

GAJCladding V-Shield

INSTALLATION MANUAL - v6.5



GAJ CLADDING

FOCUSED FOR OVER 20 YEARS

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Introduction

About GAJCladding V-Shield

V-Shield™ panel system provides you the excellent properties of the fiber cement that are ideal for high-quality and aesthetic façade solutions, modern and designer arrangements, and top level exterior architectures. Let yourself be inspired with our products and present your vision through our endless variations of this single material.

Advantages of GAJCladding V-Shield

- Maximum protection against weather
- Excellent longevity, 15 years of finish warranty
- Light weight and easy for on-site application, and easy installation in any climate
- Almost no maintenance required
- High quality panel finish in strictly controlled environment, no cracks, paint or sealant problems
- High sustainability
- Non combustible



Inspection, Proper Handling and Storage

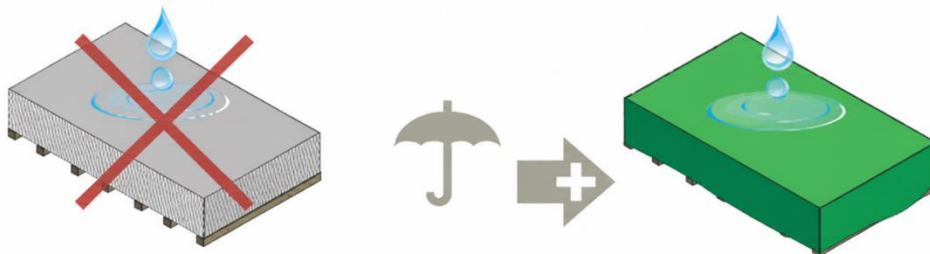
Product Inspection

Please carefully inspect all products before installation, whether they are damaged during transportation or have irregular surface products. Should you have a question or problem with your order, contact your local dealer or GAJCladding Customer Service.

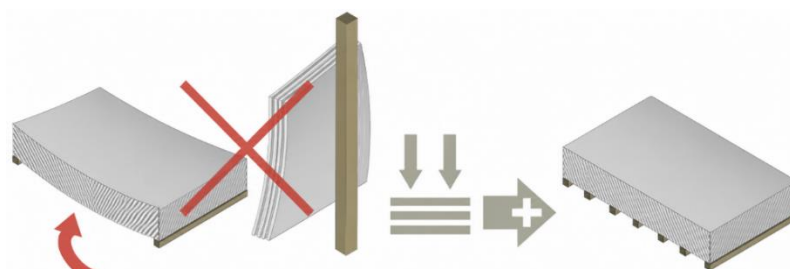
Storage

All panels must be stored flat on pallets or suitable sleepers, under a roof and in dry conditions, protected from rain, direct sunlight, and other weather influences. Panels must also be protected from potential damage or contamination caused by other trades.

Panels must be kept dry at all times. If temporary outdoor storage is unavoidable, the pallets must be protected with a suitable waterproof cover while allowing sufficient ventilation to prevent moisture accumulation and condensation.



Store panels on a flat, level, and dry surface, with adequate support to prevent bending or deformation. Provide a minimum clearance of 300 mm between adjacent stacks on all sides to allow sufficient ventilation and access.



Do not deliver panels to the building site unless they can be installed immediately or transferred to a suitable, dry, and well-protected storage area. Panels should not be exposed to prolonged outdoor conditions before installation.

Maximum stacking height: Each pallet stack must not exceed 1,000 mm (40") in height. A maximum of three pallets may be stacked in the warehouse, while a maximum of two pallets may be stacked on the building site. Pallets must be aligned and supported evenly to ensure stability.

For pre-cut and pre-drilled panels, it is recommended that pallets be arranged according to the installation sequence identified by the manufacturer or prefabricator. This can help minimize handling and improve installation efficiency.

Pallet Transportation and Moving

Pallets containing panels must be moved using suitable mechanical lifting equipment, such as a forklift or crane. Manual lifting of a complete pallet is not permitted.

When using a forklift, use forks with a sufficiently wide setting and adequate load capacity to provide stable and even support for the pallet. Avoid concentrated loading or contact between the forks and the panels.

When using a crane, use wide, suitable lifting straps or other approved lifting equipment with sufficient load capacity. Lifting equipment must be positioned to keep the pallet stable and prevent excessive pressure on the panels.

Pallets must be securely restrained during transportation to prevent shifting, tipping, or movement that could damage the panels, edges, or finished surfaces. Restraints must not be tightened excessively against the panels.

During transportation, pallets and panels must be protected from rain, direct sunlight, and other weather influences. Use a suitable waterproof cover where necessary, while allowing adequate ventilation to prevent moisture accumulation and condensation.

Inspect the pallets and panels after transportation and before unloading. Any damaged

packaging, pallets, or panels should be identified and inspected before installation.

Proper Handling

Always lift panels off one another. Never slide or drag panels over each other, as this may scratch or damage the finished surface.



Panels must be lifted and carried by two people, with each person positioned along a long edge of the panel. Do not lift or carry panels from the short edges, as this can cause excessive bending and may result in hidden internal damage or micro-cracking.

When carrying a panel, keep it supported and handle it carefully to prevent damage to the visible surface, edges, and corners. Avoid impacts, twisting, or excessive bending during handling.

