Manual for Planning and Installation

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The right answer to any question

Please check out our download area for further information, brochures, CAD detail drawings, product data sheets, declarations of performance and other information materials.
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RIB-ROOF installation films

The inside track

We at RIB-ROOF know that speed is only a question of technique. If it must be done quickly, you can watch our basic installation steps for our metal roofing systems RIB-ROOF Speed 500 and RIB-ROOF 465 as a film. Both on the PC and on your smartphone when travelling or on the construction site.
www.zambelli.com/building-envelope-installation

Zambelli channel on Youtube:
You can find installation instructions, CAD visualization and construction site documentation at
http://www.youtube.com/ZambelliGermany

Theory and practice

This practical manual should help you to plan and process our products professionally to guarantee the functionality and quality of the projects which are equipped with them.

It corresponds to the present state of technique and was drawn up to the best of one's knowledge. However, the manual doesn't release the installer from a critical check in each case. Suable claims of any form cannot be derived from it. The regulations and guidelines of the European Technical Assessements (ETAs) and the General Technical Approvals have to be observed.

We provide an intensive training of specialised companies where we can pass on our experience and gathered processing expertise.

Special trainings impart theoretical and practical basics:

- ▶ Installation instruction given by our trained supervisors on site
- ▶ 2-day-theory-workshop with main focus on installation technique
- ▶ 1-day-theory-workshop with main emphasis on structucal physics and roof constructions

1.1 Quality assurance and authorities

For more than 40 years now Zambelli has been manufacturing RIB-ROOF metal roofing systems. The production of the profiled sheets is implemented in one of the most modern factories in Germany. The sliding standing seam profiled sheets RIB-ROOF Evolution, RIB-ROOF Speed 500 and RIB-ROOF 465 in aluminium and steel are authorized with EC-marking according to the European Technical Assessment (ETA), or EN 14782. For this reason, the RIB-ROOF profiled sheets comply with the European standards.
(All declarations of performance can be downloaded on https://www.zambelli.com/en/building-envelope/service/downloads.html)

The external monitoring according to the system 2+ is imple-mented by the by the material testing institute of the Karlsruhe Institute of Technology (KIT). Zambelli carries out additional control-checks, as well as internal and external monitoring in order to guarantee a constant level of quality in material and production.

"FM-Approvals" certification mark has been used on our RIB-ROOF Speed 500 and RIB-ROOF Evolution profiled sheets made of aluminium from 0.90 mm since 2015, which are thus listed at www.roofnav.com.

FM APPROVED

General System Authorisation approved by Construction Authorities:
RIB-ROOF Evolution:
CE marking according to ETA-17/1068 (steel) | ETA-17/1069 (aluminium)
RIB-ROOF Speed 500:
CE marking according to ETA-18/0034 (steel) | ETA-18/0035 (aluminium)
RIB-ROOF 465:
CE marking according to EN 14782 (steel, aluminium)
Anchoring clip (solar brackets/snow guard system/tread support):
Nr. Z-14.4-774
Fall arrest system:
Nr. Z-14.9-802

MADE IN GERMANY

RIB-ROOF metal roofing systems are characterized by an optimal fitting accuracy and the highest processing quality. The advantages of a high-quality product, its superior technical construction and comprehensive know-how during processing, form the basis for a perfect roof.

Our ordinary membership of the im IFBS e.V. Internationaler Verband für den Metallleichtbau (Europark Fichtenhain A 13 a, 47807 Krefeld, www.ifbs.de) helps us to achieve our stated quality aims in our quality management system.

Member of:

IFBS Industrieverband für Bausysteme im Metallleichtbau

1.2 Sustainability

Our RIB-ROOF metal roof systems stand for high efficiency and safety, fulfill all requirements of sustainable construction methods and have the European Technical Assessment (ETA) as metal roof for all single-deck and multiple-deck roof constructions. Furthermore, various environmental product declarations are available for our products.
www.dgnb-navigator.de/produktdatenbank

Our products are listed in the DGNB Navigator:

DGNB NAVIGATOR Registrierungs-Code QT4332 www.dgnb-navigator.de

RIB-ROOF steel

DGNB NAVIGATOR Registrierungs-Code S5LLWN www.dgnb-navigator.de

RIB-ROOF aluminium

1.3 Service

This manual guide provides you with standardised solutions. You can also get additional technical support and advice at +49 9931 89590-0 or, of course, in a face-to-face meeting. Please send your e-mail to **rib-roof@zambelli.com**

Our specifications are available for individual downloads via "drag and drop" (selected texts).
https://www.zambelli.com/en/building-envelope/service/technical-support-service-for-architects.html

Project planning

Only those who plan in a practice-oriented way will achieve a perfect result. Right from the start of the preliminary phase of your project, the RIB-ROOF team will provide you with advice and support by offering the following services:

- Preparation of detailed solutions
- Support with CAD detailed planning
- Preparation of individual specifications
- Development of special solutions, specifications and construction of roof mock-ups
- Statics and structural advice
- Preparation of cost estimates and calculation support
- Proposals for solution for an optimal construction-progress planning

Construction coordination, property supervision and installation support

Complex projects and international building projects, as well as their execution, always represent a great challenge. Our roof experts support contractors, planners and laying personnel, as required, with the following services:

Project planning and construction coordination

- Drawing up of laying plans and detailed plans, as well as the development of special solutions
- Project detailed planning
- Requirement and time planning, as well as drawing up of bills of material
- Project management (personnel, cost and schedule control)

Installation support

- Carrying out of installation trainings
- Supervision and accompanying construction support and quality assurance on site
- Providing of installation specialists
- Logistics support (e.g. setting up just-in-time delivery plans)
- Providing special spreader beams for lifting of profiled sheets up to 72 m sheet length
- Carrying out of aluminium welding works on roof penetrations
- Providing of trained specialist personnel for asbestos disposal TRG 42
- Installation of fall arrest systems

Staff installation support

With tight deadlines, you will need all hands on deck! In particular with large-scale projects in Germany and in foreign countries, roof-laying companies come back to RIB-ROOF personnel for installation support. Here you can benefit in two ways:

- Knowledge transfer through experienced and skilled construction workers
- On-time project realisation without any calculation surprises

Service-Hotline +49 9931 89590-0

Some questions cannot wait. Especially if it has to do with the preparation of an installation offer.
Therefore, we are at your disposal under this hotline if you have any questions e.g. about the installation-time calculation.
Do not hesitate to contact us by phone or talk to your area manager.

1.4 Materials, surfaces and colours

Wide range of materials, surfaces and colours

RIB-ROOF profiled sheets are available in a wide range of materials, surfaces and colours. For more information please have a look at our brochure on this topic. Use the advantage of RIB-ROOF with a wide range of material, colour and surface selection. Only materials which have been examined before are used. Zambelli is subject to external monitoring carried out by the Materials Testing Institute of Hanover (MPA Hannover). Minor chromatic aberrations and natural surfac deviations can arise if you use different batches. They do not represent any defects, however.

Material weight of profiled sheets

Material	thickness (mm)	RIB-ROOF Evolution	RIB-ROOF Speed 500	RIB-ROOF 465
		Material weight approx. kg/m²		
Steel	0.63	6.76	6.76	7.24
	0.75	7.93	7.93	8.49

Material	thickness (mm)	RIB-ROOF Evolution	RIB-ROOF Speed 500	RIB-ROOF 465
		Material weight approx. kg/m²		
Aluminium	0.70	2.53	2.53	2.71
	0.80	2.89	2.89	3.09
	0.90	3.26	3.26	3.48
	1.00	3.62	3.62	3.87

Notice: Weight specifications without optional coatings, exact details can be found in the respective product data sheets

The temperature-related material expansion of materials is guaranteed horizontally through the profile form and vertically through the movement of the profiled sheets on and in the sliding clips.

The object-related production of profiled sheets – from ridge to eaves without any transversal joint - guarantees planners and contractors the greatest possible safety for their roof.

Temperature-related material expansion

Expansion coefficient α between

-20° C und +80° C in $\dfrac{\textbf{mm}}{\textbf{10 m x 10 K}}$

Example: Temperature-related material expansion with aluminium and a temperature difference of 60 K and a length of 30 m.

$$\Delta L = a \times \Delta T \times L = 2{,}4 \ \frac{mm}{10\,m \times 10\,K} \times 60\,K \times 30\,m = \mathbf{43\,mm}$$

Material	α
Aluminium	**2.4**
Concrete	**1.2**
Lead	**2.9**
Bronze	**1.8**
Stainless-steel*	**1.6**
Copper	**1.7**
Brass	**1.9**
PVC	**8.0**
Titanium-zinc	**2.2**
Steel	**1.2**
Brick work	**0.5**
Zinc	**2.9**
Tin	**2.3**

* (Material no. 1.4301)

When putting RIB-ROOF profiled sheets together with other materials or elements, the following list has to be observed:

Possible combination of metals

	Aluminium	Steel sheet galvanised	Zinc	Copper	Stainless steel	Lead
Aluminium	+	+	+	–	+	+
Steel sheet galvanised	+	+	+	–	+	+
Zinc	+	+	+	–	+	+
Copper	–	–	–	+	+	+
Stainless steel	+	+	+	+	+	+
Lead	+	+	+	+	+	+

+ suitable for combination – unsuitable for combination

The elements made out of different metals, according to the above-stated list ("Possible combination of metals"), mustn't be in direct contact if they show different potentials and the metal with the higher potential lies at the top of the direction of flow of the rainfall water which acts as electrolyte.

- The impact on **aluminium and aluminium mill-finish** through alkalis out of concrete or mortar and through aggressive wood protecting liquids or preservers has to be avoided when installing separation layers.

- The usage of **titanium-zinc** requires special attention.

Titanium-zinc forms a natural protective layer, which is known as Patina, on its surface under the influence of the atmosphere. But this is on the rear side only possible through sufficient air motion, e.g. with a structured mate on a fully bonded load bearing surface.
Please observe the reduced dimensions between the clips (refer to reduced chapter 2.9 to 2.11).
Contact us!

Selection criteria for corrosion-protection-systems, Corrosion categories according to DIN EN ISO 12944 for steel sheets

The assignment of the corrosion-protection-classes according to DIN EN 18807 to corrosion categories according to DIN EN 12944-2 is stated dependent on the duration of protection and the atmospheric demands stated in table 1, DIN 55634:2010-04.

Corrosion categories/ corrosion impact according to DIN EN ISO 12944-2	Duration of protection	Examples for environment (for your information) – outside	Examples for environment (for your information) – inside	Corrosion persistence category [b]	Corrosion-protection class [a] – accessible [c]	Corrosion-protection class [a] – inaccessible
C1 insignificant	low	–	heated buildings with neutral atmospheres, e.g. offices, stores, schools, hotels	RC1	I	I
	medium				I	I
	high				I	I
C2 low	low	atmosphere with low soiling. Most of the time rural areas	unheated buildings where condensation can occur, e.g. stocks, sport halls	RC2	I	II
	medium				I	II
	high				I	III
C3 moderate	low	city and industry atmosphere, moderate soiling through sulphur dioxide. coastal areas with low salt pollution	production halls with high humidity and a bit air pollution, e.g. machines for food production, laundries, breweries, dairies	RC3	II	III
	medium				II	III
	high				II	III
C4 strong	low	industrial areas and coastal regions with moderate salt pollution	chemical industries, swimming pools, boat sheds built above sea water	RC4	III	III
	medium				III	III
	high				III	_d
C5-I very strong (industry)	low	industrial areas with high humidity and aggressive atmosphere	buildings or areas with almost permanent condensation and high pollution	RC5	III	_d
	medium				III	_d
	high				_d	_d
C5-M very strong (sea)	low	coastal and off-shore areas with high salt pollution	buildings or areas with almost permanent condensation and high pollution	RC5	III	_d
	medium				III	_d
	high				_d	_d

[a] The information on the corrosion protection classes is only intended for assigning former requirements of the building authorities to the new European classification system on the basis of corrosivity categories and protection duration.
[b] According to DIN EN 10169 only for coil coating
[c] The feasibility of control and repair measures for the areas classified as "accessible" is to be already planned at the construction stage. The accessibility can be guaranteed by e.g. straight ladders, stand framings, fixed, freely-suspended or led working levels.
[d] The corrosion-protection classes are not applicable with a very high corrosion load and high protection duration as well as with special loads. The required measures with these loads and conditions have to be determined individually in each case.

According to DIN 55634: 2010-04, tables A.1 and A.2, the following "expected duration of protection" is assigned in each case to RIB-ROOF system construction components:

	C2			C3			C4			C5-I			C5-M		
L = low M = medium H = high	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Alu-zinc steel sheet with alu-zinc alloy, coating thickness 25um, (System-no. A1.11)	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	
Steel sheet galvanised on both sides and coil coated, front side 25um polyester lacquer (System-no. A2.3)	✔	✔	✔	✔	✔	✔*	✔								
Steel sheet galvanised on both sides and coil coated, front side 25um PVDF lacquer, (System-no. A2.14)	✔	✔	✔	✔	✔	✔	✔	✔		✔					

* For coastal areas with salt pollution not to recommend

1.5 Structural physics / load bearing structure

1.5.1 Structural physics

The topic regarding installation of load bearing structures and substructure for RIB-ROOF profiled sheets will not be covered here in detail. The following should only be mentioned:

The guidelines for the execution of metal roofs, claddings and plumber published by the Central Association for Sanitary, Heating and Air Conditioning as well as the relevant DIN- and EN-standards differentiate the so-called single-deck roof constructions with thermal insulation (known as warm roof) or without thermal insulation, respectively, from the double-deck roof construction with air cavity ventilation/ventilation (known as cold roof).

Metal roofs with air ventilation have a ventilated cavity with ventilated openings – as a rule, on eaves and ridge – in order to condensate the cold metal rear side and to be able to expel the existing amount of humidity in the cavity.

The sufficient dimension is construction-related and has to be considered when planning and executing. A mechanical ventilation is necessary with a roof construction which doesn't have a natural air lift. You might be aware of the fact that a large number of factors can negatively affect the functionality of the ventilation of a double-deck roof construction. For buildings which are in the planning phase, a single-deck construction with a vapour barrier membrane (Sd-value ≥ 100 m) without any ventilation is recommended.

Roof constructions with thermal-insulation and non-ventilation require a vapour barrier membrane for bordering and above-ground building components as well as all roof penetrations so that everything is wind-proof and vapour-proof.

When determining the U-value for the entire roof the thermal-protection-evidence, according to EnEV, for the influence of fixing constructions has to be considered. The results of calculations made by the Research Institute for Thermal Insulation ("Forschungsinstitut für Wärmeschutz e.V.") clearly show the negative effect of metal distance structures when made without thermal separation. They act as thermal bridges and, therefore, reduce the insulation of the building. It is thus recommended that distance constructions/roof structures with good U-values according to chapter 2.3 "Roof strucuture" should be used.

The guidelines of the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) recommend the installation of a vapour-diffusion-opened protective sheet on thermal insulation under certain conditions in order to protect them against humidity and secondary melt water which may occur on the rear side of profiled sheets under inclement weather conditions. We refer to a precise processing of bordering and above-ground building components.

You can dispose of the vapour-diffusion-open protective sheet if the mineral thermal insulation which lays under it is compressed about 20 mm at least.

More information you will find in chapter 2.5 "Pro/Contra diffusion-open protective sheet or rigid insulation boards".

DIN 4102
DIN 4108
DIN 4109

An important prerequisite for functionality, quality and efficiency of a building is compliance with the basic rules of building physics. You can find them e.g. in the German Industry Standards:

4102 – Fire behaviour of building materials and building components,
4108 – Thermal protection and energy economy in buildings and
4109 – Sound insulation in buildings

They have to be observed in the individual cases.

1.5.2 Load bearing structures

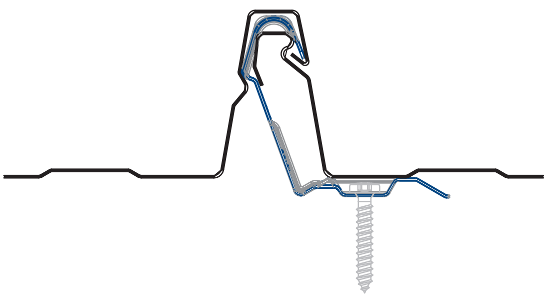
We recommend the following clips, generally made out of stain-less material, e.g. stainless steel A2 according to our General System Authorization approved by building authorities or Euro-pean Technical Authorization, for the installation on alternative or already mentioned substructures, please refer to chapter 2.3 ROOF BUILD-UPS.

Notice: according to System Authorization approved by Building Authorities no. Z-30.3-6 it may be necessary to use screws, better than A2, out of highly corrosion-resistant stainless steel material, e.g. in areas close to coasts, however depending on the distance.

Substructures

Application / substructure	Description: fixing elements	Dimension (mm)
Fastening of sliding clips on timber boarding, at least 24 mm	Self-drilling wooden screw, panhead – full thread	5.0 x 30
Fastening of the sliding clips on timber boarding, at least 30 mm	Self-drilling wooden screw, panhead – full thread	5.0 x 40
Fastening of sliding clips on wooden lathing, at least 60 x 40 mm	Self-drilling wooden screw, panhead – full thread	5.0 x 40
Fastening wooden lathing on wooden lathing	Self-drilling wooden screw, countersunk – full thread Self-drilling wooden screw, countersunk – partial thread Self-drilling wooden screw, countersunk – partial thread	5.0 x 70 5.0 x 80 (bis 120) 6.0 x 80 (bis 200)
Fastening wooden lathing on trapezoidal profiles, steel substructure 0.75 to 1.50 mm	Drilling screw, countersunk Drilling screw, countersunk	6.0 x 60 6.0 x 80 (bis 200)
Fastening of sliding clips on Z-profiles, steel structure 1.5 to 6.00 mm	Drilling screw, hexagonal head without washers	5.5 x 25
Fastening of sliding clips on steel substructure 4.0 to 12.0 mm	Drilling screw, hexagonal head without washers	5.5 x 40
Fastening Z-profile on Z-profile or trapezoidal profiles (building component II up to 2.5 mm)	Self-drilling screw with undercut, hexagonal head without washers	5.5 x 25
Fastening of clip border (penetrating rigid insulation boards) on liners, steel substructure 0.63 to 1.50 mm, or wooden substructure	Drilling screw, hexagonal head without washers	6.5 x 50 6.5 x 65 (bis 300)
Fastening of standard clips Speed 500 (only without perforation) on steel substructure 4.0 to 9.0 mm	Setting bolt by means of a setting tool according to consultancy	8.0 x 16,4
Anchoring of wooden or metal substructures on reinforced concrete	Plug system SDF	8.0 x L
Anchoring of wooden or metal substructures on aerated concrete	Plug system SDP (extraction values need to be checked in advance)	10.0 x L
Riveting of closures on profiled sheet seams	Blind rivet, big setting head 16 mm	4.8 x 10,0
Lateral riveting of fixed points	Cup blind rivet, flat round head 9.5 mm	4.8 x 8,0

Table of possible applications / substructures and necessary fixing elements; fixing elements for other substructures are available on request.



Notice: The screw tip may protrude from the timber panelling - Check individually whether this is a visual defect or whether condensation may form in the roof structure.

Only screws made of stainless material with a flat screw head on the underside approved by the building authorities are to be used (no counter-sunk screws).
In general, screw head height max. 5.5 mm;
with standard clips RIB-ROOF 465 max. 4.5 mm.

Please observe the guidelines stated in our ETAs (European Technical Assessements), chapter 4.3 Brackets (= clips): "Fastening of the brackets on the substructure is carried out with the help of the suitable joining elements specified in the European Technical Assessments and standards EN 1995." A minimum tickness of 40 mm and a minimum width of 60 mm has to be kept when using wooden lathing. The impregnated wooden lathing out of spruce/fir (according to DIN 4074-1) are dry-graded and show a wood moisture of maximum 20% without any curve (warping).
Steel or wooden load bearing structures have to be continuously installed on one level according to the IFBS assembly instructions 8.01, chapter 11.4/11.5 steel or wooden substructures. The load bearing surface of the profiled sheets has to show the same pitch as for the profiled sheets and, moreover, does not have to be penetrated by any screws, brackets, head or stopping plates/ -brackets.
Please refer to our Generel System Authorisation approved by building authorities no. Z-14.1-4, connecting elements for the combination of building elements for companies operating in the field of construction systems in light metal, applicant IFBS, chapter 3.1.1 General. "Connection elements which are exposed to entire or partial weathering or a simular impact of humidity have to consist of stainless material." Therefore, we recommend to use only screws made out of stainless material, e.g. stainless steel A2, in general.

Special spreader beam for extra long profiled sheets.

1.6 Transport of material / storage

1.6.1 Transport / Unloading

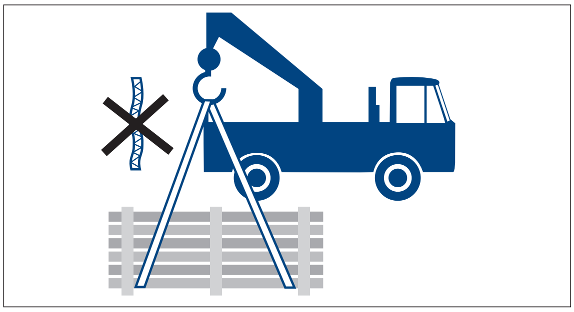
Profiled sheets are normally transported by truck without crane. The access to the desired destination must be guaranteed.
The material has to be checked for completeness and damage immediately after having been delivered. The consignments are marked with: **name of factory – description of profiled sheets – ETA number of authorisation – CE marking.**

If there are any complaints, they have to be written down on the delivery note and our factory has to be informed immediately.

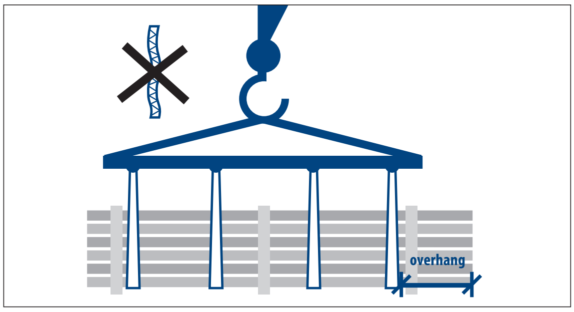
The profiled sheets which are packed as bundles (bundle weight max. 1.5 t) have to be unloaded with suitable lifting machines (crane or fork-lift truck). Please also pay attention to the punctual provision of a crane or fork-lift truck after having been informed about the delivery date.
The delivery is generally effected without any provision of a crane or a fork-lift.

A spreader beam for sheets lengths up to 30 m, incl. fixed crane hook without any belts, net weight 980 kg, plus usefull load max. 1500 kg, will be provided, upon request, in a half-finished and pre-assembled condition. Further special spreader beams are available upon request.

When using cranes, the unloading should be realized with belts. The edges of the profiled sheets have to be protected against mechanical damage.
We recommend to use **spreader beams** with sheetlengths of more than 12 m made out of aluminum, copper and zinc and with lengths of more than 18 m made out of steel sheet. Overhangs of more than 4.50 m with aluminum and steel or of more than 2.0 m with copper and titanium-zinc respectively have to be avoided.
The deposing and storing of profiled sheets on a roof requires the consideration of the load bearing capacity of the substructure. The profiled sheets have to be secured against taking off and sliding.



Unloading with crane end carriage: wide belts (at least 10 cm wide) protect the profiled sheets against mechanical load and damage.

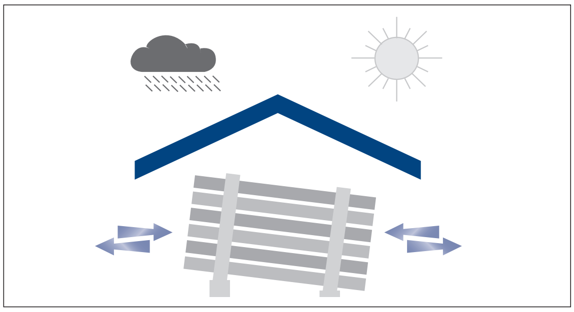


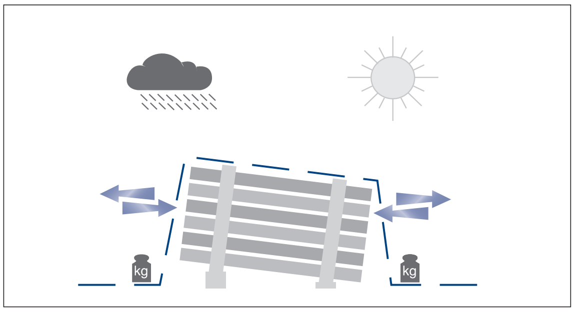
Overhang max. 4.50 m or 2.00 m with copper and titanium-zinc respectively.

1.6.2 Storage

If the profiled sheets/ flashings are not installed immediately, ensure proper weather protection. The storage must be at an incline in the profile/longitudinal direction to allow rain and secondary condensation to drain away.

Covering with tarpaulins must be windproof and provide sufficient ventilation.
To prevent secondary condensation, the packaging film must be removed from edge parts.





Surface discolouration due to white rust or well blackening is the result of improper storage of the materials after delivery, for which we as the manufacturer accept no liability and will reject any claim.

1.6.3 Profiling on site/mobile rollforming

The production of profiled sheets with lengths of more than 33 m is possible on site with our mobile rollforming machines.

Watch our film on this subject:
http://mobile-rollforming.zambelli.com

The "Instructions for the use of mobile curving/roll forming machine on site" apply in addition to our General Terms and Conditions, each available on https://www.zambelli.de/en/gtc.html.

1.7 Material processing

1.7.1 Dividing and cutting

The RIB-ROOF elements are divided and cut by means of suitable shears, plate shears, compass and circular saws with hard-metal blades. Cutting discs have to be avoided, as the arising flying sparks may damage the surface which, in turn, can lead to corrosion damage.

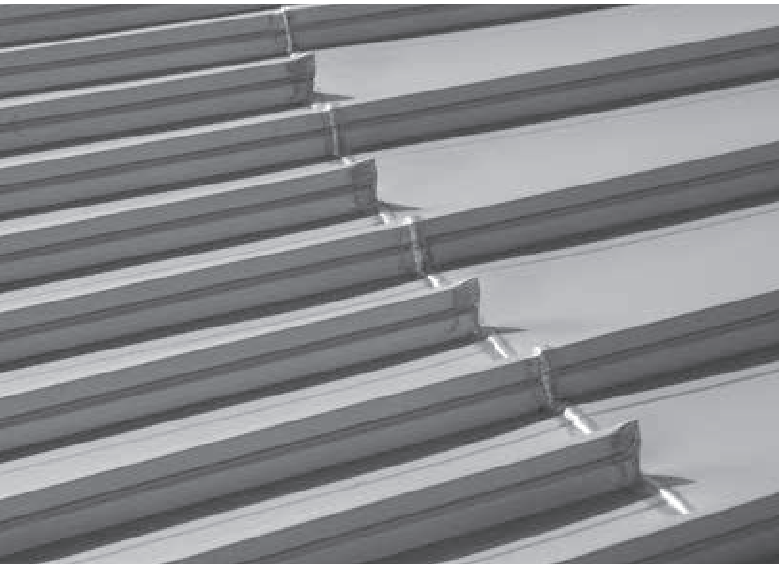
- Corrosion-protected materials (steel sheet with alu-zinc alloy or galvanised and colour-coated respectively) require further treatments of the cutting edges.
- Drilling chips and chip cuttings have to be removed immediately of the surface since they could also damage the material.
- You have to pay attention to the different materials when bending coil material out of RIB-ROOF raw material. The table on the right-hand-side shows the smallest possible bending radii of the metals.
- Markings shouldn't be made with sharp objects; therefore, we recommend the use of soft pencils.

Bending radii for flashings out of RIB-ROOF raw material
You have to pay attention to the different material qualities when bending coil material (bending on a bending bank) out of RIB-ROOF raw material. The table shows the smallest possible bending radii in which the material aluminium shows a minimum bending radii of 3.00 x material thickness t in mm with a working temperature of 20°C.

Material	Minimum bending radii
Aluminium, t = 0.70 mm	2.10 mm
Aluminium, t = 0.80 mm	2.40 mm
Aluminium, t = 0.90 mm	2.70 mm
Aluminium, t = 1.00 mm	3.00 mm
Steel sheet	2.50 mm
Titanium-zinc	1.75 mm
Copper	1.75 mm

Table of smallest possible bending radii of different metals

Maintenance advice
The metal surfaces should be cleaned with cleaning agents which are bio-degradable and environmentally-friendly, but not aggressive. Rinsing with cold water is generally necessary.
The removing of damage to paintworks has to be done with the greatest possible care. We can deliver our standard lacquers according to Zambelli's colour chart upon request. Please note that they could slightly differ in shade. Damage on zinc-alloys can only be treated after having consulted to the producer.



Transversal joint at roof with a segment of a circle with tapered profiled sheets

Welded-in dome light with dilatation band; lightning protection bracket

1.7.2 Fastening technology / welding / soldering

You have to pay attention to the different materials when connecting metals (please refer to chapter 1.3).
The lacquer of colour-coated aluminium has to be removed before welding and soldering. You have to lacquer the blank surface with the appropriate lacquer after having finished working. The fastening technologies are described in detail in the instructions of the material producers of aluminium, steel sheet, titanium-zinc and copper. Upon request, we will suggest you specialised RIB-ROOF welders. The substructure has to be covered with suitable fire prevention mats and all statutory provisions have to be adhered to prior to carrying out any welding works.

1.7.3 Adhesive bonding

A possible alternative is adhesive bonding of metals according to the explanatory leaflet "Adhesive Bonding in Plumbing" published by the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) in 53757 St. Augustin, Germany. Single-component polyurethane adhesives are normally used in plumbing.

1.8 Minimum roof pitch according to ETA

When using profiled sheets as water-bearing exterior shells of roofs, the following minimum roof pitches have to be adhered to:

Minimum roof pitch of 1.5° (2.6 %) for roofs without transverse joints. The necessary minimum roof pitch raises for roofs with transverse joints and / or penetrations (e.g. dome lights) of 2.9° (5 %).

