KALZIP® FC FAÇADE SYSTEM

Trendsetter for façade technology in aluminium

LISTED FAÇADE RESTORATION EICHENDORFF GYMNASIUM, Koblenz (GER), **Architect:** TERNES architekten BDA, **Installer:** Werhand GmbH & Co. KG

Contents **Page**

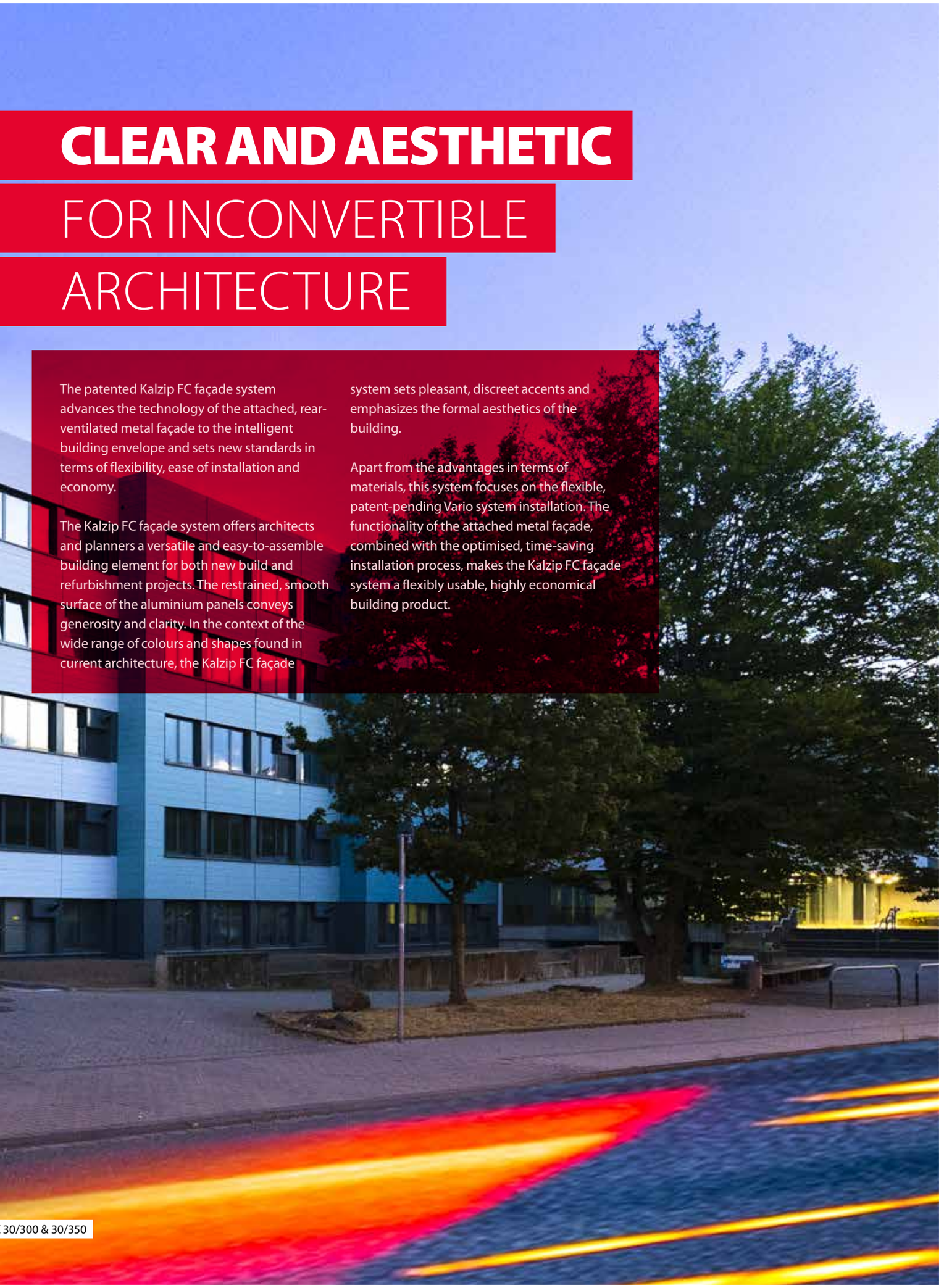
ENERGETIC FAÇADE RESTORATION BBS-TECHNIK, Koblenz (GER), **Architect:** TERNES architekten BDA, **Installer:** Metall & Stahlbau Schmickler GmbH & Co. KG, **Product:** Kalzip FC

CLEAR AND AESTHETIC FOR INCONVERTIBLE ARCHITECTURE

The patented Kalzip FC façade system advances the technology of the attached, rear-ventilated metal façade to the intelligent building envelope and sets new standards in terms of flexibility, ease of installation and economy.

The Kalzip FC façade system offers architects and planners a versatile and easy-to-assemble building element for both new build and refurbishment projects. The restrained, smooth surface of the aluminium panels conveys generosity and clarity. In the context of the wide range of colours and shapes found in current architecture, the Kalzip FC façade system sets pleasant, discreet accents and emphasizes the formal aesthetics of the building.

Apart from the advantages in terms of materials, this system focuses on the flexible, patent-pending Vario system installation. The functionality of the attached metal façade, combined with the optimised, time-saving installation process, makes the Kalzip FC façade system a flexibly usable, highly economical building product.



30/300 & 30/350

FC FAÇADE SYSTEM

SIMPLE - FLEXIBLE - ECONOMICAL

New buildings and refurbishment

Based on the versatile application options in combination with an easy construction design and the outstanding price/performance ratio, the attached and rear ventilated FC façade is the best construction-physical façade construction.

It offers the largest possible heat protection; the aluminium material protects the building reliably and sustainably against weather influences and it gives a unique character to the building.

The ventilation regulates the moisture balance, prevents a heat build-up and protects against moisture damages. This simple façade concept, developed under sustainability aspects, is for many reasons the solution for architects.

New construction

For a new construction, the system is especially attractive based on its combination variety uniqueness of colours and panel width. Different rasters of modular click rails for the substructure are available for this purpose.

Energetic façade restoration

With respect to the restoration of an existing building, simple and little plan-related efforts are required to adapt the energy balance of a building to the currently valid and requested energy standard. This dramatically reduces the CO_2 emissions and the room climate will be improved.

The simplified design makes it possible to perform the adjustment exclusively through the substructure.

EICHENDORFF GYMNASIUM, Koblenz (GER), **Architect:** TERNES architekten BDA, **Installer:** Werhand GmbH & Co. KG **Product:** Kalzip FC 30/300

EMILY CARR UNIVERSITY, Vancouver (CA), **Product:** Kalzip FC 30/300

Flexible VHF aluminium system: freely selectable installation direction and easy panel exchange

Sophisticated and leading installation systems

- Simplistic and time saving installation methodology of the system components is a cost benefit
- Freely selectable installation direction from top to bottom or from bottom to top as well as - surface related - independent of adjacent panels. The benefit: The installation is in sync with the construction progress, connections and fit components can be installed retrospectively - for example, it is possible to delay entire façade fields in the traffic area until the outside systems have been completed.
- Easy installation of the accessories for the fixed point clamp, flashing support angle etc. to the modular click rails
- Suitable for installation on a variety of substructures provides a cost effective and economic façade solution

Exchanging instead of complete dismantling

- Easy and quick exchange of damaged panels using the FC tool kit
- Removal of entire façade surfaces with low time and cost expenditures
- Guarantee of the optical appearance of the façade at any time

High design flexibility for expressive character

- Line and level marked on modular rails to aid installation
- Multi-directional installation offers variable design options for architects and planers
- Optimized production tolerances based on advanced roll-forming technology
- Maximum design flexibility due to a variety of construction widths
- Emphasizing the metallic building envelope through expressive colours and surfaces
- As a standard the panels are supplied with end returns at no extra costs

For a sustainable and economic planning

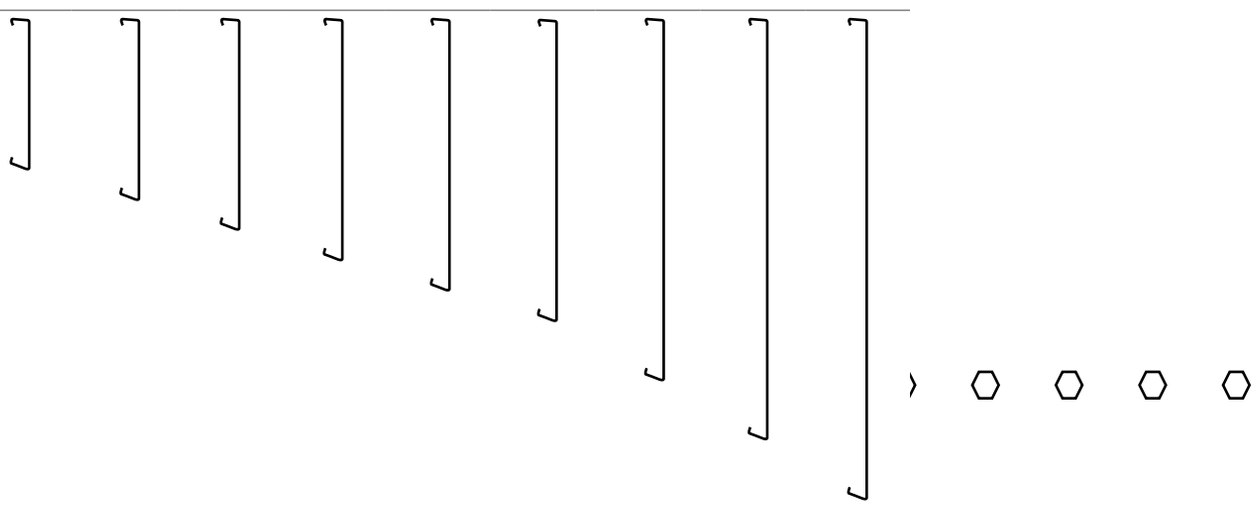
- Reduced material use through optimized panel geometry
- If required, cost-saving exchange of individual panels - a benefit for the building insurance

