

# DIM Design & Installation Manual North America

Swisspearl Largo and Linearis



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## Remarks

This DIM (Design + Installation Manual) provides technical information regarding design and installation. Refer to area manager and local distributor for further information such as:

- Terms of delivery
- Pricing
- Products and colors
- Lead time, etc.

More general information available on [www.swisspearl.com](http://www.swisspearl.com)

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## Validity of DIM

Please consult your local distributor and or the Technical Advisor prior to the commencement of shop drawings or installation for the most current DIM guide. The current DIM can always be found at [www.swisspearl.com](http://www.swisspearl.com). All previous DIM guides should be disregarded and are no longer valid

## Product warranty

20 year warranty for the functional quality of panels and accessories, provided that the installation is in full compliance with this DIM. (Zenor panels will only be covered under a 10 year warranty.)

## Maritime conditions

Maritime conditions call the use for stainless steel rivets. Those may be used on steel or anodized aluminum sub frame. Maritime conditions are considered 0.03 to 0.6 miles from the sea. Material specification for sub frame, fasteners and accessories to cater for maritime conditions according to local standards.

## Advantages of fiber cement products

- Maximum protection against weather
- Excellent longevity
- Easy installation in any climate
- Almost no maintenance required
- Proven details
- No cracks, paint or sealant problems
- High sustainability
- Non combustible

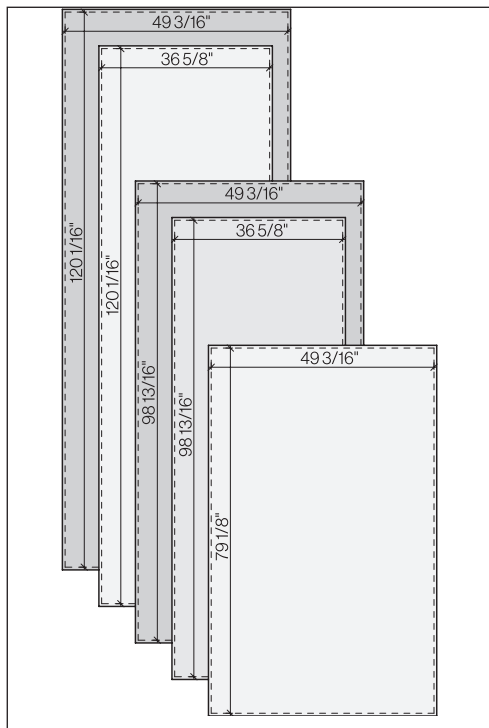
## Project specific ordering

Subtle visual differences may occur between product batches. Therefore we recommend ordering by job or specific elevation if ordering in phases.

## Disclaimer

The information and recommendations contained in this Design & Installation Manual ("DIM") are offered as a service to architects, constructors, installer and other persons involved with our products and are not intended to relieve them from their own responsibility. The information and recommendations provided herein are believed by Eternit (Schweiz) AG ("Eternit") to be accurate at the time of preparation of this DIM, or obtained from sources believed to be generally reliable. Eternit makes no warranty concerning the accuracy of the content of this DIM and shall not be liable for claims relating to any use regardless of whether it is claimed that the information or recommendations are inaccurate, incomplete, or otherwise misleading. The information and recommendations herein are intended to be used with the judgment and experience of professional personnel competent to evaluate the significance and limitations of the material contained. Eternit expressly disclaims any guarantees or warranties, expressed or implied, for anything described or illustrated herein and assumes no responsibility or liability for damages of any kind, including - without limitation - bodily harm, injury or damage to property inferred from this DIM or the use of the materials described herein.

**Overview panel sizes**



5/16" & 1/2" thick panels - max. net panel sizes

**Overview**

Swisspearl Largo		Nobilis	Zenor	Carat Reflex Avera Incora Texial Vintago	Carat Reflex
Thickness	Inches	5/16"/1/2"	5/16"	5/16"	1/2
Weight	Pounds Per/sf	3.21/ 5.04	3.21	3.21	5.0
Format	Inches				
Untrimmed panels	<b>max. net panel sizes</b>				
120 7/8" x 50"	120 1/16" x 49 3/16"	■	■	■	■
99 5/8" x 50"	98 13/16" x 49 3/16"	■	■	■	■
79 15/16" x 50"	79 1/8" x 49 3/16"	■			
120 7/8" x 37 3/8"	120 1/16" x 36 5/8"	■		*	
99 5/8" x 37 3/8"	98 13/16" x 36 5/8"	■		*	

\* Panels with 36 5/8" width are only available in CARAT colors Agate, Black Opal, Coral, Crystal, Sapphire and Topaz and require a minimum order quantity of 500 panels. Avoid mixing the two widths. Base sheets in width 49 3/16" and 36 5/8" are manufactured as different production batches so that the shade may deviate

**Product data**

- Density > 1.75g/cm3
- Modulus of elasticity ca. 15'000 MPa
- Design resistance for bending ca. 8.0 MPa
- Thermal expansion coefficient 0.01 mm / m / °K
- Fire classification according to NFPA 285 EN 13 501-1 & A2-s1,d0
- Frostresistance and durability under EN 12467
- Thermal range - 40°F to 176°F

## **HR coating**

Special coating with increased scratch and UV resistance that allows removal of graffiti using Acetone. Availability as per Program and Colors.

## **F-coating for façade**

For inclined cladding, panels with F-coating for increased exposure to weathering. It is opaque and matched to standard finishes, and has higher UV resistance.

## **R-coating for roof**

Roofing panels must have minimum fall of 6° (10.5%). R-coating is opaque and matched to standard finishes, and has higher UV resistance. The panels in the color ranges Amber and Onyx are supplied with standard grey panel core.

## **Application**

Swisspearl Largo panels can be attached to vertical timber or metal profiles. Suitable for new façades or existing cladding renovations.

## **Untrimmed full size panels**

Untrimmed panels will only be provided to approved fabricators. Untrimmed Swisspearl Largo panels must be trimmed 3/8" on all four sides.

## **Signage, light fittings, etc.**

Provide structural attachment points behind the panel as required. Leave min. 1/4" free gap between panel edge and installation - so as not to constraint the panel movement.

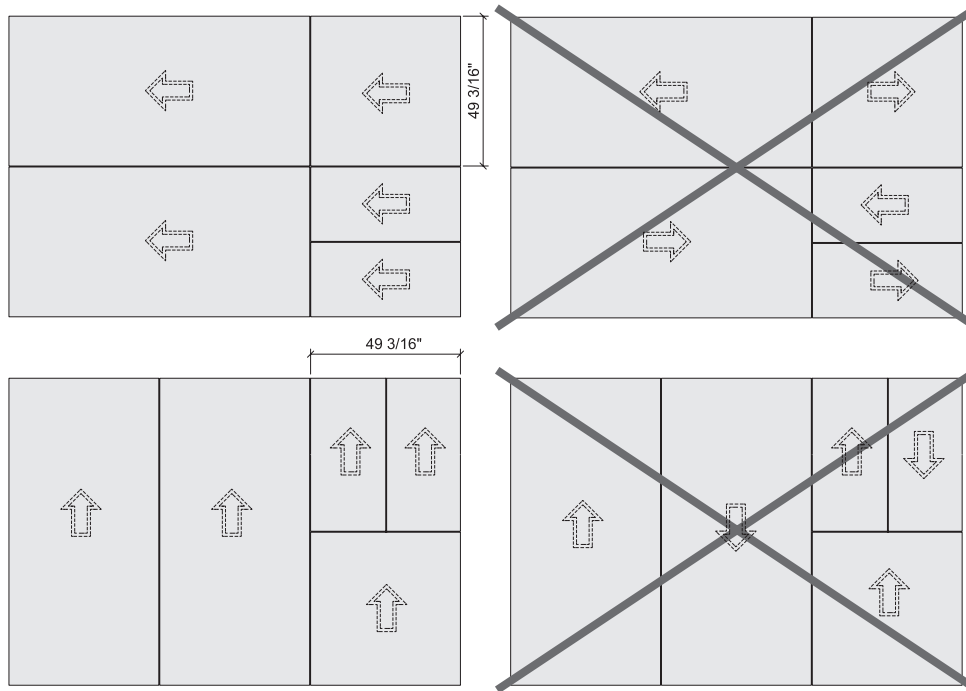
## **Sealed cut edges**

All panel edges cut on site or at a fabricators workshop must be sealed by LUKO sealer, provided by Swisspearl.

# Program I Reflex, Vintago

Swisspearl Largo

## Installation Reflex, Vintago



Panels are shown as on building elevation (finished face).

When installed, all the arrows on the backside of the Reflex and Vintago panels must point in the same direction.

Landscape orientation

All arrows to the left

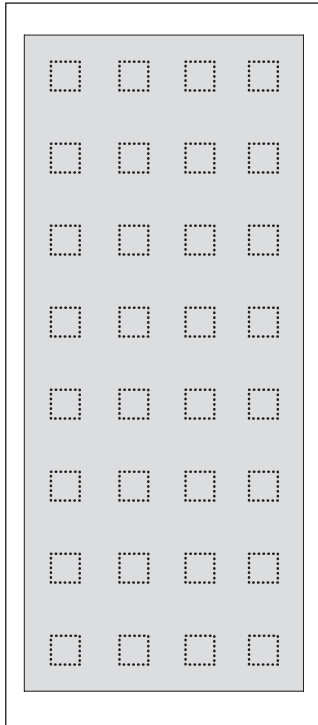
Portrait orientation

All arrows up

### Cutting CAD drawing

Regarding panel fabrication at the factory based upon CAD drawings as for odd panel shapes, perforations etc.: Arrows must be indicated on the drawings to all panels. Panels always shown as seen on building elevation (finished face).

## **Adhesive application**



## **Adhesive technology**

Specially ordered ARSB panels are signified by printed squares on the backside of the panel. Please consult with your adhesive manufacturer prior to installation. Zenor panels only available for face fastened system.

## **General requirements**

Adhesive manufacturer's instructions for use must be strictly followed including:

- Cleanliness of panels and support profiles
- Panel and air temperature
- Air moisture content

## **Support profiles**

- For exterior application the panels may be adhered to Aluminum supports only.
- Sub framing to be approved by adhesive manufacturer prior to stating the installation.

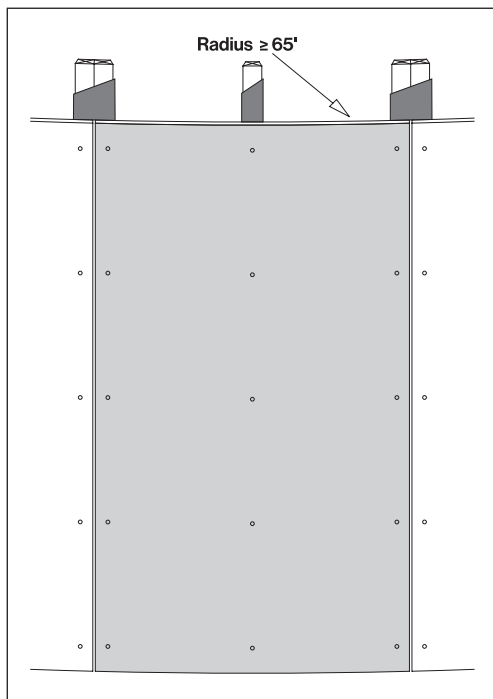
## **Panel ordering**

Panels ordered for adhesive application are called ARSB and are available upon request at time of order. Standard Swisspearl panels cannot be used for adhesive application.

## **Warranty**

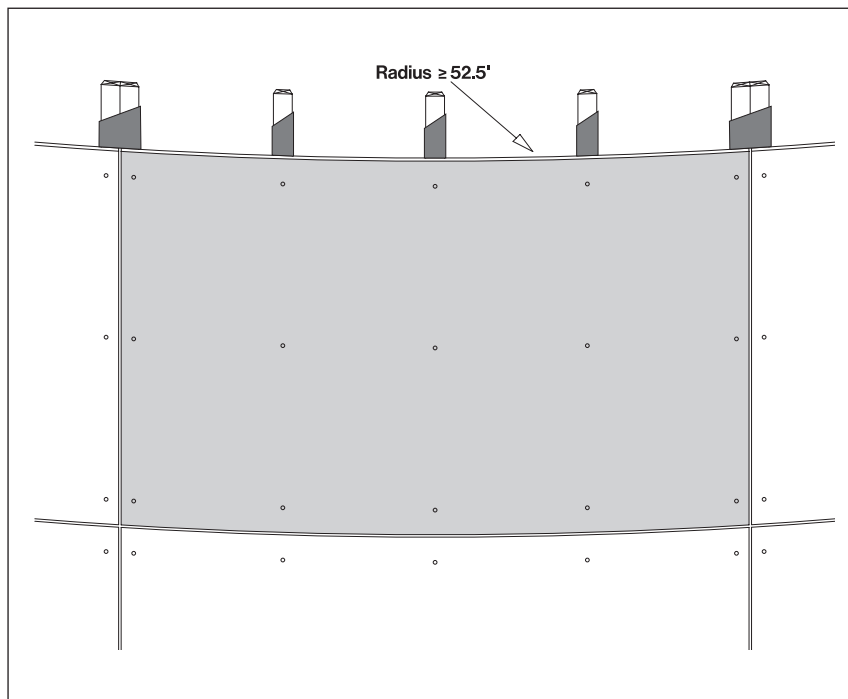
Panel manufacturer provides functional warranty for the panels only. Warranty for the attachment of the panels to be obtained by adhesive manufacturer. Warranty for the panels cannot exceed that of the adhesive.

