

SWISSPEARL® Non modular lapped cladding

Edition March 1999

Up date April 2005



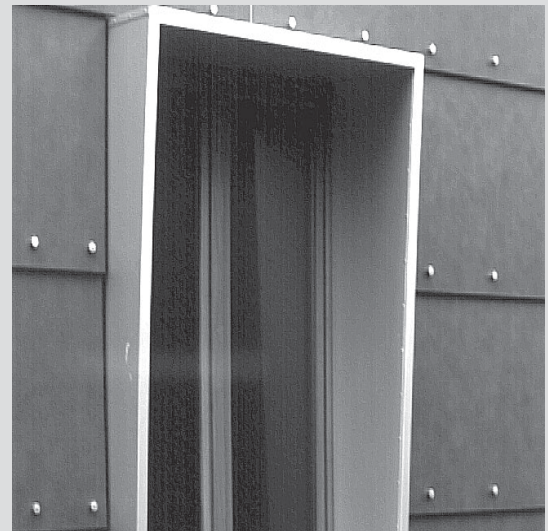
Tight lapped panels, staggered joints, color matched rivets



Tight lapped planks, staggered joints, concealed fixing



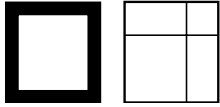
Planks with spacers to emphasise the laps



Lapped panels with spacers and decor fixings

Table of contents

		<i>Page</i>
Rain screen cladding	Advantages of system / Advantages of Swisspearl	3
General information, program	External wall design, facade engineering, rivets, technical data, panel sizes, optimising yield, guarantee, etc.	4
Planning and installation	Sub framing, wind loads, ventilation openings, panel joints, bending panels, panel fixing method, etc.	5
Components & accessories	Components for fixing onto timber / metal sub frame accessories for timber / metal sub frame	6
Design and installation details	Vertical joints, pattern, sub framing, concealed / exposed fixing	7
Installation on timber sub framing	Screws, max. horizontal spacing, timber battens, building corners, etc.	8
Installation on timber sub framing	Plank joints, concealed / exposed fixing	9
Installation on metal sub framing	Rivets max. horizontal spacing, fixed / expansion points, holes	10
Installation on metal sub framing	Concealed / exposed fixing, min. distance holes to panel edges	11
Fastening of panels - rivets	13 mm / 6 mm sleeve	12
Construction details	Tight lapped / with spacers, concealed / exposed fixing	13
Construction details	Corners, windows	14
Construction details	Bottom row	15
Handling on site	Stacking, storage, cutting, drilling, LUKO application, fabricating panels on site, cleaning procedures	16
Tools	Drill, saws, screw fastener, riveting tool	17
Swisspearl® REFLEX	Appearance, identification, planning, quotes, orders, installation	18
Warranty letter	Wording of warranty	19
Dos and don'ts	Generalities, design, storage, fabrication, cleaning	20



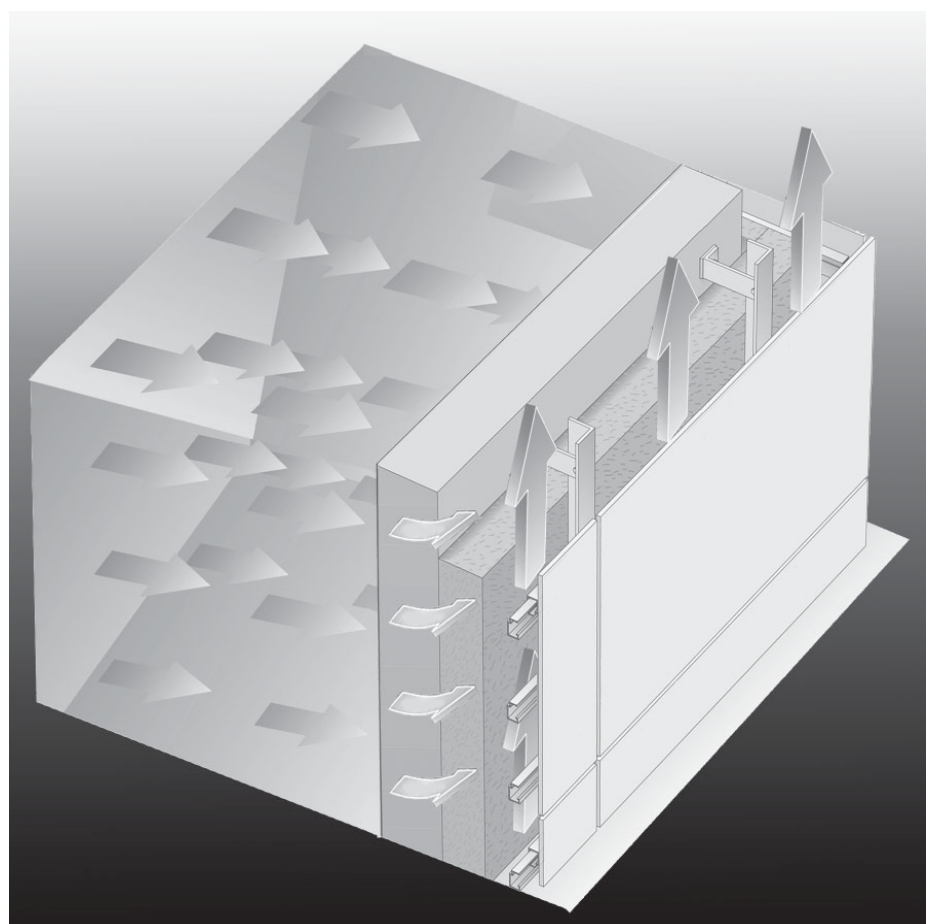
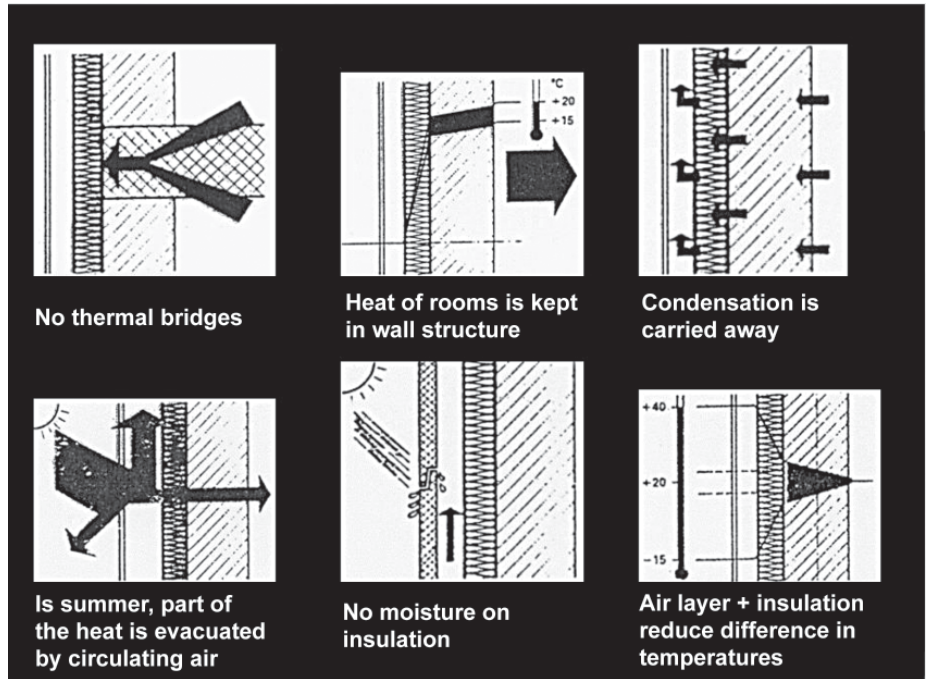
The rear ventilated façade system / rain screen cladding

All Swisspearl[®] panels and systems are specially designed for the rain screen principle associated with the permanent ventilation. The panels deflect most of the rain and the ventilated cavity carries away any moisture. The effectiveness of the system depends on a clear minimum cavity of 25-60 mm (depending on height of building) and on ventilation openings provided at the base and top of the cladding area, together with any interruption, windows, etc.

The long time proven superior quality of the Swisspearl[®] ventilated facade systems rests on Eternit Switzerland's most advanced façade "know-how" and system competence for fiber reinforced cement panels.

Advantages

- The most reliable system from the viewpoint of building physics with guaranteed performance
- Specially designed system for rain-screen cladding application. Fully tested for timber and metal sub frames
- Rear ventilation system reduces humidity
- Air circulation optimizes the efficiency of insulation
- Suitable for new buildings and refurbishment of every type and size
- Increased life expectancy of building substance
- Improved acoustic insulation
- Nearly no maintenance
- Never any plaster, paint and sealant problem
- Building tolerances can be readily accommodated



Swisspearl[®] main advantages

- Long time proven superior Swisspearl[®] quality
- Most advanced know how and system competence
- 10 year guarantee, very long life expectancy
- Unique textures and surface aspects
- Almost maintenance free
- No efflorescence

General information, program

www

For further information such as product data sheets, etc. please refer to web site www.swisspearl.com

External wall design

Architect / consultant / contractor are to assume responsibility for the correct design and execution of the external wall and its cladding - including all thermal, water, vapour and wind insulation layers – all in accordance to good building practice.

Facade engineering

Numbers and spacing of fastening points as set out in this DIM correspond to Swiss building standards, i. e. wind speed up to 140 km/h and moderate seismic exposure. If for any project higher standards are applicable - architect / consultant / contractor have to ensure that all required adaptations shall be made in order to achieve compliance with local standards and regulations.

Structural engineer / contractor shall assume overall responsibility for the facade engineering, including :

- choice of material and type of sub framing
- determine sizes of all structural members
- determine all fastening details to sub framing and panels

Swisspearl® rivets

Fastening by standard rivets as described in this DIM refers to application onto aluminum sub framing. If architect / consultant / contractor wish to use a different sub framing material – the use of standard aluminum rivets shall be at

their own risk and peril. Maritime environment (i. e. distance to ocean of less than 1 km) or other aggressive environment do not allow the use of standard rivets, but calls for stainless steel rivets instead.

