

*Aluform*

## **Aluform Siding FM System**

Installation instructions



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# Aluform Siding FM System

## Installation instructions

### 1. General information

These installation instructions are intended to serve as a guideline for the planner and installer for the planning and processing of the Aluform "FM substructure system for Aluform siding". If no answers or references to specific questions or applications can be found in these installation instructions, qualified application technology staff are available at the Aluform plant in Bernsdorf to provide relevant information.

Supplementary information to these instructions can be found

- ④ at [www.aluform.de](http://www.aluform.de)
- ④ in the brochures "Product range" and "Aluform siding"
- ④ in the documentation "Alutherm - Aluform - planning - application"

Bernsdorf, June 2020

Aluform application technology

Aluform System GmbH & Co. KG

The greatest possible care has been taken to ensure that the contents of these installation instructions are correct. However, Aluform accepts no responsibility or liability for errors or information deemed to be misleading. It is the customer's responsibility to check the suitability of the products manufactured or delivered by Aluform before using them. Contractual aspects are not addressed by these installation instructions. Claims cannot be derived from them.

All information in these installation instructions corresponds to the state of the art and the production possibilities at the time of printing. The document is not subject to the change service.

## 2. Siding

All following provisions and statements apply only to Aluform sidings in combination with the FM substructure system. For further design options and siding variants, please contact our staff at the Bernsdorf plant.

### 2.1 Application

Aluform sidings made of aluminium are used as a cladding system for rear-ventilated rainscreen façades. They can be installed both horizontally and vertically. They can be used as single-shell or multi-shell façade superstructures.

### 2.2 Materials, cover widths, coatings

Aluform sidings are made of the aluminium alloy AlMn1Mg0,5 (EN AW 3005) with the strength ¼-hard ( $R_{p0,2} > 175 \text{ N/mm}^2$ ;  $R_m > 195 \text{ N/mm}^2$ ). In terms of strength, formability and weather resistance, this material is ideally suited for use as a façade cladding system.

Sidings are produced from the aluminium strips in the standard cover widths from 200 to 500 mm with a grid spacing of 50 mm. Individual and custom widths are available on enquiry.

The visible siding surface is offered in the following versions:

- » Flat visible surface (basic form)
- » Surface with macro-lining
- » Surface with micro-lining

(Lined surfaces are only available in cover widths of 250 and 300 and in a sheet thickness of 1.2 mm.)

Another version of the design is an edge with a modified geometry that allows a façade design with a 15 mm shadow joint.

All Aluform sidings can be supplied with a normal cut edge at the siding end (standard) or with an additional single or double-sided bent end. The height of the bent end at the siding ends is approx. 10 mm. The bent ends reduce the possibility of looking into the siding ends and prevent transverse curvature. Another version of the design is the production of the sidings with a perforated view surface in the hole patterns Rv 2-3, 3-5 and 5-8. In this version, the sidings are available as standard with a polyester coating with a layer thickness of  $25 \mu\text{m}$  on the visible side. Perforated and coated sidings are generally delivered with a protective film. As standard, the rear side of the siding is provided with a transparent or grey shimmering protective varnish, approx.  $3\text{-}5 \mu\text{m}$ , with a printed arrow showing the direction of the coating. The perforated sidings can optionally be provided with an acoustic fleece for sound absorption applications. The sidings can be produced in a standard length of up to 6.0 m. For larger lengths, consultation with the application technology or production management at the Bernsdorf plant is necessary.

Since not all sidings can be produced in all sheet thicknesses, surface variants or joint patterns, it is necessary to consult the staff at the Bernsdorf plant or your specialist consultant in field service before commencing with the planning.

The possibilities to deliver Aluform sidings with perforations or with colours and surfaces that deviate from the standard depend primarily on minimum quantities. Special colours or other colour systems are usually only possible as a rule from a quantity of  $500 \text{ m}^2$ . Increased caution is required when handling and installing sidings with a natural aluminium surface. See separate leaflet "Products in natural aluminium".



Siding <sup>1</sup>	Nominal sheet thickness in mm	Surface	Shadow joint (15 mm)	Anti-drone	Acoustic fleece <sup>2</sup>	Perforation	Protective film	Bent end
25/200	1.20	smooth	possible	yes	yes	Rv 2-3 Rv 3-5 Rv 5-8	standard	possible
25/250	1.20 1.50	smooth micro-lined <sup>3</sup> macro-lined <sup>3</sup>	possible	yes	yes	Rv 2-3 Rv 3-5 Rv 5-8	standard	possible
25/300	1.20 1.50	smooth micro-lined <sup>3</sup> macro-lined <sup>3</sup>	possible	yes	yes	Rv 2-3 Rv 3-5 Rv 5-8	standard	possible
25/350	1.20 1.50	smooth	necessary	yes	yes	Rv 2-3 Rv 3-5 Rv 5-8	standard	necessary
25/400	1.20 1.50	smooth	possible	yes	yes	Rv 2-3 Rv 3-5 Rv 5-8	standard	necessary
25/450	1.50	smooth	possible	yes	yes	Rv 2-3 Rv 3-5 Rv 5-8	standard	necessary
25/500	1.50	smooth	possible	yes	yes	Rv 2-3 Rv 3-5 Rv 5-8	standard	necessary

1. In combination with the FM substructure system, only the nominal sheet thicknesses listed in the table are possible.

For further execution options, please contact our staff at the Bernsdorf plant.

