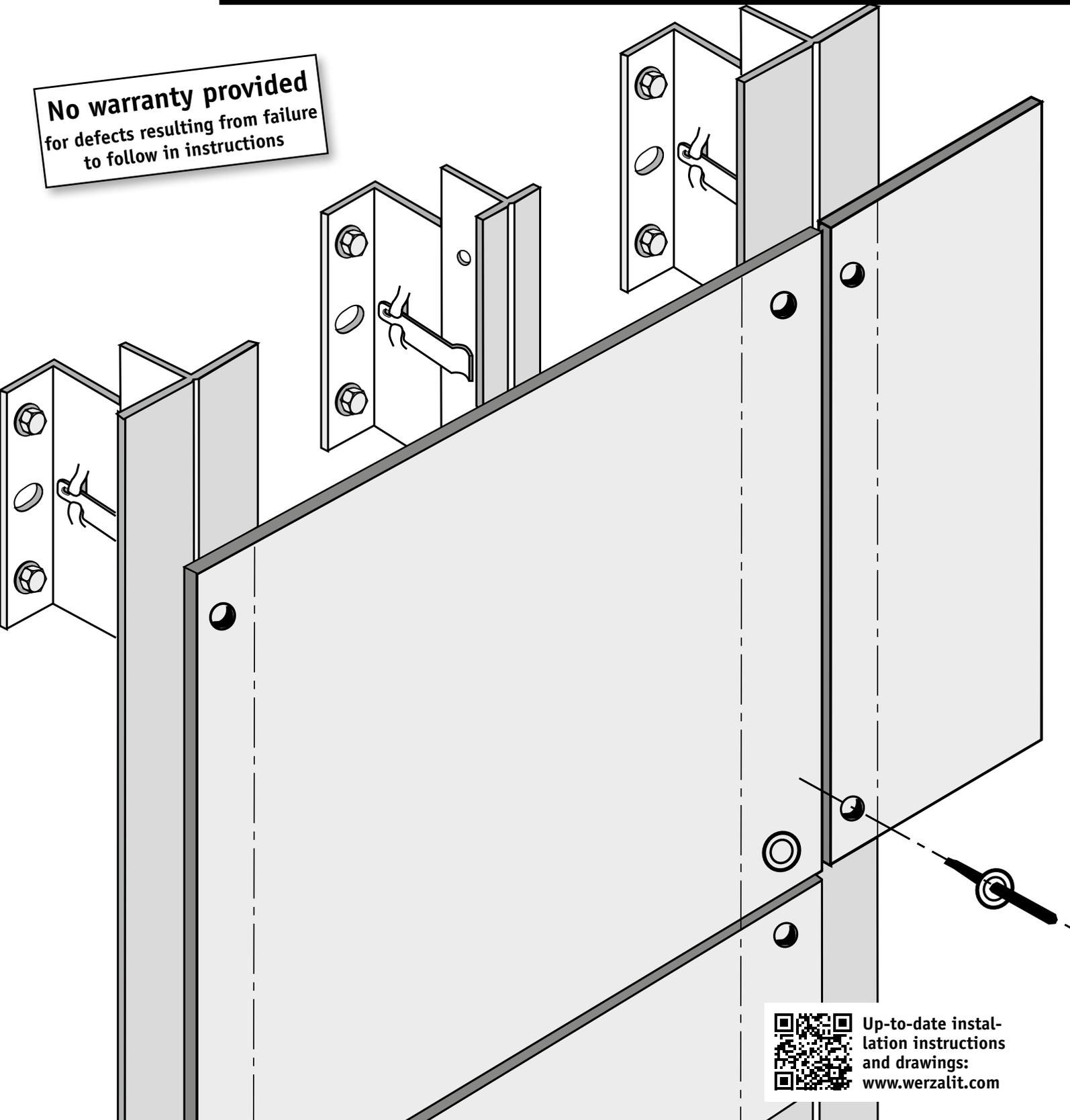


Installation Instructions square.

Cladding panel

No warranty provided
for defects resulting from failure
to follow in instructions



Up-to-date installation instructions and drawings:
www.werzalit.com

Version 02/2016

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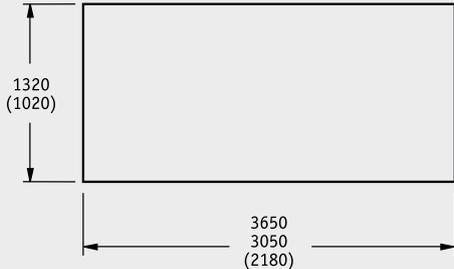
32. Connection details

P. 22 – 23 Supplier Addresses



square Product Information

1. square cladding panel



Formats: 2180 mm × 1020 mm
3050 mm × 1320 mm
3650 mm × 1320 mm

Thickness: Standard: 6 mm and 8 mm
Special design: 10 mm and 12 mm

Decor series: Universal, Fantasy, Wood, Stone, Silver Crystal

Fire protection classes: Standard design; normal flammability: B2 acc. to DIN 4102-1
D, s2-d0 acc. to EN 13501-1
Special design; low flammability: B1 acc. to DIN 4102
B, s2-d0 acc. to EN 13501-1

2. Material and properties

square cladding panels are compact laminates for use outdoors according to DIN EN 438 Part 6.

A suitable exterior layer (coating) is applied to the decorative surface on both sides to provide protection against weather and prevent fading.

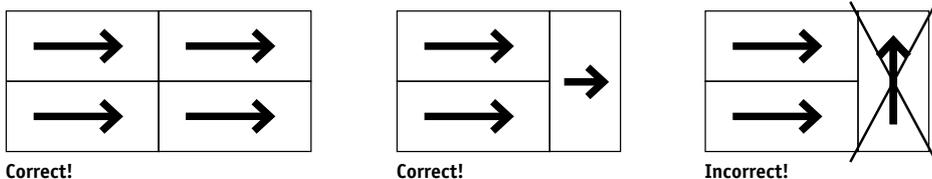
square cladding panels of HPL with a material thickness greater than 6 mm have exceptional dimensional stability, making them self-supporting. Thanks to its high modulus of elasticity, the material also offers the advantage of high flexural stiffness.

- ✓ Weather-resistant
- ✓ Light-fast
- ✓ Waterproof
- ✓ Self-supporting
- ✓ Resistant to impacts and breaking
- ✓ Can be worked with typical woodworking tools
- ✓ High flexural resistance thanks to large modulus of elasticity
- ✓ Low surface weight
- ✓ Easy to install
- ✓ Frost-proof and hail-resistant
- ✓ No vibration noise
- ✓ Rot-proof
- ✓ Rustproof, free from corrosion
- ✓ Resistant to acid rain
- ✓ Hidden or visible fastening

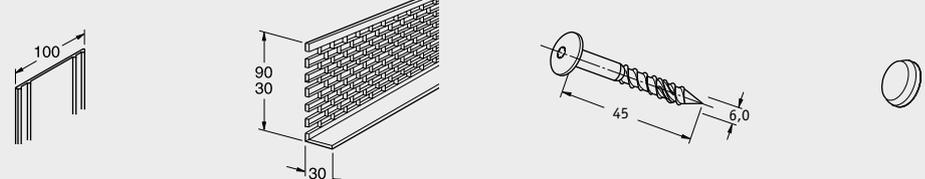
2.1 Colour reproduction

☞ Please note that the look of square cladding panels may change as a result of varying installation directions on the façade. It is therefore extremely important to consider the orientation of the panels during your planning!

Please do not change the orientation of the square cladding panels.



3. System accessories



<p>Jointing tape, Soft plastic For taping behind open butt joints, 25 m (24.093.000)</p>	<p>Ventilation profile, Plastic For covering the openings in back-ventilated façades (25.045. ... 30 mm × 30 mm) (21.016. ... 90 mm × 30 mm)</p>	<p>Universal screw H 6 x 45, Stainless steel For visible fastening of square cladding panels (24.292.000)</p>	<p>End cap, Plastic For covering the screw head of universal screws H (22.330. ...)</p>
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Additional accessories, such as edge caps, fastening materials, etc. can be obtained from the corresponding manufacturers. A list of the various manufacturers can be found on pages 22–23.

square Product Information

4. Resistance to chemicals in the atmosphere

Natural conditions and human industry can result in acidic components in air and rain, such as:

- Carbon dioxide CO₂: Household, industry, vehicles
- Sulphur dioxide SO₂: Household, industry
- Nitrous gases, e.g. NO₂: Industry
- Hydrogen chloride HCl: Industry, waste incineration

For this reason, square cladding panels are designed with weather protection and are largely resistant to acid rain.

5. Environmental impact

square cladding panels from WERZALIT feature the following aspects:

- ✓ No restrictions due to existing regulations regarding the use of square cladding panels
- ✓ Not classified as special waste
- ✓ No hazardous substances regulated by the Hazardous Substances Ordinance
- ✓ No special requirements for cutting and working the material
- ✓ square cladding panels consist of approx. 70 % cellulose that is obtained from renewable wood. The colour pigments and duroplastic resins used are also environmentally friendly.
- ✓ square cladding panels contain no harmful halogens, even the low flammability version.
- ✓ Environmentally safe manufacture and application, biologically resistant to pests and fungal infestation. Due to the high energy content (18–20 MJ/kg), cutting scraps can be thermally recycled according to the Closed Substance Cycle Waste Management Act (KrW-AbfG) and can be burned in a suitable incineration plant, especially since no harmful combustion products are produced.

6. Applications

square cladding panels are used anywhere that decorative yet weather-resistant cladding is required. Practical experience has repeatedly confirmed outstanding weather-resistance and optimal dimensional stability even under extreme climatic conditions. The high durability, including against mechanical stresses such as impacts and blows, and the imperviousness to environmental influences are particularly advantageous for the following applications:

- Exterior wall cladding
- Balcony railing cladding and balcony privacy screens
- Panelling for stairway railings, doors and gates
- Flat roof edging, parapets
- Panelling for eaves and the underside of roofs
- Verge flashing
- Baseboards
- Panelling on supports
- Sound insulation screens
- Advertisements

7. Warranty

In accordance with the applicable terms of delivery, WERZALIT offers a warranty exclusively on the square cladding panels and not on the sub-framework, insulation, structural members, installation work or any other applicable risks. Since we have no influence on the execution, our oral and written recommendations are non-binding, meaning that no claims whatsoever may be derived from them.