Interior applications

Swisspearl® panels are suitable for interior applications for walls and ceilings, but with the following exclusions :

- High traffic areas subjecting the panel surface to wear and tear
- Areas where frequent cleaning has to occur such as in toilets, change rooms, etc.
- Not suitable for flooring, nor as fire place surroundings
- Not suitable as kitchen top, nor as sills for window or doors

Useable panel sizes

Swisspearl® fibre cement sheets must have all 4 sides trimmed off. The use of panels with untrimmed edges is not allowed. Please refer to product program + color chart regarding availability of each product line.

Panel sizes	
Max. trimmed panel sizes	
mm	ft / in
3040* x 1220	9'-11 ¹¹ / ₁₆ " x 4' - 0"
2500 x 1220	8'-2 ⁷ / ₁₆ " x 4' - 0"
2000 x 1220	6'-6 ³ / ₄ " x 4' - 0"
3040* x 900	9'-11 ¹¹ / ₁₆ " x 2'-11 ⁷ / ₁₆ "
2500 x 900	8'-2 ⁷ / ₁₆ " x 2'-11 ⁷ / ₁₆ "

* 3048 if fabricated at factory

Cladding contractor

Swisspearl® facades shall be installed by Swisspearl® trained contractors.

Impregnation of cut edges

On the production line after trimming / cutting - all panel edges receive impregnation, i. e. panels leave the line sealed on all 6 faces.

If panels are cut on site, each cut has to be treated by impregnation liquid "LUKO" whereas the liquid is painted on by hand applicator.

Cutting panels - optimising yield

Based upon list of panels an optimising computer program is run in order to minimise cut off waste. The program defines the number of full panels required and counts the length of cutting needed for the job.

Project specific ordering

The characteristics of the raw materials determine properties and appearance of Swisspearl® panels. Subtle visual differences may occur between production batches. Orders should make allowance for this by itemising quantities accordingly, so that panels for adjacent surfaces on the same job can be supplied from identical production batches.

Swisspearl® Product guarantee

Swisspearl® products are covered by a 10 year functional guarantee – for details of conditions please refer to "warranty letter" (example).

Rear ventilated facade

The design principle involves deflection of almost all rain water, but allows minimal penetration through the panel joints into an inner zone (ventilated cavity), where drainage and evaporation can occur. The inner wall surface towards the ventilated cavity should be of non water absorbing or water repellent characteristics.

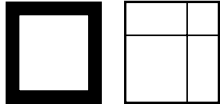
The external wall system does not call for any water nor vapour proofing layers minimising thus risk of condensation in both directions (out and inwards).

Execution details

Detail drawings showing panel dimensions, distances to panel edges, ventilation openings at top, bottom and windows, building corners, etc. shall be submitted for checking prior to ordering material.

Technical data	CH Standards	ATI/ASTM
Density	1,8 g/cm ³	
Modulus of elasticity	~ 15'000 MPa	18'450 MPa
Bending Strength	23 MPa	
Shrinkage (10 years)	1,8 mm/m ¹ panel	
Thermal expansion coefficient	10 · 10 ⁻⁶ K ⁻¹	6,97 x 10 ⁻⁶ in /in °F
Frost resistance	passed 1000 cycles	2.944 psi
Fire performance	6 q. 3 non-inflam.	UBC Class 1 / NFPA Class A
Weight for panel 8 mm (⁵ / ₁₆ ")	~ 15 kg/m ²	~ 3 lbs / ft ²

All dimensions in these guidelines are specified according to metric system with indicative Imperial values. Orders are to place and will be confirmed and processed in metric sizes only



Planning and Installation

Scope of application – sub frame

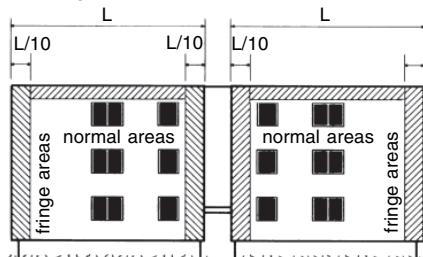
Swisspearl® panels have been designed for installation on timber, timber/metal or metal sub frame systems. Architect, consultant, contractor to choose appropriate system in accordance with local building standards / regulations.

Seismic loads

Local standards / regulations to be considered.

Wind loads

All details regarding the fastening of panels as set out in this DIM correspond to Swiss building standards, i. e. wind speed up to 140 km/h. If for any project higher standards are applicable – architect / consultant / contractor have to ensure that all required adaptations shall be made in order to achieve compliance with local standards and regulations. Fastening details in this DIM are relating to building height and distinguish between normal wind load areas and fringe zones (facade top and building corners).



Wind load fringe area = according to local standards

Sub framing – General remarks

Engineering metal sub frames : Material expansion and retraction due to temperature change must be allowed for, by duly providing 1 fixed fastening point per support and the rest expansion points, with slotted holes. At support interruptions allow a free gap of approx. 20 mm. Support interruptions must coincide with panel joints, i. e. may not be located in mid panel. Sub frame sections to be generally about 3 m high, for installation from floor to floor.

Building tolerances are to be taken up by shimming, so that all panel support profiles are in one plane. Allowable deflection ratio is 1/300 between panel supports and has to be respected for the whole facade.

Sub framing members in timber are to be protected from rain water by aluminum joint backing strips for staggered plank joints, and by EPDM strips for continuous plank joints, EPDM strip to be in 1 piece from top to bottom.

Thermal insulation

The insulation layers must be well fastened to the installation base so that they can not detach themselves and obstruct the ventilation in the cavity.

Ventilation cavity

Building tolerances must be allowed for. The cavity may not be reduced by horizontal profiles or any stray objects such as loose wind proofing layers, etc.

Minimum cavity thickness as per table below

Height of the cladding	min. uninterrupted ventilated cavity
- 6 m/ 18'	20 mm/ 13/16"
- 25 m/ 75'	30 mm/ 13/16"
- 50 m/150'	40 mm/ 19/16"
- 75 m/225'	50 mm/ 2"
> 75 m/225'	60 mm/ 23/8"

Air intake and exit openings

These must have a clear cross section of at least half the cross section of the ventilation cavity. Reductions, e. g. by insect screens, must be compensated for.

Building expansion joints

Structural expansion joints must be applied to sub framing and cladding in the identical position and to the same extent.

Bending Swisspearl® panels

Panels can be bent on building site, whereas the age of the panel and fixing distances are determining factors regarding minimal bending radii.

Approximately

min. $r = 16$ m panel bent lengthwise

min. $r = 20$ m panel bent crosswise

Shrinkage

Swisspearl® panels, like any other product containing Portland cement,

The use of joint sealing compounds must be avoided by careful detailing. Silicone, polysulphide and Thiokol sealant may not be used, as they could cause permanent staining to Swisspearl® panel. Where the use of sealant is unavoidable, compatibility (incl. primer) with Swisspearl® panel to be verified, best suitable would be hybrid polymer, polyurethane or acrylic sealant.

shrink evenly to reach after 10 years a final shrinkage of 1.8 mm per linear meter of panel. Therefore panels should not be butted tightly, thus allowing panel joints to become unnoticeably wider over the years.

Inclined cladding – special coating

Should the Swisspearl® panels / the facade be inclined more than 5° from the vertical, a special coating will have to be applied to cater for increased exposure to climate. Such surface coating tends to be less translucent than standard coating and the look of the panel surface will be slightly different.

Panel fixing method

Swisspearl® warranty only applies if panels are fastened mechanically with the supplied screws and rivets. Swisspearl® panels may not be fixed by adhesive method.

Scratches on panel surface

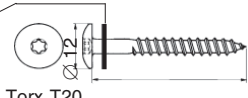

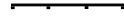
During installation handle panels with care to avoid scratches, as they can not be repaired.

Anti graffiti treatment

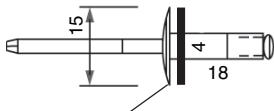


Due to the cost and unsatisfactory results of available anti graffiti treatments no product is recommended. Order a few extra panels so that panels may be replaced if damaged.

Components and Accessories

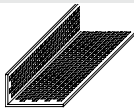
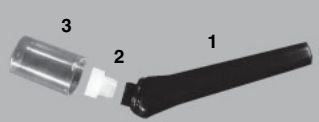
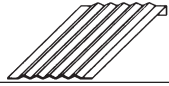
For fixing onto timber sub framing

• T20 saucer-head wood screw	4,8 × 38 mm	0,19" × 1,50"	EPDM washer only for CARAT panels, exposed fixing 
Stainless steel, blank or in colors	4,8 × 44 mm	0,19" × 1,73"	
on request	4,8 × 60 mm	0,19" × 2,36"	
• EPDM joint backing strip, black, for panel joints, external and internal corners, windows		W = 150 mm W = 120 mm	5,91" wide 4,72" wide 
• EPDM backing strip, black, for intermediate battens		W = 60 mm	2,36" wide 

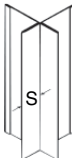
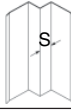


For fixing onto metal sub framing

• Rivet, mandrel A3 steel, body AlMg3 head blank or in standard colors	4,0 × 18 – H15 mm/grip range 8-13 mm 4,0 × 24 – H15 mm/grip range 13-18 mm 4,0 × 30 – H15 mm/grip range 18-23 mm		grip range includes EPDM washer 1 mm 
• Rivet, mandrel and body in stainless steel head blank or in standard colors	4,0 × 18 – H15 mm/grip range 8-13 mm 4,0 × 24 – H15 mm/grip range 13-18 mm		
• Rivet die gauge for above SS rivets to be screwed onto muzzle of GESIPA-AccuBird			
• Al, fixed point sleeve	∅ 9.4/4.1 × 6 mm		
• Al, fixed point sleeve	∅ 9.4/4.1 × 13 mm		
• Stainless steel fixed point sleeve	∅ 9.4/4.1 × 6 mm		
• Bore gauge, ref. 9541-2	∅ 4,1 mm/drill bit type A for aluminum ∅ 4,1 mm/drill bit type S for steel		

Accessories for timber and metal sub framing

• Perforated angle, Al blank, 0.7 mm thick	50 × 30 mm L = 2500 mm		
• TECTURA touch up paint (tin)	150 g		
• NATURA touch up paint (tin)	150 g	(do not use on drip edges)	
• LUKO hand applicator for impregnation of cut panel edges	125 ml/4,4 ounces reservoir (1) sponge (2) protective cap (3)		
• LUKO edge impregnation, 1 litre container		For application see instructions	
• Joint backing strip 294/66/0,2 mm, Al raw crimped, front painted black, return on top			

The following aluminium trim profiles are 0.8 mm thick, and are available natural anodised or powder coated in standard colors:

• Cross corner profile for external corner	S = 29 mm L = 2800 mm useable L = 2750 mm	
• Profile for internal building corner	S = 29 mm L = 2800 mm	
• Profile for lintel (with perforated section)	S = 29 mm L = 2800 mm	
• Profile for window / door jambs	S = 29 mm L = 2800 mm	



Design and installation details

Vertical joints

The width of the vertical joints must be at least 5 mm.