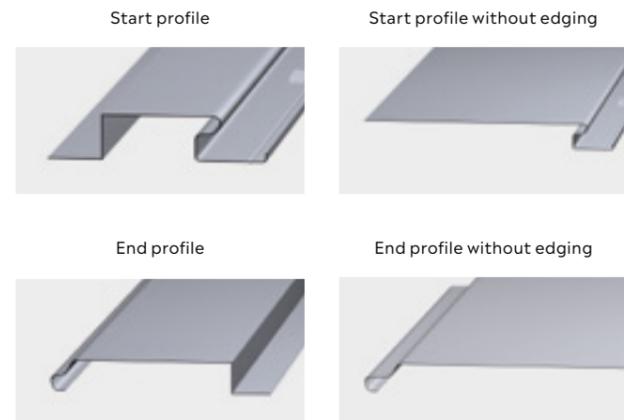
2. Only with perforated surface (no structure-borne sound!)

3. Micro-lining and macro-lining possible only with a nominal sheet thickness of 1.20 mm.

### 2.3. Accessories

In addition to the Aluform sidings, we can also supply colour-matched flat sheets in ¾-hard (H46) or ½-hard (H44) quality, edged parts (corner sheets, storey partitions, pilaster strips), fasteners and start or end profiles.

The start and end profiles are manufactured in such a way that one of the two joint profiles is cut off at the respective siding. The width of the siding is therefore dependent on the cover width of the initial siding. On the cut-off side, appropriate edges can then be made in the factory or by the customer.



### 2.4 Quality

The quality of the processed strip material, including its coating, is subject to constant factory quality control. Since there is no standard for sidings with tolerance specifications for the geometries, a separate factory standard has been created that is either based on standards for profile panels for rear-ventilated rainscreen façades or contains its own specifications. These specifications, in particular those for width and length tolerances, must be observed when planning. This factory standard can be found at [www.aluform.de](http://www.aluform.de).

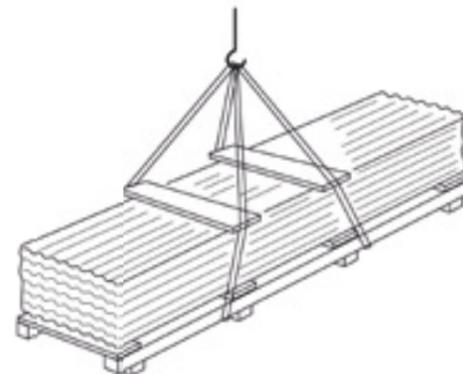
## 3. Delivery, transport and storage

Depending on the design, Aluform sidings are stacked in cartons or on disposable pallets, packed and strapped with a plastic strap to prevent slipping.

They are generally delivered to the destination in closed trucks. The factory's scope of supply ends at the building site without unloading, i.e. suitable aids for proper unloading must be provided or organised by the customer.

The shipment must be checked upon receipt for possible damage, correctness and completeness. Irregularities are to be noted on the freight documents. Depending on the length of the package, it is unloaded using one or two fork-lift trucks with maximum fork spread or by crane and straps, wherein the straps are to be spread. The overhang of the pallets must not exceed 2.0m on both sides.

The sidings can be stored outdoors for a short time under an air-permeable cover. Covered storage is generally required in the case of prolonged storage or storage of sidings with a natural surface. In the case of natural sidings, temperature and humidity changes must also be avoided in order to prevent the formation of wet storage stains.



## 4. Assembly

### 4.1 Aluform FM substructure - spacing constructions

Aluform sidings must be installed on a suitable substructure, which consists of wall brackets provided with a thermal stop to avoid thermal bridges, as well as on suitable FM system rails. The FM rail that is mountable on it has a 50 mm profile grid for accepting the FM system holder with FM retainer. This allows the sidings to be fixed without penetration by hooking and snapping in. For securing the position and for controlled length expansion, each siding must be secured with a fastener in the FM system rail. Depending on the method of installing the siding, the FM substructure is clamped either horizontally (in the case of a vertical siding) or vertically (in the case of a horizontal siding). The maximum possible distance of the substructure depends on the sheet thickness of the sidings, their cover width and the prevailing wind load and can be taken from the span tables in the documents.

The perforated FM system rails for Aluform sidings are offered as a T-profile or L-profile made of extruded aluminium in the delivery length of 6000mm. The grid of the perforation is 50 mm in the longitudinal direction. This allows sidings with the cover widths 200, 250, 300, 350, 400, 450 and 500 mm to be installed, also in combined cover widths.