PACKAGING AND DIMENSIONS

General information

Available FC panel widths

Profile type:	Kalzip FC 30/250	Kalzip FC 30/300	Kalzip FC 30/350	Kalzip FC 30/400	Kalzip FC 30/450	Kalzip FC 30/500	Kalzip FC 30/600	Kalzip FC 30/700	Kalzip FC 30/800
Profile thickness	1.0 mm 1.2 mm	1.0 mm 1.2 mm	1.0 mm 1.2 mm	1.0 mm 1.2 mm	– 1.2 mm	– 1.2 mm	– 1.47 mm	– 1.47 mm	– 1.47 mm
Micro lining	-	-	-	on request	-	-	-	-	-



Fit panels/transition sheets (max. L= 8,000 mm)

For profile type:	FC 30/250	FC 30/300	FC 30/350	FC 30/400	FC 30/450	FC 30/500	FC 30/600	FC 30/700	FC 30/800
Fit panels - width	130-249 mm	130-299 mm	130-349 mm	130-399 mm	130-449 mm	130-499 mm	130-599 mm	130-749 mm	130-799 mm
Transition sheet - leg length	280 mm	330 mm	380 mm	430 mm	480 mm	530 mm	630 mm	730 mm	830 mm

Special construction widths and lengths on request.

FAÇADE RESTORATION UNIVERSITY SIEGEN, Siegen (DE), **Product:** Kalzip FC 30/221; 290; 360; 400 & 800 with shadow joint

Profile examples

Kalzip FC profiles and fit panels with end returns

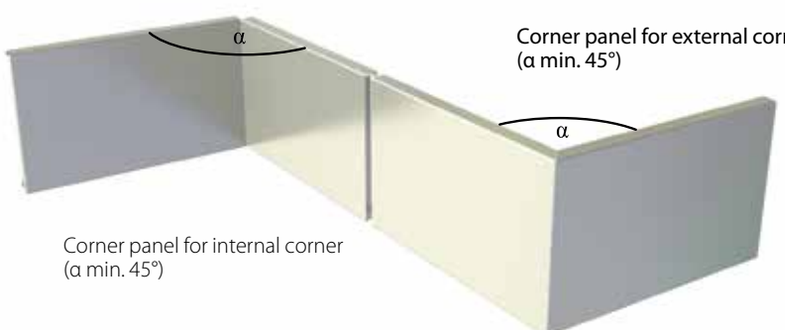
Kalzip FC profiles and fit panels without end returns

Transition sheets, upper hanging (left), lower hanging (right)

Corner panels

Corner panels can be manufactured as internal and external corners with different angles.

Specification
Leg 1: min. 150 mm / max. 1,000 mm
Leg 2: min. 300 mm / max. 2,000 mm



Other lengths on request

End returns

As a standard, FC panels are delivered with end returns on both sides at no extra costs. On request, panels can also be produced without end returns.

SPORTS COMPLEX "AM BIEL", Zwickau (GER), **Architect:** Atelier ST, **Installer:** Schüngel metal systems GmbH, **Product:** Kalzip FC 30/800 with RV 6/8

Plain panels

Aluminium plain panel in various widths (see p. 6). These panels are characterised by their smooth and seamless surface.

Perforated panels

Other perforation on request.

RV 3-5
Share of holes:
min. 29 %, max. 31 %
depending on the panel width
Perforation diameter: 3 mm

RV 6-8
Share of holes:
min. 44 %, max. 48 %
depending on the panel width
Perforation diameter: 6 mm

Micro-profiled panels

Kalzip FC 30/400 with end returns and micro-lining approx. 20 mm from the upper or lower panel end. Transition sheets without micro-lining

TECHNICAL DATA

Colours and surfaces

■ **Standard hues**

HPC RAL 9006 3% gloss degree, thicknesses: 1.0-1.47 mm
HPC RAL 9007 3% gloss degree, thicknesses: 1.0-1.47 mm
HPC RAL 7016 3% gloss degree, thicknesses: 1.0-1.47 mm
Other RAL, NCS, HPC hues and special hues on request, anti-graffiti coating on request

■ **Surfaces**

AluPlusPatina natural aluminium, thicknesses: 1.0-1.47 mm
AluPlusPatina bronze B40, thicknesses: 1.0-1.47 mm

Note: As a standard, all surfaces are delivered with a protective film.

Kalzip surfaces and colours can be found here:

Materials

EN AW-3004, EN AW-3005 or EN AW-6025

Carrying capacity values

Carrying capacity values as per Eurocode 9 and as per building-authority approval by Deutsches Institut fur Bautechnik No. Z-14.1-581

Dimensions

■ **Construction widths 250 mm – 800 mm**

as well as fit panels and transition sheets
Length: min. 400 mm, max. 8,000 mm
other profile lengths on request

Tolerances

Panel length: as per Kalzip internal standard

L ≤ 0.40 – 4.00 m	+2/-2 mm*
L > 4.00 – 8.00 m	+3/-3 mm*

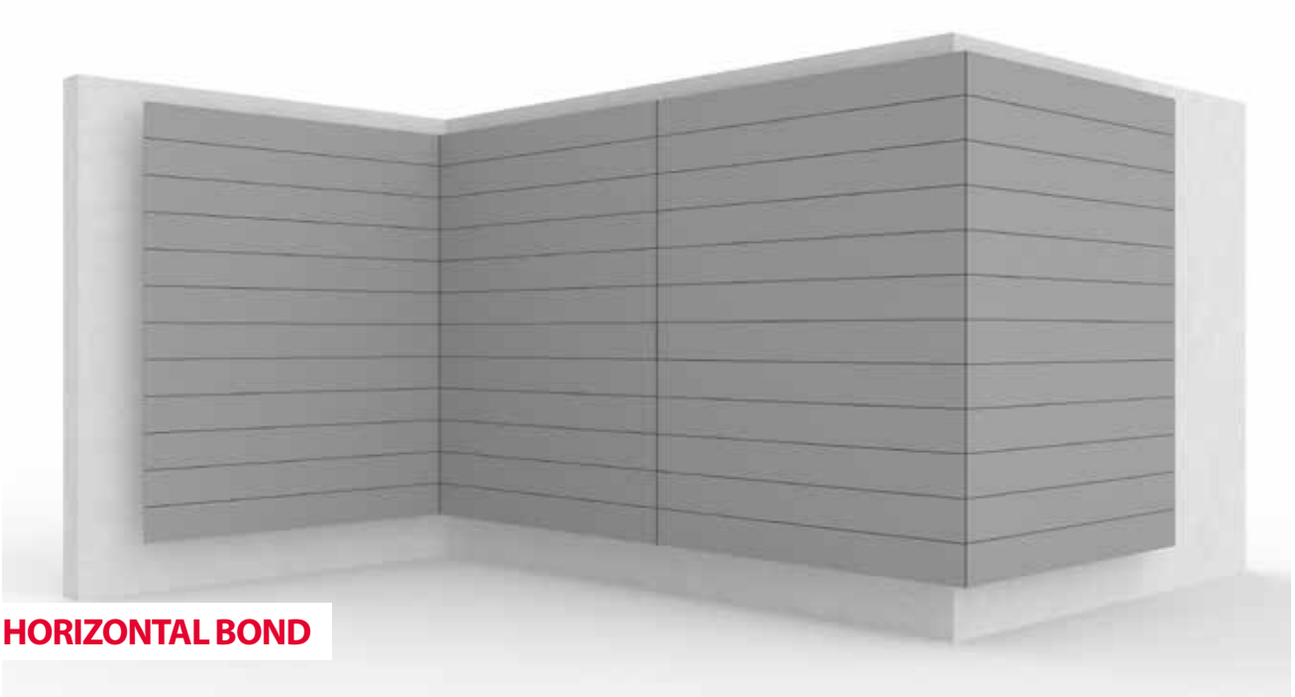
Rectangularity: as per DIN EN 508-2
u ≤ 0.5% of the nominal construction width