Roof penetrations:
The increase of the minimum roof pitch which is requested with roof penetrations, e.g. dome lights is not necessary when:

1. Completely welded soakers for sealing are used.
2. The soakers for sealing will be welded with the upper roof shell of the profiled sheets so that an absolute leak-tightness can be reached.
3. Qualifying evidence according to the guideline for welding of supporting building components out of aluminium – edition October 1986 – published by the German Institute for Building Technology with an extended scope of application for building components of less than 1.5 mm thickness was established for welding profiled sheets together or for welding on profiled sheets.

The requirement of a minimum roof pitch for curved roofs is dropped (locally limited) if the roof elements in areas of roof pitches ≤ 2.9° (5 %) are arranged in such a way that they go continously through or are welded at the ridge side.

2.1 The RIB-ROOF principle

#1:
Reliable and precise adjustment

With all the RIB-ROOF metal roof systems, **the profiled sheet seams and the clips** form a **construction unit**. The clip head corresponds exactly with the inner shape of the profiled sheet seam. The clip and seam heights match perfectly with one another . Since all the elements are manufactured for a precise fit, no further adjustment work, such as e.g. zipping, is necessary at the construction site.

#2:
Securely fastened

The assembly system for all the RIB-ROOF metal roof systems has been optimised, so that the roof covering can be executed in the shortest possible time and with the least possible effort. **The direct installation of the profiled sheets** and the clips ensures a smooth assembly procedure for all the systems. Due to connection of RIB-ROOF profiled sheets with the **RIB-ROOF sliding seams**, mechanical zipping is no longer necessary.

#3:
Customizable

Development of the RIB-ROOF metal roof systems is based on a permanent questioning of the system efficiency. This repetitive process has resulted in an **individually adjustable roof covering**. All technical components can be adapted to the project requirements. Different profiled sheet shapes, customized fastening clips and a range of accessories to complement the functions result **in a homogeneous metal roof** to coincide with the construction task.

2.2 Benefit from a system

Simple installation technology
Setting, swivelling, clicking. RIB-ROOF metal roofing systems provide you with a fast, simplified and, especially, uncomplicated way to carry out the installation. As such, the principles behind the RIB-ROOF form the basis for a roof where long-term functionality is ensured.

The innovative fixing systems
RIB-ROOF is a sliding standing seam roofing. The RIB-ROOF Principles are based on improvements to the way the roof cladding is fixed. This is because the fixing systems are developed in such a way that no tensions arise through wind load or dilatation that is a consequence of temperature-related conditions. Good sliding qualities ensure long-term functional security.

The crucial saving in terms of time
With very short construction times, the optimisation of costs and deadlines plays an important role. RIB-ROOF metal roofing systems allow for intuitive laying. This way, the installation is carried out rapidly in one pass. This brings the added bonus of an unbeatable saving in terms of time. As such, in the business of constructing commercial buildings, the laying of a RIB-ROOF roof within a few hours is no longer the exception, but the rule.

An objective view
Economic efficiency is always relative to cost and useful life. RIB-ROOF metal roofing systems stand for advanced technology which simplifies planning and installation. As a result, this approach provides a functionally durable roof. This means less costs and more benefit from a long service life. A calculation that always works in your favour.

Accessible and self-supporting
Therefore, suitable for all standard fields of application on purlins or on fully-bonded surfaces from single-deck rear-ventilated cold roof to thermally-insulated non-ventilated roof structure.

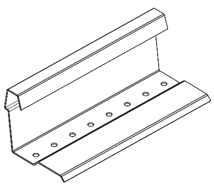
Permanently rain-proof
As a result of a penetration- and transversal-seam-free installation of the profiled sheets and penetration-free installation of the accessories on the profiled sheet seam.

Sustainability
RIB-ROOF sliding standing seam roofs form sustainable constructions and also stand for a cost-efficient roofing systems with aesthetic demands. High quality, durability, easy maintenance and recycling form the basis for a sustainable roofing system. Metal as a construction material and the system advantages provide for the highest safety against forces of nature and fire. Integral considerations of the sum of investigation and maintenance costs show that this method of building isn't only durable but also extremely economic. For more information about sustainability please refer to the IFBS-brochure "Standing seam roofing. The sustainable method of building."

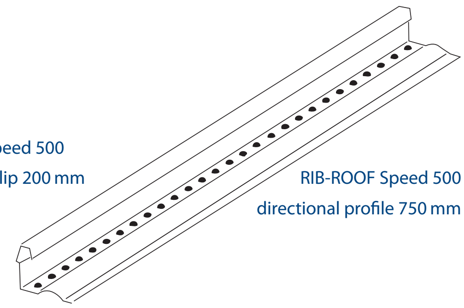
Wide range of different constructions
RIB-ROOF profiled sheets are available straight, conical, curved or conical curved. For sheet lengths of more than 33 m, the profiled sheets will be profiled and curved on site, upon request. Apart from the standard widths, we are also prepared to produce project-related measurements.

Perfect system accessories
The complete range of pre-assembled accessories allows for a flexible, efficient planning and for a quick, precise installation. Other accessories, such as fall arrest systems, snow guard elements, tread supports and solar brackets, are installed perforation-free on the seams of the profiled sheets. Please observe that we can only grant a guarantee if our system-own components are used together with our RIB-ROOF profiled sheets.

RIB-ROOF Speed 500
standard clip



RIB-ROOF Speed 500
directional clip 200 mm



RIB-ROOF Speed 500
directional profile 750 mm

2.3 Roof build-ups

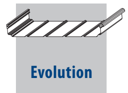
For the metal roofing system RIB-ROOF all common substructures for warm and cold roofs are possible as roof build-ups: Trapezoidal profiles, wooden purlins, timber boarding (t = minimum 24 mm), steel purlins, aerated concrete or reinforced concrete.

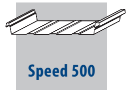
Notice RIB-ROOF Evolution: To avoid visual impact or permanent deformation, installation on a pressure-resistant substrate is preferable.

2.3.1 Warm roofs

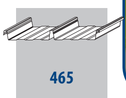
Wooden counter/- transverse lathing

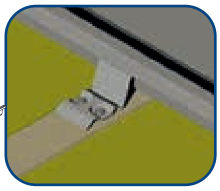
U-value 0.204 W/m²K
with insulation layer, thk = 180 mm,
thermal conductivity value 0.035W/m²K
refer to FIW calculations, construction 1



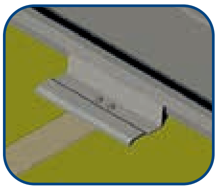


also available for

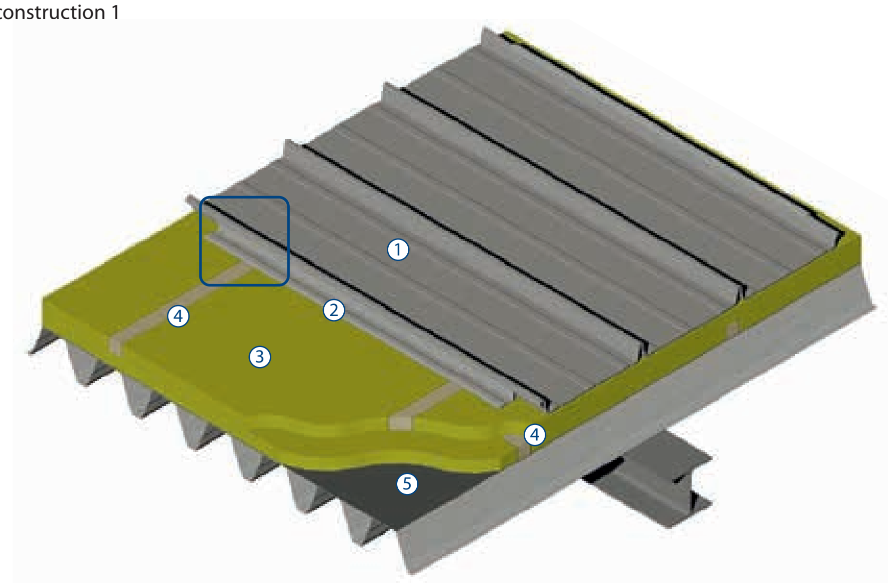




alternatively with standard clip

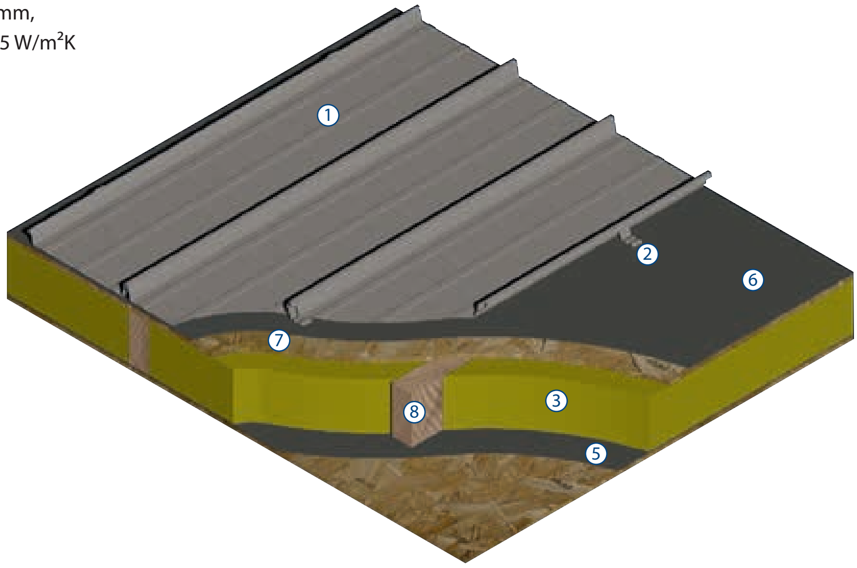


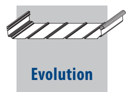
alternatively with directional clip

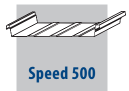


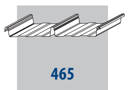
Timber boarding

U-value < 0.204 W/m²K
with insulation layer, thk = 180 mm,
thermal conductivity value 0.035 W/m²K









1 RIB-ROOF profiled sheets
2 Standard clip / directional clip / directional profile
3 Insulation
4 Wooden counter/-transverse lathing (double-layer) at a distance of 1.19 m
5 Vapour barrier membrane
6 High-diffusion-open protective sheet
7 Timber boarding minimum 24 mm
8 Wooden lathing / purlin (single-layer)

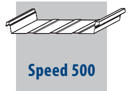
Installation on fully-inserted supports with clip border
RIB-ROOF Speed 500 can alternatively be installed on fully-inserted supports. Another alternative besides timber boarding is the rigid insulation boards which are also resistant to pressure (application type WD).

As desired, the profiled sheets can be installed on directional profiles which correspond to the thickness of a thermal insulation, or on clip border universal – which are fastened to the roof structure.

Open butt joints have to be avoided when installing insulation panels. This design is also transferable to RIB-ROOF 465 when using the so-called pressure-distributing profiles.

Roof build-ups with clip border universal

U-value 0.208 W/m²K
with rigid insulation layer, thk = 180 mm, thermal conductivity value 0.037 W/m²K
refer to FIW calculations, construction 2a



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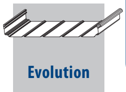
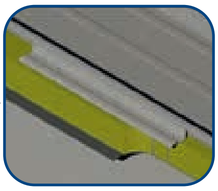
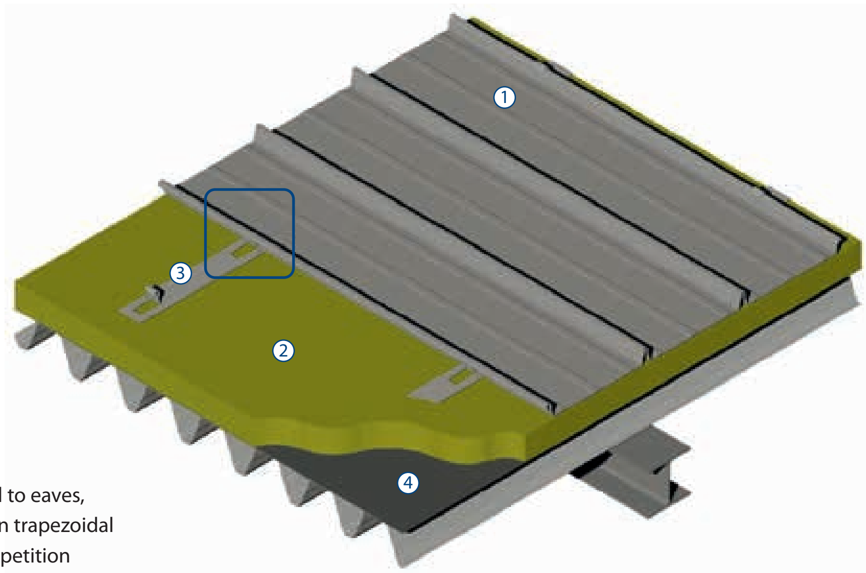




alternatively with directional profile

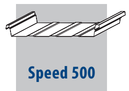


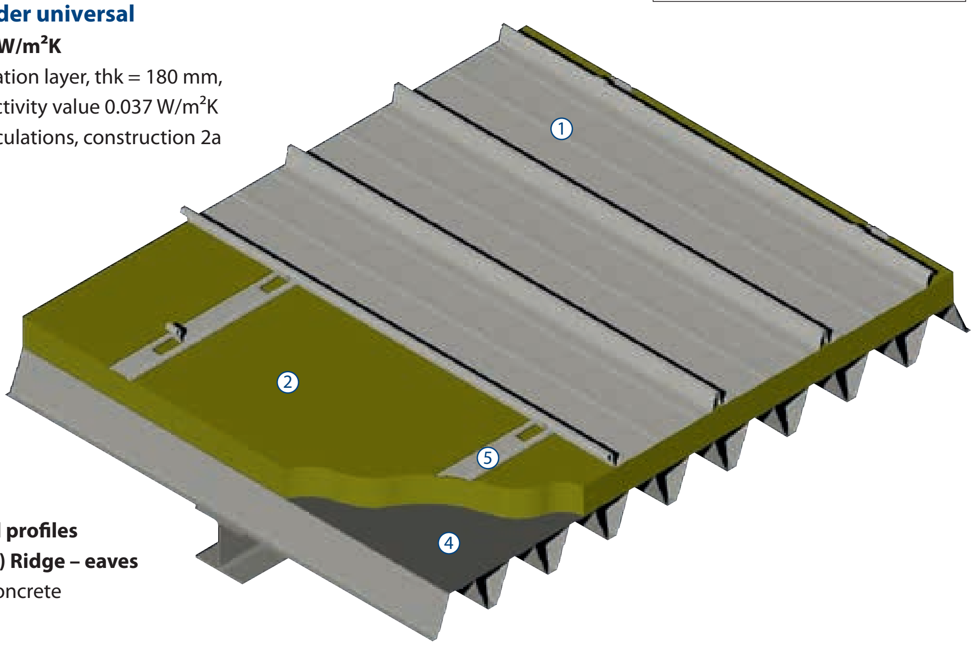
On trapezoidal profiles, parallel to eaves, or alternatively ridge – eaves on trapezoidal profiles (only with top chord repetition every 125, 250 or 500 mm)

A regular offsetting of the clip border universal can be necessary due to statical reasons.

Roof build-ups with clip border universal

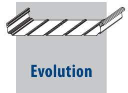
U-value 0.208 W/m²K
with rigid insulation layer, thk = 180 mm, thermal conductivity value 0.037 W/m²K
refer to FIW calculations, construction 2a

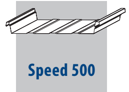




On trapezoidal profiles (any geometry) Ridge – eaves
or on aerated concrete

1 RIB-ROOF profiled sheets
2 Rigid insulation layer
3 Flat clip border at a distance of 1.8 m
4 Vapour barrier membrane
5 Clip border universal at a distance of 1.8 m

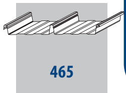


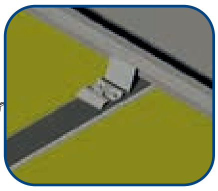


Double-layer of Z-profiles with one thermal separation strip on each Z-profile

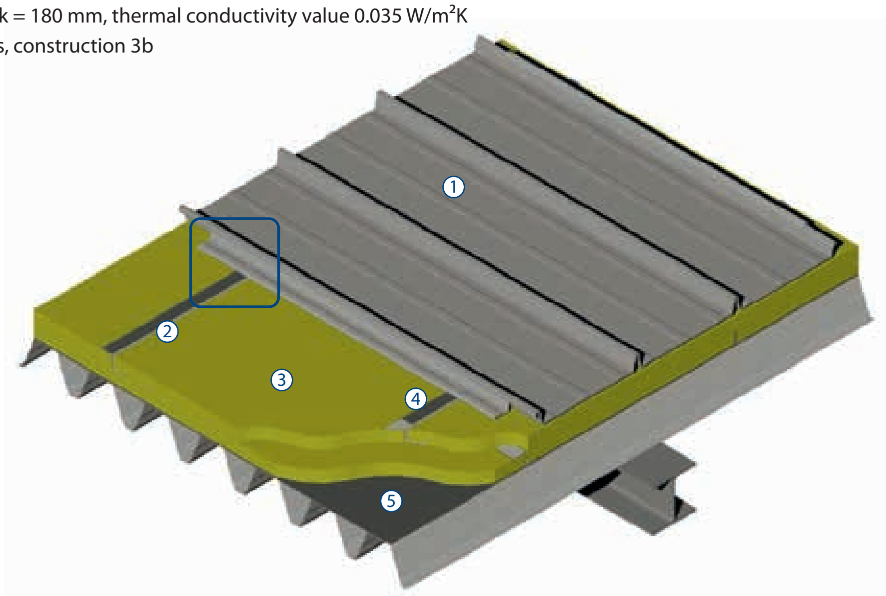
- **at a distance of 1.8 m U-value 0.216 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 3a
- **at a distance of 1.2 m U-value 0.240 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 3b

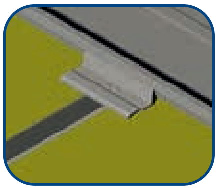
also available for



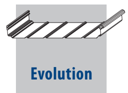


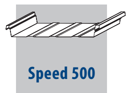
alternatively with standard clip





alternatively with directional clip

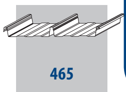


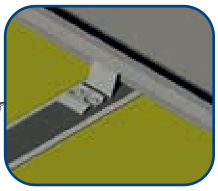


Single-layer of Z-profiles with two thermal separation strips

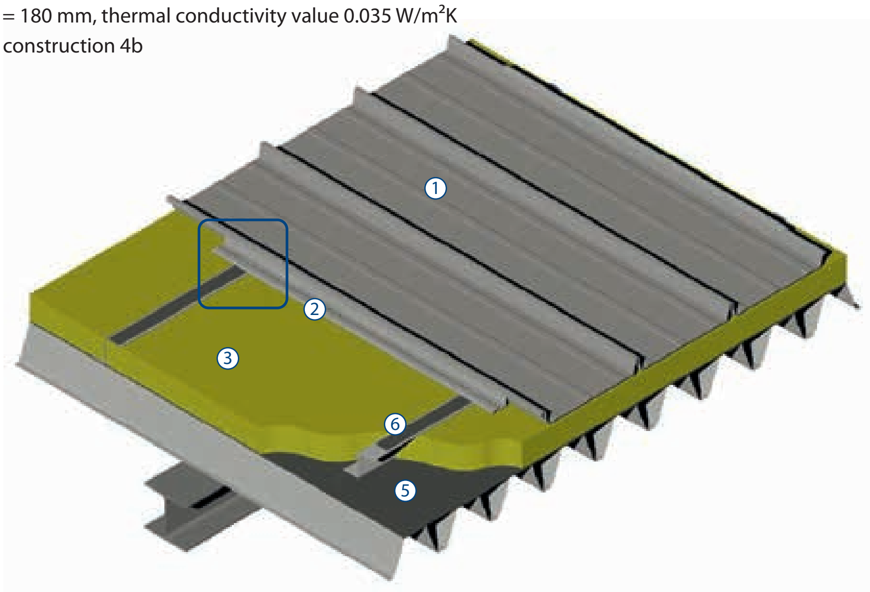
- **at a distance of 1.8 m U-value 0.271 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 4a
- **at a distance of 1.2 m U-value 0.314 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 4b

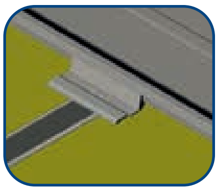
also available for





alternatively with standard clip

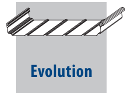


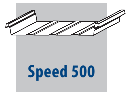


alternatively with directional clip

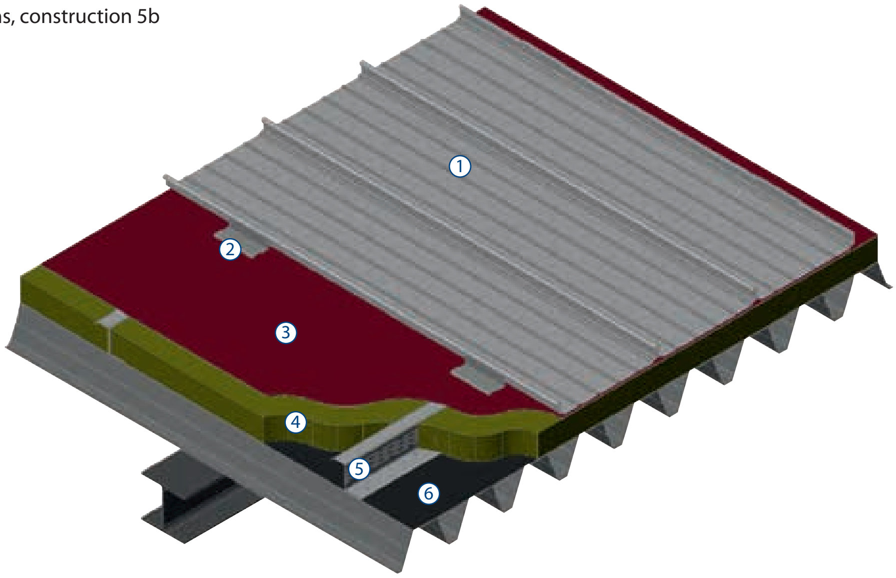
1. RIB-ROOF profiled sheets
2. Directional profile
3. Insulation layer
4. Double-layer of Z-profiles with thermal separation strips on each Z-profile
5. Vapour barrier membrane
6. Single-layer of Z-profile with two thermal separation strips

Thermo-Z spacer profile, single layer, installation at 90° without thermal separating strips on the Z-profile

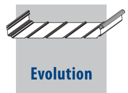


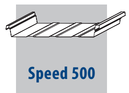


- **at a distance of 1.8 m U-value 0.208 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 5a
- **at a distance of 1.2 m U-value 0.220 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 5b

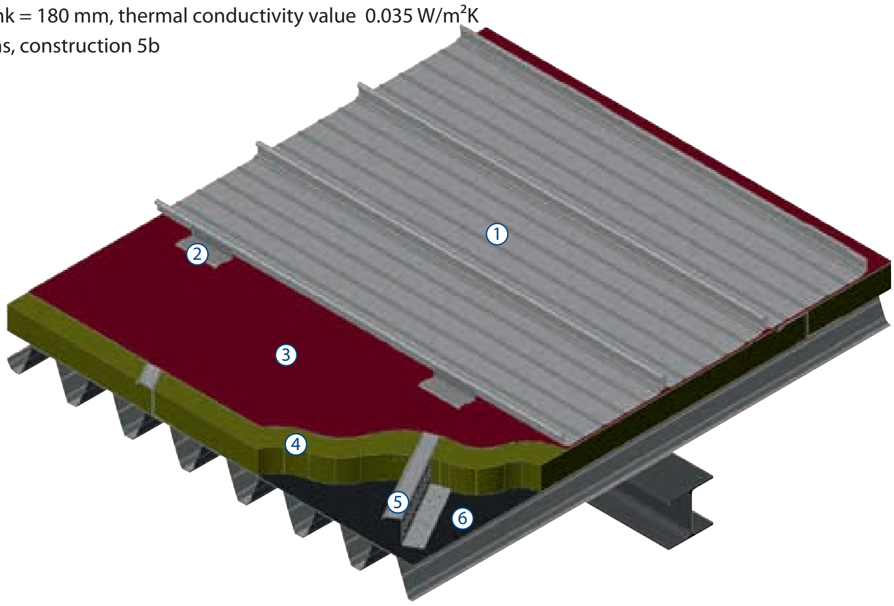


Thermo-Z spacer profile, single layer, installation at 45° without thermal separating strips on the Z-profile



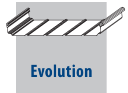


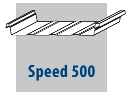
- **at a distance of 1.8 m U-value 0.208 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 5a
- **at a distance of 1,2 m U-value 0.228 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 5b



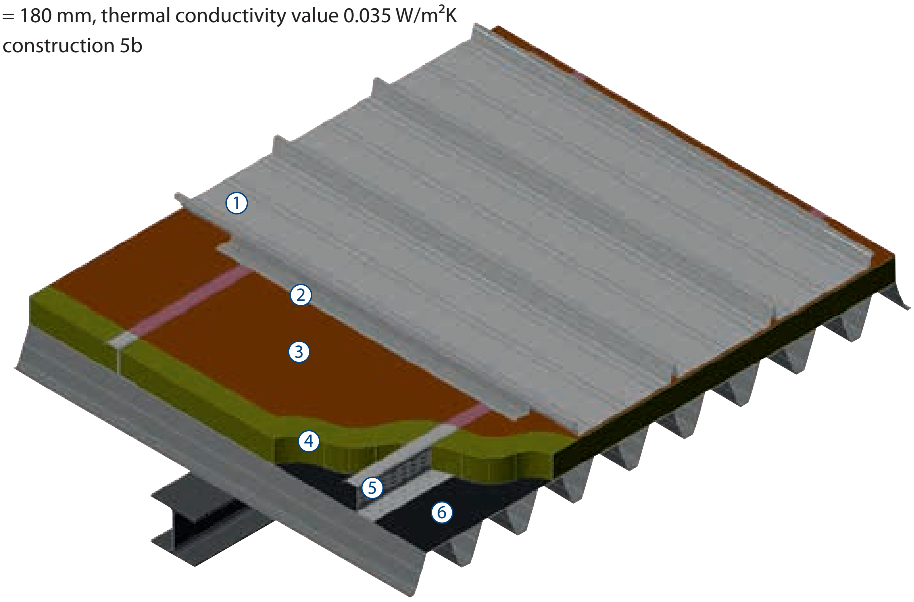
1. RIB-ROOF Evolution
2. Directional clip (optionally: turned directional clip)
3. High diffusion protective sheet (optional)
4. Insulation
5. Thermo-Z spacer profile (single layer), without thermal separating strips
6. Vapour barrier membrane

Thermo-Z spacer profile, single layer, installation at 90° without thermal separating strips on the Z-profile

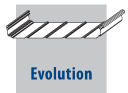


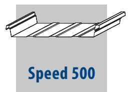


- **at a distance of 1.8 m U-value 0.208 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 5a
- **at a distance of 1.2 m U-value 0.220 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 5b

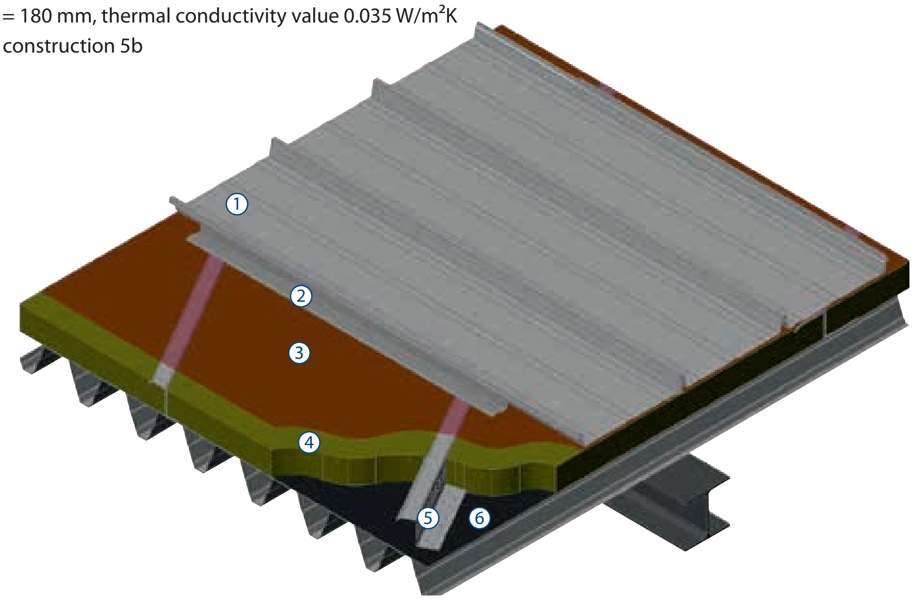


Thermo-Z spacer profile, single layer, installation at 45° without thermal separating strips on the Z-profile





- **at a distance of 1.8 m U-value 0.208 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 5a
- **at a distance of 1.2 m U-value 0.220 W/m²K**
  with insulation layer, thk = 180 mm, thermal conductivity value 0.035 W/m²K
  refer to FIW calculations, construction 5b



1 RIB-ROOF Speed 500
2 Directional profile (optionally: turned directional profile)
3 High diffusion protective sheet (optional)
4 Insulation
5 Thermo-Z spacer profile (single layer), without thermal separating strips
6 Vapour barrier membrane