When temporarily resting a panel on its edge, lean it slightly towards its back edge to protect the visible front edge from damage. The use of soft, clean bearers is recommended to support the panel edge and minimize the risk of damage.



Basics

Panel Cutting

All GAJCladding V-Shield™ panels may be cut using a circular saw or jigsaw equipped with a suitable diamond-tipped blade. Panels may be cut using either hand-held or stationary cutting equipment.

Note 1. Cutting equipment must have a minimum rotational speed of 6,000 rpm. Use a suitable diamond-tipped blade designed for cutting fibre cement panels.

Note 2. The saw blade must enter the panel from the front face (finished surface). Ensure that the panel is adequately supported during cutting to prevent excessive vibration, bending, or movement.

Note 3. When using high-speed cutting tools, effective dust extraction must be used. Appropriate respiratory protection and other personal protective equipment should be used in accordance with local safety requirements.

Note 4. Cut only one panel at a time. Do not stack multiple panels and cut them simultaneously.

Note 5. The cutting depth should extend slightly beyond the full thickness of the panel to ensure a complete and clean cut.

Note 6. Avoid L-shaped cut-outs wherever possible. If an L-shaped cut cannot be avoided, pre-drill a hole at the internal corner of the cut-out before making the cuts. The hole should form a smooth radius (R) at the corner rather than a sharp internal corner. This helps reduce stress concentration and minimizes the risk of cracking during installation and subsequent service.

Note 7. After cutting, remove any loose fibers and dust from the cut edges and ensure that the exposed edges are properly treated or sealed in accordance with the GAJCladding installation requirements.

Panel Technical Data

Properties		Text Value
Apparent Density		1.57g/cm ³
Carrier Board Water Absorption		19.9%
Water Absorption after Coating		0.2%
Wet Rate		0.15%
Flexural Strength (Equilibrium Conditioning))		23.57MPa
Flexural Strength (Wet Conditioning)		18.5MPa
100 Freeze-Thaw Cycles Resistance	Physical Observations	Pass
	Flexural Strength Retention Rate	84.5%
50 Soak/Dry Cycles Performance		91.2%
Falling Ball Impact		Pass (10J)
Non-Combustibility		Class A
Thermal Range		-40°C to +80°C

Panel Drilling

Panel should face up, and use the drill bit that is fully hardened steel bit with a cutting edge to drill hole. Before drilling, carefully and clearly mark hole positions on the face of panel.

Note 1: One panel is drilled at one time.

Edge Treatment & Cleaning

After cutting and drilling the panel, the cut edges should be sanded and sealed with edge sealant. This reduces possibility of damage and improves panel edge performance.

Remove dust caused by panel cutting and drilling from the front side and backside of the panels with a soft brush/duster or a vacuum cleaner.

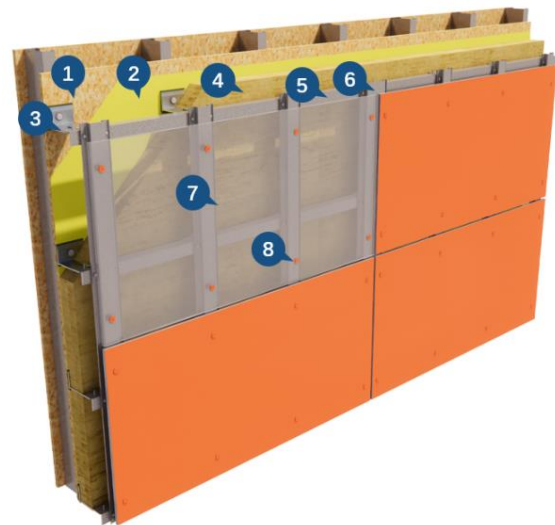
Apply GAJCladding Edge Sealant

Apply edge sealant simply run applicator along panel edges and holes. Ensure full coverage of edges and holes. Repeat this application if necessary

System Overview

Main Components

1. Exterior Wall
2. Vapor Barrier & Waterproof
3. Brackets
4. Exterior Thermal Insulation
5. Horizontal Rail
6. Vertical Rail
7. V-Shield Panel
8. Rivet or Panel Anchor



Principle

1. Metal Frame

Various metal framing systems can be used with the GAJCladding V-Shield™ system. The support frame shall be appropriately designed and installed to meet the project-specific structural requirements, applicable local building codes, and design loads.

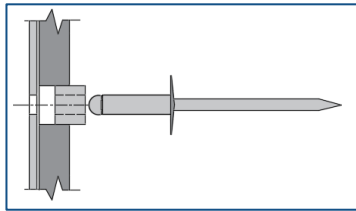
2. Ventilated Cavity

The main function of the ventilated cavity is to discharge water and excess heat. Use the pressure difference between the bottom and the top to make the air circulate naturally.