Cross arching: as per EPAQ – European quality directive for profiles:
to the outside (+ 0.02* panel width ≤ 10 mm)
to the inside (+ 0.01* panel width < 10 mm)

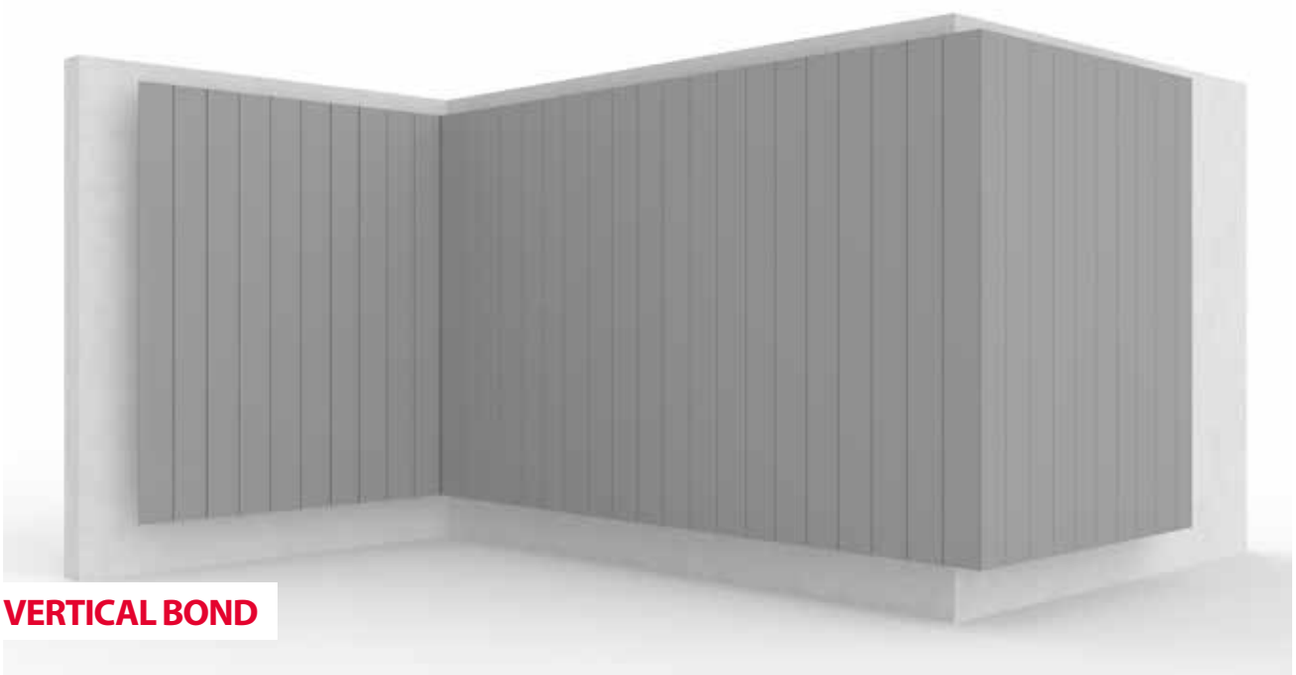
*Temperature information: measured at 20 °C

DESIGN EXAMPLES

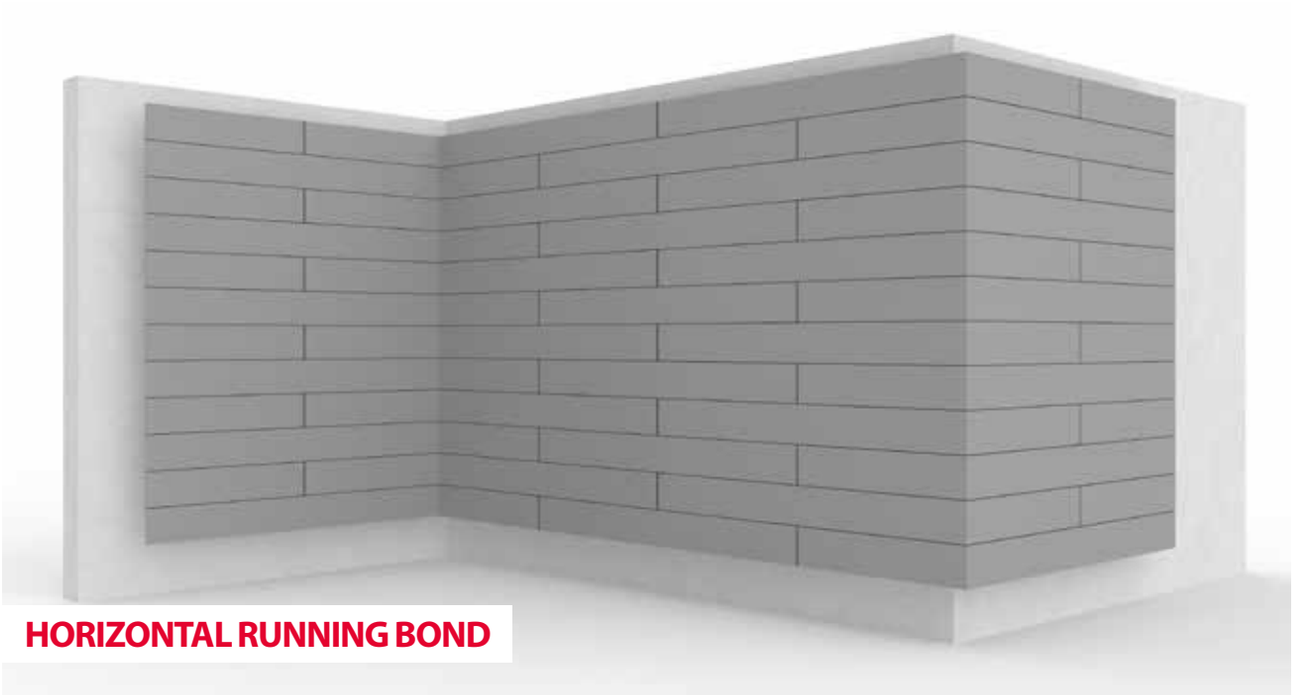
The façade design of a building is an important aspect of the architecture and has a major influence on its visual effect. The design possibilities of the FC façade in particular offer a wide range of options for achieving an appealing look. It's not only the choice of colours and materials that play a role, but also the usage possibilities of construction widths and installation directions. By varying these factors, different design effects can be achieved that range from the classic-traditional to modern and avant-garde. In this context it is of great importance that the design of the façade meets both functional and aesthetic requirements.



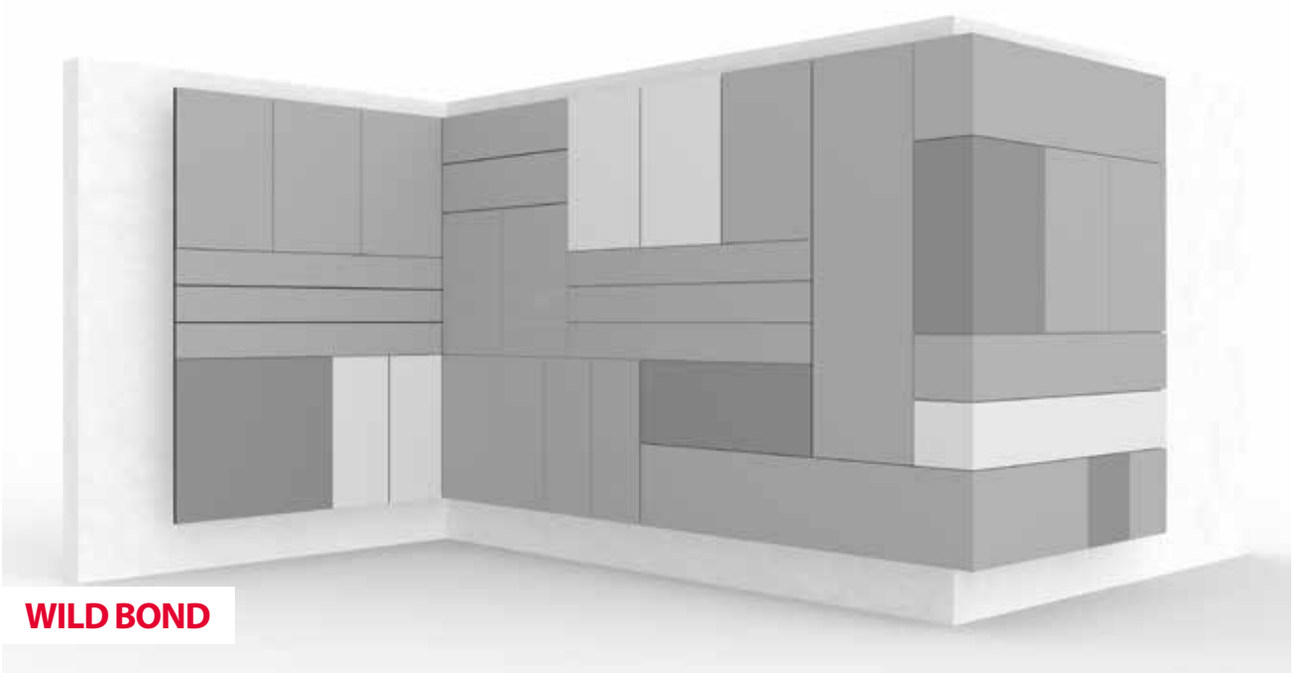
HORIZONTAL BOND



VERTICAL BOND



HORIZONTAL RUNNING BOND



WILD BOND

In addition to the variation of construction widths and installation directions, there are further design variants that can be considered when designing the façade. These include, for example, the arrangement of windows and doors, and the use of different surface structures. The integration of solar or greened areas can also influence the look of the façade, in addition to having a positive effect on the climate and the quality of life in the surrounding area. Overall, the façade design possibilities offer a broad range of options for creating an individual and appealing appearance.