Description of construction	Thermal insulation thickness (mm)	RIB-ROOF with standard clips/ directional clips 200/ directional profile 1500 on double-layer wooden substructure; construction 1[1]	RIB-ROOF with clip border/ directional profile 750 on rigid insulation boards; construction 2a	RIB-ROOF with standard clips/ directional clips 200 on double-layer Z-profiles with two thermal separation strips; construction 3a/b		RIB-ROOF with standard clips/ directional clips 200 on single-layer Z-profiles with two thermal separation strips; construction 4a/b		to recommend: one layer Thermo-Z spacer profile without thermal separating strips. costructions 5a/b	
Distance (m)		B = 1.19	B = 1.80	B = 1.80	B = 1.20	B = 1.80	B = 1.20	B = 1.80	B = 1.20
Heat transition coefficient in **undisturbed areas** in W/ (m^2 x K)	120	0.280	0.291	0.269	0.269	0.269	0.269	0.280	0.280
	140	0.245	0.257	0.239	0.239	0.239	0.239	0.242	0.242
	160	0.214	0.228	0.212	0.212	0.212	0.212	0.212	0.212
	180	0.189	0.202	0.188	0.188	0.188	0.188	0.189	0.189
	200	0.170	0.180	0.168	0.168	0.168	0.168	0.171	0.171
	220	0.156	0.161	0.151	0.151	0.151	0.151	0.156	0.156
	240	0.143	0.146	0.137	0.137	0.137	0.137	0.143	0.143
	260	0.132	0.134	0.126	0.126	0.126	0.126	0.132	0.132
	280	0.123	0.126	0.119	0.119	0.119	0.119	0.123	0.123
	300	0.115	0.122	0.114	0.114	0.114	0.114	0.115	0.115
Heat transition coefficient **incl. thermal bridges** in W/ (m^2 x K)	120	0.302	0.296	0.302	0.328	0.363	0.410	0.310	0.330
	140	0.264	0.262	0.271	0.296	0.329	0.375	0.267	0.284
	160	0.231	0.232	0.243	0.268	0.300	0.344	0.237	0.253
	180	0.204	0.206	0.219	0.243	0.273	0.316	0.213	0.228
	200	0.183	0.183	0.198	0.221	0.250	0.291	0.192	0.204
	220	0.168	0.164	0.180	0.203	0.230	0.270	0.175	0.186
	240	0.158	0.149	0.165	0.188	0.214	0.253	0.163	0.174
	260	0.146	0.137	0.154	0.176	0.201	0.238	0.153	0.164
	280	0.136	0.129	0.146	0.167	0.191	0.227	0.144	0.156
	300	0.127	0.124	0.141	0.162	0.184	0.219	0.137	0.148

Source of information: FIW-report B3.2-2020/01 of 17 January 2020: each value with thermal insulation WLG 035 (exception: rigid thermal insulation in construction 2a is WLG 037)

1) Calculation according to DIN EN ISO 6946

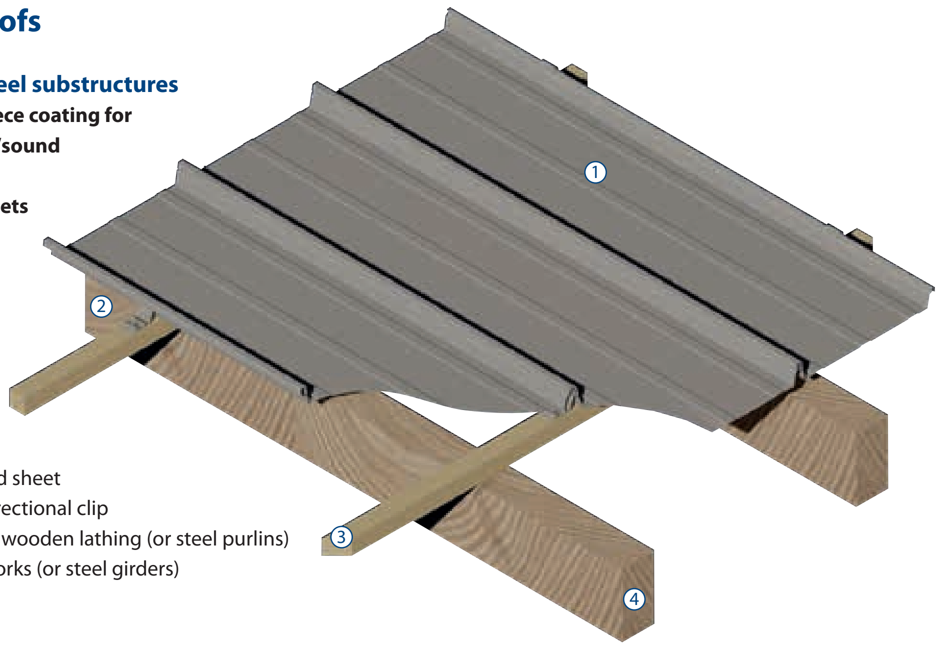
Energy saving costs by means of wooden lathing

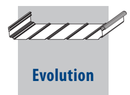
With distance constructions out of wooden lathing, you can annually save approx. 1400 euros per 1000 m2 roof area in comparison to constructions with metal Z-profiles without thermal separation strips according to an investigation report of FIW of 17 January 2020 (calculation with DIN EN ISO 6946, values with thermal insulation 180 mm and WLG 035). The energy saving costs amount to 540 Euros per year for the same area in comparison to metal clips which penetrate thermal insulation.

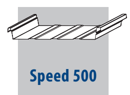
2.3.2 Cold roofs

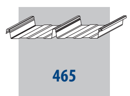
On wooden or steel substructures

optionally with fleece coating for anti-condensation/sound absorption on rear side of profiled sheets









① RIB-ROOF profiled sheet
② Standard clip / directional clip
③ Wooden purlins / wooden lathing (or steel purlins)
④ Wooden frameworks (or steel girders)

2.4. Pro / contra diffusion-open protective sheet or compressed thermal insulation

ZVSHK leaflet "Ventilated and non-ventilated metal roofs made of industrial pre-assembled lock seam profiles"

You generally have the possibility with RIB-ROOF metal roofing systems of installing not only a diffusion-open protective sheet but also a compressed thermal insulation. As you can gather from the ZVSHK leaflet "Ventilated and non-ventilated metal roofs out of industrial pre-assembled lock seam profiles", the ZVHSK (Central Association for Sanitary, Heating and Air Conditioning) recommends both types of construction. In individual cases, you can weigh up the pro and contras of the two variants and discuss these with project owners and architects. Out of economic reasons, the design with compressed thermal insulation has also proved its worth apart from a diffusion-open protective sheet which has been tried and tested for over three decades.

Pro / contra diffusion-open protective sheet

Pro

- Melt water diversion to the eaves on the protective membrane laid over the entire roof surface with glued joints, even in case of backwater due to extreme ice/snow situations at the eaves

Contra

- Highest request to laying personnel in order to avoid eventual puddle formation
- Costs

Pro / contra compressed thermal insulation

Pro

- Less air space which results in minimized formation of condensation
- Improved sound protection: especially when building houses
  → recommendation for increased sound-proofing (have a look at next page)

Contra

- Water flow can be inhibited with extreme ice/snow situation on eaves which may result in soaking of the thermal insulation (solution: use of a protective sheet with a width of at least 3 m parallel to eaves and additional snow guard rows should be installed according to manual guide chapter 4.11)

Note: The project owner has to provide for the water flowing off in extreme snow and ice conditions so that it won't stay on the roof.

Your responsible area manager will be at your disposal if you have more questions on this subject.

Further advantages of our metal roofing system RIB-ROOF in accordance with diffusion-open sheet or compressed thermal insulation:

1. Possibility when using a protective sheet

Especially with the metal roofing system RIB-ROOF you have the **practical choice of installing** a diffusion-open protective sheet on mineral wool because of the geometry of our sliding clips. Since RIB-ROOF clips are fastened **from above through the protective sheet** into the substructure and, therefore, the protective sheet doesn't have to be penetrated below the pre-assembled clips by tearing the foil.

2. Best U-values for warm roofs

With a distance construction made out of wooden counter- and transverse lathing in an installation-friendly distance of 1.19 m in normal range and with intervening mineral wool insulation you can achieve the best values for warm roofs (with vapour barrier membrane Sd-value > 100 m). Good achieved U-values, in comparison to metal distance constructions, can be found in an investigate report published by the Research Institute for Thermal Insulation in Munich ("Forschungsinstitut fuer Waermeschutz e.V." - FIW), (refer to the table on page 23)
In order to reach the same U-value with metal distance constructions with Z-profiles or with "high" system clips, an appropriate increase in thermal insulation thickness is required (costs)!

3. High diffusion ability for RIB-ROOF sliding standing seam roofing

RIB-ROOF sliding standing seam roofing is more diffusion-open than mechanically zipped systems or conventional angle or double standing seam roofing. The following mean Sd-values are stated in the corresponding investigation "Determining of water permeability" carried out by the FIW-Institute in Munich incorporated association:

- with **RIB-ROOF Evolution** mean Sd-value of 8.0 m with aluminium 0.80 mm
- with **RIB-ROOF Speed 500** middle Sd-value of 12.8 m with aluminium 0.70 mm
- with **RIB-ROOF 465** middle Sd-value of 25.7 with aluminium 0.90 mm
- compared to: mechanically zipped system middle Sd-value of 30.6 with aluminium 0.90 mm

Moreover, the FIW investigation report C3.3-2015/08 specifies: "In practice, a direct wind flow on a roof surface can lead to an additional air exchange over the seam joints. Besides, depending on the installation conditions, **an additional air exchange takes place in the seam cavities of the RIB-ROOF profiled sheets** or between insulation or protective sheets and RIB-ROOF profiled sheets."

General advice for warm roof construction without ventilation:

- According to DIN 4108 / part 3 (11-2014) with vapour barrier membranes (Sd-value > 100m) airtight and vapour-proof, nonventilated warm roofs do not require any arithmetical evidence if there is neither wood nor wood-based material above the diffusion-resistant layer

- Wooden substructures of wooden lathing/timber formwork, on which our RIB-ROOF sliding clips are mounted, are considered as "non-load-bearing components" in the sense of transfer load.
  The use of the DIN 68800-2 for "non-load bearing components" is just a recommendation and since the aspects of constructive wood preservation are regulated in the DIN 68800-2 according to DN 4108-3, chapter 5.3.1, an additional verification according to DIN 4108-3 for wood materials is only considered as a recommendation as well.Nonetheless, the issued FIW-investigation report C3.3-2015/08, dated 26th November 2015, additionally confirms that non-ventilated RIB-ROOF roof structures of which the wood or wood materials are above the diffusion-resistant layer, Sd-value ≥ 100 m, and are hydrothermal functional in the long run, if, however, the q50-values, calculated on the basis of the WUFI-simulation method, of the proposed air permeability, according to DIN 4108-7 (01-2011) are adhered to.

2.5 Recommendation for higher soundproofing, e.g. when building houses

In the leaflet "Sound insulation with metal roof constructions", dated May 2006, published by the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) in 53757 St. Augustin, Germany, the following instructions shall be observed:
General

Sound insulation according to DIN 4109

If the building owner desires a higher sound insulation than the general compulsory standards, indicated in the DIN 4109:1989-11 1, the characteristic values, to be taken from the supplement 2 in DIN 419:1989-11 (higher sound insulation), could be used for planning. If a higher sound insulation is desired by the residents or it shall be extended to walls and ceilings within the living area (e.g. single-family house) or on an administration building, separate agreements have to be considered. Such increased insulation values shall contractually be agreed upon between all parties (building owner, architect, trade).

Planning and implementation instructions

When choosing appropriate insulation, a porous and sound absorbent insulation material has to be used in general. A greater bulk density has a positive impact on the sound insulation.
Please ensure that the covering and substructure preferably needs to be acoustically decoupled (e.g. GKB on spring strip).
Verified constructions have to be used when decoupling lightweight roof construction out of wooden profiles and trapezoidal profiles!
Coverings for ceilings have to be decoupled springy. Wherever it is necessary and possible, the surface weight of the entire construction can be increased by integrating heavy construction boards.
In order to avoid flanking transmission, all connections to apartment and townhouse walls need to be acoustically decoupled.
Pipe openings are to be formed non-rigid.
Sound insulation regulations are to be considered when installing windows/dome lights! Please take care of dense installation!

However, one of the most important execution principles is to avoid cavities!

Cambered, only in longitudinal area overlying metal profiled sheets operate strongly acoustically. Cavities form soundboards beneath the covering, which strengthen the acoustic noise during rain and hail.
The best (object-) sound insulation is achieved in direct contact with the roofing material, on the entire profiled sheet width, and the substructure (shuttering or insulating material). This factor can be led back that the fully supported light roofing material is connected to the substructure.
In the "Guidelines for Execution of Plumber Works on Roofs and Facades" (plumber guidelines), dated 11/2009, published by the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) in 53757 St. Augustin, Germany, the following planning instructions as mentioned under point 1.1 planning and working in advance: "In order to reduce beat and temperature-related creaking noise, appropriate safety measures already have to be taken into consideration when planning".

From our own experience, we recommend **RIB-ROOF Evolution or RIB-ROOF Speed 500 out of aluminium, as a warm roof with higher sound insulation without any cavity (also without any rear ventilation)** for the installation of a metal roof with higher sound insulation requirements, e.g. when building houses.

Please see the following installation alternatives:

- Either on compressed thermal insulation between the distance construction out of wood or steel.
- or as a RIB-ROOF acoustic roof on the timber boarding with structured separation layers, profiled sheets with acoustic fleece coating on the rear side fastened with standard clips.
- or on a slightly compressed acoustics insulation plate (delivery thickness 15 mm with higher ability of pressing it together) on timber boarding (minimum 24 mm with high diffusion-open protective sheet) laid between standard clips of profiled sheets.

Additional installation instructions with sound-sensitive projects:

- please observe that the profiled sheets' construction width necessarily has to be adhered in order to avoid sound-producing stresses caused by pressed or wrenched profiled sheets
- ridge and verge coverings as well as roof penetrations must not be installed rigidly
- all accessories, e.g. snow guard and solar bracket, have to be installed at a certain distance from the underlying clip in order to avoid tension
- fixed-points have to be installed at a distance of approx. 1/3 of the profiled sheet length beneath the ridge, in order to reduce the max. length expansion
- substructures, e.g. wooden lathing / timber boarding, are to be fixed sustainably with suitable approved wooden screws. It is absolutely prohibited fixing by means of nails. However, if it involves preliminary work on site, a correct fastening necessarily has to be verified, as the substructure eventually creates tension

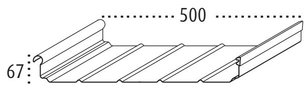
2.6 Delivery program

RIB-ROOF Evolution

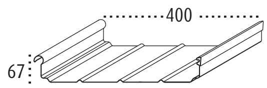
Standard construction width = 500 mm; special construction widths of profiled sheet possible!

straight | tapered | convex curved | concave curved | tapered convex curved | tapered concave curved

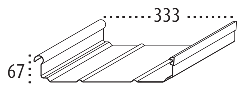
Profiled sheet standard construction width 500 mm



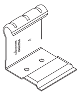
Special construction width of profiled sheet 400 mm



Special construction width of profiled sheet 333 mm

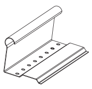


Standard clip



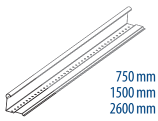
70 mm

Directional clip

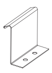


200 mm

Directional profile

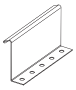


Turned clip



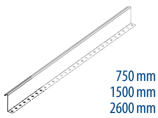
70 mm

Turned directional clip



200 mm

Turned directional profile

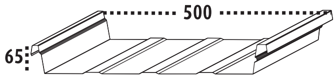


RIB-ROOF Speed 500

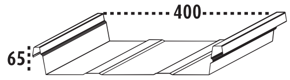
Standard construction width = 500 mm; special construction widths of profiled sheet possible!

straight | tapered | convex curved | concave curved | tapered convex curved | tapered concave curved

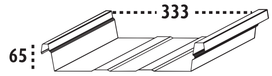
Profiled sheet standard construction width 500 mm



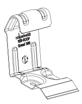
Special construction width of profiled sheet 400 mm



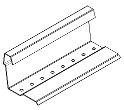
Special construction width of profiled sheet 333 mm



Standard clip

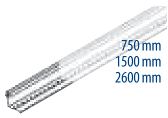


Directional clip

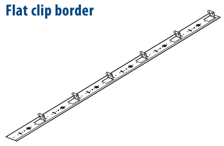


200 mm

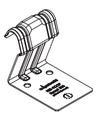
Directional profile



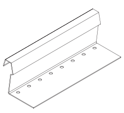
Flat clip border



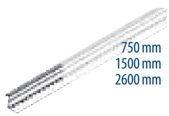
Turned clip



Turned directional clip

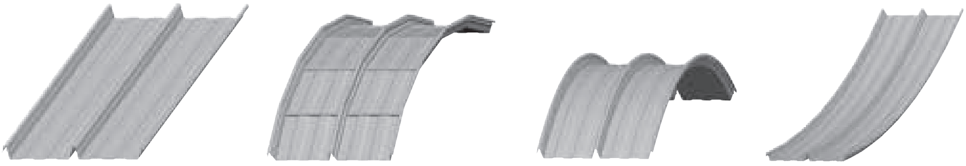


Turned directional profile



RIB-ROOF 465

Standard construction width = 465 mm



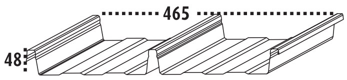
straight

forced curved

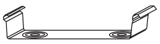
convex curved

concave curved

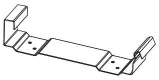
Profiled sheet



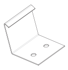
Standard clip



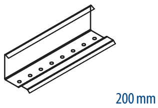
Start clip



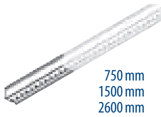
End clip



Directional clip

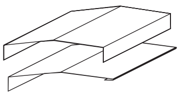


Directional profile

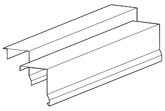


Ridge

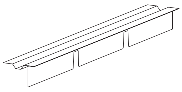
Ridge cap



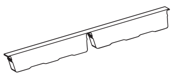
Single pitch covering



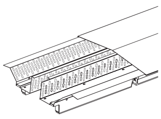
Closure



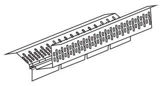
Profile filler, top side



Ventilation ridge cap

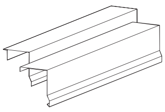


Ventilation closure

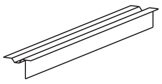


Verge

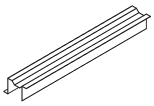
Cover sheet for verge



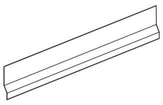
Suspended profile



Suspended profile 330

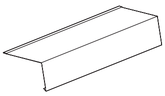


Stopping plate

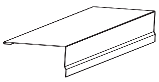


Eaves

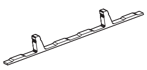
Gutter inlet sheet



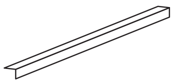
Eaves panel



Profile filler, rear side

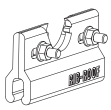


Eaves angle

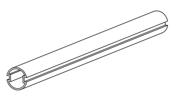


Accessories

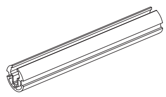
Snow guard bracket



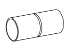
Snow guard pipe with groove



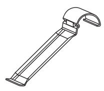
Solar pipe with groove



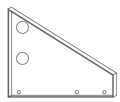
Pipe connector



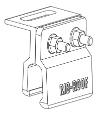
Ice stopper



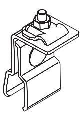
Snow guard raising element



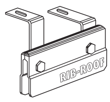
Solar bracket



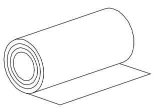
Bracket for lightning protection



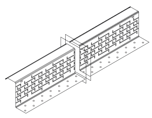
Tread support



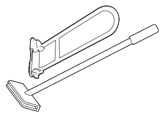
Coil material



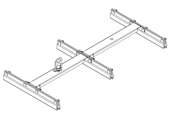
Thermo-Z spacer profile



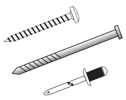
Tools for profiled sheets



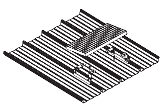
Fall arrest system



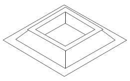
Screws



Walkway

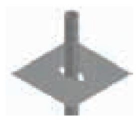


Edging as plug-in system



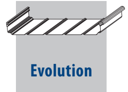
Sanitarian vent/ covering cap

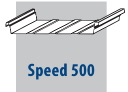
Air pipe with flange surface



2.7 Tapered, curved and tapered curved profiled sheets

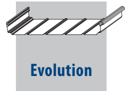
2.7.1 Tapered profiled sheets

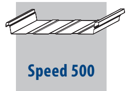


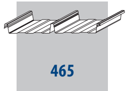


RIB-ROOF profiled sheets are also available tapered, curved or tapered curved. Tapered profiled sheets with a minimum construction width of 230 mm and a maximum standard width of 500 mm are executable. Apart from the standard width of 500 mm, we are prepared to manufacture other construction widths, e.g. 333 mm, 400 mm or up to 600 mm as a maximum, upon request.

2.7.2 Curved profiled sheets







The requirement of a minimum roof pitch for curved roofs is dropped (locally limited) if the roof elements in areas of roof pitches ≤ 2.9° (5 %) are arranged in such a way that they go continously through or are welded at the ridge side.

In general: As the profiled sheets have to be pressed onto the requested radius when carrying out convexly force-curving, waves are possible. Therefore, curving with machines is the optically better solution.
Concave profiled sheets exclusively with mechanical curving, force-curving is not possible.

In area of cutting edges, there might arise some changes in the construction width at the beginning and end of each profiled sheet, due to natural tension inside the material. Moreover, such changes in the construction width could also arise when curving profiled sheets.
„A direct connection as joint forming with straight profiled sheets is not possible due to material- and production technical construction width deviations when curving with machines (smooth curving).

Like with forced-curved sheets material- and technical production conditions can cause optical impairments like material warpage or waves, though do not present a complain.
If there are higher optical requirements, we recommend our consultation and if applicable to make use of a comparison sampling Depending on the material and material thickness (t in mm) when curving with machines, the following minimum bending radii have to be observed.

Minimum bending radii RIB-ROOF Evolution

Material	Material thickness t [mm]	convex Radius [m]	concave Radius [m]
Steel	0.63	10.00	20.00
Aluminium	1.00	5.00	10.00
Aluminium	0,90	8.00	20.00
Aluminium	0.80	10.00	-
Titanium zinc	1.00	on request	on request
Copper	0.60	on request	on request

Table of minimum bending radii

Minimum bending radii RIB-ROOF Speed 500

Material	Material thickness t [mm]	convex Radius [m]	concave Radius [m]
Steel	0.63	4.00	10.00
Aluminium	1.00	1.00	10.00
Aluminium	0.90	5.00	10.00
Aluminium	0.80	10.00	-
Titanium zinc	1.00	on request	on request
Copper	0.60	on request	on request

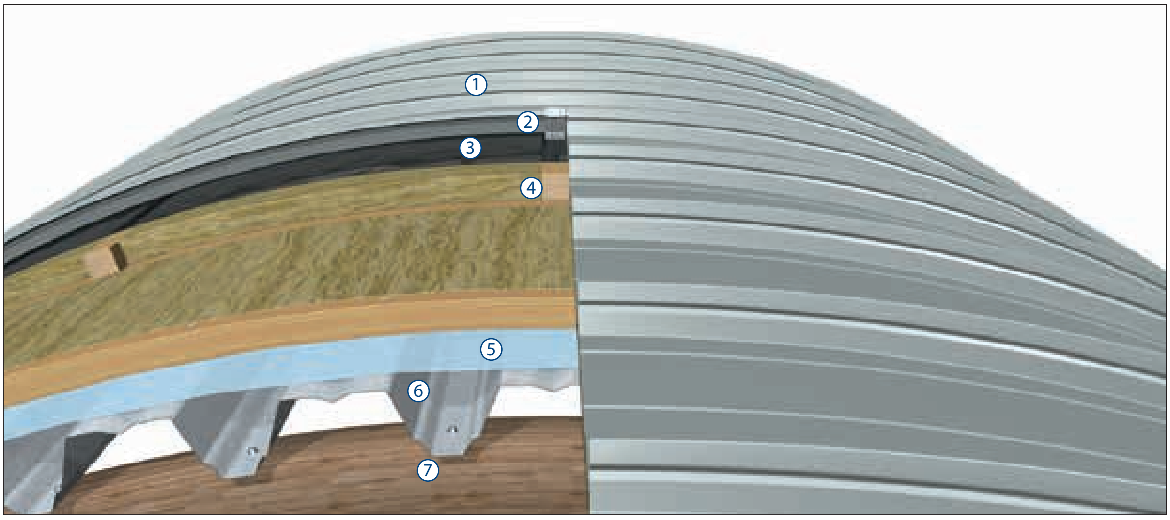
Table of minimum bending radii

Minimum bending radii with RIB-ROOF 465

Material	Material thickness t [mm]	convex Radius [m]	concave Radius [m]
Steel	0,63	6,00	on request
Aluminium	1,00	6,00	on request
Aluminium	0,90	10,00	on request
Aluminium	0,80	15,00	-
Titanium zinc	1,00	on request	on request
Copper	0,60	on request	on request

Table of minimum bending radii

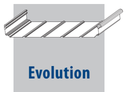
Please contact us in advance if you intend to order curved profiled sheets with lower bending radii.
RIB-ROOF Evolution and Speed 500 profiled sheets with a radius over 100 m will be curved without any machines but forced-curved and installed with turned standard/directional clips (installation direction is from right to left).
RIB-ROOF 465 profiled sheets can alternatively be forced-curved so that low bending radii are possible. RIB-ROOF 465 profiled sheets can also be curved without any machines with a convex radius over 60 m but forced-curved.

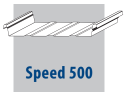


Radii of r > 1.0 m (with RIB-ROOF 465 of r > 6.0 m) are possible with wooden counter lathing or metal Z-profiles or hat profiles without transverse lathing each. Low bending radii on request. Radii of more than r > 8.0 m are possible with wooden counter/transverse lathing

1. RIB-ROOF
2. Turned clip, directional clip
3. Diffusion-open protective sheet
4. Counter/transverse lathing with thermal insulation in between
5. Vapour barrier membrane
6. Trapezoidal profiles
7. Roof truss

2.7.3 Tapered curved profiled sheets

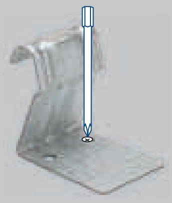




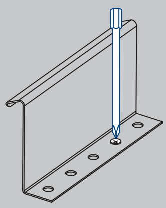
Please inform us well in advance when intending to carry out projects with tapered curved profiled sheets.

For curved profiled sheets RIB-ROOF Evolution and RIB-ROOF Speed 500 with **radii less than 100 m, turned clips/directional clips** have to be used for installation.

