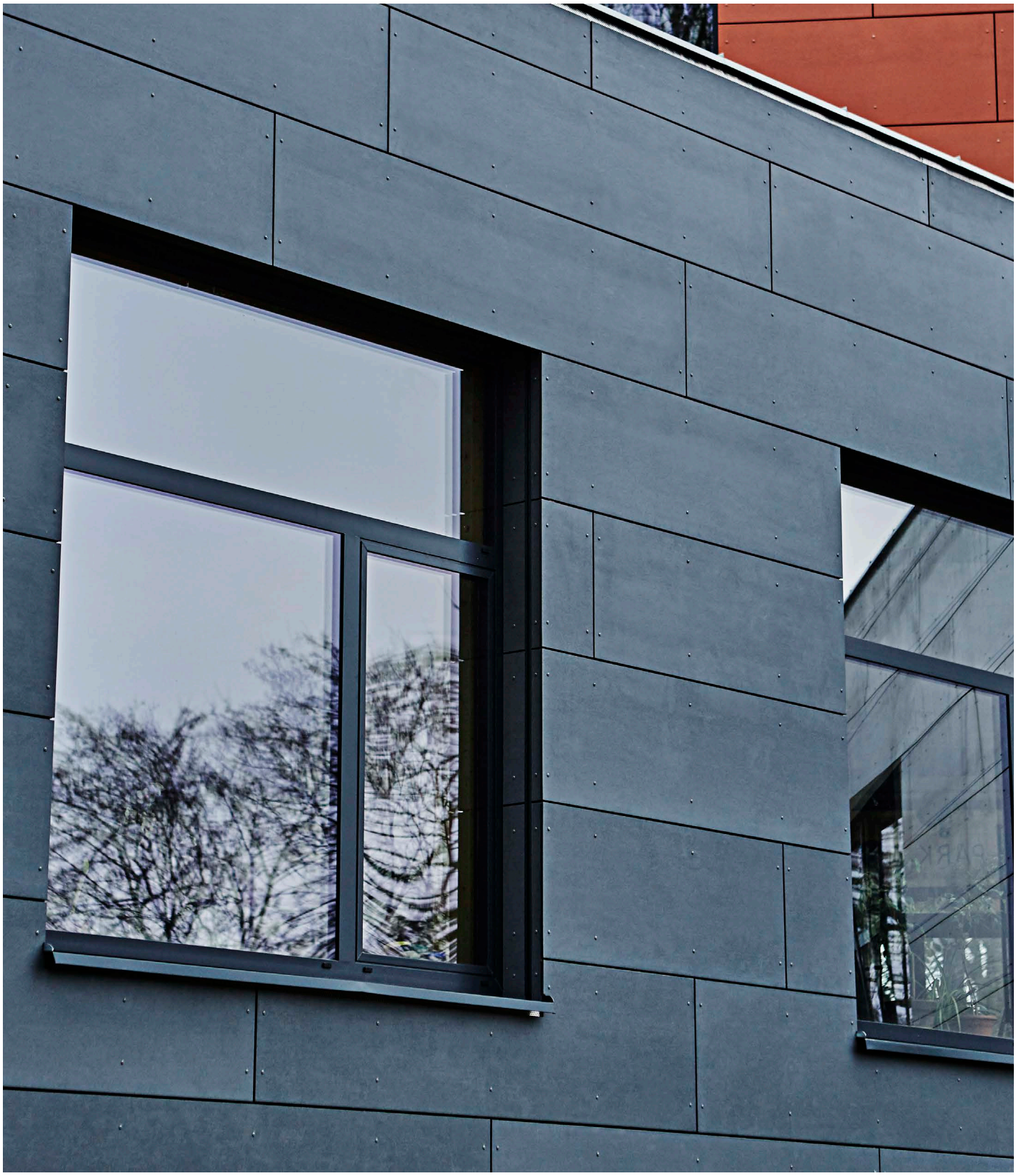
SWISSPEARL

DIM Design & Installation Manual North America

Facade on Steel – Swisspearl Patina NXT Design Line



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Swisspearl

Swisspearl
Swisspearl is a leading manufacturer of high-performance fiber cement building materials. These products provide durable, low-maintenance facade solutions for a wide range of architectural applications.

Swisspearl supports architects, contractors, and installers with technical guidance to ensure efficient design and installation.

Product Information
Swisspearl fiber cement is a modern building material manufactured from natural and environmentally responsible raw materials. With over 90 years of experience in fiber cement production, Swisspearl ensures consistent product performance and durability.

Swisspearl facade panels are suitable for use in ventilated facade systems and provide:

- Noncombustibility
- Weather resistance
- Impact resistance
- Acoustic performance

Quality
Swisspearl product specifications and classifications comply with EN 12467:2012 and 13501-1:2007+ A1:2009 and ASTM C1185/1186.

The facade range:
- is manufactured in accordance with the quality management system ISO 9001:2015
- complies with the provisions set out in the Construction Products Regulation (EU) No. 305/2011

Product warranty
Warranty conditions are available on request from your Swisspearl distributor or representative.

Note!
The following limitations exist for the Swisspearl Patina NXT design line
Do not use the following facade constructions: Sloped facade with deviation over 5 degrees from vertical, curved facade or non-ventilated facade.

Disclaimer
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The self-ventilating facade

A self-ventilated facade is a system that helps minimize temperature variations in the wall throughout the year. Sunlight and heat are partially reflected during summer conditions, and insulation behind the facade boards reduces heat loss in lower temperatures.

At the same time, natural ventilation within the system helps reduce condensation.

The self-ventilating facade has additional features and benefits.

The most important benefit is the protection of the underlying construction against weather, wind, and moisture. Some moisture passes through the facade, but it is limited to a level that can either be drained away or eliminated by natural ventilation.

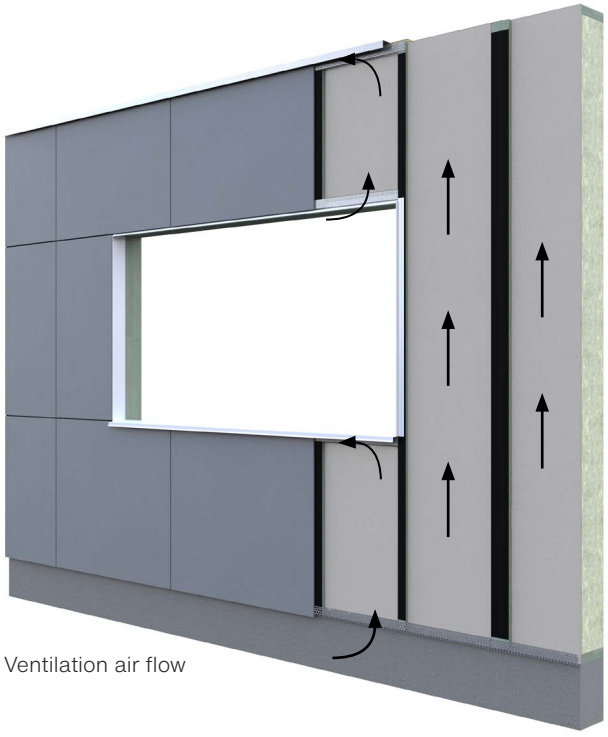
The drainage feature of the system works when rainwater or moisture penetrates through the gaps in the facade. The moisture runs down either the reverse of the facade boards, the windstopper, or the insulation. There should be ventilation openings at the base of the structure and above doors and windows. These openings will also help drain the water away from the construction.

The natural ventilation works by means of a chimney effect. The air enters at the bottom of the structure and on its way up through the facade takes moisture-laden air through the ventilation openings at the top of the structure or at window or door openings.

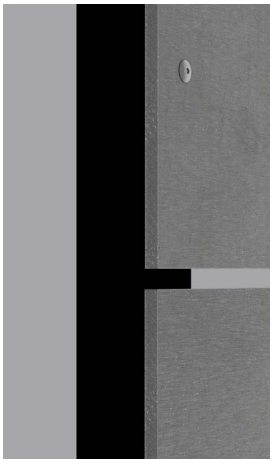
The boards can be installed with open horizontal joints or with joint profiles. Horizontal joints between boards contribute minimally to natural ventilation and therefore profiles can be used in these joints, if required.

Swisspearl recommends increasing the ventilation area behind the facade boards when installing facade boards on taller buildings. The table below shows the recommended minimum ventilation cavities behind the facade boards.

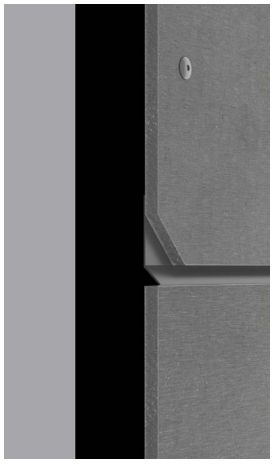
Cladding height	min. cavity
< 20'	3/4"
20' - 99'	1"
> 99'	1 3/4"