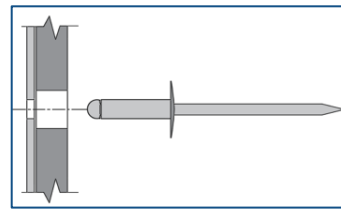
Cladding Height	Min. Cavity
<6m	20mm
6~15m	25mm
15~25m	30mm
25~50m	40mm
50~75m	50mm
75~100m	75mm
> 100m	100mm

Panel Fixing

Fixing & Gliding Point



Fixing Point



Gliding Point

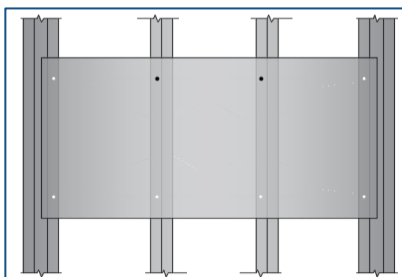
If using rivets to anchor panels, always stainless steel or galvanized steel rivets. Each panel must be fastened by 2 fixing fastening points in the panel center, installed first. All the others are gliding points.

Diameter of the anchoring point hole is 8mm or 10mm, and of the fixing point must use Rivet Sleeve.

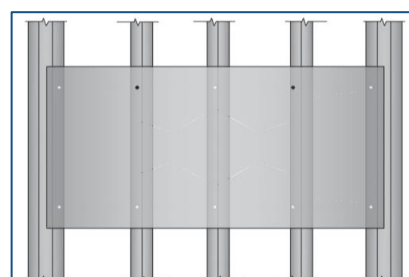
The gliding point connection is NOT meant to accommodate building drift or seismic movement.

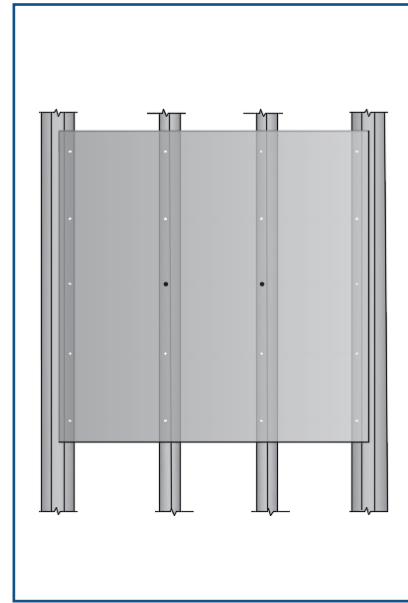
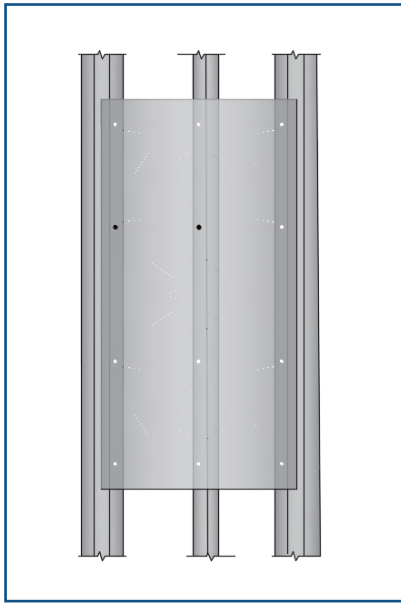
Two fixing points are required per panel, and they are always the same height in each panel, close to center of panel as possible, and then either the next adjacent point to the left or right. Be consistent in panel-to-panel location, center and left or center and right, so fixing points are at the same level horizontally for attachment to vertical rail. Between fixing points, the maximum distance can be 1 gliding point.

For



Example:

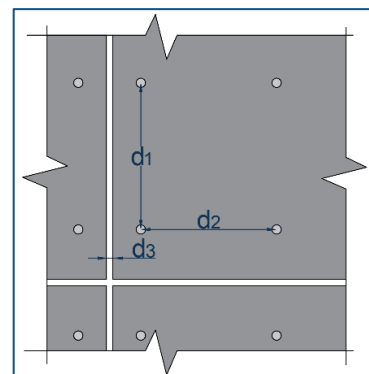
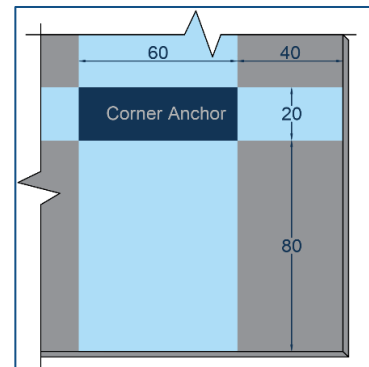




● Fixing Point ○ Gliding Point

Anchor Layout

- Corner anchoring point area
Horizontally: 40 ~ 100 mm
Vertically: 80 ~ 100 mm
- Panel joints
 d_3 : 5~10 mm
- Distance between anchors
Horizontally (d_2): 200 ~ 400 mm
Vertically (d_1): 200 ~ 450 mm
- Holes in panel for rivet
 $\varnothing$: 8 / 10 mm
- All rivets must be inserted perpendicularly to the panel surface and must not be under tightened, nor over tightened to restrain the free movement of the panel.
- To prevent distortion of the panel at mid anchoring points when fastening the panes,



foam tapes need to be placed around these mid anchoring points as a cushion on the rails.

- NOTE: When drilling or cutting occurs on project site, extra care and protection should be taken not to scratch the surface of the panel.

Project-Specific Engineering

For projects where the design wind load, building height, building location, façade configuration, fixing system, support-frame arrangement, or other project conditions differ from the standard application conditions, the fixing layout shall be verified by the project structural engineer or façade engineer based on the actual design wind loads.