These installation instructions may be changed at any time without prior notice as a result of technical advancements. The most recent version is always available on the Internet (www.werzalit.com).

8. Guarantee

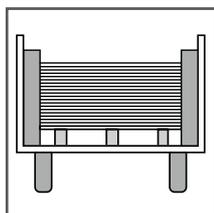
Under our "Terms of Guarantee", we guarantee the properties listed below on the basis of current technology for a period of 10 years for the decor series Fantasy, Wood, Stone and Silver Crystal:



- ✓ Unaltered mechanical properties
- ✓ High resistance to impacts and breakage that fully satisfies the typical requirements
- ✓ A sealed decor surface
- ✓ Unaltered surface texture
- ✓ Identical colour characteristics of all the installed panels

Should a defect arise with regard to one of these properties during the specified period, replacement square cladding panels will be delivered at no cost. This guarantee only applies in the event that the instructions for handling and processing the square cladding panels as well as the applicable construction regulations are complied with and if the defects discovered during the guarantee period are reported immediately.

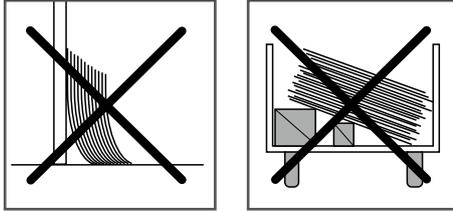
9. Transport



During transport, the square cladding panels must be secured against slipping on sufficiently large, level and stable pallets. The panels must be protected from moisture and dirt while on the truck. square cladding panels are not classified as hazardous goods according to transport regulations, meaning that no labelling is required.

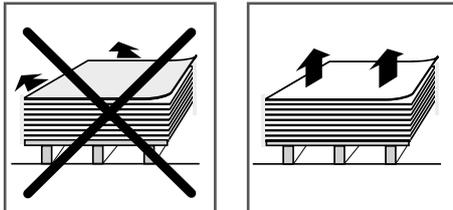
square Product Information

10. Storage



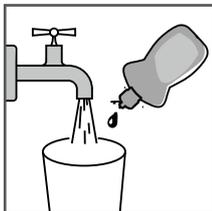
square cladding panels must be stored under normal climatic conditions, lying horizontal with their full area in contact with a level surface. They must be protected against dirt, moisture and mechanical damage. No other objects may be stored between the panels. When covering the stack of square cladding panels, such as with plastic sheeting, make certain that no condensation forms.

11. Handling



When removing panels from the stack, always lift them up completely, do not drag them. During processing of the panels, always ensure that the surfaces are absolutely clean. Otherwise, a risk of damage exists.

12. Care and cleaning



square cladding panels require no special care. Clean lightly soiled panels with water; heavier soiling, such as after installation, can be removed with soap or detergent. When finished, dry with a clean rag, leaving no streaks. Never use the following:

- Cleansers with abrasive components
- Paint thinner or petroleum ether

In case of doubt, use a piece of a panel to test whether the cleaning agent is appropriate.

Removing graffiti:

The removal agent "MBE Anti Graffiti Spray" from MBE GmbH has proven effective for the removal of graffiti (see address list on p. 23). This product allows the surface of the square cladding panels to be cleaned with relative ease and without damaging the panels.

13. Disposal

Excerpt from the Closed Substance Cycle Waste Management Act (KrW-AbfG)

The Closed Substance Cycle Waste Management Act entered into force on 1 September 1996. It stipulates that waste materials with a calorific value of 11 MJ/kg or greater must be disposed of and thermally utilised in authorised industrial incineration plants. HPL scrap has a calorific value of 18–20 MJ/kg and is therefore covered under this rule. If you have additional questions on this topic, please contact our factory.

KrW-AbfG §6: Material recycling and energy utilisation

Wastes can be:

- recycled as material or
- utilised for the production of energy

The most environmentally safe manner of recycling or utilisation should be used.

Ordinances with more detailed stipulations

Insofar as no ordinance stipulates a preferred method of recycling or utilisation, energy utilisation is only permitted if the following conditions are met:

- The calorific value of the individual waste (without mixing) is at least 11 MJ/kg.
- The combustion efficiency is at least 75 %.
- It is possible to use or dissipate the resulting heat and any waste resulting from this can be deposited without further treatment, as far as possible.

Summary

- HPL waste does not require monitoring in accordance with the KrW-AbfG.
- According to §6 KrW-AbfG, thermal utilisation of HPL wastes is the most environmentally safe method of recycling or utilisation.
- Energy content of HPL: 18 MJ/kg, coal: 30 MJ/kg.
- From an environmental and economical perspective, the transporting of waste over distances greater than 100 to 150 km should be avoided since long transport routes have an impact on the environment.
- The newly amended KrW-AbfG offers the possibility of disposing of the waste in a manner that is economical and environmentally sound. Private disposal companies maintain the appropriate logistical infrastructure and are able to ensure the utilisation of HPL waste in accordance with the legal requirements.

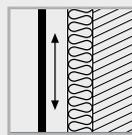
14. Back-ventilated curtain façade (BVCF)

When using square cladding panels for façade cladding, a back-ventilated curtain façade should be constructed. A ventilation space is left between the outer wall/insulation and the square cladding panels through which moisture arising during construction or occupancy can escape. The ventilation space must be sufficiently dimensioned in accordance with the pertinent regulations.

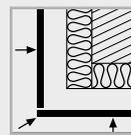
Ventilation space: Ventilation gap ≥ 20 mm
Condensation is removed via the ventilation.

Ventilation: Ventilation area ≥ 50 cm²/linear m
according to DIN 18516

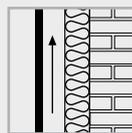
Sufficient ventilation openings must be ensured on the top and bottom edges of the exterior cladding as well as in the area of window and door openings. Planning details must be coordinated between the structural engineer and the façade builder.



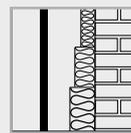
1. The basic design with a second sealing layer with ventilation space has proven itself for centuries.



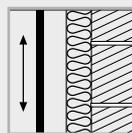
7. The façade surfaces, corners and edges of square cladding panels are optimally protected against high impacts and jolts.



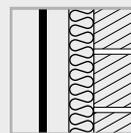
2. The load-bearing exterior wall generally requires no special preparation. The exterior wall need not be plastered.



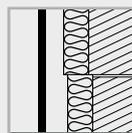
8. The thermal insulation can be employed flexibly according to the newly amended Thermal Insulation Ordinance and the supplemental, building-specific conditions.



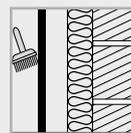
3. Every weather shell reacts to changing weather conditions and moisture with changes in dimension. If the structure is designed properly, these changes are captured in the weather shell and are not transferred to the exterior wall.



9. Dry construction materials in the case of back-ventilated façade cladding ensure reliable values for dew point calculation and determination of the insulation thicknesses.



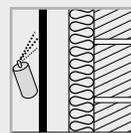
4. Even larger building tolerances can be reliably bridged over by back-ventilated façade cladding.



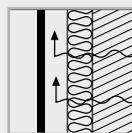
10. Coats of paint for the purposes of renovation are not required in the case of back-ventilated façade cladding with permanently treated weather shells, eliminating the problem of moisture migration from inside to outside that is associated with such painting measures.



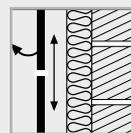
5. The fire protection requirements of state construction ordinances are satisfied both as a material and as a component in accordance with the specified building heights.



11. In contrast to plastered surfaces, graffiti can be removed from square cladding panels.



6. The moisture balancing and insulation during the summer and winter are guaranteed even under unfavourable construction conditions.



12. Back-ventilated façades can be replaced at any location with panels of identical colour.

15. Fire protection

Preventive fire protection

The basis for the use of exterior wall cladding is established in the respective state construction ordinances or in regulations, such as for the "Use of Flammable Materials in Buildings". According to these sources, B2 construction materials, with normal flammability as per DIN 4102, may be used up to a height of 7 m and B1 construction materials up to a maximum building height of 22 m (see state construction ordinances).

The square cladding panels have normal flammability (B2) according to DIN 4102 Part 4, even without verification. The low flammability design has received building authority approval (No. Z-33.2-11) and is classified as B1 (low flammability).

Firewalls

In Europe, special firewall systems are sometimes used on back-ventilated façades for tall buildings, such as with coated, horizontally installed stainless steel panels to counteract the spread of fire within the rear ventilation gap.

No ageing process

The square cladding panels in B1 design have been specially developed for use outdoors. Although this product is constantly exposed to weathering influences, the fire protection properties are fully intact even years after installation. The flame-retardant additives in the square cladding panels are integrated into the panel structure. This has been officially verified in repeated tests after five years of weathering. The low flammability version of the square cladding panels contains flame retardants that do not emit harmful halogens in event of a fire.

International certificates

Certificates for use in building construction have been issued for the square cladding panels in B1 design in the following countries: Germany | France | Great Britain | the Netherlands | Russia.

Fire protection in Europe

In Europe, laminate panels intended for use in construction are tested according to EN 13823 (SBI test, thermal loads from a single burning item) and according to EN ISO 11925-2 (testing with a small burner). The fire behaviour determined in this way is stated in agreement with EN 13501-1. The square cladding panels with fire protection properties are classified according to Euronorm EN 13501-1 at low flammability, Euro class B-s2, d0 (certificate of conformity 0672-CPD-0151).

16. Thermal insulation and windproof properties

The thermal insulation must be dimensioned according to the current Energy Saving Ordinance (EnEV). The sub-framework must be selected based on the insulation thickness, insulation material, etc.