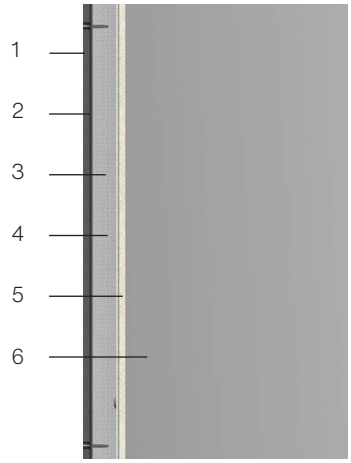
Ventilation air flow



Open joints



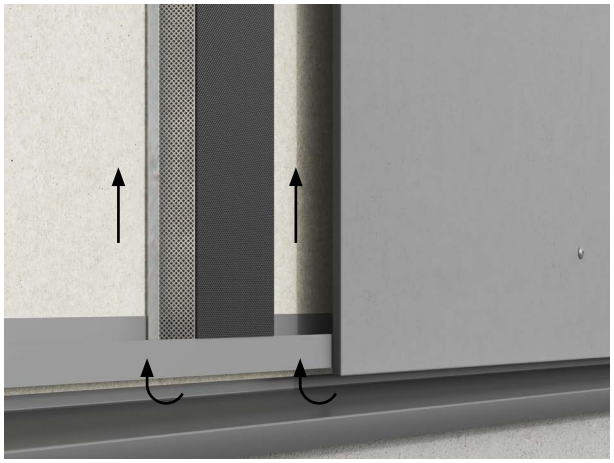
Joint profile



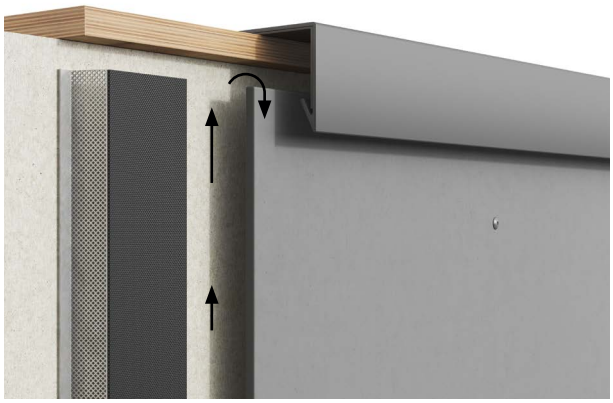
Steel construction on heavy wall
1. Swisspearl facade board
2. EPDM
3. Steel profile / Swisspearl VFL profile
4. Ventilated area
5. Swisspearl Windstopper
6. Load-bearing wall

The self-ventilating facade

Ventilated openings

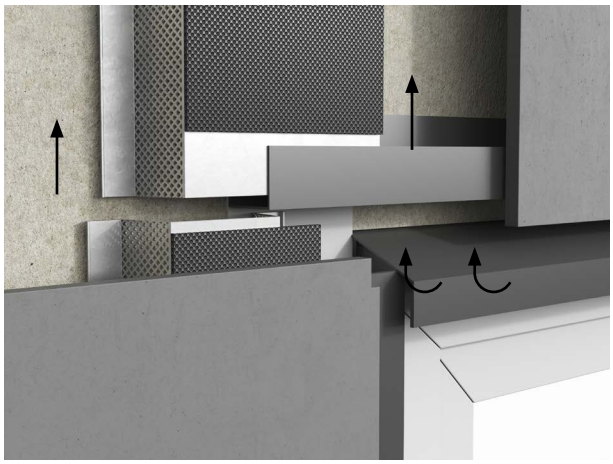


Ventilation at the base
Air is drawn into the construction through an opening at the base of the facade. Maintain unobstructed ventilation over the full height of the facade. A ventilation gap of minimum 3/4", or 9.45 in^2 per linear foot, is required. If steel, aluminum, or plastic perforated profiles are used, a minimum ventilation opening of 60% of the required ventilation area per linear foot must be provided. The base opening also serves to drain any moisture entering the facade.



Ventilation at the top of the facade
The passage of air must be maintained at the top of the facade where it meets a roof or other structure. As at the base, a ventilation gap of minimum 3/4", or 9.45 in^2 per linear foot, must be provided.

Ventilation under windows
A horizontal ventilation opening of minimum 3/4", or 9.45 in^2 per linear foot, must be maintained beneath windows or other openings with a sill. The ventilation gap is typically formed between the top edge of the facade boards and the bottom edge of the sill. The sill should project at least 1 1/4" beyond the face of the facade to prevent water runoff from entering the structure.

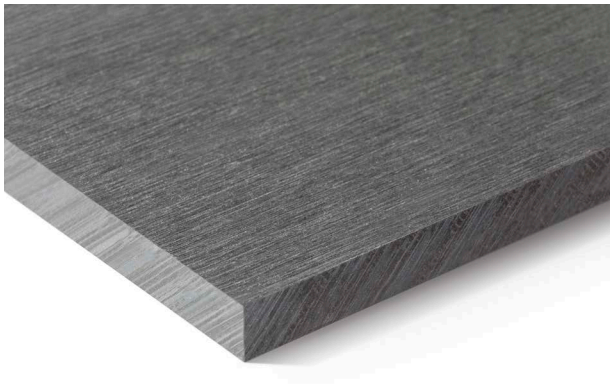


Ventilation above windows and doors
A horizontal free ventilation opening must also be maintained above windows and doors. The ventilation gap must be at least 3/4" wide. If steel, aluminum, or plastic perforated profiles are used, a minimum ventilation opening of 9.45 in^2 per linear foot is required. The opening also serves to drain any moisture that has entered the facade.

Product Range

The Swisspearl Patina NXT design line

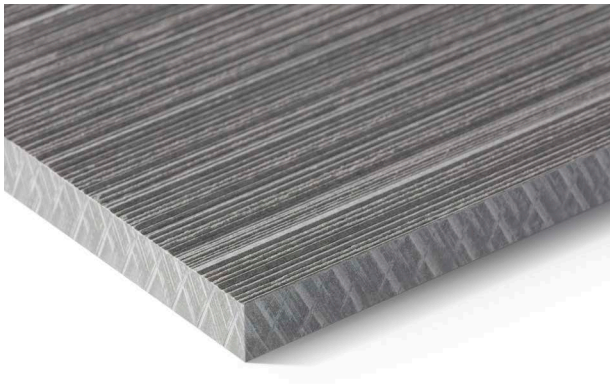
Swisspearl Patina Original NXT

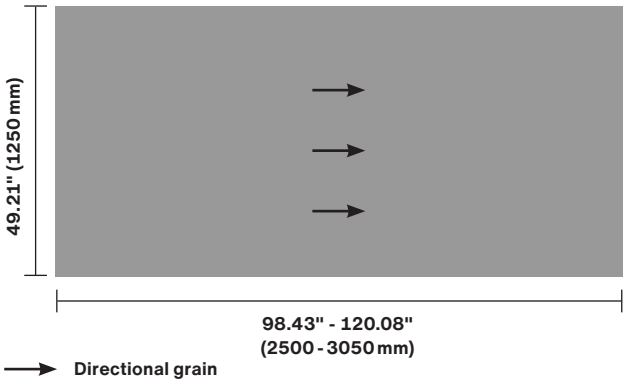


Swisspearl Patina Rough NXT

Swisspearl Patina Inline NXT

Swisspearl Patina Structure NXT





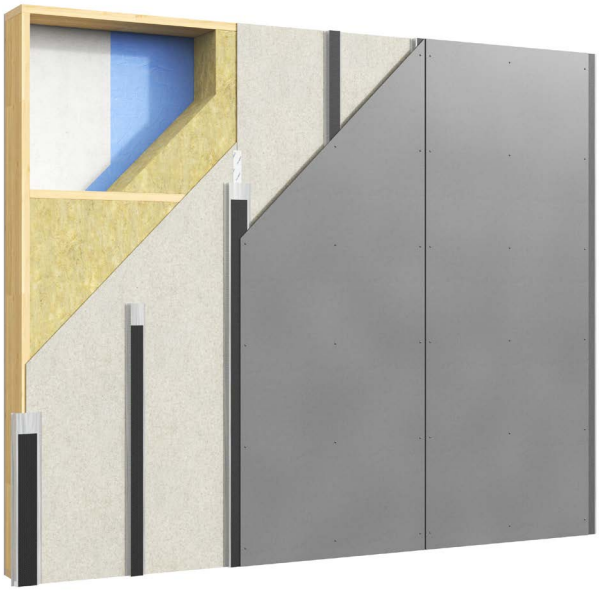
Directional grain
Swisspearl Patina NXT's manufacturing process gives the boards a unique surface texture. This unique finish is enhanced by a process which adds a directional grain to the board - leaving the boards with a different appearance depending on the lighting and the angle of the board. Rotating boards within the facade makes it possible to obtain a playful visual effect - depending on the viewer's position and the lighting conditions.

Quick facts	Type	Fire class	Thickness	Dimensions	Weight/ft²
Swisspearl Patina Original NXT Swisspearl Patina Rough NXT Swisspearl Patina Structure NXT	Through colored	A2,s1-d0 / ASTM E84 / ASTM E136	8 mm	49.21" x 98.43" (1250 × 2500 mm) 49.21" x 120.08" (1250 × 3050 mm)	2.87 lbs./ft² *
Swisspearl Patina Inline NXT	Through colored	A2,s1-d0 / ASTM E84 / ASTM E136	9.5 mm or 8 mm	49.21" x 98.43" (1250 × 2500 mm) 49.21" x 120.08" (1250 × 3050 mm)	3.28 lbs./ft² *

* Weights in this DIM are indicative only. Always refer to the Swisspearl Patina NXT datasheet for valid values.

Installation

Steel substructure



Light wall with vertical steel profiles

Light wall with horizontal steel profiles

Swisspearl facade boards can be installed on different types of steel profiles and support systems.

All drawings and descriptions in this manual are with the assembly of Swisspearl facade boards on hat steel profiles. Swisspearl Facade boards can also be installed on other types of steel profiles. If other types of profiles are used, then the overall installation principles both regarding the steel installation and the facade boards installation must be followed.

Swisspearl facade boards can be attached to a steel profile with Swisspearl facade rivets. Swisspearl recommends a minimum steel thickness of at least 0.04". Swisspearl facade boards must not be installed on steel profiles longer than 10 ft.

Profile installation
Profiles can be used on lightweight wall constructions or installed directly on a heavy wall. The hat profiles are perforated so that they can be installed both horizontally or vertically (see above). When installed horizontally, the perforated holes will allow the air to pass and this way the construction will still be ventilated behind the facade boards.

Attaching profiles to the wall
Fastening of hat steel profiles must be done with two fastenings at each fastening point. This is done to ensure that the profile will not twist (Fig. 1). For that reason, it will require horizontal structure for vertically installed profiles. Securing the profiles to the load-bearing wall must comply with all local standards and regulations as well as follow the manufacturers' recommendations. Before installing on a load-bearing wall, the installer should check to ensure that the wall is flat and true and that the support system can be mounted safely.