The engineering calculation shall verify the adequacy of the panel, fixings, and support system under the applicable positive and negative wind pressures. The final fixing layout shall be documented in the project-specific engineering calculation or approved shop drawings.

Any fixing spacing, fixing arrangement, panel thickness, fixing type, or support-frame configuration that differs from the GAJCladding standard installation requirements must receive prior written approval from GAJCladding. Failure to obtain such approval may affect the validity of the product warranty.

Support Frame

1. General Requirements

The support frame is an essential part of the GAJCladding V-Shield™ rainscreen system and must be designed and installed to safely withstand all applicable structural and environmental loads.

The support frame, its connections, anchors, and fixings shall comply with the applicable local building codes and project requirements. The structural adequacy of the support frame shall be verified by the project structural engineer or other appropriately qualified professional.

The selection and design of the support frame shall take into account the building height, wind loads, substrate conditions, panel layout, insulation thickness, cavity depth, and other project-specific requirements.

2. Site Requirements

Before installation, the installer must inspect the substrate and support conditions to confirm that they are structurally sound, sufficiently flat and aligned, and suitable for installation of the cladding system.

Any significant deviation, damage, instability, or other condition that may affect the installation or performance of the cladding system must be reported to the project design team before installation proceeds.

The support frame must be installed accurately and securely, with the required alignment, spacing, and fixing arrangement maintained throughout the façade.

3. Structural Design

All components of the external cladding system, including the support frame, brackets, anchors, fasteners, and panel fixings, shall be designed in accordance with the applicable national and local building codes and project-specific structural requirements.

The design shall consider, as applicable:

- Design wind pressure, including positive and negative pressure;
- Building height and exposure conditions;
- Localized wind loads at corners, edges, and around openings;
- Dead loads and other applicable loads;
- Properties and condition of the supporting substrate;
- Strength and stiffness of the support frame;
- Capacity of brackets, anchors, and fasteners; and
- Required serviceability and permissible deflection limits.

Where required, project-specific structural calculations shall be prepared by the responsible structural or façade engineer.

4. Support Frame Layout

For the GAJCladding V-Shield™ system, vertical metal profiles are generally used as the primary panel support members. The support frame shall be arranged to provide continuous and adequate support for the required panel fixing locations.

The vertical arrangement of the profiles also helps maintain a continuous drainage and ventilation cavity behind the panels. The cavity should remain unobstructed to allow air circulation and drainage of incidental moisture.

The support frame layout and profile spacing shall be coordinated with the panel dimensions, fixing locations, insulation system, and project-specific structural requirements.

The maximum panel fixing spacing specified in the GAJCladding installation requirements must not be exceeded unless a project-specific engineering calculation has verified the proposed arrangement and GAJCladding has provided prior written approval.

5. Anchoring of the Support Frame

Secure anchoring of the support frame to the primary structure or supporting substrate is critical to the performance of the cladding system.

The type, size, quantity, spacing, and installation method of anchors shall be selected according to the substrate characteristics, design wind loads, bracket loads, and applicable building codes, and shall be verified by engineering calculations where required.

For existing or renovation buildings where the condition or load-bearing capacity of the substrate is uncertain, on-site pull-out testing or other appropriate verification methods are recommended before finalizing the anchor specification.

The anchor capacity must be adequate for the calculated design loads, with the applicable safety factors required by local regulations.

The installer must follow the anchor manufacturer's installation requirements, including minimum embedment depth, edge distance, drilling method, and installation torque where applicable.

Profile Specification

Wider profiles are used behind vertical joints between panels while a narrow profile is used as intermediate profiles in the middle of the panel. It is advisable to use a vertical profile that allows for tolerance and any discrepancy in component layout and installation dimensions.

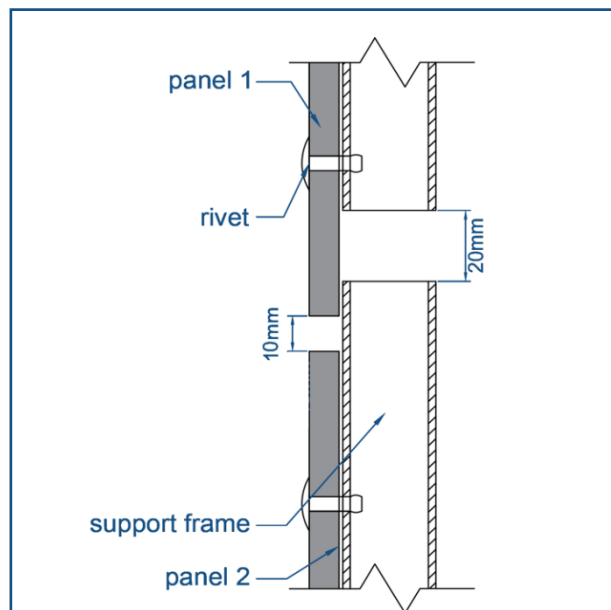
The values listed below are general recommendations and shall not be considered as final structural requirements. The profile size, material and thickness shall be verified by project-specific structural calculations based on the applicable design loads, span, fixing arrangement, substrate and other relevant conditions.

