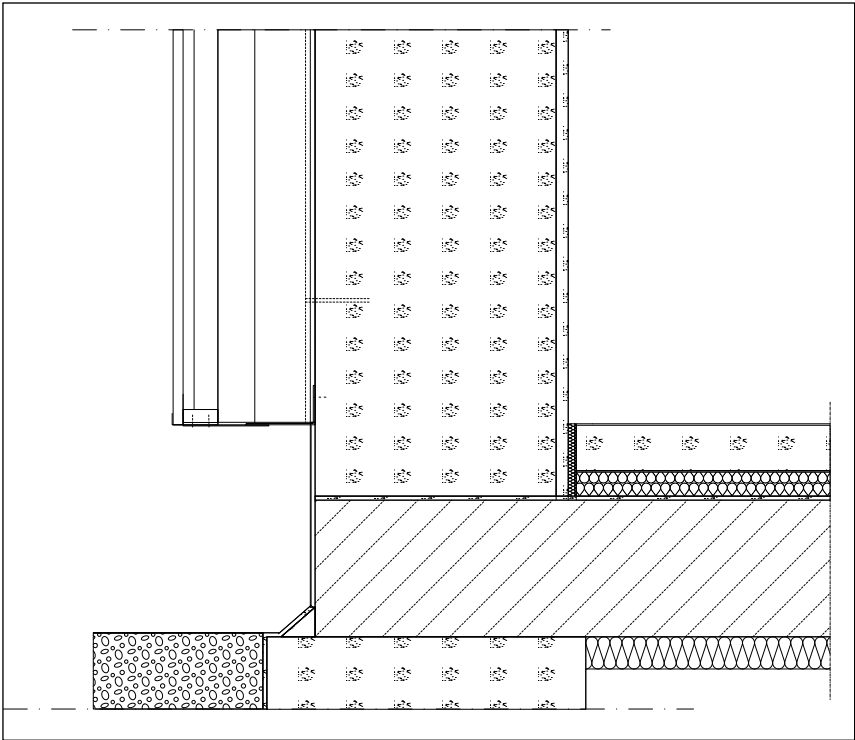
The vertical aluminium rail is available untreated or with a black coating.

Stainless steel mounting clamps can be coated in various colours.

### 4. TECHNICAL DETAILS

#### Notes

Visible parts made of aluminium must be coated for use on facades. Uncoated aluminium can discolour unevenly, and leads to distracting irregularities in the cladding material.



#### 4.1 Base design

Using an extrusion is recommended for larger gaps between the cladding and the external wall. The dimensions of the ventilation profile must be individually adjusted based on the structure.

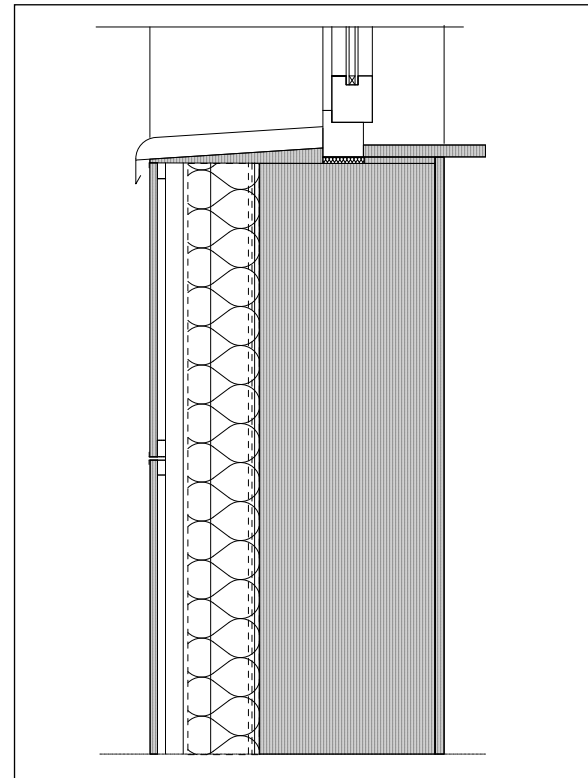
## 4. TECHNICAL DETAILS

## 4.2 Parapet connection

To prevent annoying dripping noises from rain, it is recommended that sound damping material be installed on the underside of large surfaces such as windowsills and flashing.