Fig. 1

To select the correct fastening solution for the profiles, the following must be taken into consideration.
- Fasteners must be compatible with the substrate.
- Corrosion resistance must be taken into account to be sure to use the correct types in relation to the surroundings.
- Wind load must be calculated or verified.

Based on these parameters, a fastening is then selected.

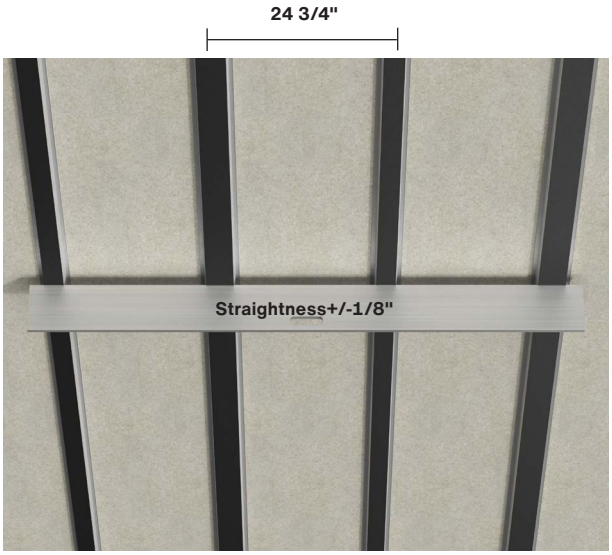
Installation

Steel substructure

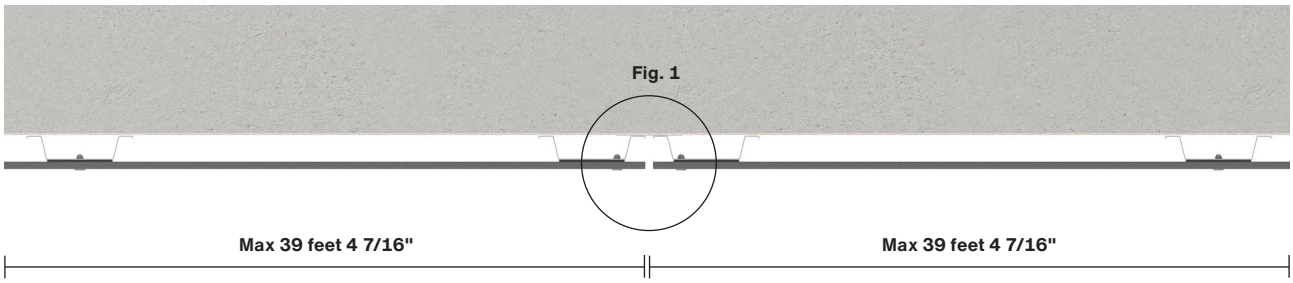
To ensure the optimum, long-term performance and aesthetic characteristics for Swisspearl facade boards, it is vital to ensure that the support system substructure is absolutely straight, horizontally and vertically. In order to ensure this, please follow the guidelines below.

Straightness of substructure
The horizontal tolerance is +/- 1/8" measured over a distance of 6'-6 3/4".

The vertical tolerance is +/- 3/64" over 23 5/8" measured over a distance of 6'-6 3/4".



Straightness of substructure

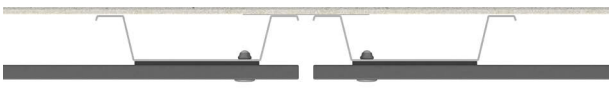


Movement joints
When installing Swisspearl facade boards using steel support systems over a large area, the movement of the facade boards and the support system must be taken into account.

Instead of using large hat profiles or Omega profiles at joints, use separate profiles to create a movement joint. This ensures that the two facade sections can move separately. These joints should be included every max 39 feet 4 7/16".

The movement joint gap (between the two facade sections) should be minimum 5/16" (Fig.1)

Fig. 1



Installation

Steel support system fixing

Fixing points (F) Sliding points (S)

Steel support system fixing and sliding points
Since steel expands and contracts due to climatic conditions, the steel profiles must be installed using both fixing points and sliding points. Fixing points secure the profiles in place, while sliding points allow the profiles to move vertically as the steel expands or contracts.

The fixing point should be positioned as close to the center of the profile as possible so that the profile can move in both directions. The example above illustrates a construction where the fixing points are positioned near the middle of the profiles.

If only two fasteners are used, the fixing point should be placed at the top of the profile. This allows the profile to move downward as expansion or contraction occurs.

All additional fasteners must be installed in the elongated holes in the flange of the profile (Fig. 2 sliding points). These fasteners must be positioned in the center of the elongated hole so that the profile can move in both directions (Fig. 2).

Facade boards may only be installed on profiles where the fixing points are aligned at the same level.

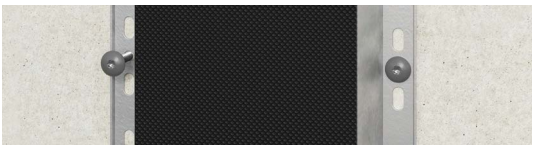


Fig.1. Fixing points: profiles are installed with fastener between the elongated holes

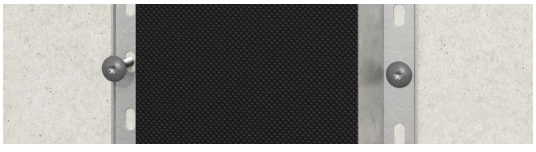


Fig.2. Sliding points: profiles are installed with fastener in the center of the elongated holes

Installation

Steel substructure

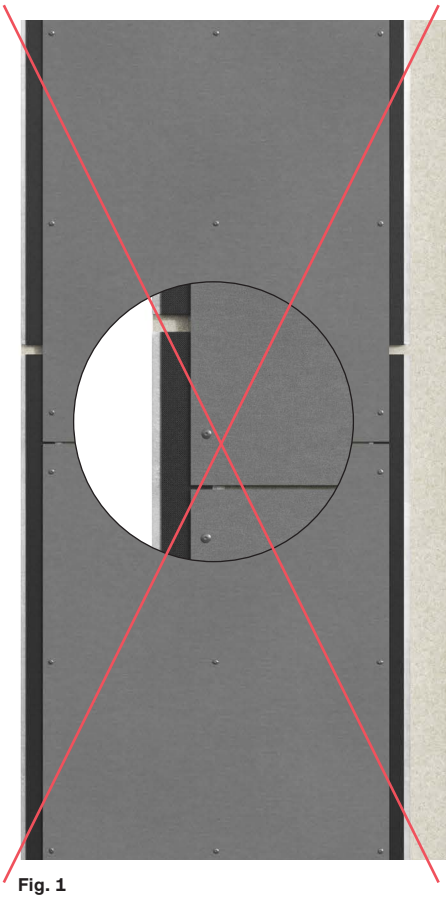


Fig. 1

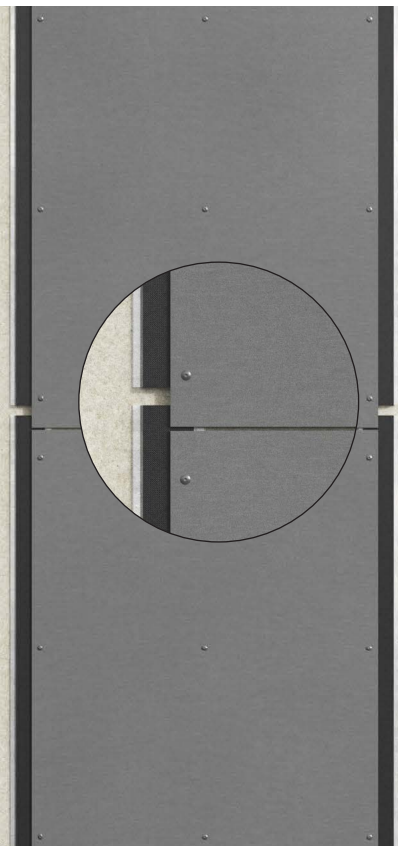


Fig. 2

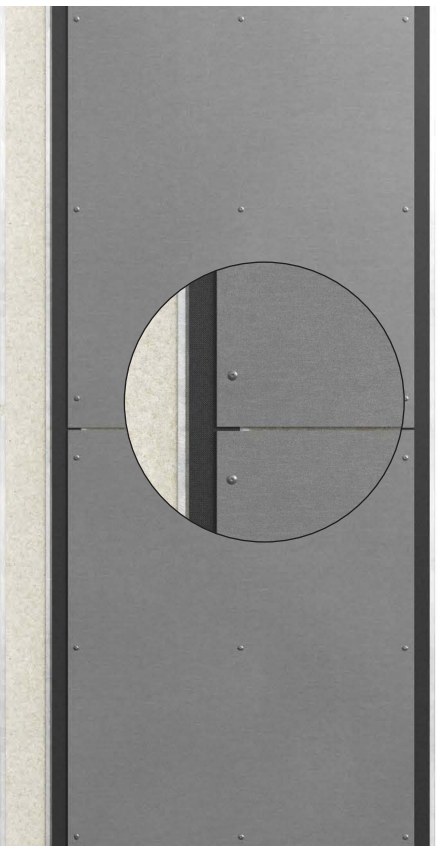


Fig. 3

Correct installation of the steel support system
Never install Swisspearl facade boards spanning over two or more steel profiles lengthwise, as movement of the steel and the facade boards caused by moisture and temperature changes could potentially damage the boards (Fig. 1).

Swisspearl facade boards can either be installed to match the module length of the support system profiles (Fig. 2), or smaller format boards can be installed so that several boards span the same profile (Fig. 3), provided that facade boards are not fixed to two separate support profiles.

Ensure a minimum 3/4" gap between the steel profiles (Fig. 4).