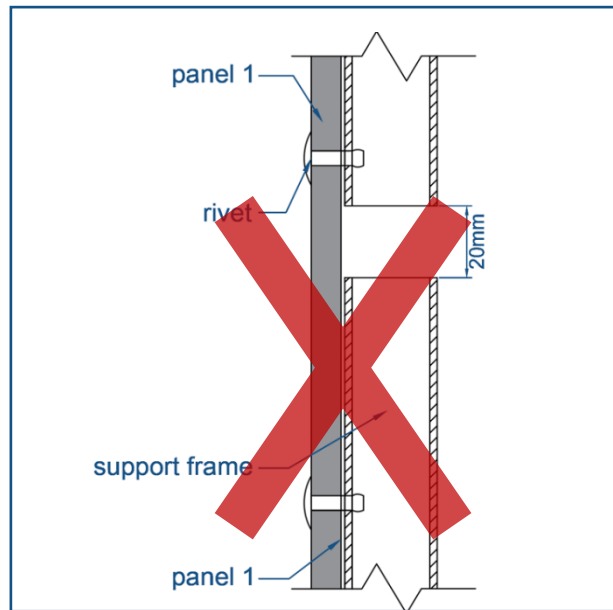
Minimum profile thickness	Aluminum	$\geq 2\text{mm}$
	Galvanized/stainless steel	$\geq 1.2\text{mm}$
Minimal depth of profile		$\geq 35\text{mm}$
Minimal width of intermediate profile		$\geq 40\text{mm}$
Minimal width of vertical joint profile		$\geq 90\text{mm}$

Recommended width of joint profile	$\geq 120\text{mm}$
Maximum buckle under influence of strain	$\leq \text{Span}/250$
Safety factor calculation of strength	3
Maximum length of vertical profile	6m
Movement joints between adjacent profiles	20mm
Maximum unsupported length from last bracket/anchor	250mm

Movement of Support Frame

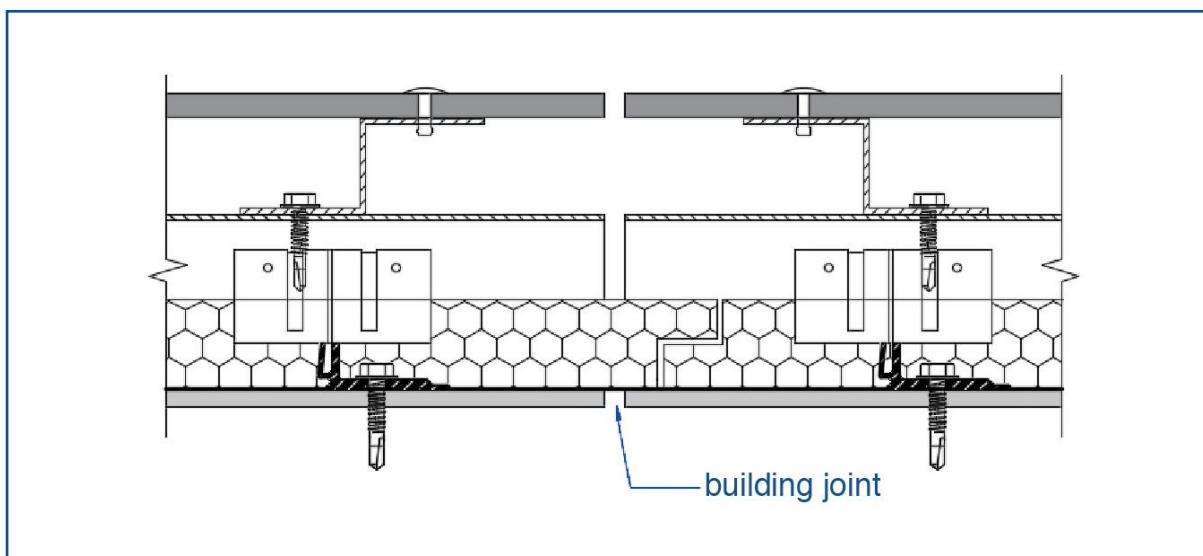
The movement in the profiles of panel support caused by expansion and contraction of the metal material needs to be taken into account while installing the profiles. A minimum 20 mm gap between profiles should be kept along the profile direction. A panel shall never be fixed on two separate profiles in the profile direction since the movement of the profiles may cause the cross-fixed panel to crack.