Sub framing

The sub framing must be installed accurately in one plane, such that the cladding can be fixed without any restraint. Where the sub framing consist of timber, such components must be protected from humidity by EPDM backing strips as described herein.

Joint pattern

All fixing methods illustrated can be executed with vertical plank joints staggered or continuous.



Vertical joints staggered



Vertical joints continuous

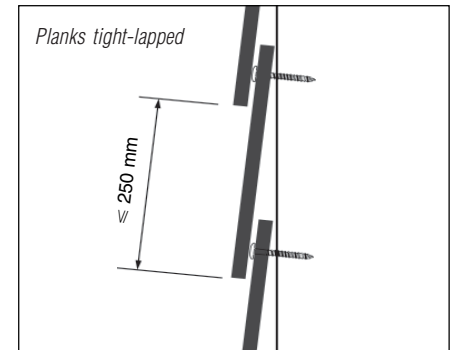
Setting out of the cladding

The panel sizes available allow for a considerable choice of strip widths without waste. Where ever possible it is recommended that the cladding lines up with window sills and lintels. Beyond the choice of strip widths, there is some scope in varying the laps; minimum laps must be observed.

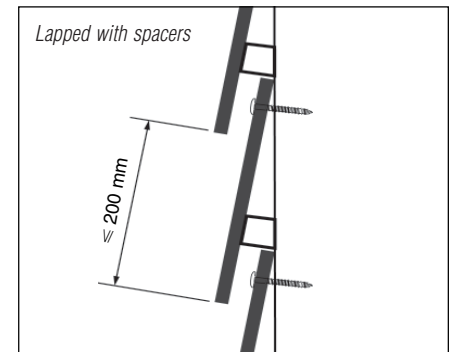
Expansion joints

Structural expansion joints must be applied to the cladding, incl. sub framing, in the identical positions to their full extent.

Concealed fixing

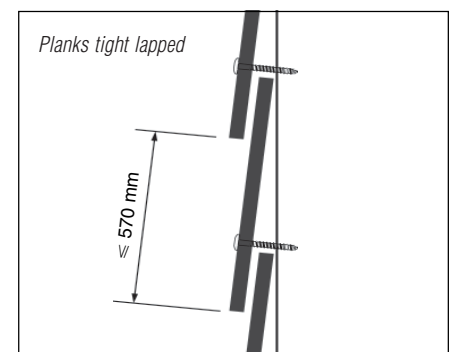


Visible strip height for plank thickness 8 mm maximum 250 mm

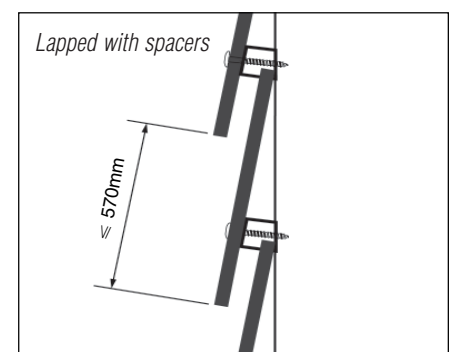


Visible strip height for plank thickness 8 mm maximum 200 mm

Exposed fixing



Visible strip height for panels 8 mm maximum 570 mm

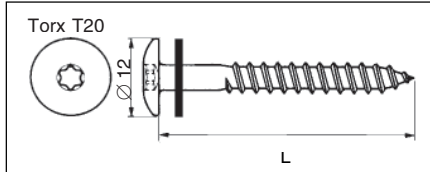


Visible strip height for panels 8 mm maximum 570 mm

Installation on timber sub framing

Timber sub-framing

- **Screws**
 Saucer-head wood screws
 4.8 x 38/44/60 mm screw length
 according to application



Max admissible load
 $F_{adm} = 390 \text{ N}$

- **Pre drilled holes**
 Generally $\varnothing 5,5 \text{ mm}$
- **Distances of fixing points from panel edge** (see page 11)

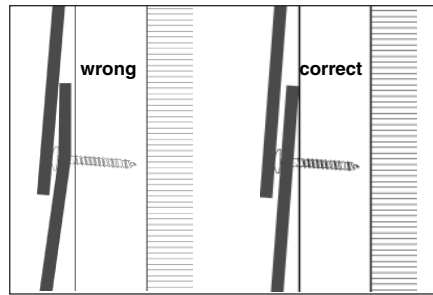
Maximum horizontal spacing of fixing points for 8 mm panels:

- **Exposed fixing**
 (max. visible strip height = 570 mm)

Building height	Screw spacing	
	Normal areas	Fringe areas
$\leq 8 \text{ m}$	710 mm	650 mm
8-15 m	550 mm	510 mm
15-25 m	455 mm	380 mm

- **Concealed fixing**
 (max. visible strip height = 250 mm)

Building height	Screw spacing	
	Normal areas	Fringe areas
$\leq 8 \text{ m}$	750 mm	750 mm
8-15 m	750 mm	585 mm
15-25 m	585 mm	420 mm



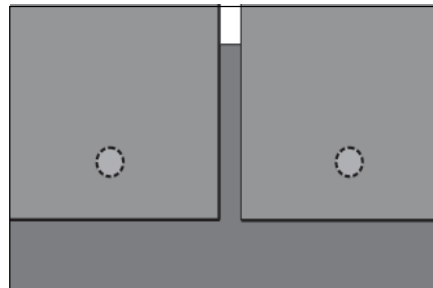
Screws

Screws to be fastened with original Torx T20 bit. Screws to be set perpendicular to the panel surface.

For screw fastening use depth gauge (slip clutch) to be adjusted prior to start works in order to ascertain constraint free fastening.

Two screws

In case of concealed fixing and staggered vertical joints, two screws must be set in the middle of each panel to ensure that adjacent corners of the covering panels will lay in the same plane, as per illustration below.



Timber battens

Use dry (max. 16% moisture content), straight grown pine. If impregnated, pressure treated with protective salts, that will not wash out.

- **Horizontal support battens**
 To be provided in case of external thermal insulation at a distance to suit width of insulation mats, so the mats need not be trimmed.
- **Main vertical support battens**
 30 x 120 mm to panel joints with aluminum joint backing strips (staggered joints).
 27 x 120 mm to panel joints with 3 mm EPDM backing strips (continuous joints).
- **Intermediate vertical battens**
 30 x 60 mm for concealed fastening
 27 x 60 mm in case of EPDM strips

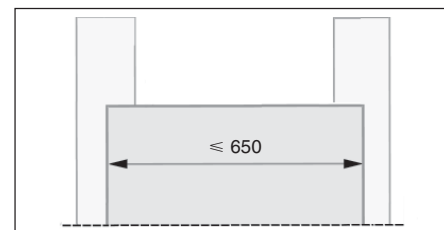
- **Exposed fasteners**
 All timber battens including intermediate supports to be protected by EPDM strips to entire batten surface.
- **Shimming**
 Shim battens as required, so that all batten faces lay in one plane.
- **Panel butt joints**
 Joints to be made water proof. For tight lapped cladding joints either use EPDM strips or metal backing strips. For lapped cladding with spacers or with staggered joints in general use metal joint backing strips.
- **Metal joint backing strips**
 To be made of crimped aluminum sheeting, 0.2 mm thick, powder coated in black color to front face, 8 mm return on top bent forward at right angle to hold the strip in position. If the panels are higher than 300 mm use 0.4 mm thickness.
- **Continuous vertical joints**
 The battens are to be protected by EPDM strips 120 mm wide, or by metal joint backing strips for laps with spacers.
- **Staggered vertical joints**
 Use at each panel joint metal joint backing strip.

Internal/external building corners

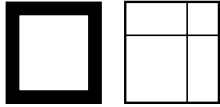
Protect vertical battens 27 mm thick by EPDM strip of same width as battens or by metal profiles in which case batten to be 30 mm thick and panel corners to be mitred so that water can not flow back onto timber batten.

Fastening of timber battens

The timber sub framing fastening details to be determined and checked by structural engineer all in accordance to local standards for applicable wind load etc.

