



INSTALLATION GUIDELINES

PREFALZ



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These installation guidelines are for architects and installers. The sketches provided are examples of normal cases.

Projects that are either subject to specific regulations or can be found in exposed locations (e.g. with strong winds) must be considered separately. For questions do not hesitate to contact us.

All known relevant regulations, standards, ordinances and guidelines must be adhered to. Contractual factors are not discussed in these installation guidelines. Thus, no enforceable claims for damage, faults or incompleteness may be derived from these guidelines. Project-related structural factors are not discussed in these installation guidelines. The installation guidelines are not a substitute for independent thoughts and actions.

The installation of PREFA roof and façade systems should only be carried out by trained specialists. The present installation instructions therefore presuppose the routine handling of roof, façade and roof drainage materials.

NOTE

If you have any questions, please contact the PREFA Product Technology department.

On our website www.prefa.com, you can find all the information on our products, as well as a detailed description of our comprehensive range of services for certified specialists.

If you are interested in our installation videos or want to sign up to our PREFA Academy, you can obtain login data from your PREFA consultant on request.



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BUILDING PHYSICS

1 VENTILATED ROOF BUILD UPS

Ventilated roof structures have been used for many decades and have proven themselves in all climatic conditions. We recommend designing PREFA aluminium roofs with a ventilated build up.

The roof covering and thermal insulation layers are separated by a ventilated gap. This has the advantage that accumulated moisture (condensation) is carried away again. In principle, the roof covering is ventilated (see Figure 1).

Particularly suitable for converted attics, because the circulating air has a positive effect on the room climate both in summer and in winter. However, the entire attic can be ventilated, too (see Figure 2).

In the case of ventilated roof structures, the ventilation height must be adapted to the applicable standards. A ventilation mesh from perforated aluminium installed at the eaves prevents insects and birds from entering.

When using ventilation mesh, the reduction of incoming air has to be considered. For the unobstructed function of the vented build up it is essential to have suitable openings on the bottom as well as on the top, e.g. vented ridge capping.

NOTE

Roof structures must be built in accordance with building physics rules and national standards, regulations and requirements.



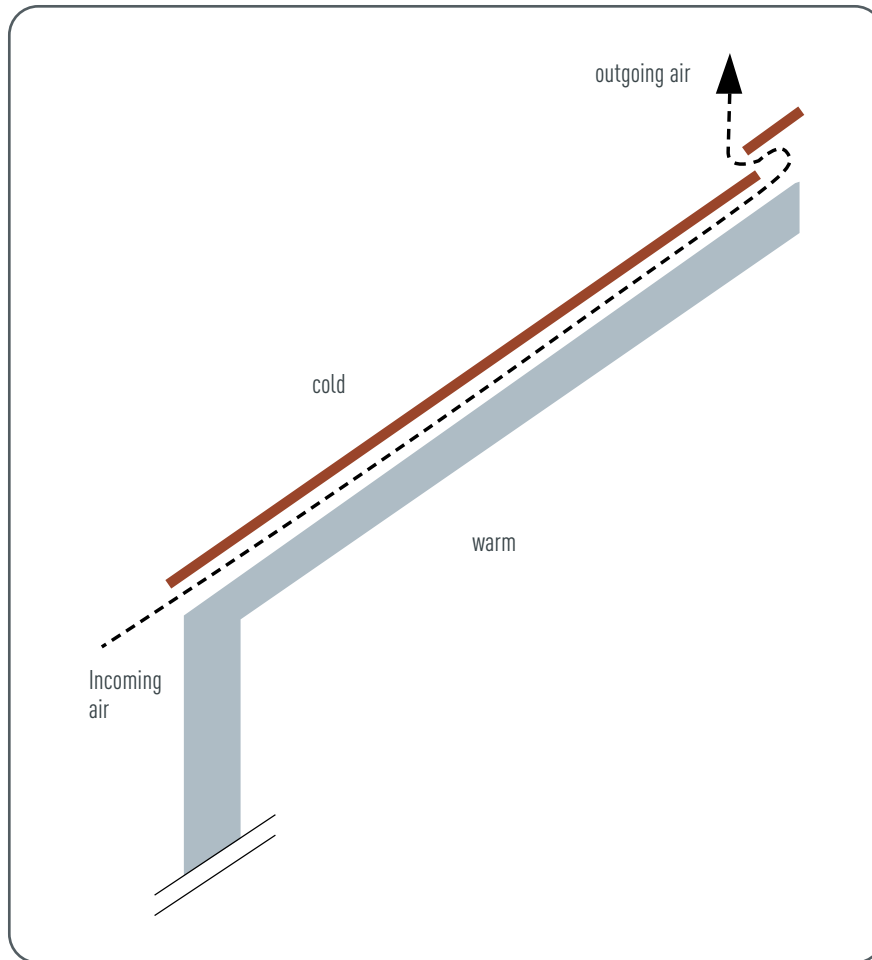


Figure 1 • Double-shell roof structure

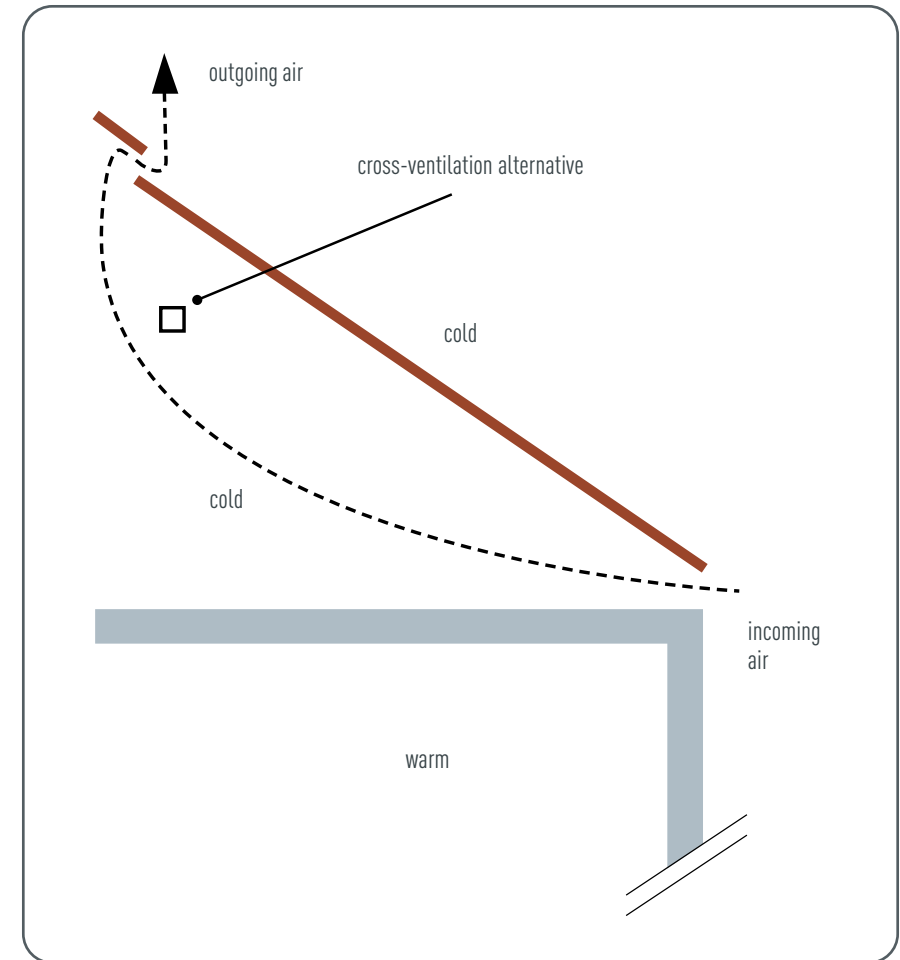


Figure 2 • Single-shell roof structure

1.1 ATTIC SPACE CONVERTED INTO LIVING SPACE (FIGURE 3)

Compared to a single-skin roof structure, a ventilated channel is added to the double-skin roof structure (counter battens). This measure can also be used to thermally insulate between the rafters. A double-shell roof structure is preferable to a single-shell roof structure.

NOTE

Physical building conditions must be checked and the relevant standards observed.

THE ATTIC CAN ALSO BE USED AS LIVING SPACE

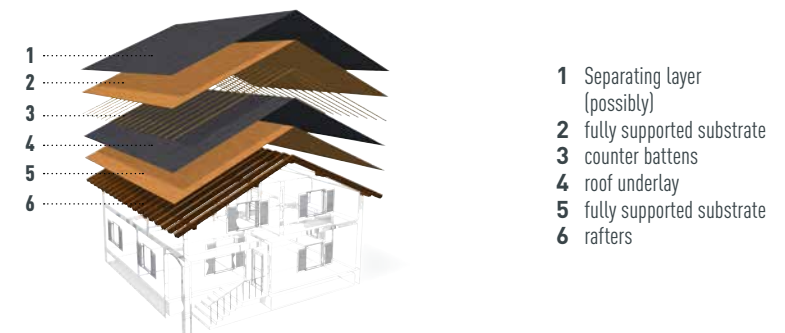


Figure 3 • Double-shell roof structure

1.2 ATTIC SPACE IS NOT USED FOR LIVING PURPOSES (FIGURE 4)

In the case of a single-shell roof structure, the entire attic is ventilated. With this type of roof structure, the attic ceiling must be thermally insulated (complicated creation of an attic extension at a later stage).

NOTE

In the case of single-shell, non-insulated roof constructions, a sub-roof must comply with the requirements of national regulations (sub-roof standards), however, a bitumen separating layer is required as a minimum.

THE ATTIC IS NOT USED AS LIVING SPACE



Figure 4 • Single-shell roof structure

2 NON-VENTILATED ROOF STRUCTURE

Non-ventilated insulated roof structures have also been used on metal roofs for a number of years. In this case, the guidelines (particularly the building physics requirements) for insulated roofs must be observed.

NOTE

Roof structures must be built in accordance with building physics rules and national standards, regulations and requirements.

SUPPORTING SUBSTRATE

The build up is to be designed and executed according to structural requirements (project and location-related).

Provide all relevant information regarding build up details (ridge, hips, etc.) to the carpenter and monitor workmanship carefully.

If necessary, an incline must be ensured, as a minimum roof pitch is required. The minimum required roof pitch for standing seam metal roofs is 3°. National standards, technical regulations or other regulations can specify higher minimum roof pitches and must therefore be taken into account.

PREFALZ standing seam applications require a fully supported substrate. Generally a fully supporting soft timber substrate is recommended because this provides most efficient pull out values.

NOTE

The lower the fall the higher the danger of water ingress through the standing seams caused by rain, wind, snow. For roof pitches of up to 7°, precautions must be taken into consideration, e.g. the seam must be sealed with a seaming gel or tape. We therefore highly recommend a roof pitch > 7° (13%).

FULLY SUPPORTED SUBSTRATE

The supporting substrate for standing seam applications is to be carried out in accordance with the applicable standards:

(for example)

- Board width: 80–160 mm
- Board thickness*: min. 24 mm (min. 22 mm when dry)
- Wood humidity: max. 20%

*Observe national regulations and guidelines

SHEETS MADE OF WOOD-BASED MATERIALS

When using wood-based sheets as a substrate for PREFA roof applications, the choice of thickness, the fixings into the wood-based material and the intended use as a metal roof substrate must be agreed with the manufacturer and/or distributor of the wood-based sheets.

When using wood-based sheets, a separating layer is required. OSB sheets as a substrate are special purpose solutions and should be planned as such.

NOTE

PREFA does not recommend the use of OSB sheets as a substrate for metal roofing with or without a separating layer.

SEPARATION LAYER

The arrangement of separating layers is not regulated by standards. Bitumen separating layers on the upper formwork level can, under certain conditions, represent a sub-roof in accordance with ÖNORM B 4119, but this is not always the case. The requirements or conditions under which a bitumen waterproofing sheet, arranged directly under the metal covering, can replace a normatively required sub-roof, are regulated in ÖNORM B 4119.

Separating layers arranged directly under the roof covering can fulfil a variety of tasks. Whether a separating layer is used or which separating layer is to be used should thus be already taken into account in the planning phase.

Separating layers can:

- protect the wooden formwork or wood-based panels from moisture during the construction phase.
- improve sound insulation (= acoustic decoupling).
- compensate for minor unevenness in the roof structure
- improve the extension and contraction of the trays.
- protect the metal on the underside against damaging alkaline influences and possible harmful chemicals in substrate
- support the roof covering and the sub-roof with regard to the rainproof function.

Depending on the function that a separating layer is to assume, a suitable product must be agreed with the manufacturer of the separating layers. If, for example, the separating layer's function is to provide additional sound insulation, the use of stronger, heavier bitumen separating layers (e.g. BauderTOP UDS 3 NK or similar) is recommended. If the separating layer is "only" intended to protect the substructure during the building phase, a thinner bitumen separating layer can be used (e.g. BauderTOP TS 40 NSK or similar).

If no wood preservatives containing salt or copper are used and none of the above tasks and noise protection measures are required, there is no need for a separating layer. The prerequisite for this is a clean, even and dry substrate.

NOTE

In the case of single-shell, non-insulated roof constructions, a sub-roof must comply with the requirements of national regulations (sub-roof standards), however, a bitumen separating layer is required as a minimum.

Structured separation layers are not required due to the material properties of aluminium. PREFA advises against using structured separating layers in combination with PREFA roof products (Exception: special building physics requirements).

In general, we recommend the use of suitable bituminous separation layers. When using thicker separating layers, use longer nails if necessary.