**Swisspearl Largo 5/16" portrait**



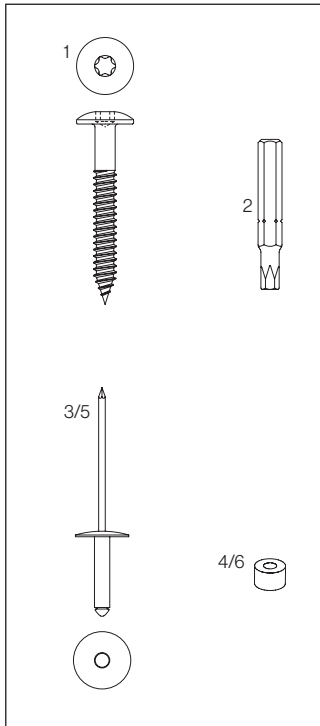
Portrait panels, attached to vertical supports.  
Minimum radius = 65'. Fix the battens with 2 screws per fixing point.

**Swisspearl Largo 5/16" landscape**



Landscape panels, attached to vertical supports at max. 24" centers.  
Minimum radius = 52.5'. Fix the battens with 2 screws per fixing point.

## Fasteners



### To timber battens

- 1 Steel screw,  $\varnothing$  12 mm, T20 drive, blank or powder coated  
4.8×30, **4.8×38 mm**  
4.8×44, 4.8×60 mm
- 2 Torx bit T 20 W

### To Aluminum profiles

- 3 Aluminum rivet head  $\varnothing$  15 mm, blank or powder coated
  - **4.0×18-K15, 8-13 mm grip range**
  - 4.0×24-K15, 13-18 mm grip range
  - 4.0×30-K15, 18-23 mm grip range
- 4 Fixed point sleeve aluminum type 8

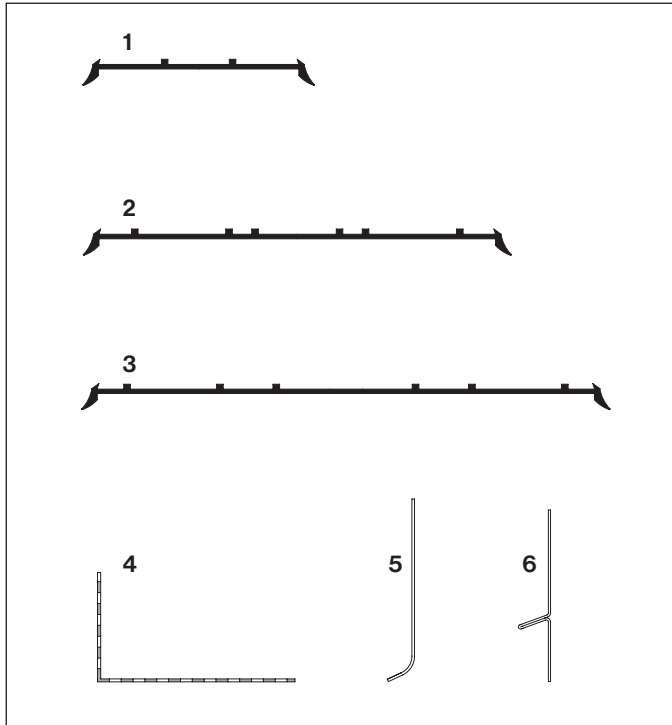
### To steel profiles

- 5 Stainless steel rivet, head  $\varnothing$  15 mm, blank or powder coated
  - **4.0×18-K15, 9-14 mm grip range**
  - 4.0×23-K15, 14-19 mm grip range
- 6 Fixed point sleeve stainless steel type 8

### Maritime conditions

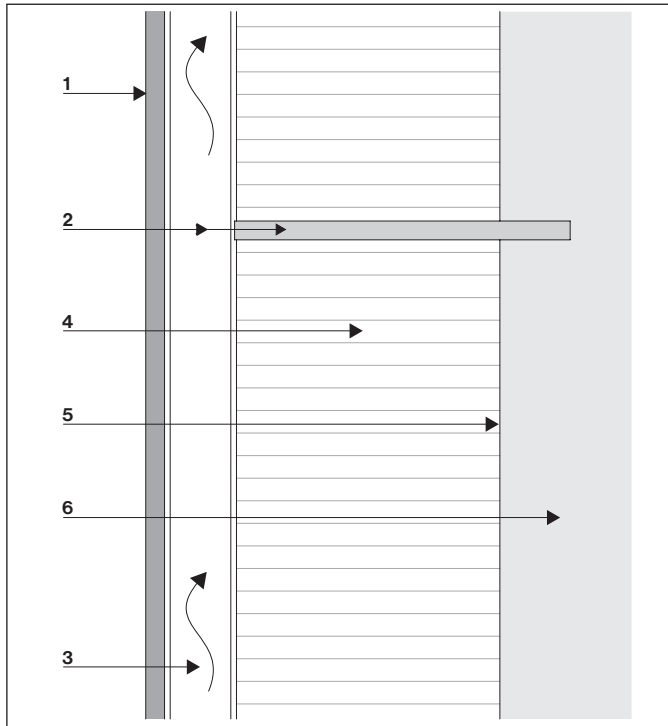
Maritime conditions call the use for stainless steel rivets. Those may be used on steel or anodized aluminum sub frame. Maritime conditions are considered within a distance 0.6 miles from the sea. Material specification for sub frame, fasteners and accessories to cater for maritime conditions according to local standards.

**Joint material**



- 1 EPDM band, black, 60 mm wide for intermediate supports with side flanges, in 50m rolls
- 2 EPDM band, black, 100 & 120 mm wide for butt joints with side lips, in 50m rolls
- 3 EPDM band, black, 150 mm wide for inner and outer corners with side flanges, in 25m rolls
- 4 Ventilation profile, raw aluminum or standard colors, 50x30 mm, 70x30 mm, 100x40 mm. 2500 mm long, 0,6 mm thick
- 5 L-flashing, stainless steel, millor powder coated, 0,5 mm thick 2510 / 3050 mm long
- 6 Horizontal joint flashing, Aluminum, powder coated black, 0,5 mm thick 2510 / 3050 mm long

## Terminology



Vertical section

### Rear ventilated cladding

The design principle involves the screening of rain water to prevent it from entering the system. As the panel joints are not sealed, minimal amounts of water can gain access into the air cavity behind the panel. The cavity is naturally ventilated by vent gaps at bottom and top, so that any moisture will evaporate naturally by thermal action.

### Cladding (1)

Panels with open or closed joints, in one plane or lapped.

### Sub framing (2)

System options should be considered based on panel layout, wall conditions, and required external insulations. Min requirements are 3/4" vertical airflow.

### Ventilation cavity (3)

Cavity behind panel with ventilation gaps at bottom and top.

### Thermal insulation layer (4)

To increase the thermal insulation capacity of the exterior wall.

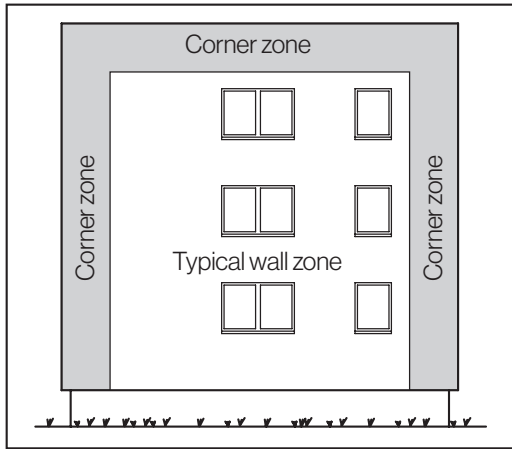
### Substrate (5)

Face of exterior wall, such as plaster, concrete, exterior sheathing, vapor air barrier, etc.

### Exterior wall (6)

Brick, concrete, wood and steel studs

**Corner zone**



**Wind load zones**  
The applicable wind load values must be determined in the cladding specification.

**Min. manufacturer cavity depth:**

Mandatory for issuance of the warranty letter.

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

**Application**

Swisspearl cladding panels can be attached to vertical supports made of timber, Aluminum or steel.

**Windload**

Always use local standards when determining panel fastener differences. This is especially important for tall buildings, for buildings with special shapes and for high wind exposure areas.

**Ventilation cavity**

Building tolerances must be allowed for. The cavity may not be reduced by horizontal profiles or any stray objects such as loose insulation and other materials.

**Building expansion joints**

The buildings structural expansion joints should be considered when designing subframe systems. Structural expansion joints must be applied to sub frame and cladding as provided to the building structure.

**Ventilation cavity**

Minimum airflow at the backside of the panels should be 100% free of obstructions with no less than 200 cm<sup>2</sup> of vertical airflow (Min 3/4" System depth) behind panels. Minimum air flow at base and top of walls is required to have at least 60% unobstructed ventilation if using ventilated profiles.

**Ventilation cavity with perforated horizontal subframe components**

Min ventilation gap to be 1.5". Horizontal profiles should allow min. 75% airflow. In advance please contact your Technical Service for approval.

## Panel support

Panel must be supported on an even surface.

## Optional venting requirements

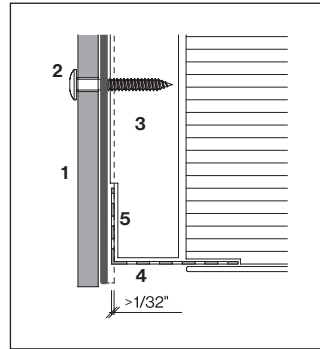
If perforated angles are placed between the panel and vertical batten profile the closure piece must not exceed 1/32". Perforated angles must allow ventilation entrance with a min. perforation of 60%. The use of an Aluminum mesh is possible. It has a high ventilation ratio, thin material thickness (won't push panel out) and is easy to install.

## Material compatibility

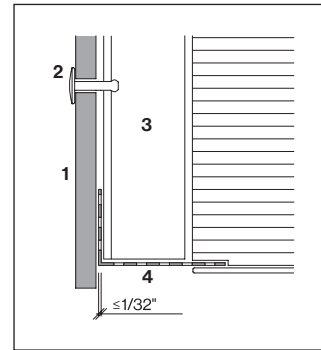
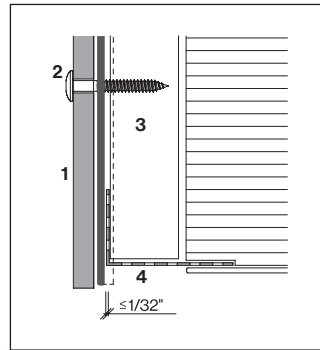
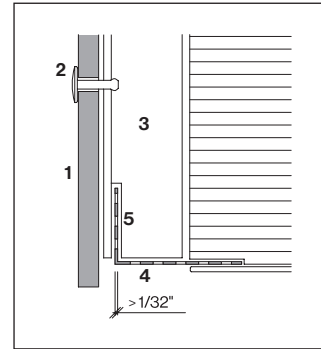
Untreated aluminum material such as Window sills, frames, etc. is not compatible with cement and must be protected against dust from drilling panels, etc. Aluminum components are to be used in anodized or powder-coated or Kynar Coated for exterior applications with protective films.