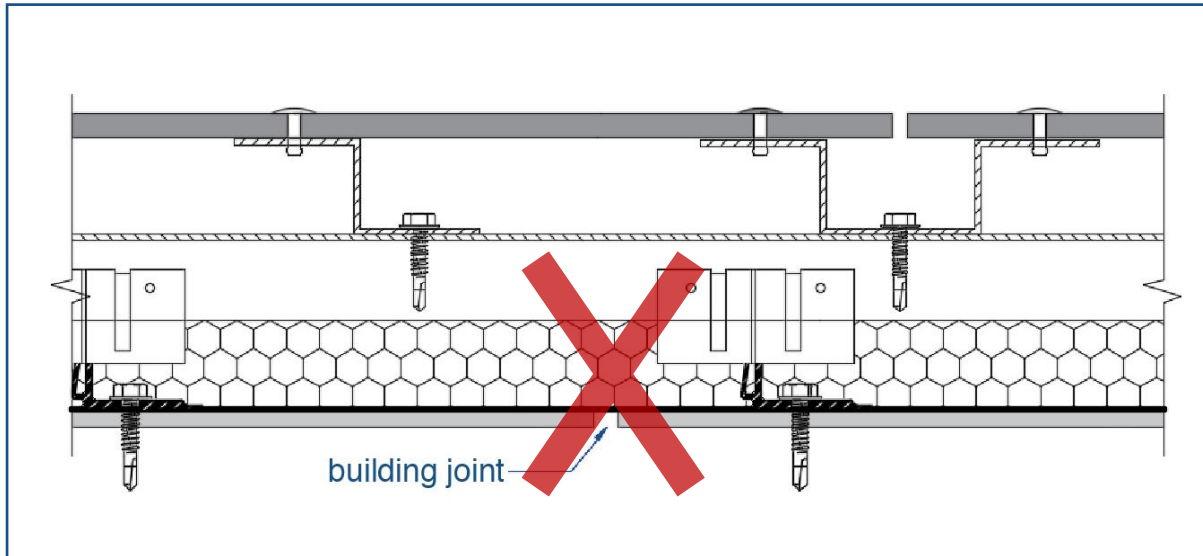




About Building Joint

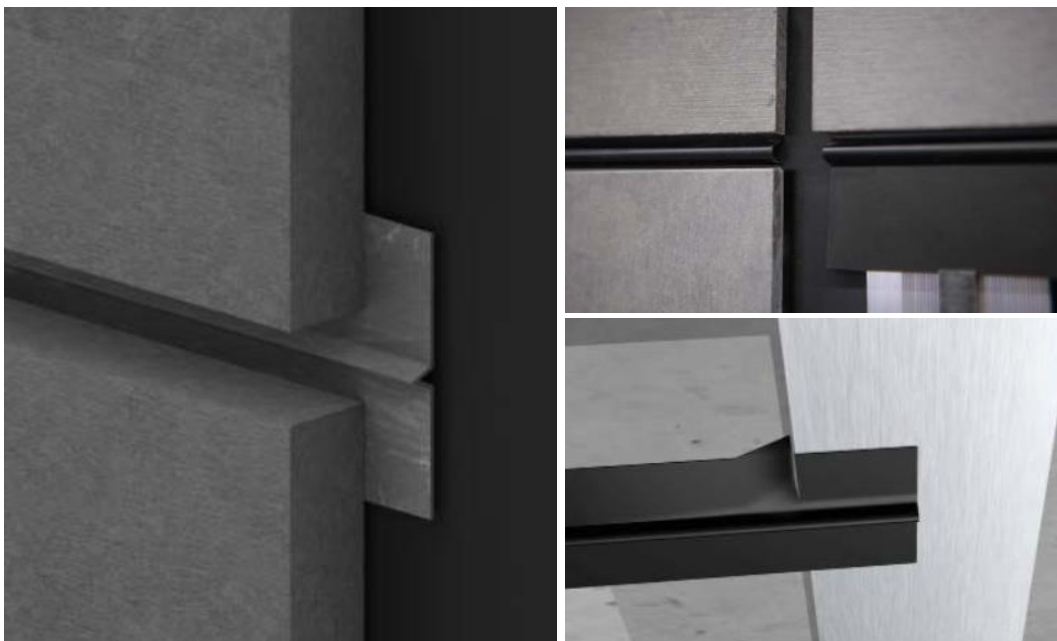
No panel or its supporting frame shall be installed across the building structural joints, and no panel shall be installed across its supporting frame along the frame's direction, vertically or horizontally.





About Panel Joints

V-Shield will be available in two panel seam designs, one open and one closed. For open joints, the weather-cavity thickness to be min. 40 mm. Substrate to be UV resistant and colored dark as it will be visible through the open joints. Closed Joint system eliminates open joints between panels. This system closed the joint by mounting the joint rail. The rain screen system still function as a back draining, ventilated rain screen but may reduce ventilation, because the closed joints don't allow bulk water to penetrate.



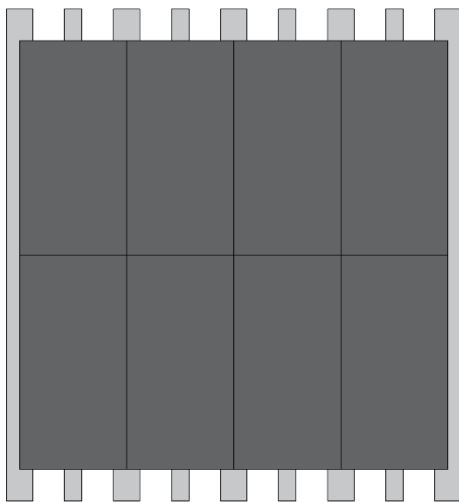
Panel Layout

One factor in the design of the support frame is wind load, and another important factor is the actual panel layout required by the architect. The panel layout can have a large impact on the number and type of profiles required for the project.