The FM system rails are attached to the wall holders of the substructure with self-drilling screws or suitable blind rivets. Fixing at the sliding points as well as at the sliding joints is done using the factory-manufactured slot in the wall bracket. The fastener must be placed centrally in this slot to ensure the length expansion of the FM system rail. The round holes are used for the fasteners in the area of the fixed point. The insertion depth of the FM system rail at the wall bracket should not be less than 20mm. The FM system rail must be aligned to the façade plane and the axis of the factory-manufactured profile grid perforation.

### 4.2 Thermal insulation

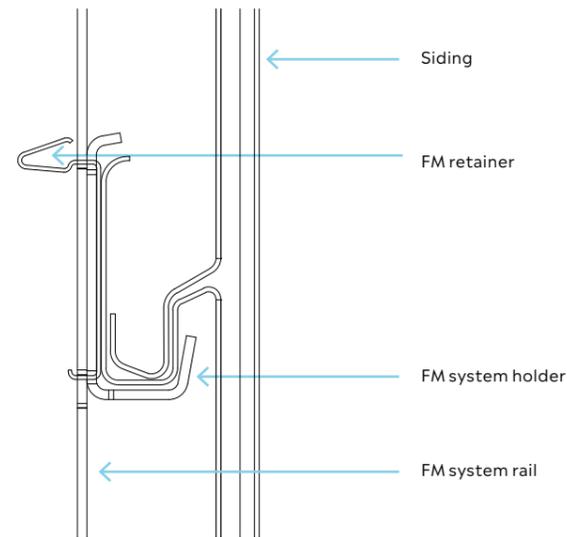
The sidings can be installed both as uninsulated façade components and as part of a multi-shell façade construction on solid components or profile panels.

Multi-shelled constructions are usually implemented with insulation. The insulation thickness depends on the usage requirements of the building and the EnEV (German Energy Saving Regulations).

The distance between the load-bearing component and the siding is bridged by an appropriate spacing construction. In accordance with DIN 18516 Part 1, a rear ventilation plane with a distance of 20mm must be ensured between the outer surface of the insulation and the siding. This rear ventilation plane is necessary in order to reduce humidity and to drain off any penetrating precipitation and condensate on the inside of the cladding. The required distance is already ensured by the panel height (25mm) when the sidings are installed vertically. In the case of horizontal installation, the distance must be created by means of the appropriate design of the spacing construction. If rear ventilation is required, air inlet or outlet openings of at least 50 cm<sup>2</sup>/m must be ensured at the base and at the upper connection.

### 4.3 Carrying out the installation

The Aluform sidings have a groove-like form on one side and a tongue-like form on the other and thus an asymmetric joint geometry. An embossment (lock) is stamped in the outlet of the groove profile.



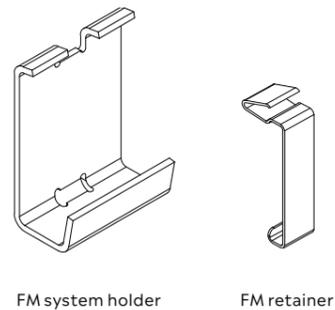
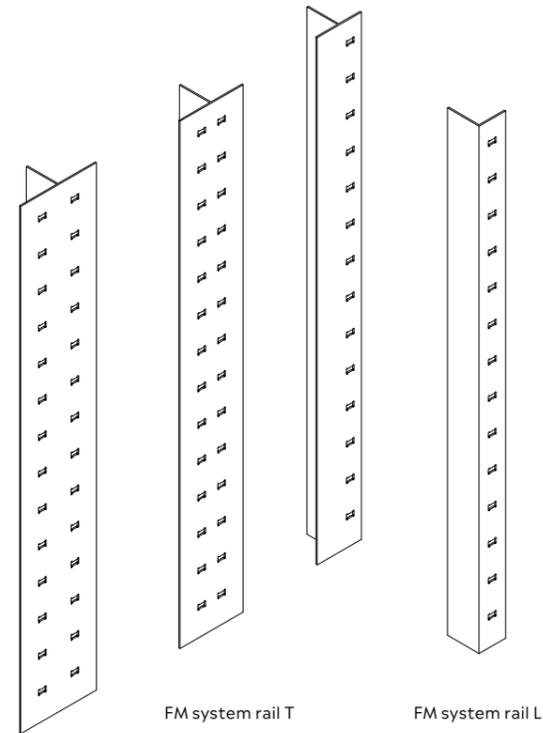
The task of the lock is to prevent the sidings from becoming unhooked after installation due to wind suction. During installation, the lock must be completely overlapped by the next panel. It must be ensured that the siding panel is fully snapped in over the entire length. Frequently, a metallic tone is heard when snapping in. The siding is held by means of an FM system holder including FM retainer, which is snapped into the perforated FM system rail.

In the drilled slot, the fixed point of the siding is executed by means of a self-drilling screw (e.g. JT 3-3-5.5 x 25). The self-drilling screws must meet the corrosion protection requirements of EN 1090-5.