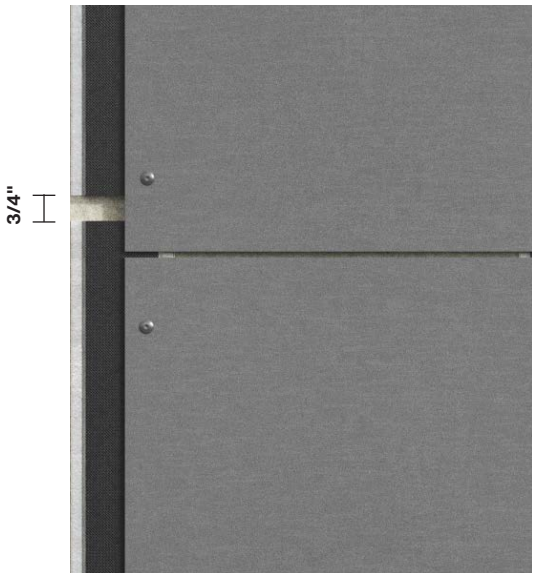


Fig. 4

Installation

Edge Distances

There must be a ventilated cavity between the back of the facade panel and the insulation. Read more about this in the section on "The self-ventilating facade".

The profiles behind joints should be min 4" width (Fig. 1), and the middle profiles should be min 1 1/2" width (Fig. 2).

Joint gaps between boards should be min 5/16" and max 5/8".

It is optional to use EPDM on steel profiles. However, for aesthetic purposes, including the EPDM will make the steel profiles less visible through the joints.

Swisspearl facade boards can also be installed on horizontal steel profile systems. If using horizontal systems, a minimum of 3/4" ventilated vertical area between the profiles and the supporting wall or insulation must be ensured.

To ensure that boards are able to accommodate movement without damage, please adhere to the following Swisspearl guidelines for correct fixing centers and hole sizes. Holes should be pre-drilled using a Ø 9.5 mm drill bit for rivets.

The position of the corner hole is dependent on the direction of the support system.

Fixing distances from the board edge, in the direction of the support system, should be minimum 3 1/8" up to max 4".

Fixing distances from board side edges should be min 1 1/4" and max 4".

The illustrations show a vertical support system. If using horizontal support system, the corner distances should be reversed.

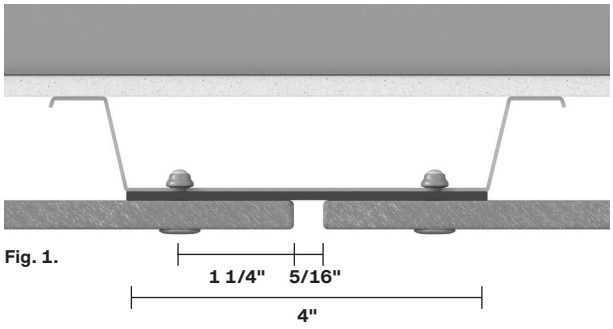


Fig. 1.

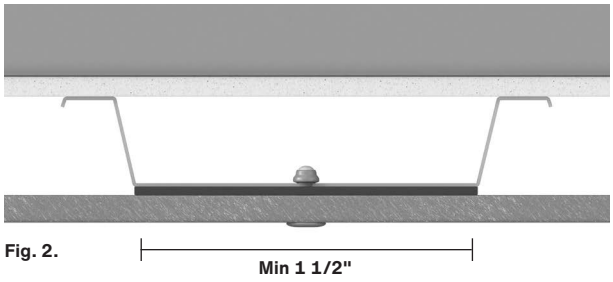
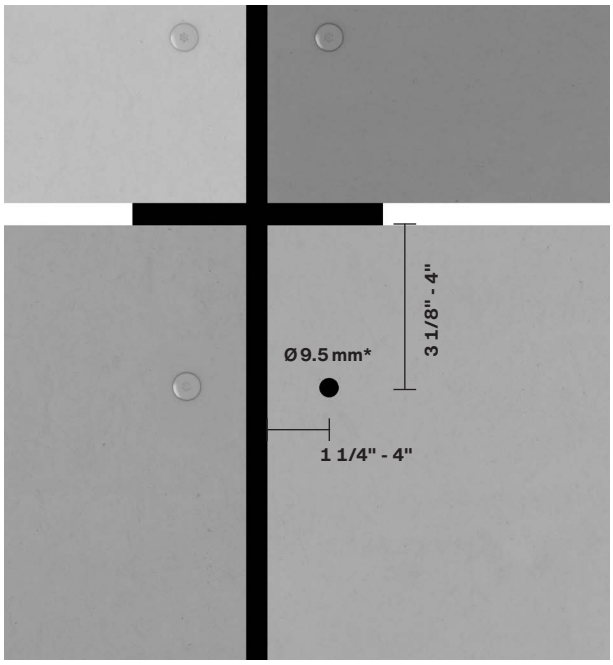


Fig. 2.



Example of vertical substructure

* 9.5 mm drill bit for rivets

Installation

Steel substructure

Swisspearl facade boards installed on vertical VFL profiles

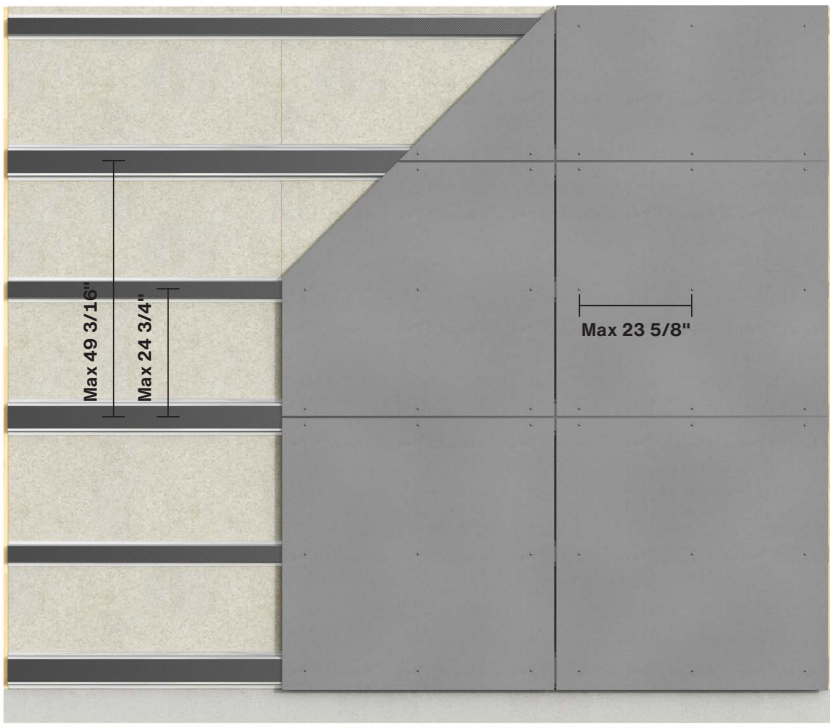
Steel support system

Mounting 8 mm Swisspearl facade boards on steel
Max support distances:
24 3/4"o.c.

Max rivet centers: 23 5/8"

Max. wind load: Please contact your project/construction engineer.

The following rivet types can be used for this construction:
- Swisspearl Rivet Steel RIV-S
  4.0×16-K15, 10-12 mm grip range
  4.0×18-K15, 12-14 mm grip range



Swisspearl facade boards installed on horizontal profiles

Installation

Edge distances

Swisspearl Patina Inline NXT
Swisspearl Patina Inline NXT is available in the following dimensions:
49.21" × 98.43" (1250 × 2500 mm)
49.21" × 120.08" (1250 × 3050 mm)

Make sure to adhere to the installation principles in this manual when installing Swisspearl Patina Inline NXT. The areas in which the installation of Swisspearl Patina Inline NXT differs from the normal installation method will be explained below. Pre-drill the Swisspearl Patina Inline NXT board using a Ø 9.5 mm drill for rivets suitable for fiber cement.

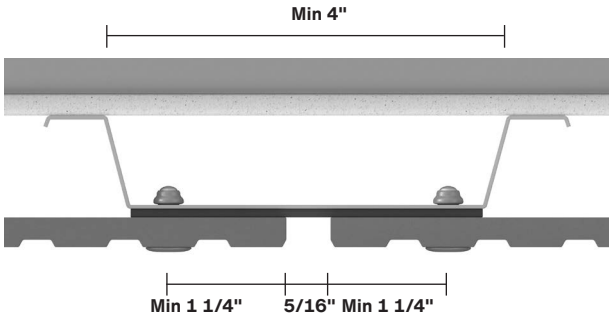


Fig. 1. Swisspearl Patina Inline NXT installation on profile behind joint.

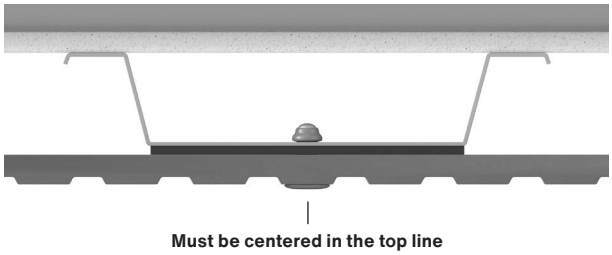


Fig. 2. Swisspearl Patina Inline NXT installation on the middle profile.

Edge distances
The edge distance of the hole is dependent on the direction of the support system - as per the normal installation principles.
- Edge distances from the board end, in the direction of the support system, should be minimum 4" up to max 5 7/8"
- The edge distance from the board side edges should be minimum 1 1/4" and max 4"

If the board is mounted with horizontal lines as in fig. 3* the edge distance should be minimum 4", but as the milled lines will not necessarily match the edge distance, it should be placed at the nearest following top line.

If the board is mounted with vertical lines as in fig. 3** the edge distance should be minimum 1 1/4" for full size boards. If cut to size, please refer to the paragraph below. Please note that the rivet should always be mounted at the top of a line and centered (fig. 1). The same applies to the installation on central battens (fig. 2).