GÖRRES GYMNASIUM, Koblenz (GER), **Architect:** TERNES architekten BDA, **Product:** Kalzip FC 30/300

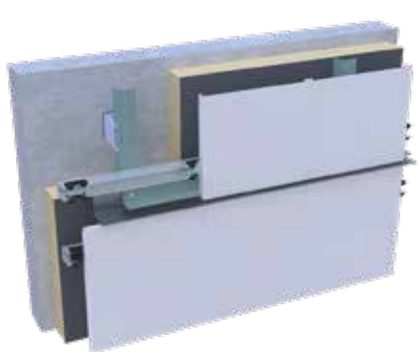
FAÇADE STRUCTURES

The Kalzip FC façade system is extremely versatile and can be used on various anchoring substrates. It is suitable for mounting on brickwork and concrete as well as on steel liner trays and sandwich elements. The system adapts itself perfectly to the different architectural requirements.

SEL modular click rail on individual wall brackets

SE modular click rail on a horizontal substructure

SE modular click rail on a vertical substructure



24´7 twentyfoursevен, Bremen (D);
Architect: ArchitekturBüro kauert und könig

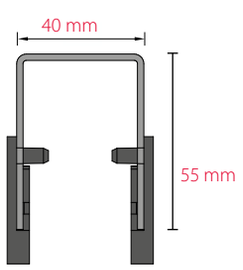
SE modular click rail on a cassette profile

SE modular click rail on sandwich element

PATENTED FASTENING
ON A MODULAR CLICK RAIL

Modular click rail SE

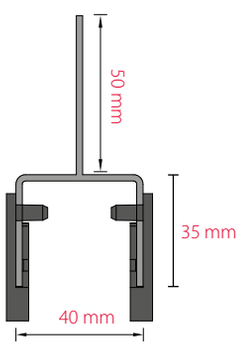
The modular click rail SE is a self-carrying rail, which can be used as a statically carrying profile. It can be fastened to the wall bracket or the support profile regardless of the click-in position of the FC panel.



System depth with modular click rail SE

Modular click rail SEL

The modular click rail SEL is also a self-carrying rail and it can be fastened directly at the wall brackets by using the 50 mm long legs. An additional continuous profile is not required.

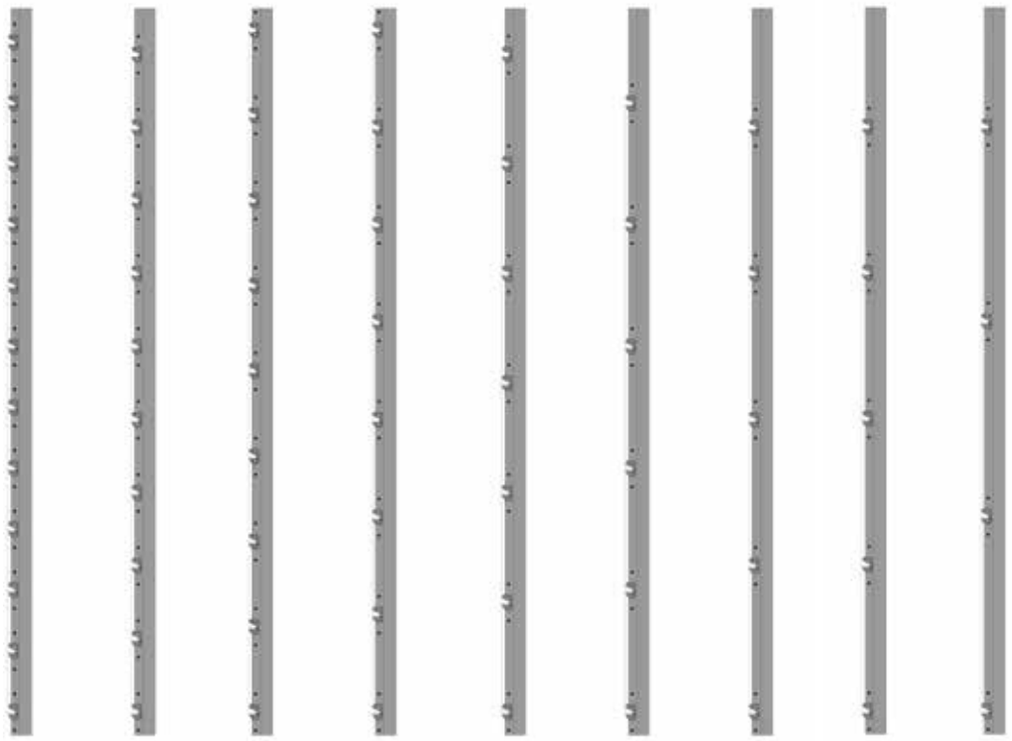


System depth with modular click rail SEL

Distance calliper - pins

Using the distance calliper, modular click rails, which must be installed on top of each other, can be adjusted. The pins are inserted in the rail and can accept the complete range of standard or non-standard covering widths. See section 5.6. for detailed installation instructions.

Modular click rails (SE, SEL), standard lengths



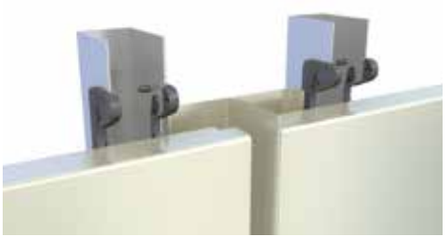
Type								
250	**300**	**350**	**400**	**450**	**500**	**600**	700	**800**
Standard length short in mm								
2,985	2,985	2,985	2,985	2,985	2,985	2,985	2,985	2,985
Number of hanging points								
12	10	9	8	7	6	5	5	4
Standard length long in mm								
5,935	5,935	5,935	5,935	5,750	5,935	5,935	5,935	5,935
Number of hanging points								
24	20	17	15	13	12	10	9	8

IVY STATION, Culver City, CA (USA), **Architect:** KFA Architects, **Product:** Kalzip FC 30/300; 350; 400 & 500

DETAILED DESIGN

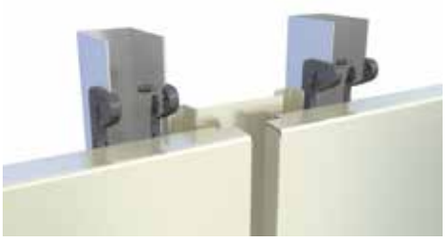
Detailed variants

Narrow fabricated joint

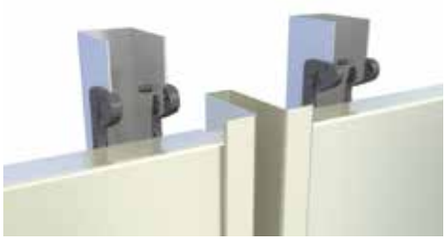


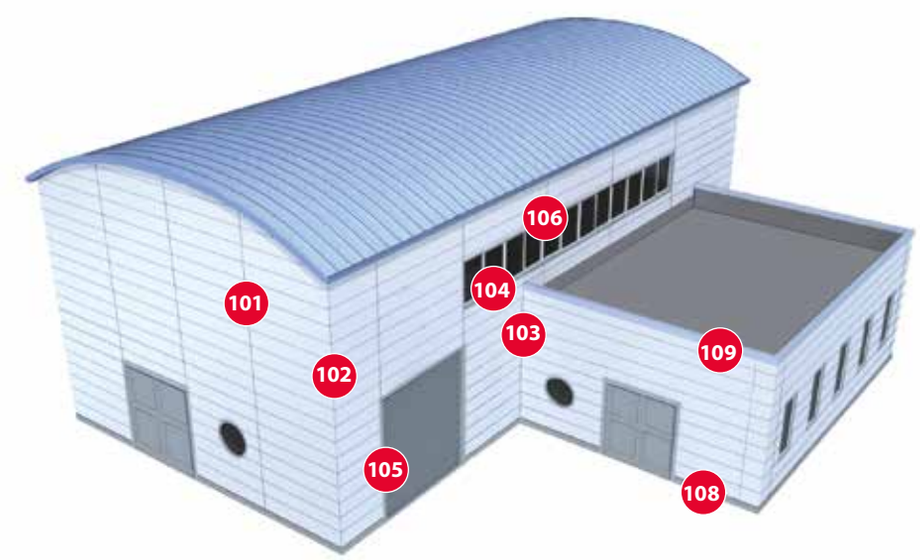
Wide fabricated joint

Without protruding flashings



Overlapping flashings





Design details

The FC façade system can be used with a variety of support structures and wall constructions. To simplify the planning, 10 standard details with 4 different design variants were developed exemplary for 6 different substructure variants. They are available in the technical download on www.kalzip.com as pdf or dwg files.