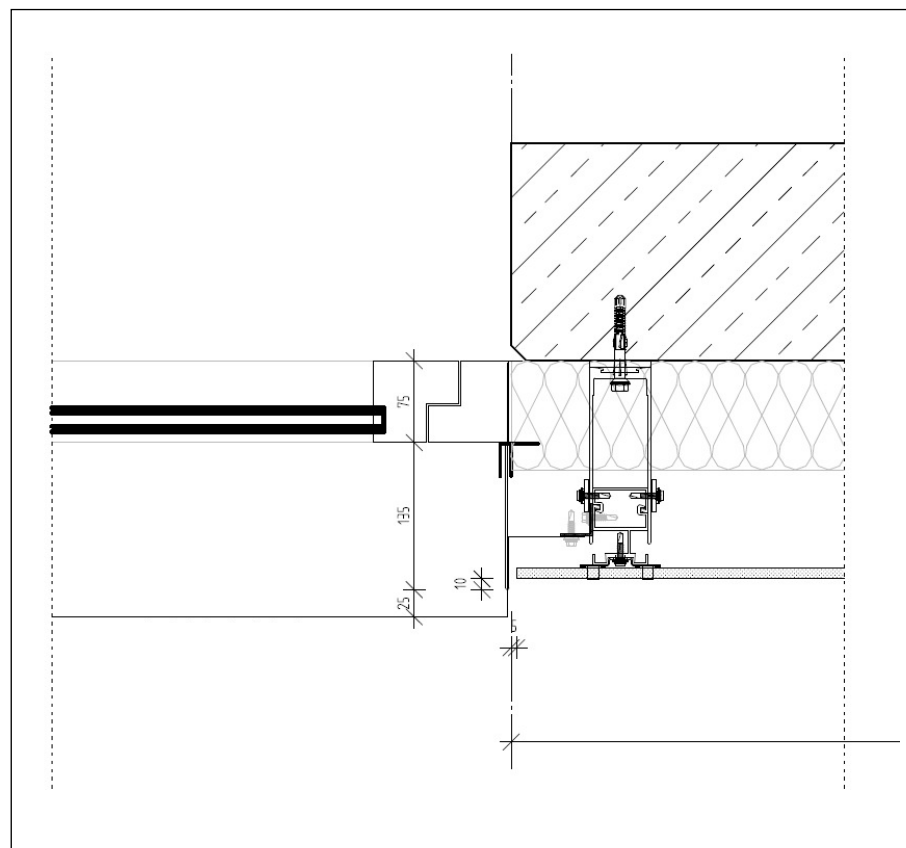
The gap between the drip shield and the components beneath it must measure at least 20 mm. If copper is used, the minimum gap must measure at least 50 mm. The profile edge should overlap the slate at these building heights:

- |                             |          |        |
|-----------------------------|----------|--------|
| ▶ up to 8 m                 | at least | 50 mm  |
| ▶ greater than 8 up to 20 m | at least | 80 mm  |
| ▶ greater than 20 m         | at least | 100 mm |