- 1 Swisspearl Largo
- 2 Fastener
- 3 Panel support
- 4 Perforated angle
- 5 Recess

## Timber battens



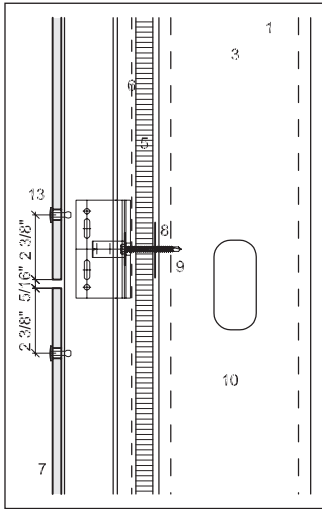
## Metal profile



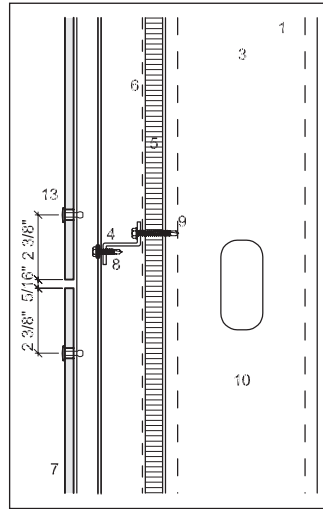
## Sealant material

It is recommended, to keep the cladding maintenance free, the use of sealants should be avoided. Where the use of sealant is unavoidable Polyurethane, Acrylic or Hybrid Polymer products would be best suitable. Before applying any sealant to fiber cement material the compatibility must be checked as certain materials leave permanent staining on panel surface.

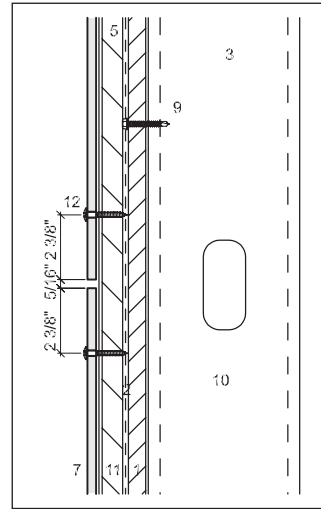
**Sub frame types**



Metal / metal



Metal / metal

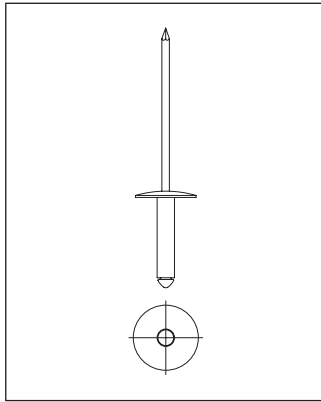


Timber / timber

Typical wall constructions for wood battens is as follows:  
 2"×4" exterior grade plywood, sheathing  
 Vapor Air barrier either liquid applied or self adhered  
 Vertical wood batten screwed in the plywood  
 EPDM over the wood battens Panel.

- 1 Substrate
- 2 Vapor Air Barrier
- 3 Thermal Insulation
- 4 Horizontal batten
- 5 Vertical batten
- 6 Vent cavity
- 7 Swisspearl Largo panel
- 8 Bracket
- 9 Engineered Screw by Others
- 10 Wall Cavity
- 11 Vertical Wood Battens
- 12 Screw by Swisspearl for Timber Applications
- 13 Rivet by Swisspearl for Metal Applications

## Swisspearl rivet



Swisspearl rivet: Ø 15 mm

## Holes in panel for rivets

Diameter 3/8"

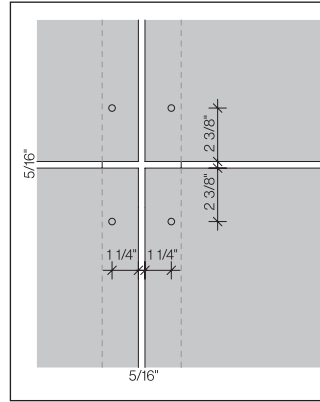
## Minimum edge distances

Horizontally 1 1/4"

Vertically 2 3/8"

## Maximum edge distance

Horizontally and vertically 4"



Panel edge distances

## Panel joints

Typical panel joint is 5/16", this allows panel scraps to be used as spacers. Wider joints will make any inaccuracies in the installation less noticeable.

## Fixed, sliding points

Each panel must be fastened by 2 fixed points in the panels center to support the panels deadload. All other rivets are sliding points.

## Drill holes Ø 3/16" to metal profiles

Use centering drill gauge so the holes will be concentric to the 3/8" hole in the panel. Use drill bit type A for aluminum profiles and type S for steel.

## Sub-frame engineering

Engineer / contractor is responsible for the design and installation of all sub frame parts including all associated fasteners.

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

**Aluminum profiles**

Aluminum thickness should be a min. of 5/64". Profiles should not exceed 10' and profile breaks should coincide with panel joints.

**Aluminum rivet**

4.0 x 18 - K15 rivet, head Ø 15 mm, powder coated or blank.

**Staggered horizontal panel joints**

Use two vertical profiles to vertical panel joint so that each can be broken on its horizontal panel joint level.

**Black panel joints**

Panel joints read as shadow lines. It is recommended to blacken the metal where visible, with paint or PVC paint tape.

**Steel profiles**

Steel panel supports to be min. 18 gauge to obtain nominal pull out value. Profiles should not be longer than 20'.

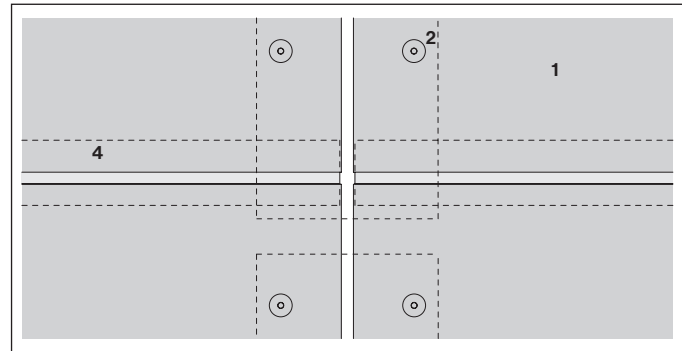
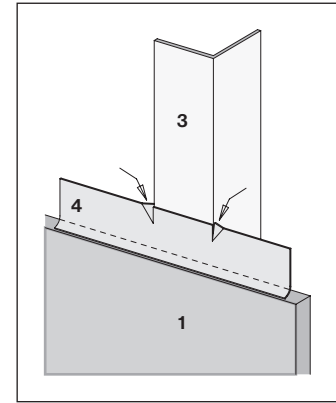
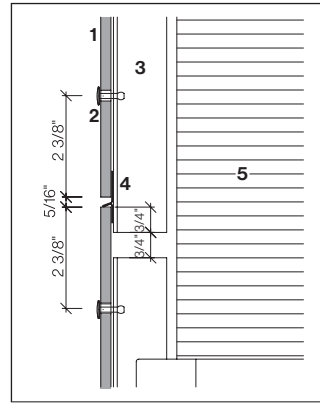
**Stainless steel rivet**

4.0 x 18 - K15 rivet, head Ø 15 mm, powder coated or blank.

**Sub-frame engineering**

Engineer / contractor is responsible for the design and installation of all sub frame parts including all pertaining fasteners.

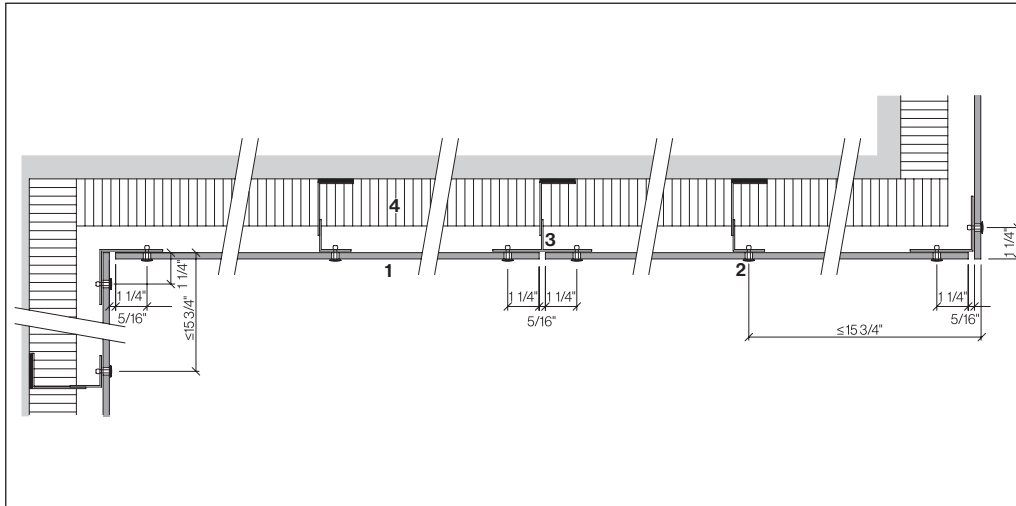
**Horizontal joint**



- 1 Swisspearl Largo 5/16"
- 2 Rivet
- 3 Panel support profile
- 4 Joint flashing (optional). Always leave -1/16" of the panel width
- 5 Thermal insulation

Any breaks to panel support profiles must be located at panel joints as shown. Flashing cut at one vertical as shown to prevent lateral dislocation of flashing.

## Horizontal section



Panel may be cantilevered max. 15 3/4".

- 1 Swisspearl Largo 5/16"
- 2 Rivet
- 3 Aluminum profile
- 4 Thermal insulation

**Rivet installation**

Use rivet gun GESIPA ACCUBIRD or similar. Do not use pneumatic equipment. Use centering drill gauge with drill bit  $\varnothing 0.1614''$  to obtain concentric hole [A/3].

**Fixed point for Aluminum Sub-frame**

Fixed point for Aluminum, Type 8  $\varnothing 9.4$  mm [B/4]

- Rivet head  $\varnothing 15$  mm 4.0×18-K15, blank or powder coated.

**Fixed point for Steel Sub-frame**

Fixed point steel A2, Type 8,  $\varnothing 9.4$  mm [B/4]

- SS Rivet, head  $\varnothing 15$  mm 4.0×18-K15, blank or powder coated.

Each panel must be fastened by 2 fixed fastening points in the panel center, installed first. All the others are sliding points.

**Sliding points for Aluminum Sub-frame**

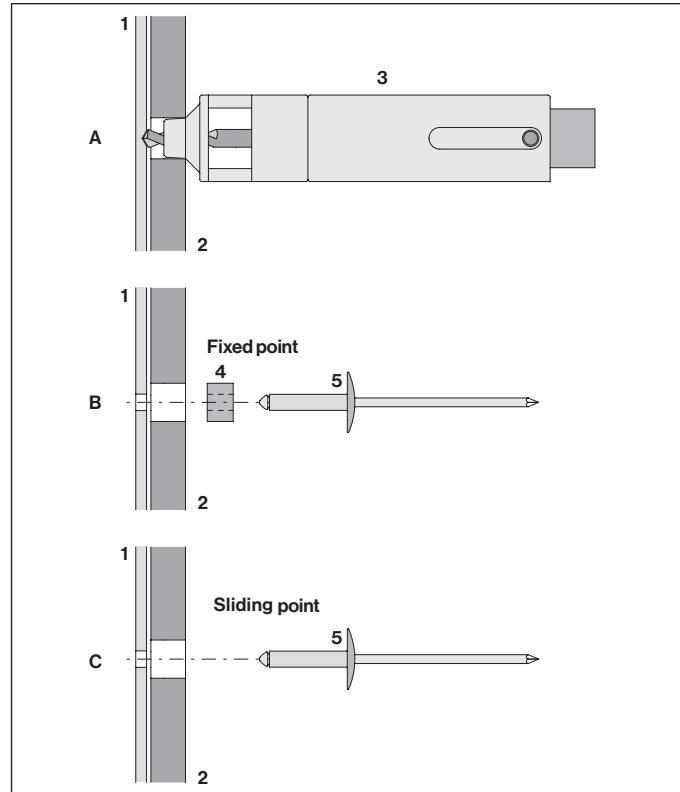
Use centering drill gauge with drill bit  $\varnothing 0.1614''$  to obtain concentric hole [C/5]

- Aluminum Rivet, head  $\varnothing 15$ mm, 4.0×18-K15 blank or powder coated. Sliding points for Steel Sub-frame use center drill gauge with drill bit  $\varnothing 0.1614''$  to obtain concentric hole [C/5]

**Sliding points for Steel Sub-frame**

- Sliding points for Steel Sub-frame. Use centering drill gauge with drill bit  $\varnothing 0.1614''$  to obtain concentric hole [C/5]
- SS Rivet, head  $\varnothing 15$  mm 4.0×18-K15, blank or powder coated.