Installation direction is from right to left.
Measurements of screws
(no counter-sunk screws):
Screw head-Ø max. 10.50 mm,
Screw head height max. 5.50 mm

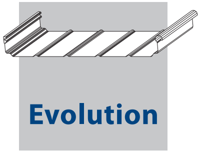


fix turned standard clips for RIB-ROOF Speed 500 with extended screwdriver bits

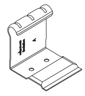


fix turned clips for RIB-ROOF Evolution with extended screwdriver bits

2.8 Spans / clip distances RIB-ROOF Evolution



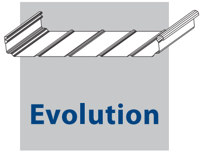
Standard clip



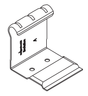
Wind loads according to DIN EN 1991-1-4/NA		Wind zone 1 inland			Wind zone 2 inland			Wind zone 3 inland			Wind zone 4 inland			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thick-ness (mm)	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	max. span limit for accessi-bility*
Height of building h ≤ 10,00 m														
		$q_p = 0.50$ kN/m²			$q_p = 0.65$ kN/m²			$q_p = 0.80$ kN/m²			$q_p = 0.95$ kN/m²			
		w=0.60 kN/m²	w=1.00 kN/m²	w=1.25 kN/m²	w=0.78 kN/m²	w=1.30 kN/m²	w=1.63 kN/m²	w=0.96 kN/m²	w=1.60 kN/m²	w=2.00 kN/m²	w=1.14 kN/m²	w=1.90 kN/m²	w=2.38 kN/m²	
Steel	**0.63**	2.98 m	1.79 m	1.43 m	2.29 m	1.38 m	1.10 m	1.86 m	1.12 m	0.90 m	1.57 m	0.94 m	0.75 m	1.60 m
	0.75	3.17 m	1.90 m	1.52 m	2.44 m	1.46 m	1.17 m	1.98 m	1.19 m	0.95 m	1.67 m	1.00 m	0.80 m	2.40 m
Aluminium	**0.70**	2.45 m	1.47 m	1.18 m	1.88 m	1.13 m	0.90 m	1.53 m	0.92 m	0.74 m	1.29 m	0.77 m	0.62 m	**
	0.80	3.20 m	1.92 m	1.54 m	2.46 m	1.48 m	1.18 m	2.00 m	1.20 m	0.96 m	1.68 m	1.01 m	0.81 m	1.50 m
	0.90	3.50 m	2.10 m	1.68 m	2.69 m	1.62 m	1.29 m	2.19 m	1.31 m	1.05 m	1.84 m	1.11 m	0.88 m	1.70 m
	1.00	3.82 m	2.29 m	1.83 m	2.94 m	1.76 m	1.41 m	2.39 m	1.43 m	1.15 m	2.01 m	1.21 m	0.96 m	1.90 m
Height of building h > 10,00 m ≤ 18,00 m														
		$q_p = 0.65$ kN/m²			$q_p = 0.80$ kN/m²			$q_p = 0.95$ kN/m²			$q_p = 1.15$ kN/m²			
		w=0.78 kN/m²	w=1.30 kN/m²	w=1.63 kN/m²	w=0.96 kN/m²	w=1.60 kN/m²	w=2.00 kN/m²	w=1.14 kN/m²	w=1.90 kN/m²	w=2.38 kN/m²	w=1.38 kN/m²	w=2.30 kN/m²	w=2.88 kN/m²	
Steel	**0.63**	2.29 m	1.38 m	1.10 m	1.86 m	1.12 m	0.90 m	1.57 m	0.94 m	0.75 m	1.30 m	0.78 m	0.62 m	1.60 m
	0.75	2.44 m	1.46 m	1.17 m	1.98 m	1.19 m	0.95 m	1.67 m	1.00 m	0.80 m	1.38 m	0.83 m	0.66 m	2.40 m
Aluminium	**0.70**	1.88 m	1.13 m	0.90 m	1.53 m	0.92 m	0.74 m	1.29 m	0.77 m	0.62 m	1.07 m	0.64 m	0.51 m	**
	0.80	2.46 m	1.48 m	1.18 m	2.00 m	1.20 m	0.96 m	1.68 m	1.01 m	0.81 m	1.39 m	0.83 m	0.67 m	1.50 m
	0.90	2.69 m	1.62 m	1.29 m	2.19 m	1.31 m	1.05 m	1.84 m	1.11 m	0.88 m	1.52 m	0.91 m	0.73 m	1.70 m
	1.00	2.94 m	1.76 m	1.41 m	2.39 m	1.43 m	1.15 m	2.01 m	1.21 m	0.96 m	1.66 m	1.00 m	0.80 m	1.90 m
Height of building h > 18,00 m ≤ 25,00 m														
		$q_p = 0.75$ kN/m²			$q_p = 0.90$ kN/m²			$q_p = 1.10$ kN/m²			$q_p = 1.30$ kN/m²			
		w=0.90 kN/m²	w=1.50 kN/m²	w=1.88 kN/m²	w=1.08 kN/m²	w=1.80 kN/m²	w=2.25 kN/m²	w=1.32 kN/m²	w=2.20 kN/m²	w=2.75 kN/m²	w=1.56 kN/m²	w=2.60 kN/m²	w=3.25 kN/m²	
Steel	**0.63**	1.99 m	1.19 m	0.95 m	1.66 m	0.99 m	0.80 m	1.36 m	0.81 m	0.65 m	1.15 m	0.69 m	0.55 m	1.60 m
	0.75	2.11 m	1.27 m	1.01 m	1.76 m	1.06 m	0.84 m	1.44 m	0.86 m	0.69 m	1.22 m	0.73 m	0.58 m	2.40 m
Aluminium	**0.70**	1.63 m	0.98 m	0.78 m	1.36 m	0.82 m	0.65 m	1.11 m	0.67 m	0.53 m	0.94 m	0.57 m	0.45 m	**
	0.80	2.13 m	1.28 m	1.02 m	1.78 m	1.07 m	0.85 m	1.45 m	0.87 m	0.70 m	1.23 m	0.74 m	0.59 m	1.50 m
	0.90	2.33 m	1.40 m	1.12 m	1.94 m	1.17 m	0.93 m	1.59 m	0.95 m	0.76 m	1.35 m	0.81 m	0.65 m	1.70 m
	1.00	2.54 m	1.53 m	1.22 m	2.12 m	1.27 m	1.02 m	1.73 m	1.04 m	0.83 m	1.47 m	0.88 m	0.70 m	1.90 m

Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.
** only on fully-inserted supports



Standard clip



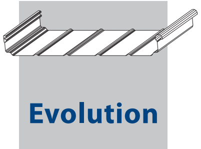
Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea			Wind zone 3 coasts and islands of Baltic Sea			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea			Wind zone 4 islands of North Sea			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thick-ness (mm)	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	max. span limit for accessi-bility*
Height of building h ≤ 10.00 m														
		qp = 0.85 kN/m²			qp = 1.05 kN/m²			qp = 1.25 kN/m²			qp = 1.40 kN/m²			
		w=1.02 kN/m²	w=1.70 kN/m²	w=2.13 kN/m²	w=1.26 kN/m²	w=2.10 kN/m²	w=2.63 kN/m²	w=1.50 kN/m²	w=2.50 kN/m²	w=3.13 kN/m²	w=1.68 kN/m²	w=2.80 kN/m²	w=3.50 kN/m²	
Steel	**0.63**	1.75 m	1.05 m	0.84 m	1.42 m	0.85 m	0.68 m	1.19 m	0.72 m	0.57 m	1.07 m	0.64 m	0.51 m	1.60 m
	0.75	1.86 m	1.12 m	0.89 m	1.51 m	0.90 m	0.72 m	1.27 m	0.76 m	0.61 m	1.13 m	0.68 m	0.54 m	2.40 m
Aluminium	**0.70**	1.44 m	0.86 m	0.69 m	1.17 m	0.70 m	0.56 m	0.98 m	0.59 m	0.47 m	0.88 m	0.53 m	0.42 m	**
	0.80	1.88 m	1.13 m	0.90 m	1.52 m	0.91 m	0.73 m	1.28 m	0.77 m	0.61 m	1.14 m	0.69 m	0.55 m	1.50 m
	0.90	2.06 m	1.24 m	0.99 m	1.67 m	1.00 m	0.80 m	1.40 m	0.84 m	0.67 m	1.25 m	0.75 m	0.60 m	1.70 m
	1.00	2.25 m	1.35 m	1.08 m	1.82 m	1.09 m	0.87 m	1.53 m	0.92 m	0.73 m	1.36 m	0.82 m	0.65 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		q_p = 1.00 kN/m²			q_p = 1.20 kN/m²			q_p = 1.40 kN/m²						
		w=1.20 kN/m²	w=2.00 kN/m²	w=2.50 kN/m²	w=1.44 kN/m²	w=2.40 kN/m²	w=3.00 kN/m²	w=1.68 kN/m²	w=2.80 kN/m²	w=3.50 kN/m²				
Steel	**0.63**	1.49 m	0.90 m	0.72 m	1.24 m	0.75 m	0.60 m	1.07 m	0.64 m	0.51 m				1.60 m
	0.75	1.58 m	0.95 m	0.76 m	1.32 m	0.79 m	0.63 m	1.13 m	0.68 m	0.54 m				2.40 m
Aluminium	**0.70**	1.23 m	0.74 m	0.59 m	1.02 m	0.61 m	0.49 m	0.88 m	0.53 m	0.42 m				**
	0.80	1.60 m	0.96 m	0.77 m	1.33 m	0.80 m	0.64 m	1.14 m	0.69 m	0.55 m				1.50 m
	0.90	1.75 m	1.05 m	0.84 m	1.46 m	0.88 m	0.70 m	1.25 m	0.75 m	0.60 m				1.70 m
	1.00	1.91 m	1.15 m	0.92 m	1.59 m	0.95 m	0.76 m	1.36 m	0.82 m	0.65 m				1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		q_p = 1.10 kN/m²			q_p = 1.30 kN/m²			q_p = 1.55 kN/m²						
		w=1.32 kN/m²	w=2.20 kN/m²	w=2.75 kN/m²	w=1.56 kN/m²	w=2.60 kN/m²	w=3.25 kN/m²	w=1.86 kN/m²	w=3.10 kN/m²	w=3.88 kN/m²				
Steel	**0.63**	1.36 m	0.81 m	0.65 m	1.15 m	0.69 m	0.55 m	0.96 m	0.58 m	0.46 m				1.60 m
	0.75	1.44 m	0.86 m	0.69 m	1.22 m	0.73 m	0.58 m	1.02 m	0.61 m	0.49 m				2.40 m
Aluminium	**0.70**	1.11 m	0.67 m	0.53 m	0.94 m	0.57 m	0.45 m	0.79 m	0.47 m	0.38 m				**
	0.80	1.45 m	0.87 m	0.70 m	1.23 m	0.74 m	0.59 m	1.03 m	0.62 m	0.50 m				1.50 m
	0.90	1.59 m	0.95 m	0.76 m	1.35 m	0.81 m	0.65 m	1.13 m	0.68 m	0.54 m				1.70 m
	1.00	1.73 m	1.04 m	0.83 m	1.47 m	0.88 m	0.70 m	1.23 m	0.74 m	0.59 m				1.90 m

Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

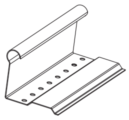
* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.

** only on fully-inserted supports

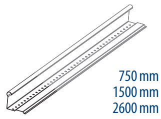
2.8.1 Spans / clip distances RIB-ROOF Evolution



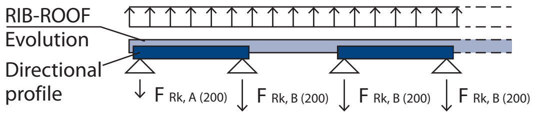
Directional clip 200



Directional profile[1]



1) The holding bracket distance of a directional clip 200, can be taken for each connection point of directional profiles with the substructure. As an example, the sketch shows the allocation of resistivity for directional profiles with two connection points (supports).

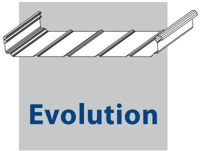


Wind loads according to DIN EN 1991-1-4/NA		Wind zone 1 inland			Wind zone 2 inland			Wind zone 3 inland			Wind zone 4 inland			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thickness (mm)	H (standard area) $c_{pe.1}$ = -1.2	G (edge area) $c_{pe.1}$ = -2.0	F (corner area) $c_{pe.1}$ = -2.5	H (standard area) $c_{pe.1}$ = -1.2	G (Rand-bereich) $c_{pe.1}$ = -2.0	F (Eck bereich) $c_{pe.1}$ = -2.5	H (Normal-bereich) $c_{pe.1}$ = -1.2	G (Rand-bereich) $c_{pe.1}$ = -2.0	F (Eck bereich) $c_{pe.1}$ = -2.5	H (Normal-bereich) $c_{pe.1}$ = -1.2	G (Rand-bereich) $c_{pe.1}$ = -2.0	F (Eck bereich) $c_{pe.1}$ = -2.5	max. span limit for accessibility*
Height of building h ≤ 10.00 m														
		qp = 0.50 kN/m²			qp = 0.65 kN/m²			qp = 0.80 kN/m²			qp = 0.95 kN/m²			
		w=0.60 kN/m²	w=1.00 kN/m²	w=1.25 kN/m²	w=0.78 kN/m²	w=1.30 kN/m²	w=1.63 kN/m²	w=0.96 kN/m²	w=1.60 kN/m²	w=2.00 kN/m²	w=1.14 kN/m²	w=1.90 kN/m²	w=2.38 kN/m²	
Steel	**0.63**	4.88 m	2.93 m	2.34 m	3.76 m	2.25 m	1.80 m	3.05 m	1.83 m	1.47 m	2.57 m	1.54 m	1.23 m	1.60 m
	0.75	4.88 m	2.93 m	2.34 m	3.76 m	2.25 m	1.80 m	3.05 m	1.83 m	1.47 m	2.57 m	1.54 m	1.23 m	2.40 m
Aluminium	**0.70**	4.33 m	2.60 m	2.08 m	3.33 m	2.00 m	1.60 m	2.71 m	1.63 m	1.30 m	2.28 m	1.37 m	1.09 m	**
	0.80	5.65 m	3.39 m	2.71 m	4.35 m	2.61 m	2.09 m	3.53 m	2.12 m	1.70 m	2.97 m	1.78 m	1.43 m	1.50 m
	0.90	5.65 m	3.39 m	2.71 m	4.35 m	2.61 m	2.09 m	3.53 m	2.12 m	1.70 m	2.97 m	1.78 m	1.43 m	1.70 m
	1.00	5.65 m	3.39 m	2.71 m	4.35 m	2.61 m	2.09 m	3.53 m	2.12 m	1.70 m	2.97 m	1.78 m	1.43 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		qp = 0.65 kN/m²			qp = 0.80 kN/m²			qp = 0.95 kN/m²			qp = 1.15 kN/m²			
		w=0.78 kN/m²	w=1.30 kN/m²	w=1.63 kN/m²	w=0.96 kN/m²	w=1.60 kN/m²	w=2.00 kN/m²	w=1.14 kN/m²	w=1.90 kN/m²	w=2.38 kN/m²	w=1.38 kN/m²	w=2.30 kN/m²	w=2.88 kN/m²	
Steel	**0.63**	3.76 m	2.25 m	1.80 m	3.05 m	1.83 m	1.47 m	2.57 m	1.54 m	1.23 m	2.12 m	1.27 m	1.02 m	1.60 m
	0.75	3.76 m	2.25 m	1.80 m	3.05 m	1.83 m	1.47 m	2.57 m	1.54 m	1.23 m	2.12 m	1.27 m	1.02 m	2.40 m
Aluminium	**0.70**	3.33 m	2.00 m	1.60 m	2.71 m	1.63 m	1.30 m	2.28 m	1.37 m	1.09 m	1.88 m	1.13 m	0.90 m	**
	0.80	4.35 m	2.61 m	2.09 m	3.53 m	2.12 m	1.70 m	2.97 m	1.78 m	1.43 m	2.46 m	1.47 m	1.18 m	1.50 m
	0.90	4.35 m	2.61 m	2.09 m	3.53 m	2.12 m	1.70 m	2.97 m	1.78 m	1.43 m	2.46 m	1.47 m	1.18 m	1.70 m
	1.00	4.35 m	2.61 m	2.09 m	3.53 m	2.12 m	1.70 m	2.97 m	1.78 m	1.43 m	2.46 m	1.47 m	1.18 m	1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		qp = 0.75 kN/m²			qp = 0.90 kN/m²			qp = 1.10 kN/m²			qp = 1.30 kN/m²			
		w=0.90 kN/m²	w=1.50 kN/m²	w=1.88 kN/m²	w=1.08 kN/m²	w=1.80 kN/m²	w=2.25 kN/m²	w=1.32 kN/m²	w=2.20 kN/m²	w=2.75 kN/m²	w=1.56 kN/m²	w=2.60 kN/m²	w=3.25 kN/m²	
Steel	**0.63**	3.26 m	1.95 m	1.56 m	2.71 m	1.63 m	1.30 m	2.22 m	1.33 m	1.07 m	1.88 m	1.13 m	0.90 m	1.60 m
	0.75	3.26 m	1.95 m	1.56 m	2.71 m	1.63 m	1.30 m	2.22 m	1.33 m	1.07 m	1.88 m	1.13 m	0.90 m	2.40 m
Aluminium	**0.70**	2.89 m	1.73 m	1.39 m	2.41 m	1.44 m	1.16 m	1.97 m	1.18 m	0.95 m	1.67 m	1.00 m	0.80 m	**
	0.80	3.77 m	2.26 m	1.81 m	3.14 m	1.88 m	1.51 m	2.57 m	1.54 m	1.23 m	2.17 m	1.30 m	1.04 m	1.50 m
	0.90	3.77 m	2.26 m	1.81 m	3.14 m	1.88 m	1.51 m	2.57 m	1.54 m	1.23 m	2.17 m	1.30 m	1.04 m	1.70 m
	1.00	3.77 m	2.26 m	1.81 m	3.14 m	1.88 m	1.51 m	2.57 m	1.54 m	1.23 m	2.17 m	1.30 m	1.04 m	1.90 m

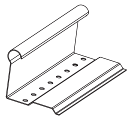
Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.

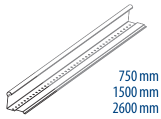
** only on fully-inserted supports



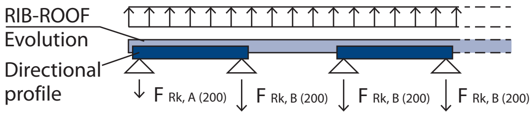
Directional clip 200



Directional profile[1)]



1) The holding bracket distance of a directional clip 200, can be taken for each connection point of directional profiles with the substructure. As an example, the sketch shows the allocation of resistivity for directional profiles with two connection points (supports).

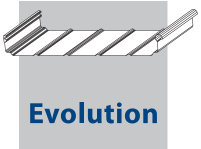


Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea			Wind zone 3 coasts and islands of Baltic Sea			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea			Wind zone 4 islands of North Sea			
		Clipabstand (m) bei			Clipabstand (m) bei			Clipabstand (m) bei			Clipabstand (m) bei			
material	thickness (mm)	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	max. span limit for accessibility*
		Height of building h ≤ 10.00 m												
		$q_p = 0.85$ kN/m²			$q_p = 1.05$ kN/m²			$q_p = 1.25$ kN/m²			$q_p = 1.40$ kN/m²			
		w=-1.02 kN/m²	w=-1.70 kN/m²	w=-2.13 kN/m²	w=-1.26 kN/m²	w=-2.10 kN/m²	w=-2.63 kN/m²	w=-1.50 kN/m²	w=-2.50 kN/m²	w=-3.13 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²	
Steel	**0.63**	2.87 m	1.72 m	1.38 m	2.33 m	1.40 m	1.12 m	1.95 m	1.17 m	0.94 m	1.74 m	1.05 m	0.84 m	1.60 m
	0.75	2.87 m	1.72 m	1.38 m	2.33 m	1.40 m	1.12 m	1.95 m	1.17 m	0.94 m	1.74 m	1.05 m	0.84 m	2.40 m
Aluminium	**0.70**	2.55 m	1.53 m	1.22 m	2.06 m	1.24 m	0.99 m	1.73 m	1.04 m	0.83 m	1.55 m	0.93 m	0.74 m	**
	0.80	3.32 m	1.99 m	1.60 m	2.69 m	1.61 m	1.29 m	2.26 m	1.36 m	1.08 m	2.02 m	1.21 m	0.97 m	1.50 m
	0.90	3.32 m	1.99 m	1.60 m	2.69 m	1.61 m	1.29 m	2.26 m	1.36 m	1.08 m	2.02 m	1.21 m	0.97 m	1.70 m
	1.00	3.32 m	1.99 m	1.60 m	2.69 m	1.61 m	1.29 m	2.26 m	1.36 m	1.08 m	2.02 m	1.21 m	0.97 m	1.90 m
		Height of building h > 10.00 m ≤ 18.00 m												
		qp = 1.00 kN/m²			$q_p = 1.20$ kN/m²			$q_p = 1.40$ kN/m²						
		w=-1.20 kN/m²	w=-2.00 kN/m²	w=-2.50 kN/m²	w=-1.44 kN/m²	w=-2.40 kN/m²	w=-3.00 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²				
Steel	**0.63**	2.44 m	1.47 m	1.17 m	2.03 m	1.22 m	0.98 m	1.74 m	1.05 m	0.84 m				1.60 m
	0.75	2.44 m	1.47 m	1.17 m	2.03 m	1.22 m	0.98 m	1.74 m	1.05 m	0.84 m				2.40 m
Aluminium	**0.70**	2.17 m	1.30 m	1.04 m	1.81 m	1.08 m	0.87 m	1.55 m	0.93 m	0.74 m				**
	0.80	2.83 m	1.70 m	1.36 m	2.35 m	1.41 m	1.13 m	2.02 m	1.21 m	0.97 m				1.50 m
	0.90	2.83 m	1.70 m	1.36 m	2.35 m	1.41 m	1.13 m	2.02 m	1.21 m	0.97 m				1.70 m
	1.00	2.83 m	1.70 m	1.36 m	2.35 m	1.41 m	1.13 m	2.02 m	1.21 m	0.97 m				1.90 m
		Height of building h > 18.00 m ≤ 25.00 m												
		qp = 1.10 kN/m²			$q_p = 1.30$ kN/m²			$q_p = 1.55$ kN/m²						
		w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	w=-1.86 kN/m²	w=-3.10 kN/m²	w=-3.88 kN/m²				
Steel	**0.63**	2.22 m	1.33 m	1.07 m	1.88 m	1.13 m	0.90 m	1.58 m	0.95 m	0.76 m				1.60 m
	0.75	2.22 m	1.33 m	1.07 m	1.88 m	1.13 m	0.90 m	1.58 m	0.95 m	0.76 m				2.40 m
Aluminium	**0.70**	1.97 m	1.18 m	0.95 m	1.67 m	1.00 m	0.80 m	1.40 m	0.84 m	0.67 m				**
	0.80	2.57 m	1.54 m	1.23 m	2.17 m	1.30 m	1.04 m	1.82 m	1.09 m	0.87 m				1.50 m
	0.90	2.57 m	1.54 m	1.23 m	2.17 m	1.30 m	1.04 m	1.82 m	1.09 m	0.87 m				1.70 m
	1.00	2.57 m	1.54 m	1.23 m	2.17 m	1.30 m	1.04 m	1.82 m	1.09 m	0.87 m				1.90 m

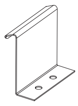
Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.
** only on fully-inserted supports

2.8.2 Spans / clip distances RIB-ROOF Evolution



Turned directional clip 70

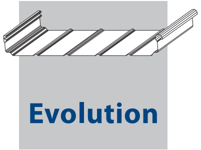


Wind loads according to DIN EN 1991-1-4/NA		Wind zone 1 inland			Wind zone 2 inland			Wind zone 3 inland			Wind zone 4 inland			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thick-ness (mm)	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	max. span limit for accessi-bility*
Height of building h ≤ 10.00 m														
		qp = 0.50 kN/m²			q_p = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			
		w=-0.60 kN/m²	w=-1.00 kN/m²	w=-1.25 kN/m²	w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	
Steel	**0.63**	2.20 m	1.32 m	1.06 m	1.69 m	1.02 m	0.81 m	1.38 m	0.83 m	0.66 m	1.16 m	0.69 m	0.56 m	1.60 m
	0.75	2.20 m	1.32 m	1.06 m	1.69 m	1.02 m	0.81 m	1.38 m	0.83 m	0.66 m	1.16 m	0.69 m	0.56 m	2.40 m
Aluminium	**0.70**	1.62 m	0.97 m	0.78 m	1.24 m	0.75 m	0.60 m	1.01 m	0.61 m	0.49 m	0.85 m	0.51 m	0.41 m	**
	0.80	2.12 m	1.27 m	1.02 m	1.63 m	0.98 m	0.78 m	1.32 m	0.79 m	0.64 m	1.11 m	0.67 m	0.53 m	1.50 m
	0.90	3.23 m	1.94 m	1.55 m	2.49 m	1.49 m	1.19 m	2.02 m	1.21 m	0.97 m	1.70 m	1.02 m	0.82 m	1.70 m
	1.00	4.37 m	2.62 m	2.10 m	3.36 m	2.02 m	1.61 m	2.73 m	1.64 m	1.31 m	2.30 m	1.38 m	1.10 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		q_p = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			q_p = 1.15 kN/m²			
		w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	w=-1.38 kN/m²	w=-2.30 kN/m²	w=-2.88 kN/m²	
Steel	**0.63**	1.69 m	1.02 m	0.81 m	1.38 m	0.83 m	0.66 m	1.16 m	0.69 m	0.56 m	0.96 m	0.57 m	0.46 m	1.60 m
	0.75	1.69 m	1.02 m	0.81 m	1.38 m	0.83 m	0.66 m	1.16 m	0.69 m	0.56 m	0.96 m	0.57 m	0.46 m	2.40 m
Aluminium	**0.70**	1.24 m	0.75 m	0.60 m	1.01 m	0.61 m	0.49 m	0.85 m	0.51 m	0.41 m	0.70 m	0.42 m	0.34 m	**
	0.80	1.63 m	0.98 m	0.78 m	1.32 m	0.79 m	0.64 m	1.11 m	0.67 m	0.53 m	0.92 m	0.55 m	0.44 m	1.50 m
	0.90	2.49 m	1.49 m	1.19 m	2.02 m	1.21 m	0.97 m	1.70 m	1.02 m	0.82 m	1.41 m	0.84 m	0.67 m	1.70 m
	1.00	3.36 m	2.02 m	1.61 m	2.73 m	1.64 m	1.31 m	2.30 m	1.38 m	1.10 m	1.90 m	1.14 m	0.91 m	1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		qp = 0.75 kN/m²			q_p = 0.90 kN/m²			q_p = 1.10 kN/m²			q_p = 1.30 kN/m²			
		w=-0.90 kN/m²	w=-1.50 kN/m²	w=-1.88 kN/m²	w=-1.08 kN/m²	w=-1.80 kN/m²	w=-2.25 kN/m²	w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	
Steel	**0.63**	1.47 m	0.88 m	0.70 m	1.22 m	0.73 m	0.59 m	1.00 m	0.60 m	0.48 m	0.85 m	0.51 m	0.41 m	1.60 m
	0.75	1.47 m	0.88 m	0.70 m	1.22 m	0.73 m	0.59 m	1.00 m	0.60 m	0.48 m	0.85 m	0.51 m	0.41 m	2.40 m
Aluminium	**0.70**	1.08 m	0.65 m	0.52 m	0.90 m	0.54 m	0.43 m	0.73 m	0.44 m	0.35 m	0.62 m	0.37 m	0.30 m	**
	0.80	1.41 m	0.85 m	0.68 m	1.18 m	0.71 m	0.56 m	0.96 m	0.58 m	0.46 m	0.81 m	0.49 m	0.39 m	1.50 m
	0.90	2.16 m	1.29 m	1.03 m	1.80 m	1.08 m	0.86 m	1.47 m	0.88 m	0.71 m	1.24 m	0.75 m	0.60 m	1.70 m
	1.00	2.91 m	1.75 m	1.40 m	2.43 m	1.46 m	1.16 m	1.98 m	1.19 m	0.95 m	1.68 m	1.01 m	0.81 m	1.90 m

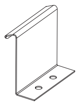
Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.

** only on fully-inserted supports



Turned directional clip 70

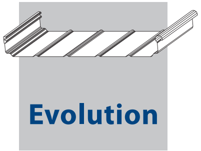


Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea			Wind zone 3 coasts and islands of Baltic Sea			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea			Wind zone 4 islands of North Sea			
		Clipabstand (m) bei			Clipabstand (m) bei			Clipabstand (m) bei			Clipabstand (m) bei			
material	thick-ness (mm)	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	max. span limit for accessi-bility*
		Height of building h ≤ 10.00 m												
		qp = 0.85 kN/m^2			q_p = 1.05 kN/m^2			q_p = 1.25 kN/m^2			q_p = 1.40 kN/m^2			
		w=-1.02 kN/m^2	w=-1.70 kN/m^2	w=-2.13 kN/m^2	w=-1.26 kN/m^2	w=-2.10 kN/m^2	w=-2.63 kN/m^2	w=-1.50 kN/m^2	w=-2.50 kN/m^2	w=-3.13 kN/m^2	w=-1.68 kN/m^2	w=-2.80 kN/m^2	w=-3.50 kN/m^2	
Steel	**0.63**	1.29 m	0.78 m	0.62 m	1.05 m	0.63 m	0.50 m	0.88 m	0.53 m	0.42 m	0.79 m	0.47 m	0.38 m	1.60 m
	0.75	1.29 m	0.78 m	0.62 m	1.05 m	0.63 m	0.50 m	0.88 m	0.53 m	0.42 m	0.79 m	0.47 m	0.38 m	2.40 m
Aluminium	**0.70**	0.95 m	0.57 m	0.46 m	0.77 m	0.46 m	0.37 m	0.65 m	0.39 m	0.31 m	0.58 m	0.35 m	0.28 m	**
	0.80	1.25 m	0.75 m	0.60 m	1.01 m	0.60 m	0.48 m	0.85 m	0.51 m	0.41 m	0.76 m	0.45 m	0.36 m	1.50 m
	0.90	1.90 m	1.14 m	0.91 m	1.54 m	0.92 m	0.74 m	1.29 m	0.78 m	0.62 m	1.15 m	0.69 m	0.55 m	1.70 m
	1.00	2.57 m	1.54 m	1.23 m	2.08 m	1.25 m	1.00 m	1.75 m	1.05 m	0.84 m	1.56 m	0.94 m	0.75 m	1.90 m
		Height of building h > 10.00 m ≤ 18.00 m												
		qp = 1.00 kN/m^2			q_p = 1.20 kN/m^2			q_p = 1.40 kN/m^2						
		w=-1.20 kN/m^2	w=-2.00 kN/m^2	w=-2.50 kN/m^2	w=-1.44 kN/m^2	w=-2.40 kN/m^2	w=-3.00 kN/m^2	w=-1.68 kN/m^2	w=-2.80 kN/m^2	w=-3.50 kN/m^2				
Steel	**0.63**	1.10 m	0.66 m	0.53 m	0.92 m	0.55 m	0.44 m	0.79 m	0.47 m	0.38 m				1.60 m
	0.75	1.10 m	0.66 m	0.53 m	0.92 m	0.55 m	0.44 m	0.79 m	0.47 m	0.38 m				2.40 m
Aluminium	**0.70**	0.81 m	0.49 m	0.39 m	0.67 m	0.40 m	0.32 m	0.58 m	0.35 m	0.28 m				**
	0.80	1.06 m	0.64 m	0.51 m	0.88 m	0.53 m	0.42 m	0.76 m	0.45 m	0.36 m				1.50 m
	0.90	1.62 m	0.97 m	0.78 m	1.35 m	0.81 m	0.65 m	1.15 m	0.69 m	0.55 m				1.70 m
	1.00	2.18 m	1.31 m	1.05 m	1.82 m	1.09 m	0.87 m	1.56 m	0.94 m	0.75 m				1.90 m
		Height of building h > 18.00 m ≤ 25.00 m												
		qp = 1.10 kN/m^2			q_p = 1.30 kN/m^2			q_p = 1.55 kN/m^2						
		w=-1.32 kN/m^2	w=-2.20 kN/m^2	w=-2.75 kN/m^2	w=-1.56 kN/m^2	w=-2.60 kN/m^2	w=-3.25 kN/m^2	w=-1.86 kN/m^2	w=-3.10 kN/m^2	w=-3.88 kN/m^2				
Steel	**0.63**	1.00 m	0.60 m	0.48 m	0.85 m	0.51 m	0.41 m	0.71 m	0.43 m	0.34 m				1.60 m
	0.75	1.00 m	0.60 m	0.48 m	0.85 m	0.51 m	0.41 m	0.71 m	0.43 m	0.34 m				2.40 m
Aluminium	**0.70**	0.73 m	0.44 m	0.35 m	0.62 m	0.37 m	0.30 m	0.52 m	0.31 m	0.25 m				**
	0.80	0.96 m	0.58 m	0.46 m	0.81 m	0.49 m	0.39 m	0.68 m	0.41 m	0.33 m				1.50 m
	0.90	1.47 m	0.88 m	0.71 m	1.24 m	0.75 m	0.60 m	1.04 m	0.63 m	0.50 m				1.70 m
	1.00	1.98 m	1.19 m	0.95 m	1.68 m	1.01 m	0.81 m	1.41 m	0.85 m	0.68 m				1.90 m

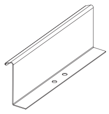
Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.
** only on fully-inserted supports

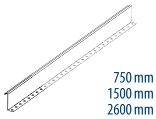
2.8.3 Spans / clip distances RIB-ROOF Evolution



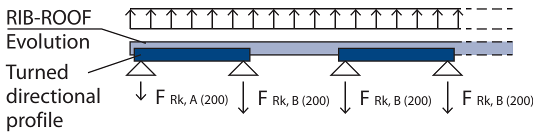
Turned directional clip 200



Turned directional profile[1]



1) The holding bracket distance of a turned directional clip 200, can be taken for each connection point of turned directional profiles with the substructure. As an example, the sketch shows the allocation of resistivity for turned directional profiles with two connection points (supports).