CHECKING THE ROOF BUILD UP

For both new builds and refurbishments, check the build up for inaccuracies. Pay attention to the minimum roof pitch of the respective products, and check the supporting substrate for any inaccuracies.

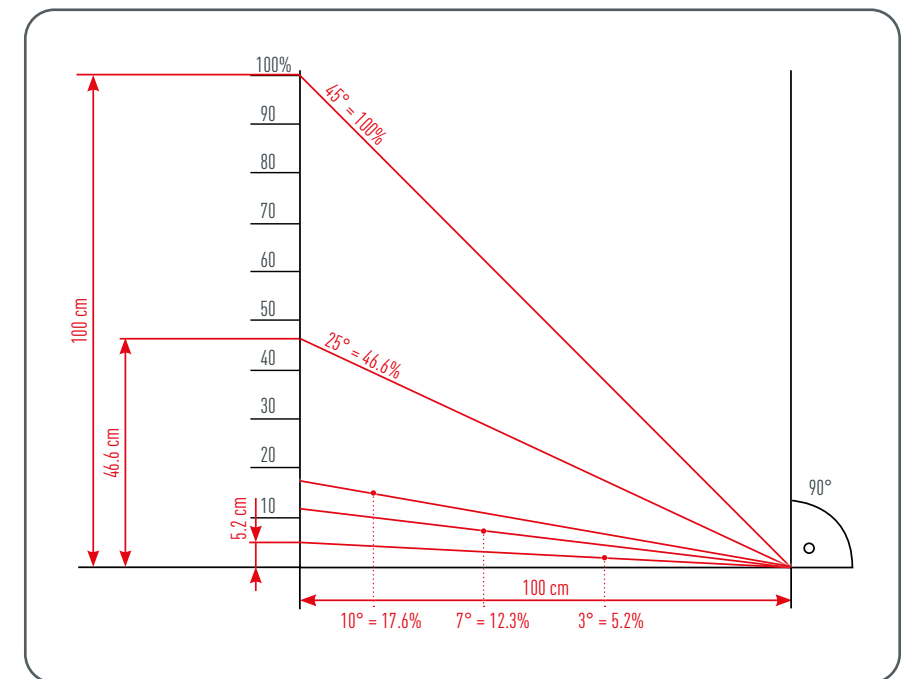


Figure 5 • Roof pitch with details in angle degrees, percent and centimetres

CONTACT WITH OTHER MATERIALS

Different metals must not touch if this could cause contact corrosion or corrosion damage. Direct metallic contact is to be prevented through the use of suitable coatings or separating layers. It is also important to pay attention to the order of the materials in the watercourse.

The table is intended to give an overview of how aluminium may be connected to other metals and which building materials should be used with caution.

Material planning	Land	City/Industry atmosphere	Near the lake/sea
Zinc	+	+	+
Stainless steel	+	+	+
Lead	+	+	-
Unprotected steel	-	-	-
Copper	-	-	-
Dry concrete	+	+	-
Concrete not set	-	-	-

No water may get from copper parts (e.g. gutters, edging, chimney caps, sheet metal coverings) onto PREFA aluminium products (observe the electrochemical series). **If this is already the case, these parts must be replaced, otherwise the materials will corrode!**

Concrete is not a suitable substrate for metal roofing. Drilling dust on the surface can cause corrosion when combined with water. Concrete and brickwork require a separating membrane. Special purpose solutions must be agreed with the architect/structural engineer.

Impurities such as drilling dust, mortar residues or effluent from concrete on coated or bare aluminium parts must be removed immediately.

PREFA aluminium products must be protected from damaging influences by other building parts (e.g. concrete) or the environment (e.g. corrosive environment).

STORAGE AND TRANSPORT

When transporting the PREFA material, handle the packaging units carefully.

Secure open units or sheet metal parts against falling in strong winds. Protect cardboard packaging stored on the roof against the rain with a tarpaulin. It must be stored upright on a level surface. The stored goods should be protected and stored dry.

Damp rooms should be avoided.

The stored goods should be protected from alkaline influences (mortar, concrete, lime or cement dust, etc.), as well as lye or acid vapors, salt (e.g. road salt).

Please note that if mill finish Aluminium coils or sheets get in contact with water or moisture black or white stains may occur. This does not affect the lifespan unless other chemical influences contribute to further decomposition of the aluminium.

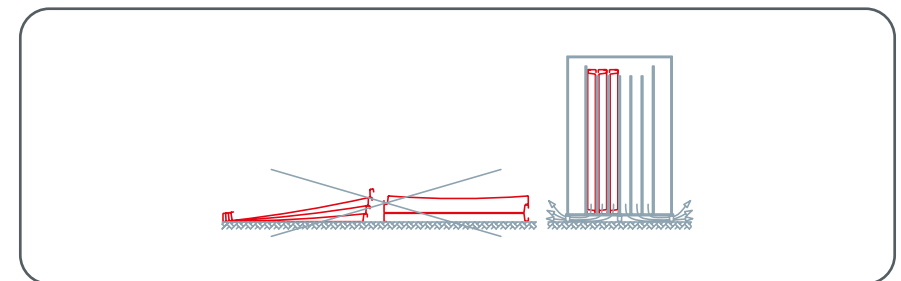


Figure 6 • Transport

NOTE

The manufacturer's packaging is a protective cover for transport only. Aluminium panels must be stored and transported vertically and on an even support.

GENERAL INFORMATION

- Debris and saw dust must be cleaned off the roof area before installing the metal roof. Otherwise, there is a risk of capillary action.
- In order for the PREFA roof covering to fulfil its function, only competent persons may walk on PREFA roof coverings. In order to prevent technical or visual damage to the roof covering (e.g. damaging seams, indentations) by third parties, additional measures must be taken, such as walkways.
- The length of prefabricated flashings should not exceed 3,000 mm. Do not make a firm connection at the joints, as expansion and contraction will be restricted otherwise.
- For flashings and trimmings only use PREFA supplementary coil material. This is the only way to ensure colour consistency in the long term.
- In order to avoid colour differences in the long term, batches should not be mixed within the same project.
- Directional arrows are printed on the back of the PREFALZ coils. To achieve a uniform appearance, ensure that the direction of the arrow is uniformly aligned on each surface.
- You will need longer grooved nails (e.g. 2.8/40) for PREFA coverings over thicker layers of bitumen or if using a thicker bituminous underlay or membranes longer ring shank nails might be necessary
- PREFA hydro paints are only suitable for adapting existing roof parts (e.g. gutter hooks). There is no need to paint over or touch up scratches on PREFALZ due to the corrosion resistance of aluminum. When touching up scratches, there may be colour differences due to different paint qualities of the touch-up paints/pens.

- The processing temperature should not fall below 0° C.
- For all built in parts, openings, penetrations and weatherings, PREFA prefabricated accessories must be installed. Verges, hips and ridges as well as weatherings must be installed professionally.
- Minor colour deviations are not a quality defect. Small scratches are possible due to processing and do not affect the function and durability.
- Coverings and cladding made from PREFALZ are “non-self-supporting profiles” and do not have an absolutely flat and even surface. This is the deformation typical of thin sheet metal. Slight quilting or oil canning is characteristic of all thin sheets and does not represent a defect.
- Ensure compliance with Health and Safety Regulations prior installation works.
- Use an installation aid and take all other safety measures into account, such as roof safety hooks that may be required.

CLEANING

The roof and the façade are parts of the building that are particularly stressed by the weather. Sun and wind, rain and snow, as well as permanent moisture (in the forest or in the shade) have an effect on the building cover. Dirt deposits (e.g. dust, leaves, needles, etc.) can impair the function and appearance of the roof covering, façade or roof drainage (e.g. blockage). Therefore, it is advisable to check roof and wall coverings, as well as roof drainage systems at certain intervals in order to be able to identify and eliminate any changes in good time.

Tips for maintenance and cleaning of PREFA coloured aluminium coils: In the event of light or moderate dirt, clean the surface with lukewarm soapy water and a sponge (no scrubbing agent). In the case of heavy contamination, such as adhesive residues, oils or fats: conventional car polish or suitable detergents. The manufacturer's instructions for cleaning agents must be observed.

Use water and a cleaning sponge for cleaning.

CAUTION

After each cleaning process, rinse sufficiently with clear water. Do not clean in direct sunlight! Never use acetone, nitro thinner or similar solvent or products with an abrasive effect for cleaning.

CALCULATIONS

The arrangement of snow protection systems must be planned and designed for the snow loads in accordance with EN 1991-1-3 and the national annexes. The snow protection measures required for solar and photovoltaic systems on PREFA roofs must also be agreed with the owner of the building.

Tray widths and clip spacings should be adapted to project location and wind load specifics. In areas with higher wind loads, clip spacings and tray width should be decreased. Please find simplified dimensioning tables in the relevant standards and technical regulations or the chapter "Processing and Installation" of this document.

NOTE

For assistance with calculations for projects in exposed locations, please contact the PREFA Product Technology Department at office.uk@prefa.com.

PREFA ACADEMY

The PREFA training courses are an important prerequisite for a satisfactory and efficient installation.

PREFA continuously provides training courses on PREFA roof systems with practice on suitable roof mock ups. Timely registration is required for these training courses.

Further information on courses and registration can be found at:

www.prefa.com/academy



Figure 7 • PREFA Academy

INSTALLATION VIDEOS

PREFA installation videos can be found on our website in the login area. Access data can be obtained from your PREFA consultant on request.

www.prefa.com

ON-SITE TRAINING/SUPPORT

Are you currently implementing your first project with PREFA products or do you need our expertise on site at difficult construction sites? No worries - our PREFA instructors are keen to assist you with hints and tips to be prepared for all upcoming PREFA projects.

www.prefa.com

HAND TOOLS

“A good hand needs good tools.” This proverb also applies to the tools required for the installation of PREFA roof systems.

IMPORTANT

Only high quality tools designed and made for metal work should be used. Tools and machines should not have any sharp edges to avoid dents and damages.

Flashings should be marked with a soft pencil or felt-tip pen, as sharp-edged tools can cause a notch effect, which could then lead to a fracture as a result of increased stress concentration.



Figure 8 • Tools



PREFALZ

PREFALZ consists of an aluminium alloy specially developed for the requirements of metal roof and wall applications. The aluminium alloy and the colour coating applied in the coil coating process is suitable for processing with the appropriate tinsmith tools.

PREFALZ aluminium coils can also be processed at low temperatures. However, the forming temperature should not fall below 0°C.

PREFALZ	
Material	Coil-coated aluminium, 0.7 mm thick
Standard dimensions	0.7 × 500 mm 0.7 × 650 mm 0.7 × 1,000 mm (Supplementary coil)
Weight	Approx. 1.89 kg/m ² Effective usage with PREFALZ 500: approx. 2.3 kg/m ² Effective usage with PREFALZ 650: approx. 2.2 kg/m ²
Minimum roof pitch	From 3° (observe national standards and guidelines)
Fastening	According to structural requirements (observe national requirements and guidelines)
Standard coil dimensions	60 kg (Inner diameter = 320 mm) 0.70 X 500 mm = approx. 63 lfm 0.70 X 650 mm = approx. 49 lfm 500 kg (Inner diameter = 500 mm) 0.70 X 500 mm = approx. 529 lfm 0.70 X 650 mm = approx. 407 lfm

MATERIAL IDENTIFICATION

The PREFALZ coils are marked on the outside with a sticker (Fig. 10).

The coil itself has a recurring imprint on the back (Fig. 9).

Look out for the PREFALZ® brand quality!





Figure 9 • Printing on the back of the coil



Figure 10 • Label on the outside of PREFALZ coils

CLIP ARRANGEMENT

Positioning and spacing of clips is of particular importance with double standing roof and wall applications.

Properly installed clips are crucial for functionality of a roof or facade. In order to avoid abrasion and other damages to roof and wall applications and thus ensure the durability in the long term, the correct installation by a specialist is an important criterion in addition to a well-engineered product. Exact fixing of the required ring shank nails and clips as well as correct positioning and spacing of clips is only a few of the requirements the installer must pay attention to.

PREFA double standing seam and angled standing seam applications are fastened with PREFA STAINLESS fixing and sliding clips. Tray lengths up to 3 meters can be installed with fixing clips only. Tray lengths of up to 12 metres are possible when using PREFA STAINLESS STEEL sliding clips in accordance with PREFA installation guidelines. In addition to the PREFA STAINLESS STEEL fixed clips for trays length between 12m and 15m, PREFA STAINLESS STEEL long sliding clips must be installed (do not combine them with PREFA STAINLESS STEEL sliding clips).

The length of the fixed area is 1-3 metres depending on the panel length. Positioning of the fixed clips area is in relation to the existing roof pitch (see fig. 11 and associated table)

Penetrations or the roof shape may affect the position of the fixed clips area. Elevations with variable fixed clip areas must be separated by separating strips.

Roof pitch	Position of the fixed clip area*
$> 3^{\circ} - 5^{\circ}$ ($> 5\% - 9\%$)	in the middle of the panel
$> 5^{\circ} - 10^{\circ}$ ($> 9\% - 18\%$)	in the upper third of the panel
$> 10^{\circ} - 30^{\circ}$ ($> 18\% - 58\%$)	in the upper quarter of the panel
$> 30^{\circ}$ ($> 58\%$)	at the top of the panel

* Roof penetrations may change the position of the fixed clip area.