The thermal insulation material must be fastened with appropriate hardware, such as insulation pins, in accordance with the instructions of the manufacturer. In principle, the installation must be made windproof to prevent cold air from flowing behind. We therefore recommend installing in two layers with overlapping joints. The insulation must be flush against the wall. A water-repelling, diffusion-permeable layer must be applied in the case of insulation materials that allow air to flow through them.

17. Sub-framework for façade cladding

The following guidelines should be followed for wood sub-frameworks:

- ✓ The wood must correspond to grade S10 (or MS10) according to DIN 4074.
- ✓ The individual cross-section must be selected according to DIN 1052, Part 1.
- ✓ The wood must be protected according to DIN 68800, Wood preservation.
- ✓ The sub-framework must be fastened using anchors and screws with technical approval and in accordance with the instructions of the manufacturer.
- ✓ The support battens must be fastened to the counter battens with at least 2 wood screws, stainless steel A2, per intersection, in a diagonal arrangement
- ✓ The sub-framework must be level and plumb. Dimensional tolerances can be found in DIN 18202, Part 2 and Part 4.
- ✓ Jointing tape must be used for open profile joints.

For sub-frameworks of metal, the instructions of the manufacturer must be followed and the manufacturer must be consulted, if necessary.

18. Wind load calculations

When determining the wind load for the exterior surface of a building, aerodynamic coefficients (**cpe**) must be considered in addition to the velocity pressure (**q**) and integrated into the following equation:

$$w_e = c_{pe} * q$$

The velocity pressure (**q**) is determined by the building height, the terrain category, the position of the building (inland, coast/ Baltic Sea islands or North Sea islands) and the influence of the height above sea level (Hs). The classification according to 4 wind zones as given in Appendix A of DIN 1055-4 forms the basis for this calculation.

Simplified procedure for velocity pressure determination

In buildings and structures not susceptible to vibrations, DIN 1055-4 offers a simplified procedure for calculation of the velocity pressure (here synonymous with the gust velocity pressure) for low structures (up to 25 m). A constant velocity pressure over the entire height of the building is assumed here. For this condition, DIN 1055-4 gives the values in the table below.

Wind zone	Velocity pressure q in kN/m ²		
	At a building height h within the following limits		
	h ≤ 10 m	10 m < h ≤ 18 m	18 m < h ≤ 25 m
1 Inland	0.50	0.65	0.75
2 Inland	0.65	0.80	0.90
2 Coast and Baltic Sea islands	0.85	1.00	1.10
3 Inland	0.80	0.95	1.10
3 Coast and Baltic Sea islands	1.05	1.20	1.30
4 Inland	0.95	1.15	1.30
4 Coast of the North and Baltic Sea and Baltic Sea islands	1.25	1.40	1.55
4 North Sea islands	1.40	–	–

Velocity pressure according to the simplified procedure from DIN 1055-4, edition 2005-03

For North Sea islands, use of this procedure is restricted to a maximum building height of 10 m. In the ranges greater than 800 m above sea level, an increase of $0.2 + (H_s/1000)$ must be assumed for these values. At greater than 1100 m above sea level and at the ridge and summit elevations of low mountain ranges, "special considerations are required" (DIN 1055-4, A.2).

Procedure for the typical case

The explanations above give rise to the evaluation scheme given below, which must be applied to each of the building surfaces:

1. Determination of the wind-zone-specific velocity pressure (**q**).
2. Determination of the height gradations and the height-specific velocity pressures (**qi**).
3. Dividing up of the wall surfaces and determination of the aerodynamic coefficients (**cpe**) for the individual areas
4. Determination of the wind pressure and wind suction forces as from the height-specific velocity pressures (**qi**) and the aerodynamic coefficients (**cpe**).

It is therefore clear that individual planning of the fastening spacing is required for every construction project since a stability verification must always be performed.

19. Standards and regulations

Building authority approval

square cladding panels have had general building authority approval from the Deutsches Institut für Bautechnik (German Institute for Building and Civil Engineering) in Berlin, for almost 25 years. One special characteristic is that previously approved tensile loads were given for the various fastening areas in approval Z-33.2-11, Appendix 3.

DIN standards and regulations:

DIN 1052 Design of timber structures – General rules and rules for buildings

DIN 1055 Actions on structures, Part 4: Wind loads

DIN 4102 Fire behaviour of buildings and building components

DIN 4108 Thermal insulation in buildings

DIN 4109 Sound insulation in buildings

DIN 4113 Aluminium constructions under predominantly static loading

DIN 18165 Fibrous insulating building materials

DIN 18201/DIN 18202 Tolerances in building construction

DIN 18338 Roofing work

DIN 18516-1 Cladding for external walls, ventilated at rear – Requirements, principles of testing

DIN 68365 Sawn timber for carpentry – Appearance grading

DIN 68800 Wood preservation

WERZALIT GmbH – factory specifications

State construction ordinances (German LBO)

Guidelines on the Use of Flammable Materials in Buildings (for the respective state)

Accident prevention regulations of the trade associations

DIN EN 438-6/7 High-pressure decorative laminates (HPL)

DIN EN 485 Aluminium and aluminium alloys – Sheet, strip and plates

DIN 4074 Strength grading of wood

DIN EN 13830 Curtain walling

DIN V 4108 Thermal insulation and energy economy in buildings

DIN 13501 Fire classification of construction products and building elements

DIN 18351 German construction contract procedures (VOB)

DIN EN 10088 Stainless steels

DIN EN 62305 Protection against lightning

EnEV 2009 Ordinance on Energy-Saving Thermal Insulation and Energy-Saving Systems in Buildings
(Energy Saving Ordinance – EnEV)

Z-30.3-6 Products, connectors and parts of stainless steels

BS 6180 Barriers in Buildings

EOTA TR 001 Determinations of impact resistance of panels and panel assemblies

CUAP Fastener of external wall claddings

ETAG Draft Guideline for European Technical Approval of kits for external wall claddings

FVHF-FOCUS® technical publications of the FVHF e.V., Berlin

20. Technical data

Properties	Test specification	Unit	Value
Elasticity modulus Longitudinal Transverse	EN ISO 178	N/mm ² N/mm ²	14,000 10,000
Flexural strength Longitudinal Transverse	EN ISO 178	N/mm ² N/mm ²	140 100
Tensile strength Longitudinal Transverse	EN ISO 527-2	N/mm ² N/mm ²	100 70
Density	ISO 1183	g/cm ³	approx. 1.4
Dimensional stability in case of rise in temperature Longitudinal Transverse	DIN EN 438-2	% %	approx. 0.2 approx. 0.4
Stability in case of rapid climate change Appearance Flexural strength index Ds Elasticity (bending) modulus index Dm	DIN EN 438-2	Degree	≥ 4 ≥ 0.95 ≥ 0.95
Resistance to weathering (including light fastness) Contrast Appearance	DIN EN 438-2	Degree	≥ 3 ≥ 4
Light fastness	DIN EN 438-2	Grey scale (EN 20105-A02)	4-5
		Blue scale (EN ISO 105-B02)	7-8
Thermal coefficient of linear expansion Longitudinal Transverse	DIN 51045 (+80/-20°C)	1/K 1/K	0.9 • 10 ⁻⁵ 1.6 • 10 ⁻⁵
Heat conductivity	DIN 52612	W/(m • k)	approx 0.3
Surface resistance (antistatic)	DIN EN 61340-2-3 (no static charging)	Ω	10 ⁻⁹ -10 ⁻¹¹
Steam diffusion resistance coefficient	DIN 52615		approx 17,200
Fire behaviour square cladding panel, standard design square cladding panel, special design	DIN 4102-1 DIN 4102-1		B2 B1
square cladding panel, standard design square cladding panel, special design	EN 13501-1 EN 13501-1		D, s2-d0 B, s2-d0
Calorific value	DIN 51900	MJ/kg	approx. 20

square Shaping

21. Shaping

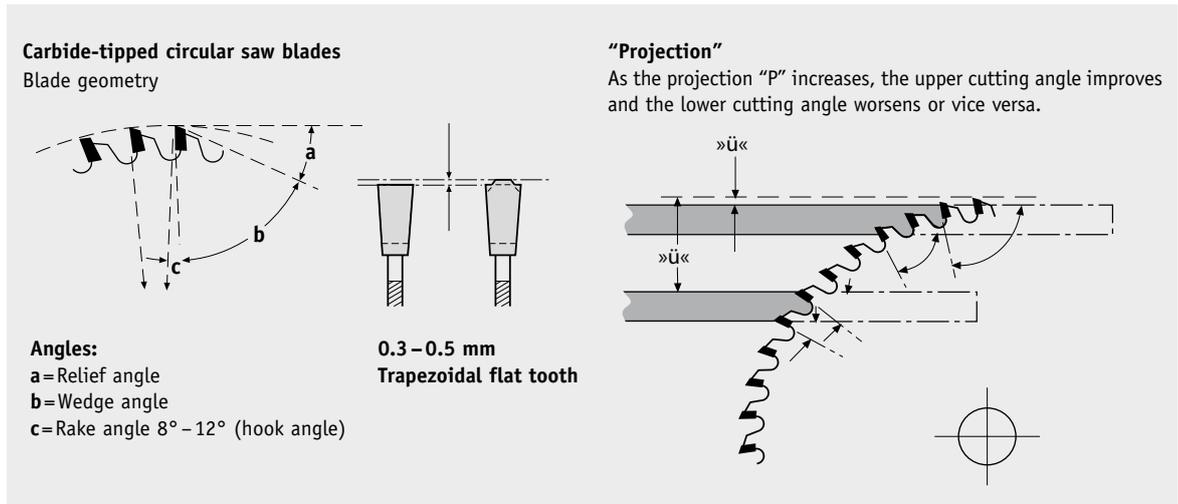
square cladding panels are delivered as panels cut to a specific format and edged on all sides. Special right-angled cuts from the standard formats can be performed at the factory and delivered. Because square cladding panels can be easily cut with woodworking tools, fitting elements as well as holes can be efficiently created in a workshop or at the construction site.