- 1 Support profile
- 2 Swisspearl Largo 5/16"
- 3 Center drill gauge
- 4 Fixed point sleeve, type 8
- 5 Rivet



## **Metal sub frame - 5/16" & 1/2" façade panels - rivet distances**

### **Engineering responsibility**

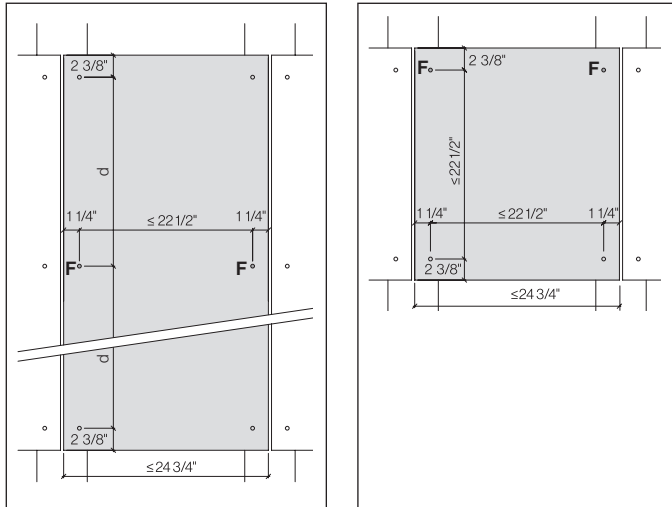
For the cladding design a locally licensed engineer shall assume responsibility for calculation and verification of all subframe components.

### **Panel data**

- Modulus of elasticity  
MOE ca. 15'000 MPa
- Modulus of rupture  
(characteristic)  
MOR (average) > 22 MPa
- Design value bending  
resistance 8.0 MPa  
(2.5 safety factor)
- Density > 1.75g/cm<sup>3</sup>

The data was evaluated according to ETAG 034 using 5/16" panel, and includes a safety factor of 2.5. Diameter of panel hole must be 3/8", and rivet head must be 9/16".  
Min. thickness for steel profiles to be 16 gauge, and 0.08" for aluminum.  
Edge distances 1 3/16" horizontally, 3 1/8" vertically. The data may be interpolated.

**Single span no intermediate support**



**Single span**

Fixed point  $\varnothing 3.8''$  [F]  
 Sliding points  $\varnothing 3/8''$

**Soffit panels**

Fastener distances for soffit panels and suspended ceilings not to exceed 19 11/16''.

- Fixed point  $\varnothing 3/8''$  [F]
- Sliding points  $\varnothing 3/8''$

Max. distance between fasteners for single span panels 22 1/2", unless smaller distances is required by high wind load as per table of fastener distances.

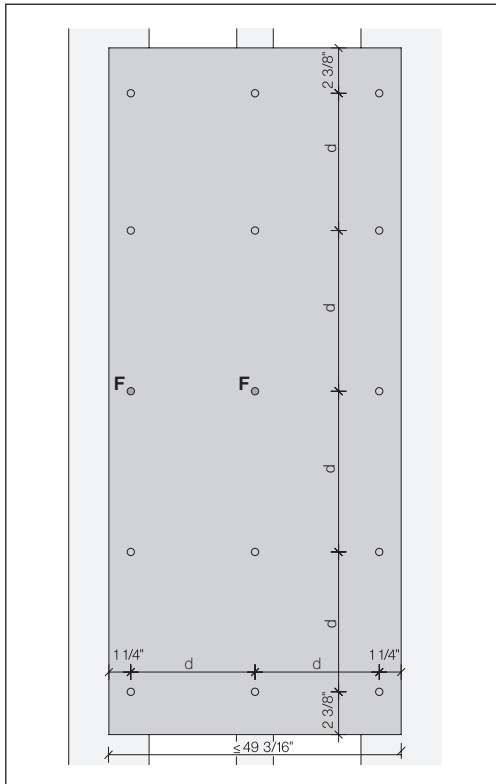
If more than 5 single span panels are adjoining each other - the chain of fixed points must be interrupted by a different configuration of the fixed points.

Consult with technical advisor.

# Design I Metal supports

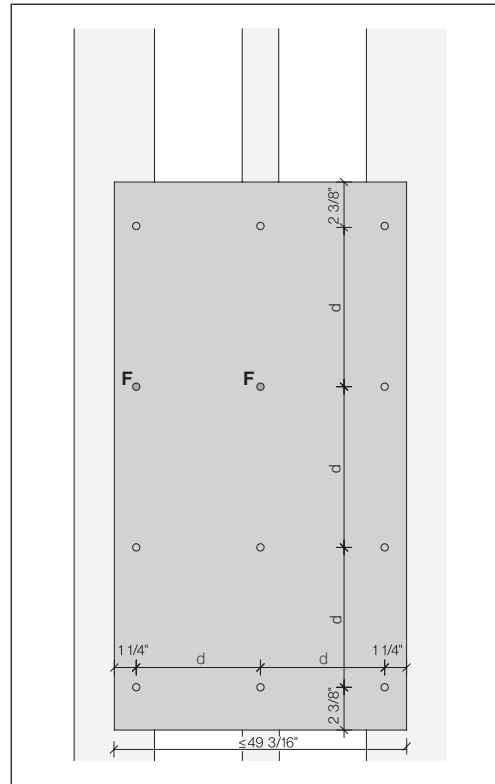
Sample rivet layouts, final layout to be determined by a local structural engineer.

## Swisspearl Largo vertical panel (portrait)



Fixed points [F] center and left.

## Swisspearl Largo vertical panel (portrait)



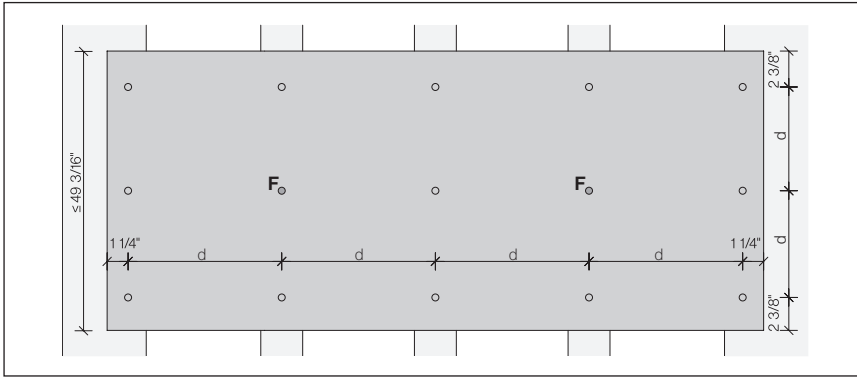
If no rivet at half height go with [F] to row above.

- Fixed point  $\varnothing 3/8"$  [F]
- Sliding points  $\varnothing 3/8"$

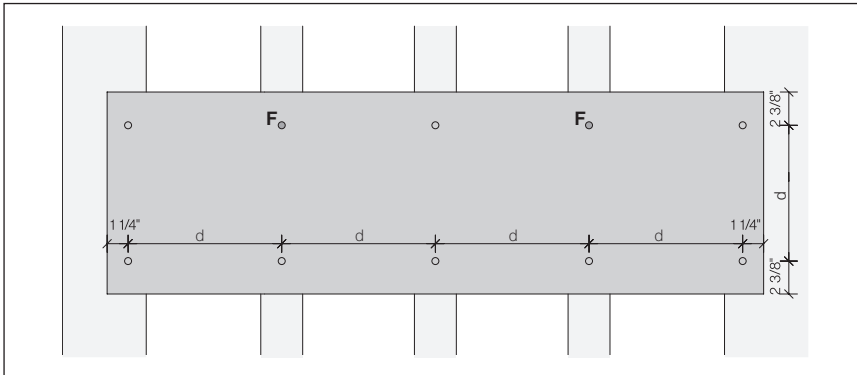
Sample rivet layouts, final layout to be determined by a local structural engineer.

Sample rivet layouts, final layout to be determined by a local structural engineer.

**Swisspearl Largo horizontal panel for odd number of rivets**



Between fixed points, the max. distance can be 1 sliding point

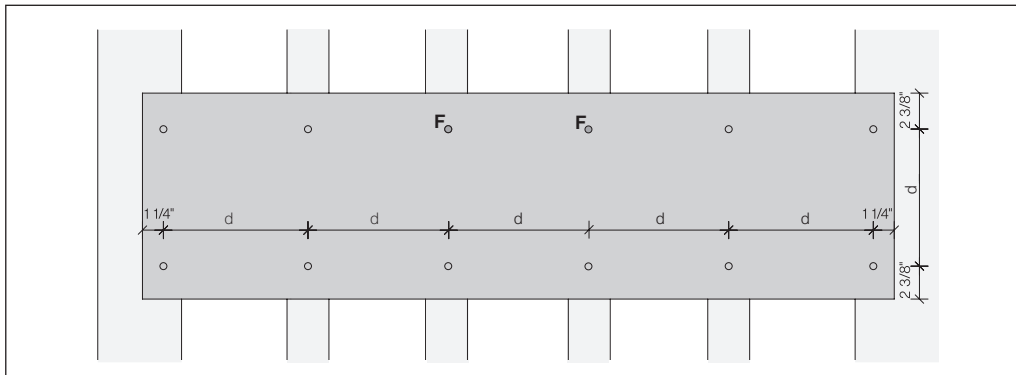
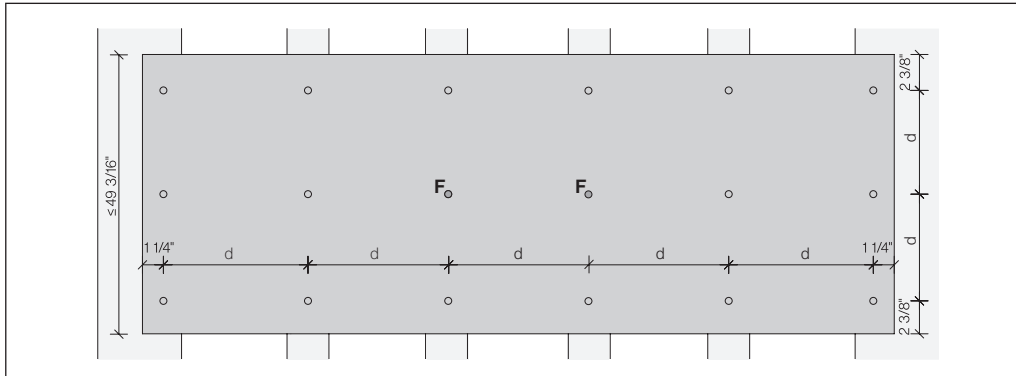


- Fixed point     ●  $\varnothing 3/8"$  [F]
- Sliding points     ○  $\varnothing 3/8"$

# Design I Metal supports

Sample rivet layouts, final layout to be determined by a local structural engineer.

## Swisspearl Largo horizontal panel (landscape) for even number of rivets

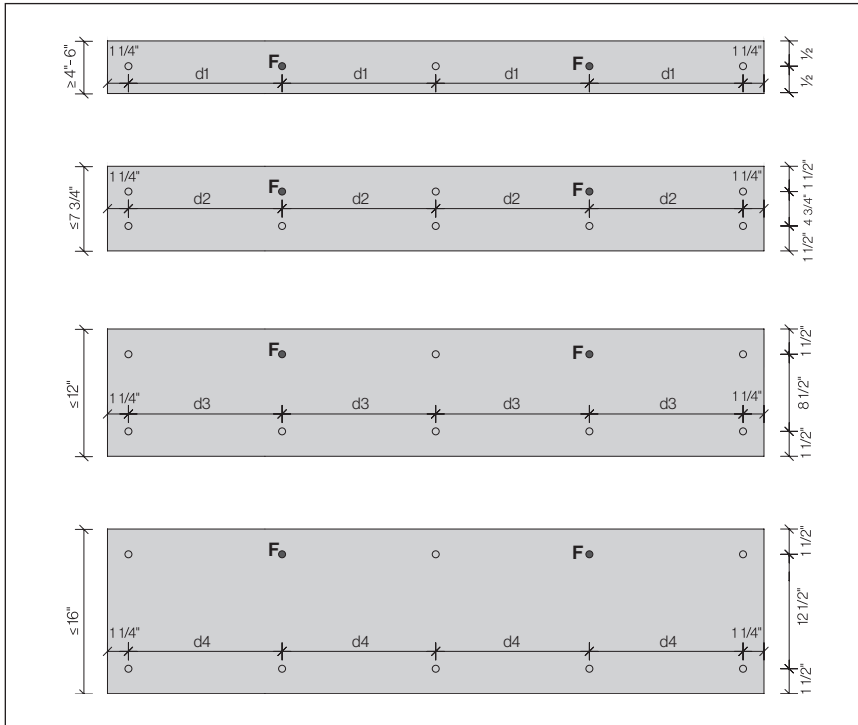


- Fixed point
- Sliding points

Ø3/8" [F]  
Ø3/8"

Sample rivet layouts, final layout to be determined by a local structural engineer.