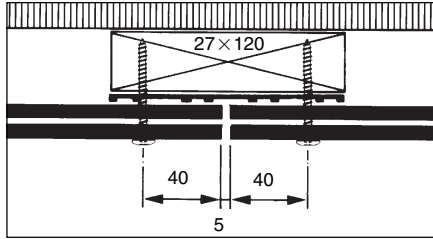


Single span panel situation (e.g. at end of building) max. panel length 650 mm

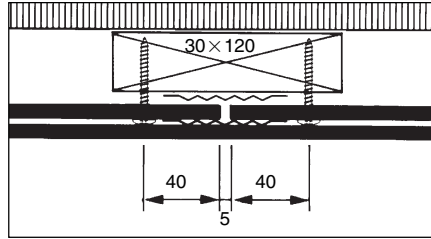


Installation on timber sub framing

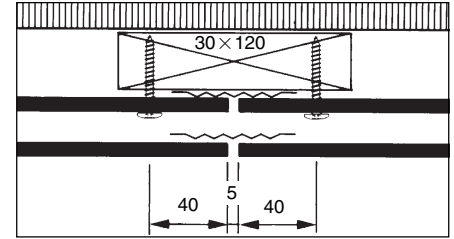
Panel (plank) joint details



EPDM strip, 120 mm wide continuous joint/no spacer, visible fixing



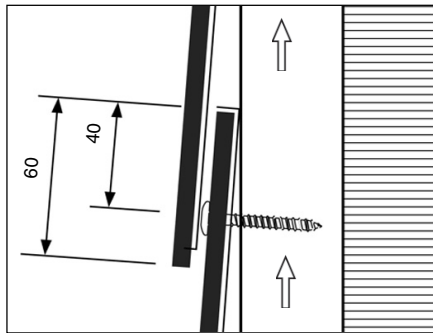
Metal joint backing strip for staggered panel joints, concealed fixing



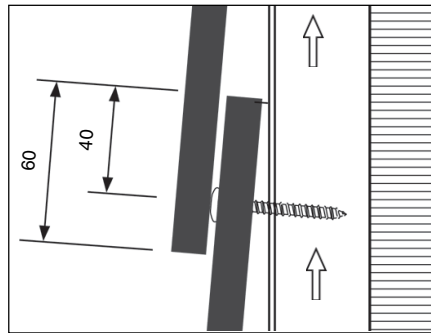
Metal joint backing strip if spacers are used, concealed fixing

Concealed fixing

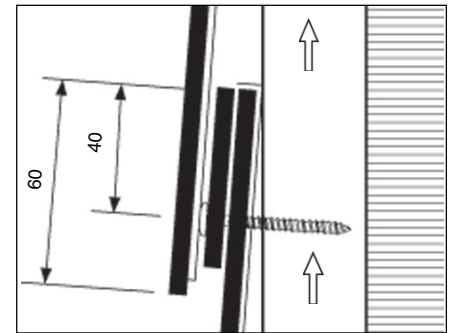
Nominal overlap 60 mm, may be reduced to min. 50 mm



- SWISSPEARL® panel 8 mm
- Screw, 4.8 x 38 mm
- Tight lapped
- Joints with EPDM strips or metal backing strips

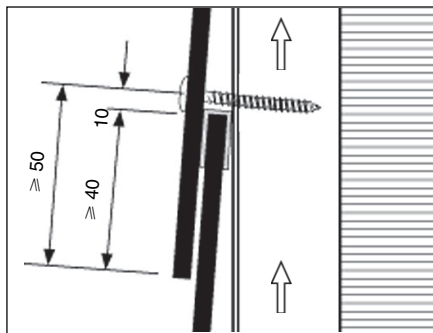


- SWISSPEARL® panel 12 mm
- Screw, 4.8 x 44 mm
- Tight lapped
- Joints with EPDM strips or metal backing strips

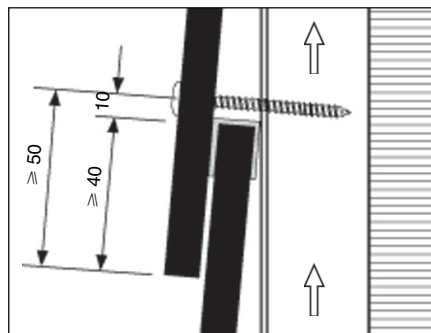


- SWISSPEARL® panel 8 mm
- Screw, 4.8 x 44 mm
- with spacer FC strip
- Joints metal backing strips

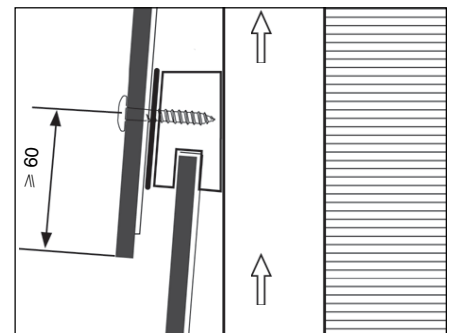
Exposed fixing



- SWISSPEARL® panel 8 mm
- Screw, 4.8 x 44 mm
- Tight lapped
- Joints with EPDM strips or metal backing strips
- EPDM U-section, 50 mm long, at fastening points



- SWISSPEARL® panel 12 mm
- Screws 4.8 x 60 mm
- Tight lapped
- Joints with EPDM strips or metal backing strips
- EPDM U-section, 50 mm long, at fastening points

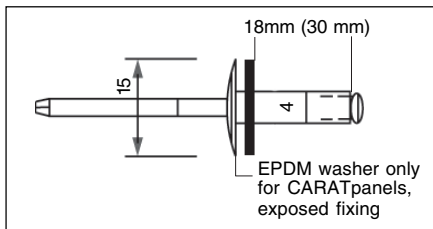


- SWISSPEARL® panel 8 mm
- Screw, 4.8 x 38 mm
- Joints with EPDM strips or metal backing strips
- Grooved timber spacer
- Horizontal spacer battens min. 30 mm thick, covered by 60 mm EPDM strip

Installation on metal sub framing

- **Rivets**

Aluminum or stainless steel (see page 5), saucer head Ø 15 mm, blank or colored



Max admissible load

$$F_{adm} = 700 \text{ N}$$

- **Stainless steel rivet**

For installation of SS rivet use setting device (die gauge) to be screwed onto muzzle of rivet gun, so that the rivet head keeps its shape. Press Swisspearl® panel against sub frame whilst setting the rivet. SS rivets must always have EPDM washer.

- **Drill holes to sub frames**

Ø 4.1 mm. Use concentric bore gauge ref. 9541-2.

- **Drill holes to panels**

Ø 9.5 mm, throughout.

Maximum horizontal spacing of fixing points for 8 mm panels

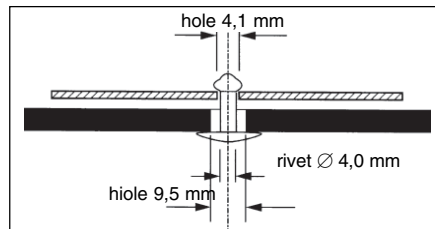
- **Exposed fixing**
 (max. visible strip height = 570 mm)

Building height	Rivet spacing	
	Normal areas	Fringe areas
<= 15 m	710 mm	710 mm
15-25 m	710 mm	500 mm
>25 m	500 mm	400 mm

- **Concealed fixing**

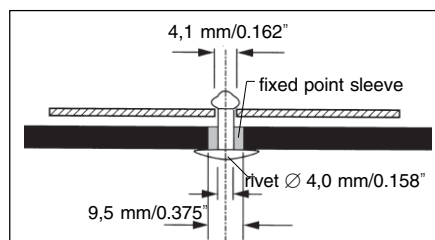
(max. visible strip height = 240 mm)

Building height	Rivet spacing	
	Normal areas	Fringe areas
<= 15 m	750 mm	750 mm
15-25 m	750 mm	585 mm
> 25 m	585 mm	420 mm



Expansion point

Free room around rivet enables movement of panel



Fixed point

Hole filled out with sleeve leaves no room for movement

- **Holes to sub framing**

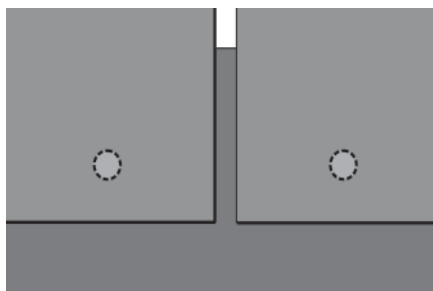
Ø 4.1 mm. Use concentric bore gauge ref. 9541-2

- **Holes to the panels**

Ø 9.5 mm, throughout

- **Two rivets**

In case of concealed fixing and staggered vertical joints, two rivets must be set in the middle of each panel to ensure that adjacent corners of the covering panels will lay in the same plane, as per illustration below.



- **Horizontal load bearing profiles**

Positioning of fixed/expansion points to be determined per Technical Services

- **Vertical panel joints**

Tight lapped panels:

Vertical joints are sufficiently closed by the vertical sub frame, there are no water proofing measures required

Staggered joints or panels spaced:

Use metal joint backing strip

Metal sub frame

- **Sub framing**

Sub frame including pertaining fasteners as per structural engineer's details in accordance with local standards

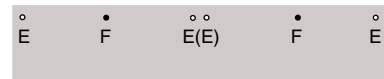
- **Vertical load bearing profiles**

To allow for expansion and retraction the profiles must be interrupted every approx. 3 m. For multistorey buildings it is good practice to design and install the sub framing floor to floor height, whereby the joints and fixed points of the vertical sub framing are to be located all on the same level and have to coincide with the Swisspearl® panels

- **Fixed points, expansion points**

Swisspearl® panels fastened onto metal sub framing require for each panel 2 fixed points and the rest expansion points as per the following schemes

- **Concealed fixing**

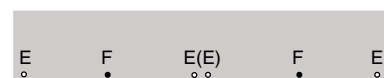
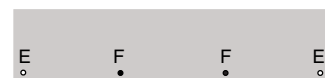


F = Fixed point. The sleeve (6 mm long) prevents any movement

E = Expansion point

(E) = only for staggered vertical joints

- **Exposed fixing**



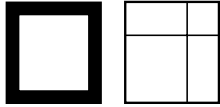
F = Fixed point. The sleeve (13mm long) prevents any movement

E = Expansion point

(E) = only for staggered vertical joints

Important!