The selection is based on the following approach:

1. Selection of the suitable substructure (p. 12/13)
2. Selection of the design variant
3. Selection of the required detail

Example

SE modular click rail on
horizontal substructure = 5 (see p. 12)
wide flashings = B
Detail window cill = 104
Detail No. 5 - B - 104

Details

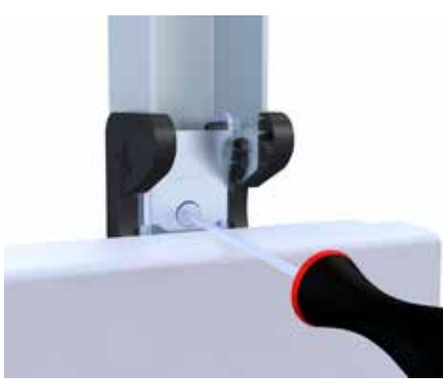
Number	Description
101	Vertical joint
102	External corner 90°
103	Internal corner 90°
104	Window cill
105	Door / gate / window jamb
106	Door /gate / window head
108	Dwarf wall interface
109	Parapet interface

CAMPUSONE STUDENT RESIDENCES, Toronto (CA), **Architect:** Diamond Schmitt Architects, **Product:** Kalzip FC 30/300 & 350

SYSTEM ACCESSORIES
FOR A PERFECT RESULT

Fixed-point clamp

To guarantee a uniform vertical joint pattern, each FC panel must be fixated in its defined position by a system-related fixed-point clamp. The fixed-point clamp can be re-released and fixated again after the installation and alignment of the panel, using an Allen wrench, if required, even through the horizontal panel joint.



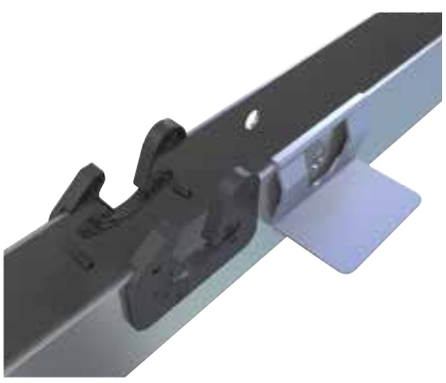
Guidance snapper

The guidance snappers ensure a steady gap between the panels and therefore guarantee an even joint pattern. The use of guidance snappers is mandatory for very short panels and corner panels. as well as for vertical and overhead installations. Information can be found in the installation guideline.

UNIVERSITY SIEGEN, Siegen (DE), **Installer:** STIM GmbH, **Product:** Kalzip FC 30/221; 290; 360; 400 & 800

Flashing support angle

A flashing support angle pluggable on the modular click rails is available for an easy and quick fastening of flashings (vertical joint, corner, jamb and connection profiles). The flashing support angle 'clips' into the modular click rails via the guidance holes, to facilitate the installation of fabricated items [corners joint details etc].



Number and arrangement of flashing support angles: approx. 1.5 units/m (arranged offset)

Adapter for SE and SEL rail

Two FC adapters are available, that permits a simple installation of FC fit panels from 130 mm up to the panel construction width used (see page 6) at the dwarf wall interface and parapet interface as well as above and below openings within the façade surface (e.g. doors and windows). The FC adapter is delivered with 2 complete plastic inlays and therefore, it can be used for the upper as well as the lower connection.

FC adapter for SE rail
Length 94 mm, depth 53 mm without inlay, 3 holes, hole diameter: 5.2 mm

FC adapter for SEL rail
Length 94 mm, depth 33 mm without inlay, 3 holes, hole diameter: 5.2 mm

HYBRID FC FAÇADE

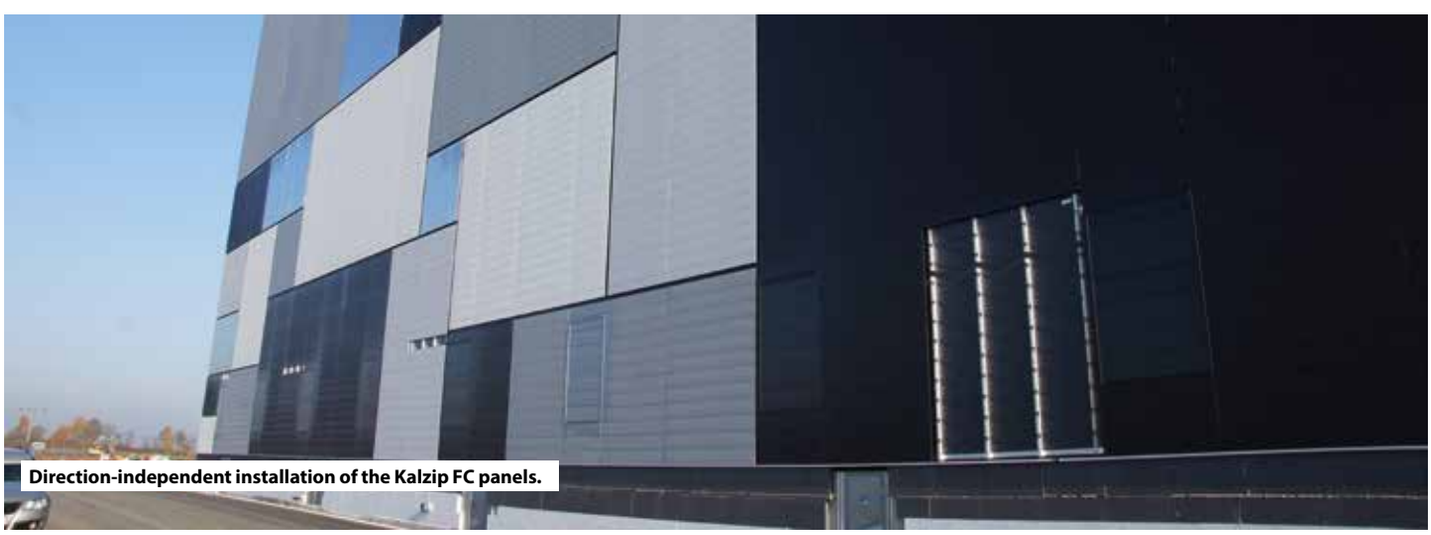
THE INNOVATIVE FAÇADE SOLUTION

Design and economic feasibility

The combination of energy efficiency, economic feasibility and highest design versatility makes the HYBRID FC façade the most innovative façade solution for industrial and commercial buildings. As a result, this façade offers an outstanding combination of design flexibility, energy efficiency and sustainability for architects, planners and building owners. The hybrid FC façade enables the development of aesthetically appealing and functional solutions for new buildings and renovation projects that meet the highest requirements for thermal insulation, noise protection and weather resistance.

The HYBRID FC façade, which has building authority approval, consists of a double-shell wall cladding: The sandwich element is connected to the attached, rear ventilated FC aluminium façade by Kalzip®. The FC panels on the sandwich element are installed by using the SE modular click rails and a newly developed fastening material. The modular click rail SE is in this case only fastened to the system rail of the panel manufacturer - it does not penetrate the sandwich element. A substructure on the inside of the sandwich panels to support the loads is therefore not required.

Quick and economic installation of the sandwich elements.



Direction-independent installation of the Kalzip FC panels.