**Swisspearl Largo strips or Linearis**



Linearis panel strips are delivered without drill holes. Installation details as per this DIM are applicable.

Due to deformation of the panel the max. fastener distances not to exceed:

- d1: 16 1/8"
- d2: 19 11/16"
- d3: 22 7/16"
- d4: 23 5/8"

- Fixed point
- Sliding points
- Ø3/8" [F]
- Ø3/8"

## **Swisspearl Largo strips or Linearis with open joints**

### **Product**

Swisspearl Linearis are ready-made Largo panel strips, for installing with open joints. Whether monochrome or multicolored, equal or varying format lengths, with continuous or offset joints – there is immense scope for different combinations.

### **Holes in panel for rivets**

Fastener holes to be done at the jobsite. Diameter 3/8".

### **Panel joints**

Swisspearl Linearis typical panel joint is min .25".

### **Installation Reflex, Vintago**

When installed, all the arrows on the backside of the Reflex and Vintago panels must point in the same direction.

## **Fixed point for Aluminum Sub-frame**

Fixed point for Aluminum, Type 8 diameter 9.4 mm [B/4]

- Rivet head diameter 15 mm, 4.0×18-K15 blank or powder coated.

## **Fixed point for Steel Sub-frame**

Fixed point steel A2, Type 8, diameter 9.4 mm [B/4]

- SS Rivet, head diameter 15 mm, 4.0×18-K15 blank or powder coated.

## **Drill holes diameter 3/16" to metal profiles**

Use concenter drill gauge so that the holes will be concentric to the diameter 3/8" hole in the panel. Use drill bit type A for aluminum profiles and type S for steel.

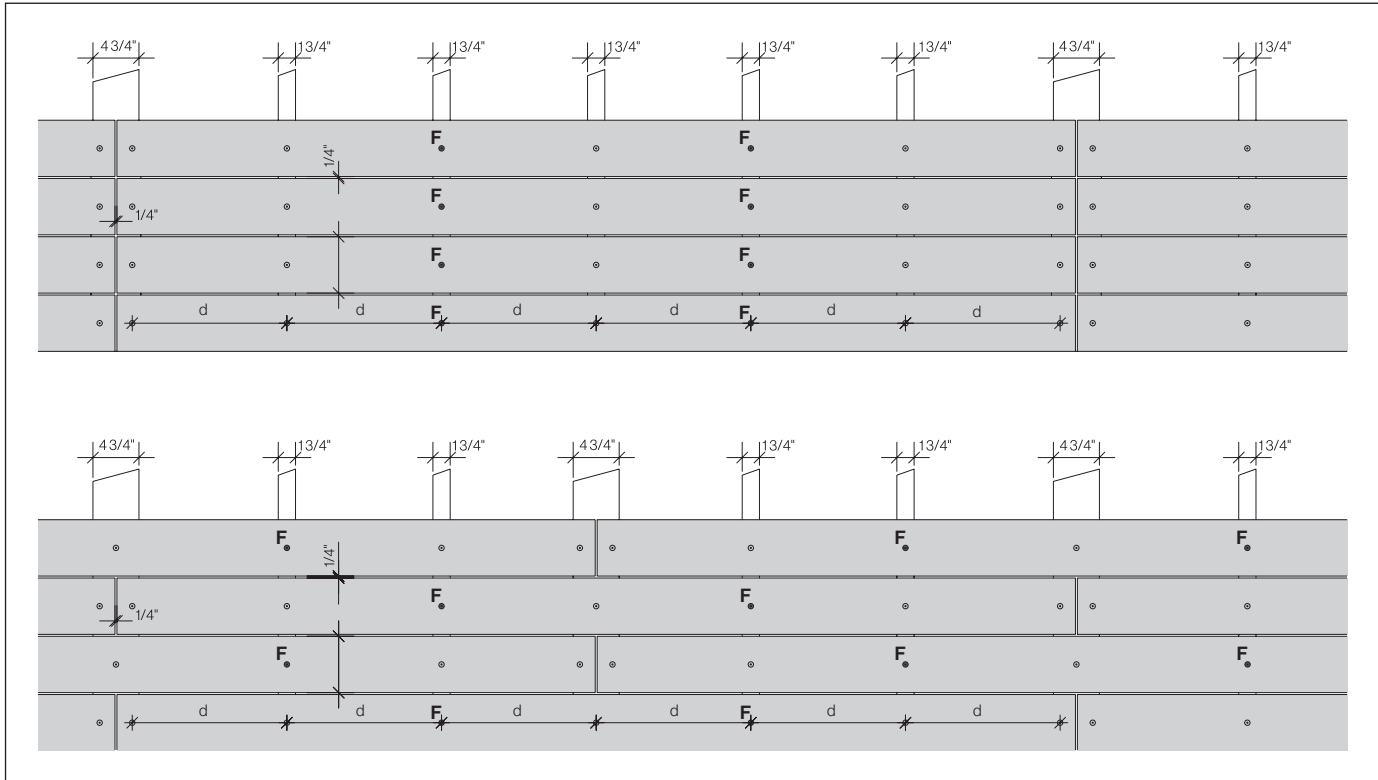
### **Details**

Installation details as per this DIM are applicable.

### **Vertical installation**

The arrangement of Swisspearl Linearis is usually horizontal. For the execution of a vertical application please contact the Technical Service.

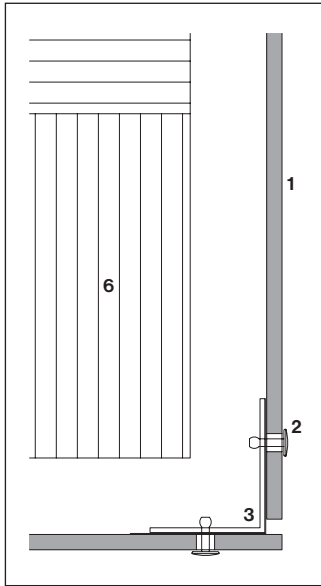
**Swisspearl Linearis example**



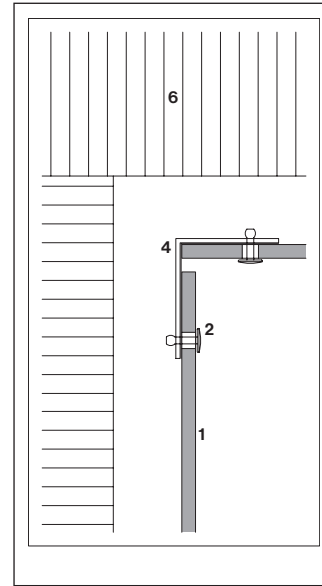
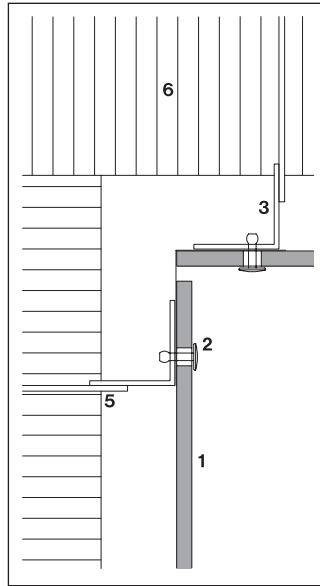
Attention! Staggered layout with offset rivet is also allowed per the discretion of the design, hat or t depending on Subframe components.

- Fixed point      Ø3/8" [F]
- Sliding point    Ø3/8"

**Example outer corner**



**Example inner corner**

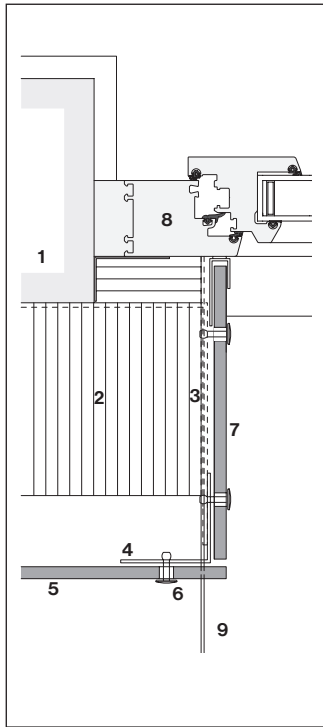


- 1 Swisspearl Largo 5/16"
- 2 Rivet 4.0x18-K15
- 3 Min. angle 2 1/4" x 2 1/4"
- 4 Min. angle 2 3/4" x 2 1/4"
- 5 Bracket
- 6 Thermal insulation

Corner angle not attached back to building as shown can be cantilevered up to 16".

Depending on structural calculations (windloads) needs an extra support at the corners.

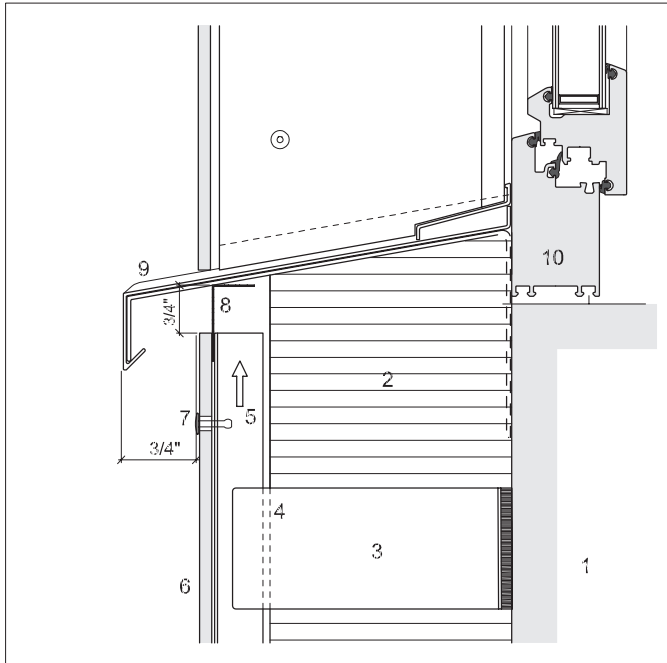
**Example window jamb**



- 1 Exterior wall
- 2 Thermal insulation
- 3 Horizontal support
- 4 Vertical support
- 5 Swisspearl Largo 5/16"
- 6 Rivet 4.5x18 K15
- 7 Swisspearl Largo
- 8 Window frame
- 9 Window sill

Jamb with 5/16" panel

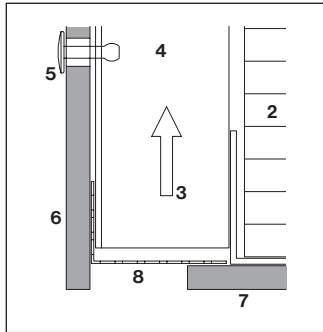
## Example window sill



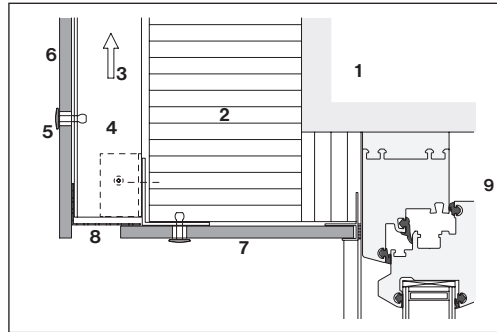
- 1 Exterior wall
- 2 Thermal insulation
- 3 Bracket
- 4 Vertical support
- 5 Ventilation cavity
- 6 Swisspearl Largo 5/16"
- 7 Rivet 4.0x18-K15
- 8 Perforated angle
- 9 Window sill
- 10 Window frame

Window sill made of metal

**Example window head**



Perforated angle

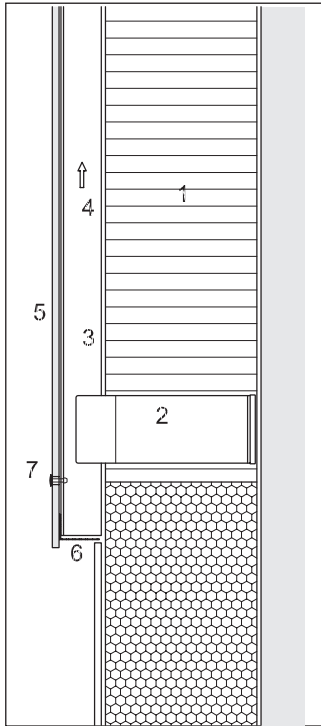


Metal framing around whole window

- 1 Exterior wall
- 2 Thermal insulation
- 3 Ventilation cavity
- 4 Vertical support
- 5 Rivet 4.0x18-K15
- 6 Swisspearl Largo 5/16"
- 7 Swisspearl Largo 5/16"