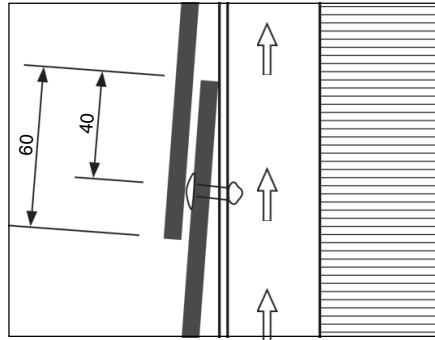
Rivets must be set perpendicularly to the panel so that the head rests firmly on the surface
 Panels must be installed without restraint.



Installation on metal sub framing

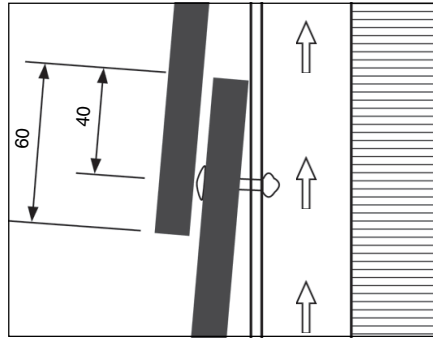
Metal sub-framing (cont.)

• Concealed fixing

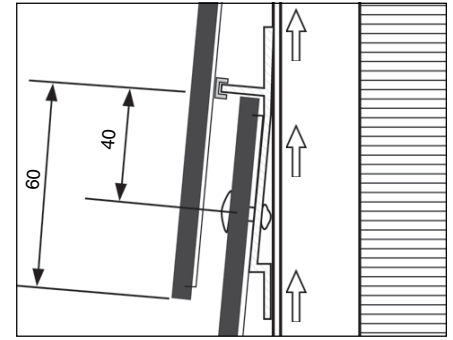


- Swisspearl® panel 8 mm
- tight lapped
- rivet 4 x 18 mm

The nominal overlap is 60 mm. The overlap may be decreased down to 50 mm for adjustments (lining up lintels and sills), for the same reason the overlap may be increased.



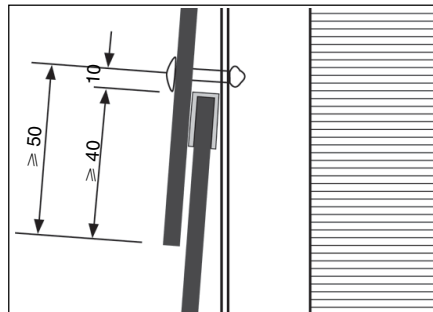
- Swisspearl® panel 12 mm
- tight lapped
- rivet 4 x 24 mm



- Swisspearl® panel 8 mm
- laps with light metal spacers
- rivet 4 x 18 mm
- metal joint backing strips

• Exposed fixing

- Swisspearl® panel 8 mm
- tight lapped
- rivet 4 x 30 mm
- EPDM U-sections 50 mm long at the fastening points only to avoid humidity between the panels



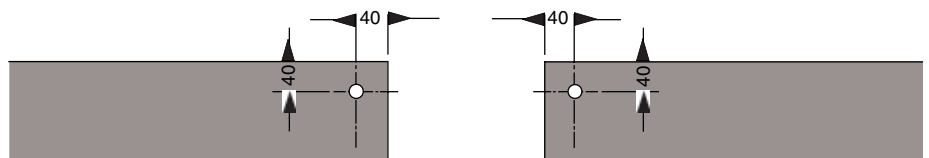
Conversion metric/imperial

10 mm	/	13/32"
40 mm	/	1-9/16"
50 mm	/	1-31/32"
60 mm	/	2-3/8"
80 mm	/	3-1/8"

Minimum distances of fixing points from panel edges

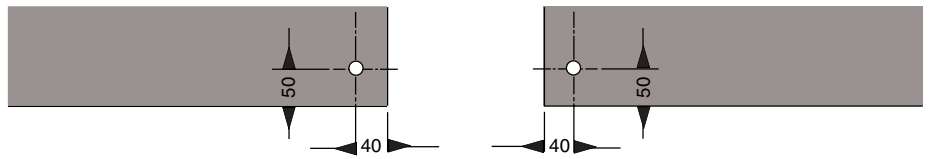
• Concealed fixing

Vertical timber, and metal sub framing: 40/40 mm



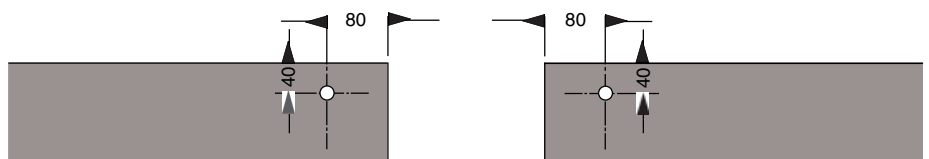
• Exposed fixing

Vertical timber, and metal sub framing: 40/50 mm



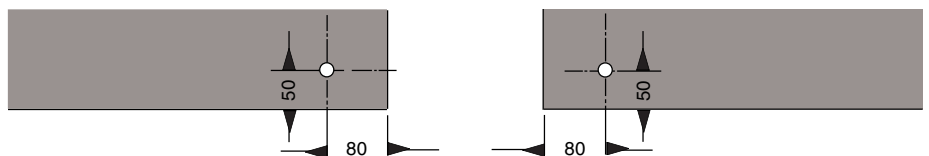
• Concealed fixing

Horizontal metal sub framing and spacer: 80/40 mm



• Exposed fixing

Horizontal metal sub framing: 80/50 mm



Fastening of panels - rivets and fix points sleeves

Metal sub frame Drilling and riveting

13 mm long sleeve to:

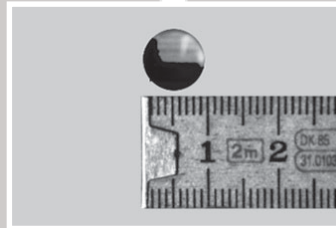
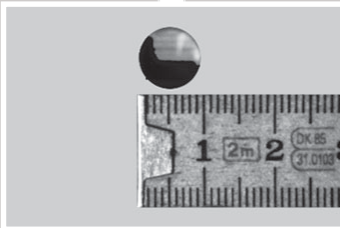
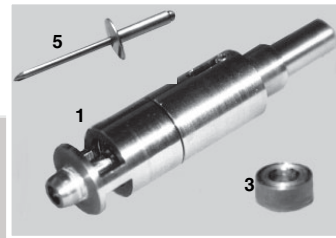
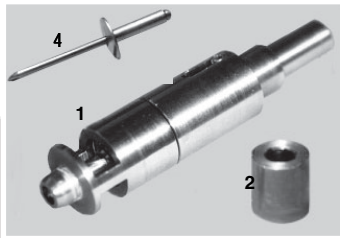
- 8 mm panels, exposed fixing
- 12 mm panels, concealed fixing

Metal sub frame Drilling and riveting

6 mm long sleeve to:

- 8 mm panel, concealed fixing

- 1 Concentric bore gauge ref. 9541-2 with integrated drill bit \varnothing 4.1 mm
- 2 Fixed-point sleeve 13 mm long
- 3 Fixed-point sleeve 6 mm long
- 4 Rivet body 30 mm long
- 5 Rivet body 18 mm long

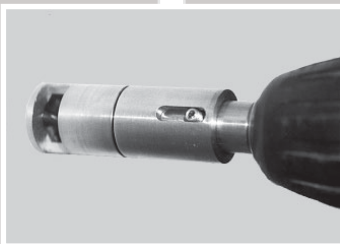


Important
 The diameter of all fixing holes to cladding panels for both fixed and expanding points, is **9.5 mm / 3/8"**