THE BENEFITS:

- **Outstanding heat insulation:** The hybrid façade reduces the energy consumption for heating and cooling
- **Easy installation** without additional substructure
- **Efficient planning:** The façade panels are available digitally for the planning with BIM
- **Protection against corrosion:** The sandwich elements are additionally protected by the attached FC façade and the PE coating
- **Cost effective overall concept** In comparison to cassette constructions and other designs, such as aerated concrete
- Extension of the warranty by especially developed **system components**
- With comprehensive design details and **specification service**
- **Specification assistance** and texts

RÉSIDENCE REGARD SUR PARC, St. Herblain (FR), **Architect:** LEIBAR & SEIGNEURIN, **Product:** Kalzip FC 30/400; 600 & 800

DESIGN OPTIONS:
HORIZONTAL - VERTICAL
PARALLEL - OFFSET

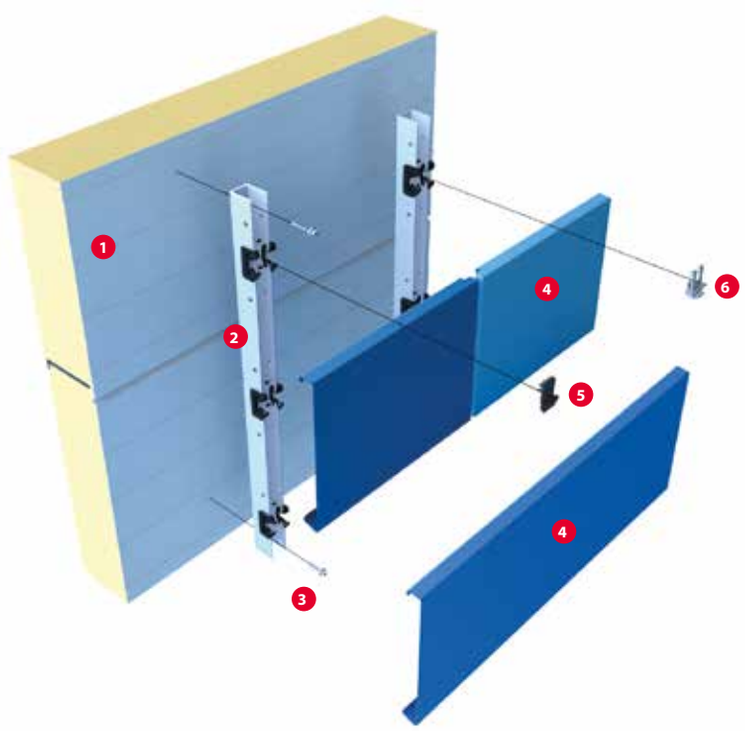
Industry aesthetics 2.0

Using the hybrid FC façade gives you a variety of design options: The attached panels are available in different construction widths. They can be placed horizontal and vertical with the standard end returns. This is supported by a large selection of colours and surfaces as well as individual design options with printed and perforated panels.

New options for design and aesthetics:

- Surfaces and colours: In contrast to conventional sandwich designs, a large number of surfaces and colours can be combined with each other when using the hybrid FC façade.
- Highest design variety: The FC panels can be printed based on requirements - all options are open to you.
- Corporate Architecture: Integrate your brand in the design!
- Design solutions: Cover the wall openings through perforated panels!

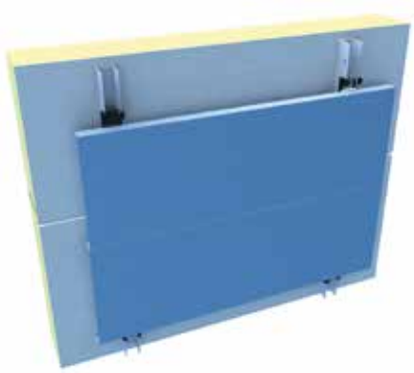
Schematic design
The hybrid FC façade system with all system components



1. Sandwich element
2. Kalzip SE modular click rail
3. System fastener SFS SLG/2-5-S-6.5x20 EJOT JF3-2-5.5*25 with disk Ø 16 mm
4. Kalzip FC panel
5. Kalzip FC guide snapper
6. Kalzip FC fixed point clamps

A-JA HOTEL, Travemünde (GER), **Architect:** Züblin AG, **Installer:** Schmidt Bedachung Hamburg GmbH, **Product:** Kalzip FC 30/800

Hybrid FC panel on sandwich element: horizontal, parallel



Hybrid FC panel on sandwich element: vertical, offset

Hybrid FC panel on sandwich element: horizontal, offset

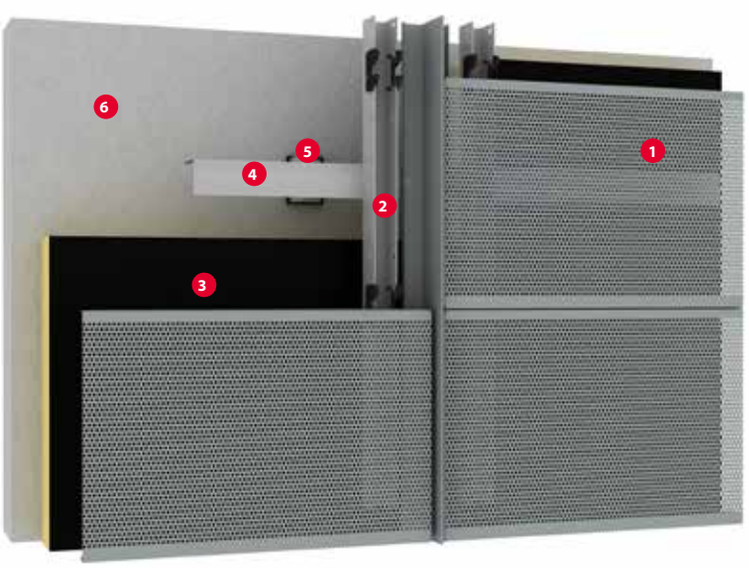
Hybrid FC panel on sandwich element: vertical, parallel

THE SOUNDPROOF FAÇADE

FOR QUIETER LIVING AND WORKING

The façade of a building not only meets aesthetic requirements, but also performs functional tasks. Noise protection is gaining in importance, especially in the urban area where we are facing big challenges due to noise and environmental pollution. One way to reduce the noise level in building interiors is to use noise protection and absorption façades, e.g. the FC façade. These façades absorb more than 6 decibels of noise without emitting any noise or sounds themselves. As a result, the room climate is improved and a pleasant working and living atmosphere is created. The FC Façade is suitable for a wide range of construction projects, for example for residential units, offices or public buildings, and can be adapted individually to suit the specific requirements. Overall, the FC façade offers an effective way of optimising noise protection in buildings and thus helps to improve the quality of life.

Construction of the Kalzip FC noise protection façade



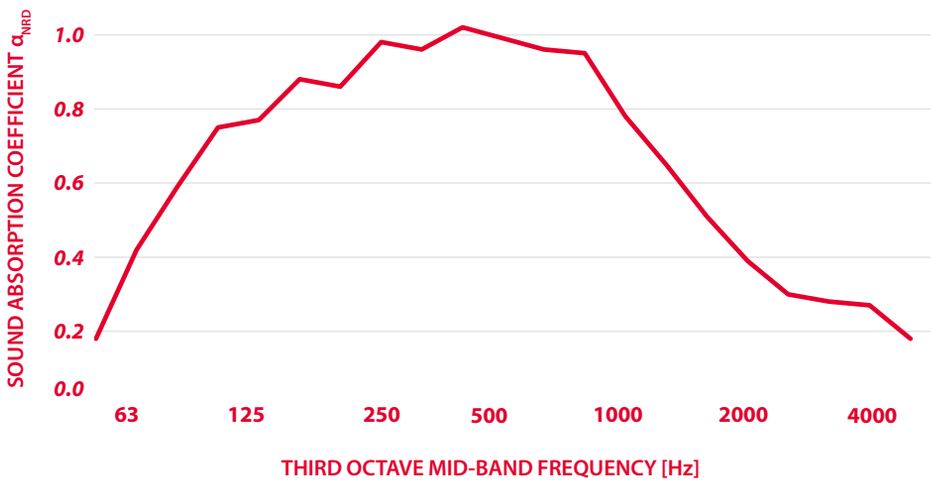
1. Kalzip FC panel with underlay
2. Kalzip SE modular click rail
3. Thermal insulation
4. L-profile wall bracket
5. Angle profile
6. Anchoring substrate

Unbeatable advantages for modern, urban architecture:

- Aesthetic design without loss of living space or usable area
- Also ideal for the renovation of existing buildings
- No elaborate planning necessary in order to meet noise protection requirements
- Surfaces and colours: The entire range of Kalzip colours and surfaces is available to you

Sound absorption of the Kalzip FC façade

Measurement result: Single figure data for the airborne sound insulation according to EN 1793-2:2017 $DL_{\alpha NRD} = 6dB$