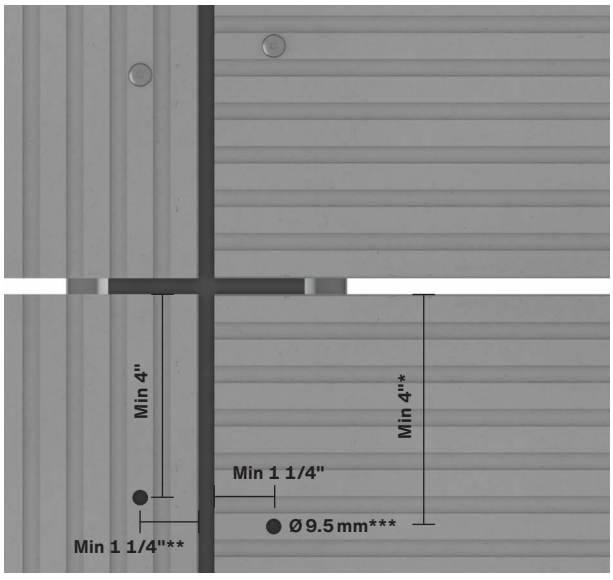


Fig. 3. Swisspearl Patina Inline NXT edge distances.
Note! Min distance and/or the nearest following top line.
***9.5 mm drill bit for rivet.

Edge distance of cut to size boards
If the board is cut to size to be installed in connection with windows, doors or similar, it may not be possible to keep the edge distance at 1 1/4"due to the nature of the lines. It will be necessary to place the rivet at the following top instead (fig. 4).

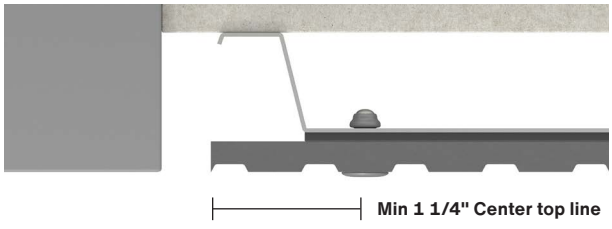


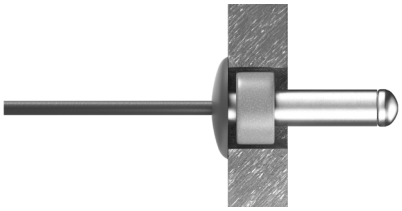
Fig. 4. Swisspearl Patina Inline NXT installation on cut to size board.

Installation

Fixing points for Swisspearl facade boards

To simplify installation on steel, Swisspearl facade boards should be installed using two fixing positions and all other positions should be sliding points. These positions should be as close to the board center as possible and must be aligned horizontally.

When installing Swisspearl facade boards using rivets, begin with the fixing positions, followed by the sliding points above the fixing positions and finally the sliding points below (see illustration below)



X : Fixing position hole diameter Ø 9.5 mm.
Insert a Swisspearl Fixing Sleeve in the hole before the rivet is fixed.

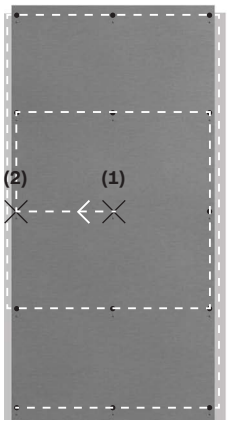
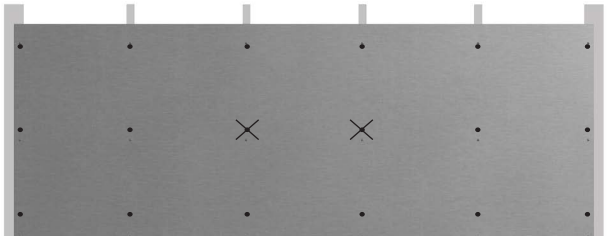
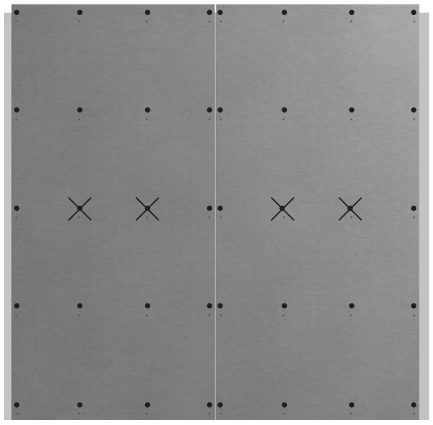


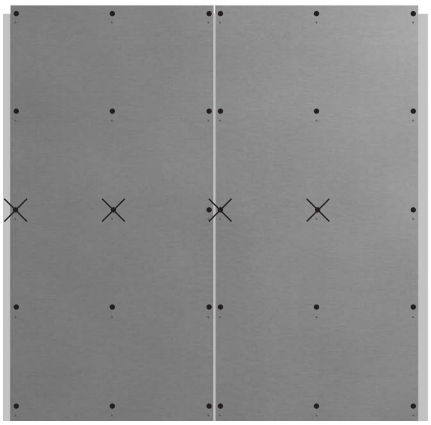
Illustration of correct rivet installation sequence. 1 and 2 are fixing points



Example: Horizontally mounted boards with four intermediate steel profiles



Example: Vertically mounted boards with two intermediate steel profiles



Example: Vertically mounted boards with one intermediate steel profile

Installation

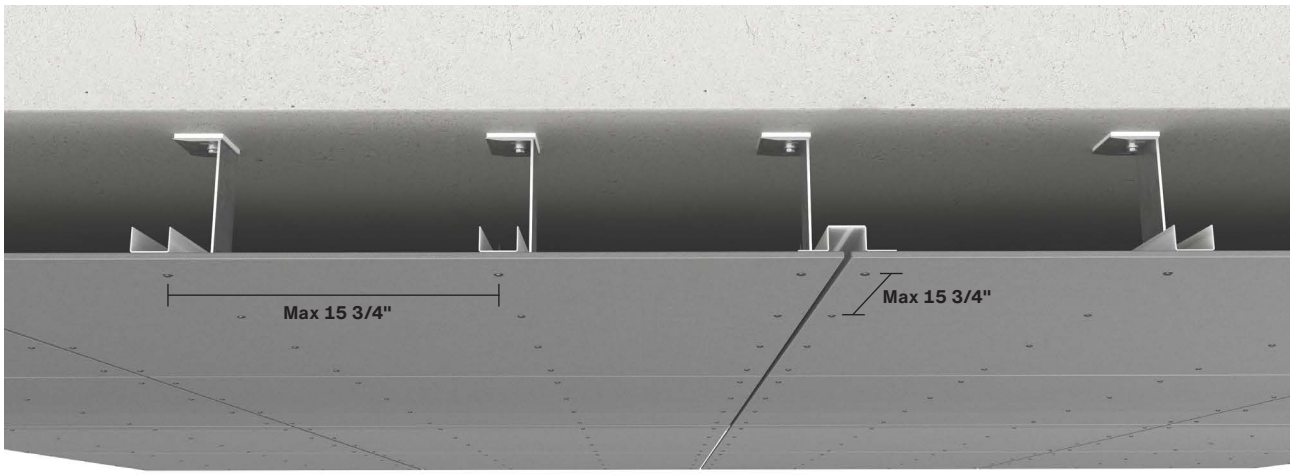
Swisspearl facade boards used as ceiling or soffit

Swisspearl facade boards are ideal for use as ceilings and soffits. The solution can be used for both exterior and interior applications.

The boards can be installed on profiles directly mounted to a concrete deck or wooden structure, or they can be used as part of a solution with a suspended ceiling system.
It is possible to change or remove the Swisspearl facade boards to access any hidden installations as the boards are mounted using visible rivets.

Installing 8mm Swisspearl facade boards on a steel structure - as ceiling or soffit
Max support distances: 15 3/4" o.c
Max rivet centers: 15 3/4"

The edge distances when using Swisspearl facade boards as ceiling or soffit are in principle the same as for facade boards in which the direction of the substructure and the orientation of the board define the edge distances. This also applies to hole sizes, joints and distances to other building materials.



When Swisspearl facade panels are installed as ceilings or soffits, standard steel substructure systems may be used. For larger cavity depths, consult the steel manufacturer to verify system suitability. The number of brackets and types of anchoring used for the type of deck/ceiling has to be calculated, and the manufacturer's instructions should always be followed.

Installation

Cut outs

To avoid cracking of the boards (Fig. 3) when installing Swisspearl facade boards around windows, doors and other openings, ensure that the facade boards are installed correctly using Swisspearl's instructions.

Swisspearl recommends avoiding single, exact cut-outs in panels (see Fig. 3). Instead, use smaller sections installed individually.

Cut the boards and make vertical joints of 5/16". Ensure that support is provided behind the joints to allow the facade panels to be securely mounted.

If the small cut outs are not wider than 4" - 6" (Fig. 1), they can be mounted with only one rivet in the middle of the board (a). This also applies when using the Swisspearl facade boards in other solutions on a building as window jambs or in connection with other narrow spaces.

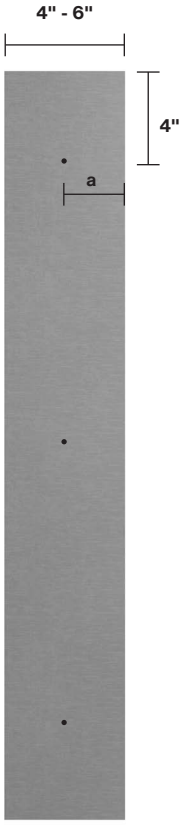


Fig. 1

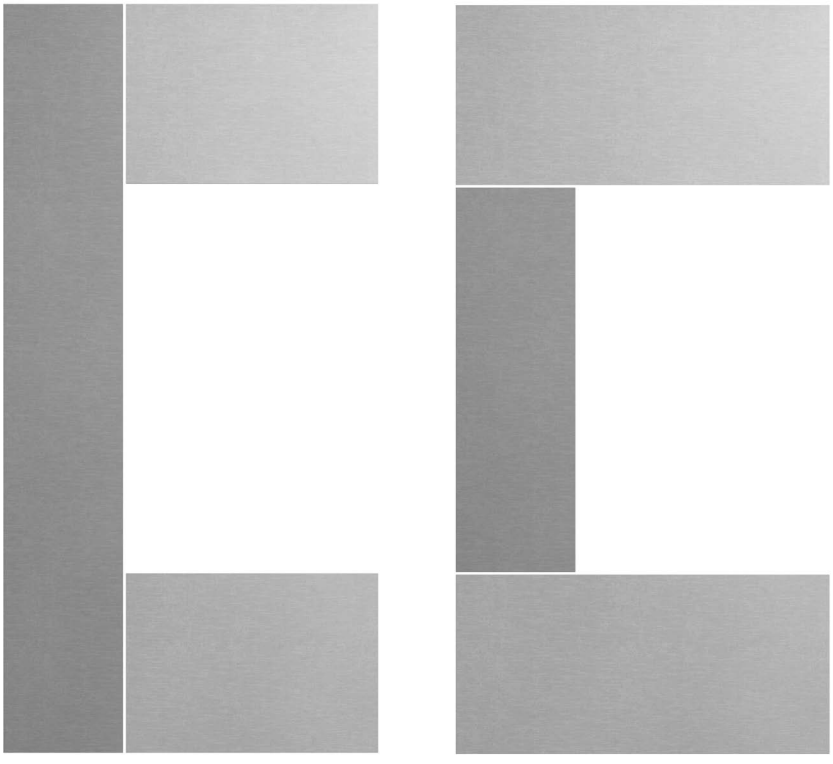


Fig. 2. Correct installation of Swisspearl facade boards at windows, doors, and openings.