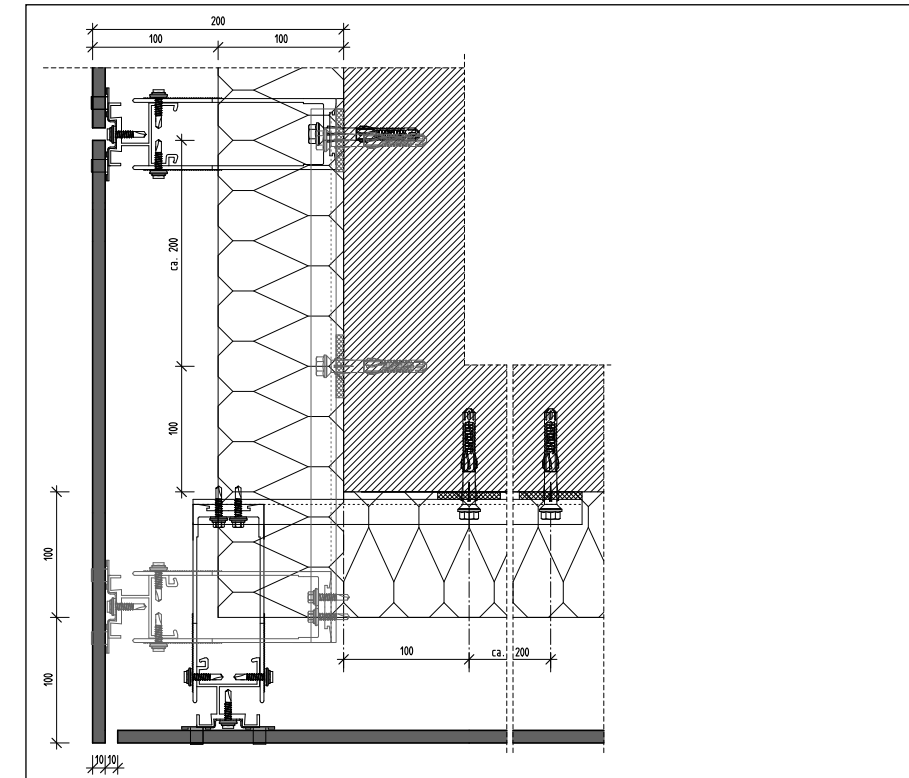


### 4.3 Reveal

Reveal plate of a system sash made of coated aluminium.

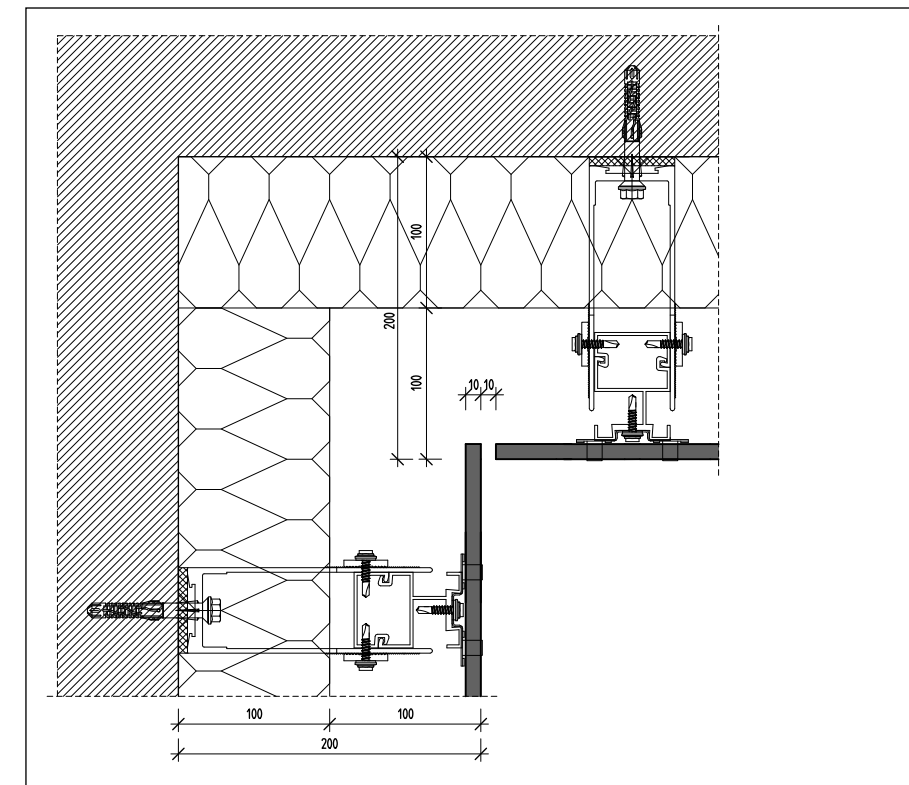


## 4. TECHNICAL DETAILS



#### 4.4 External building corner

The edge distances for the slide and anchor points must be considered in terms of statics.