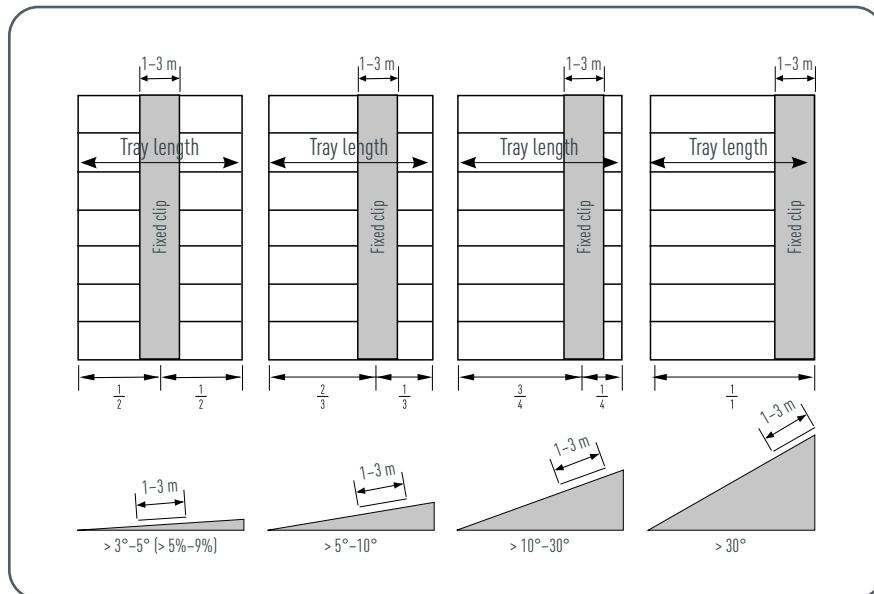


Figure 11 • Fixed clip area

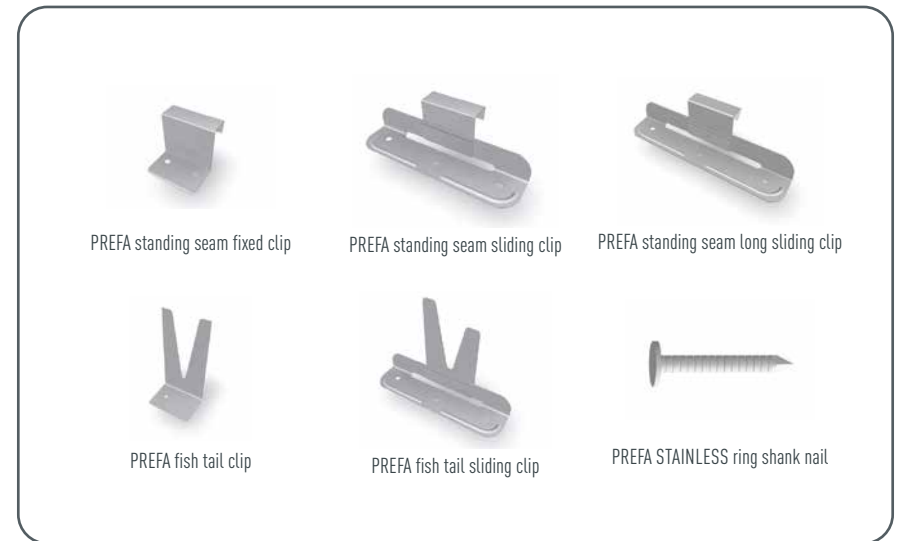


Figure 12 • Nailed clips + ring shank nail

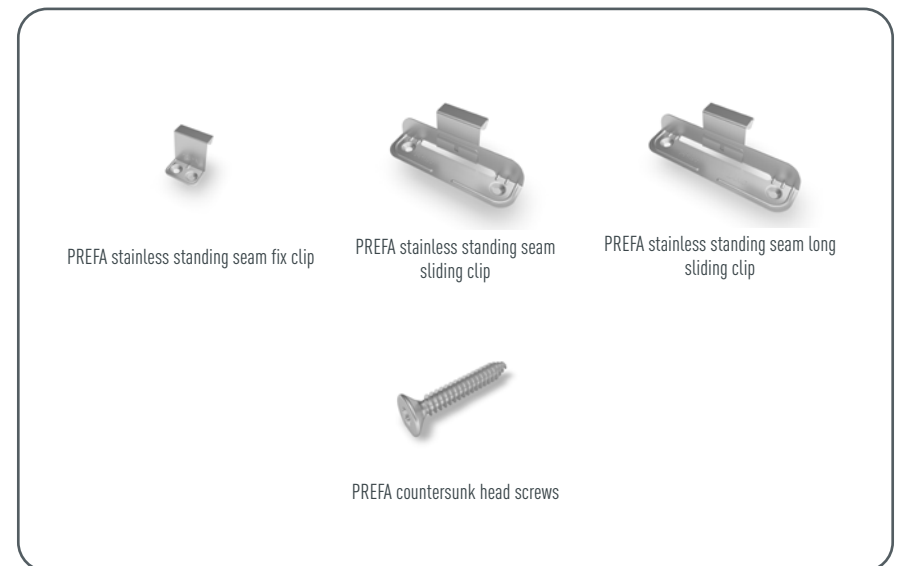


Figure 13 • Screwed clip + countersunk head screw

NOTE

For fixings of standing seam applications, stainless steel ring shank nails or screws are required. For this reason, PREFA offers STAINLESS steel ring shank nails in variable lengths

When fastening the PREFA STAINLESS STEEL fixed clips, sliding clips and long sliding clips, ensure that the nails are sufficiently countersunk and do not protrude over the base of the clip in order to avoid pressure and chafe marks on the tray. PREFA stainless steel fixed clips must be installed with 2 stainless steel ring shank nails. PREFA stainless steel sliding/long sliding clips must be installed with 3 stainless steel ring shank nails.

PREFA also provides manufactured clips as well as suitable countersunk screws for a screwed fixing version. In the case of screwed versions, 2 screws per clip are sufficient for fixed clips, sliding clips and long sliding clips.

When using thicker separating layers, use longer nails or screws if necessary.

PREFA STAINLESS STEEL fixed, sliding and long sliding clips are only suitable for even and solid surfaces and only for seam heights of 25 mm!

TRANSVERSE/CROSS WELT DETAILING

With panels over 12 metres, there are possibilities to create longitudinal expansion (Steps, gradient jump, longitudinal sliding clip). No clips may be used for cross welts.

NOTE

In addition to the PREFA stainless steel fixed clips for trays length between 12m and 15m, long sliding clips must be installed (do not combine them with PREFA stainless steel sliding clips).

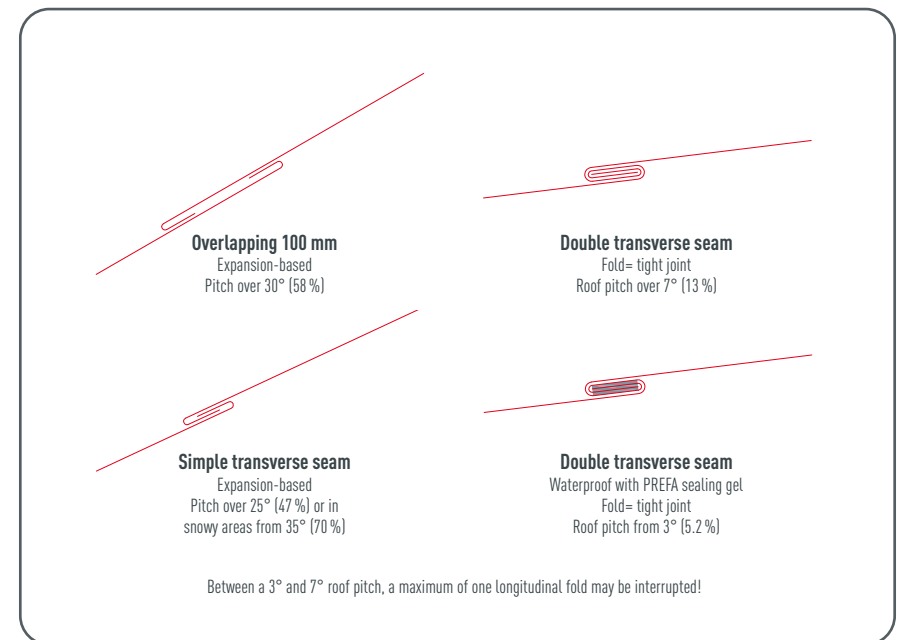
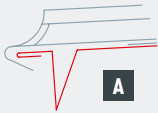
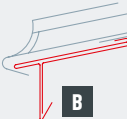
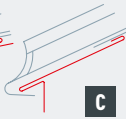


Figure 14 • Variations of cross joints

RECOMMENDED VALLEY DETAILING

VALLEY FALL	VALLEY TYPE	VALLEY JOINT
$\geq 3^\circ$	boxed valley with drip edge	Maximum 6 metres in length or valley joint with an expansion
$\geq 7^\circ$	Double seamed tray valley Attention: noexpansion of valley!	maximum length of valley 6 m
$\geq 10^\circ$	The roof tray is joined to the valley with a single lock welt with additional savety fold Remark: good expansion of the valley and roof tray	valley joints: Sliding seam with additional fold or with PREFA safety valley!
$\geq 25^\circ$	tray is joined with valle through a simple fold Remark: good expansion of the throat and roof panel	valley joint with simple transverseseam

RECOMMENDED EAVES DETAILING

Roof pitch $\geq 3^\circ$	Detail with V-shaped eave starter flashing (recessed eaves board). Remark: breaks capillary at the eaves! Compensate sheet metal thicknesses at the eaves = recess formwork at the eaves.	
Roof pitch $\geq 7^\circ$	Design with drip edge In the event of an eaves capillary interruption as shown in figures B and C, the boarding is to be recessed at the eaves.	 

Eaves starter flashing min. 1.0 mm thick (e.g. Fig. A). starter flashing (eaves strip) min. 0.7 mm thick with a continious retaining strip min. 0.8 mm (e.g. Fig. B).

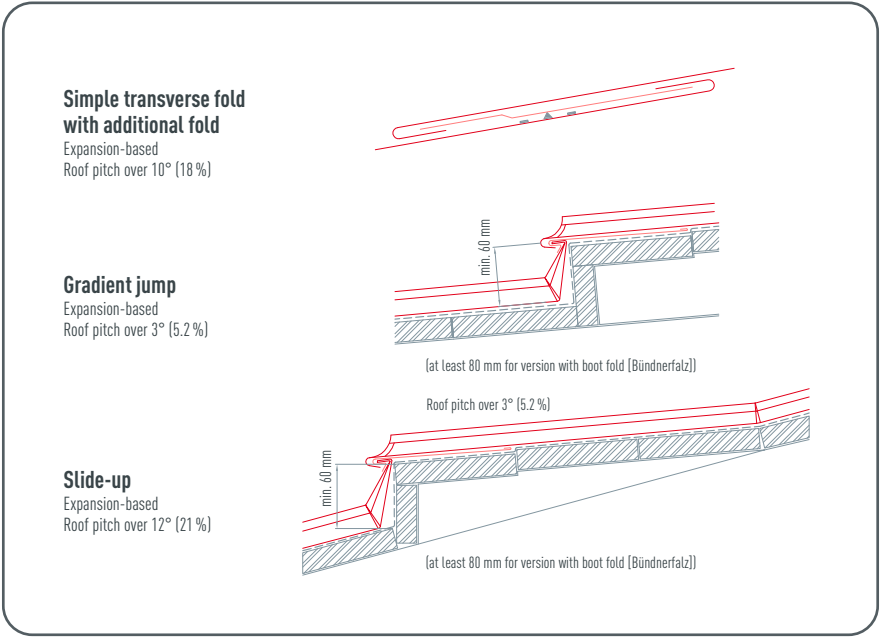


Figure 15 • Variations of cross joints

RAIN-PROOF, TRANSVERSE SEAMS

DESIGN	REQUIRED ROOF PITCH
transverse step	$\geq 3^\circ$
simple transverse fold with additional fold	$\geq 10^\circ$
sprocket	$\geq 12^\circ$
simple transverse seam	$\geq 25^\circ$

TRAY LENGTH

Maximum PREFALZ tray length 12 m when using standard sliding clips. Longer panels are possible with additional measures (see Chapters “Clip arrangement” and “Transverse seam detailing”).

For tray lengths of 10 metres or more, we recommend reducing the panel widths (axis dimension: max. 430 mm; Cut: max. 500 mm). With tray lengths of 12 metres to 15 metres, panel widths with an axis dimension of max. 430 mm (Cutting width: max. 500 mm) or narrower are to be used. The cutting width with PREFALZ aluminium sheets should not exceed 650 mm on the roof and 500 mm on the façade. Façade and preferably with a single lock seam can be installed staggered with a simple cross welt up to 4 metre length.

TRAY WIDTHS

For standing seam applications observe local wind load conditions to determine tray width and spacing of clips. PREFA has prepared basis assessment tables for professional installers. The simplified dimensions only apply to closed structures and only for PREFALZ or FALZONAL in combination with PREFA fixed and sliding clips and associated fasteners (nails/screws) from PREFA and when installing on fully supported substrate with a separating layer. The tables are created based on EN 1991-1-4. Please refer to EN 1991-1-4 for the terrain category and to national supplements to EN 1991-1-4 for the base speed. The roof areas have been optimised to two areas and renamed (R = edge area, N = main area). The wind loads are higher at the edges of buildings and require special attention.

Building height: Greatest height of the building (e.g. ridge, hip).

The panel width is calculated from coil width minus theseams:

- For handcrafted standing seam roofs: $\sim 80 \text{ mm}$ (e.g. $650 \rightarrow \sim 570 \text{ mm} / 500 \rightarrow \sim 420 \text{ mm}$).
- When using a profiling machine: $\sim 70 \text{ mm}$ (e.g. $650 \rightarrow \sim 580 \text{ mm} / 500 \rightarrow \sim 430 \text{ mm}$).