Drill \varnothing 9,5 mm hole to panel

Drill \varnothing 9,5 mm hole to panel

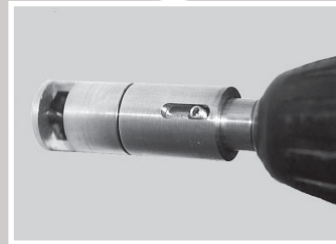
Fixed point



Drill \varnothing 4,1 mm hole to sub frame

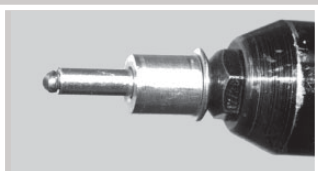
Expansion point

Fixed point

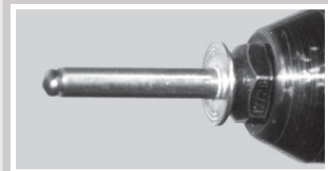


Drill \varnothing 4,1 mm hole to sub frame

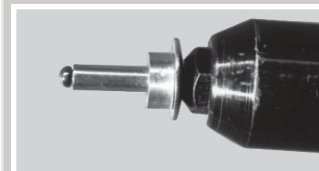
Expansion point



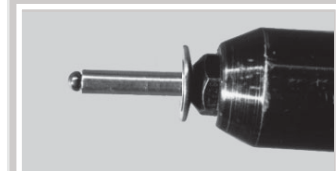
Fix point sleeve 13 mm long



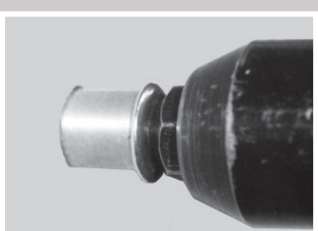
Rivet body 30 mm long



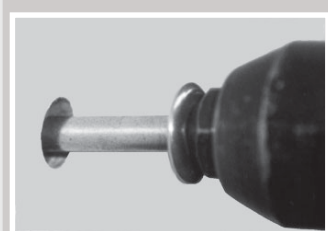
Fixed-point sleeve 6 mm long



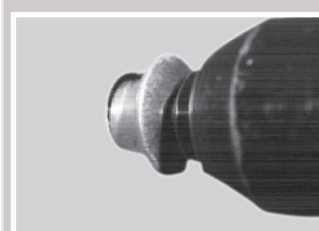
Rivet body 18mm long



Install rivet with fixed-point sleeve



Install rivet only



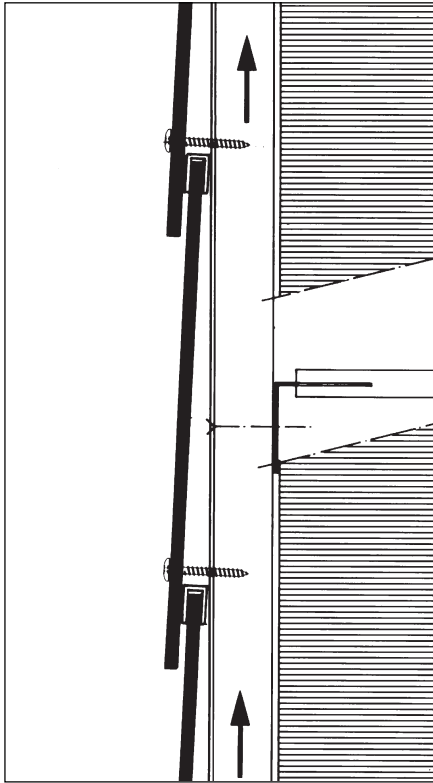
Install rivet with fixed-point sleeve



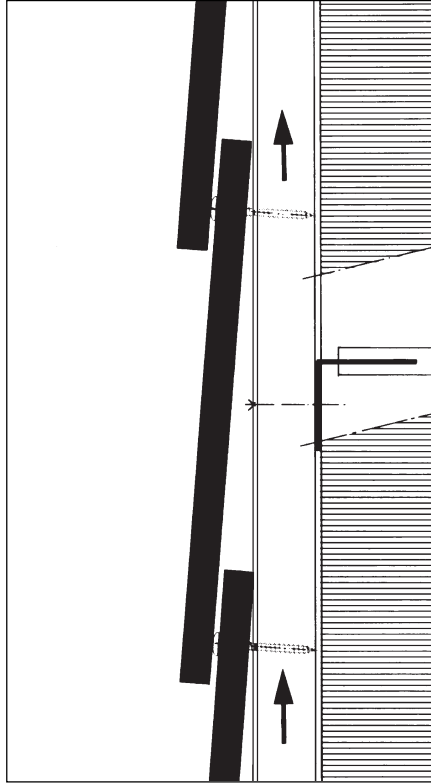
Install rivet only



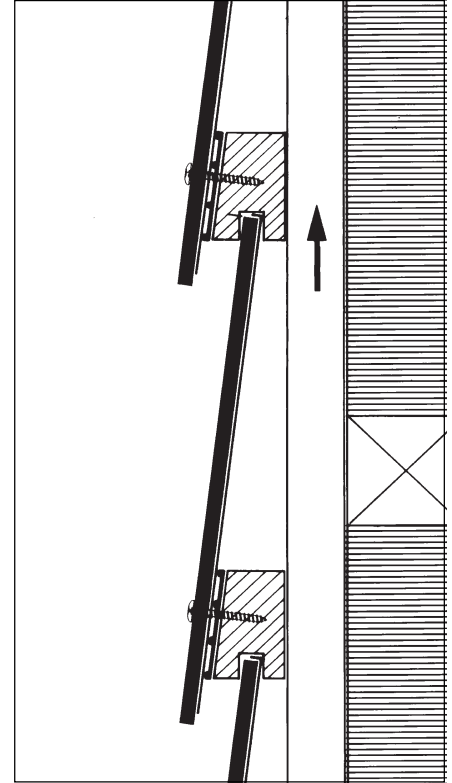
Construction details



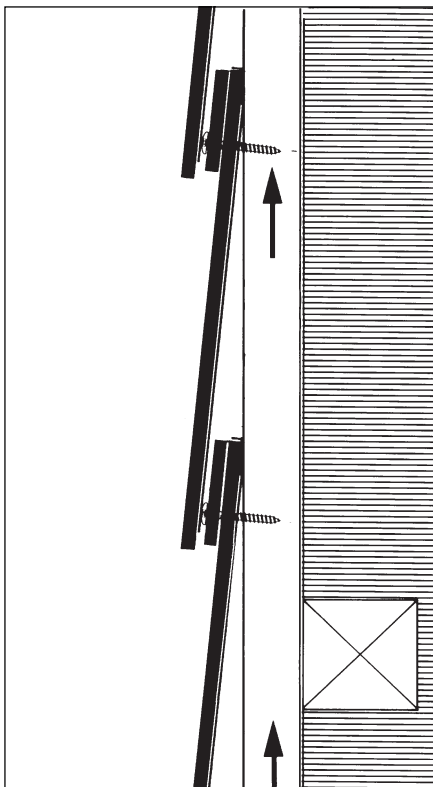
Strip-lap cladding 8 mm exposed fixing with short lengths of EPDM U-section at fixing points



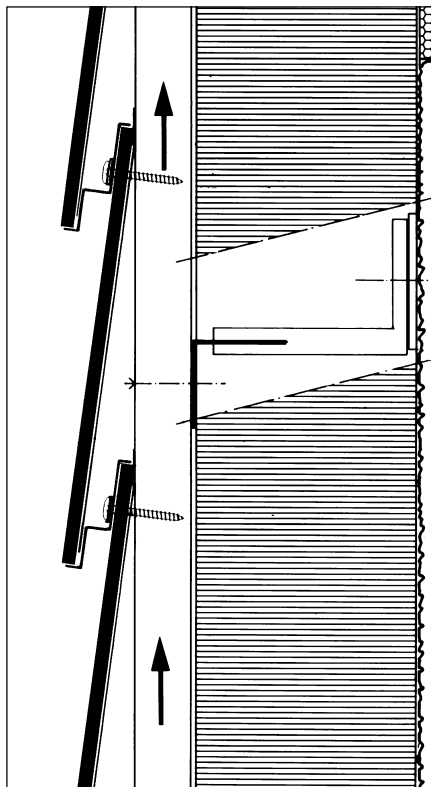
Strip-lap cladding 12 mm, tight lapped, concealed fixing



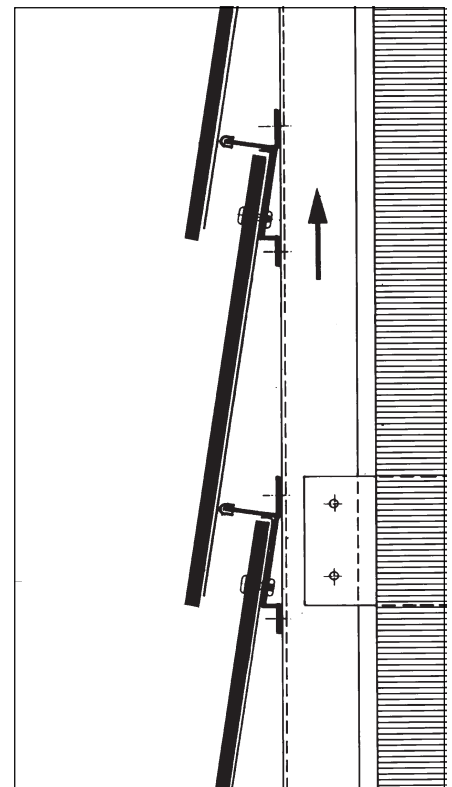
Strip-lap cladding with spacer batten, exposed fixing, vertical joints with metal backing strips



Strip-lap cladding with fiber-cement spacer strip, concealed fixing, vertical joints with metal backing strips



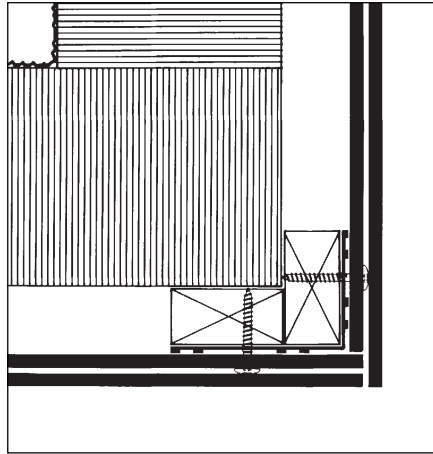
Strip-lap cladding with light-metal spacer profile, concealed fixing, vertical joints with metal backing strips



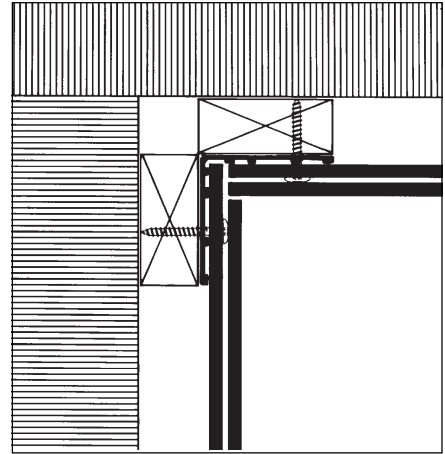
Strip-lap cladding with light-metal spacer profile, concealed fixing, vertical joint with metal backing strips

Construction details (cont.)