Cutting

Carbide-tipped saw blades should be used for cutting. Tooth pitch 10 to 15 mm, cutting speed 40 to 100 m/s, see table. Cost-effective results can be achieved with a scoring saw when a clean cut is required on both sides.

With circular saw blades, the cutting quality can be influenced by changing the exit angle (height adjustment).

Contour cuts can be made with a jigsaw. In this case, the square cladding panels must be placed with the facing side down on a clean surface (possibly protected with felt). Particularly clean edges without chipping can be achieved through the use of a table or hand router.



Guiding value ranges

Operation	Tool	Cutting Speed	Rotation Speed	Feeding
Panel cutting	Circular table saw	50 – 100 m/s	~ 3000 – 6000 rpm	10 – 30 m/min
Trimming	Circular hand saw	30 – 50 m/s	3000 – 4500 rpm	Hand feeding

Drilling

HSS drills are used for drilling.

Planing

Panels can be planed to fit on-site with an electric hand planer (with carbide-tipped blade).

Milling

A smooth edge can easily be achieved by milling in a woodworking machine using carbide-tipped tools.

Cutting speed V in m/s based on tool diameter and rotation speed, e.g. for circular saws:

Tool Diameter in mm	Cutting Speed V in m/s					
	20	40	60	80	100	120
400	20	40	60	80	100	120
380	19	38	57	76	95	114
360	18	36	54	72	90	108
340	17	34	51	68	85	102
320	16	32	48	64	80	96
300	15	30	45	60	75	90
280	14	28	42	56	70	84
260	13	26	39	52	65	78
240	12	24	36	48	60	72
220	11	22	33	44	55	66
200	10	20	30	40	50	60
180	9	18	27	36	45	54
160	8	16	24	32	40	48
140	7	14	21	28	35	42
120	6	12	18	24	30	36
100	5	10	15	20	25	30
80	4	8	12	16	20	24
60	3	6	9	12	15	18
40	2	4	6	8	10	12
20	1	2	3	4	5	6
Rotation speed of the tool shaft (rpm)	1000	2000	3000	4000	5000	6000

square Installation

22. Installation principles

Like every other material, square cladding panels are subject to physical laws. Depending on the climatic influences on the material, changes in dimension may occur. However, these will have no negative consequences as long as these handling and installation instructions are followed. The sections below present a detailed description of the most typical fastening methods: In principle, it is true for all fastening types that a building authority approval and a stability verification are required for building heights of 8 m and higher.

The starting point for determining the execution details lies in the applicable construction laws, taking into consideration the location, height, type and use of the structure and the type of cladding application. In particular, buildings taller than 8 m must comply with the provisions regarding fire protection and stability. Generally, the structural engineer individually specifies the fastening distances required for the structure.

The live loads according to DIN 1055 and the permissible forces according to the approvals must be taken into account here. The pertinent standards and factory specifications, such as those of the company supplying the framework or fastening materials, must be complied with as agreed between the customer and the installation company.

23. Fastening

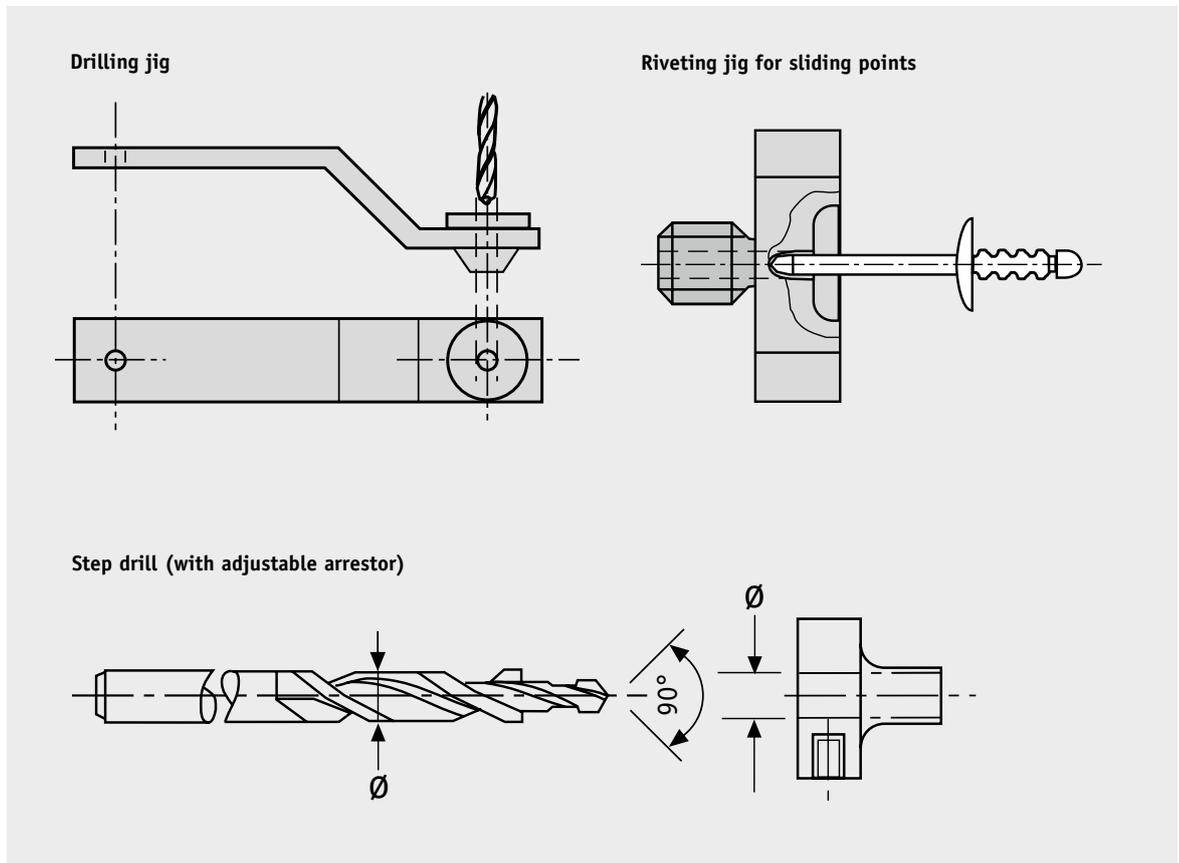
Exclusively fastening materials with building authority approval may be used for fastening the square cladding panels at building heights over 8 m. In principle, one differentiates between the following fastening methods:

Visible Fastening	Hidden Fastening
With screws onto wood sub-framework	With glues onto wood and aluminium sub-framework
With rivets onto aluminium sub-framework	With hanger + anchors onto aluminium sub-framework

Only a few diagrams are provided in these installation instructions for clamped or clip-based fastening methods since the design details are largely equivalent to the visible riveted method. If you require more detailed information, please contact the manufacturer of the respective sub-framework.

24. Installation aids

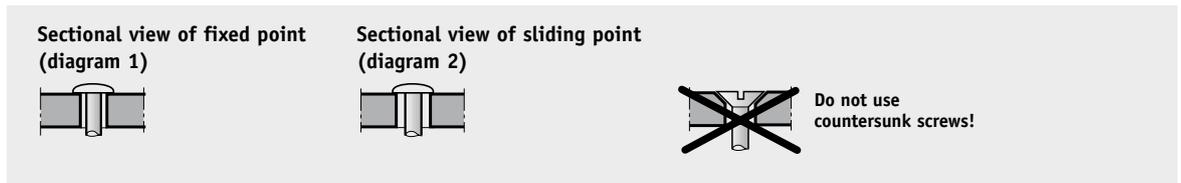
Since the fastening materials are seated centred in the holes, sufficient play must be ensured. A suitable drilling jig or riveting jig may be used as an aid. On metal sub-frameworks, step drills offer the advantage of allowing the holes to be drilled into the sub-framework and the panel at the same time.



square Installation

25. Holes for fastening

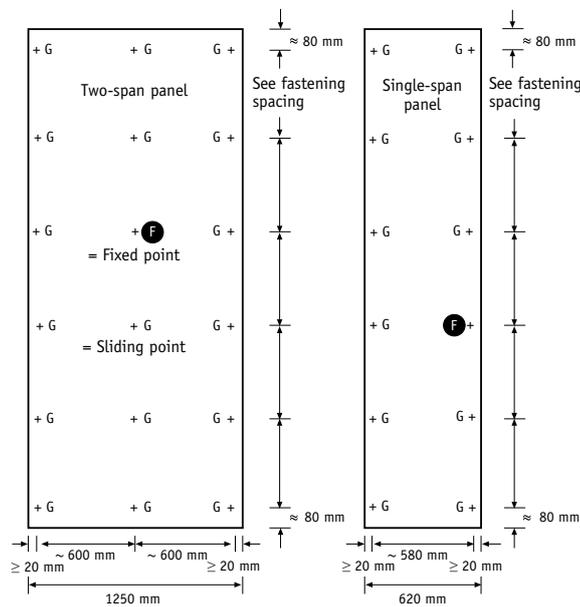
The square cladding panels are generally fastened with one fixed point (diagram 1) and multiple sliding points (diagram 2).



In the case of two-span fastening, the fixed point is located in the centre of the panel and, in the case of single-span fastening, in the middle zone at the edge of the panel (diagrams 3 and 4).

Two-span panel (Diagram 3)

Single-span panel (Diagram 4)



F = Fixed point, G = Sliding points

Holes for fixed points:

Hole diameter = screw diameter

Holes for sliding points:

Hole diameter = screw diameter + approx. 3 mm

Edge distances:

Holes in square cladding panels must be created such that the distance to the edge is at least 20 mm for fastening materials that pass through the panel and at least 30 mm for hidden fastening.

Open overhangs:

square cladding panel thickness

6 mm = max. 100 mm

8 mm = max. 150 mm

10 mm = max. 200 mm

Larger overhangs can be realised with appropriate structural solutions.