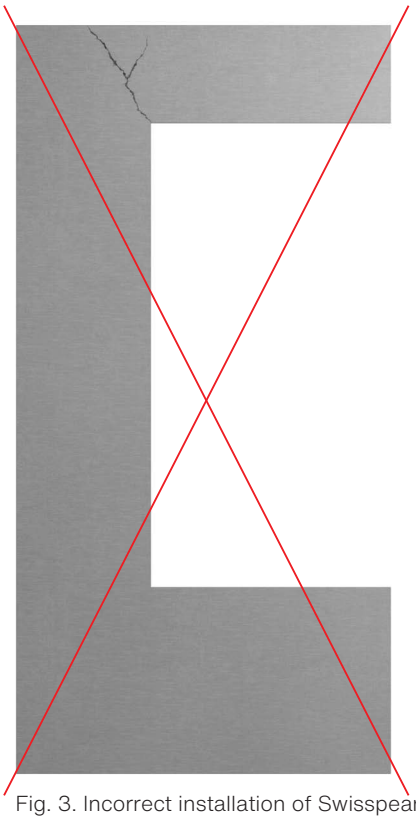
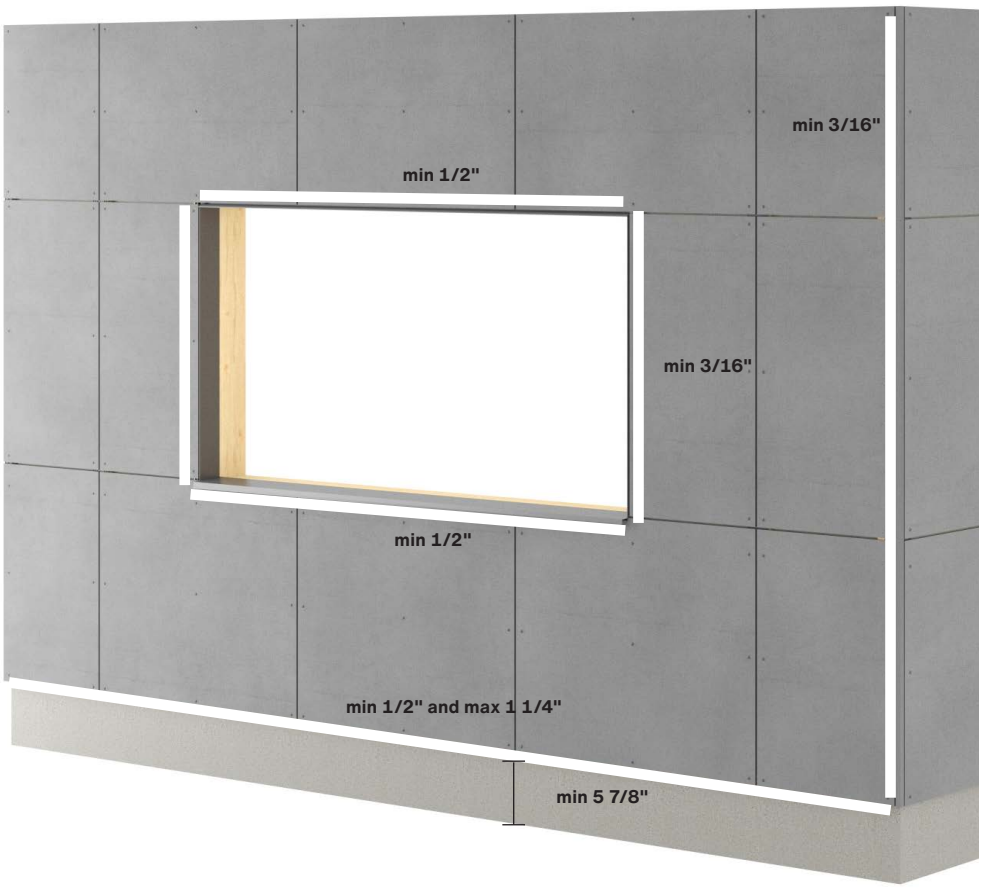


Fig. 3. Incorrect installation of Swisspearl facade boards at windows, doors, and openings.

Installation

General distances



Follow the guidelines regarding distances described in this manual. The facade board should finish between 1/2" and 1 1/4" below the bottom end of the substructure. For overhang and similar, the maximum distance is 4".

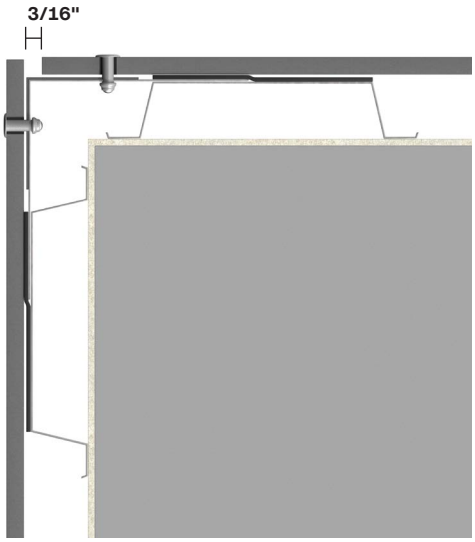
The bottom edge of the facade panel must be a minimum of 5 7/8" above grade. The clearance to flat roofs, balconies, and other horizontal surfaces with drainage, should be a minimum of 2".

Vertical clearance to profiles such as Swisspearl Alu Trim or Swisspearl Corner profile should be minimum 3/16". For horizontal clearances at windows and doors etc., provide a minimum 3/4" ventilation gap.

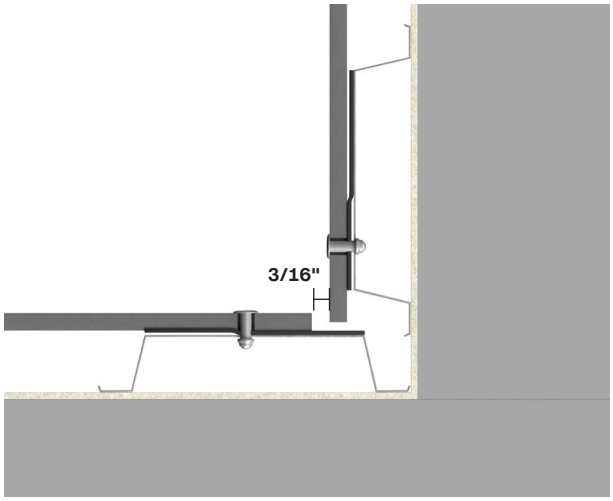
The clearance to other building materials should be minimum 5/16" for movement and water drainage.

Installation

Details

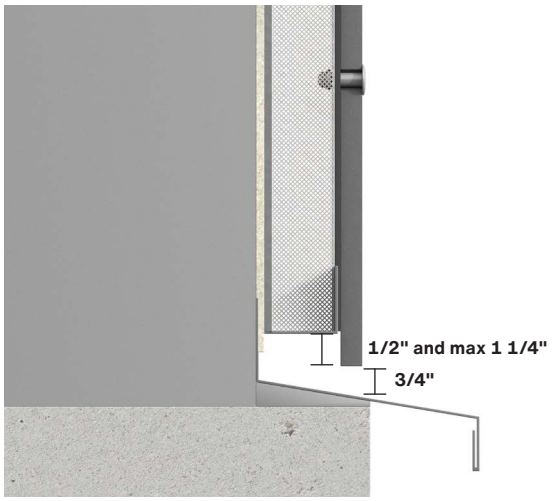


Horizontal view: external corner construction with open joint
It is possible to create an external corner detail without a Swisspearl corner profile. There should be a min. 3/16" gap between the facade boards forming the corner joint. If using brackets and profiles, an angle profile can be used behind the facade. It should be fixed with rivets. The distance from the corner to the profile that is fixed to the wall should not be more than 7 7/8".

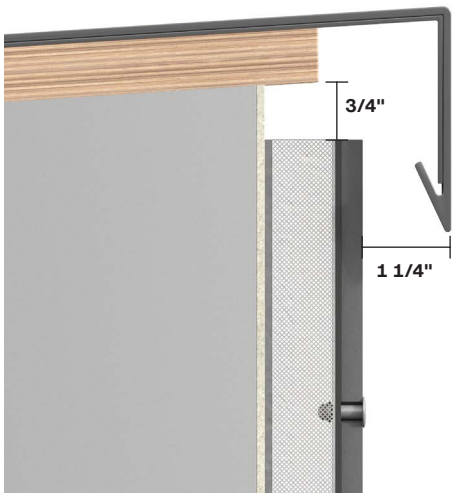


Horizontal view: internal corner construction with open joint
There should be a min. 3/16" gap between the facade boards forming the corner joint.

If you use an angle profile in the corner behind the boards, Swisspearl recommends using a flat EPDM or UV tape to cover the angle profile for aesthetic reasons.