Terrain category 0 - lakes and coastal areas exposed to the open sea.



Terrain category I - lakes and areas with low vegetation and without obstacles.



Terrain category II - areas with low vegetation such as grass and individual obstacles (trees, buildings) with a distance of at least 20 times obstacle height.



Terrain category III - areas with uniform vegetation and buildings or with individual objects with distances of less than 20 times obstacle height (e.g. villages, suburban developments, forest areas).



Terrain category IV - areas where at least 15% of the surface is covered with buildings with an average height of 15 metres.

NOTE

The tables below are not applicable due to different national regulations for Germany and Switzerland. For further information, please contact the Product Technology department of the respective country!

Specification of the maximum recommended tray width [cm] depending on the terrain category, building height and basic wind speed. The values given in the table are empirical values. The specified panel widths do not take into account waste when using standard coil dimensions.

SIMPLIFIED CALCULATION OF MAXIMUM PANEL WIDTH [CM]																			
Basic speed pressure [kN/m²]	Basic speed [m/sec]	TERRAIN CATEGORIES II						TERRAIN CATEGORIES III						TERRAIN CATEGORIES IV					
		BUILDING HEIGHT [M]						BUILDING HEIGHT [M]						BUILDING HEIGHT [M]					
		< 15		15-30		30-50		< 15		15-30		30-50		< 15		15-30		30-50	
		N	R	N	R	N	R	N	R	N	R	N	R	N	R	N	R	N	R
≤ 0.32	≤ 22.5	58	50	58	47	43	43	58	52	58	49	58	47	58	58	58	53	58	50
≤ 0.39	≤ 25.0	58	47	43	43	43	43	58	49	58	46	43	43	58	54	58	50	58	48
≤ 0.47	≤ 27.5	43	43	43	42	43	26	58	47	43	43	43	42	58	51	58	48	43	43
≤ 0.56	≤ 30.0	43	42	43	35	43	26	43	43	43	41	43	34	58	49	43	43	43	43

SPACING AND AMOUNT OF CLIPS

Specification of the minimum clip number [piece/m²] depending on the terrain category, building height and basic wind speed.

SIMPLIFIED CALCULATION FOR MINIMUM CLIP NUMBER FOR FIXED AND SLIDING CLIPS [PCS./M ²]																			
PREFA STAINLESS SLIDING CLIPS [PCS./M ²]		TERRAIN CATEGORIES II						TERRAIN CATEGORIES III						TERRAIN CATEGORIES IV					
Basic speed pressure [kN/m ²]	Basic speed [m/sec]	BUILDING HEIGHT [M]						BUILDING HEIGHT [M]						BUILDING HEIGHT [M]					
		< 15		15-30		30-50		< 15		15-30		30-50		< 15		15-30		30-50	
		N	R	N	R	N	R	N	R	N	R	N	R	N	R	N	R	N	R
≤ 0.32	≤ 22.5	3.7	8.2	4.3	9.7	4.9	10.9	3.1	7.0	3.8	8.5	4.4	9.9	2.2	5.0	2.9	6.4	3.5	7.8
≤ 0.39	≤ 25.0	4.5	10.0	5.3	11.8	6.0	13.3	3.8	8.5	4.7	10.4	5.4	12.0	2.7	6.0	3.5	7.9	4.3	9.5
≤ 0.47	≤ 27.5	5.4	12.0	6.4	14.2	7.2	16.1	4.6	10.2	5.6	12.5	6.5	14.5	3.3	7.3	4.2	9.5	5.2	11.5
≤ 0.56	≤ 30.0	6.4	14.3	7.6	16.9	8.6	19.1	5.5	12.2	6.7	14.9	7.7	17.3	3.9	8.7	5.1	11.3	6.1	13.7

SIMPLIFIED CALCULATION FOR MINIMUM CLIP NUMBER FOR LONG SLIDING CLIPS [PCS./M ²]																			
PREFA STAINLESS LONG SLIDING CLIPS [PCS./M ²]		TERRAIN CATEGORIES II						TERRAIN CATEGORIES III						TERRAIN CATEGORIES IV					
Basic speed pressure [kN/m ²]	Basic speed [m/sec]	BUILDING HEIGHT [M]						BUILDING HEIGHT [M]						BUILDING HEIGHT [M]					
		< 15		15-30		30-50		< 15		15-30		30-50		< 15		15-30		30-50	
		N	R	N	R	N	R	N	R	N	R	N	R	N	R	N	R	N	R
≤ 0.32	≤ 22.5	4.2	9.3	4.9	10.9	5.5	12.4	3.5	7.9	4.3	9.6	5.0	11.2	2.5	5.6	3.3	7.3	4.0	8.9
≤ 0.39	≤ 25.0	5.1	11.3	6.0	13.3	6.8	15.1	4.3	9.6	5.3	11.7	6.1	13.6	3.1	6.8	4.0	8.9	4.8	10.8
≤ 0.47	≤ 27.5	6.1	13.6	7.2	16.1	8.1	18.2	5.2	11.6	6.3	14.1	7.4	16.4	3.7	8.2	4.8	10.7	5.8	13.0
≤ 0.56	≤ 30.0	7.3	16.2	8.6	19.1	9.7	21.6	6.2	13.8	7.6	16.9	8.8	19.5	4.4	9.8	5.7	12.8	6.9	15.5

* The specified minimum number of clips takes into account a partial safety factor of 1.35 and are to be understood as theoretically determined values. R = edge area (External pressure coefficient cpe = -2.9), N = main area (External pressure coefficient cpe = -1.3).

NOTE

Irrespective of the calculated values, the clip spacing must not exceed 330 mm in the fixed area and 500 mm in the sliding clip area. In areas where seam clamps for snow guards, PV system or similar are attached to the seam, clip spacing may not exceed 330 mm.

Calculation of the clip spacing based on the panel width and the required number of clips/m².

$$\frac{100}{\text{Panel width [m]} \times \text{clip number [Pcs./m}^2\text{]}} = \text{clip spacing (in cm)} \left[\begin{array}{l} \text{max. clip spacing 50 cm} \\ \text{max. fixed clip spacing 33 cm} \end{array} \right]$$

Figure 16 • Formula for calculating the clip spacing

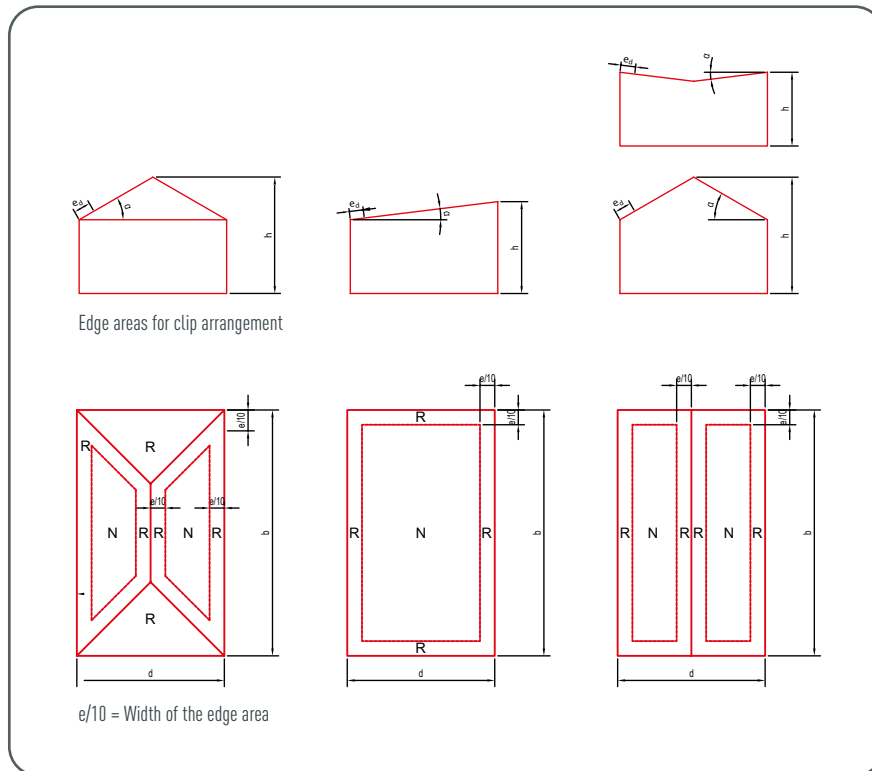


Figure 17 • Overview of arrangement of edge areas

NOTE:

$e = b$ or $2 \cdot h$ (whichever is smaller) – distance refers to the base area

e_d = distance to roof area; $e_d = \left[\frac{(e/10)}{(\cos \alpha)} \right]$

b = greatest building width

h = greatest building height

a = roof pitch

EXAMPLE:

Site	Innsbruck
Building in terrain category	II
Greatest building height	10.5 m
Basic speed	27.1 m/sec (from ÖNORM B 1991-1-4)
Max. panel width acc. Table 1	43 cm
Number of clips for the edge area acc. to Table 2	12.0 pcs./m ²
Clip number for normal area acc. Table 2	5.4 pcs./m ²

$$\text{Edge area (R)} = \frac{100}{0.43 \text{ m} \times 12.0 \text{ Stk./m}^2} = 19.4 \text{ cm} \rightarrow 19 \text{ cm clip spacing} \left[\begin{array}{l} \text{max. clip spacing 50 cm} \\ \text{max. fixed clip spacing 33 cm} \end{array} \right]$$

$$\text{Normal area (R)} = \frac{100}{0.43 \text{ m} \times 5.4 \text{ pcs./m}^2} = 43.1 \text{ cm} \rightarrow 43 \text{ and } 33 \text{ cm clip spacing} \left[\begin{array}{l} \text{max. clip spacing 50 cm} \\ \text{max. fixed clip spacing 33 cm} \end{array} \right]$$

Figure 18 • Example:

SNOW GUARD SYSTEM

Snow protection systems (e.g. seam clamps including snow guard pipes and ice stoppers) generally prevent snow and ice from slipping off. Absolute snow protection or avalanche protection is not possible! Snow transport and the formation of cornices cannot be prevented. In the event of a hazard, the removal of the snow masses must be arranged by the homeowners.

In the case of standing seam coverings, the snow guard is secured using seam clamps incl. snow guard pipes and ice stoppers. The number of required rows of snow guards are to be calculated depending on the property and location.

The seam clamps are only to be used for their intended purpose (snow guard!).

NOTE

Provided calculations by PREFA are based on the installation of single pipe clamps on each seam and double pipe clamps on the eave.



Figure 19 • Seam clamps

- Open the screws far enough that the sailer clamps rest on the roof covering (Fig. 19).
- Align the row and then tighten the screws to a torque of 35 Nm. Only the supplied original screws may be used for attachment.
- PREFA seam clamps can also be placed in the clip area. This does not affect the longitudinal and transverse expansion of the panels.
- The seam clamps must be mounted at right angles to the roof surface.
- In order to prevent the pipes from being pushed or turning, each pipe must be fixed once in the middle. Join the snow guard pipes with provided sleeves. The pipe expansion is ensured by the foam elements in the connecting sleeve. The overhang in the edge area may not exceed 30 cm.
- Double pipe seam clamps are to be used in the eaves area, while single pipe seam clamps would be sufficient for the main roof area. 2 ice stoppers per tray must also be attached to the lower snow guard pipe in the eaves area. Ice stoppers are attached to the snow guard pipes. To avoid the pipes from twisting, the ice stops should be installed contrary to each other.
- PREFA double pipe seam clamps must be positioned in such a manner that the lower of the two pull-through pipes is arranged on the eaves side (see Fig. 20)
- PREFA seam clamps with an elongated hole can be used up to an eaves pitch of 45°.

BONDED VENT PIPE COVER

1 ADHESIVE BONDING

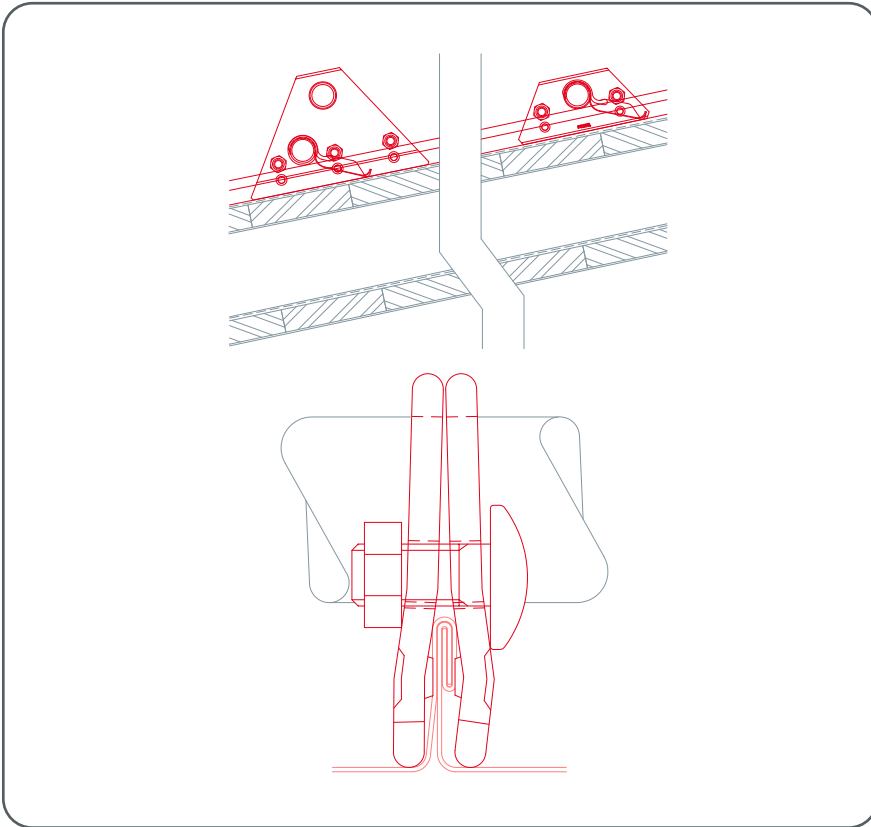


Figure 20 • Single pipe and double pipe seam clamps



Figure 21 • Adhesive set

Bonding of metals has the advantage, among other things, that this procedure does not require high temperatures, which would change the structure of the aluminium and thus its hardness and strength.