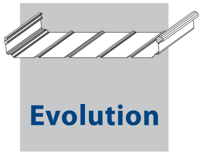


Wind loads according to DIN EN 1991-1-4/NA		Windzone 1 inland			Windzone 2 inland			Windzone 3 inland			Windzone 4 inland			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thickness (mm)	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	max. span limit for accessibility*
Height of building h ≤ 10.00 m														
		qp = 0.50 kN/m²			q_p = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			
		w=-0.60 kN/m²	w=-1.00 kN/m²	w=-1.25 kN/m²	w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	
Steel	**0.63**	4.47 m	2.68 m	2.14 m	3.44 m	2.06 m	1.65 m	2.79 m	1.68 m	1.34 m	2.35 m	1.41 m	1.13 m	1.60 m
	0.75	4.47 m	2.68 m	2.14 m	3.44 m	2.06 m	1.65 m	2.79 m	1.68 m	1.34 m	2.35 m	1.41 m	1.13 m	2.40 m
Aluminium	**0.70**	3.05 m	1.83 m	1.46 m	2.35 m	1.41 m	1.13 m	1.91 m	1.14 m	0.92 m	1.61 m	0.96 m	0.77 m	**
	0.80	3.98 m	2.39 m	1.91 m	3.06 m	1.84 m	1.47 m	2.49 m	1.49 m	1.20 m	2.10 m	1.26 m	1.01 m	1.50 m
	0.90	4.90 m	2.94 m	2.35 m	3.77 m	2.26 m	1.81 m	3.06 m	1.84 m	1.47 m	2.58 m	1.55 m	1.24 m	1.70 m
	1.00	5.80 m	3.48 m	2.78 m	4.46 m	2.68 m	2.14 m	3.63 m	2.18 m	1.74 m	3.05 m	1.83 m	1.47 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		qp = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			q_p = 1.15 kN/m²			
		w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	w=-1.38 kN/m²	w=-2.30 kN/m²	w=-2.88 kN/m²	
Steel	**0.63**	3.44 m	2.06 m	1.65 m	2.79 m	1.68 m	1.34 m	2.35 m	1.41 m	1.13 m	1.94 m	1.17 m	0.93 m	1.60 m
	0.75	3.44 m	2.06 m	1.65 m	2.79 m	1.68 m	1.34 m	2.35 m	1.41 m	1.13 m	1.94 m	1.17 m	0.93 m	2.40 m
Aluminium	**0.70**	2.35 m	1.41 m	1.13 m	1.91 m	1.14 m	0.92 m	1.61 m	0.96 m	0.77 m	1.33 m	0.80 m	0.64 m	**
	0.80	3.06 m	1.84 m	1.47 m	2.49 m	1.49 m	1.20 m	2.10 m	1.26 m	1.01 m	1.73 m	1.04 m	0.83 m	1.50 m
	0.90	3.77 m	2.26 m	1.81 m	3.06 m	1.84 m	1.47 m	2.58 m	1.55 m	1.24 m	2.13 m	1.28 m	1.02 m	1.70 m
	1.00	4.46 m	2.68 m	2.14 m	3.63 m	2.18 m	1.74 m	3.05 m	1.83 m	1.47 m	2.52 m	1.51 m	1.21 m	1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		qp = 0.75 kN/m²			q_p = 0.90 kN/m²			q_p = 1.10 kN/m²			q_p = 1.30 kN/m²			
		w=-0.90 kN/m²	w=-1.50 kN/m²	w=-1.88 kN/m²	w=-1.08 kN/m²	w=-1.80 kN/m²	w=-2.25 kN/m²	w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	
Steel	**0.63**	2.98 m	1.79 m	1.43 m	2.48 m	1.49 m	1.19 m	2.03 m	1.22 m	0.97 m	1.72 m	1.03 m	0.82 m	1.60 m
	0.75	2.98 m	1.79 m	1.43 m	2.48 m	1.49 m	1.19 m	2.03 m	1.22 m	0.97 m	1.72 m	1.03 m	0.82 m	2.40 m
Aluminium	**0.70**	2.03 m	1.22 m	0.98 m	1.69 m	1.02 m	0.81 m	1.39 m	0.83 m	0.67 m	1.17 m	0.70 m	0.56 m	**
	0.80	2.66 m	1.59 m	1.27 m	2.21 m	1.33 m	1.06 m	1.81 m	1.09 m	0.87 m	1.53 m	0.92 m	0.74 m	1.50 m
	0.90	3.27 m	1.96 m	1.57 m	2.72 m	1.63 m	1.31 m	2.23 m	1.34 m	1.07 m	1.88 m	1.13 m	0.90 m	1.70 m
	1.00	3.87 m	2.32 m	1.86 m	3.22 m	1.93 m	1.55 m	2.64 m	1.58 m	1.27 m	2.23 m	1.34 m	1.07 m	1.90 m

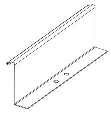
Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.

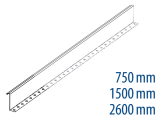
** only on fully-inserted supports



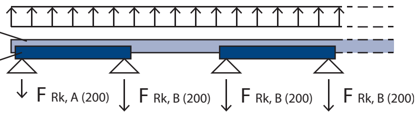
Turned directional clip 200



Turned directional profile[1]



1) The holding bracket distance of a turned directional clip 200, can be taken for each connection point of turned directional profiles with the substructure. As an example, the sketch shows the allocation of resistivity for turned directional profiles with two connection points (supports).



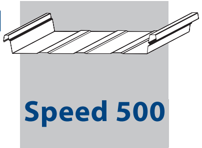
Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea			Wind zone 3 coasts and islands of Baltic Sea			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea			Wind zone 4 islands of North Sea			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thick-ness (mm)	H (standard area) $c_{pe.1}$ = -1.2	G (edge area) $c_{pe.1}$ = -2.0	F (corner area) $c_{pe.1}$ = -2.5	H (standard area) $c_{pe.1}$ = -1.2	G (edge area) $c_{pe.1}$ = -2.0	F (corner area) $c_{pe.1}$ = -2.5	H (standard area) $c_{pe.1}$ = -1.2	G (edge area) $c_{pe.1}$ = -2.0	F (corner area) $c_{pe.1}$ = -2.5	H (standard area) $c_{pe.1}$ = -1.2	G (edge area) $c_{pe.1}$ = -2.0	F (corner area) $c_{pe.1}$ = -2.5	max. span limit for accessibility*
Height of building h ≤ 10.00 m														
		qp = 0.85 kN/m²			q_p = 1.05 kN/m²			q_p = 1.25 kN/m²			q_p = 1.40 kN/m²			
		w=-1.02 kN/m²	w=-1.70 kN/m²	w=-2.13 kN/m²	w=-1.26 kN/m²	w=-2.10 kN/m²	w=-2.63 kN/m²	w=-1.50 kN/m²	w=-2.50 kN/m²	w=-3.13 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²	
Steel	**0.63**	2.63 m	1.58 m	1.26 m	2.13 m	1.28 m	1.02 m	1.79 m	1.07 m	0.86 m	1.60 m	0.96 m	0.77 m	1.60 m
	0.75	2.63 m	1.58 m	1.26 m	2.13 m	1.28 m	1.02 m	1.79 m	1.07 m	0.86 m	1.60 m	0.96 m	0.77 m	2.40 m
Aluminium	**0.70**	1.79 m	1.08 m	0.86 m	1.45 m	0.87 m	0.70 m	1.22 m	0.73 m	0.59 m	1.09 m	0.65 m	0.52 m	**
	0.80	2.34 m	1.41 m	1.12 m	1.90 m	1.14 m	0.91 m	1.59 m	0.96 m	0.76 m	1.42 m	0.85 m	0.68 m	1.50 m
	0.90	2.88 m	1.73 m	1.38 m	2.33 m	1.40 m	1.12 m	1.96 m	1.18 m	0.94 m	1.75 m	1.05 m	0.84 m	1.70 m
	1.00	3.41 m	2.05 m	1.64 m	2.76 m	1.66 m	1.33 m	2.32 m	1.39 m	1.11 m	2.07 m	1.24 m	0.99 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		qp = 1.00 kN/m²			q_p = 1.20 kN/m²			q_p = 1.40 kN/m²						
		w=-1.20 kN/m²	w=-2.00 kN/m²	w=-2.50 kN/m²	w=-1.44 kN/m²	w=-2.40 kN/m²	w=-3.00 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²				
Steel	**0.63**	2.23 m	1.34 m	1.07 m	1.86 m	1.12 m	0.89 m	1.60 m	0.96 m	0.77 m				1.60 m
	0.75	2.23 m	1.34 m	1.07 m	1.86 m	1.12 m	0.89 m	1.60 m	0.96 m	0.77 m				2.40 m
Aluminium	**0.70**	1.53 m	0.92 m	0.73 m	1.27 m	0.76 m	0.61 m	1.09 m	0.65 m	0.52 m				**
	0.80	1.99 m	1.20 m	0.96 m	1.66 m	1.00 m	0.80 m	1.42 m	0.85 m	0.68 m				1.50 m
	0.90	2.45 m	1.47 m	1.18 m	2.04 m	1.23 m	0.98 m	1.75 m	1.05 m	0.84 m				1.70 m
	1.00	2.90 m	1.74 m	1.39 m	2.42 m	1.45 m	1.16 m	2.07 m	1.24 m	0.99 m				1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		qp = 1.10 kN/m²			q_p = 1.30 kN/m²			q_p = 1.55 kN/m²						
		w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	w=-1.86 kN/m²	w=-3.10 kN/m²	w=-3.88 kN/m²				
Steel	**0.63**	2.03 m	1.22 m	0.97 m	1.72 m	1.03 m	0.82 m	1.44 m	0.86 m	0.69 m				1.60 m
	0.75	2.03 m	1.22 m	0.97 m	1.72 m	1.03 m	0.82 m	1.44 m	0.86 m	0.69 m				2.40 m
Aluminium	**0.70**	1.39 m	0.83 m	0.67 m	1.17 m	0.70 m	0.56 m	0.98 m	0.59 m	0.47 m				**
	0.80	1.81 m	1.09 m	0.87 m	1.53 m	0.92 m	0.74 m	1.28 m	0.77 m	0.62 m				1.50 m
	0.90	2.23 m	1.34 m	1.07 m	1.88 m	1.13 m	0.90 m	1.58 m	0.95 m	0.76 m				1.70 m
	1.00	2.64 m	1.58 m	1.27 m	2.23 m	1.34 m	1.07 m	1.87 m	1.12 m	0.90 m				1.90 m

Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

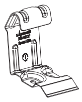
* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.
** only on fully-inserted supports

2.9 Spans/clip distances RIB-ROOF Speed 500

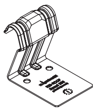
2.9.1



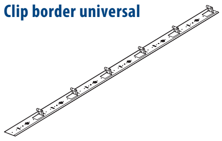
Standard clip



Turned clip



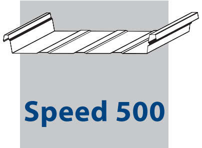
Clip border universal



Wind loads according to DIN EN 1991-1-4/NA		Wind zone 1 inland			Wind zone 2 inland			Wind zone 3 inland			Wind zone 4 inland			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thick-ness (mm)	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	max. span limit for accessi-bility*
Height of building h ≤ 10.00 m														
		qp = 0.50 kN/m²			q_p = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			
		w=-0.60 kN/m²	w=-1.00 kN/m²	w=-1.25 kN/m²	w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	
Steel	**0.63**	2.43 m	1.46 m	1.17 m	1.87 m	1.12 m	0.90 m	1.52 m	0.91 m	0.73 m	1.28 m	0.77 m	0.61 m	1.60 m
	0.75	2.95 m	1.77 m	1.42 m	2.27 m	1.36 m	1.09 m	1.84 m	1.11 m	0.89 m	1.55 m	0.93 m	0.75 m	2.40 m
Aluminium	**0.70**	1.92 m	1.15 m	0.92 m	1.47 m	0.88 m	0.71 m	1.20 m	0.72 m	0.58 m	1.01 m	0.61 m	0.48 m	1.20 m
	0.80	2.52 m	1.51 m	1.21 m	1.94 m	1.16 m	0.93 m	1.57 m	0.94 m	0.76 m	1.32 m	0.79 m	0.64 m	1.50 m
	0.90	2.87 m	1.72 m	1.38 m	2.21 m	1.32 m	1.06 m	1.79 m	1.08 m	0.86 m	1.51 m	0.91 m	0.72 m	1.70 m
	1.00	3.13 m	1.88 m	1.50 m	2.41 m	1.45 m	1.16 m	1.96 m	1.18 m	0.94 m	1.65 m	0.99 m	0.79 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		qp = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			q_p = 1.15 kN/m²			
		w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	w=-1.38 kN/m²	w=-2.30 kN/m²	w=-2.88 kN/m²	
Steel	**0.63**	1.87 m	1.12 m	0.90 m	1.52 m	0.91 m	0.73 m	1.28 m	0.77 m	0.61 m	1.06 m	0.63 m	0.51 m	1.60 m
	0.75	2.27 m	1.36 m	1.09 m	1.84 m	1.11 m	0.89 m	1.55 m	0.93 m	0.75 m	1.28 m	0.77 m	0.62 m	2.40 m
Aluminium	**0.70**	1.47 m	0.88 m	0.71 m	1.20 m	0.72 m	0.58 m	1.01 m	0.61 m	0.48 m	0.83 m	0.50 m	0.40 m	1.20 m
	0.80	1.94 m	1.16 m	0.93 m	1.57 m	0.94 m	0.76 m	1.32 m	0.79 m	0.64 m	1.09 m	0.66 m	0.53 m	1.50 m
	0.90	2.21 m	1.32 m	1.06 m	1.79 m	1.08 m	0.86 m	1.51 m	0.91 m	0.72 m	1.25 m	0.75 m	0.60 m	1.70 m
	1.00	2.41 m	1.45 m	1.16 m	1.96 m	1.18 m	0.94 m	1.65 m	0.99 m	0.79 m	1.36 m	0.82 m	0.65 m	1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		qp = 0.75 kN/m²			q_p = 0.90 kN/m²			q_p = 1.10 kN/m²			q_p = 1.30 kN/m²			
		w=-0.90 kN/m²	w=-1.50 kN/m²	w=-1.88 kN/m²	w=-1.08 kN/m²	w=-1.80 kN/m²	w=-2.25 kN/m²	w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	
Steel	**0.63**	1.62 m	0.97 m	0.78 m	1.35 m	0.81 m	0.65 m	1.11 m	0.66 m	0.53 m	0.94 m	0.56 m	0.45 m	1.60 m
	0.75	1.97 m	1.18 m	0.94 m	1.64 m	0.98 m	0.79 m	1.34 m	0.80 m	0.64 m	1.13 m	0.68 m	0.54 m	2.40 m
Aluminium	**0.70**	1.28 m	0.77 m	0.61 m	1.06 m	0.64 m	0.51 m	0.87 m	0.52 m	0.42 m	0.74 m	0.44 m	0.35 m	1.20 m
	0.80	1.68 m	1.01 m	0.81 m	1.40 m	0.84 m	0.67 m	1.14 m	0.69 m	0.55 m	0.97 m	0.58 m	0.46 m	1.50 m
	0.90	1.91 m	1.15 m	0.92 m	1.59 m	0.96 m	0.76 m	1.30 m	0.78 m	0.63 m	1.10 m	0.66 m	0.53 m	1.70 m
	1.00	2.09 m	1.25 m	1.00 m	1.74 m	1.04 m	0.84 m	1.42 m	0.85 m	0.68 m	1.21 m	0.72 m	0.58 m	1.90 m

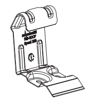
Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.

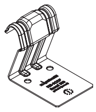


Speed 500

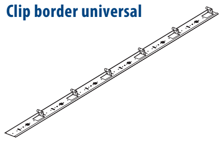
Standard clip



Turned clip



Clip border universal

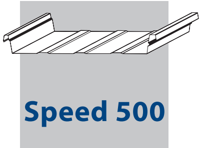


Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea — Clip distance (m) with			Wind zone 3 coasts and islands of Baltic Sea — Clip distance (m) with			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea — Clip distance (m) with			Wind zone 4 islands of North Sea — Clip distance (m) with			
material	thick-ness (mm)	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	H (standard area) $c_{pe.1} = -1.2$	G (edge area) $c_{pe.1} = -2.0$	F (corner area) $c_{pe.1} = -2.5$	max. span limit for accessibi-lity*
Height of building h ≤ 10.00 m														
		qp = 0.85 kN/m²			q_p = 1.05 kN/m²			q_p = 1.25 kN/m²			q_p = 1.40 kN/m²			
		w=-1.02 kN/m²	w=-1.70 kN/m²	w=-2.13 kN/m²	w=-1.26 kN/m²	w=-2.10 kN/m²	w=-2.63 kN/m²	w=-1.50 kN/m²	w=-2.50 kN/m²	w=-3.13 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²	
Steel	**0.63**	1.43 m	0.86 m	0.69 m	1.16 m	0.70 m	0.56 m	0.97 m	0.58 m	0.47 m	0.87 m	0.52 m	0.42 m	1.60 m
	0.75	1.74 m	1.04 m	0.83 m	1.40 m	0.84 m	0.67 m	1.18 m	0.71 m	0.57 m	1.05 m	0.63 m	0.51 m	2.40 m
Aluminium	**0.70**	1.13 m	0.68 m	0.54 m	0.91 m	0.55 m	0.44 m	0.77 m	0.46 m	0.37 m	0.68 m	0.41 m	0.33 m	1.20 m
	0.80	1.48 m	0.89 m	0.71 m	1.20 m	0.72 m	0.58 m	1.01 m	0.60 m	0.48 m	0.90 m	0.54 m	0.43 m	1.50 m
	0.90	1.69 m	1.01 m	0.81 m	1.37 m	0.82 m	0.66 m	1.15 m	0.69 m	0.55 m	1.02 m	0.61 m	0.49 m	1.70 m
	1.00	1.84 m	1.11 m	0.88 m	1.49 m	0.90 m	0.72 m	1.25 m	0.75 m	0.60 m	1.12 m	0.67 m	0.54 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		qp = 1.00 kN/m²			q_p = 1.20 kN/m²			q_p = 1.40 kN/m²						
		w=-1.20 kN/m²	w=-2.00 kN/m²	w=-2.50 kN/m²	w=-1.44 kN/m²	w=-2.40 kN/m²	w=-3.00 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²				
Steel	**0.63**	1.22 m	0.73 m	0.58 m	1.01 m	0.61 m	0.49 m	0.87 m	0.52 m	0.42 m				1.60 m
	0.75	1.48 m	0.89 m	0.71 m	1.23 m	0.74 m	0.59 m	1.05 m	0.63 m	0.51 m				2.40 m
Aluminium	**0.70**	0.96 m	0.58 m	0.46 m	0.80 m	0.48 m	0.38 m	0.68 m	0.41 m	0.33 m				1.20 m
	0.80	1.26 m	0.76 m	0.60 m	1.05 m	0.63 m	0.50 m	0.90 m	0.54 m	0.43 m				1.50 m
	0.90	1.43 m	0.86 m	0.69 m	1.19 m	0.72 m	0.57 m	1.02 m	0.61 m	0.49 m				1.70 m
	1.00	1.57 m	0.94 m	0.75 m	1.31 m	0.78 m	0.63 m	1.12 m	0.67 m	0.54 m				1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		qp = 1.10 kN/m²			q_p = 1.30 kN/m²			q_p = 1.55 kN/m²						
		w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	w=-1.86 kN/m²	w=-3.10 kN/m²	w=-3.88 kN/m²				
Steel	**0.63**	1.11 m	0.66 m	0.53 m	0.94 m	0.56 m	0.45 m	0.78 m	0.47 m	0.38 m				1.60 m
	0.75	1.34 m	0.80 m	0.64 m	1.13 m	0.68 m	0.54 m	0.95 m	0.57 m	0.46 m				2.40 m
Aluminium	**0.70**	0.87 m	0.52 m	0.42 m	0.74 m	0.44 m	0.35 m	0.62 m	0.37 m	0.30 m				1.20 m
	0.80	1.14 m	0.69 m	0.55 m	0.97 m	0.58 m	0.46 m	0.81 m	0.49 m	0.39 m				1.50 m
	0.90	1.30 m	0.78 m	0.63 m	1.10 m	0.66 m	0.53 m	0.92 m	0.55 m	0.44 m				1.70 m
	1,00	1,42 m	0,85 m	0,68 m	1,21 m	0,72 m	0,58 m	1,01 m	0,61 m	0,49 m				1,90 m

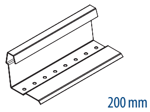
Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.

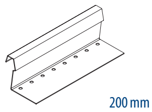
2.9.2 Spans/clip distances RIB-ROOF Speed 500



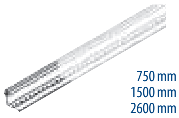
Directional clip



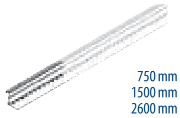
Turned directional clip



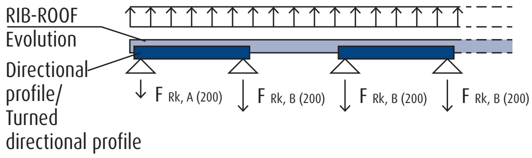
Directional profile[1)]



Turned directional profile[1)]



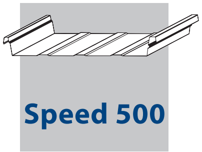
1) The holding bracket distance of a directional clip 200 or a turned directional clip 200 respectively, can be taken for each connection point of directional profiles and turned directional profiles with the substructure. As an example, the sketch shows the allocation of resistivity for directional profiles and turned directional profiles with two connection points (supports).



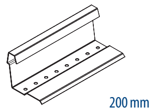
Wind loads according to DIN EN 1991-1-4/NA		Wind zone 1 inland			Wind zone 2 inland			Wind zone 3 inland			Wind zone 4 inland			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thickness (mm)	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	max. span limit for accessibility*
Height of building h ≤ 10.00 m														
		qp = 0.50 kN/m²			q_p = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			
		w=-0.60 kN/m²	w=-1.00 kN/m²	w=-1.25 kN/m²	w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	
Steel	**0.63**	3.83 m	2.30 m	1.84 m	2.95 m	1.77 m	1.42 m	2.40 m	1.44 m	1.15 m	2.02 m	1.21 m	0.97 m	1.60 m
	0.75	3.83 m	2.30 m	1.84 m	2.95 m	1.77 m	1.42 m	2.40 m	1.44 m	1.15 m	2.02 m	1.21 m	0.97 m	2.40 m
Aluminium	**0.70**	2.35 m	1.41 m	1.13 m	1.81 m	1.08 m	0.87 m	1.47 m	0.88 m	0.71 m	1.24 m	0.74 m	0.59 m	1.20 m
	0.80	3.07 m	1.84 m	1.47 m	2.36 m	1.42 m	1.13 m	1.92 m	1.15 m	0.92 m	1.61 m	0.97 m	0.77 m	1.50 m
	0.90	3.77 m	2.26 m	1.81 m	2.90 m	1.74 m	1.39 m	2.35 m	1.41 m	1.13 m	1.98 m	1.19 m	0.95 m	1.70 m
	1.00	4.35 m	2.61 m	2.09 m	3.35 m	2.01 m	1.61 m	2.72 m	1.63 m	1.31 m	2.29 m	1.37 m	1.10 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		qp = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			q_p = 1.15 kN/m²			
		w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	w=-1.38 kN/m²	w=-2.30 kN/m²	w=-2.88 kN/m²	
Steel	**0.63**	2.95 m	1.77 m	1.42 m	2.40 m	1.44 m	1.15 m	2.02 m	1.21 m	0.97 m	1.67 m	1.00 m	0.80 m	1.60 m
	0.75	2.95 m	1.77 m	1.42 m	2.40 m	1.44 m	1.15 m	2.02 m	1.21 m	0.97 m	1.67 m	1.00 m	0.80 m	2.40 m
Aluminium	**0.70**	1.81 m	1.08 m	0.87 m	1.47 m	0.88 m	0.71 m	1.24 m	0.74 m	0.59 m	1.02 m	0.61 m	0.49 m	1.20 m
	0.80	2.36 m	1.42 m	1.13 m	1.92 m	1.15 m	0.92 m	1.61 m	0.97 m	0.77 m	1.33 m	0.80 m	0.64 m	1.50 m
	0.90	2.90 m	1.74 m	1.39 m	2.35 m	1.41 m	1.13 m	1.98 m	1.19 m	0.95 m	1.64 m	0.98 m	0.79 m	1.70 m
	1.00	3.35 m	2.01 m	1.61 m	2.72 m	1.63 m	1.31 m	2.29 m	1.37 m	1.10 m	1.89 m	1.13 m	0.91 m	1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		qp = 0.75 kN/m²			q_p = 0.90 kN/m²			q_p = 1.10 kN/m²			q_p = 1.30 kN/m²			
		w=-0.90 kN/m²	w=-1.50 kN/m²	w=-1.88 kN/m²	w=-1.08 kN/m²	w=-1.80 kN/m²	w=-2.25 kN/m²	w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	
Steel	**0.63**	2.56 m	1.53 m	1.23 m	2.13 m	1.28 m	1.02 m	1.74 m	1.05 m	0.84 m	1.47 m	0.88 m	0.71 m	1.60 m
	0.75	2.56 m	1.53 m	1.23 m	2.13 m	1.28 m	1.02 m	1.74 m	1.05 m	0.84 m	1.47 m	0.88 m	0.71 m	2.40 m
Aluminium	**0.70**	1.57 m	0.94 m	0.75 m	1.31 m	0.78 m	0.63 m	1.07 m	0.64 m	0.51 m	0.90 m	0.54 m	0.43 m	1.20 m
	0.80	2.04 m	1.23 m	0.98 m	1.70 m	1.02 m	0.82 m	1.39 m	0.84 m	0.67 m	1.18 m	0.71 m	0.57 m	1.50 m
	0.90	2.51 m	1.51 m	1.21 m	2.09 m	1.26 m	1.00 m	1.71 m	1.03 m	0.82 m	1.45 m	0.87 m	0.70 m	1.70 m
	1.00	2.90 m	1.74 m	1.39 m	2.42 m	1.45 m	1.16 m	1.98 m	1.19 m	0.95 m	1.67 m	1.00 m	0.80 m	1.90 m

Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

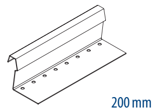
* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.



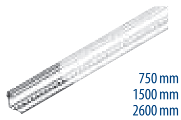
Directional clip



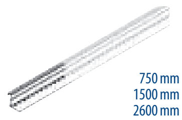
Turned directional clip



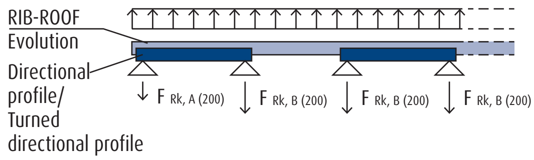
Directional profile[1)]



Turned directional profile[1)]



1) The holding bracket distance of a directional clip 200 or a turned directional clip 200 respectively, can be taken for each connection point of directional profiles and turned directional profiles with the substructure. As an example, the sketch shows the allocation of resistivity for directional profiles and turned directional profiles with two connection points (supports).