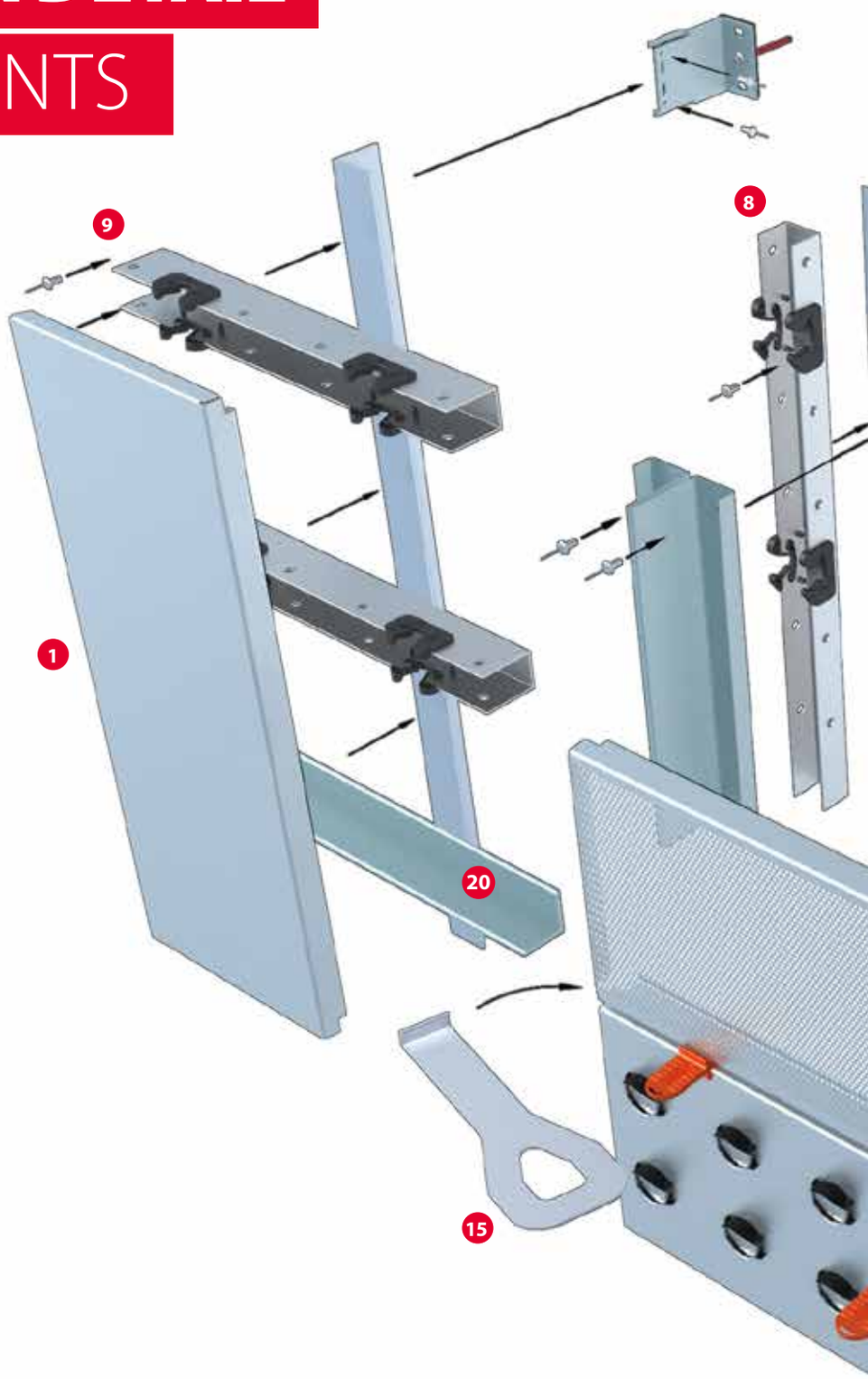


More exact data can be found in the Frauenhofer Institute's test report

FIRE BRIGADE SICKTE, Sickte (GER), **Architect:** struhkarchitekten BDA Planungsgesellschaft mbH, **Installer:** Gurr Spezialbau GmbH, **Product:** Kalzip FC 30/300 & 600

THE SYSTEM IN DETAIL

THE COMPONENTS



Panels

Delivery options

1 FC panel
2 FC corner panel
3 Surface micro-profiled (only FC 30/400)
4 Perforation Rv 3-5
5 Perforation Rv 6-8
6 FC panel luminaire

System substructure

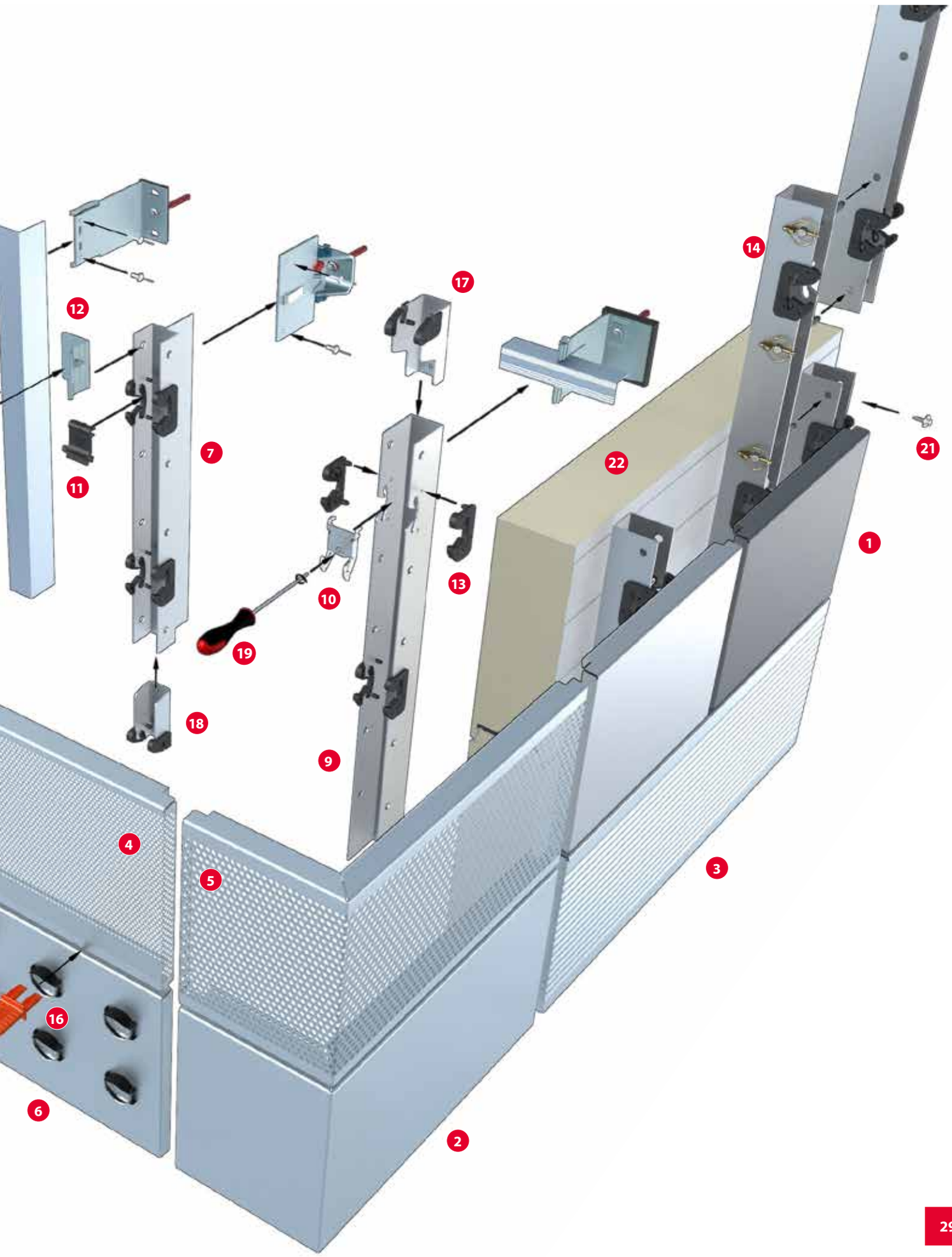
Variants

7 Modular click rail SEL
8 Modular click rail NE (only on request)
9 Modular click rail SE

System accessories

Components and assemblies

10 Fixed-point clamp
11 Guidance snapper
12 Flashing support angle
13 Plastic inlays (pre-assembled)
14 Distance calliper
15 Panel removal tool
16 Plastic shims
17 Adapter SE
18 Adapter SEL
19 Allen key for fixed point clamp
20 Base support angle
21 System fastener
22 Sandwich element


12
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2

REMOVAL OF PANELS

1

2

3

In case of damages, the FC façade enables the exchange of individual panels without the need to remove the entire wall cover. The removal of a panel can be performed fast and easy by using the especially developed tools of the Kalzip FC tool kit.

The tool will be inserted in the joint and pushed up to the first modular click rails and the panel will now be loosened. Repeat this action at each rail.

More detailed information can be found in the FC installation guide.

BI-DIRECTIONAL PANEL INSTALLATION

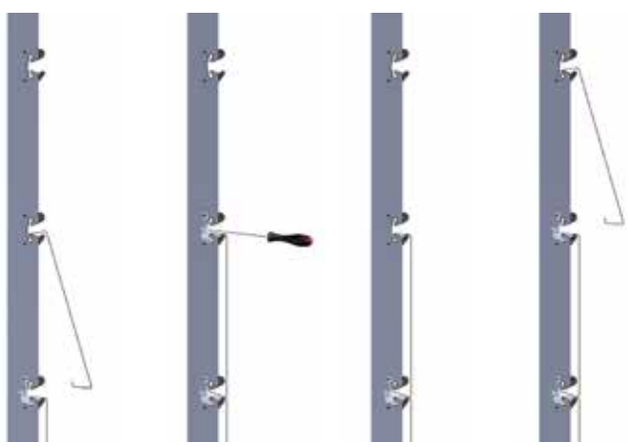
From bottom to top

Step 1 Attach panel

Step 2 Click panel in

Step 3 Click fixed point clamp in, adjust panel, tighten fixed point clamp.