The strength of an adhesive connecting depends on several factors:

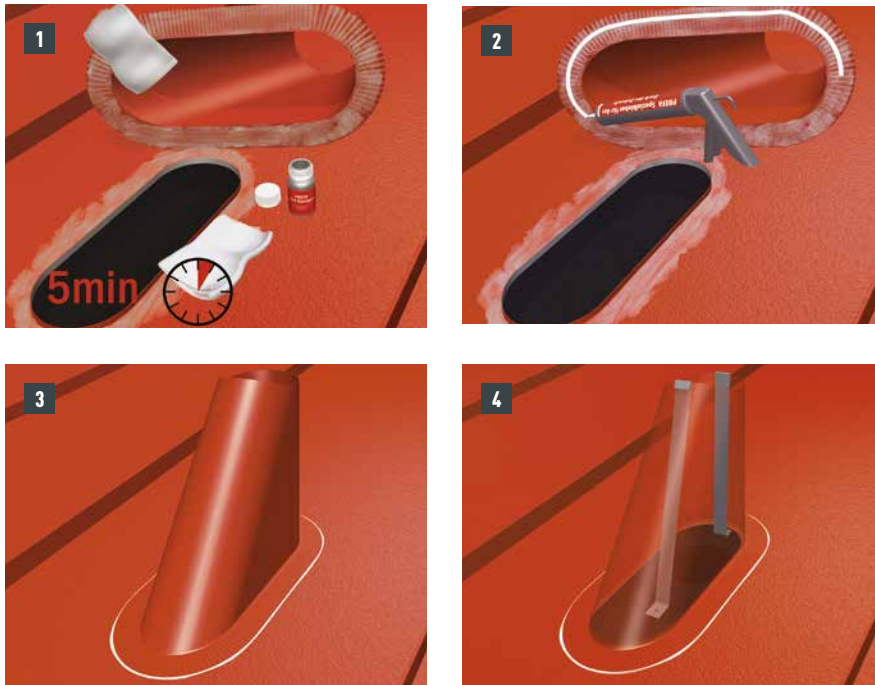
Size of the adhesive surface, the type of adhesive, pre-treatment of the adhesive surface, and thickness of the adhesive layer.

The handy PREFA special adhesive set can be used to permanently glue pipe covers, joints, on-roof and gutterjoints. A particular advantage lies in the subsequent installation, which is quick, easy and possible without seaming.

When using the PREFA special adhesive set, please follow PREFA instructions:

- Roughen the surface of the areas to be glued with supplied sanding paper and clean with also supplied cleaning agent.
- During the curing, all parts must be secured against sliding down.

2 BONDED VENT PIPE COVER



- Position the PREFAL adhesive pipe cover over the pipe lead-through and mark the oval, inner and outer adhesive flange on the PREFALZ sheet.
- Cut out the PREFALZ sheet approx. 10 mm smaller. Then sand the adhesive surfaces with the sandpaper (grain 60–100) included in the special adhesive set. Sweep opening approx. 10 mm upwards. Carefully clean the adhesive flange and the PREFALZ sheet in the adhesive area with an adhesive cleaner and a cleaning cloth. Wait for the cleaner to evaporate (Image 1).
- Apply special adhesive evenly in the centre of the prepared surface (Thickness of the adhesive bead approximately 10–12 mm). 1 cartridge is sufficient for about 4 covers (Image 2).
- Apply pressure to the cover until the glue leaks (Image 3).

- While the glue is drying, the cover must be secured against moving. Full strength is only achieved after several days depending on temperature and humidity. Secure the cover with at least 1 approx. 30 mm wide aluminium strip. The aluminium strips are to be bent sufficiently over the top edge of the cover and fixed to the substrate (Image 4)

NOTE

Do not install the pipe cover close to the standing seam. Protect the pipe penetrations against strong mechanical stress (e.g. snow pressure).

3 VENTILATION PIPE

- Mark the pipe diameter on the pipe cover, and cut it accordingly.
- Slide enclosed cover rosette and EPDM seal onto the ventilation pipe and mount the ventilation pipe. Then slide the EPDM seal down over the edging so that the transition between the edging and the ventilation pipe is sealed.
- Slide the cover rosette down over the EPDM seal and fix the cover rosette onto the pipe.



Figure 22 • Ventilation pipe

NOTE

- Check the tight connection to the plastic pipe.
- Avoid thermal bridges.

SEALING THE STANDING SEAMS WITH PREFA SEALING GEL

1 PRODUCT DESCRIPTION:

The lower the fall the higher the danger of water ingress through the standing seams caused by rain, wind, snow. For a roof pitch of up to 7°, special measures (e.g. sealing gel) must be taken into consideration.

PREFA sealing gel is a thixotropic butyl rubber product. It is a smooth gel that can be wiped off without threads and is highly adhesive. After curing, it becomes an elastomeric sealant with high resistant to aging.

The gel is applied to the inside of the over seam. Ideally, the bead of sealing gel has a diameter of between 3-5 mm and is sufficient for approx. 30 lfm. The cover sheet is then to be placed on top of the lower cover with clips, which must be closed within a max. of 48 hrs.

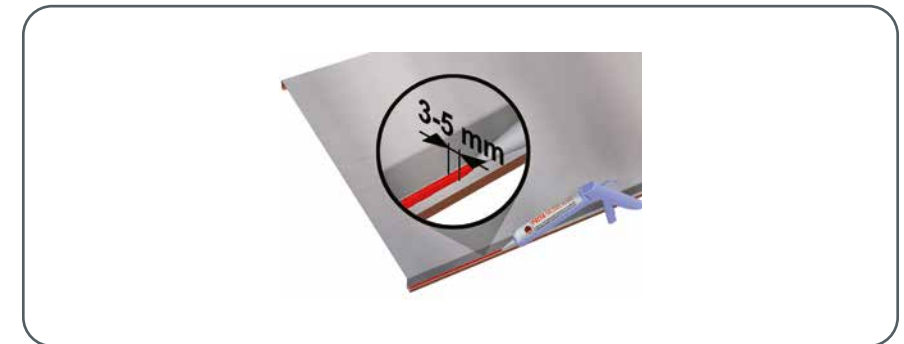


Figure 23 • PREFA sealing gel

1.1 GENERAL TECHNICAL DATA

Delivery type: 0.3 l cartridge and 0.6 l foil bag

Durability: approx. 5 years when stored in a cool, dry and closed place

Instructions for use: Use only with sufficient ventilation

Processing temperature: 0°C to > +70°C

1.2 MATERIAL DATA

Density: 1.0–1.5 g/cm³

Viscosity: gel-like

Appearance: red

Boiling point: 150-200°C

Ignition temperature: 290°C

Solubility: insoluble in water

Chemical resistance: resistance to water, weak acids, alkali resistant; in normal use, no split-off products are formed; during combustion, carbon monoxide and hydrocarbons are produced.

ALUMINIUM TRAYS – HANDLING AND PROCESSING

1 ROLL FORMING

When roll forming, it is important to ensure that the profile dimensions correspond to the specifications and that the profiling machine is used in accordance with the operating instructions.

Fig. 23 shows the angles and dimensions to be observed on the profile.

IMPORTANT

A dimension of 9 mm on the underlay side must not be exceeded.

The following basically applies: After changing the setting, the dimensions and angles must first be checked on a test sheet made of the appropriate material!

INSTALLATION OF TRAYS

1 INSTALLATION

When installaing, do not pull the trays apart or press them together (see Figure 24).

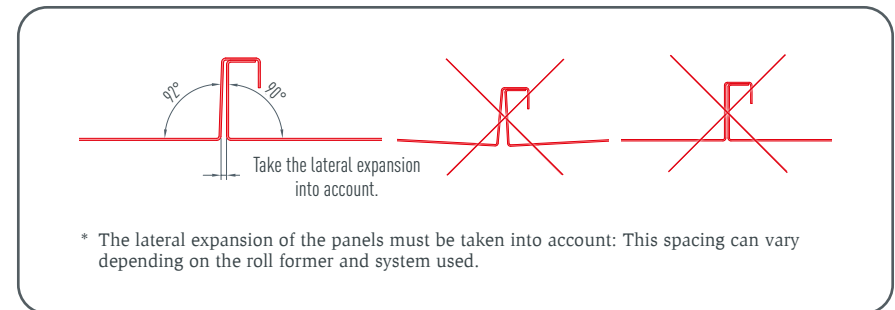


Figure 25 • Installation of trays

CAUTION

Install only one sheet at a time, set the grip pliers, close the seams and fix the clips afterwards!

2 FASTENING OF PREFALZ TRAYS

Before installing the clips with stainless clips the over seam must be closed already. Pay attention that all used nails or screws are inserted vertically. (Fig. 25).

The pressure and the impact depth of the pneumatic nailer must be adjusted accordingly!

After attaching and fastening the clips, close tight the clip to the underseam (Fig. 25).

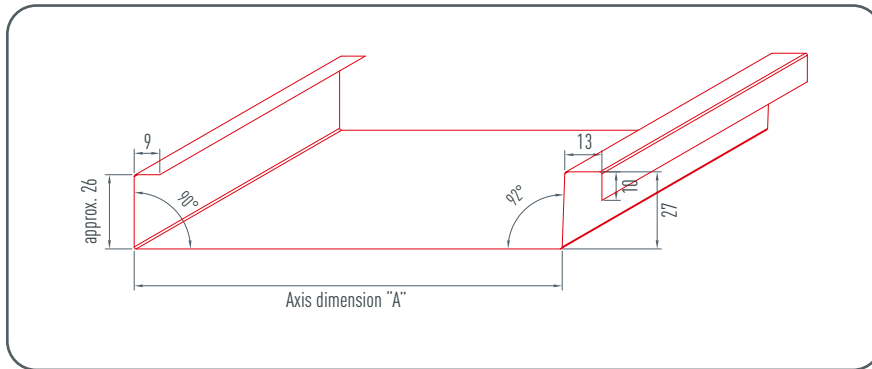


Figure 24 • Angles and dimensions on the double standing seam profile

The dimensions may vary slightly depending on the profiling system used.

2 UNCOILING/UNWINDING

The aluminium coil must be easily unrolled. The coil dimension and weight must be matched to the decoiler or the unwinder. Coils over 70 kg are to be processed with decoiling systems or unwinders.

There must be a sufficient distance between the profiling machine and the decoiler/unwinder.

The unwinding is undercut, the coil inside is the visible side after roll forming. Adjustment of the profiling machine acc. to the operating manual (e.g.: Set the infeed stop to the strip width without tension and without any free space, check seam dimensions and angles, etc.).

NOTE

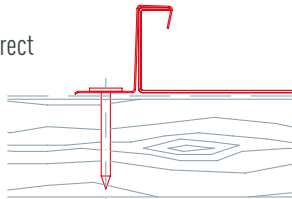
Additional measures must be taken with blank PREFALZ sheets. In order to enable problem-free gliding through the numerous rollers, the bare aluminium strip must be sufficiently lubricated with an easily degradable, biological oil (e.g. WD40) on both sides of the profiling.

NOTE

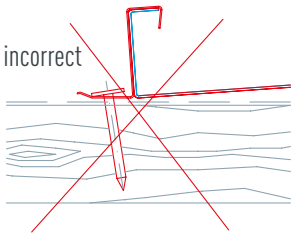
The use of sharp-edged tools should be avoided. The surface must be flat and clean. Only use PREFA stainless fixed and sliding clips.

1 PLACING THE CLIPS AND GROOVED NAILS

correct



incorrect



2 FOLDING THE CLIP FRONT EDGE

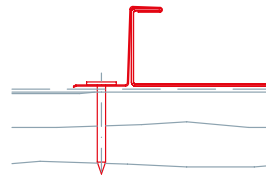
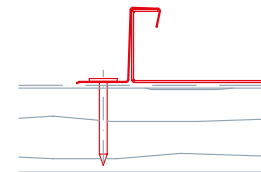


Figure 26 • Fastening of PREFALZ panels

3 CLOSING THE SEAM

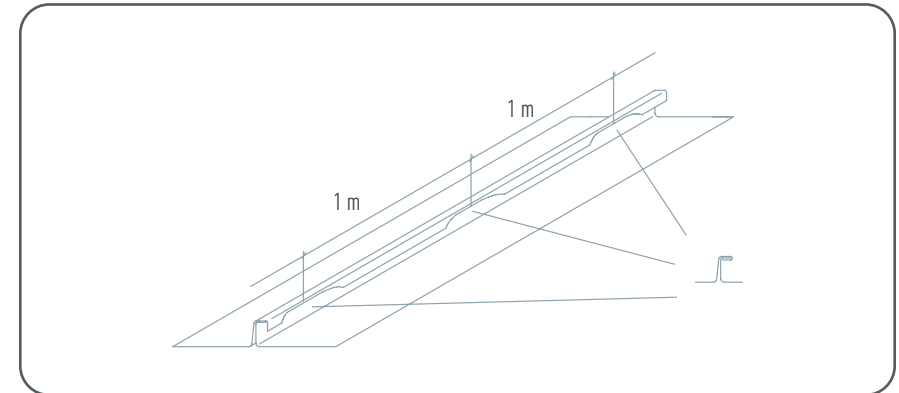


Figure 27 • Preparations with the manual double seam closer

Before closing the standing seam with a machined gripping tool close the seam to an angle with a suitable tool (Fig. 26).