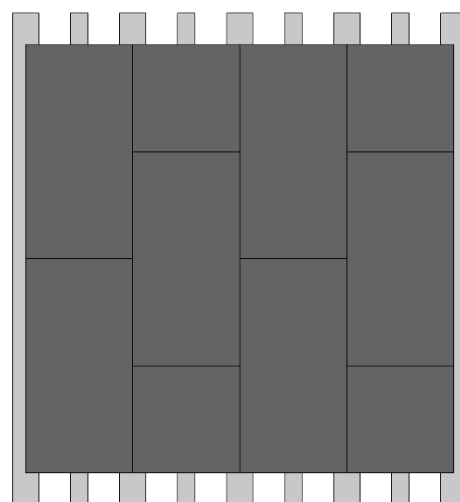
Other effects on the layout of the support frame include staggered panel joints or completely free patterns that use different sized panels in a random layout. These considerations may result in the use of different kinds of profiles.

Vertical Layout:

aligned grid pattern

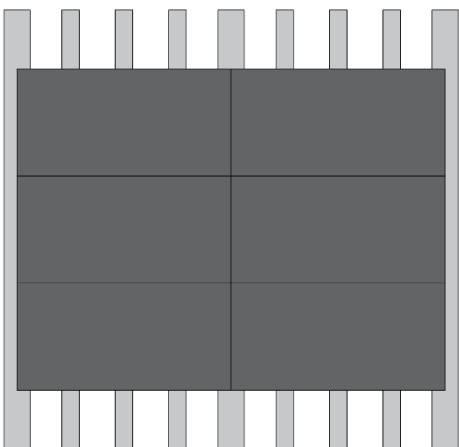


staggered grid pattern

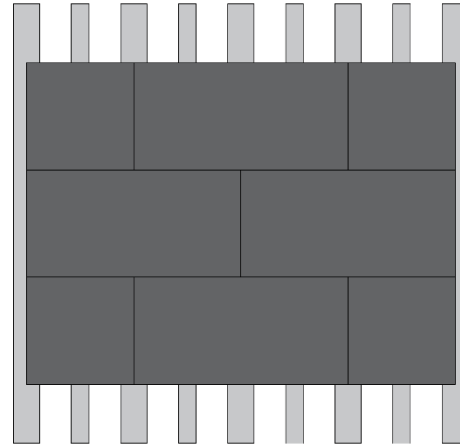


Horizontal Layout:

aligned grid pattern

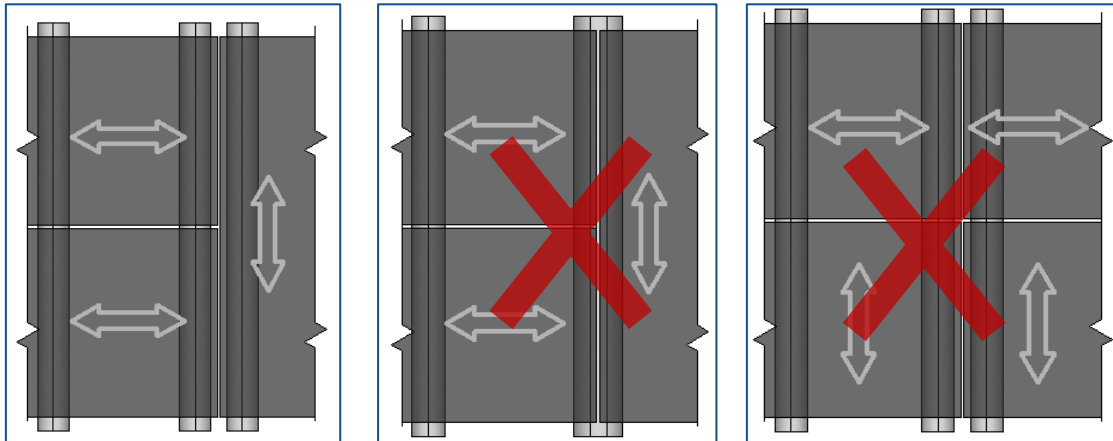


staggered grid pattern



The GAJCladding panel grain direction is along long side of the standard panel, and is marked on the protective film of the panel.

During the installation, all the arrows on the protective film of panels sharing the same supporting rail shall point in the same direction.

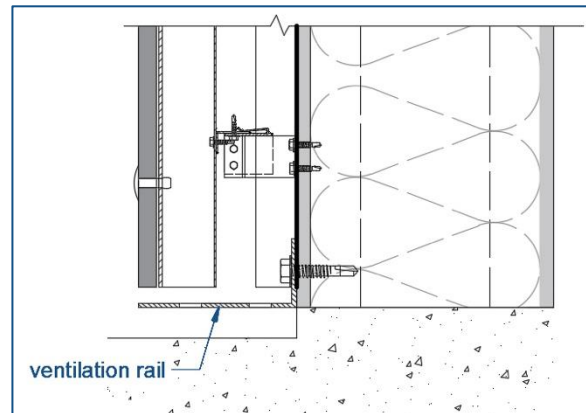


Vertical Panel Joints

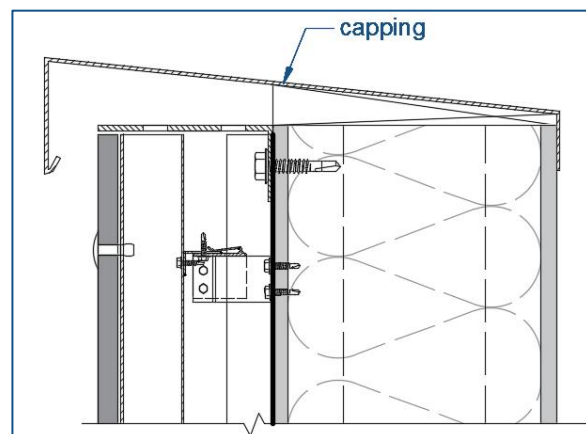
Vertical panel joints are usually backed with vertical supporting rails. If the light or silver color galvanized steel rail is used, the joints can be very eye-catching especially when the panel is coated with dark color. To black out the prominent vertical joints, the black UV light resistant wide foam tapes are usually used, or painting on the metal rails can be applied alternatively.