Corners

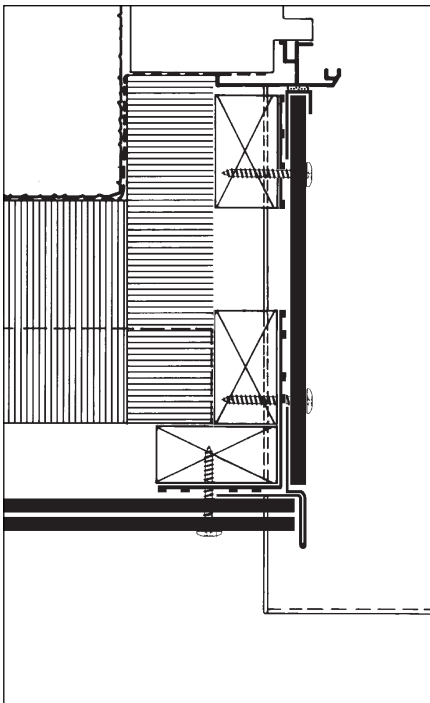


External corner

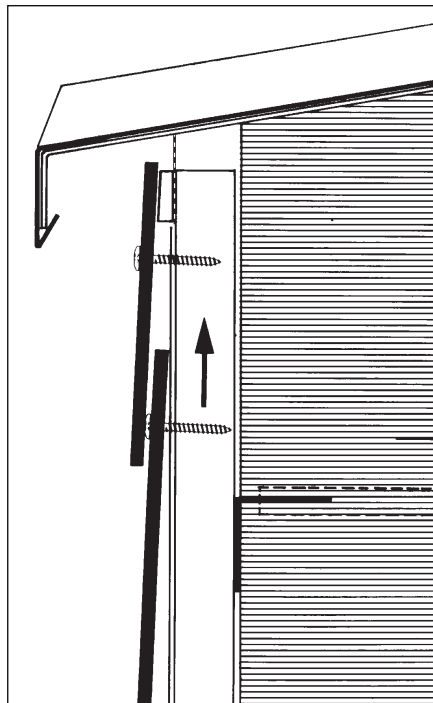


Internal corner

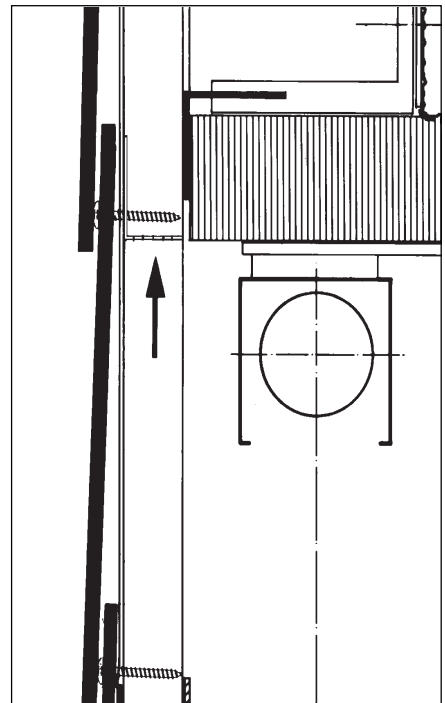
Windows



Window jamb



Window sill



Window head



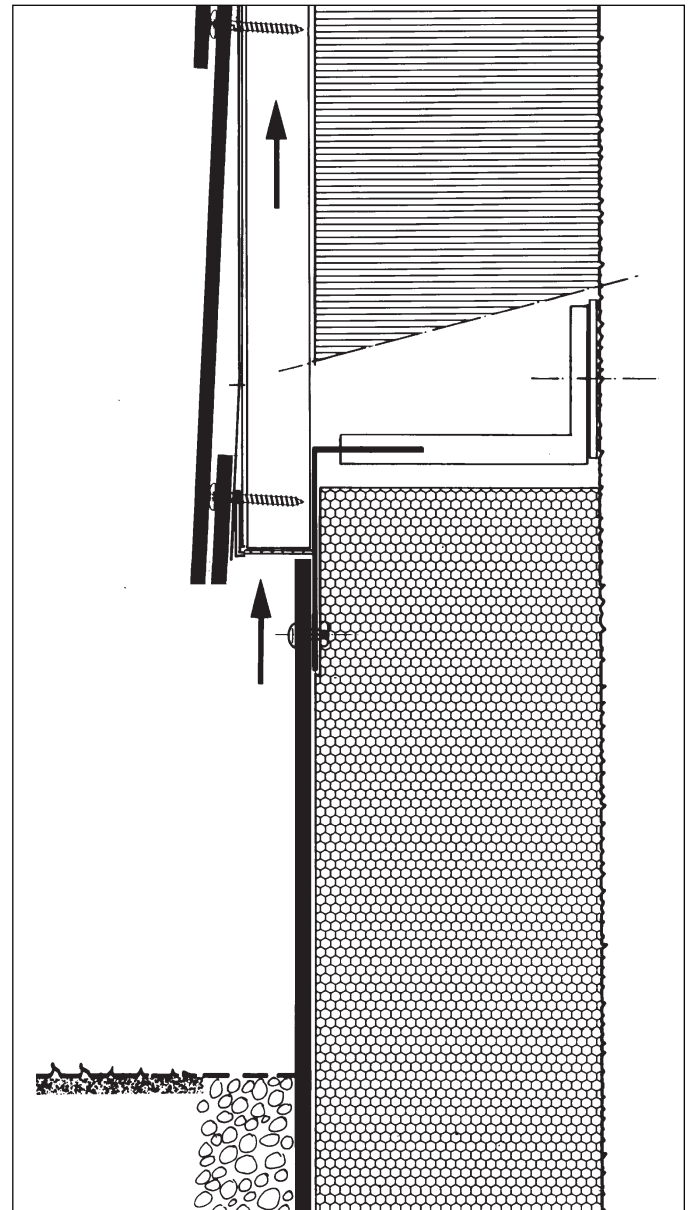
Construction details (cont.)

Bottom row

Strip-lap cladding, tight lapped,
concealed fixing

Note

The fiber cement spacer strip at the bottom course reinforces the exposed edge and provides the correct tilt to the lowest cladding strip.



Handling on site

Processing of Swisspearl® panels at the factory

- Cutting panels to size and drilling holes for fasteners according to list of panels, which has to be provided by the contractor
- It is recommended to order the panels and to have them packed onto pallets in the sequence of installation

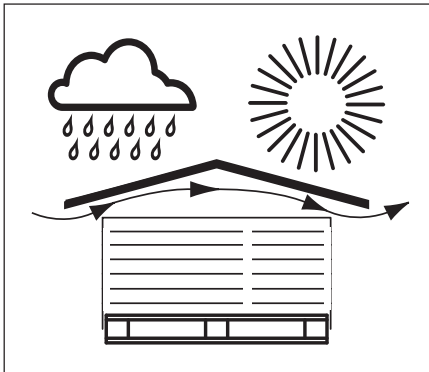
Re stacking panels on site

- Always stack the panels flat
- Each stack should not be more than 500 mm high (1' 8"), max. 2 stacks on top of each other
- Use foam protection layer between panels (as supplied by factory)
- Lift panels off the stack, do never pull them from the stack

On site storage

Swisspearl® panels must be protected from dampness and weather under a roof. Where this is not possible, store under tarpaulin to avoid permanent staining.

If panels stored for more than 2 months, panels to be stacked between battens.



Stacks must be stored out of dampness and direct sunlight. The shrink wrapping, the panels are supplied in, is not sufficient.

Fabricating panels at local fabricators or on building site

- Tools which produce fine dust must be avoided
- Always work out of the weather
- Rig up work bench (e. g. using saw horses and planks or pallets)
- Always drill / cut perpendicularly to the panel surface
- Cut panel to size : Use circular saw with straight edge and dust extraction. Blade hard metal teeth TF or diamond tipped
- Cut outs in panel : Use jig saw with suitable blade
- Dust from fabricating on site must be removed immediately

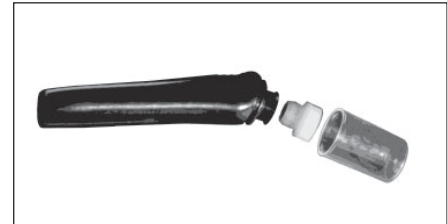
Cleaning procedures

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

Cleaning of new claddings

- *Non calcium based stains*
Use water blaster to thoroughly wash cladding with cold water at 40 – 80 bars. Prior do test on inconspicuous part of cladding
- *Calcium based stains*
 1. Apply a mist spray of acetic acid (9.5 %)
 2. Allow to react a few minutes but do not dry out
 3. Use water blaster to rinse cladding (see above)
 4. Repeat steps 1 to 3 on obstinate stains
- Do not use glass cleaning detergents !



LUKO Impregnation to panel edges

Instructions for use

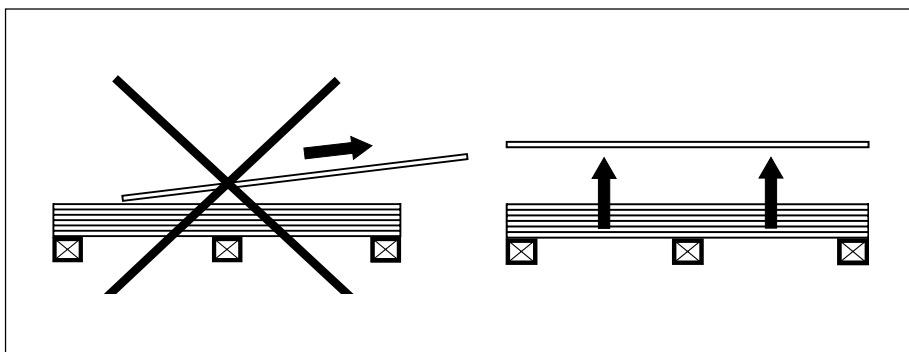
1. Panel edge must be slightly broken, clean and dry
2. Remove protective cap
3. Position hand applicator – tank upwards
4. Apply sponge at right angle to panel edge and run with moderate pressure twice along edge (forth and back)
5. Caution – do not allow LUKO to flow onto front face of panel remove immediately
6. Check that LUKO has been applied over entire panel length
7. Put on the cap when interrupting the job
8. Replace sponge when worn
9. Store + use at min. + 5°C (+41°F)

LUKO liquid can be conserved up to 6 months.