#### 4.5 Internal building corner

Simple internal corner design with open, vertical joint.

## 5. ASSEMBLY NOTES

The device for cladding the external walls of structures and buildings consists of a substructure

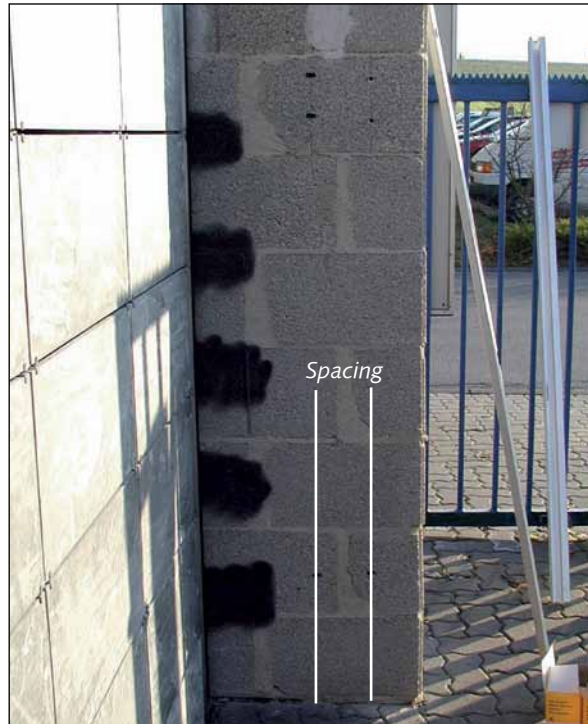
These bearing profiles are vertically parallel and evenly spaced relative to each other. Attach them to the building wall at the anchor and slide points.

The aluminium substructure is a three-dimensional system that can be adjusted for height, depth and lateral position.

Static specifications are always material to mounting this structure.

The test certificate for mounting is included here.

Arranging the facade surface for positioning the vertical bearing profile.



Spacing: 310 mm when joint width is 10 mm.

Mark the vertical anchor and slide points according to static specifications.



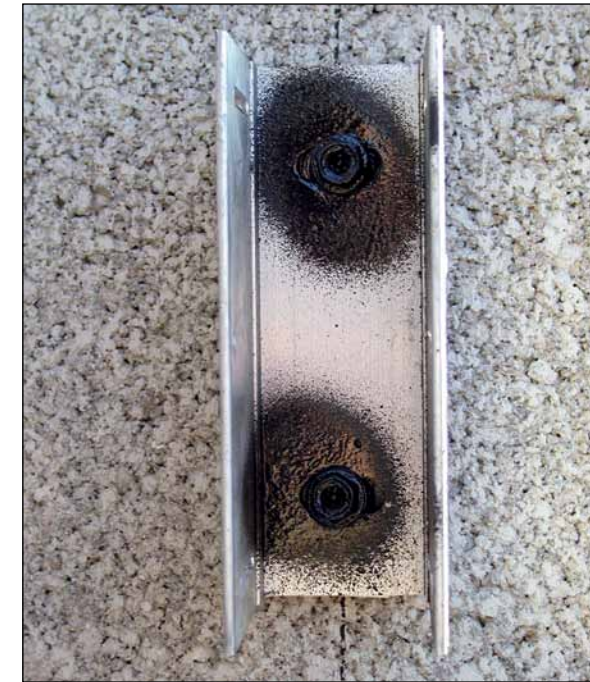
Anchor point: Here HE132/150

### Spacing dimensions: Stone size + joint width

When arranging the spacing, take the planner's guidelines into consideration within the scope of the deplanning, where available. In addition, depending on overhang at the side ends, the spacing can be adjusted.

## 5. ASSEMBLY NOTES

Affix the vertical anchor (HE132/80) and slide points (HE132/50) according to static specifications.



The anchor point length is 150 mm; the minimum spacing between the two wall plug holes is at least 100 mm. Take static specifications into consideration.



The slide point length is 50 mm. Also affix the slide point according to static specifications.