Fastening spacing:

square cladding panel thickness

6 mm = max. 600 mm

8 mm = max. 700 mm

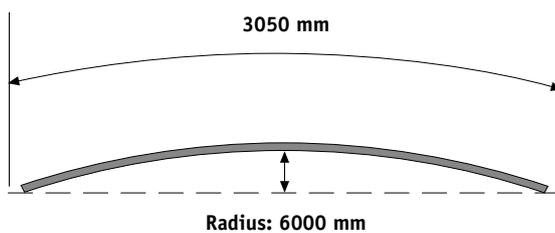
10 mm = max. 800 mm

12 mm = max. 800 mm

or according to the stability verification based on the building authority approvals.

26. Bending radii

square cladding panel 6 mm



One special advantage of square cladding panels is their bending ability. The following information assumes a bending radius that can be practically achieved by hand under construction site conditions using a cold process – i.e. at normal temperatures – against a curved sub-framework. The lengthwise edges must be cut without chipping! No point-wise fastening may be used on the transverse edges! For bending lengthwise, the transverse edges must be secured by cap or omega profiles as effective line fastening.

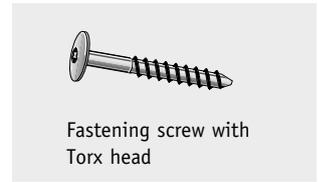
square Visible Fastening to Wood

27. Screwing onto wood

In accordance with the general building authority approval Z-33.2-11 for fastening square cladding panels to a wood sub-framework:

- Length:** 35 mm thread for wood
- Holes for fixed points:** Hole diameter = screw diameter
- Holes for sliding points:** Screw diameter + approx. 3 mm
- Painting:** In the colours of the square cladding panels range*
- Washers not required
- Material:** Material number 1.4401

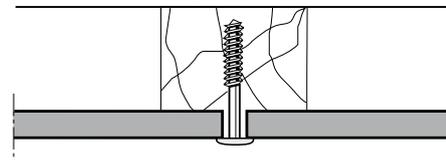
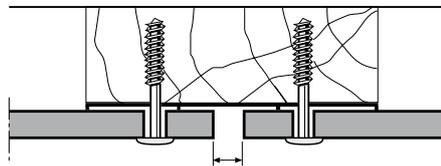
* The screws can be obtained from MBE (see p. 22). Please include the desired WERZALIT square cladding panel decor number with the order.



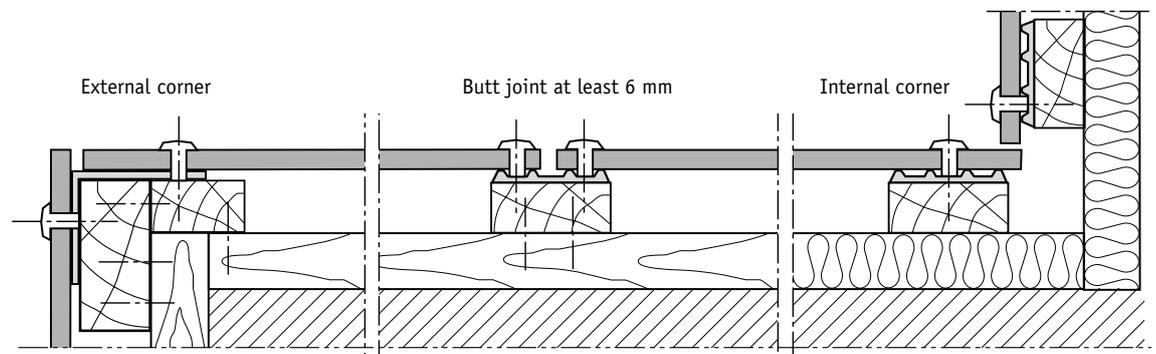
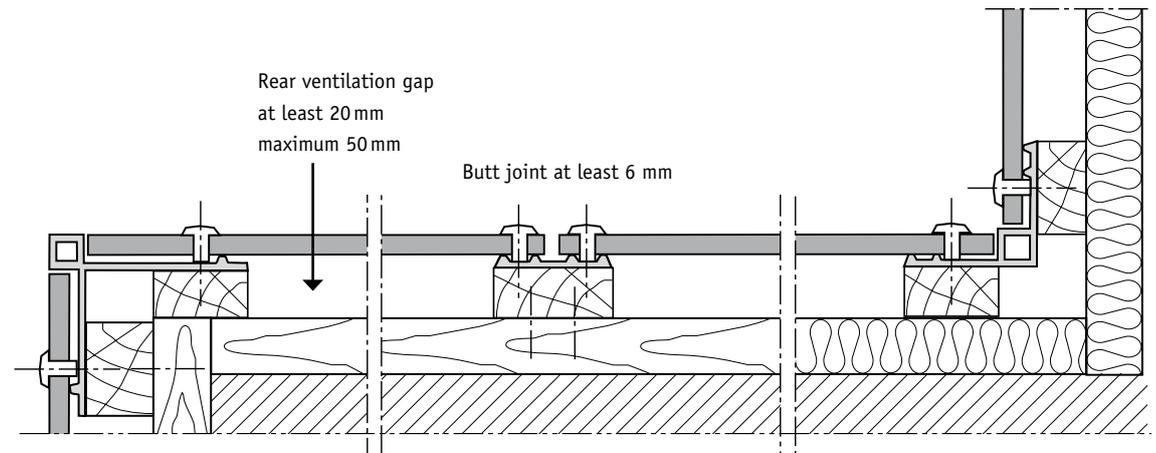
Panel joint
Back with sufficiently wide jointing tape

Centre fastening
With fastening screws onto wood sub-framework

Important: Joints on wood sub-frameworks must receive "rain-proof" backing.



① Horizontal section with and without profile

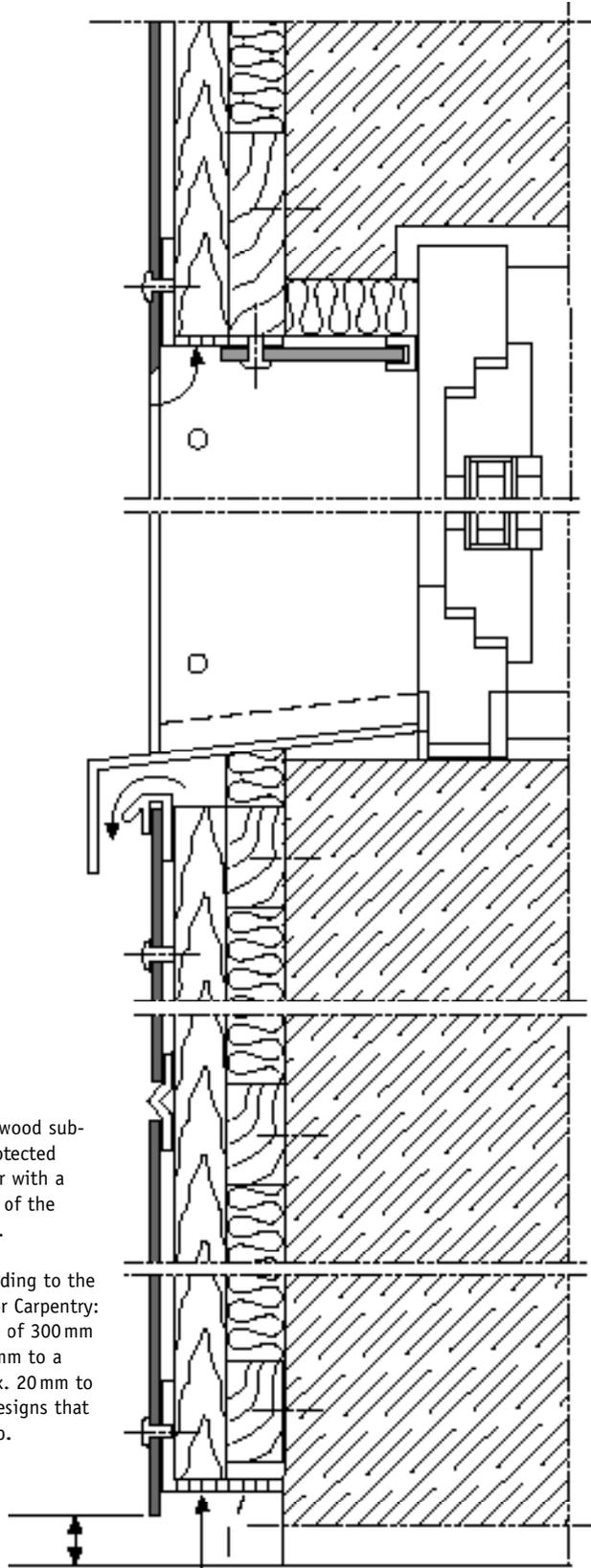


Fastening spacing based on panel thickness

square Visible Fastening to Wood

Continued
27.
Screwing onto
wood

②
Vertical section
with ventilation

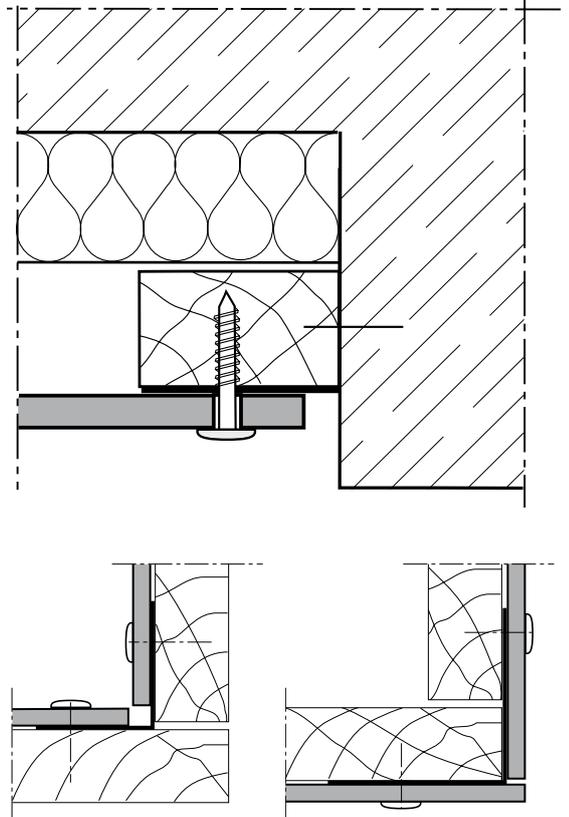


Recommendation: The wood sub-framework is better protected against splashing water with a max. 20 mm projection of the square cladding panels.