Use LUKO liquid undiluted

Check existence of application: Simply check with water, if it gets absorbed – edge has not been treated with LUKO

- Never wash warm facades in direct sun light with alkaline or acid cleaners, as the detergent may cause irreversible stains

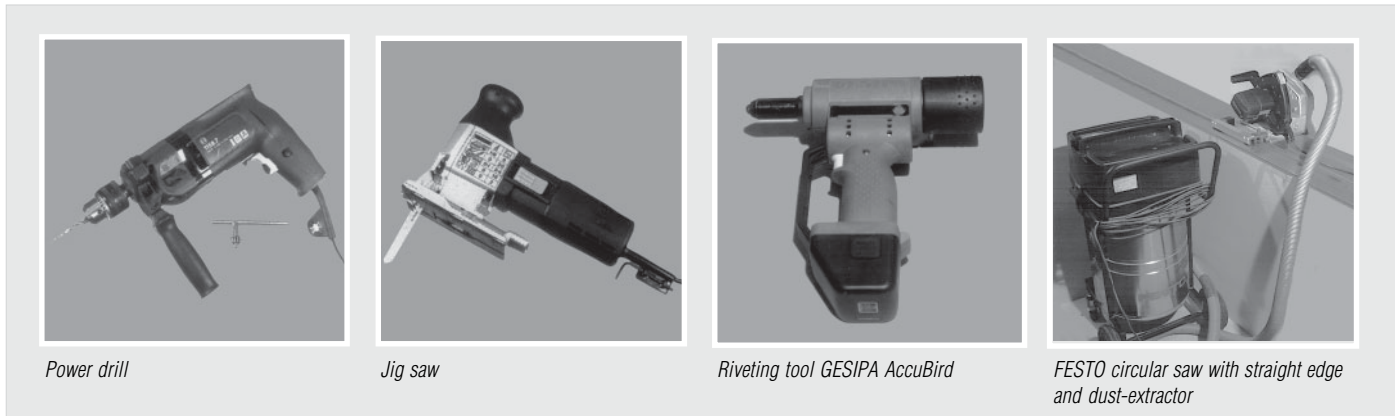


Wrong: Panels must not be pulled from stack

Correct: Always lift panels off the stack



Tools



Power drill

Jig saw

Riveting tool GESIPA AccuBird

FESTO circular saw with straight edge and dust-extractor

Advantages

- A single setting of the depth gauge ensures that all screws are tightened to exactly the desired depth, independent of the differences in the substrata. Thus every sheet is fastened without tension.
- The screw fastener is compact and easy to operate.
- This method allows for an absolute quality installation with a high laying performance.



A screw fastener with depth gauge (slip clutch) is the simple answer to correct and tension free screw fastening for all façade panels.



Bosch power drill, model GSR 6-40 TE
Distribution: Specialized dealers



Bosch cordless drill, model GSR 12 VET
Distribution: Specialized dealers



Bosch, proprietary depth gauge "Eternit"
Distribution: Eternit AG, Switzerland

Swisspearl® REFLEX

Appearance

With varying angles of viewing and changing incidence of light, the iridescent surface of REFLEX presents a different aspect to the beholder. This effect is influenced by the direction the panels are manufactured. To achieve consistency in the aspect over an entire façade, from whatever angle it is viewed, the panels must come from the same batch and must be installed aligned alike.

Identification

On the back of every REFLEX panel arrows indicate the direction of production which always runs with the longitudinal edge of the panel.

Planning

Already at the design stage the direction of production of the panel must be considered in order to assure the consistency in the aspect of the iridescent surface; i.e. all the panels must be installed either horizontally or vertically throughout.

Quotes

Requests for quotes must already state the direction of production for

every parcel of panels. This information determines the number of full panels required for the job in question.

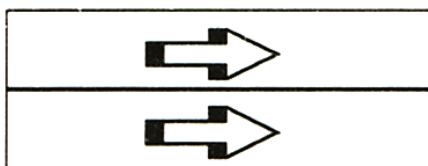
Orders

Orders should be placed using the itemized schedule "Swisspearl® REFLEX". This schedule issued by the cladding contractor is binding. It is the basis for pre-cutting and pre-drilling the panels at the factory. Where possible itemized cladding layouts should be enclosed.

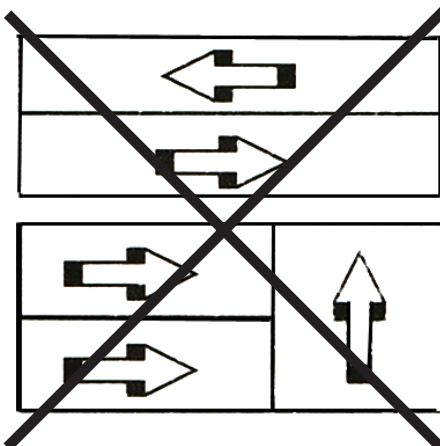
To assure the consistent alignment of the direction of production, orders should cover the entire project. Where orders in stages can not be avoided, this must be clearly stated on the order forms. Minor color variations must be expected.

Installation

Install all panels orientated alike. No matter how small the job, **the arrows on the back of all the panels must point in the same direction.** Where this requirement is not strictly observed, panels that are orientated incorrectly will appear in the façade as color deviations.



Correct



Wrong



Warranty Letter (Example)

With reference to your order n° _____ of ___ 200. and our consignment(s) for above mentioned building we confirm that we give a warranty for a period of 10 years, beginning on date of delivery, provided that:

- the panels were cut/drilled at the fabricator's shop, transported, stored and cut/drilled on the building site according to the recommendations applicable to Swisspearl® panels as specified in the technical guidelines valid at the date of ordering/delivery; and
- the panels were fixed
 - according to our recommendations applicable to Swisspearl® panels
 - with our prescribed system accessories, i.e. rivets, screws, fix point sleeves, etc.

This warranty covers

- the water tightness and frost resistance as well as the mechanical and physical characteristics of the Swisspearl® panels, the average figures of which are defined in the CEN-norms and Eternit-standards.
- the functional quality of the accessories supplied by Eternit, i.e. rivets, screws, fix point sleeves, EPDM strips, etc.

The warranty does not cover

- defects caused or substantially contributed to by
- inappropriate fabricating and storage (at the fabricator's shop and/or on the building site), handling and installation of the panels
- inappropriate application of the panels for the local conditions
- the use of inappropriate fasteners for the building location and/or sub framing
- slight modifications in colours such as homogeneous lightening according to test values or alterations due to air pollution or other environmental influences (dust, soiling from window sills, metal profiles, etc.)
- damages due to the use of accessories which do not belong to our range

- damages due to aggressive cleaning procedures
- damages due to algae

Any Eternit product which does not comply with these quality standards will be replaced free of charge, **ex works Niederurnen**, on the condition that Eternit AG, Niederurnen, are notified within a period of 4 weeks after the appearance of any defect. Purchaser's remedies hereunder for replacement of the defective product are exclusive and in lieu of any other remedies, such as rescission of the purchase contract or reduction of the purchase price, which purchaser might have. In particular, the warranty covers neither the transport costs nor labour expenses for dismantling and dumping defective panels and installing new panels. Except for the warranties set out in this document, Eternit makes no warranty, express or implied, with respect to the panels and accessories and expressly disclaims any warranty of merchantability, description or fitness for any particular purpose or function. In no event shall Eternit be liable to purchaser or any other party for special, consequential, incidental or punitive damages including, without limitation, loss of use, profits, revenue or goodwill. Eternit shall not be liable for failure of performance hereunder due to force majeure.

Attachment: Technical Data sheet

Very important: "dos and don'ts"

Generalities

- All local, state, federal and other applicable safety regulations must always be complied with
- Purchase Swisspearl® facade panels/systems only from appointed authorised distributors
- Use Swisspearl® facade panels/systems only for applications recommended by manufacturer
- All manufacturer's recommendations regarding design, storage, fabrication, installation and cleaning of Swisspearl® facade panels/systems must be fully complied with

Design and Installation

- Before start of installation, verify that:
 - detail drawings have been approved by Swisspearl® /distributor
 - correct fasteners and accessories have been delivered to site
- Sub frames are to be designed by structural engineer/contractor. Thermal expansion/retraction is to be accounted for by providing fixed/expansion point brackets
- Expansion joints within support profiles must coincide with panel joints
- Uninterrupted air circulation, from bottom to top, must be maintained behind Swisspearl® facade panels
- Do not install Swisspearl® facade panels/systems directly onto wall surfaces of any kind
- Do not use any sealant in connection with Swisspearl® facade panels
- Adhesive fixing is prohibited
- Do not use any EPDM backing strips onto metal sub framing
- Use screws to timber sub frame, use rivets to metal sub frame, do not use screws to metal sub frame

Storage and Handling

- Lift long pallets from end only, using fork extensions. Set forks apart to prevent pallet from bending
- When lifting pallet up by crane, attach pallet at sufficient support points to prevent it from bending
- Stacked Swisspearl® panels to be stored under roof. If not possible (e. g. on building site) use tarpaulin to cover the pallets (the plastic sheeting the pallets are wrapped in, is not sufficient)
- Pallets / stacks always to be placed horizontally, and to be kept off the grade
- Never slide panels across one another. Lift panels individually to avoid scratching
- Panel stacks to be max. 500 mm (2') high, do not stack more than 2 pallets. When re-stacking panels, insert foam foil between each panel to protect the surface. Protect stack adequately
- All manufacturer's labels, instructions, Design + Installation Manuals must be made available to the entire staff on building site. When re-stacking/re-palletising, the instructions must be attached onto the new stacks/pallets such as to be noticed easily

Fabrication and Handling

- Fabricate Swisspearl® facade panels with vacuum equipped power tools
- Fabricate Swisspearl® facade panels with tools recommended by manufacturer
- Immediately remove fabricating dust from panel
- Never use sawing system with water cooled blade
- After saw cutting, each panel edge must be sealed by using LUKO impregnation liquid
- Do not allow LUKO impregnation liquid to flow onto the panel face
- Install Swisspearl® facade panels/systems by contractors trained & instructed by Swisspearl® /distributor
- Make sure that dust is removed from face and back side of panel prior to it's installation
- If a panel is to be rested on it's edge, use protection pads to avoid damage

Cleaning

- Do not clean Swisspearl® facade panels by dry methods
- Immediately remove cement stains by applying a solution of 10% acetic acid in water, allow to react 5-20 minutes, but do not allow to dry out. Follow up with a cold, clean water rinse. If required, use high pressure water blaster at 40-80 bars (580-1160 psi), always test this method on inconspicuous panel area
- Never clean a facade in the bright sun light