- 8 Perforated angle
- 9 Window frame

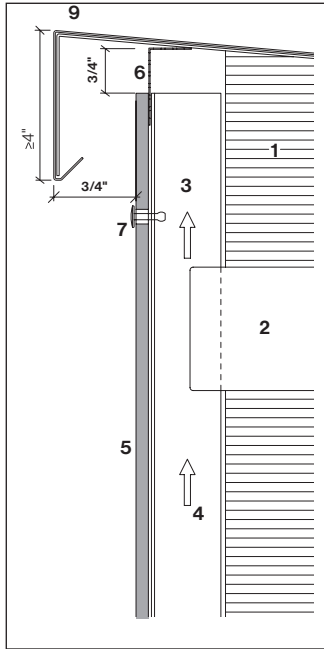
## Example bottom detail



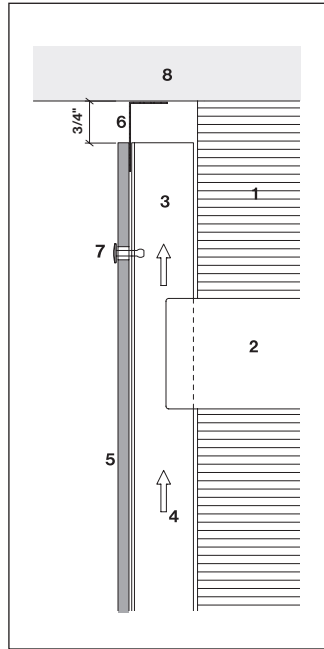
- 1 Thermal insulation
- 2 Bracket
- 3 Vertical support
- 4 Ventilated cavity
- 5 Swisspearl Largo 5/16"
- 6 Perforated angle
- 7 Rivet 4.0×18-K15

In order to avoid damages its advised to keep a minimum distance of 8" from bottom of the panel to the ground

**Example coping detail**



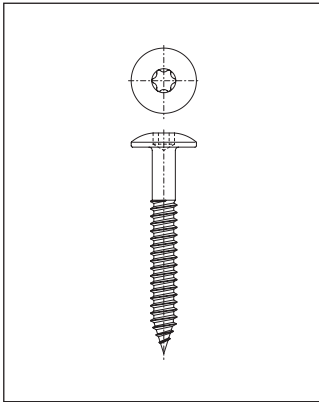
Coping detail



Details under slab

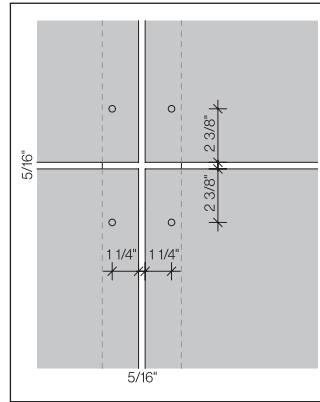
- 1 Thermal insulation
- 2 Bracket
- 3 Vertical support
- 4 Ventilated cavity
- 5 Swisspearl Largo 5/16"
- 6 Perforated angle
- 7 Rivet 4.0x18-K15
- 8 Soffit
- 9 Coping

## Swisspearl screw



Swisspearl screw, stainless steel, saucer head  $\varnothing$  12 mm, T20 drive, 4.8×38 mm.

## Distances to panel edge



## Panel hole

Diameter 1/4"

## Minimum edge distances

Horizontally 1 1/4"

Vertically 2 3/8"

## Maximum edge distance

Horizontally and vertically max. 4".

## Panel joints

Typical panel joint is 5/16", this allows panel scraps to be used as spacers. Wider joints will make any inaccuracies in the installation less noticeable.

## Installation

The screws must be installed with depth stop at 90 degrees set to the panel. The screw head must rest even to the panel.

## Sub-frame engineering

Engineer / contractor are responsible for the design and installation of all sub framing parts including all pertaining fasteners.

## Timber battens

Straight grown pine, dry (max. 20% moisture content). Grade No.2

**Timber battens**

Installation over timber battens is allowed provided the design meets local engineered codes and standards.

**Timber quality**

Battens must be thickness gauged to 1 face:

- Thickness min. 3/4" (depending on the building height, the cavity will increase, see recommended cavity depth page 12) should the building be higher, the vent. cavity has to increase.
- Always use planed surface timber
- Solidity class II (FK II/C24)
- Recommended only using kiln-dried lumber
- Moisture content max. 20-%
- Timber must be of equal or higher quality

**Min. vertical battens**

At panel joints:  
 2 x .75" x 2.50" or  
 1 x .75" x 5"

Intermediate supports:  
 .75" x 2.50"

**Engineering**

Battens including their attachment to be engineered per local standards.

**Battens screw**

Screw Ø min. 1/4"  
 Head Ø min. 1/2"  
 For battens wider than 2.25" use two screws per point of attachment. Rear ventilation, thermal insulation, moisture proofing, wind proofing layers. All local standards are applicable and must be complied with.

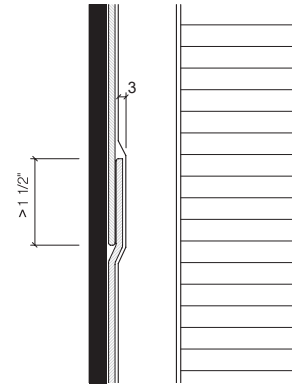
**Joint flashing**

Horizontal joint and L-flashing should be .08" shorter than panel and thus not visible in vertical joints. If required butt joint the flashings on any batten, do not overlap flashing.

L-flashings and horizontal joint flashing are not 100% water-proof! Therefore all timber battens must be fully covered by EPDM bands to protect them against moisture and to prevent rotting and the growth of fungi and mold.

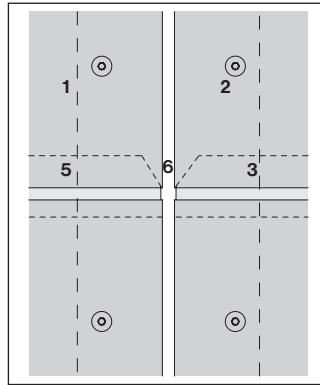
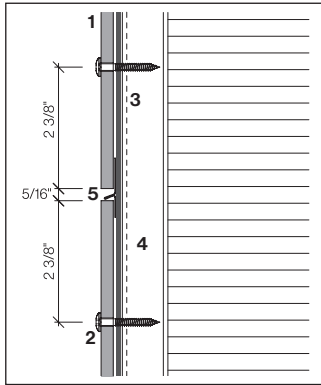
**EPDM strips**

All timber battens must be fully covered by EPDM backing strips stapled to the battens. Stapled at the edges of the bands. EPDM strips to be in one single piece top to bottom or overlapped as per diagram.



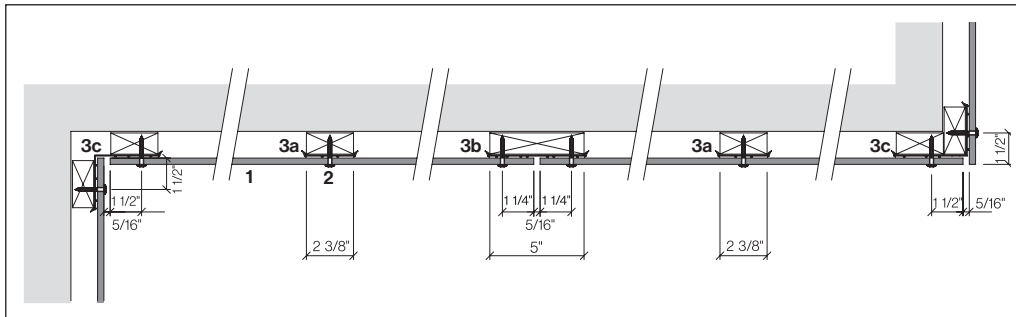
EPDM strip overlap

## Horizontal panel joint

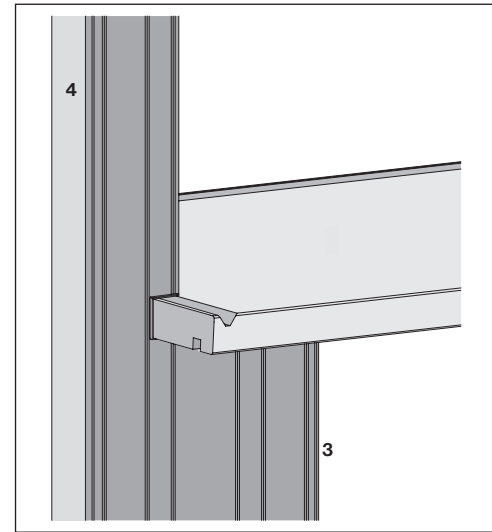
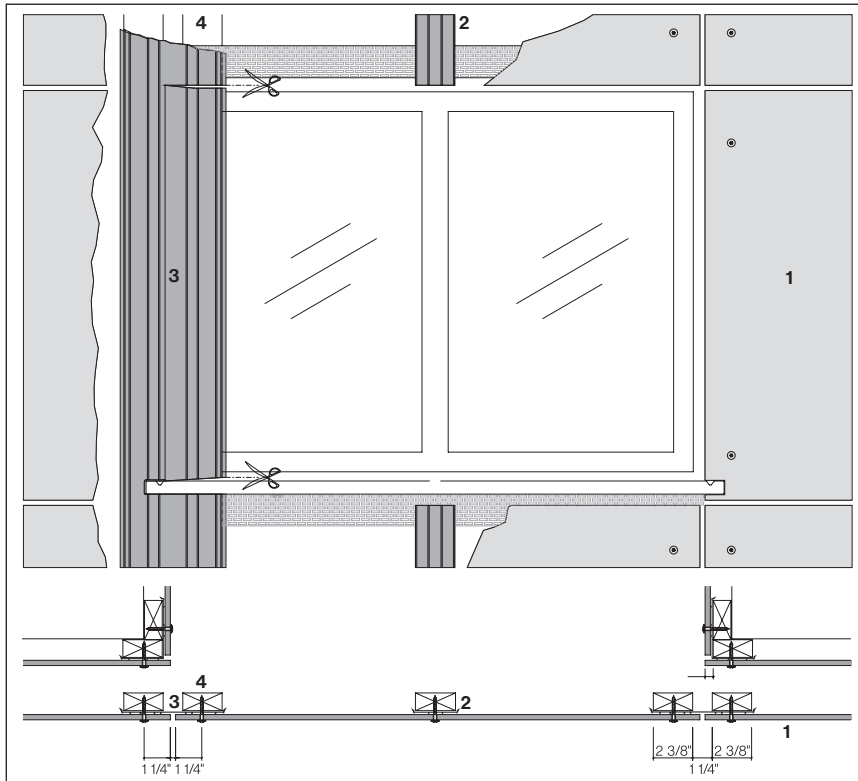


- 1 Swisspearl Largo 5/16"
- 2 Screw
- 3a EPDM band 2 1/4"
- 3b EPDM band 5"
- 3c EPDM band 6"
- 4 Batten 3/4" x 2 1/4", 3/4", 4 3/4"
- 5 Joint flashing
- 6 Cut corners of panel joint profiles at 45° to help with moisture removal and cover with EPDM

## Horizontal section through vertical battens



**Vertical joint at window**



- 1 Swisspearl Largo 5/16"
- 2 EPDM band 2 1/4"
- 3 EPDM band 6"
- 4 Batten 3/4"×2 1/4"

## **Timber sub frame - 5/16" & 1/2" façade panels - screw distances**

### **Engineering responsibility**

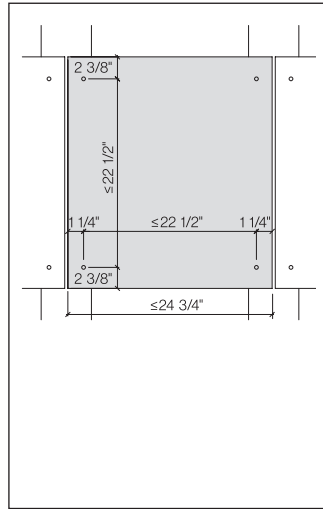
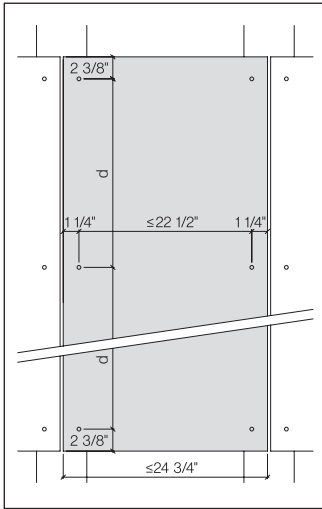
For the cladding design a locally licensed engineer shall assume responsibility for calculation and verification of all subframe components.