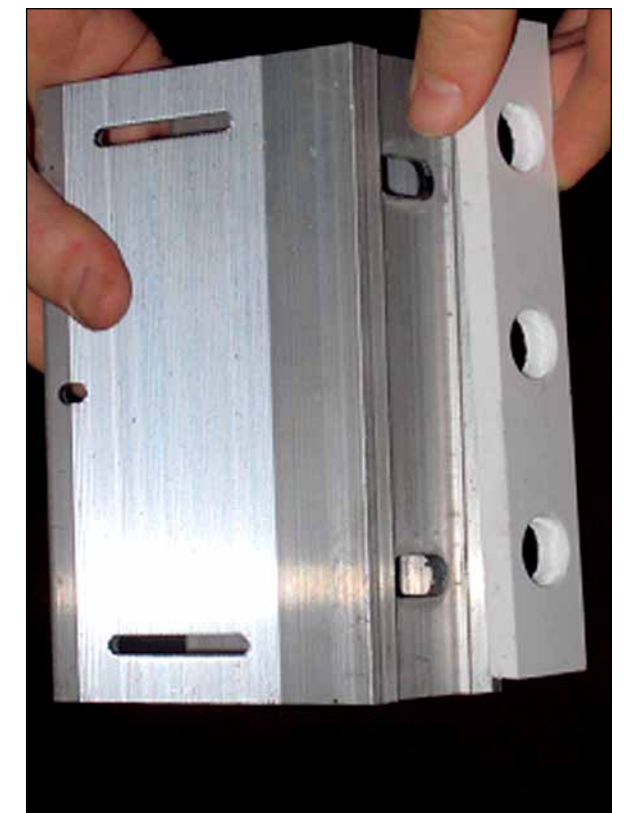
Slide point: Here HE132/50

The number of mounting points and the type of mounting material (wall plug length and extraction values) are established based on static specifications. These specifications take the following into consideration:

- ▶ Wind range/building height
- ▶ Masonry composition
- ▶ Distance from the masonry to the front edge of the facade
- ▶ Weight of the facade per m<sup>2</sup>
- ▶ Spacing of the vertical bearing profiles

Follow the processing specifications set by the wall plug manufacturer.

To prevent thermal bridges, install a thermal separating element between the wall holder and the wall (Thermostopp, included with delivery).



Thermostopp, self-adhesive on the rear side

## 5. ASSEMBLY NOTES

Insert the wall plug and tighten the screw according to specifications set by building inspectors.

If statics require the use of zinc-plated screws, the screw head must additionally be treated with a protective coating (see permit).



*Teroson spray or similar (follow the specifications set by building inspectors)*

Install the facade insulation boards between the substrate and the insulation layer in a tightly adjoining arrangement, leaving no space, in conformity with the standards. Affix them mechanically with insulation fasteners - on average 5 fasteners per m<sup>2</sup>. Mount them tightly to the abutting components.



Install the bearing profiles in the U-wall-holders at floor level, and align and rivet them with a horizontal/vertical laser.



## 5. ASSEMBLY NOTES

Drill holes with a diameter of 5.2 mm in the wall holders and the vertical bearing profiles for the rivets.

Attach each of the vertical bearing profiles under load to the anchor points with 4 rivets 5 x 14 K11 (follow the static specifications).



*Hole diameter 5.2 mm*

Before fixing the slide points, laterally insert a separate sliding profile (HE105) on the rear side of the bearing profile.



*Sliding profile HE105*

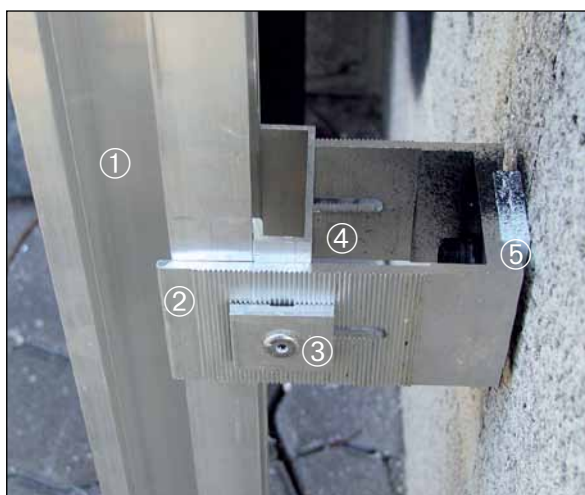
This can also be done if the vertical bearing profiles have already been attached to the wall holders at the anchor points.