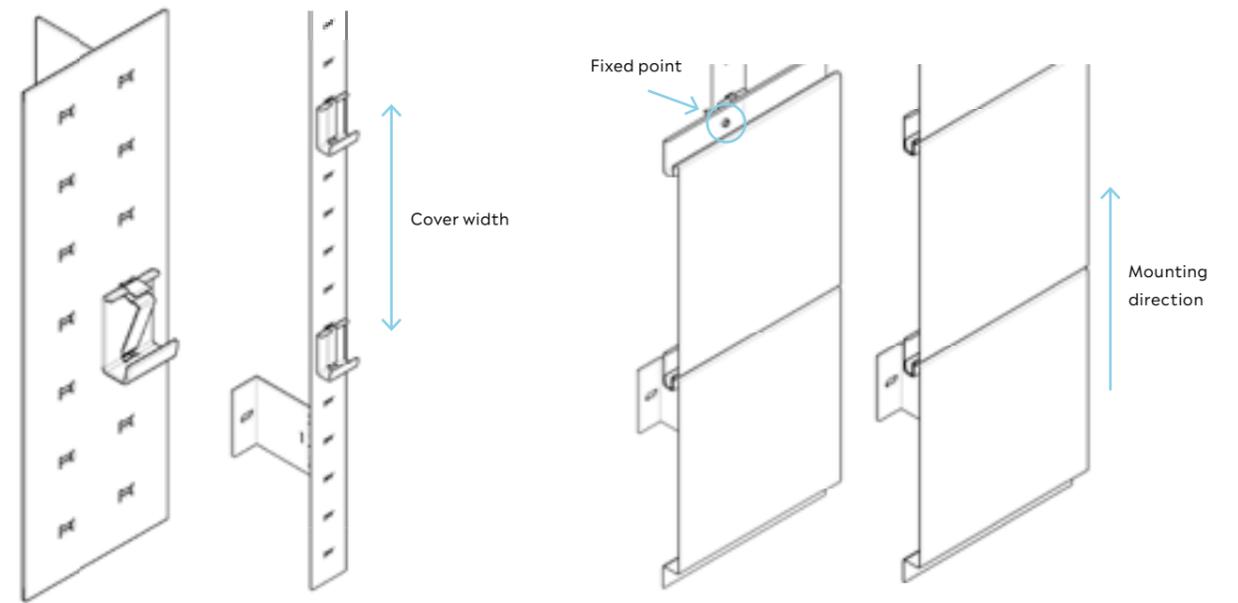
Aluform sidings can be installed both vertically and horizontally. Due to the asymmetric joint formation and the necessary compliance with the coating direction or surface finishing of the visible side of the siding, installation is only possible in one direction at a time.

While vertical mounting allows both left-to-right and right-to-left installation, the installation must always be carried out from bottom to top in the case of horizontal installation. It is not possible to change the installation direction within a wall. It should also be ensured that the colour arrow of the paintwork always points in the same direction on the entire building (unless intentional for design reasons).

### 4.4 Components of the FM substructure system

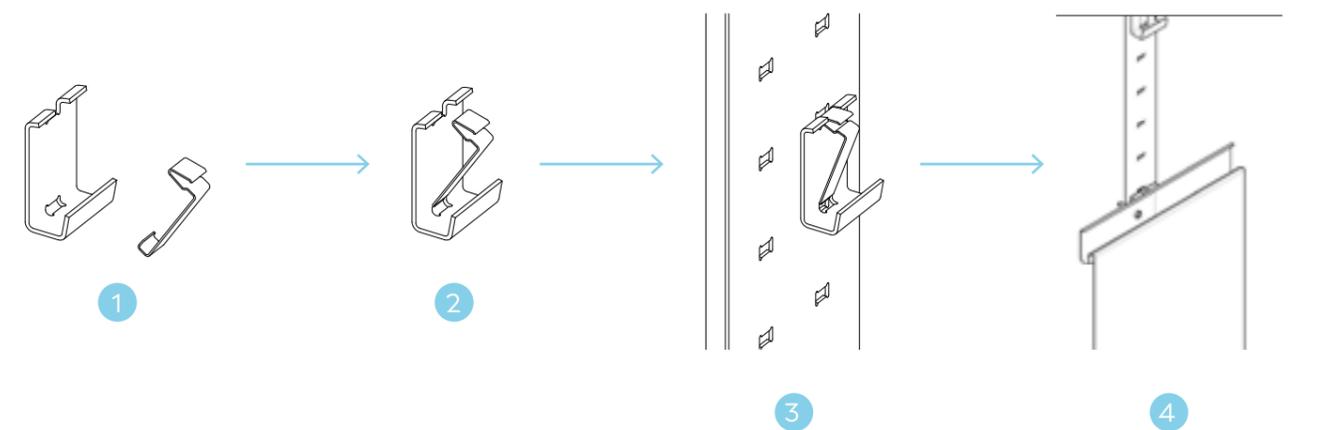


### 4.5 Connections of the siding to the FM substructure



Installation starts on the substructure aligned in the horizontal and vertical direction. The FM system holder is fixed by means of the FM retainer by snapping in at the distance of the respectively installed cover width.