### **Panel data**

- Modulus of elasticity  
MOE ca. 15'000 MPa
- Modulus of rupture  
(characteristic)  
MOR (average) > 22 MPa
- Design value bending  
resistance 8.0 MPa  
(2.5 safety factor)
- Density > 1.75g/cm<sup>3</sup>

The data was evaluated according to ETAG 034 using 5/16" panel, and includes a safety factor of 2.5. Diameter of panel hole must be 1/4", and screw head must be 1/2". Minimum screw engagement in timber to be 1 1/16". Edge distances 1 3/16" horizontally, 3 1/8" vertically. The data may be interpolated.

**Single span panel (no intermediate support)**



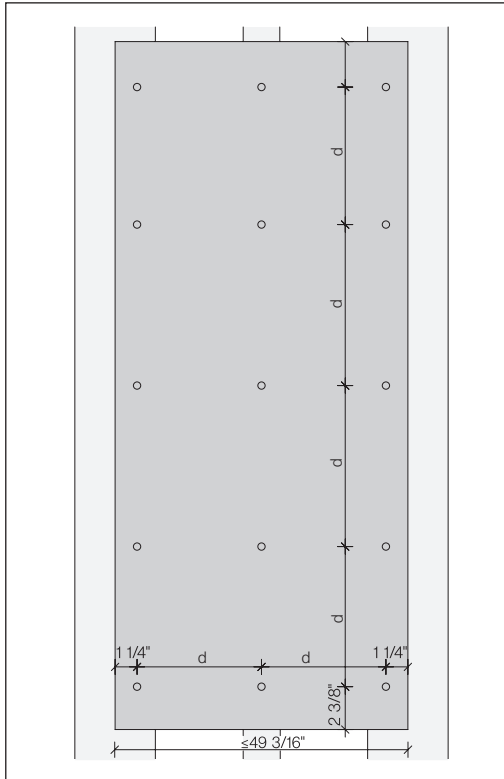
**Soffit panels**

Fastener distances for soffit panels and suspended ceilings not to exceed  $19 11/16''$ .

Max. distance between fasteners for single span panels  $22 1/2''$ , unless smaller distance is required by high wind load as per table of fastener distances.

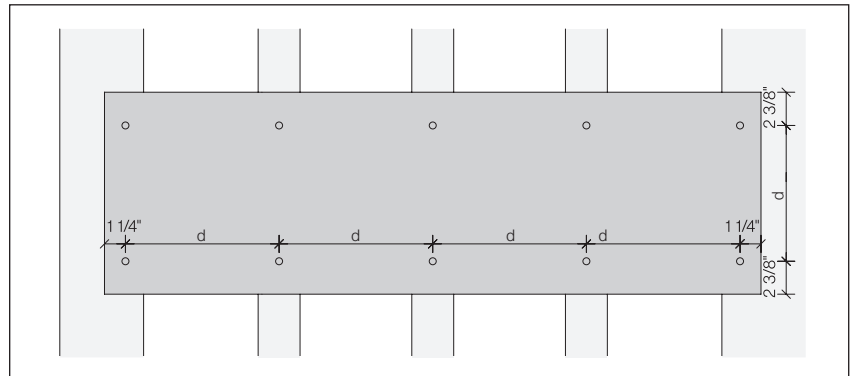
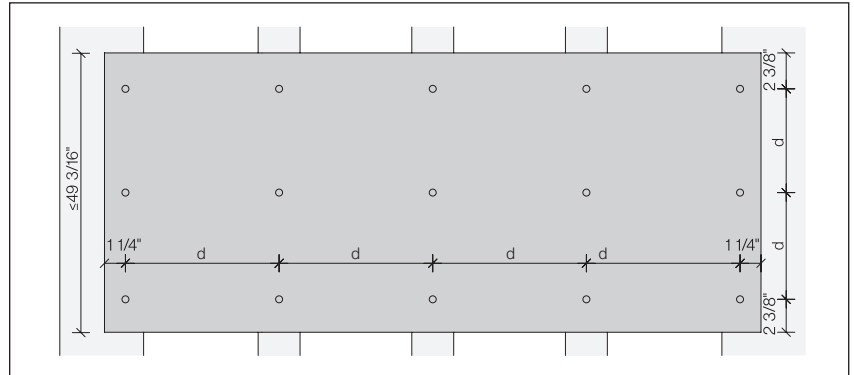
Sample screw layouts, final layout to be determined by a local structural engineer.

## Swisspearl Largo vertical panel (portrait)



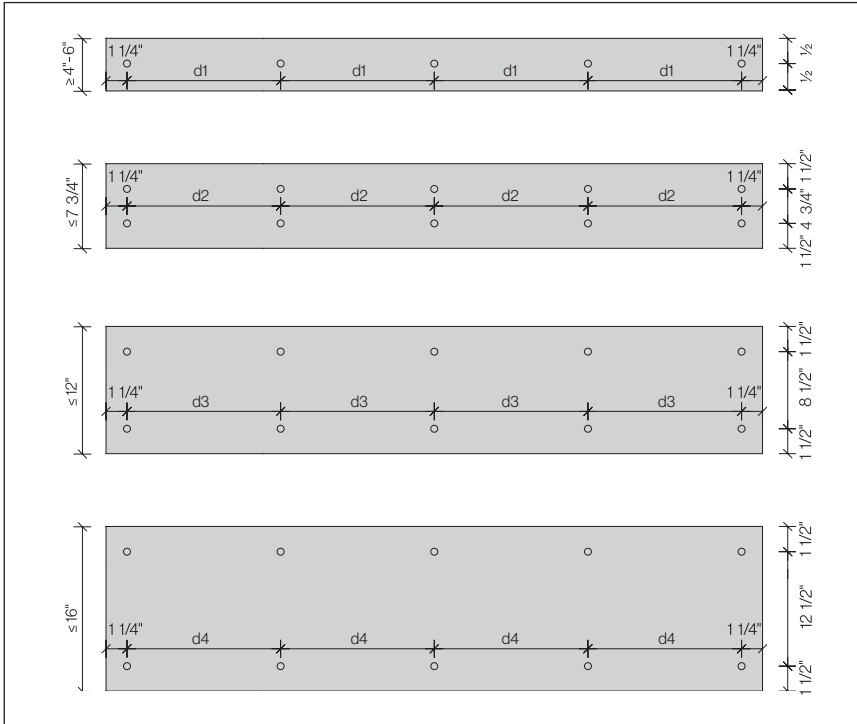
Drill holes  $\varnothing$  5.5 mm

## Swisspearl Largo horizontal panel (landscape)



Sample screw layouts, final layout to be determined by a local structural engineer.

**Swisspearl Largo strips or Linearis 5/16"**



Linearis panel strips are delivered without drill holes. Installation details as per this DIM are applicable.

Due to deformation of the panel the max. fastener distances not to exceed:

d1:  $16\frac{1}{8}"$

d2:  $19\frac{11}{16}"$

d3:  $22\frac{7}{16}"$

d4:  $23\frac{5}{8}"$

## **Swisspearl Largo strips or Linearis with open joints**

### **Product**

Swisspearl Linearis are ready-made Largo panel strips, for installing with open joints. Whether monochrome or multicolored, equal or varying format lengths, with continuous or offset joints – there is immense scope for different combinations.

### **Holes in panel for screws**

Fastener holes to be done at the jobsite. Diameter 1/4".

### **Ventilation cavity**

The min. cavity to be 3/4" with open joints.

### **Panel joints**

Linearis typical panel joint is 1/4".

### **Installation Reflex, Vintago**

When installed, all the arrows on the backside of the Reflex and Vintago panels must point in the same direction.

## **Timber battens**

Installation over timber battens is allowed provided the design meets local engineered codes and standards.

### **EPDM strips**

All timber battens must be fully covered by EPDM backing strips stapled to the battens. Stapled at the edges of the bands. EPDM strips to be in one single piece top to bottom or overlapped.

Mandatory the use of Swisspearl EPDM bands with side lips

## **Details**

Installation details as per this DIM are applicable.

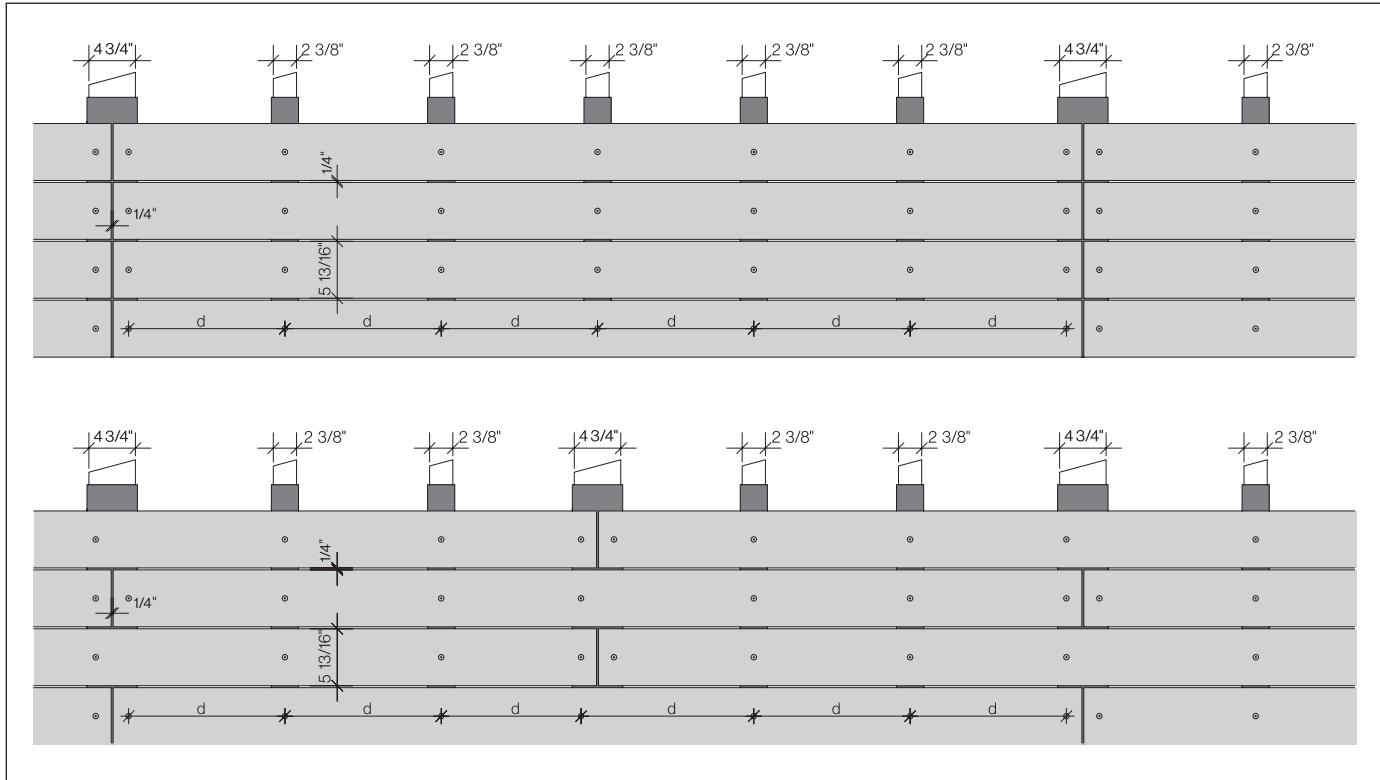
### **Vertical installation**

The arrangement of Swisspearl Linearis is usually horizontal. For the execution of a vertical application please contact the Technical Service.

### **Vertical battens**

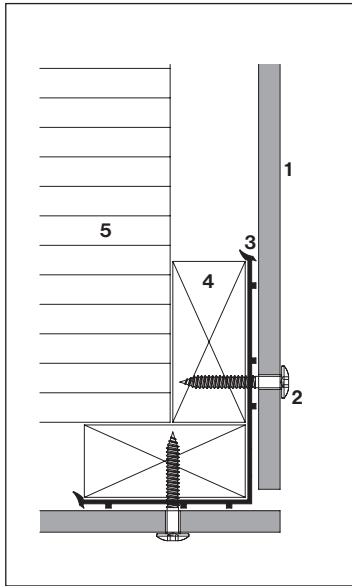
Under butt joint 1×3/4"×4 3/4" or 2×3/4"×2 1/4", one-sided planed. Intermediate support 3/4"×2 1/4", one-sided planed.