Fix the tray over the entire length with seam clamps (see Image 1) at a distance of approx. 1.5–2.0 m (see Image 2). Thus both vertical legs will be compressed to 90°.



Seam clamps with plastic jaws (e.g. MASC type SGZS) every 1.5–2.0 m (Image 1).

At least 2 seam clamps are required for closing the seam, they will be readjusted during the process. Image 2: Setting the grip pliers (Image 2).

3.1 PREPARING THE SEAM

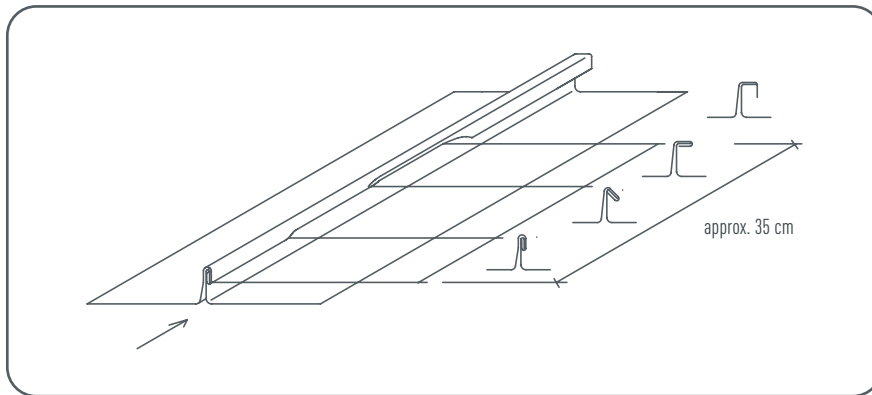


Figure 28 • Preparing the seam

Before using the seam closer the seam must be fully closed for about 350 mm as a double lock seam as illustrated in Fig. 27.

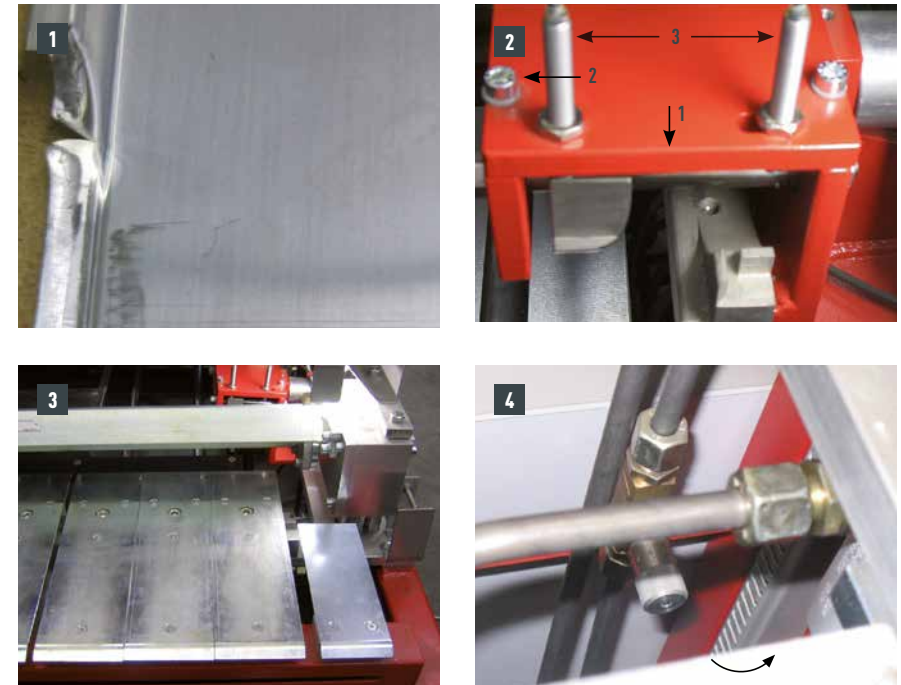
Seaming: With coated aluminium coils, little pressure is required from the pushing rollers (as opposed to more brittle, harder materials).

Adjust the pressure on the seaming machine. Lubrication is not necessary. The spacing between the metal sheets is determined by the seaming machine and should be approx. 2 mm.

NOTE

seaming machine adjustment: Care must be taken to ensure that the seaming machine is equipped with the correct set of rollers to prevent indentation of notches in the profile sheet. A notch in the lateral profile sheet inevitably means that the sheets will bulge (see manufacturer's manual). Adjust the fold spacing to the laying temperature: When using a folding machine, too great fold spacing can lead to deformation of the folded edges and thus to dishing up of the sheets. A small spacing prevents lateral expansion.

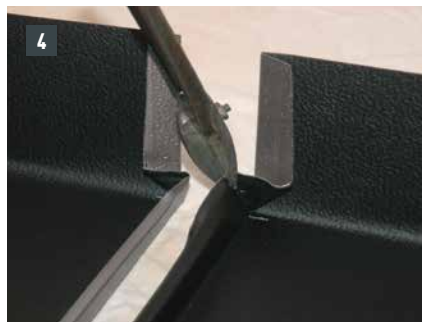
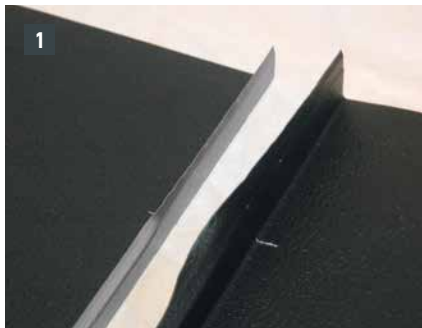
ADJUSTING THE NOTCHING UNIT WITH PREFALZ



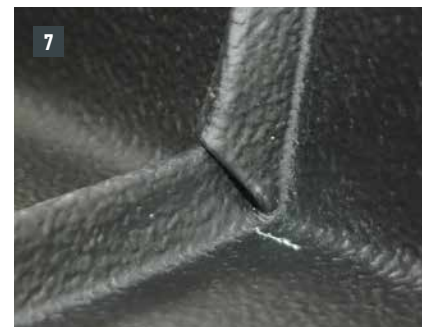
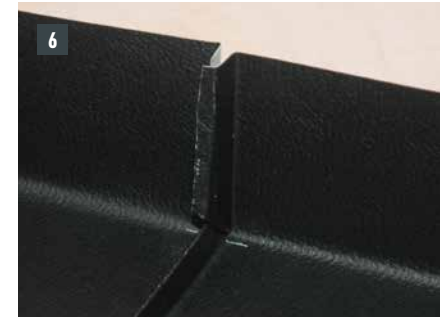
- Image 1 and 2: On machines built before 1996, the cover plate (item 1) must be replaced with a new version with a longitudinal hole. First, the two limit switches (item 3) must be released. Then the 4 screws (item 2) can be loosened on the plate and replaced. The limit switches are then to be adjusted as described below.
- Remove the plate from the driver, and set the proximity switch approx. 2 mm inwards, so that it is not driven to the yield point (Image 3).
- Image 4: Loosen the stud screw from the one-way flow control valve, then close the valve approx. 2 mm (to the right). Re-tighten stud screw and support plates.

FOLDING PROCESS PINCHED SEAM (BÜNDNERFALZ)

Pinched seams (Bündnerfälze) are used for connections on the ridge side (upstands).



- Mark abutment height, flatten the seams (Image 1).
- Turn the raised fold bracket diagonally inwards with needle-nose pliers. Twist the flattened seam inwards on both sides with a long nose plier. (Image 2).
- Cut 10 mm off diagonally on both sides (Image 3).
- Approx. 8 mm into the under seam and approx. 15 mm into the over seam (Image 4).



- Close the longitudinal seam and push the legs together, make a double seam (Image 5).
- Adjust the boot fold (Bündnerfalz) (Image 6).
- Finished pinched seam (Bündnerfalz) (Image 7 and 8).