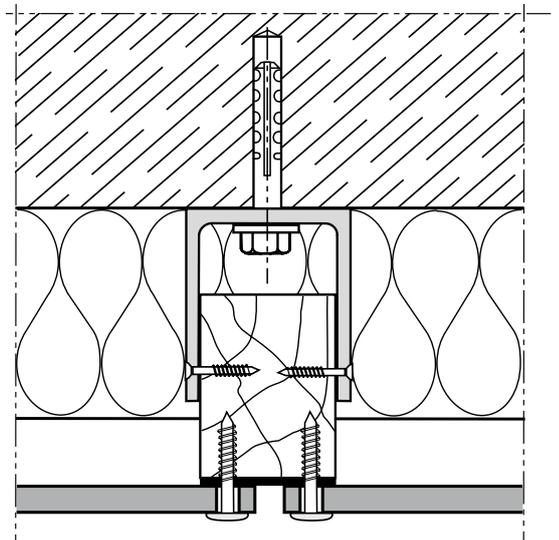
Recommendation according to the Technical Guidelines for Carpentry: Cladding panel spacing of 300 mm to smooth floors, 150 mm to a gravel layer and approx. 20 mm to a metal grate. Avoid designs that allow moisture build-up.

Rear ventilation gap
at least 20 mm
maximum 50 mm

③
Connection joint
on wood sub-
framework



④
Aluminium spacing brackets
for high insulation thickness



square Visible Fastening to Aluminium

28. Rivets on aluminium sub-framework

In accordance with the general building authority approval Z-33.2-11 for fastening square cladding panels to an aluminium sub-framework:

Execution: Blind rivets of aluminium / stainless steel with break-off shaft design

Rivet length: 18.0 mm

Shaft diameter: 5.0 mm

Head diameter: 14.0 mm

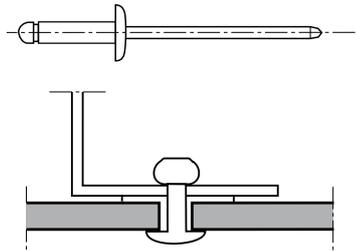
Rivet tube: ALMg 3/5

Rivet mandrel / break-off shaft: Stainless steel A2 (1.4541)

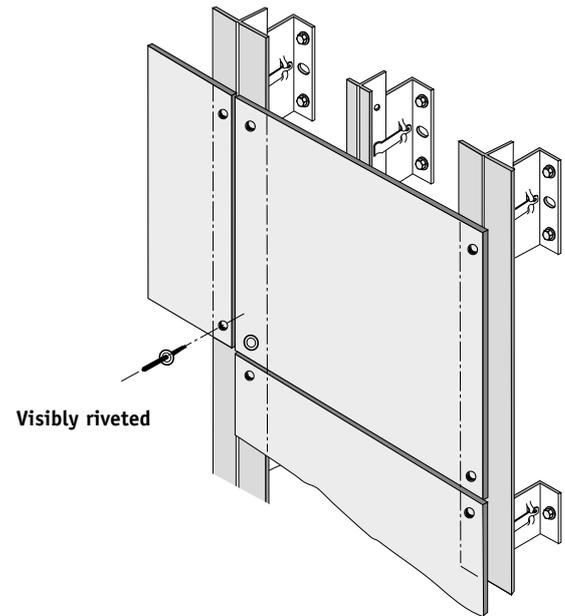
Painting: Two-component paint, light-fast, available in the colour tones of the square cladding panels colour range

Holes for fixed points: 5.2 mm

Holes for sliding points: 8.5 mm

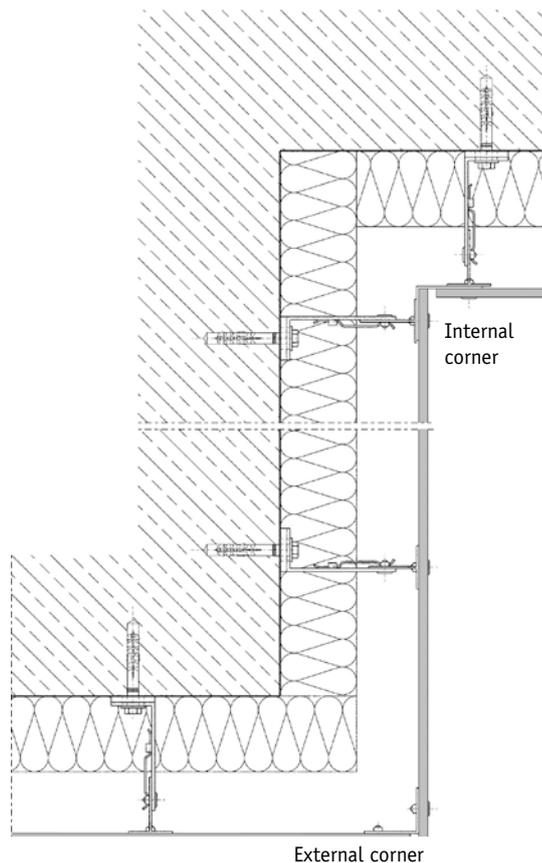


Blind rivets of aluminium / stainless steel with break-off shaft design



①

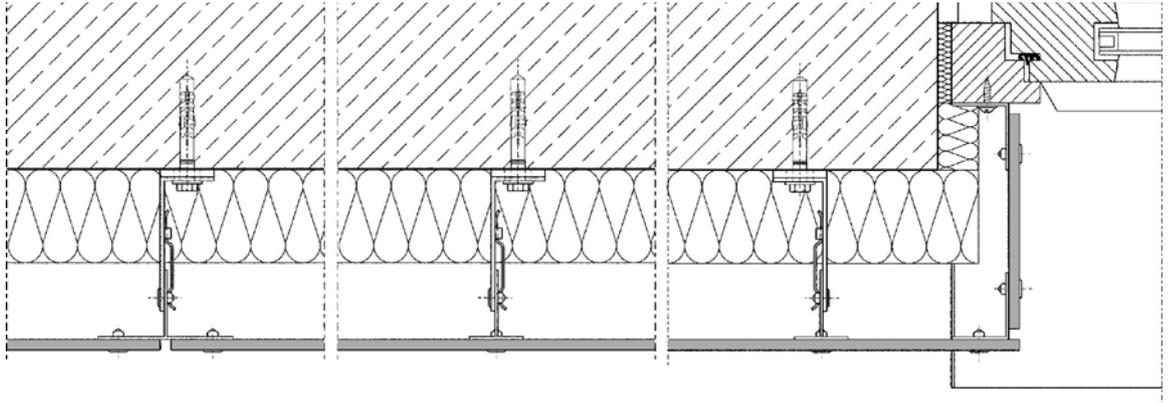
Horizontal section Building corners



square Visible Fastening to Aluminium

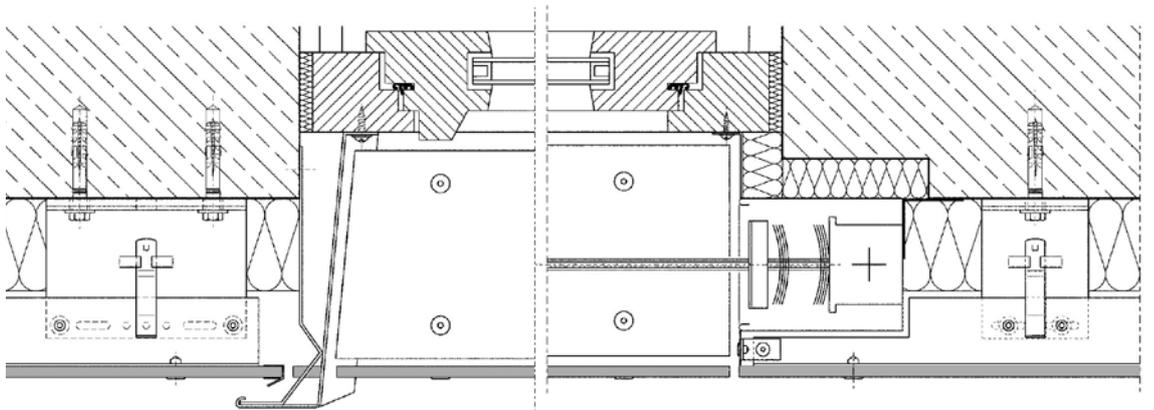
2

Window reveal



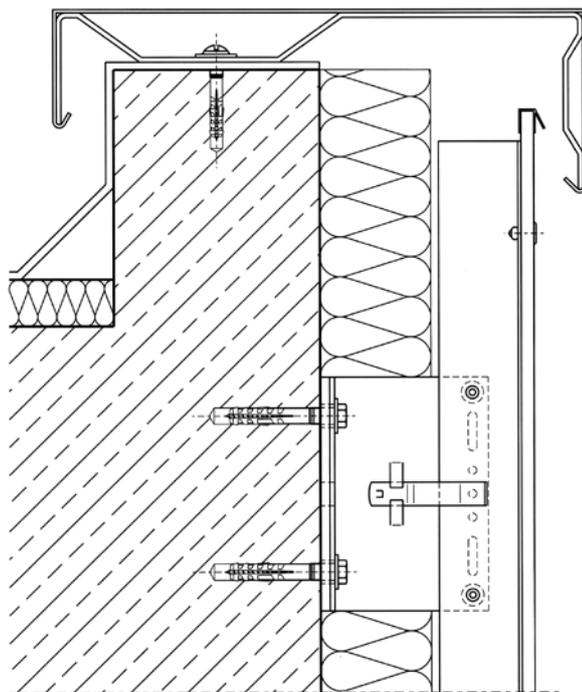
3

Vertical section
Window detail



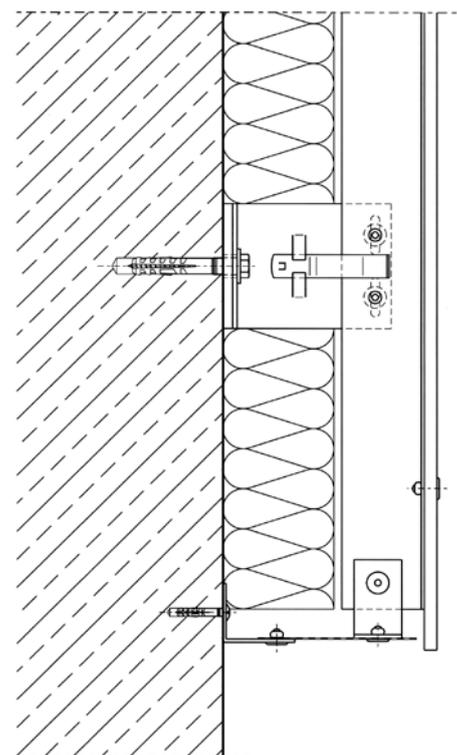
4

Parapet
termination



5

Baseboard
termination



square Hidden Fastening

29. Gluing

Façade adhesive systems are adhesive systems for hidden installation of façade panels onto wood or aluminium sub-frameworks. The system consists of a permanently elastic adhesive, double-sided installation tape for fastening the panels and corresponding products for pre-treatment of both the backs of the square cladding panels and the sub-framework.