Step 4 Install next panel

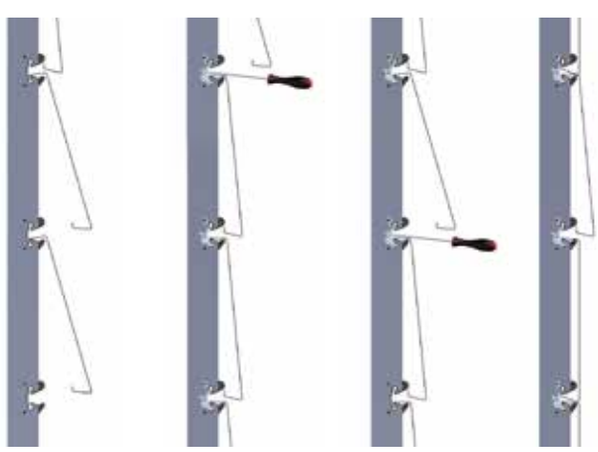


From top to bottom

Step 1 Attach panels

Steps 2 and 3 The lower attachment must be pulled forward slightly for the installation of the fixed point clamp. Click fixed point clamps in, adjust panels, tighten fixed point clamps.

Step 4 Click panels in



Centred of the surface

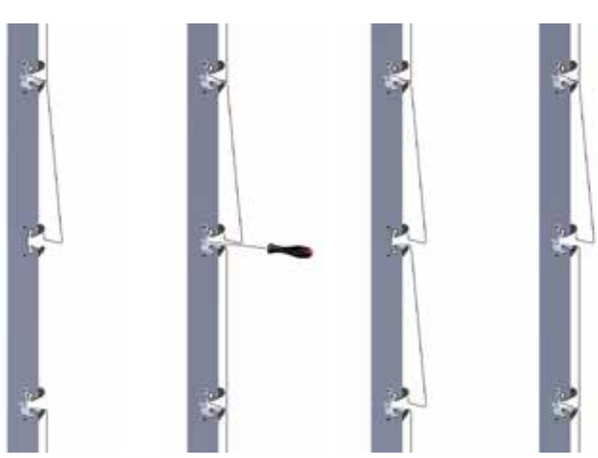
Step 1 Unhook panel (only lower attachment) above the panel to be installed.

Step 2 Attach panel

Step 3 Click panel in above

Step 4 Click fixed point clamp in, adjust panel, tighten fixed point clamp.

Step 5 Click panels in



5 REASONS

TO PLAN WITH KALZIP FC

1. Innovative click system

The entire alignment of the façade of the FC façade system is performed in the substructure. The façade panels must now only be attached and clicked in and their position must be secured using the fixed point clamp.

2. Variable installation

In areas in which the FC panels cannot be installed directly - due to scaffold anchors, missing panels or for other reasons - they can be installed retrospectively without any additional effort. The construction progress is not impaired and additional costs due to longer scaffold usage time will be prevented.

3. Ease of installation

If the joint pattern should - after the completion of the work - not be in accordance with the requirements of the builder or the architect, then the panels can be adjusted retrospectively in the installed condition (through the joint).

4. Flexible system

Different panel widths, bent special panels or special joint panels can be integrated in the system and they do not need separate substructures or fasteners. This makes the FC façade system especially flexible for planners and installers.

5. Easy removal

A special feature is the option to remove and subsequently reinstall individual FC panels in a non-destructive manner, without the need to remove the entire façade surface. This means that elements which need maintenance from time to time can be integrated.

EFFICIENT PLANNING WITH BIM

Plan your project now with BIM data for the Kalzip FC façade system. The seamless integration of the BIM data into your software makes your planning child's play. Download extensive data free of charge and benefit from our first-class service, which supports both planners and installers. Immerse yourself in the future of 3D planning and discover a world full of possibilities with Kalzip. Get ready for efficient, high-quality and smooth construction projects – with constant support from Kalzip.

FC PANELS

FC CORNER PANELS

FC ADAPTER

FC MODULAR CLICK RAIL

FC FIXED POINT CLAMP

FC GUIDANCE SNAPPER

FC FLASHING SUPPORT ANGLE

MORE DOWNLOADS FOR A TOP-CLASS SERVICE:

GENERAL INFORMATION

Substructure

Two-part, adjustable substructures are recommended, to ensure tolerance compensation.

The distances, profile thicknesses and fastening materials must be dimensioned in accordance with the static requirements and must be professionally installed.

Heat insulation materials

As a matter of principle, the insulation material (outer insulation of the wall behind the ventilation, WAB) should have water repellent characteristics as per DIN 18165.

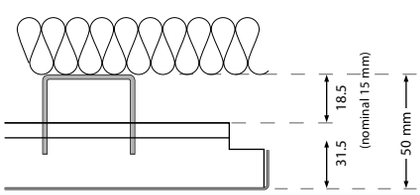
Based on the valid construction laws, only those heat insulation materials may be installed that are approved and monitored for this application and that fulfil the exclusion of liability criteria of the Ordinance on Hazardous Substances. Adherence to the fire protection regulations of the individual State construction regulations is required; as a matter of principle, non-flammable insulation materials as per DIN 4102-1 must be used for high rise buildings.

The insulation provides a heat storage of the inner areas and prevents large heat losses during the cold seasons. During the warmer seasons, a large part of the heat volume that is radiated onto the cover will be reflected, an additional part will be discharged through the convective air exchange in the ventilation space.

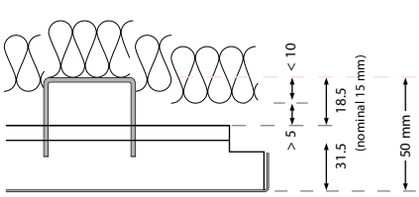
UNDERGROUND STATION GROSSREUTH, Nürnberg (GER), **Architect:** Berschneider + Berschneider, **Installer:** P+E Schmitt GmbH & Co. KG, **Product:** Kalzip FC 30/500

Rear ventilation

The FC façade system should be designed as a rear ventilated façade system. The insulations and cover components are structurally separated from each other in this system of attached, rear ventilated façades. The façade cover is the visible part and it fulfils - in addition to the aesthetic claim - the protection of the building against weather influences, especially rain. The insulation fulfils the functions of the cold and heat protection and, if required, the fire protection.



The rear ventilation space is located between these two components. It is used for the discharge of the construction or usage moisture and must be dimensioned accordingly. Ideally, the insulation should be placed directly behind the modular rails. A free cross section of 18.5 mm exists when using the modular click rail SEL.



In accordance with DIN, adherence to a minimum distance of 5 mm is required in the areas of the rear bending. A theoretical value for the rear air space of 15 mm is achieved if the possible tolerances (10 mm) for the installation of the heat insulation are incorporated.

An upper or lower façade end can be provided by ventilation grates, the free rear ventilation cross section should in this case be at least 200 cm^2/m.

Note!
The use of these ventilation grates can be dispensed with if at least 3 FC panels (equivalent to 4 open joints) are installed on top of each other. This was confirmed through analyses by the I.F.I. Institut fur Industrieaerodynamik GmbH (institute at the advanced technical college Aachen).

Statics calculation

The characteristic resistance values for the FC façade panels as well as the statically effective modular click rails (SE and SEL) can be found in the general building-authority approval of the Kalzip FC façade system. These are available for download under www.kalzip.com. A project related, verifiable static calculation for the FC façade system can be generated on request by the application system in Koblenz.

Fire protection

As part of the sample list "Technical construction regulations" in the appendix of DIN 18516-1, adherence to special technical fire protection precautions is required for rear ventilated outer wall covers with cross floor hollow spaces. This is divided in horizontal and vertical fire barriers (shown as excerpts in the following).

Horizontal fire barriers
Fire barriers must be installed on every second floor in the rear air gap between wall and cover. In case of a fire, these elements must be dimensionally stable for at least 30 minutes. A steel sheet t ≥ 1.0 mm can be used. The size of the openings in the horizontal firewalls must be limited to a total of 100 cm^2/running meters of wall.

The openings can be arranged as evenly distributed individual openings or as a continuous gap.

The installation of a horizontal fire barrier between the insulation material and the FC panels is adequate in case of an outside heat insulation, assumed that the insulation material in case of a fire is dimensionally stable and has a melting point of > 1000°C. Horizontal fire barriers are not required:

- For outer walls without openings
- If a fire cannot spread in the rear air gap due to the placement of the windows, e.g. in case of continuous window bands or cross-floor window element
- If opening jambs in case of a fire are closed dimensionally stable for at least 30 minutes (e.g. due to a circumferential steel sheet t ≥ 1.0 mm)

Vertical fire barriers
They are only required in the area of fire walls and must be at least as thick as the fire wall. The rear air gap must not be routed longer that the fire wall.

In this case, the insulation must use a dimensionally stable insulation material (melting point > 1000°C).

Please refer to the brochure **Kalzip® FC façade details,** Design suggestions, page 67.

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german brand award '22 winner

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07/23