FOLD DETAILS

1 45° EAVES DETAIL FOR STANDING SEAM

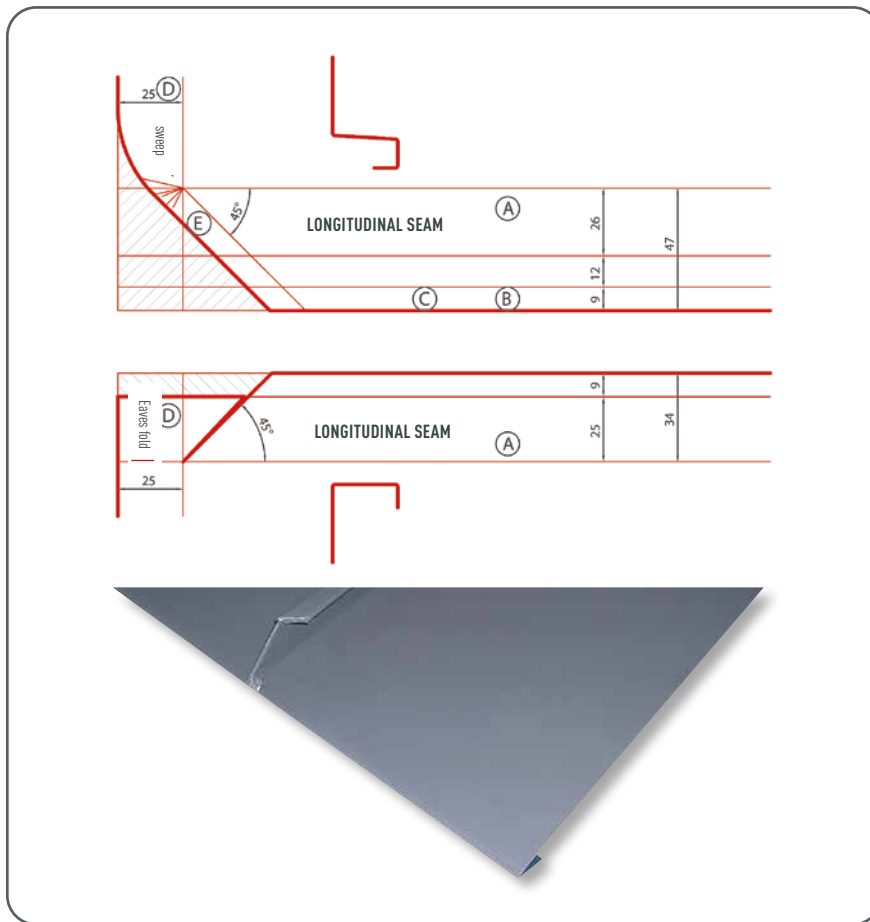


Figure 29 • 45° eaves detail for standing seam

2 SEMI-CIRCULAR EAVES DETAIL FOR STANDING SEAM

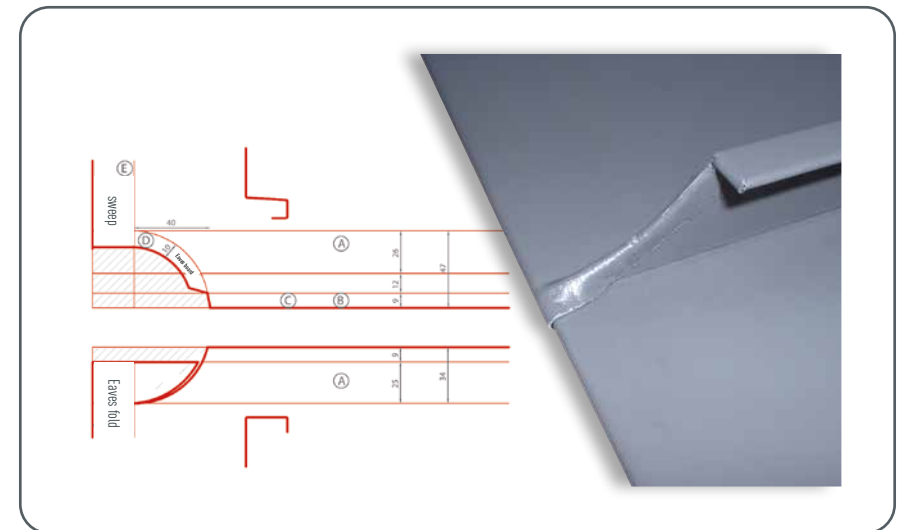


Figure 30 • Semi-circular eaves detail for standing seam

3 SEMI-CIRCULAR EAVES DETAIL FOR DOUBLE STANDING SEAM

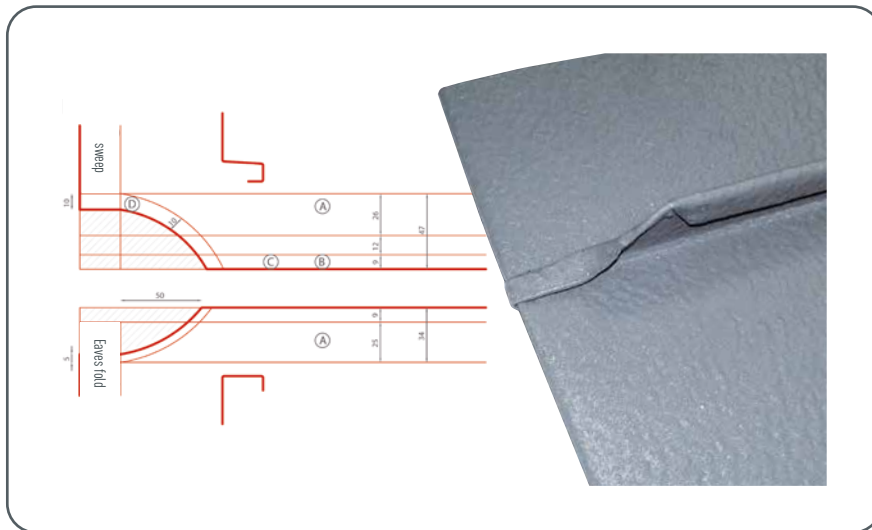


Figure 31 • Semi-circular eaves detail for double standing seam

4 SIMPLE TRANSVERSE WELT, VARIANT I

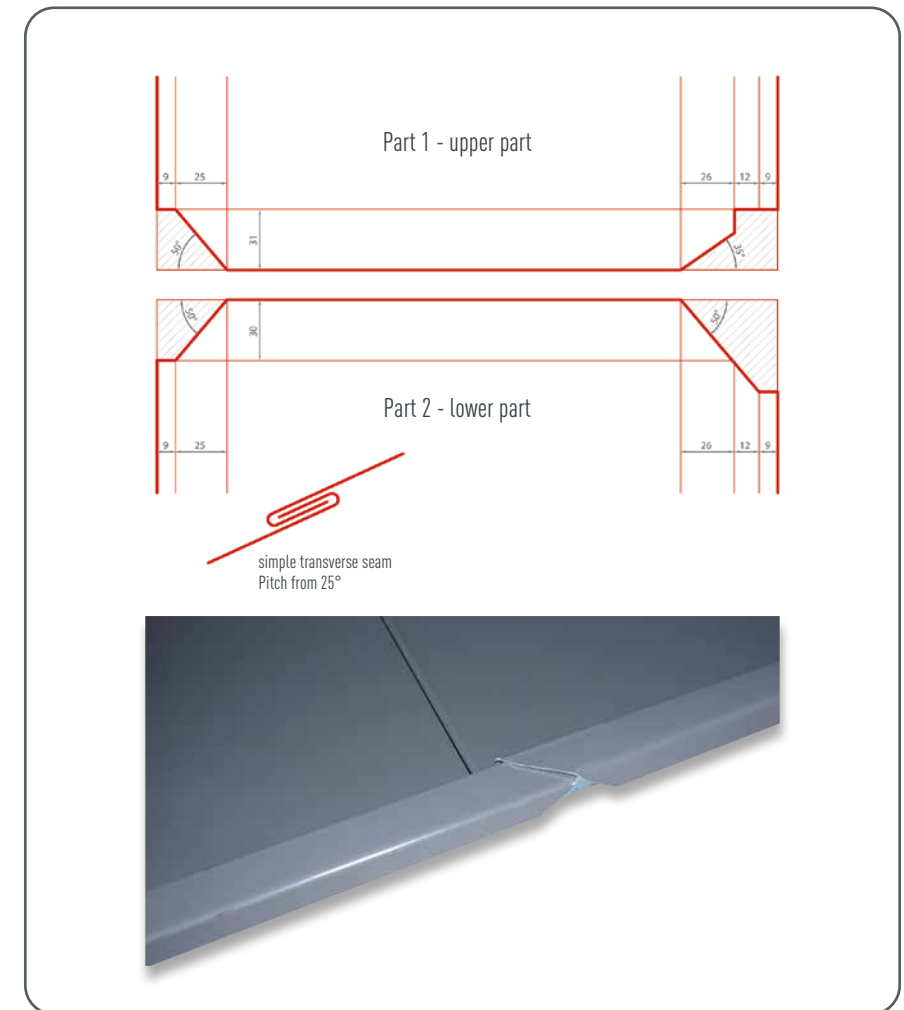


Figure 32 • Simple transverse welt, variant I

5 SIMPLE TRANSVERSE WELT, VARIANT II

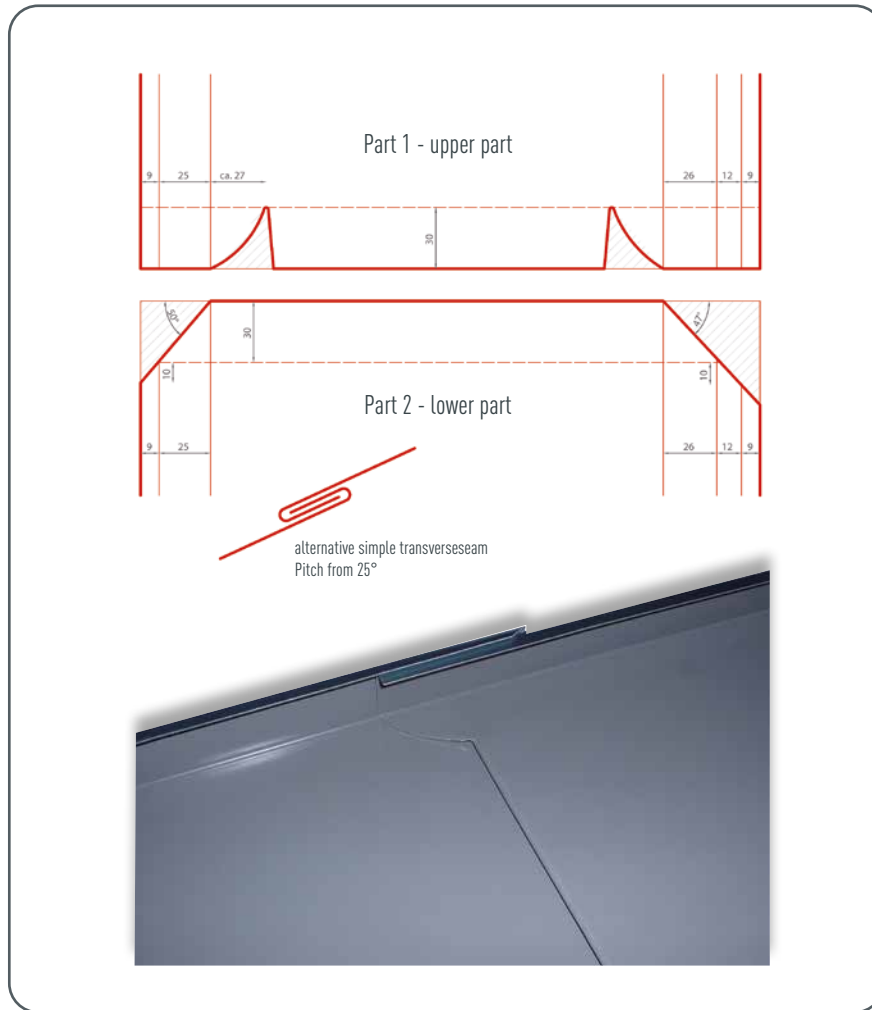


Figure 33 • Simple transverse welt, variant II

6 DOUBLE TRANSVERSE SEAM

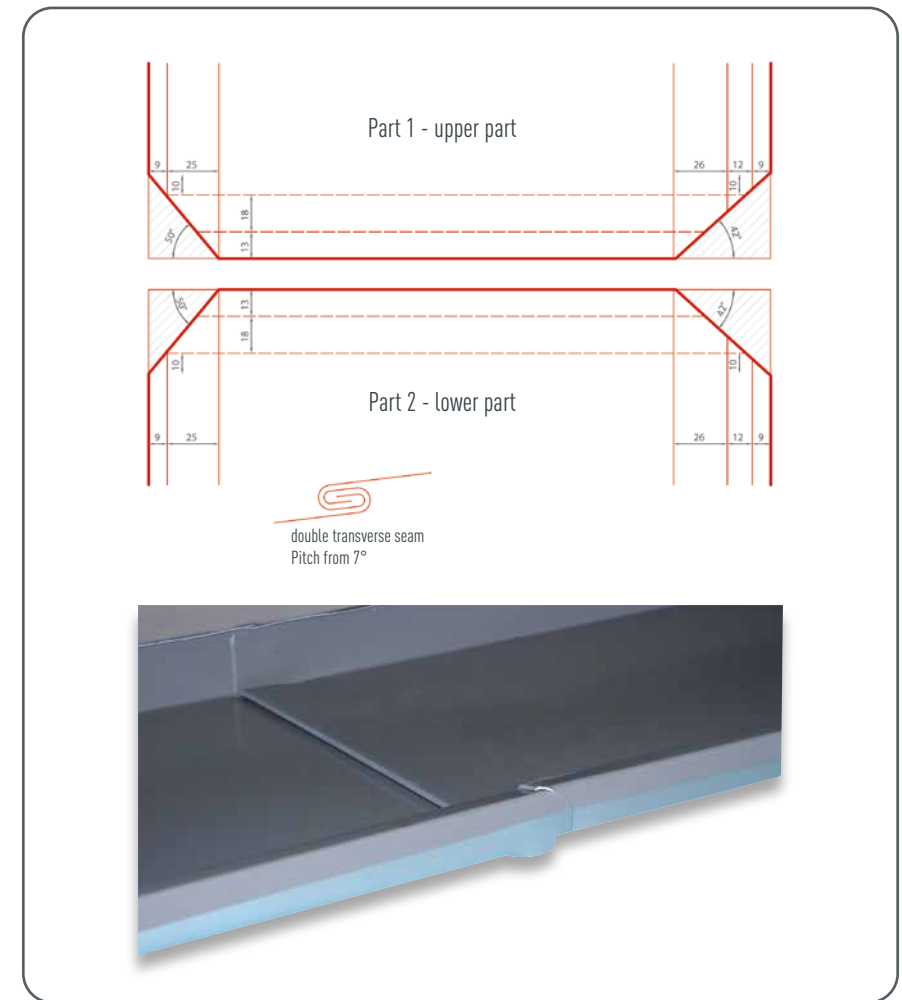


Figure 34 • Double transverse seam

7 RIDGE DETAIL, VENTILATED

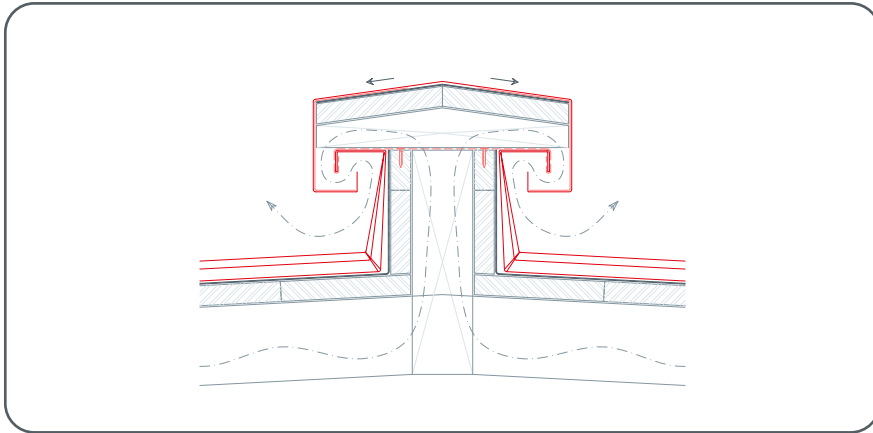


Figure 35 • Ridge detail, ventilated

8 RIDGE DETAIL, NON-VENTILATED

Seaming process:

- Prepare under seam and over seam.
- Indicate transverse seam. Pull the angle bisector back to the ridge.
- Slowly pull the ridge upstand upwards, following the transverse fold formation. Press the transverse folds together and fold them over in the opposite direction to the angle fold (only at the overlap).
- Hook in the longitudinal fold and press shut.
- Press the overlapping tabs shut.
- Knock the transverse folds of the underlay against the transverse folds of the cover sheet.

8.1 VARIANT RIDGE DETAIL NON-VENTILATED

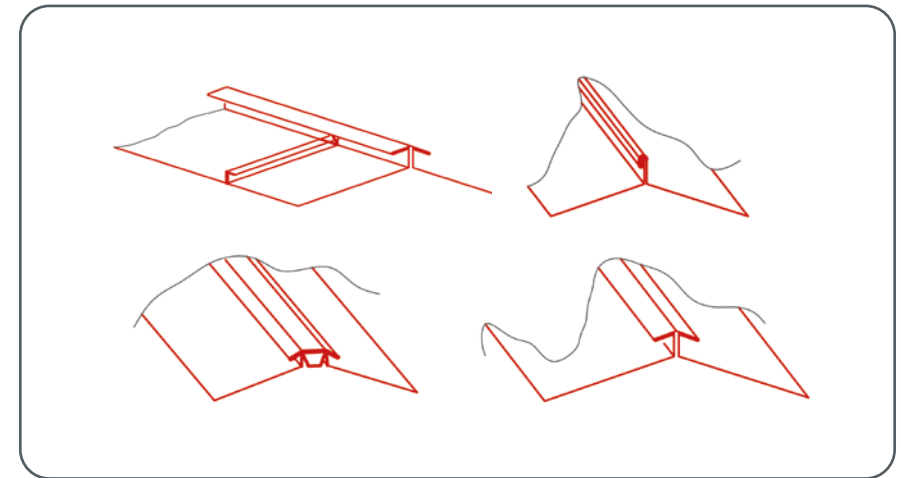


Figure 36 • Variant ridge detail non-ventilated

11 SEAM POSITION AT OPENINGS

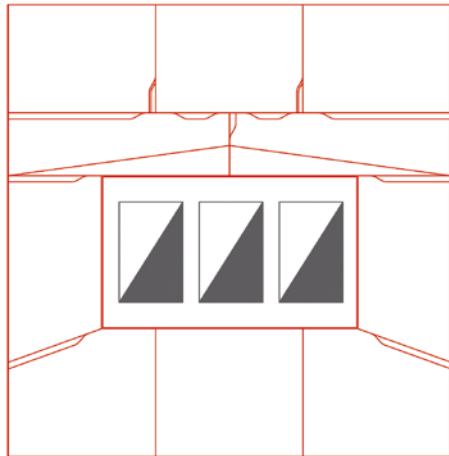
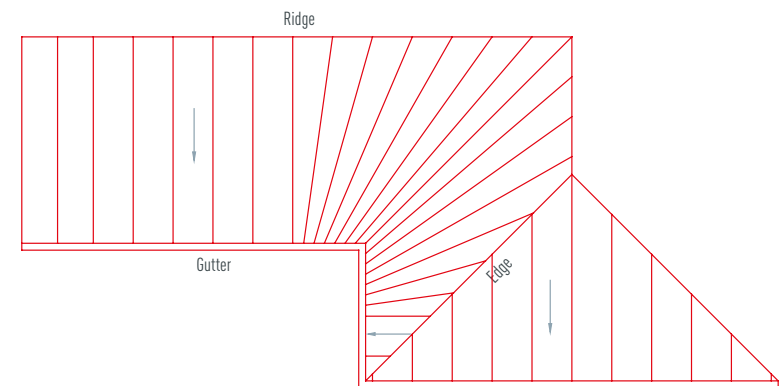


Figure 39 • Fold position at penetration

12 VALLEY DETAIL WITH TAPERED TRAYS (MINIMUM ROOF PITCH 5°)



For valleys with a low pitch and no recess is possible, tapered trays must be installed.