A fixed point is required for each siding and is manufactured by means of screwing a self-drilling screw through the leg of the siding directly into the FM system rail. The next panel is then placed on top, thus covering the fixed point.



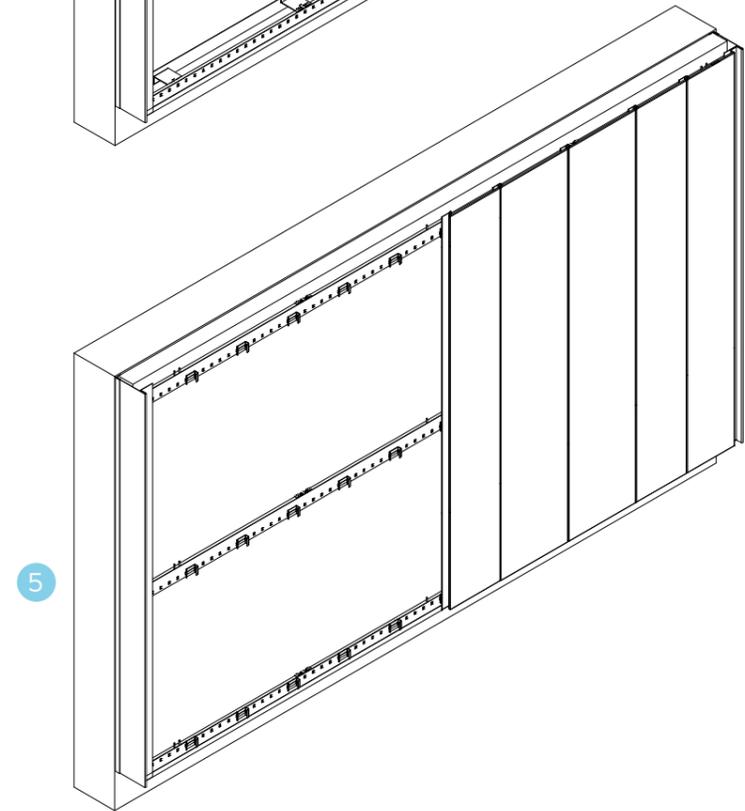
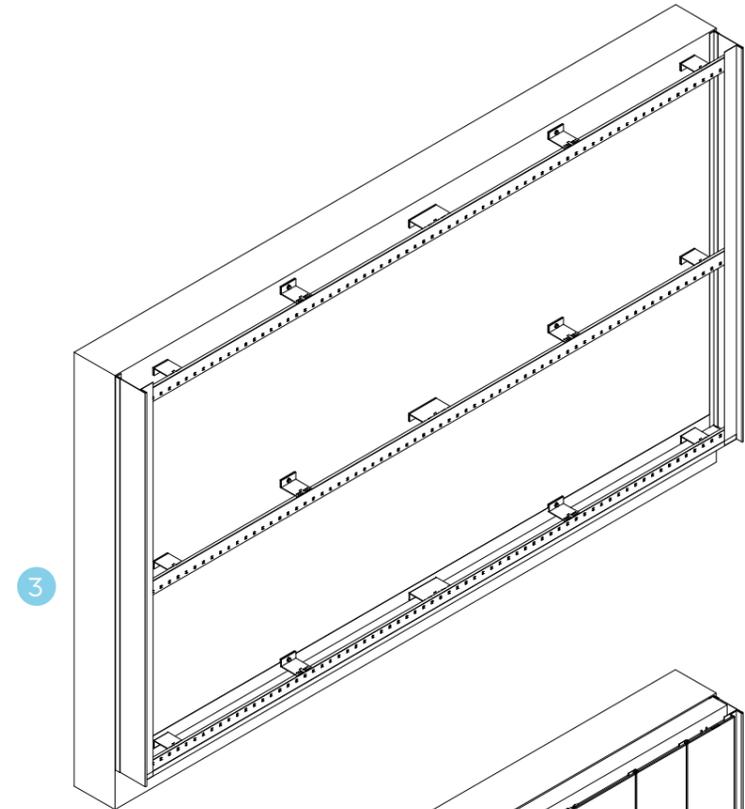
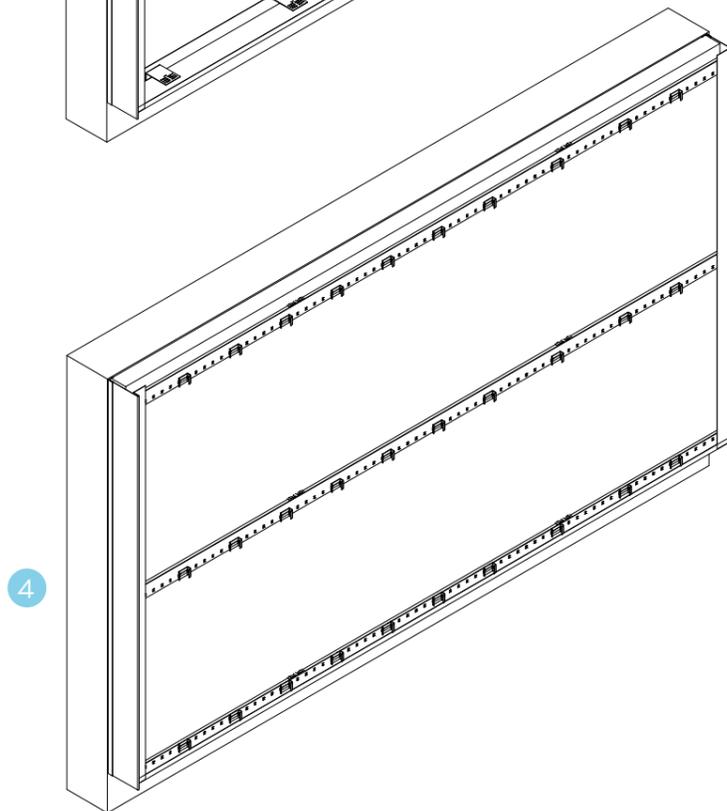
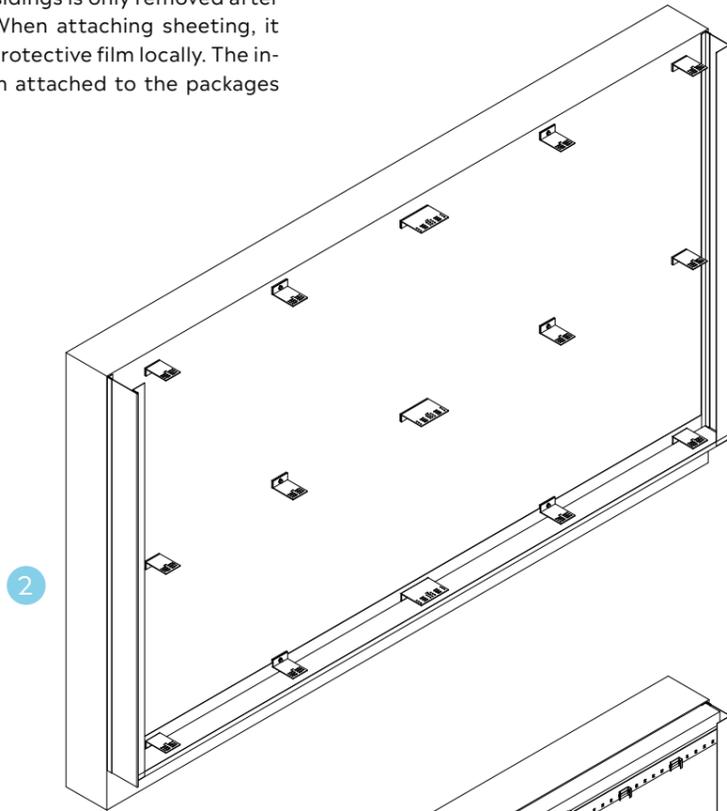
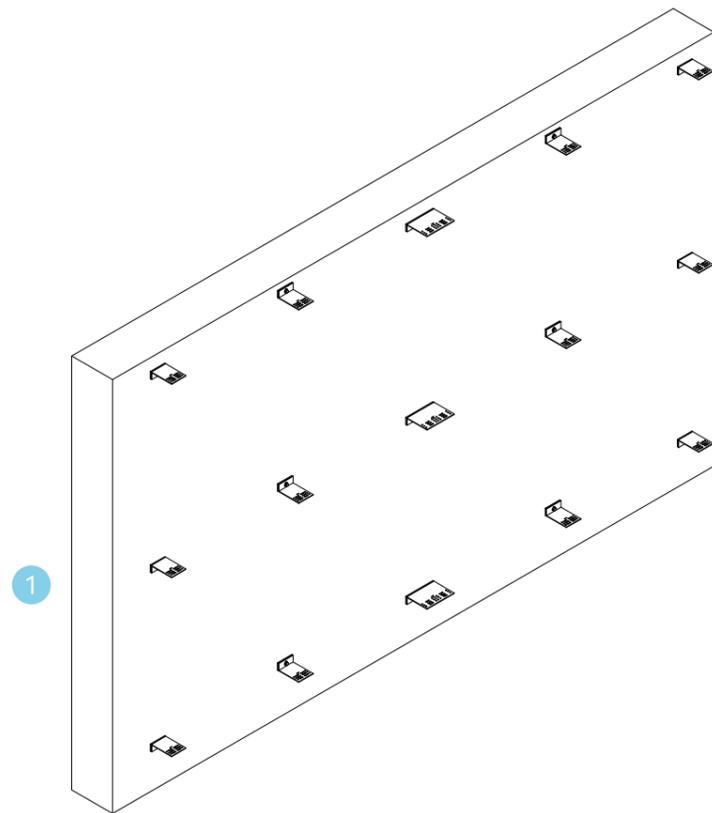
#### 4.6 Vertical installation