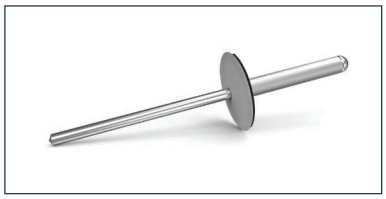
Vertical view: plinth construction
Ensure that the facade boards project past the base of the support from 1/2" and max 1 1/4", thereby allowing the water from the facade to run off. Use a ventilation grille at the base of the cladding to ensure that insects and vermin cannot enter the construction behind the facade boards. There should be a minimum free open area of 3/4", or 9.45 in^2 per linear foot.



Vertical view: top construction
Make sure that air can move freely from throughout the construction. There should be a minimum free open area of 3/4", or 9.45 in^2 per linear foot to provide adequate ventilation throughout the system. There should be a minimum gap of 1 1/4" between the front face of the facade board and the drip edge of the capping.

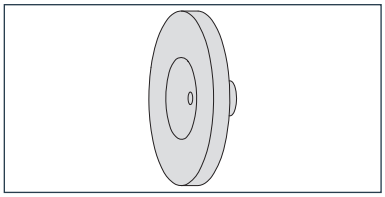
Accessories

When fixing Swisspearl facade boards using steel profiles, use purpose-designed accessories. In general, using appropriate tools will achieve the best installation.



Swisspearl Rivets Steel
RIV-A EPDM
4.0×16-K15, 10-12 mm grip range
4.0×18-K15, 12-14 mm grip range

Swisspearl Fixing Sleeve
Sleeve for Steel Rivets
4.1 x 5.5 x 8.8 mm Nylon black



Swisspearl Nose tool

Swisspearl EPDM 3 x 100 mm
Swisspearl EPDM 3 x 50 mm
30 m/roll black

Centralizing Bit Drill
4.1 / 9.5 mm

Swisspearl Blades
For cutting Swisspearl facade boards, the following blades can be used.

Diameter	Ø 160	Ø 190	Ø 216	Ø 250
Thickness mm	2.2/1,6	2.2/1.6	2.2/1.6	2.6/1.8
Center hole mm	20	20	30	30
RPM	4800	4000	3500	3000
Teeth	6	6	6	14

Drill
For pre-drilling of Swisspearl facade boards, please refer to your local Swisspearl office for instructions.

Diameter	9.5 mm

Accessories

Rivets

Rivets for Swisspearl facade boards
Use Swisspearl Steel Rivets (Fig. 1)
RIV-S EPDM 4.0×16-K15, 10-12 mm grip range
4.0×18-K15, 12-14 mm grip range

Use Swisspearl Fixing Sleeves at the fixing positions - see page 16.

Installing Swisspearl facade boards using rivets
Before installing the boards, pre-drill holes in Swisspearl facade boards using a Ø 9.5 mm drill.

Dust from cutting or drilling must be removed with a brush or compressed air immediately after the work has been completed, otherwise it can mark the surface of the boards.

Before drilling the holes in the steel profiles, place the facade board in its intended position on the steel structure. You can hold the board in place using locking pliers or use a supporting board below the facade board.

Centralizing tool
Position the centralizing tool (Fig. 2) through the pre-drilled hole in the board to ensure accurate fixing hole positions in the steel profiles that perfectly match the board's hole positions.

For the fixing points, you must insert the rivets into the Swisspearl Fixing Sleeves (Fig. 3) and install them at the fixing positions of the board.

All other rivets are installed without the fixing sleeve to allow the boards to move freely in the sliding points.

The Stand-Off Head (Fig. 4) must be used for all rivets. This provides a small space between the board and the rivet head to allow for movement caused by moisture or temperature changes.

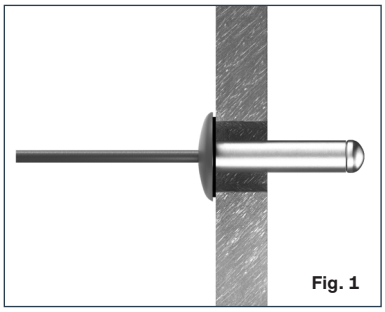


Fig. 1

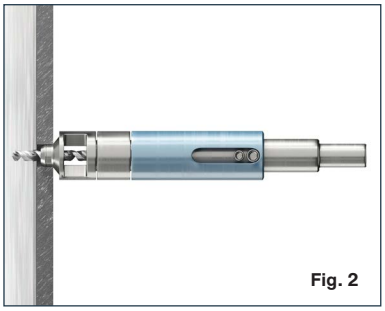


Fig. 2

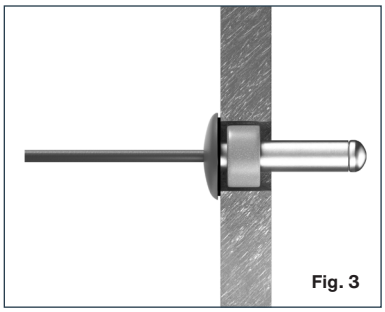


Fig. 3

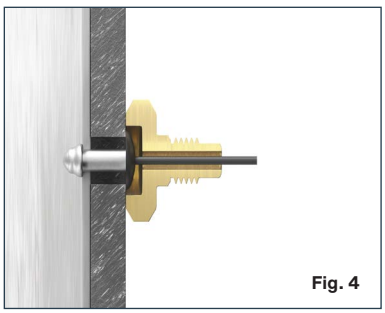


Fig. 4

Accessories

Swisspearl Blade

To ensure a neat finish when cutting Swisspearl facade boards, it is important to use the correct blade. Swisspearl recommends using Swisspearl Blades as they have been customized for the purpose and provide optimal cutting results.

The blades have trapezoidal diamond teeth which provide excellent cutting quality and extremely long durability. In addition, the amount of dust generated is significantly reduced compared to similar blades. The Swisspearl Blade is available in 4 sizes depending on which saw is used.

The Swisspearl blade can be used with dive saw, circular saw and stationary circular saw.

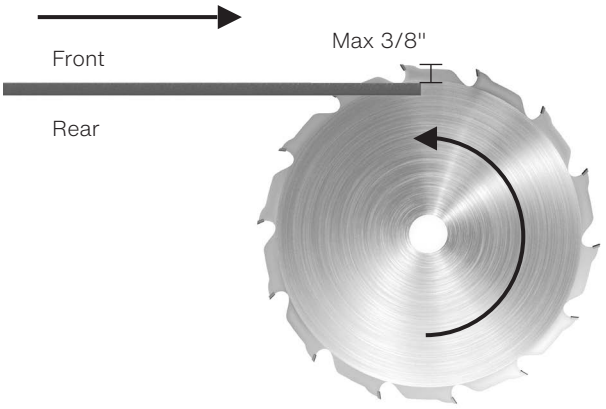
The Swisspearl Blade is a high quality product that can be sharpened, thus improving cost efficiency.

To achieve the best quality cut and to know which side to cut from, make sure to follow the instructions shown here. The direction varies depending on which saw you use.

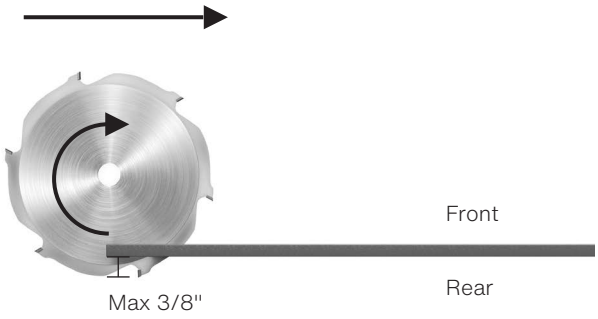
Handling
When cutting the facade boards, do not force the saw blade through the board. If you force the saw, the blade might overheat causing small vibrations - affecting the straightness of the cut or causing the board to flake if near the edges. The blade depth must be adjusted so that the blade goes max 3/8" through the board.

It is important to remove dust caused by cutting and drilling immediately either with a soft brush or a vacuum cleaner as it otherwise might damage the boards. Ensure that the boards are properly cleaned before installation, and if necessary use clean water, or water with a mild detergent and a soft sponge, or brush to remove dirt and dust from the surface.

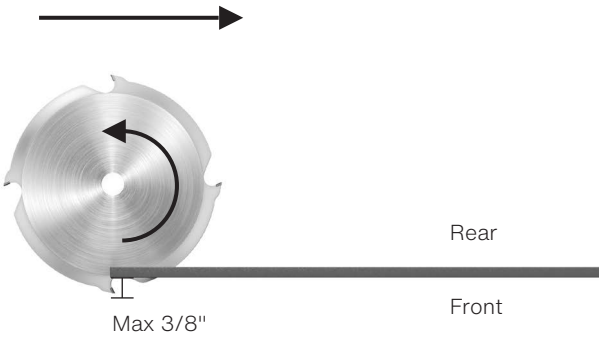
Local requirements regarding safety must always be followed. Make sure to use correct safety equipment such as masks and dust ventilation and ensure that the saw is set up correctly according to the manufacturer's instructions. Never use water when cutting Swisspearl facade boards.



When using a table saw, place the board with the face uppermost on the table and cut from the rear of the board.



When using a mitre saw, cut the board from the front.



When using a circular saw or dive saw, cut the board from the rear.

Storing and Handling

Swisspearl products are delivered with plastic protection cover. If undamaged, the plastic cover provides good protection against dust and weather conditions during transportation. Always store Swisspearl products on a flat dry level surface.

Only two pallets must be stacked on top of each other. Ensure pallets are positioned securely and remain stable.

If the pallets are stored outside when they arrive at the building site, the plastic cover should be removed. The facade boards should be stored on the pallet or sleepers with max 500mm distances.

Replace the plastic with a tarpaulin. It is very important that there is ventilation all around the tarpaulin and also on top of the pallet under the tarpaulin. This is done to make sure that condensation is reduced as much as possible.

If Swisspearl facade boards are stored more than 2-3 weeks on site, the pallets should be kept under a roof to ensure dry and ventilated conditions.

Do not drag products from the pallet, as it may leave permanent scratch marks. Lift the product by its narrow edge as it may break if handled incorrectly.