Figure 40 • Valley detail with tapered trays

13 DETAIL OF BOTTOM AND TOP DETAIL VERTICAL STANDING SEAM FAÇADE CLADDING

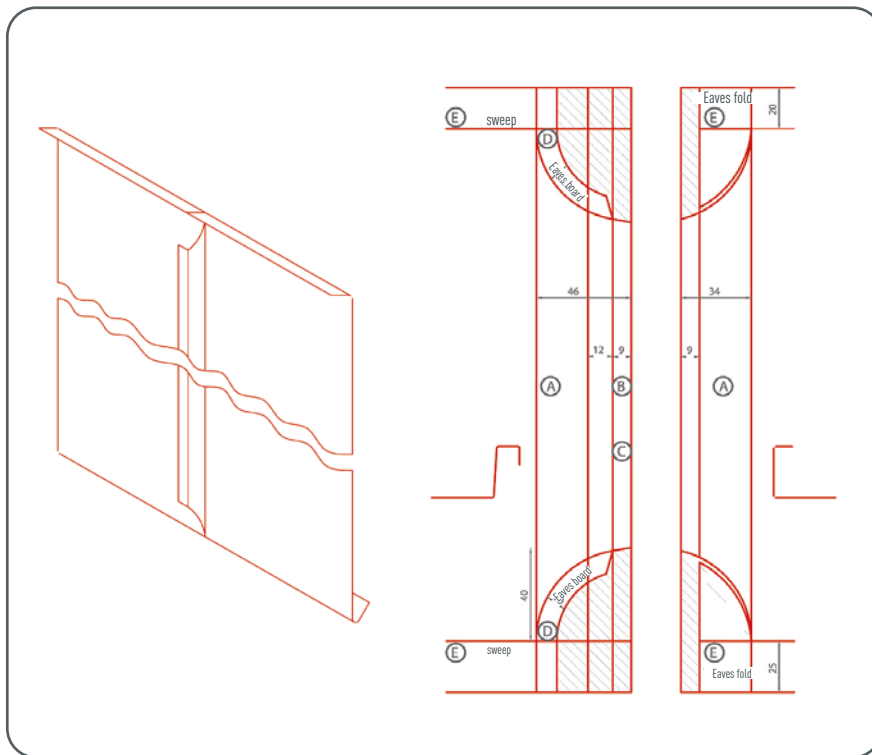


Figure 41 • Bottom and top detail with vertical standing seam façade cladding

STAGGERED AND PANEL APPLICATIONS – SEAMING DETAILS

These coverings consist of trays made from coil or sheet material. These are joint with simple transverse seams, which are arranged symmetrically or asymmetrically, and thus offer a wide range of design options.

Panel covering (Image 1)

The vertical seams are designed as single lock seams, staggered transverse seams as expansion-based sliding seams.

Mirror covering (Image 2)

The horizontal seams are continuous, the vertical seams are offset. Both seams are single lock standing seam. The execution of mirror and panel coverings must comply with the applicable standards and regulations.

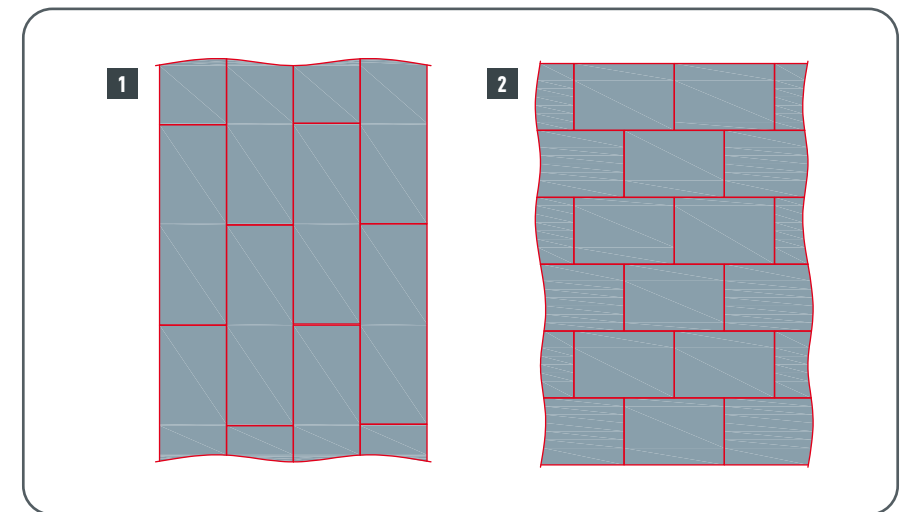
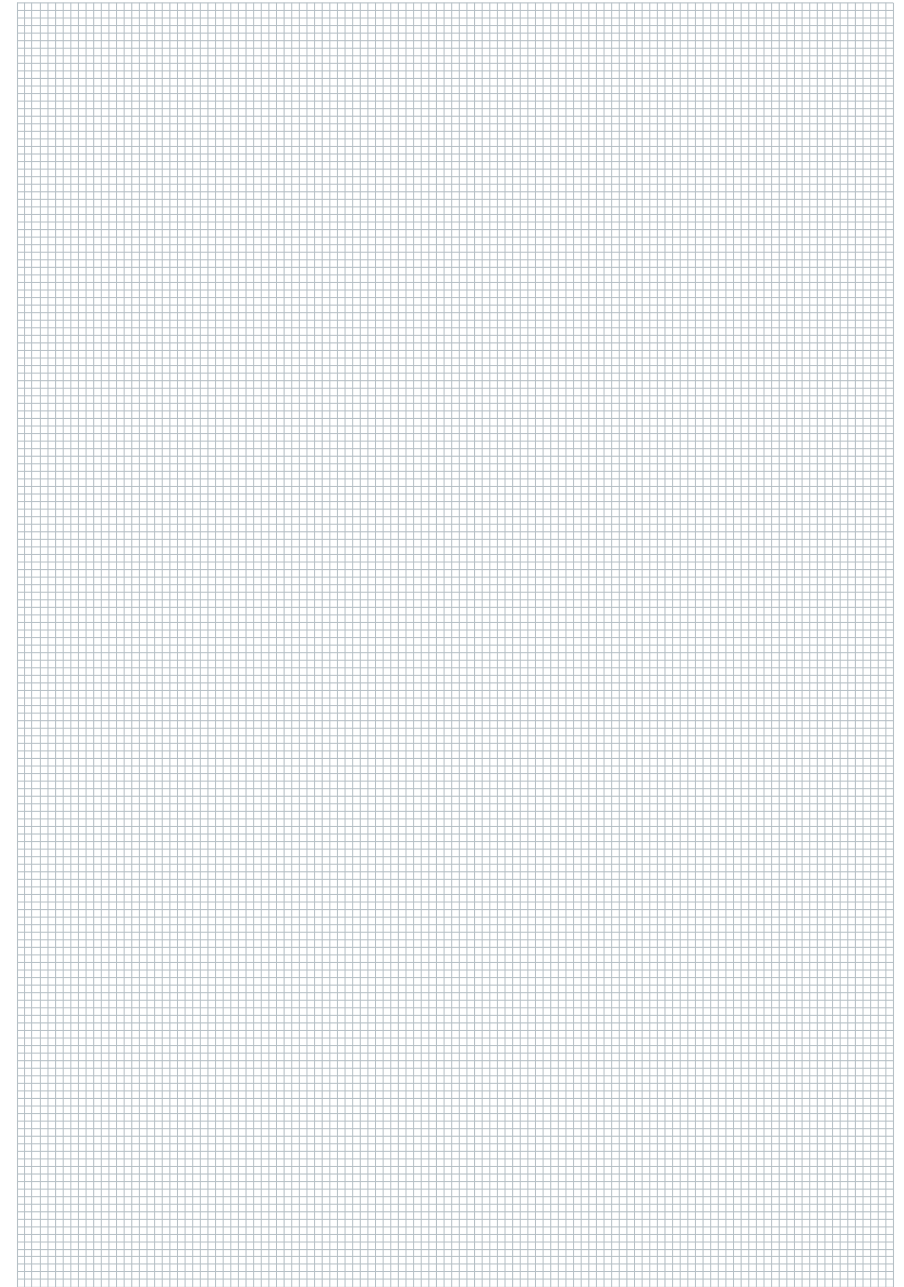
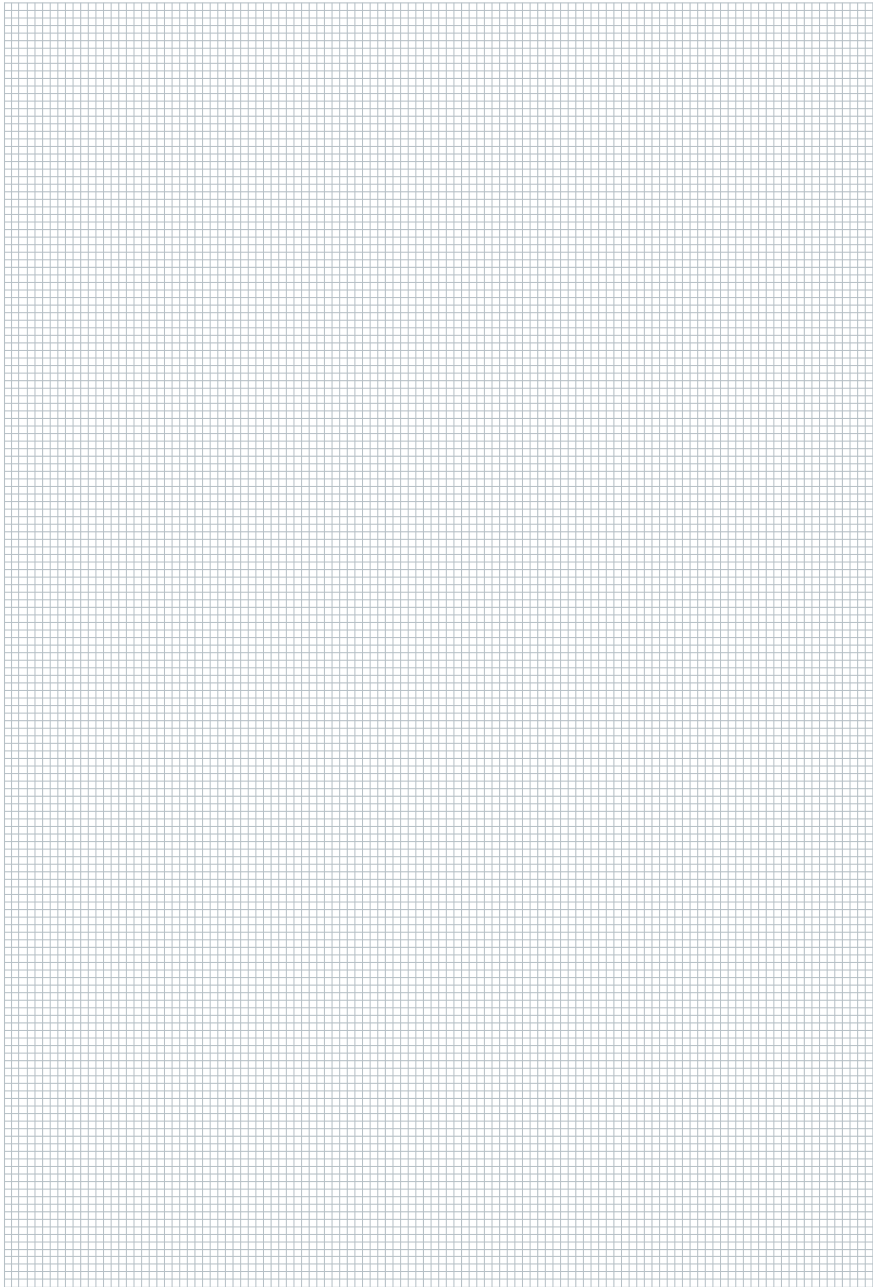


Figure 42 • Mirror and panel covering





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