After inserting the sliding profile, affix the clamping disk to the wall holder.



## 5. ASSEMBLY NOTES

The lateral dovetail (clamping disk) must be mounted such that the lateral dovetail is connected to the wall holder under load.



- 1 Bearing rail HE130
- 2 Wall holder 132/50 Slide point
- 3 Clamping disk HE100
- 4 Slide piece HE105
- 5 Thermostopp

This assembly procedure ensures that the substructure can accommodate thermal expansion.

The sliding profiles are usually pre-drilled so that no further drilling is necessary.

If the sliding profiles are not drilled, the hole diameter must measure 5.2 mm (according to the test certificate).

Mount the clamping disk with a rivet that conforms to the test certificate.

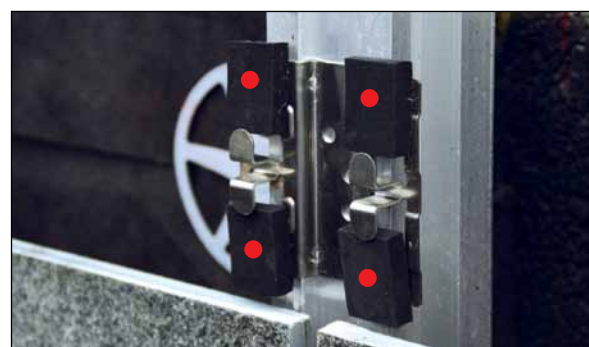
After assembling the vertical substructure, start arranging the horizontal spacing.

The spacing dimensions correspond to the size of the facade stones plus joint width. Slate width for symmetrical cladding is usually approx. 600 x 300 mm or approx. 600 x 600 mm.

Affix the initial clips to the lower end of the vertical bearing profile in the designated V-groove and fasten them with a self-tapping screw (e.g. Ejot) according to the test certificate.

To ensure sideways clearance and to prevent clattering noises, insert foam rubber strips between the slate and the stainless steel mounting clips. Place 4 foam rubber strips per stone on the stainless steel mounting clips.

Fasten the upper section of the last row with an initial clip turned the other way.



- Foam rubber strips

## 5. ASSEMBLY NOTES

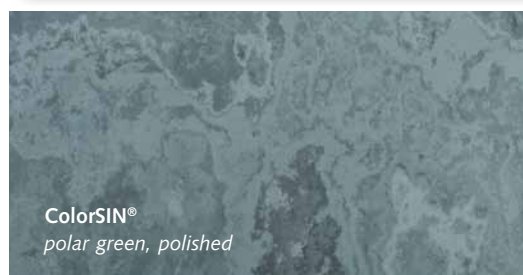
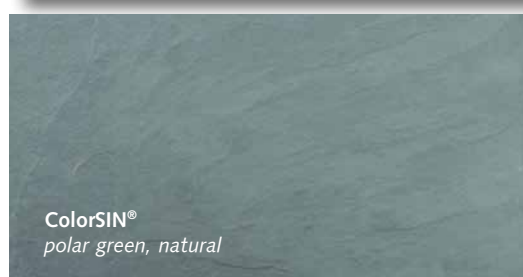
Fasten all of the other rows to the profile with a double clip as described earlier.



Symmetrical cladding 600 x 300 mm, laid vertically, fastened to the aluminium substructure with stainless steel mounting clips HE130



Symmetrical cladding 600 x 300 mm, laid horizontally, fastened to the aluminium substructure with stainless steel mounting clips HE130



*Slate is a natural product. Irregularities in colour and structure may occur. These nuances and the individual appearance of each stone make up the charm of slate cladding.*

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