Care & Maintenance

On-site

Cleaning of boards after cutting and drilling
It is important to immediately remove dust caused by cutting and drilling from the front and rear of the boards with a soft brush/duster or a vacuum cleaner, as it otherwise might damage the boards. Ensure that the boards are properly cleaned before installation, and if necessary use clean water or water with a mild detergent and a soft sponge or brush to remove dirt and dust from the surface. Thereafter, wipe the boards with a damp cloth. It may also be necessary to wash the surface after installation if the building site conditions have been unfavorable. Use lots of clean water or water with a mild detergent and a soft sponge or brush and finally wiping the boards with a damp cloth.

Removal of calcium-based residues
Calcium carbonate residue may occasionally be seen on the board surface. This can be difficult to remove with water or even with detergents because it does not dissolve in water. For cleaning purposes 10% acetic acid (CH_3COOH) solution is used to dissolve the calcium compounds.

Note! Carefully observe safety precautions (MSDS) when working with acetic acid. R-phrase R36/R38 is valid: “Irritating to eyes, respiratory system and skin“. Use proper clothing, nitrile rubber gloves, eye protection goggles and approved respirator (filter A, E or A/E).

Carry out the mixing outdoors. Apply the diluted
10% acetic acid solution evenly with a spray can to the surface of the stained board. Leave it to react for a few minutes. Do not allow the solution to dry, but rinse with lots of clean water. Repeat the process if necessary and rinse with water afterwards.

Note! Do not execute the cleaning process with acetic acid in direct sunlight or on hot surfaces. This might create permanent stains.

Cleaning of neighboring areas
Windows and glass in particular but also other adjacent areas must be kept clean during the facade board installation and if necessary protected with plastic film. Alkaline leaching from cement bonded materials (dust from cutting or drilling holes in struc-tural concrete, etc.) is prone to damaging glass and other materials. Therefore, frequent cleaning during and after the construction period is needed.

Surface damages and scratches
Damages and scratches should be avoided by lifting the boards off the pallet and handling them carefully during installation. Scratches might leave white streaks on the surface which will turn dark when exposed to rain, because the board absorbs water through the scratch. Repair paint is not available. In any case the dark area will diminish after 6 to 12 months, because of the carbonation reactions in the cement matrix of the board.

Behavior in wet conditions
Since the boards are made of Portland cement, their color may turn darker when exposed to rain if the board absorbs moisture through holes, scratches or insufficiently sealed edges. This is natural behavior for any cement-based product and it does not affect the integrity or long-term durability of the board. The original color is restored as soon as the boards dry out. The darkening will show after heavy rainfall for the first months after installation. It will gradually reduce within 6 to 12 months, because the cement- based matrix reacts with carbon dioxide from the atmosphere – carbonation – and thereby reduces water penetration.

Care & Maintenance

After installation

Annual inspection
Normally Swisspearl facade boards do not require any maintenance. Weathering may however influence the appearance of the facade. Therefore, an annual inspection of the ventilation gaps, joints and fixings is a good idea. Detection and repair of possible damage ensures a prolonged lifespan for the facade.

Cleaning
Swisspearl facades can be cleaned with cold or lukewarm water if necessary with the addition of a mild household cleaning agent not containing solvents. Always start from below with well-defined areas. Rinse with plenty of clean water until the facade is perfectly clean. Before full-scale cleaning, it is recommended to test the chosen cleaning method on a smaller area to ensure it works and does not damage the board surface.

High-pressure cleaning
Warning! High-pressure cleaning is a severe treatment for fiber cement facade. Improper use of a high-pressure cleaner may damage the surface. Therefore, high-pressure cleaning is not recommended.

Moss & algae
Moss and algae growth can be removed with common agents available on the market. Care should be taken to ensure that the cleaning agent does not cause damage to the surface of the Swisspearl facade boards.

Confirm the compatibility of your cleaning agent with your cleaning agent supplier, and ensure it is applied according to the supplier's instructions. It is advised that before conducting a large-scale application a test is carried out on a small, inconspicuous area to ensure that the cleaning agent has no effect on the color of Swisspearl facade boards.

Efflorescence
Efflorescence is a naturally occurring, white, powdery deposit that can appear on cement-based building materials (including bricks, cement walls, grout, and fiber cement). It is the result of a process in which moisture draws salt crystals to the surface, evaporates, and leaves a chalky substance behind. Efflorescence occurs when all three of the following conditions exist:

1. Water-soluble salts are present in the building material.
2. There is enough moisture in the wall to turn the salts into a soluble solution.
3. There is a path for the soluble salts to get to the surface.

Efflorescence may also be a sign of water ingress behind the facade. Make certain that all openings are properly covered and there is no water intrusion due to over-driven nails.

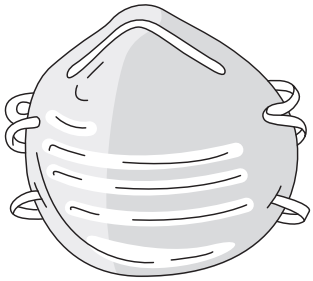
While some efflorescence may weather away naturally on its own, it is best to take steps to treat it. Efflorescence can be removed with household white vinegar and water. For most cases of efflorescence, Step 1 - 3 works well. But for substantial deposits of efflorescence go to Step 4. For best results, follow these cleaning instructions:

1. Protect areas that are not to be cleaned. Rinse all plants and vegetation around the facade with water before and after application of the vinegar.
2. Generously coat the entire surface area with vinegar. Allow the solution to sit on the surface for 10 minutes.
3. Rinse the treated area thoroughly with water from the top down and allow the area to air dry.
4. For extra tough efflorescence: Use a 10% acetic acid solution and apply to affected area with a cotton cloth. A light scrubbing with the cotton cloth may be required. After about 20 seconds rinse with water.

Health and Safety

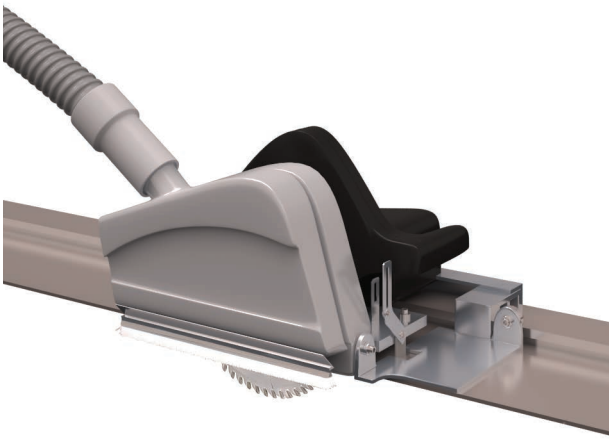
As with all building materials, safety precautions must be taken into account and local laws and regulations must be observed.

Cutting and drilling
When cutting, grinding or drilling, dust from the fiber cement boards is released. This dust is characterized as mineral dust. Breathing large amounts of dust may cause irritation to respiratory functions, eyes or skin. Therefore, Swisspearl always recommends wearing personal protection equipment or as required by local law (Safety goggles, safety suit and a respiratory mask - P2 marked).

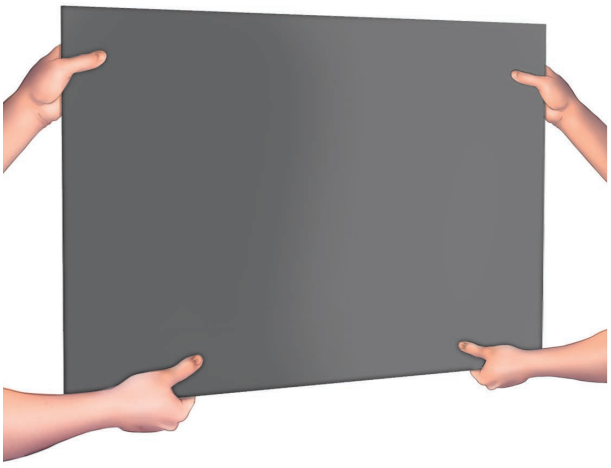


When cutting Swisspearl facade boards ensure adequate ventilation.

If the boards are cut indoors, it may be necessary to use an extractor system or a HEPA filter vacuum attachment attached to the power saw. When cutting outdoors, you should also use a HEPA filter vacuum attachment to the power saw. If ventilation is not adequate to limit exposure, wear a disposable respirator or air purifying cartridge respirator fitted with a Class P2 filter (European EN 143 standard). To reduce exposure to dust, Swisspearl recommends using Swisspearl Circular Blade.



Lifting Swisspearl facade boards
When lifting Swisspearl facade panels, follow safe lifting practices to ensure personnel safety and prevent damage to the panels. When lifting or moving the facade board, please make sure to lift the board by its narrow edge as it may otherwise break if handled incorrectly. If lifting Swisspearl facade board manually, make sure to adhere to any local rules. When lifting large boards, use mechanical lifting gear if possible. If this lifting gear uses suction/vacuum, be careful not to apply too much suction, as this may damage the surface or leave permanent marks.



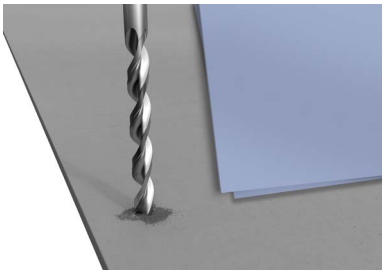
On-site Handling

Swisspearl facade boards are supplied with a polyethylene foam layer between each board to prevent scratching and damage to the surface. The polyethylene is an environmentally friendly polymer that can be disposed of as normal combustible waste.

When marking panels, ensure that marks do not exceed the diameter of the drilled hole or the thickness of the saw blade, as marks may be difficult to remove after cutting.

Once boards are cut, you can bevel the cut edge with a fine grinder to sandpaper (80-grit) to give the edge a pre-cut finish.

The bevel should be angled at 45° relative to the board. This retains edge strength and removes small irregularities.



Dust from cutting or drilling must be removed with a brush or a fiber cloth immediately after the work has been completed, otherwise it can mark the surface of the boards.

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