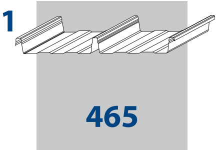
Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea			Wind zone 3 coasts and islands of Baltic Sea			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea			Wind zone 4 islands of North Sea			
		Clipabstand (m) bei			Clipabstand (m) bei			Clipabstand (m) bei			Clipabstand (m) bei			
material	thickness (mm)	H (standard area) $c_{pe.1}$ = -1.2	G (edge area) $c_{pe.1}$ = -2.0	F (corner area) $c_{pe.1}$ = -2.5	H (standard area) $c_{pe.1}$ = -1.2	G (edge area) $c_{pe.1}$ = -2.0	F (corner area) $c_{pe.1}$ = -2.5	H (standard area) $c_{pe.1}$ = -1.2	G (edge area) $c_{pe.1}$ = -2.0	F (corner area) $c_{pe.1}$ = -2.5	H (standard area) $c_{pe.1}$ = -1.2	G (edge area) $c_{pe.1}$ = -2.0	F (corner area) $c_{pe.1}$ = -2.5	max. span limit for accessibility*
Height of building h ≤ 10.00 m														
		qp = 0.85 kN/m²			q_p = 1.05 kN/m²			q_p = 1.25 kN/m²			q_p = 1.40 kN/m²			
		w=-1.02 kN/m²	w=-1.70 kN/m²	w=-2.13 kN/m²	w=-1.26 kN/m²	w=-2.10 kN/m²	w=-2.63 kN/m²	w=-1.50 kN/m²	w=-2.50 kN/m²	w=-3.13 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²	
Steel	**0.63**	2.25 m	1.35 m	1.08 m	1.83 m	1.10 m	0.88 m	1.53 m	0.92 m	0.74 m	1.37 m	0.82 m	0.66 m	1.60 m
	0.75	2.25 m	1.35 m	1.08 m	1.83 m	1.10 m	0.88 m	1.53 m	0.92 m	0.74 m	1.37 m	0.82 m	0.66 m	2.40 m
Aluminium	**0.70**	1.38 m	0.83 m	0.66 m	1.12 m	0.67 m	0.54 m	0.94 m	0.56 m	0.45 m	0.84 m	0.50 m	0.40 m	1.20 m
	0.80	1.80 m	1.08 m	0.87 m	1.46 m	0.88 m	0.70 m	1.23 m	0.74 m	0.59 m	1.10 m	0.66 m	0.53 m	1.50 m
	0.90	2.22 m	1.33 m	1.06 m	1.79 m	1.08 m	0.86 m	1.51 m	0.90 m	0.72 m	1.35 m	0.81 m	0.65 m	1.70 m
	1.00	2.56 m	1.54 m	1.23 m	2.07 m	1.24 m	0.99 m	1.74 m	1.04 m	0.84 m	1.55 m	0.93 m	0.75 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		qp = 1.00 kN/m²			q_p = 1.20 kN/m²			q_p = 1.40 kN/m²						
		w=-1.20 kN/m²	w=-2.00 kN/m²	w=-2.50 kN/m²	w=-1.44 kN/m²	w=-2.40 kN/m²	w=-3.00 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²				
Steel	**0.63**	1.92 m	1.15 m	0.92 m	1.60 m	0.96 m	0.77 m	1.37 m	0.82 m	0.66 m				1.60 m
	0.75	1.92 m	1.15 m	0.92 m	1.60 m	0.96 m	0.77 m	1.37 m	0.82 m	0.66 m				2.40 m
Aluminium	**0.70**	1.18 m	0.71 m	0.56 m	0.98 m	0.59 m	0.47 m	0.84 m	0.50 m	0.40 m				1.20 m
	0.80	1.53 m	0.92 m	0.74 m	1.28 m	0.77 m	0.61 m	1.10 m	0.66 m	0.53 m				1.50 m
	0.90	1.88 m	1.13 m	0.90 m	1.57 m	0.94 m	0.75 m	1.35 m	0.81 m	0.65 m				1.70 m
	1.00	2.18 m	1.31 m	1.04 m	1.81 m	1.09 m	0.87 m	1.55 m	0.93 m	0.75 m				1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		qp = 1.10 kN/m²			q_p = 1.30 kN/m²			q_p = 1.55 kN/m²						
		w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	w=-1.86 kN/m²	w=-3.10 kN/m²	w=-3.88 kN/m²				
Steel	**0.63**	1.74 m	1.05 m	0.84 m	1.47 m	0.88 m	0.71 m	1.24 m	0.74 m	0.59 m				1.60 m
	0.75	1.74 m	1.05 m	0.84 m	1.47 m	0.88 m	0.71 m	1.24 m	0.74 m	0.59 m				2.40 m
Aluminium	**0.70**	1.07 m	0.64 m	0.51 m	0.90 m	0.54 m	0.43 m	0.76 m	0.45 m	0.36 m				1.20 m
	0.80	1.39 m	0.84 m	0.67 m	1.18 m	0.71 m	0.57 m	0.99 m	0.59 m	0.47 m				1.50 m
	0.90	1.71 m	1.03 m	0.82 m	1.45 m	0.87 m	0.70 m	1.22 m	0.73 m	0.58 m				1.70 m
	1.00	1.98 m	1.19 m	0.95 m	1.67 m	1.00 m	0.80 m	1.40 m	0.84 m	0.67 m				1.90 m

Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

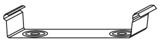
* eventual waves/bulges arising from inspection/installation of e.g. lathing or Z-profile, do not deem any defect.

2.10 Spans/clip distances RIB-ROOF 465

2.10.1



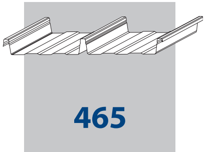
Standard clip



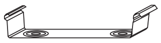
Wind loads according to DIN EN 1991-1-4/NA		Windzone 1 inland			Windzone 2 inland			Windzone 3 inland			Windzone 4 inland			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thick-ness (mm)	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	max. span limit for accessi-bility*
Height of building $h \leq 10.00$ m														
		qp = 0.50 kN/m²			q_p = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			
		w=-0.60 kN/m²	w=-1.00 kN/m²	w=-1.25 kN/m²	w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	
Steel	**0.63**	3.71 m	2.23 m	1.78 m	2.85 m	1.71 m	1.37 m	2.32 m	1.39 m	1.11 m	1.95 m	1.17 m	0.94 m	1.60 m
	0.75	4.21 m	2.53 m	2.02 m	3.24 m	1.94 m	1.55 m	2.63 m	1.58 m	1.26 m	2.21 m	1.33 m	1.06 m	2.40 m
Aluminium	**0.70**	1.51 m	0.91 m	0.72 m	1.16 m	0.70 m	0.56 m	0.94 m	0.57 m	0.45 m	0.79 m	0.48 m	0.38 m	1.20 m
	0.80	1.97 m	1.18 m	0.94 m	1.51 m	0.91 m	0.73 m	1.23 m	0.74 m	0.59 m	1.04 m	0.62 m	0.50 m	1.50 m
	0.90	2.21 m	1.33 m	1.06 m	1.70 m	1.02 m	0.82 m	1.38 m	0.83 m	0.66 m	1.16 m	0.70 m	0.56 m	1.70 m
	1.00	2.46 m	1.48 m	1.18 m	1.89 m	1.13 m	0.91 m	1.54 m	0.92 m	0.74 m	1.29 m	0.78 m	0.62 m	1.90 m
Height of building $h > 10.00$ m ≤ 18.00 m														
		qp = 0.65 kN/m²			q_p = 0.80 kN/m²			q_p = 0.95 kN/m²			q_p = 1.15 kN/m²			
		w=-0.78 kN/m²	w=-1.30 kN/m²	w=-1.63 kN/m²	w=-0.96 kN/m²	w=-1.60 kN/m²	w=-2.00 kN/m²	w=-1.14 kN/m²	w=-1.90 kN/m²	w=-2.38 kN/m²	w=-1.38 kN/m²	w=-2.30 kN/m²	w=-2.88 kN/m²	
Steel	**0.63**	2.85 m	1.71 m	1.37 m	2.32 m	1.39 m	1.11 m	1.95 m	1.17 m	0.94 m	1.61 m	0.97 m	0.77 m	1.60 m
	0.75	3.24 m	1.94 m	1.55 m	2.63 m	1.58 m	1.26 m	2.21 m	1.33 m	1.06 m	1.83 m	1.10 m	0.88 m	2.40 m
Aluminium	**0.70**	1.16 m	0.70 m	0.56 m	0.94 m	0.57 m	0.45 m	0.79 m	0.48 m	0.38 m	0.66 m	0.39 m	0.31 m	1.20 m
	0.80	1.51 m	0.91 m	0.73 m	1.23 m	0.74 m	0.59 m	1.04 m	0.62 m	0.50 m	0.86 m	0.51 m	0.41 m	1.50 m
	0.90	1.70 m	1.02 m	0.82 m	1.38 m	0.83 m	0.66 m	1.16 m	0.70 m	0.56 m	0.96 m	0.58 m	0.46 m	1.70 m
	1.00	1.89 m	1.13 m	0.91 m	1.54 m	0.92 m	0.74 m	1.29 m	0.78 m	0.62 m	1.07 m	0.64 m	0.51 m	1.90 m
Height of building $h > 18.00$ m ≤ 25.00 m														
		qp = 0.75 kN/m²			q_p = 0.90 kN/m²			q_p = 1.10 kN/m²			q_p = 1.30 kN/m²			
		w=-0.90 kN/m²	w=-1.50 kN/m²	w=-1.88 kN/m²	w=-1.08 kN/m²	w=-1.80 kN/m²	w=-2.25 kN/m²	w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	
Steel	**0.63**	2.47 m	1.48 m	1.19 m	2.06 m	1.24 m	0.99 m	1.69 m	1.01 m	0.81 m	1.43 m	0.86 m	0.68 m	1.60 m
	0.75	2.81 m	1.68 m	1.35 m	2.34 m	1.40 m	1.12 m	1.91 m	1.15 m	0.92 m	1.62 m	0.97 m	0.78 m	2.40 m
Aluminium	**0.70**	1.01 m	0.60 m	0.48 m	0.84 m	0.50 m	0.40 m	0.69 m	0.41 m	0.33 m	0.58 m	0.35 m	0.28 m	1.20 m
	0.80	1.31 m	0.79 m	0.63 m	1.09 m	0.66 m	0.52 m	0.89 m	0.54 m	0.43 m	0.76 m	0.45 m	0.36 m	1.50 m
	0.90	1.47 m	0.88 m	0.71 m	1.23 m	0.74 m	0.59 m	1.00 m	0.60 m	0.48 m	0.85 m	0.51 m	0.41 m	1.70 m
	1.00	1.64 m	0.98 m	0.79 m	1.37 m	0.82 m	0.66 m	1.12 m	0.67 m	0.54 m	0.95 m	0.57 m	0.45 m	1.90 m

Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* installation-related, e.g. with lathing or Z-profile



Standard clip



Wind loads according to DIN EN 1991-1-4/NA		Wind zone 2 coasts and islands of Baltic Sea			Wind zone 3 coasts and islands of Baltic Sea			Wind zone 4 coasts of North and Baltic Sea as well as islands of Baltic Sea			Wind zone 4 islands of North Sea			
		Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			Clip distance (m) with			
material	thick-ness (mm)	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	H (standard area) $c_{pe.1}=-1.2$	G (edge area) $c_{pe.1}=-2.0$	F (corner area) $c_{pe.1}=-2.5$	max. span limit for accessi-bility*
Height of building h ≤ 10.00 m														
		qp = 0.85 kN/m²			q_p = 1.05 kN/m²			q_p = 1.25 kN/m²			q_p = 1.40 kN/m²			
		w=-1.02 kN/m²	w=-1.70 kN/m²	w=-2.13 kN/m²	w=-1.26 kN/m²	w=-2.10 kN/m²	w=-2.63 kN/m²	w=-1.50 kN/m²	w=-2.50 kN/m²	w=-3.13 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²	
Steel	**0.63**	2.18 m	1.31 m	1.05 m	1.77 m	1.06 m	0.85 m	1.48 m	0.89 m	0.71 m	1.32 m	0.79 m	0.64 m	1.60 m
	0.75	2.48 m	1.49 m	1.19 m	2.00 m	1.20 m	0.96 m	1.68 m	1.01 m	0.81 m	1.50 m	0.90 m	0.72 m	2.40 m
Aluminium	**0.70**	0.89 m	0.53 m	0.43 m	0.72 m	0.43 m	0.34 m	0.60 m	0.36 m	0.29 m	0.54 m	0.32 m	0.26 m	1.20 m
	0.80	1.16 m	0.69 m	0.56 m	0.94 m	0.56 m	0.45 m	0.79 m	0.47 m	0.38 m	0.70 m	0.42 m	0.34 m	1.50 m
	0.90	1.30 m	0.78 m	0.62 m	1.05 m	0.63 m	0.50 m	0.88 m	0.53 m	0.42 m	0.79 m	0.47 m	0.38 m	1.70 m
	1.00	1.45 m	0.87 m	0.69 m	1.17 m	0.70 m	0.56 m	0.98 m	0.59 m	0.47 m	0.88 m	0.53 m	0.42 m	1.90 m
Height of building h > 10.00 m ≤ 18.00 m														
		qp = 1.00 kN/m²			q_p = 1.20 kN/m²			q_p = 1.40 kN/m²						
		w=-1.20 kN/m²	w=-2.00 kN/m²	w=-2.50 kN/m²	w=-1.44 kN/m²	w=-2.40 kN/m²	w=-3.00 kN/m²	w=-1.68 kN/m²	w=-2.80 kN/m²	w=-3.50 kN/m²				
Steel	**0.63**	1.85 m	1.11 m	0.89 m	1.55 m	0.93 m	0.74 m	1.32 m	0.79 m	0.64 m				1.60 m
	0.75	2.10 m	1.26 m	1.01 m	1.75 m	1.05 m	0.84 m	1.50 m	0.90 m	0.72 m				2.40 m
Aluminium	**0.70**	0.75 m	0.45 m	0.36 m	0.63 m	0.38 m	0.30 m	0.54 m	0.32 m	0.26 m				1.20 m
	0.80	0.98 m	0.59 m	0.47 m	0.82 m	0.49 m	0.39 m	0.70 m	0.42 m	0.34 m				1.50 m
	0.90	1.10 m	0.66 m	0.53 m	0.92 m	0.55 m	0.44 m	0.79 m	0.47 m	0.38 m				1.70 m
	1.00	1.23 m	0.74 m	0.59 m	1.02 m	0.61 m	0.49 m	0.88 m	0.53 m	0.42 m				1.90 m
Height of building h > 18.00 m ≤ 25.00 m														
		qp = 1.10 kN/m²			q_p = 1.30 kN/m²			q_p = 1.55 kN/m²						
		w=-1.32 kN/m²	w=-2.20 kN/m²	w=-2.75 kN/m²	w=-1.56 kN/m²	w=-2.60 kN/m²	w=-3.25 kN/m²	w=-1.86 kN/m²	w=-3.10 kN/m²	w=-3.88 kN/m²				
Steel	**0.63**	1.69 m	1.01 m	0.81 m	1.43 m	0.86 m	0.68 m	1.20 m	0.72 m	0.57 m				1.60 m
	0.75	1.91 m	1.15 m	0.92 m	1.62 m	0.97 m	0.78 m	1.36 m	0.81 m	0.65 m				2.40 m
Aluminium	**0.70**	0.69 m	0.41 m	0.33 m	0.58 m	0.35 m	0.28 m	0.49 m	0.29 m	0.23 m				1.20 m
	0.80	0.89 m	0.54 m	0.43 m	0.76 m	0.45 m	0.36 m	0.63 m	0.38 m	0.30 m				1.50 m
	0.90	1.00 m	0.60 m	0.48 m	0.85 m	0.51 m	0.41 m	0.71 m	0.43 m	0.34 m				1.70 m
	1.00	1.12 m	0.67 m	0.54 m	0.95 m	0.57 m	0.45 m	0.79 m	0.48 m	0.38 m				1.90 m

Table with max. spans and clip distances (central axis) for enclosed halls, e.g. double pitch roof up to 5° roof pitch.

* installation-related, e.g. with lathing or Z-profile

Span limits with titanium zinc and copper

The maximum span limit of accessibility with titanium zinc is 0.60 m for single-span and multi-span supports. Fully-supported or appropriate substructures are necessary. The maximum span limit of accessibility with copper is 1.20 m.

We support you when determining object-related clip distances (or span limits). The extraction value of the chosen clip in each substructure has to be checked. Please contact us.

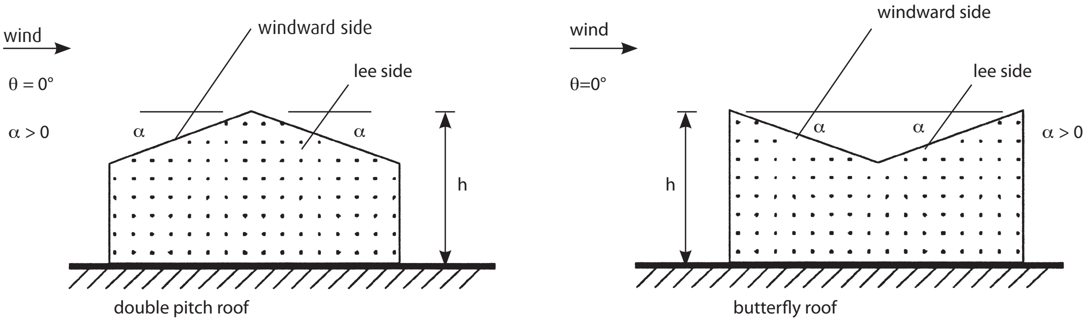
Extract of DIN EN 1991-1-4:2010-12, EN 1991-1-4:2005 + A1:2010 + AC:2010 (D)

Picture 7.8 – dividing of roof area with double pitch and butterfly roofs

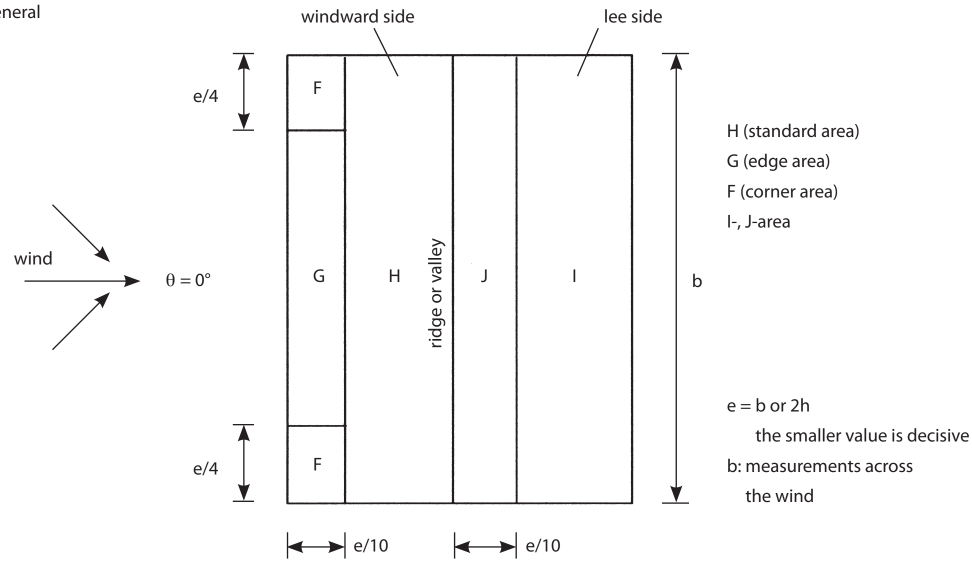
Wind loads according to DIN EN 1991-1-4

The wind loads have been set according to DIN EN 1991-1-4, (version 2010-12), table 7.4 – external pressure coefficient for double pitch roof with a slope up to 5° for enclosed halls, H (normal area) with cpe, 1=-1.2. For the evidence of the clip connection higher wind load coefficients for G (side areas) with cpe, 1=-2.0 and F (edge area) with cpe,1=-2.5 have been considered in addition.

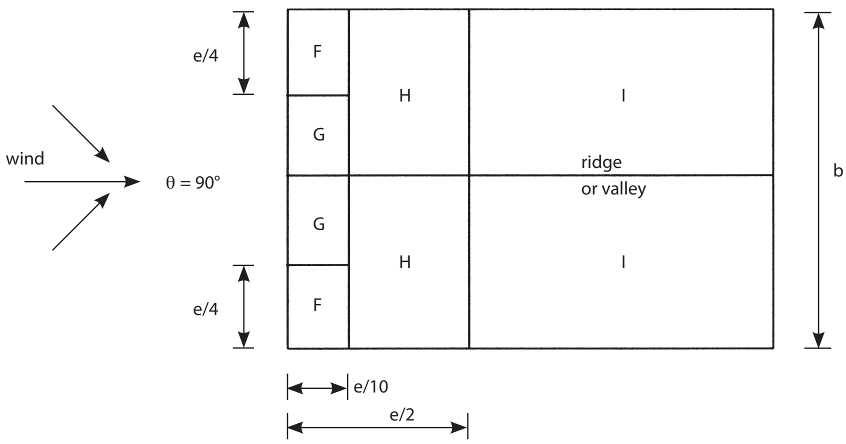
Depending on the building geometry according to DIN EN 1991-1-4, image 7.8 the width of G (side areas) and F (edge area) e/10 and a length of F (edge area) e/4, in which for e=b or 2/h the minor value is decisive.

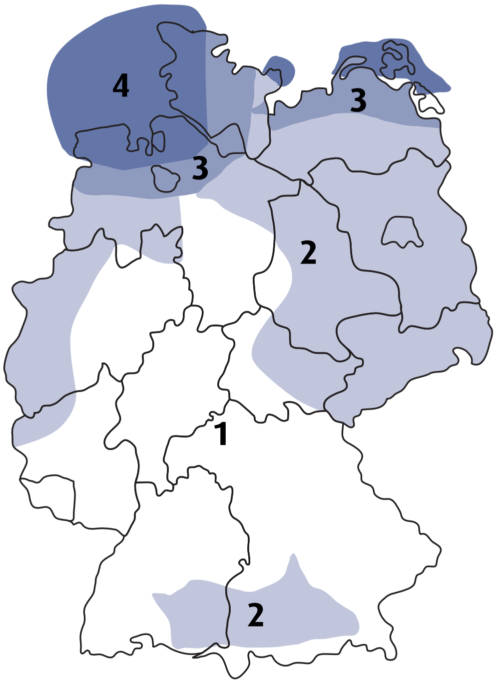


(a) in general



(b) direction of flow θ = 0°
or (c) direction of flow θ = 90°

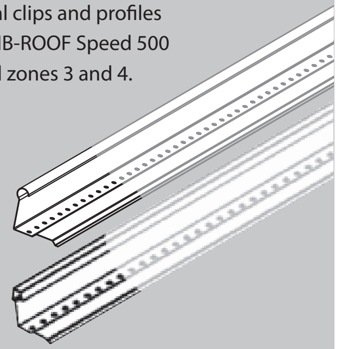




Wind zone	$v_{b,0}$	$q_{b,0}$
WZ 1	22,5 m/s	0,32 kN/m²
WZ 2	25,0 m/s	0,39 kN/m²
WZ 3	27,5 m/s	0,47 kN/m²
WZ 4	30,0 m/s	0,56 kN/m²

The use of our directional clips and profiles RIB-ROOF Evolution or RIB-ROOF Speed 500 is recommended in wind zones 3 and 4.

Contact us.



3.1 RIB-ROOF Evolution / RIB-ROOF Speed 500

3.1.1 Installation with sliding clips

Straight profiled sheets with standard clip/directional clip

Film "Installation Principle RIB-ROOF Evolution Sliding Standing Seam Roof with Directional Clips on Wooden Lathing"

Discover within two minutes how to install RIB-ROOF Evolution with straight profiled sheets and directional clips.
http://install-evolution-wooden.zambelli.com

Film "Installation Principle RIB-ROOF SPEED 500"

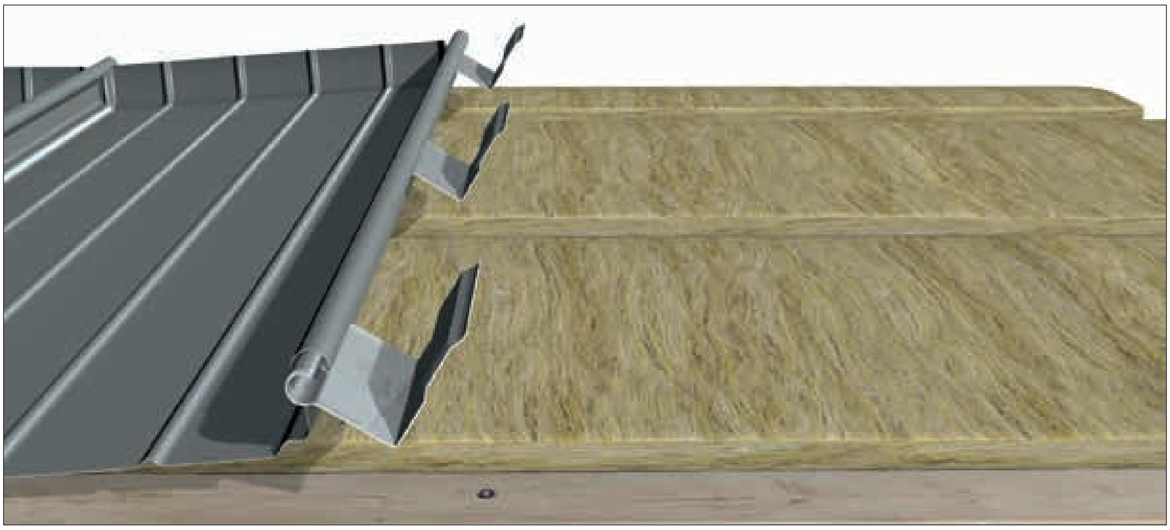
Discover within two minutes how to install RIB-ROOF Speed 500 with straight profiled sheets and standard clips.
http://install-speed500.zambelli.com

1. Place the first row of clips

Align the clips along the verge and fasten them with rivets or screws which are approved by Building Authorities (chapter 1.4.2) on the substructure. Additional pre-assembling isn't necessary. The clip distances depend on data specifically for each building and wind load (refer to chapter 2.7). Please pay attention to the fact that clips have to be fastened only with screws which are fully-threaded.

2. Insert the first profiled sheet and place next row of clips

Push the small rib of the first profiled sheet into the clips. Then swivel the profiled sheet onto the substructure. Each profiled sheet is going to be secured with a fixed point in order to avoid sliding down (refer to chapter 3.1.3). The folding up (only possible with RIB-ROOF Speed 500) or down of bottom booms can be done either at our factory or on site.



The position of the sliding clips (standard clips/directional clips) is determined by the profiled sheet width.

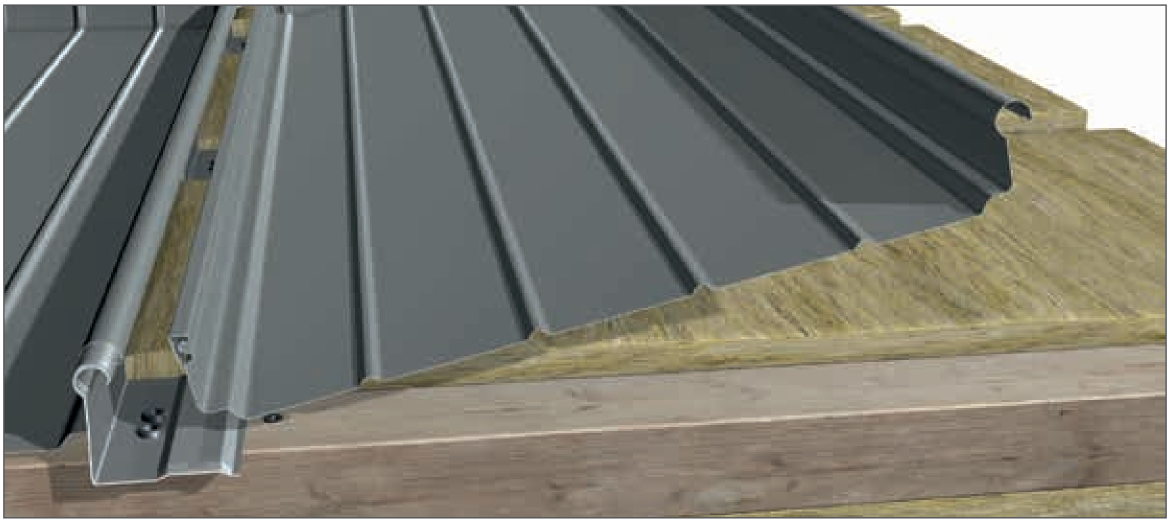
The position of the next row of clips results from the width of the profiled sheet. Therefore, pre-assembling and aligning of clips by means of plumb lines isn't necessary. Insert the sliding clip with a simple turn of the hand into the large rib. Then swivel, click into the rib and fasten it on the substructure use an assembly jig to adjust the construction width.

The sliding clip clicks into the rib and now, it can be fastened.

3. Insert the next profiled sheet

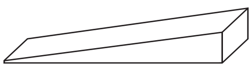
Swivel the next profiled sheet with its small rib under the clip and the large seam. Then swivel downwards and click-into-place (clip). Time-consuming zipping of profiled sheets isn't necessary.

RIB-ROOF Evolution and RIB-ROOF Speed 500 are reinforced in the eaves by joining the bottom booms to an eaves angle. (chapter 4.3).



The second profiled sheet is swivelled under the sliding clip...

... and through the clicking-into-place mechanism, a permanent profiled sheet connection is guaranteed.



If the RIB-ROOF Speed 500 profiled sheets eventually have to be opened after installation (e.g. when fitting in roof penetrations later), you can do so by using a wedge out of hard plastics (available from Zambelli).

Curved profiled sheets with turned sliding clip

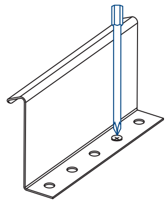
Film “Installation Principle RIB-ROOF Evolution Curved Profiled Sheets with Turned Directional Clips 70 on Wooden Counter-/transverse Lathing”

Discover within two minutes how to install RIB-ROOF Evolution with curved profiled sheets and turned directional clips. http://install-evolution-curved-wooden.zambelli.com

Film “Installation Principle RIB-ROOF Speed 500 Curved with Turned Standard Clips on Wooden Counter-/transverse Lathing”

Discover within two minutes how to install RIB-ROOF Speed 500 with curved profiled sheets and turned clips. http://install-speed500-curved.zambelli.com

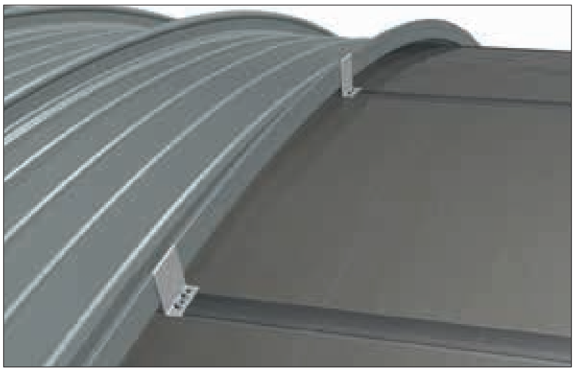
1. Place the first row of clips and click profiled sheet into place
Align turned clips along the verge, e.g. by means of a line. Set the first profiled sheet onto the turned clips and press it onto the profiled sheet seam. If you have installed them correctly, you can hear it click when pressing the profiled sheet into the clip.



fix turned clips for RIB-ROOF Evolution with extended screwdriver bits

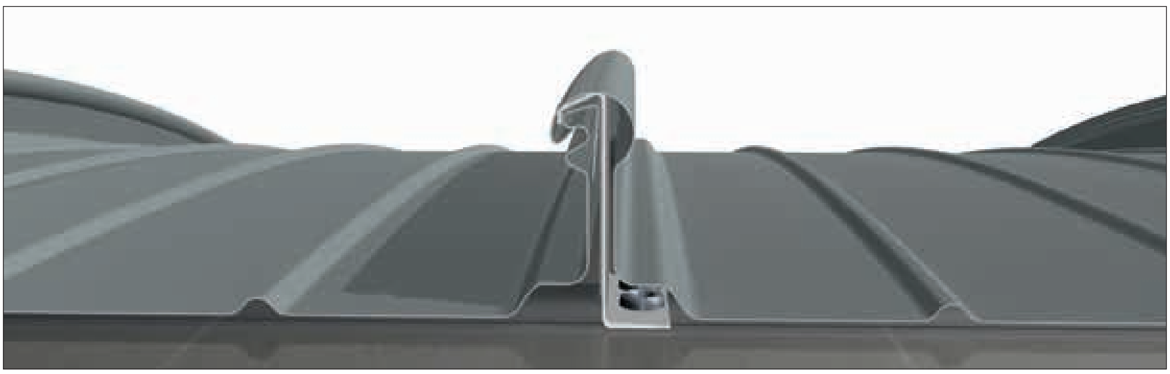
Curved profiled sheets are installed with turned clips.