System features

- ✓ Single-component, ready-to-apply adhesive, meaning simple and reliable application
- ✓ Weather- and ageing-resistant
- ✓ Elastic, movement-absorbing connection
- ✓ Economical, efficient installation
- ✓ Aesthetic façade surfaces
- ✓ No rust or dirt streaks
- ✓ Manufacturing according to DIN ISO 9001
- ✓ Uniform tension distribution over the entire panel

Applications

Fastening of back-ventilated façade panels in the following areas: Residential and commercial buildings, new buildings and renovations, interior design

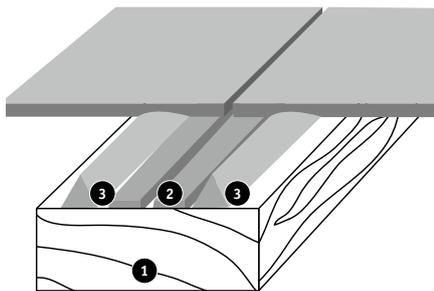
Panel size: 3650 × 1320 mm

Minimum thickness: 8 – 12 mm

1 Hidden, glued fastening onto wood sub-framework

To date, no building authority approval exists for wood sub-frameworks, which limits the possibilities to applications that do not require approval (up to 8 m building height).

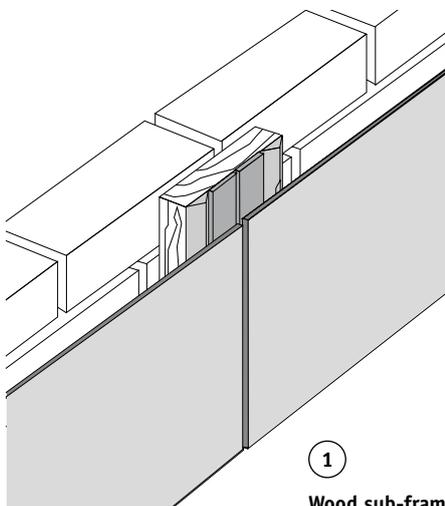
The sub-framework consists of spruce or fir, planed, max. wood moisture 15 % according to DIN 1052. The bonding surface must be untreated and free of surface treating agents.



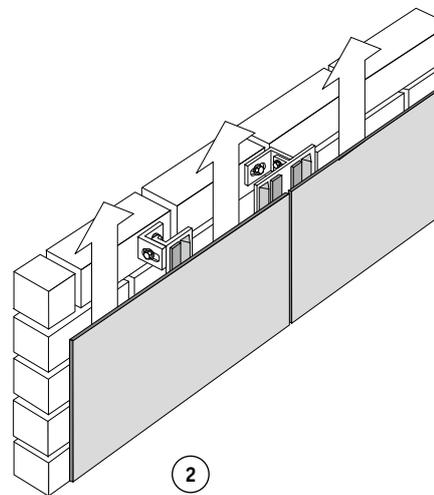
- 1 Wood sub-framework
- 2 Adhesive tape
- 3 Adhesive application

2 Hidden, glued fastening onto aluminium sub-framework

The bonding technology can be used for building heights up to 22 m according to the building authority approval. The allowed adhesives are high-quality, elastic polyurethane adhesives that cure in contact with air moisture. The product specifications and processing instructions of the adhesive manufacturer must always be followed. The aluminium sub-framework must satisfy both DIN 1748-1 and the requirements of the building authority approval.



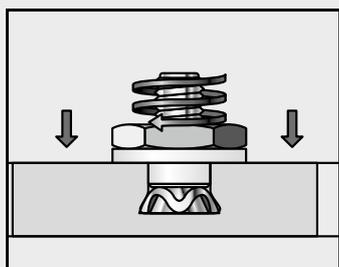
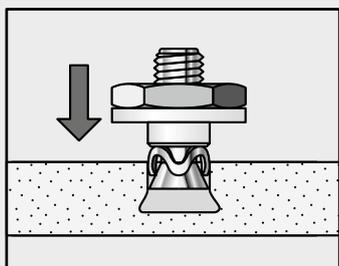
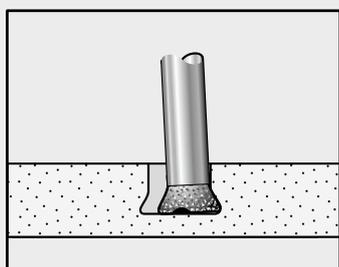
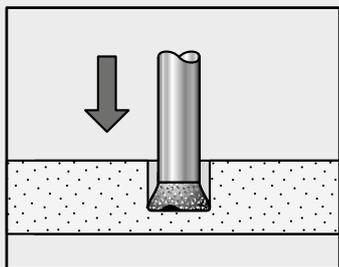
1 Wood sub-framework



2 Aluminium sub-framework

30. Fastening with hangers and anchors

Hole creation / anchor installation



System description

Hidden fastening of square cladding panels is possible with metal hangers on the back side of the panel using undercut rivet anchors.

The Fischer Zykon panel anchor FZP-II-T fastening system is approved for use with square cladding panels according to building authority approval ETA-13-0137.

Advantages / benefits

- ✓ No fastening elements visible from the front
- ✓ Anchoring without the use of expansion pressure
- ✓ Easy push-through installation with blind rivet technology
- ✓ No outline punch hole in framework necessary
- ✓ Large panel formats possible
- ✓ High retention forces
- ✓ Optimal long-term properties
- ✓ High level of prefabrication under factory conditions
- ✓ Typical aluminium sub-frameworks available on the market may be used

Applications

Fastening back-ventilated façade panels for residential and commercial buildings.

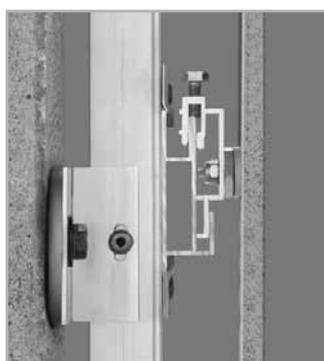
Panel size: max. 1000 mm × 1900 mm

(Must be fastened with at least 4, no more than 6 individual hangers.)

Thickness: 8, 10, 12 mm



Anchor in the square cladding panel



square cladding panel mounted to sub-framework with FZP-II-T

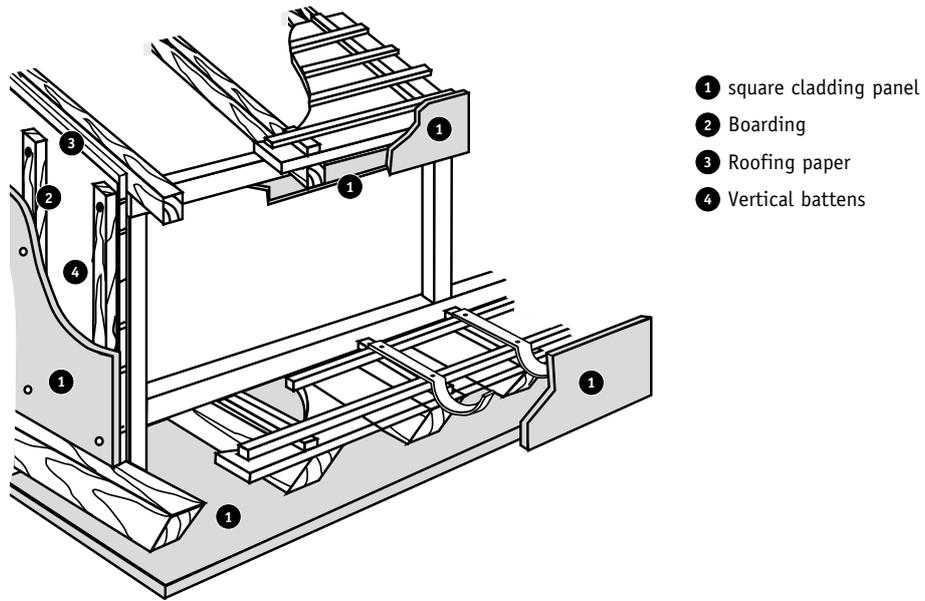
square Roof and Parapet Terminations

31. Roof and parapet terminations

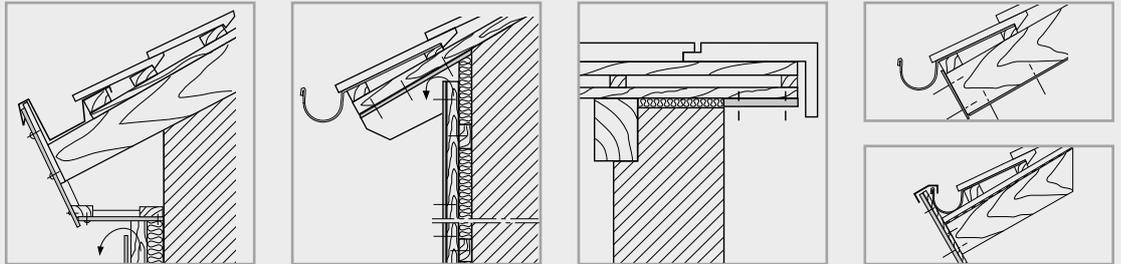
In the roof area, square cladding panels offer particularly practical solutions for lasting protection against weathering influences. The following can be covered easily and quickly with square cladding panels:

- ✓ Dormer sides
- ✓ Eaves
- ✓ Roof undersides
- ✓ Fascia
- ✓ Flat roof edging
- ✓ Soffits
- ✓ Verge flashing
- ✓ Tops of masonry walls

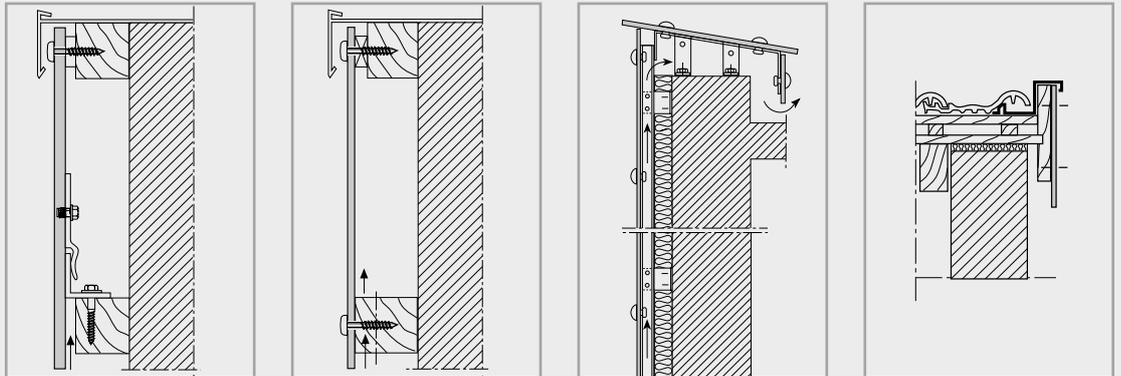
square cladding panels as panelling for eaves and dormer sides



Fascia and roof underside



Verge

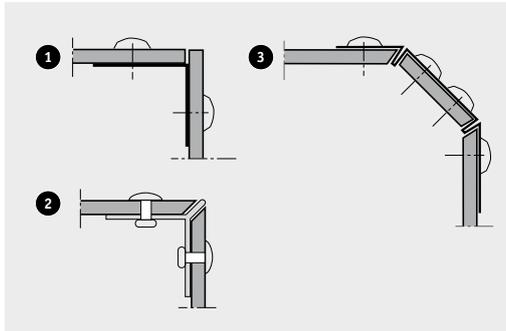


square Connection Details

32. Connection details

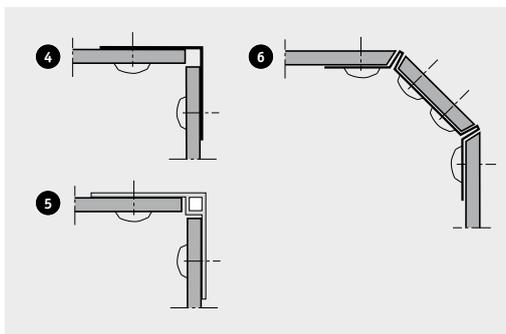
Suitable connection profiles are available from the companies listed on page 22. A few application examples are given below.

1 External corners



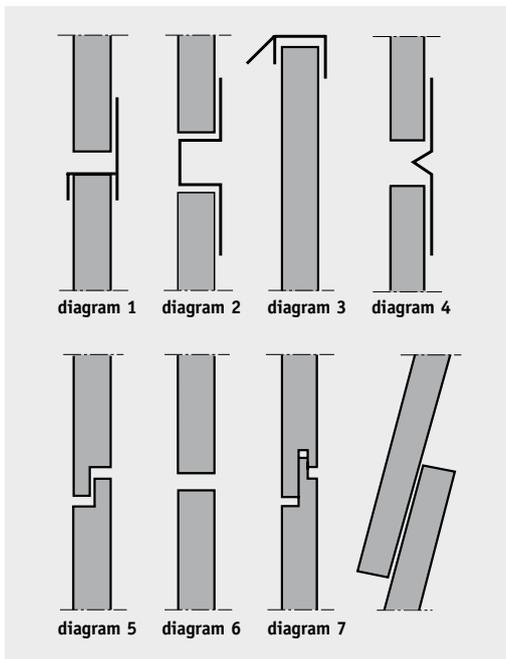
- 1 External corner, butt joint, with 100 mm jointing tape, angled, visible fastening.
- 2 External corner, mitre joint with aluminium profile, hidden fastening, thickness 10 mm.
- 3 Segmented external corners with rolled metal intermediate profile.

2 Internal corners



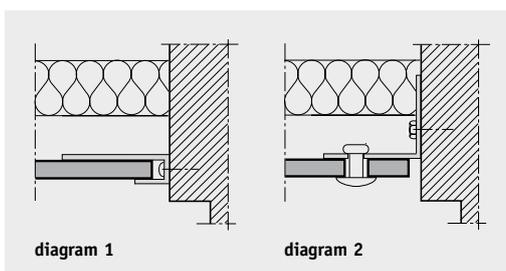
- 4 Internal corner, visible fastening on wood or aluminium sub-framework, angled with 100 mm jointing tape.
- 5 Internal corner, visible fastening to internal corner profile.
- 6 Segmented inside corner with rolled metal intermediate profile.

3 Horizontal joints



- The cut edge does not have to be sealed (painted).
- Rain-proof horizontal joint for wood sub-frameworks with PVC or aluminium jointing profile.
Important: Observe the required play! (diagram 1)
- Rain-proof horizontal joint with non-overlapping aluminium jointing profile (diagram 2)
- Horizontal panel termination – e.g. under window sill – with rain-deflecting profile. For wood sub-frameworks (diagram 3).
- Backing of joint with reinforced profile (diagram 4).
- Rain-proof execution of the horizontal joint with overlapping panel edges.
Important: Observe the required play of 5 mm! (diagram 5).
- Open panel joints! Permitted with aluminium sub-framework and functional back-ventilation (diagram 6).
- Joint with milled tongue on 10 mm square cladding panel (diagram 7).

4 Wall connection joints



- Window termination with aluminium or PVC-U profile: Minimal fitting required, saves space (diagram 1)
- Connection joint with aluminium angle (diagram 2)

33. Supplier Addresses

A selection of addresses can be found below.

1. Aluminium sub-framework systems

BWM Dübel + Montagetechnik GmbH

Ernst-Mey-Straße 1
D-70771 Leinfelden-Echterdingen
Phone +49 (0) 711/90 31-30
Fax +49 (0) 711/90 31-320
E-mail info@bwm.de
www.bwm.de

Montaflex Aluminiumprofile + Bauartikel GmbH

Am Hafen 36
D-38112 Braunschweig
Phone +49 (0) 531/210 22-0
Fax +49 (0) 531/210 22-20
E-mail info@montaflex.de
www.montaflex.de

2. Connection profiles / jointing tape

Protektor UK Limited

Systems House
Frederick Road
Hoo Farm Industrial Estate,
Kidderminster, Worcestershire
England, DY11 7RA
Phone +44 (0) 15 62/51 52 00
Fax +44 (0) 15 62/51 51 16
E-mail sales@protektor.co.uk

3. Anchors / dowels

fischer fixings UK Ltd.

Whitely Road
Oxon OX10 9AT Wallingford
Phone +44 (0) 14 91 82 79 00
Fax +44 (0) 14 91 82 79 53
E-mail info@fischer.co.uk
www.fischer.co.uk

Hilti (Gt. Britain) Limited

1 Trafford Wharf Road
Trafford Park
Manchester | M17 1BY
Phone: 0800 886 100 (Freephone)
Fax 0800 886 200 (Freefax)
E-mail gbsales@hilti.com

4. Hidden fastening systems for square cladding panels

fischer fixings UK Ltd.

Whitely Road
Oxon OX10 9AT Wallingford
Phone +44 (0) 1491 82 79 00
Fax +44 (0) 1491 82 79 53
E-mail info@fischer.co.uk
www.fischer.co.uk

5. Visible fastening systems for square cladding panels

MBE GmbH

Siemensstraße 1
D-58706 Menden
Phone +49 (0) 23 73/17 43 00
Fax +49 (0) 23 73/17 43 01 1
E-mail info@mbe-gmbh.de
www.mbe-gmbh.de

6. Adhesives for bonding to wooden or aluminium sub-frameworks

MBE GmbH

Siemensstraße 1
D-58706 Menden
Phone +49 (0) 23 73/17 43 00
Fax +49 (0) 23 73/17 43 01 1
E-mail info@mbe-gmbh.de
www.mbe-gmbh.de

Sika Ltd.

Watchmead
Welwyn Garden City
Hertfordshire AL7 1BQ
Phone +44 (0) 17 07 39 44 44
Fax +44 (0) 17 07 39 01 04
www.sika.co.uk

Continued
33.
Supplier
addresses

7. Processing tools / hand-held circular saws

Tooltechnic Systems GB Ltd.

Saxham Business Park, Saxam

Bury St. Edmunds

IP28 6RX Suffolk

Great Britain

Phone +44 (0) 12 84 76 07 91

Fax +44 (0) 12 84 70 21 56

E-mail info@festool.co.uk

www.festool.co.uk

8. Graffiti removal

Graffiti-Ex

Adolf Würth GmbH & Co. KG

Reinhold-Würth-Straße 12-17

D-74653 Künzelsau-Gaisbach

Phone +49 (0) 7940 15-0

Fax +49 (0) 7940 15-1000

E-mail info@wuerth.com

www.wuerth.com

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