Accessories

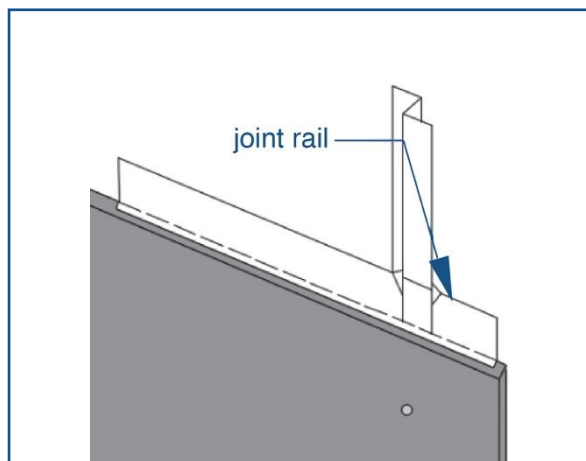
Ventilation Rail is a perforated profile rail. It is applied between the panel and the wall. This rail can allow air to enter the cavity space while preventing the entry of birds or vermin.



Capping is applied between front of the panel and the top of the ventilated cavity. The capping usually use with perforated profile rail, it can allow to enter the cavity space while preventing the entry of rain, birds or vermin.



Joint Rail is used to close horizontal joints. Normally, there are two types of panel joint between panels. Open joints in which there is a clear open gap between panels. Closed joints need joint rail.



Attention: The joint rail should be slid up under the panel, before final fixing of the lowest rivets on a panel. (The length of joint rail needs to be 2 mm shorter than panel length)

Top-Down Installation

There are many benefits to use the top-down approach for cladding panel installation, for examples, to prevent the installed façade from damaging by working on the scaffold, to reduce time needed to clean the façade installed, to minimize the chances of dirty panels, to use the supporting rail ensure the accurate panel joints, etc.

Major steps of working top-down approach are as follows:

Step 1. Starting at the top of the façade, measure, mark and align the top panel position on the supporting rails, then temporarily clamp a horizontal panel support across the vertical supporting rails. Place the top panel onto this support and position into its place. Adjust and secure the clamp into the position.

Step 2. Always fix the two central fixing points first to hold the panel, and then tighten the rest of sliding points, always from the center towards the edges. Note: if a horizontal joint profile is to be installed, do not fasten the bottom row fasteners at this moment.

Step 3. Place 10mm spacers before placing the next below panel. Make sure the spacers can be removed without causing panel damage.

Step 4. Measure down from bottom edge of the upper installed panel and mark the position of the next panel below it. Remember to add horizontal joint space, which is panel height plus spacer height (10 mm).

Step 5. Repeat the Step 1, 2, 3 and 4.

Remarks

Cleaning

There are two methods of cleaning panel, mechanical cleaning and chemical cleaning. In principle, perform the cleaning of the panel over the entire surface, because partial cleaning can result in color and tonal imbalance. Normal stains can be removed with a sponge and water. Warning High Pressure Cleaning is a rough treatment of panel. Use of a high-pressure cleaner may damage the surface. Therefore, high pressure cleaning is not recommended.

Impact by Pollution and Nature

Weather and nearby vegetation may affect the appearance of the panels. Take caution to avoid pollution, dust and leaves from trees, bushes and flowers to not impact the integrity of the panels. Excessive humidity, salts, or other chemical agents can corrode the panel and attack metal.

Special Information

THE INFORMATION OR DATA IN THIS SHEET SERVES TO ENSURE THE PRODUCT'S INTENDED PURPOSE OR ITS SUITABILITY FOR USE AND IS BASED ON OUR FINDINGS AND EXPERIENCE. NEVERTHELESS, USERS ARE RESPONSIBLE FOR ESTABLISHING THE SUITABILITY OF THE PRODUCT FOR ITS INTENDED USE. APPLICATIONS OTHER THAN THOSE EXPLICITLY MENTIONED IN THIS TECHNICAL DATA SHEET ARE ONLY PERMISSIBLE AFTER PRIOR CONSULTATION WITH CHONGQING GUANJIE QIZHONG BUILDING MATERIALS CO., LTD. WHERE NO APPROVAL IS GIVEN, SUCH APPLICATIONS ARE AT THE RISK OF THE USER. THIS APPLIES IN PARTICULAR WHEN THE PRODUCT IS USED IN COMBINATION WITH OTHER PRODUCTS. WHEN A NEW TECHNICAL DATA SHEET IS PUBLISHED, ALL PREVIOUS TECHNICAL DATA SHEETS ARE NO LONGER VALID. THE LATEST VERSION IS AVAILABLE ON THE INTERNET AT WWW.GAJCLADDING.COM.

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