2. Insert the next row of clips
The next turned clips will be set on the seam of the previously set profiled sheet and then fastened.



Through the profiled sheet seam turned clips have a firm hold.

3. Click-in the next profiled sheet
Set the next profiled sheet again onto the turned clips and press on the profiled sheet seam. If you have installed them correctly, you can hear it click when pressing the profiled sheet into the clip.

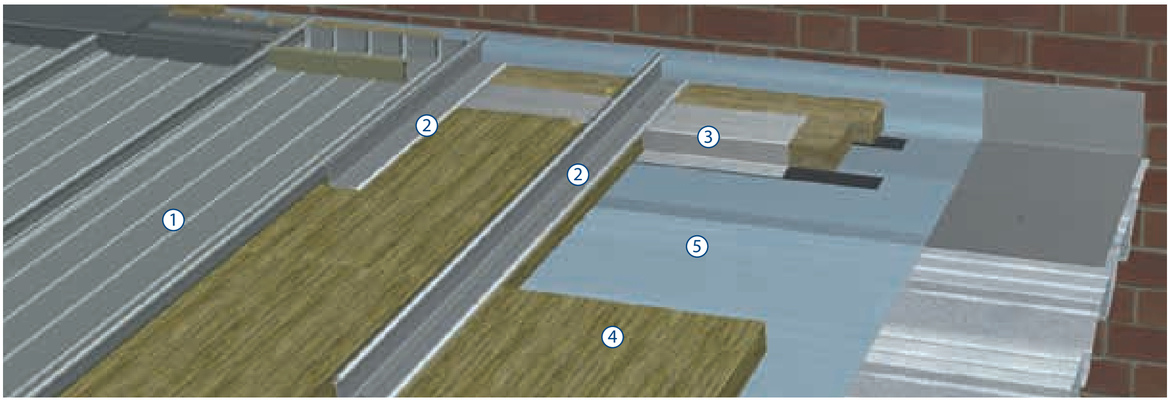


3.1.2 Installation on fully fully-supported insulation

3.1.2.1 RIB-ROOF Evolution with directional profile 750 on rigid insulation boards

Film "Installation Principle RIB-ROOF Evolution with Directional Profile 750 on Rigid Insulation Boards"

Discover within two minutes how to install RIB-ROOF Evolution with directional profile.
http://install-evolution-directional-profile.zambelli.com



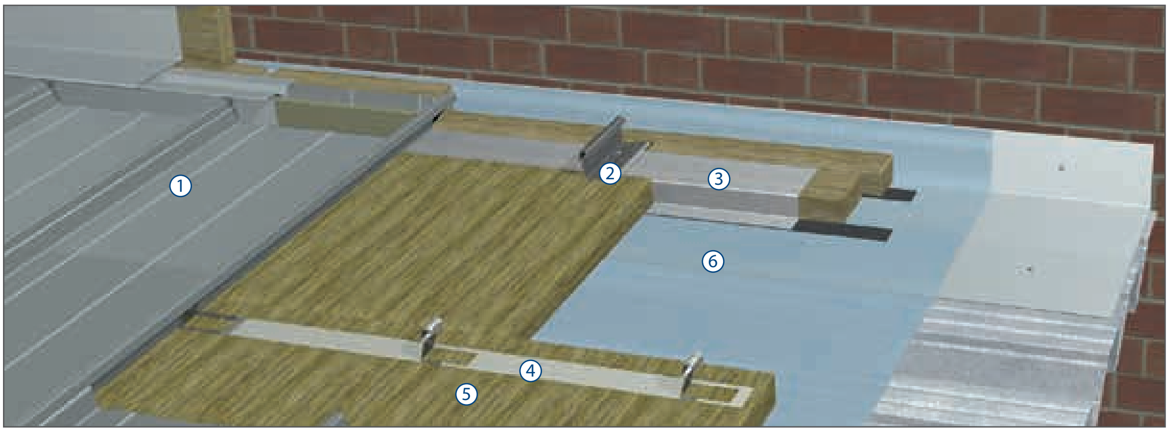
Trapezodial profile to eaves area

1 RIB-ROOF Evolution/RIB-ROOF Speed 500
2 Direcotional profiles
3 Hat profile
4 Rigid insulation board
5 Vapour barrier membrane

3.1.2.2 RIB-ROOF Speed 500 with flat clip border on rigid insulation boards

Film "Installation Principle RIB-ROOF SPEED 500 clip border universal on Rigid Insulation Boards"

Discover within two minutes how to install RIB-ROOF Speed 500 with clip border.
http://install-speed500-clipborder.zambelli.com



Trapezoidal profile parallel to eaves area*

1 RIB-ROOF Speed 500
2 Directional clip 1.0 x 200 mm as a fixed point
3 Hat profile
4 clip border universal
5 Rigid insulation board
6 Vapour barrier membrane

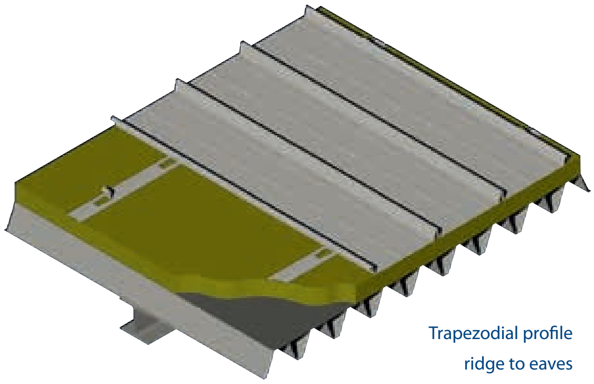
RIB-ROOF Speed 500 can alternatively be installed on fully-bonded supports. Another alternative apart from wooden lathing is a pressure-resistant and rigid insulation board (application type WD). The installation of profiled sheets is carried out either on distance profiles, which correspond to the thickness of the thermal insulation, or on clip border universal, which are fixed directly on the supporting structure. When installing thermal plates, open joins have to be avoided. This carrying out is also applicable with RIB-ROOF 465 when using the so-called pressure-distributing profiles.

* A regular offsetting of the clip borders can be necessary due to statically reasons.

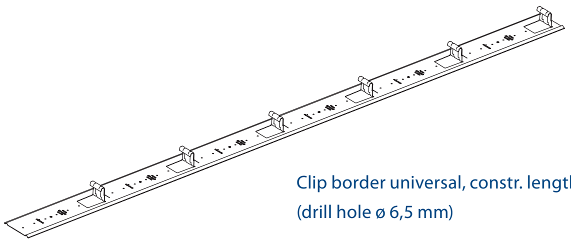
Field of applications for the Clip border Universal RIB-ROOF Speed 500:

Use the Clip border Universal on fully-bonded supports, e.g. on wooden lathing or rigid insulation boards. The Clip border Universal is fastened to the substrate with centrally positioned screws, which should be distributed evenly along the length of the Clip border as closely to the clips.
Select the number of screws according to static requirements and local conditions. Select the number of screws according to static requirements and local conditions. Observe the specifications in the screw recommendations. The screw heads disappear into the profile of the clip strip.

No milling or reworking of the substrate is necessary.



Trapezodial profile
ridge to eaves

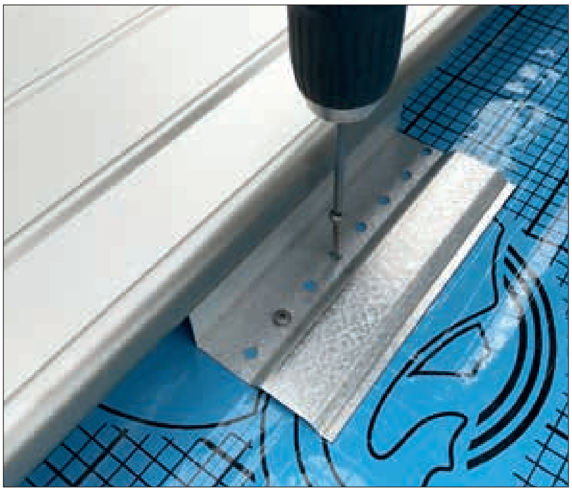


Clip border universal, constr. length 3 m
(drill hole ø 6,5 mm)

3.1.3 Fixed point options

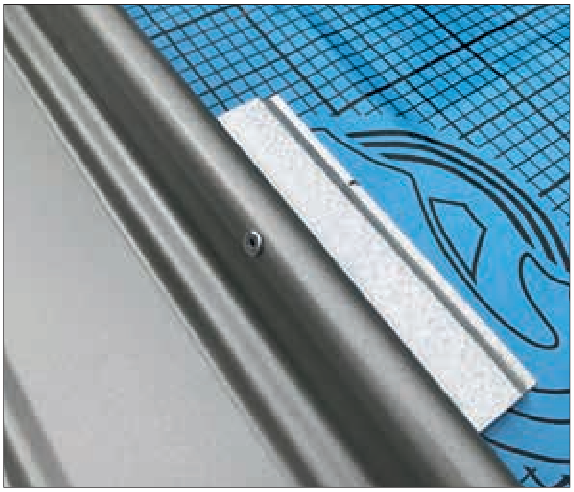
"Standard"

Assembly sequence with directional clips 200: sheet, clip, rivet, sheet



1. Place a directional clip 200 mm in the fixed point area

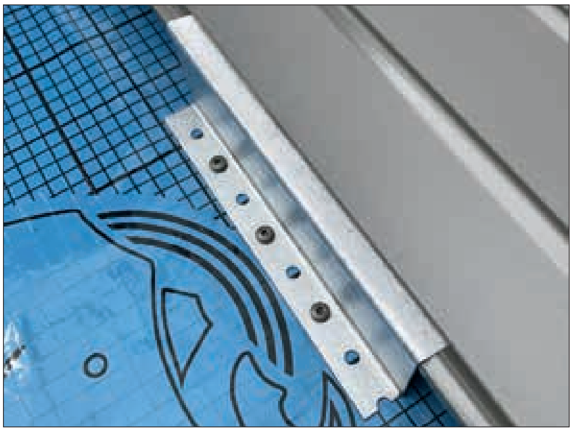
2. Drill a lateral hole on the circular seam at an angle of approx. 45°



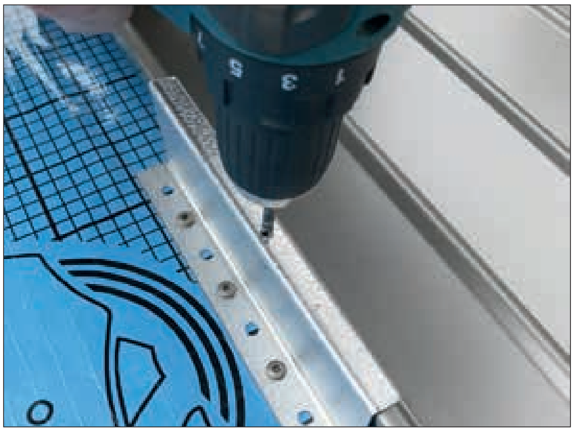
3. Fix it with the help of an already given number of the closed end blind rivets 4.8 x 8.0 mm

4. Finally, swivel in the next profiled sheet

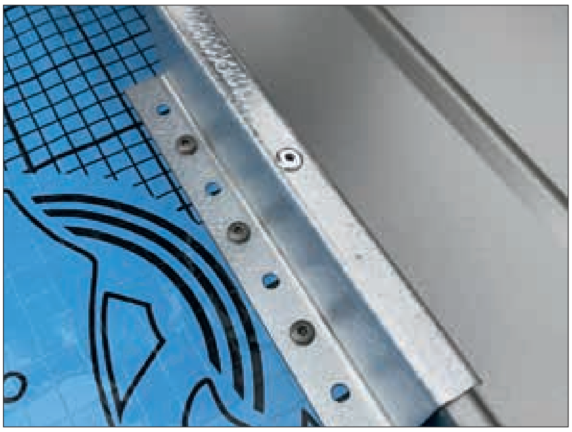
Assembly sequence with turned directional clips 200: sheet, clip, rivet, sheet



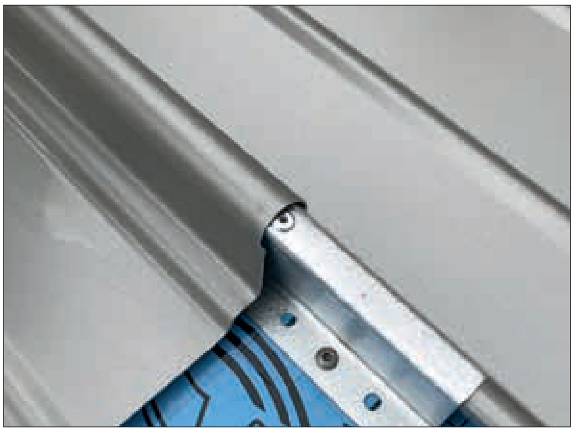
1. Place a turned directional clip 200 mm in the fixed point area



2. Drill a hole perpendicularly at the top of the turned directional clip



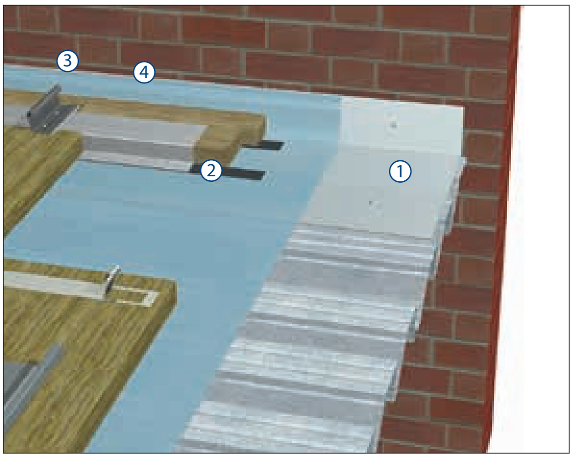
3. Fix it with the help of an already given number of the closed end blind rivets 4.8 x 8.0 mm



4. Finally, place the next profiled sheet onto the turned directional clip and press it

Roof pitches < 15°

Profiled sheets up to approx. 20 m, roof pitches < 15° and normal snow loads, its retaining bracket shoulder at ridge is fastened by means of a cup blind rivet at side (Ø 4.8 mm x length 8 mm, truss head 9.5 mm).



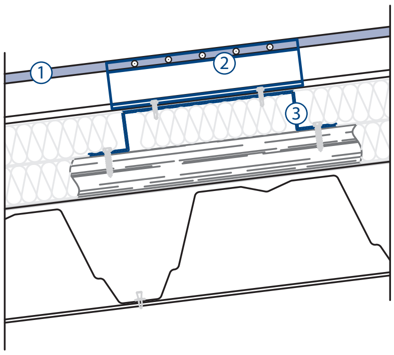
The dilatation of profiled sheets from the fixed point to the ridge has to be considered when carrying out ridge caps. We are at your disposal for informing you about a sliding ridge option with directional profile and extended closure when intending to install long profiled sheets.

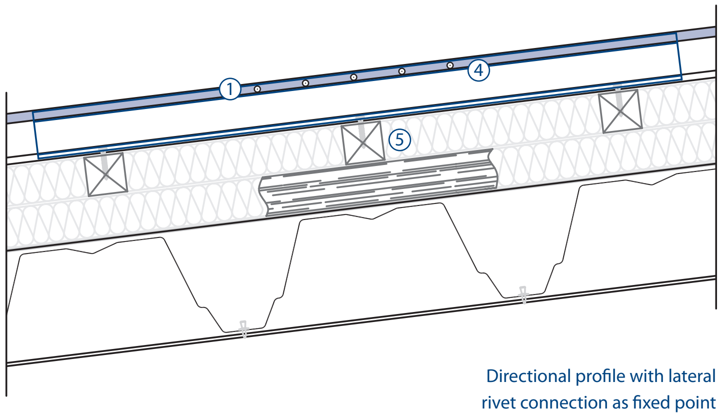
Roof pitches > 15°

With roof pitches > 15°, high snow loads and sheet lengths of more than approx. 20 m and a height of thermal insulation ≥ 160 mm, please contact us in advance so that we can plan the necessary amount of fixed-point rivet connection with special constructions, e.g. directional clip/profile or standard clip on hat profile.

1 Edge bracing
2 Vapour barrier membrane
3 Directional clip 1.0 x 200 mm as fixed point
4 Hat profile

Tip: Loads of fixed points have to be diverted into the substructure.

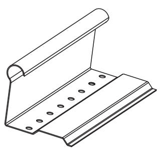




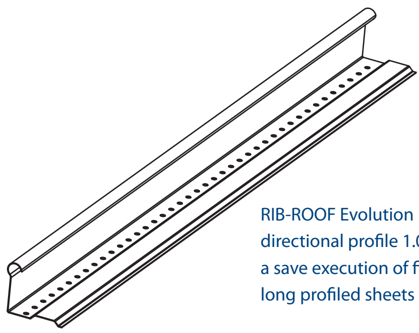
Directional profile with lateral rivet connection as fixed point

① RIB-ROOF
② Directional clip 1.0 x 200 mm as fixed point riveted with profiled sheet
③ Hat profile

④ Directional clip 1.0 x 750 mm as fixed point riveted with profiled sheet
⑤ Wooden counter-/transverse lathing



RIB-ROOF Evolution directional clip 1.0 x 200 mm as fixed point

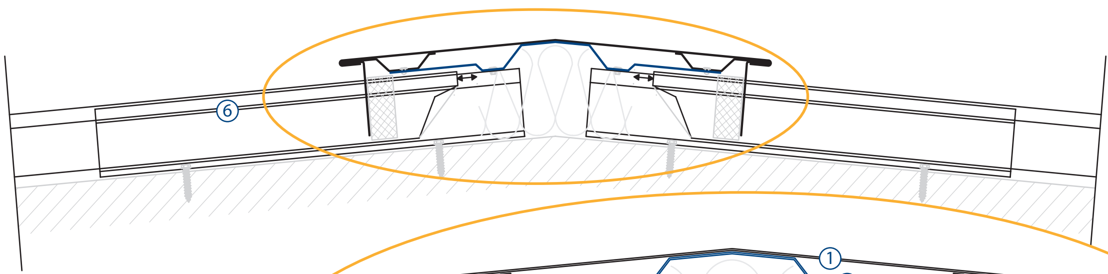


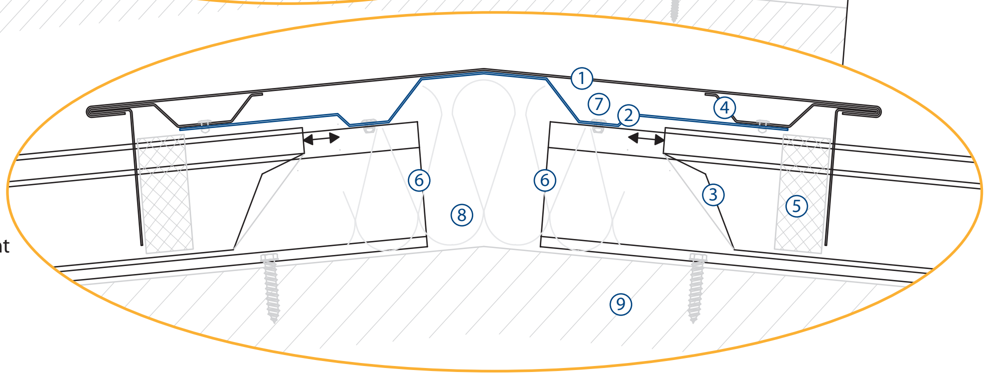
RIB-ROOF Evolution directional profile 1.0 x 750 mm for a save execution of fixed points with long profiled sheets

3.1.4 Sliding ridge for ultra long profiled sheets

We recommend a "sliding ridge solution" with directional profile when intending to install ultra long profiled sheets. We can deliver the sliding ridge solution as package incl. the necessary directional profiles, closures and ridge caps.

Example: 100 m long profiled sheets made out of aluminium have a dilatation of approx. 40 mm in case the fixed point is installed at an approx. 1/3 of the length of the sheets. The material expansion has to be absorbed by the ridge cap. We are pleased to support you for your individual project.





① Ridge cap
② Holding sheet
③ RIB-ROOF bottom boom turned-up at seam height
④ Closure
⑤ Profile filler
⑥ Directional profile
⑦ Sealing rivets
⑧ Cavity with thermal insulation

3.2 RIB-ROOF 465

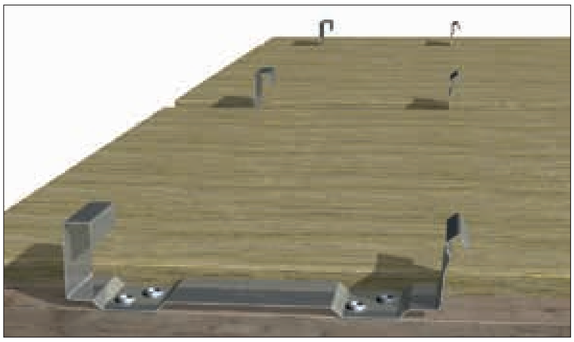
Installation with sliding clips

Straight profiled sheets with standard clips

Film "Installation Principle RIB-ROOF 465 with Standard Clips on Wooden Counter-/transverse Lathing"

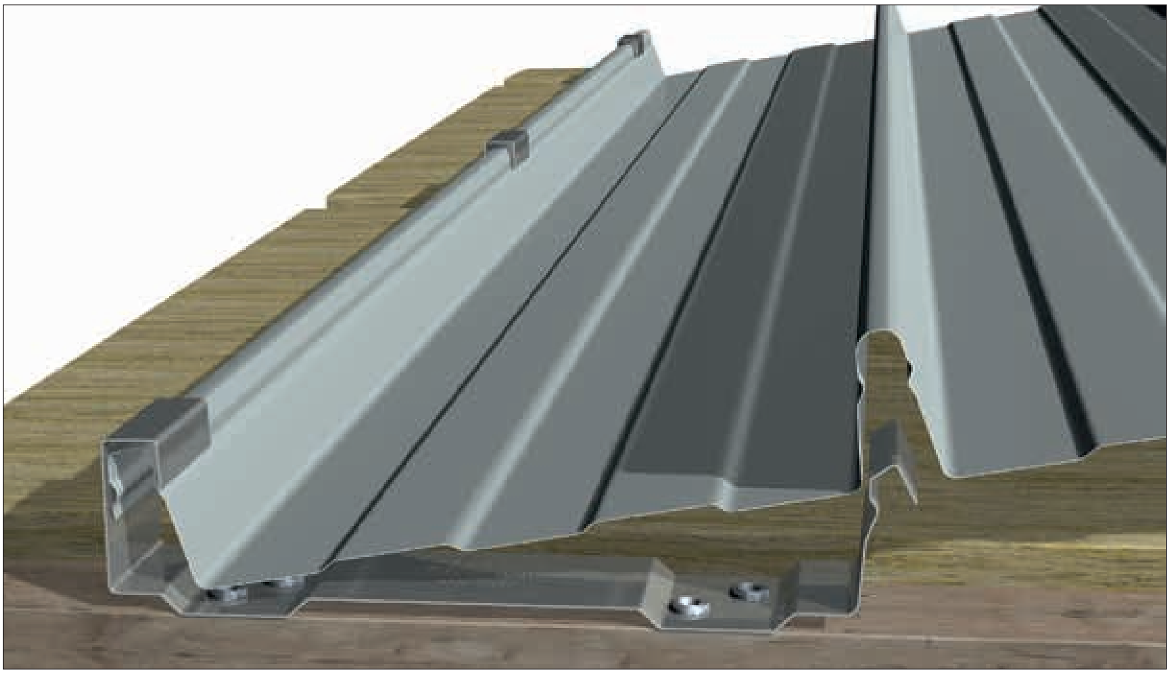
Discover within two minutes how to install RIB-ROOF 465 with straight profiled sheets and standard clips.
http://install-465.zambelli.com

1. Place the first row of clips
Align the clips (start or standard clips) along the verge and fasten them with rivets and screws approved by Construction Authorities (chapter 1.3.2). Further pre-assembling of sliding clips isn't necessary. The sliding clip distances depend on project specific data (span limits/clip distances for enclosed halls, refer to chapter 2.8). Please generally pay attention to a higher wind load in edge and corner areas



The first row of sliding clips with start clips is aligned along the verge side.

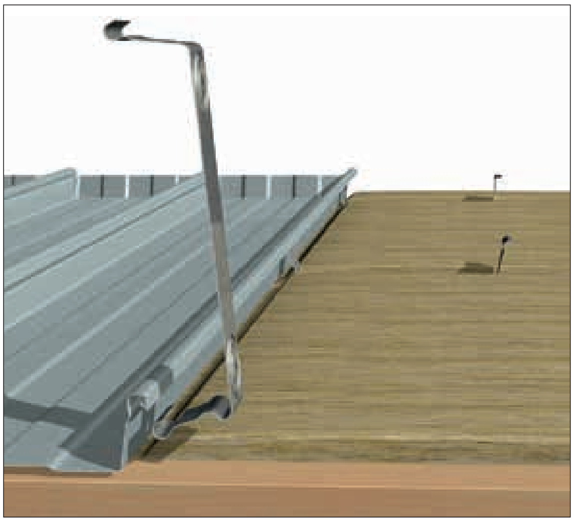
2. Insert the first profiled sheet
The first profiled sheet is swivelled with the large rib into the overlapping start clip and clicked onto the clip in the middle rib. Alternatively with standard clip, it is possible to press the large rib in the overlapping area together and click the profiled sheet with large and middle rib onto the clip (click-into-place is hearable). Fasten the profiled sheet with brackets which spread to the outer rib on the substructure (this isn't necessary when using the start clip).



3. Place the next row of clips

The position of the next row depends on the construction width of the elements. We recommend to use a plumb line on the eaves as well as to regularly check the construction width in order to ensure a parallel and aligned installation of the profiled sheets.

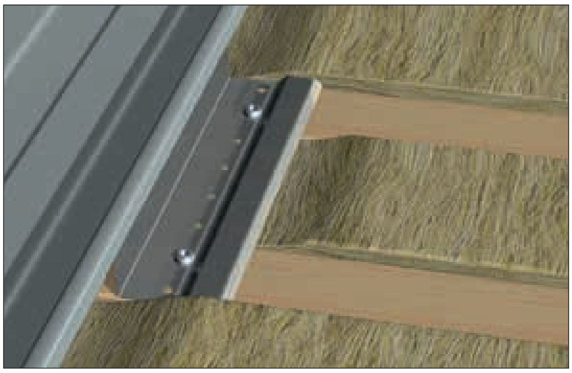
Now fasten the next row of clips at an angle of > 90° to the fastening structure to the rear edging of the bare small rib of the profiled sheet and swivel the profiled sheet onto the substructure. Click the clips into place in the longitudinal trough of the rib and fasten them onto the substructure.



The construction widths should be checked when installing profiled sheets. The standard clip is used up from the second row of clips.

Please fasten every profiled sheet with a fixed-point clip or fixed-point profile in order to avoid a slide-off. Profiled sheets up to approx. 20 m, roof pitches < 15° and normal snow loads, each profiled sheet's small rib is fastened at its retaining bracket shoulder at ridge by means of a cup blind rivet at side (4.8 mm x length 8.0 mm, flat round head 9.5 mm). The rivet head is covered with the large rib of next profiled sheet.

Set the fixed point with sufficient distance to the ridge when installing longer profiled sheets in order to ensure a greater material expansion. Please also take into consideration the length expansion of the profiled sheet from fixed-point to ridge, also when using ridge caps, e.g. with enlarged closures.



Fixed-point clip

With roof pitches > 15°, high snow loads and sheet lengths of more than approx. 20 m and height of thermal insulation ≥ 160 mm , please contact us in advance so that we can plan the necessary amount of fixed-points with special constructions, e.g. fixed-point clip/fixed-point profile or standard clips on hat profile.

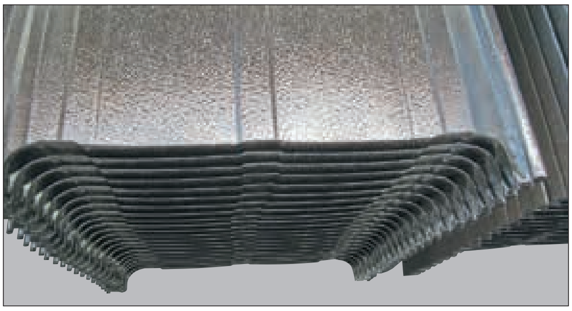
4. Insert the next profiled sheet

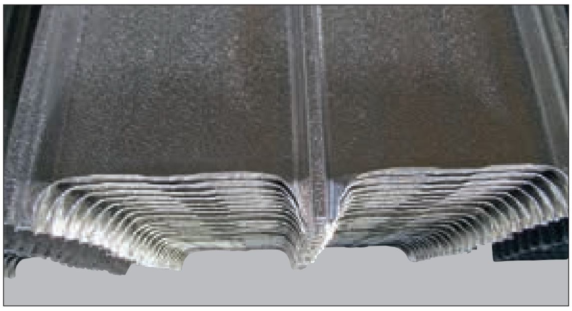
Click the large and middle rib of the second profiled sheet onto the first one and onto the exposed part of the clip. Use the alternate merging principle and proceed from eaves point to ridge point. The clicking normally occurs by well-aimed walking (utilities: wooden batten with drilled grooves). Thanks to moulded longitudinal troughs, the longitudinal pushes are rainproof after having been clicked into place. Zipping by machine or working concerning craftsmanship isn't necessary. RIB-ROOF 465 is reinforced in the eaves by joining the bottom booms to an eaves angle.