Installation usually starts at a wall corner with a starting profile (groove side), the required width of which can be determined from the installation plan or the grid drawing. In the case of multi-storey buildings or higher single-storey buildings, as well as in the case of single-row installation of the siding, the installation begins in the base area above an already assembled base deflector plate. The start profile is visibly fastened on one side. In the case of corner sheeting, the fastening of the corner sheet can be combined with the fastening of the start profile.

Edged sidings can also be used as corner elements. The respective next siding is installed by inserting the tongue side at a slight angle and snapping the profiling over the lock into the groove side of the previous siding. After that, the alignment (height and plumb) as well as the fixing of the siding in the required position (e.g. by setting the fixed point in the substructure) take place.

With higher buildings, in which several rows of sidings have to be installed on top of each other, the individual rows are separated by a corresponding storey separation profile (edge part). Depending on the position of the wall in relation to the compass point, length changes of the aluminium siding of approx. 1.0 mm/m can be expected.

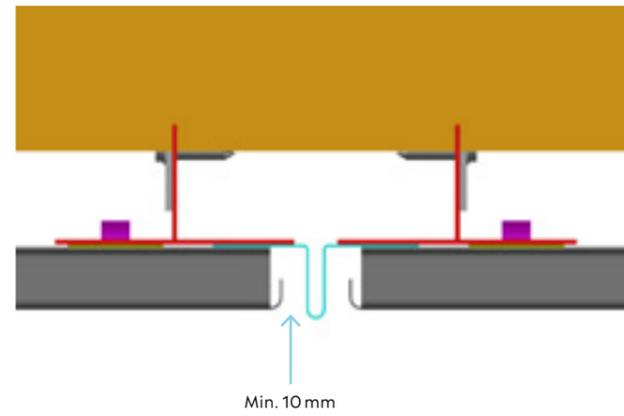
When installing the next siding row, care must be taken to ensure that the lower and upper joints lie plumb above one another. The protective film of the sidings is only removed after completion of the installation. When attaching sheeting, it may be necessary to pull off the protective film locally. The instructions for the protective film attached to the packages must be observed.



#### 4.7 Horizontal installation

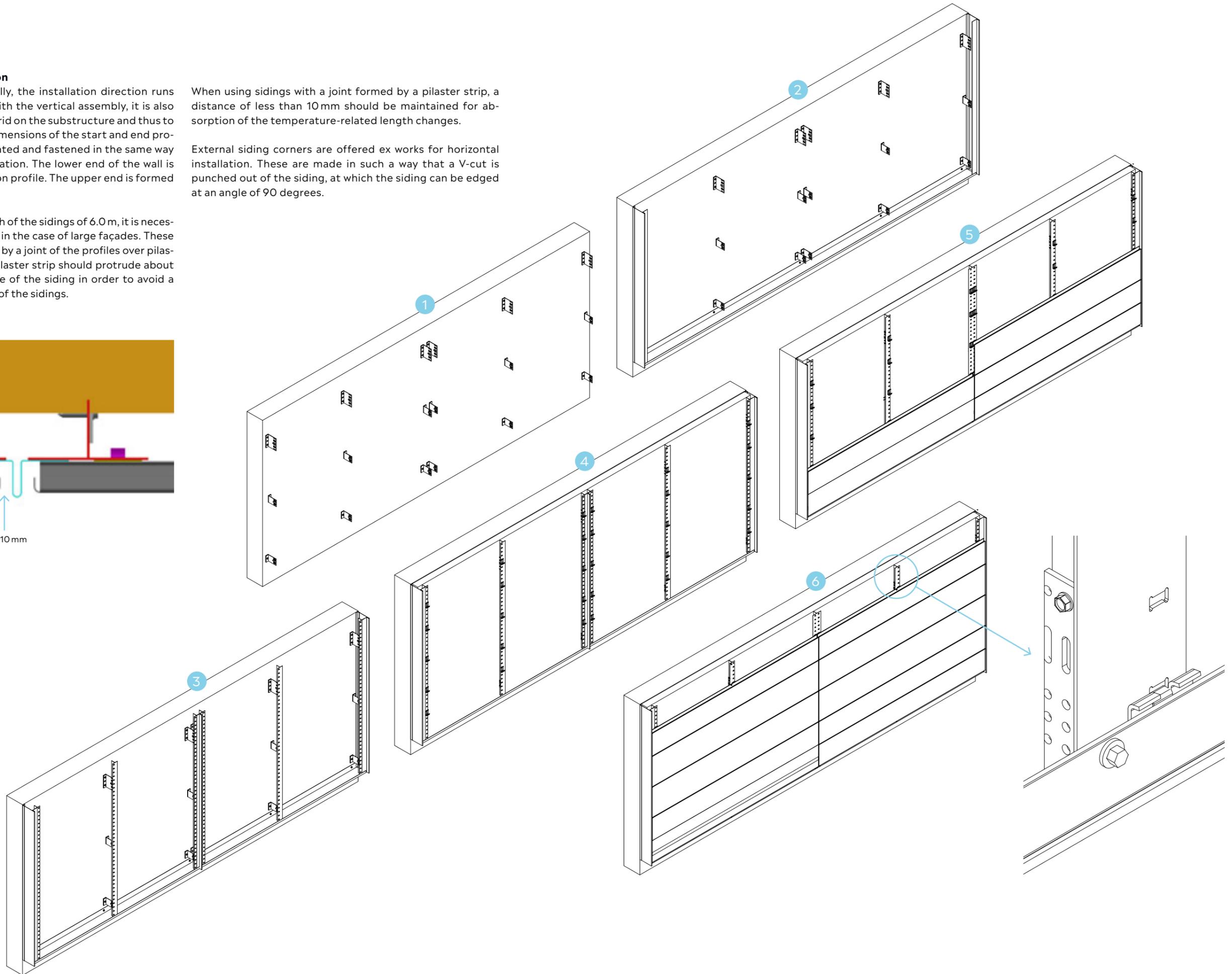
When installing horizontally, the installation direction runs from bottom to top. As with the vertical assembly, it is also recommended to draw a grid on the substructure and thus to determine the required dimensions of the start and end profiles. The sidings are mounted and fastened in the same way as with the vertical installation. The lower end of the wall is then formed by a deflection profile. The upper end is formed by an end profile.