**Swisspearl Linearis example**



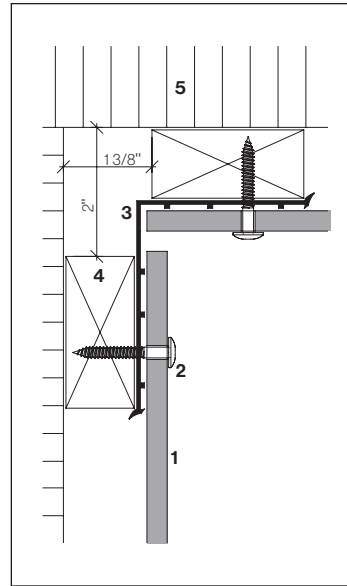
By an offset configuration, fastener hole not to be placed at the joint axis (water course).

## Swisspearl Linearis example outer corner



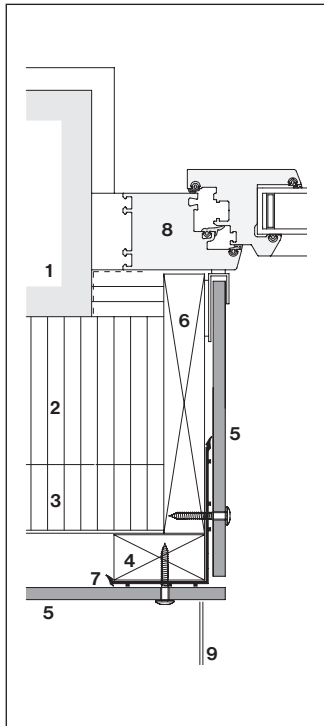
Batten configuration to building corner as shown above with the use of 6" EPDM.

## Swisspearl Linearis example inner corner



- 1 Swisspearl Linearis 5/16"
- 2 Swisspearl Screw 4.8x38 mm
- 3 EPDM band 6"
- 4 Batten 3/4" x 2 1/4"
- 5 Thermal insulation

**Swisspearl Largo example window jamb**

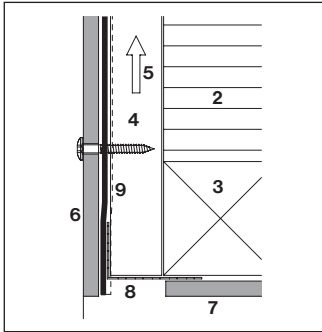


- 1 Exterior wall
- 2 Thermal insulation
- 3 Horizontal support
- 4 Vertical support
- 5 Swisspearl Largo 5/16"
- 6 Jamb board
- 7 EPDM band 150 mm
- 8 Window frame
- 9 Window sill

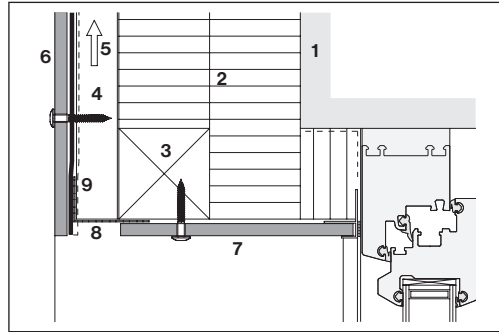
Jamb with 5/16" panels



**Example window head**



Perforated angle

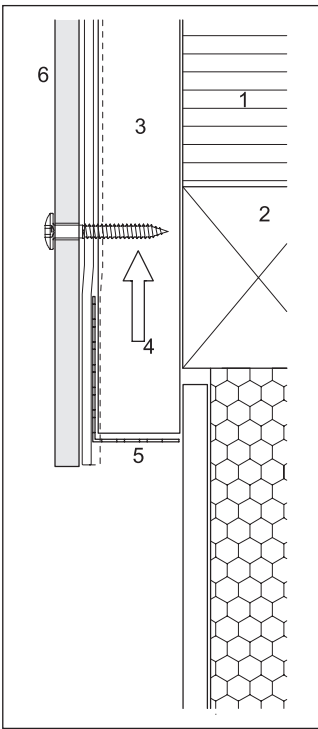


Metal framing around whole window

- 1 Exterior wall
- 2 Thermal insulation
- 3 Horizontal support
- 4 Vertical support
- 5 Ventilation cavity
- 6 Swisspearl Largo 5/16"
- 7 Swisspearl Largo 5/16"

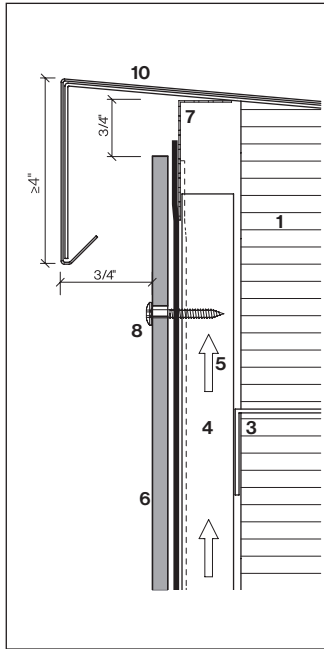
- 8 Perforated angle
- 9 EPDM band

## Example bottom detail

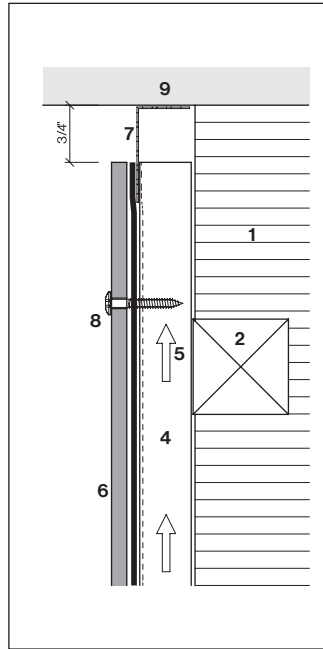


- 1 Thermal insulation
- 2 Horizontal batten
- 3 Vertical support
- 4 Ventilated cavity
- 5 Perforated angle
- 6 Swisspearl Largo 5/16"

**Example coping detail**



Coping detail



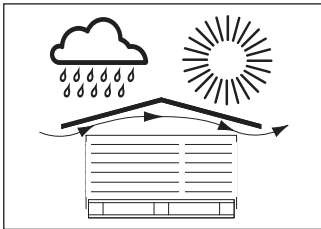
Detail under slab

- 1 Thermal insulation
- 2 Horizontal batten
- 3 Horizontal support
- 4 Vertical support
- 5 Ventilated cavity
- 6 Swisspearl Largo 5/16"
- 7 Perforated angle
- 8 Screw
- 9 Soffit
- 10 Coping

## On site storage

Pallets must be stored under cover i.e. out of rainfall and direct sunlight. Where this is not possible, store under a tarp. Ingress of water into stacked panels will cause permanent staining to panel surface. Excess heat to stacked panels can cause damage to panel surface. Overseas pallets can be stacked 3 high above another.

Provisional roofing or tarp covers are to be used in a manner that allows cross ventilation as shown.



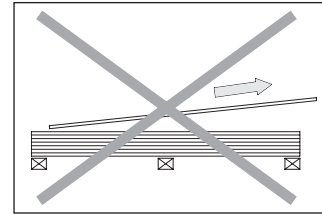
## Fabricating panels at local fabricators or on site

Always work out of the weather. Cutting panels to size:

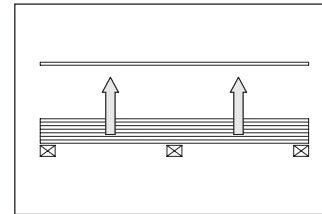
- Use industrial vertical panel saw for large quantities
- For small quantities use circular hand saw with straight edge and dust extraction
- Panel cut outs, etc. use jig saw
- Cutting blade supplied by factory or procured locally; considering cutting quality, performance, costs
- Dust from fabricating on site must be removed immediately
- Avoid tools which produce fine dust

## Stacking panels on site

- Always stack the panels horizontally on pallet base
- Each stack should not be more than 20" high
- Use foam protection layer between the panels (as supplied by factory)
- 3 stacks on top of each other



Do not pull panel across...



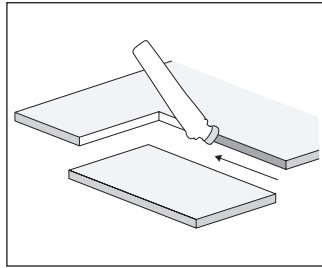
...but lift up vertically

**Panel fabrication on site**

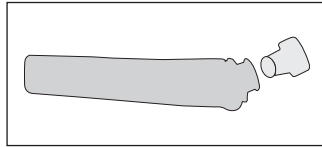
For long cuts use multifunction table with circular hand saw, guide rail and dust extractor. Saw blade supplied by panel manufacturer or at own choice.

**Cut outs**

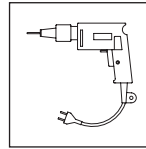
For smaller cut outs or odd shapes use pendular jig saw. For drilling use drill bits on site storage  $\varnothing 3/8''$  /  $\varnothing 1/4''$  (metal / timber supports) with carbide metal tips supplied by panel manufacturer or procured locally.

**Sealer to cut edges**

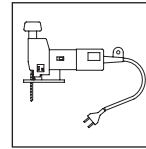
All cut edges must be sealed with impregnation liquid LUKO. Immediately wipe LUKO off the face of the material.

**LUKO hand applicator**

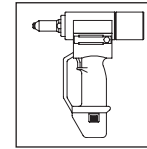
LUKO filled in hand applicators is frost proof to 18°F. LUKO supplied in 1 liter bottles is not frost proof but dries faster (for fabrication in work shop).

**Tools**

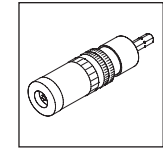
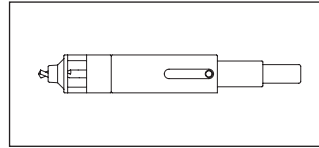
Drill



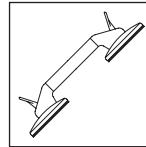
Jig saw



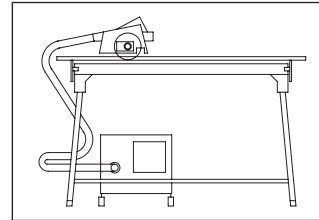
Rivet gun

Depth stop  
(mandatory for  
timber sub-frame)

Centering drill gauge



Vacuum handle with silicone cups. (Keep silicone cups clean during installation to prevent scratching panels).



Circular hand saw with guide rail and dust extraction

## **Swisspearl panels including**

Carat, Avera, Incora, Texial, Reflex, Vintago, Nobilis and Zenor including those panels with an added Façade and or Roof coatings fall into these categories.

## **Cleaning procedures**

Remove dust immediately after fabricating panels.

## **Dry dust**

To be removed with a vacuum cleaner, or with a clean, dry and soft cloth or brush.

## **Wet dust**

Results in staining the panel surface. It must be removed immediately, using plenty of water and a sponge or soft brush.

## **Cleaning of completed claddings**

Non calcium based stains:

- Use high pressure cold water at max. 1160 PSI (minimum distance from panel 10"). Use flat fan spray nozzle, dirt blasters are not allowed. Test on in- conspicuous part of cladding prior to complete cleaning.
- If required use mild soap or dish-washing liquid. Do not use abrasive or solvent containing cleaning agents
- Do not use glass cleaning detergents!
- Never wash claddings in direct sun light with alkaline or acid cleaners, as the detergent may cause irreversible stains

Calcium based stains:

- Apply a mist spray of a solution of 9.5% acetic acid and water
- Allow to react a few minutes but do not let dry out
- Use high pressure cold water to rinse cladding

Repeate steps 1 to 3 on difficult stains:

## **Cleaning during service life**

Normally no cleaning will be needed since the rain will periodically wash away dust, environmental dirt, etc. However, if particular environmental conditions lead to a dirty surface, wash with garden hose or high pressure cold water.

## **Cleaning of HR panels**

Clean the surface with a soft cloth, remove stains with Acetone using a different soft cloth. Apply 2-3 times treatment if necessary. If the surface is not acceptable after the 3rd time, a change of the panel is recommended.

Do not clean the surface in direct sun light, and always use appropriate safety equipment.

For detailed specifications on HR panels please contact your Technical Advisor.

## **Organic growth**

Remove algae / fungii with a 5% solution of hydrogen peroxide (H2O2) to eliminate all spores.

## **Masking tape**

For the use of masking tape on panels it should be noted that most common masking tapes are not resistant to UV rays.

Such tapes leave behind residues, that cannot be removed without causing damage to panel surface. However the use of the following masking tapes is recommended:

- Masking tape 3M Blue 2090 for temporary application (1 - 2 weeks)
- Masking tape 3M Gold 244 for longer term application.