Due to the maximum length of the sidings of 6.0 m, it is necessary to form vertical joints in the case of large façades. These joints are usually executed by a joint of the profiles over pilaster strips. The bar of the pilaster strip should protrude about 10 mm beyond the surface of the siding in order to avoid a side view of the cut edges of the sidings.



When using sidings with a joint formed by a pilaster strip, a distance of less than 10 mm should be maintained for absorption of the temperature-related length changes.

External siding corners are offered ex works for horizontal installation. These are made in such a way that a V-cut is punched out of the siding, at which the siding can be edged at an angle of 90 degrees.



#### 4.8 Sheeting

The sheets (pilaster strips, deflection sheets, corner sheets, etc.) must be installed either before, during or after installation, depending on the position. The connection to the FM substructure or to the siding is usually executed by riveting/screwing.

The joints of sheets must be overlapped by at least 100 mm. To guarantee temperature-related length changes, no inter-connection may be made at the overlapping joint.

An execution without an overlap is also permitted if the edged part is backed by a joint plate (at least 100 mm long) and the length elongation between the components is guaranteed.

#### 4.9 Short siding lengths

Aluform sidings are offered as standard from a length of 500 mm up to a maximum of 6000 mm. Other lengths or short lengths on enquiry.

#### 4.10 Rounding of sidings

Curved panels for the siding façade can be mechanically rounded (cambered) in their longitudinal direction. The smallest possible radius is 1.0 m. Prior to the planning of rounded panels, it is necessary to consult the staff at the Bernsdorf plant.

#### 4.11 Internal and external corners

Aluform sidings can be manufactured as corner elements for the formation of internal and external corners. The leg length of the corner sidings is at least 500 mm and at the most 1500 mm. The substructure must be adapted accordingly to the intended corner formation.

### 5. Subsequent colour coating

Smaller siding quantities often cannot be supplied in the desired colours. For this reason, bare sidings are subsequently colour-coated.

These coatings are usually done by means of powder coating or enamelling with heat treatment. These heat treatments can release stresses in the material of the sidings, which can lead to increased surface waviness. Waviness is particularly visible in the case of coatings with a high degree of gloss. An alternative to enamelling is the use of air-drying paints.

### 6. Dismantling and replacing sidings

If individual damaged sidings are to be removed from the wall surface or entire surfaces are to be dismantled, this is only possible in the opposite direction to the installation. For this purpose, the tongue sides of the siding must be levered over the lock on the groove side by means of a long screwdriver or similar.

### 7. Processing sidings on the building site

When installing the Aluform siding panels, various processing actions may be required. These can be executed as follows:

- ⌚ **Cross-cuts or inclined cuts** - by means of a circular saw or hand-held circular saw with cutting discs for non-ferrous metals or saw blades with medium teething with tungsten carbide and the additional use of cutting wax.
- ⌚ **Longitudinal cuts** - by means of a circular saw or hand-held circular saw or electric tin snips or electric nibbler
- ⌚ **Cut-outs** - by means of nibbler or jigsaw
- ⌚ **Edgings** - depending on material strength
  - H 44 → edging with  $R_{\min} = 2.5 \times$  sheet thickness
  - H 46 → edging with  $R_{\min} = 3.5 \times$  sheet thickness

### 8. Fire protection

Pursuant to Section 28 (4) of the Musterbauordnung 2012 (MBO) [Model Building Regulations], special precautions must be taken to prevent the spread of fire in the case of exterior wall constructions with voids or air spaces spanning the storeys, such as rear-ventilated rainscreen façades.

One of these possible precautions is fire barriers. They hinder fire propagation in the rear ventilation space by interruption or partial reduction of the free cross-section. The depth of the rear ventilation space must not exceed 50 mm (timber substructure) or 150 mm (metal substructures).

Pursuant to Section 28 (5) of the MBO 2012, these requirements do not apply to buildings in building classes 1 to 3. No special precautions need to be taken for these classes of buildings.

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