3.3 Ridge construction

Folding up of profiled sheets at the ridge at factory
The water-distributing bottom booms of the profiled sheets have to be folded up in order to avoid eventual penetration of rain water or drifting snow. The easiest way of folding the profiled sheet up at the ridge or down at the eaves is to order this service at our factory.

Indication: folding up at ridge side not possible with RIB-ROOF Evolution.

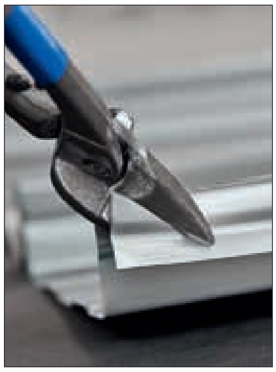




Folding up of profiled sheets at our factory, installation direction is from left to right

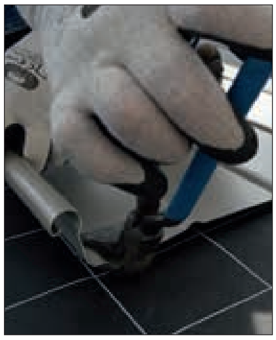
Folding up of profiled sheets at the ridge on site
Instead of folding up the profiled sheet at ridge (with RIB-ROOF Speed 500 and RIB-ROOF 465) at our factory, it is also possible to do so on site by using our folding up tools.
The profiled sheets have to be folded up at the ridge before installing connections to other building components (e.g. walls, strip lights).

Otherwise, the folding up of the profiled sheets at the ridge will be carried out when installing. With RIB-ROOF 465 each large rib of the profiled sheet is going to be cut on its exposed seam end at an angle of 45° (have a look at right picture).



Folding up of RIB-ROOF Evolution profiled sheets on site

1. Set marking at -5cm.



2. Position the curved folding pliers on the right and set up the bottom boom slightly.

3. Position the curved folding pliers on the left and set up the bottom boom slightly again.

4. Apply folding up tool.

5. Knock with plastic hammer during installation.

6. Set up bottom boom up to 90° and then check.

Ridge construction
Important: Before installing ridge caps or connecting sheets, the fixed-points of the profiled sheets have to be checked. The opposed material dilatation of the profiled sheet and ridge cap requires indirect fastening over the closures.

They will be aligned either on one side (single-pitch roof, wall or strip light connections) or on both sides (double pitch roof ridge) by a plumb line or a distance gauge and the ribs of profiled sheets are fastened with blind rivets or self-drilling screws.

3.4 Transversal joint

Profiled sheet transversal joints are generally **not necessary** since the length of the material dilatation is taken up by the clips. If the profiled sheets are **too long** (> 33 m) and, therefore, can not be transported with a truck, rollforming on site can be offered (refer to chapter 1.4.1).

However, if transversal joints are necessary, preferably welded profiled sheets out of aluminium are chosen. In certain cases and exclusively with roof pitches of more than 7°, transversal joints with sealing rivets and sealing material are executed. Contact us!

3.5 Sealing of the longitudinal joint

With **roof pitches of less than 1.5°** in subareas and differences in measurements or unevenness in the substructure (danger of forming puddle), an additional measure of sealing is recommended, the inserting of sealing tapes (e.g. brand ISO Chemie).

This solution is also recommended with curved roof constructions in the highest point running continuously up to reaching the angle of inclination of 1.5°.

3.6 Important basic rules for installation

1. The installation has to be stopped with extreme weather conditions, single profiled sheets have to be fixed immediately. Installation can also be carried out with low outside temperatures since zipping isn't necessary with RIB-ROOF.

2. If you intend to walk on profiled sheets during installation, please refer to tables in chapter 2.8 / 2.9 / 2.10 (installation-related maximum support span of accessibility).

3. There could probably arise some changes in the construction width in the area of cutting edges at the end/beginning of the profiled sheet, due to converting tensions caused by production. Moreover, there could arise some changes in the construction width with curved profiled sheets as well. Therefore, we recommend to carry out an examination regarding the division and positioning of profiled sheets before installation.

4. Before walking on the roof please point out to other craftsmen that they have to put down load-spreading elements in their walkway area, in order to avoid deformation or damage of profiled sheets. But be aware: before the customer has taken over the roof every damage may have to be paid by the company which has installed the profiled sheets provided that there isn't another person responsible.

5. The connection of the profiled sheets to above-ground building components requires folding up of bottom boom before installation (available at our factory), have a look at chapter 3.3.

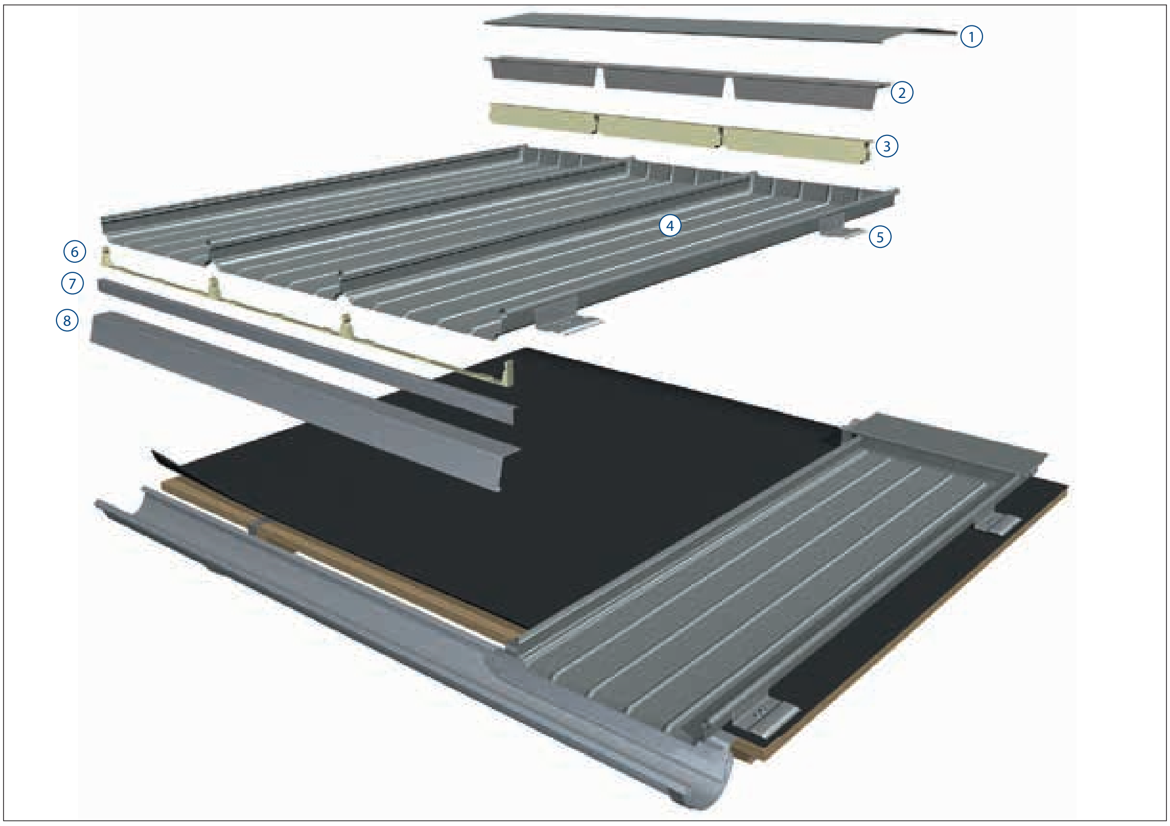
6. It must be strictly observed that all connection and end profiles (ridge, verge etc.) are fixed by means of suitable fixing elements – taking into consideration free expansion – in order to avoid sliding and dislocation caused by thermal changes.

3.7 Inspection and maintenance

If you want more information about a maintenance contract or roof and façade controls, please visit the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) at www.wasserwaermeluft.de or the IFBS ("Industrieverband für Bausysteme im Metallleichtbau"), which is an important industrial association that represents companies operating in the field of construction systems in light metal, at www.ifbs.de.

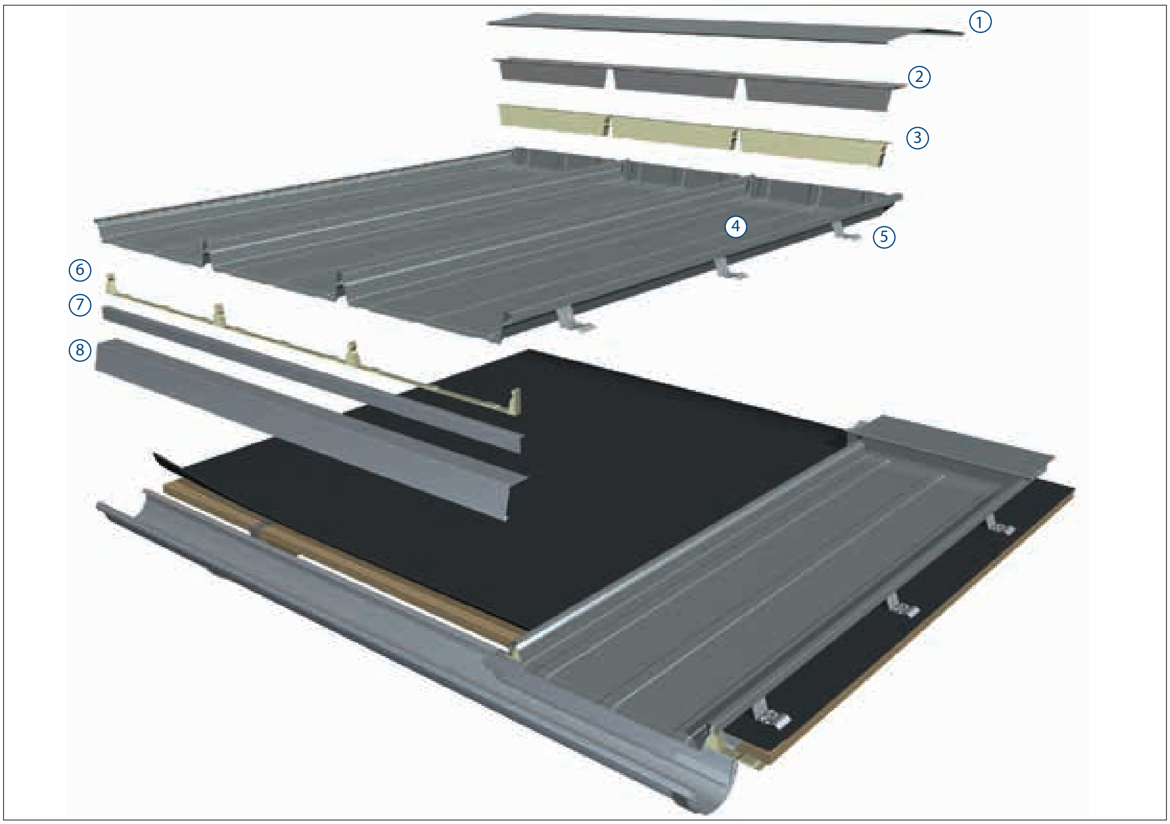
The development of details of ridges, verges and eaves always has to be homogeneous in the interest of architecture (eventually installation of samples in accordance with the client). In the following you will get some suggestions as an example for construction details. The standard CAD detail drawings in all common file formats can be downloaded from our website www.zambelli.com.
Please refer to the Building Components Catalogue by BIMsystems to view the Zambelli products: waya.bimsystems.de

RIB-ROOF Evolution

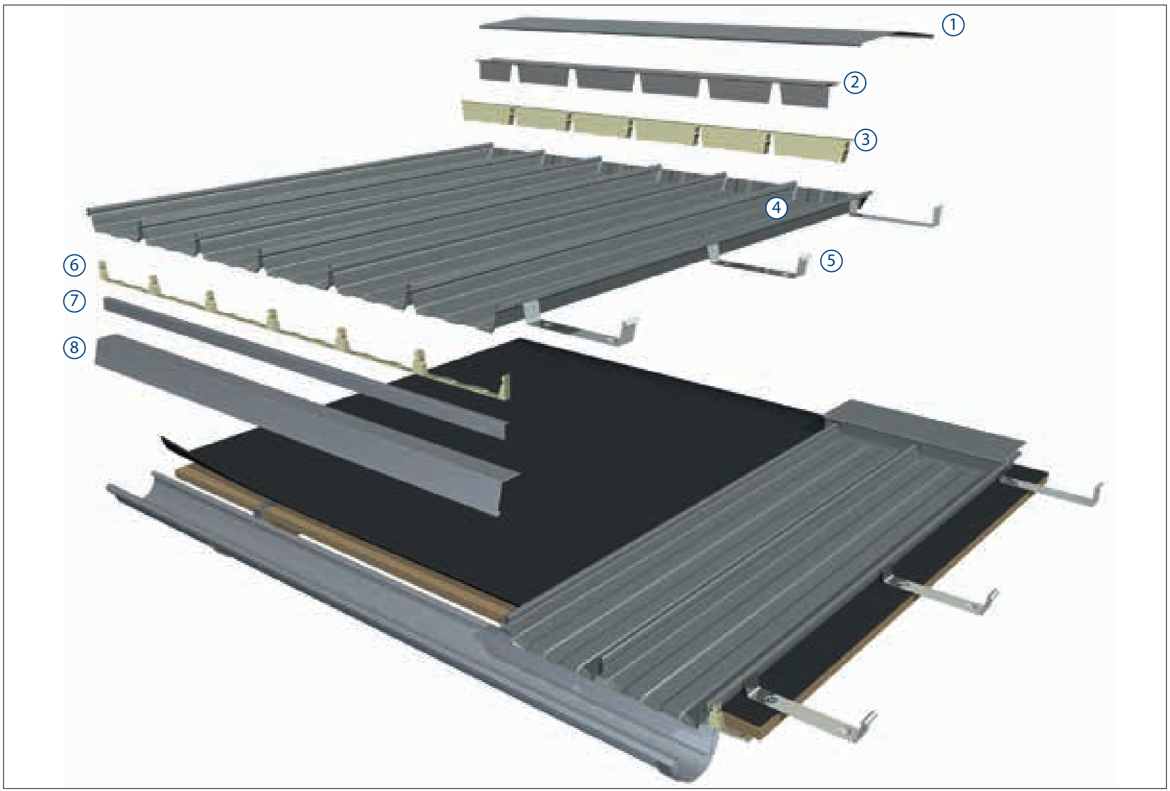


1 Ridge cap
2 Closure
3 Profile filler - top side
4 RIB-ROOF Evolution
5 Directional clip Evolution
6 Profile filler - rear side
7 Eaves angle
8 Gutter inlet sheet

RIB-ROOF Speed 500



RIB-ROOF 465



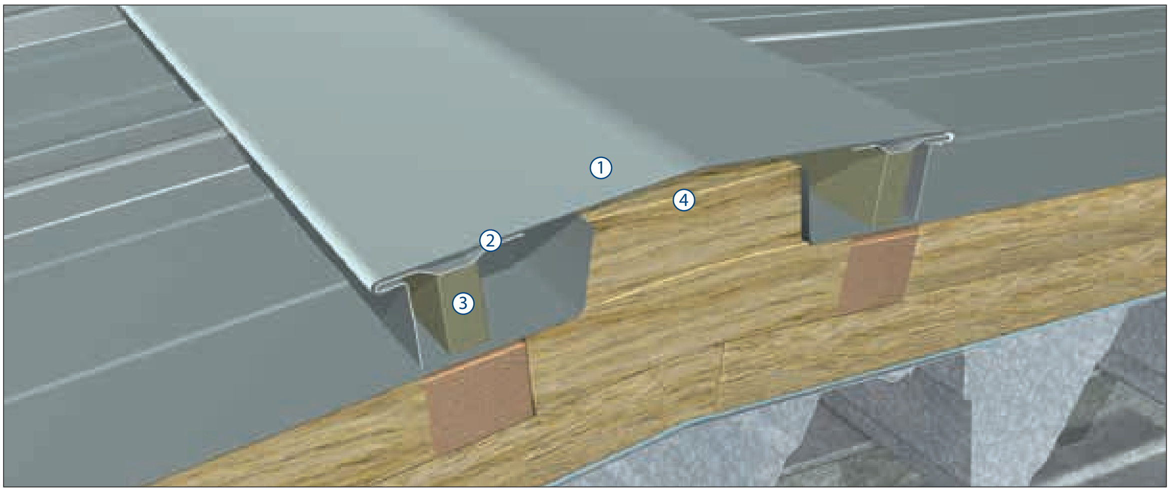
1 Ridge cap
2 Closure
3 Profile filler - top side
4 RIB-ROOF 465 / RIB-ROOF Speed 500
5 Standard clip / Directional clip
6 Profile filler - rear side
7 Eaves angle
8 Gutter inlet sheet

4.1 Ridge

4.1.1 Double pitch ridge

The double pitch ridge **without any openings for ventilation** (for single-skinned roof constructions, warm roof) is hung on the closures with its backward-bending on both sides (crimping with approx. 10 mm radius) and pressed together on its seam.

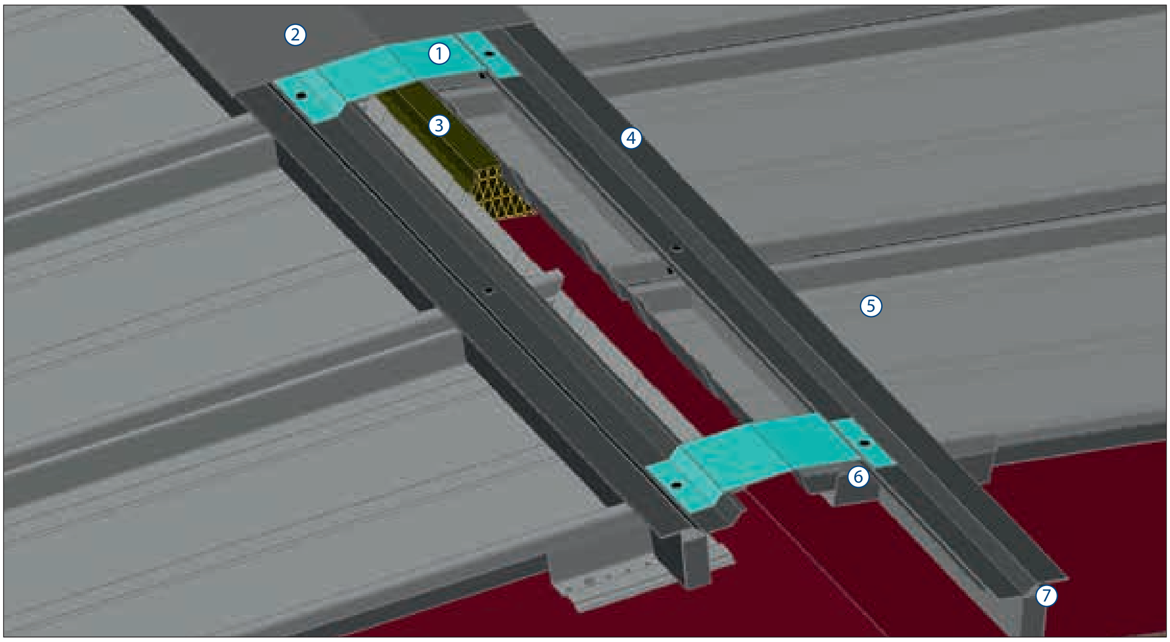
The connection is folded by craftsmen or is carried out with blind rivets on the extension gadgets.
If required fillers will be installed. The structure and distance of extension gadgets have to be observed in any case.



① Double pitch ridge cap
② Closure
③ Profile filler - top side
④ Thermal insulation

Storm protection

In the case of construction projects situated in the areas with high wind loads or in exposed locations, a ridge cap can optionally be made with an additional storm protection.

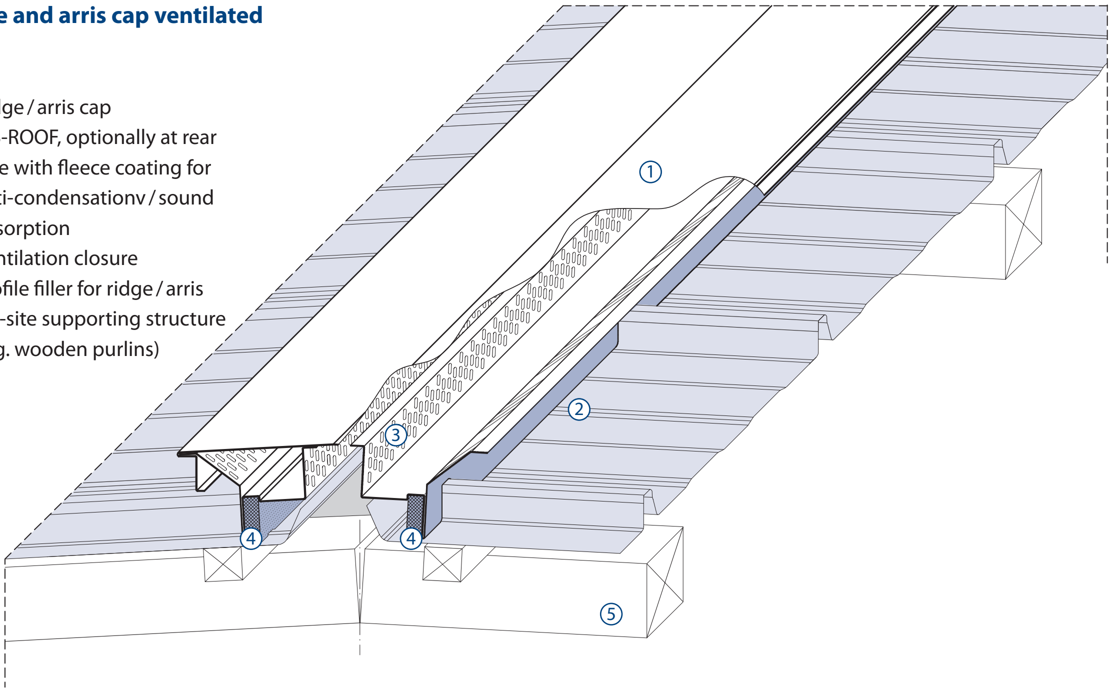


① Storm protection (Aluzinc, t = 1.30 mm)
② Ridge cap
③ Insulated cavity
④ Closure (fixed with blind rivets 4.8 x 10 mm with large setting head 16 mm)
⑤ RIB-ROOF
⑥ Fixed point clip
⑦ Profile filler, top side

The double pitch ridge **with an opening for ventilation** (for double-skinned roof constructions, cold roof) is a standard product of our delivery program and available in all materials according to our roofing materials as a construction kit with two integrated ventilation closures and profile fillers.

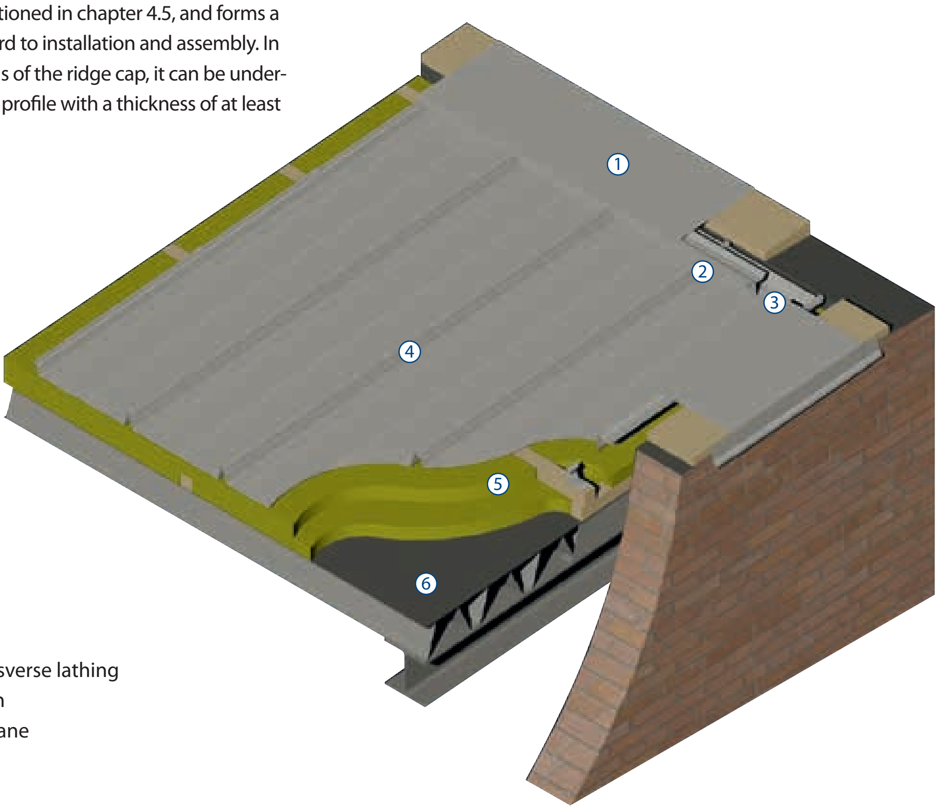
Ridge and arris cap ventilated

1. Ridge / arris cap
2. RIB-ROOF, optionally at rear side with fleece coating for anti-condensationv / sound absorption
3. Ventilation closure
4. Profile filler for ridge / arris
5. On-site supporting structure (e.g. wooden purlins)



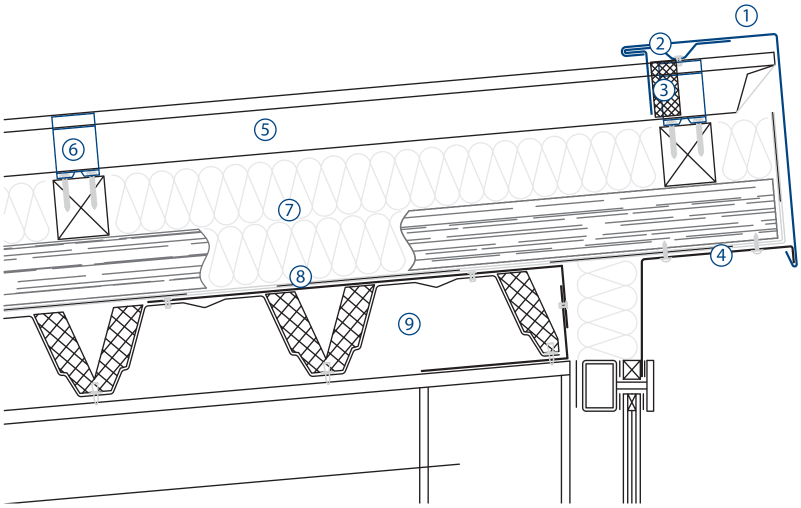
4.1.2 Single pitch ridge

The single pitch ridge (without / with openings for ventilation) is similar to the verge, mentioned in chapter 4.5, and forms a creative unit also with regard to installation and assembly. In order to avoid deformations of the ridge cap, it can be underlain with a galvanised steel profile with a thickness of at least 1.00 mm.

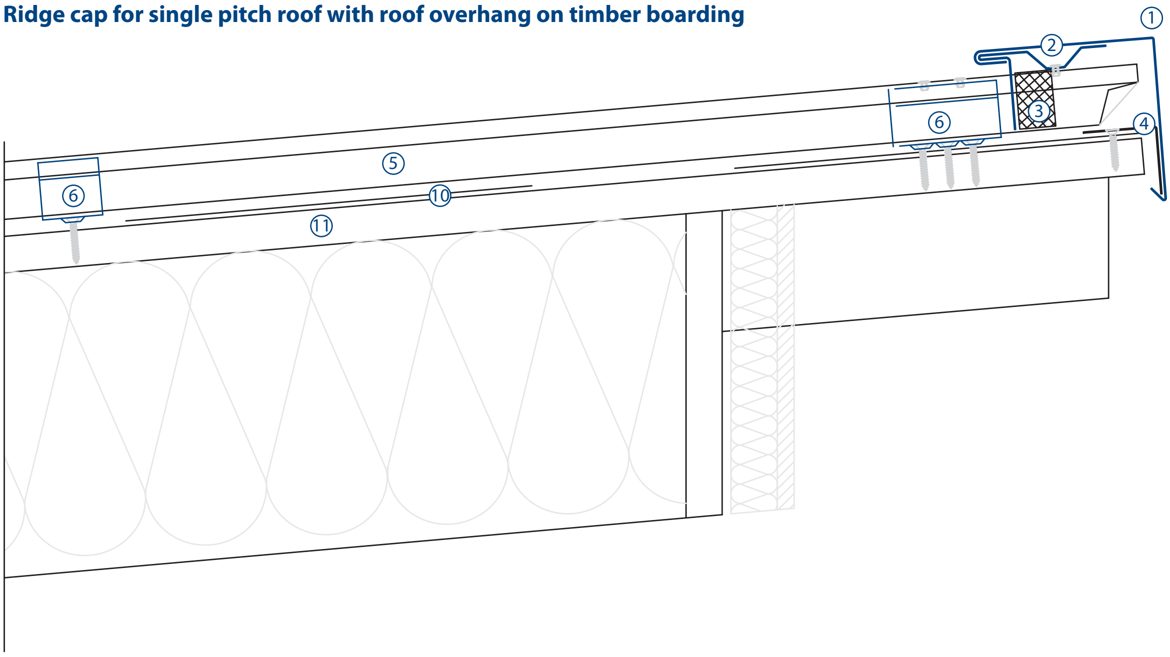


1. Single pitch ridge cap
2. Closure
3. Profile filler - top side
4. RIB-ROOF
5. Wooden counter / transverse lathing with thermal insulation
6. Vapour barrier membrane

Ridge cap for single pitch roof with roof overhang on trapezoidal profiles



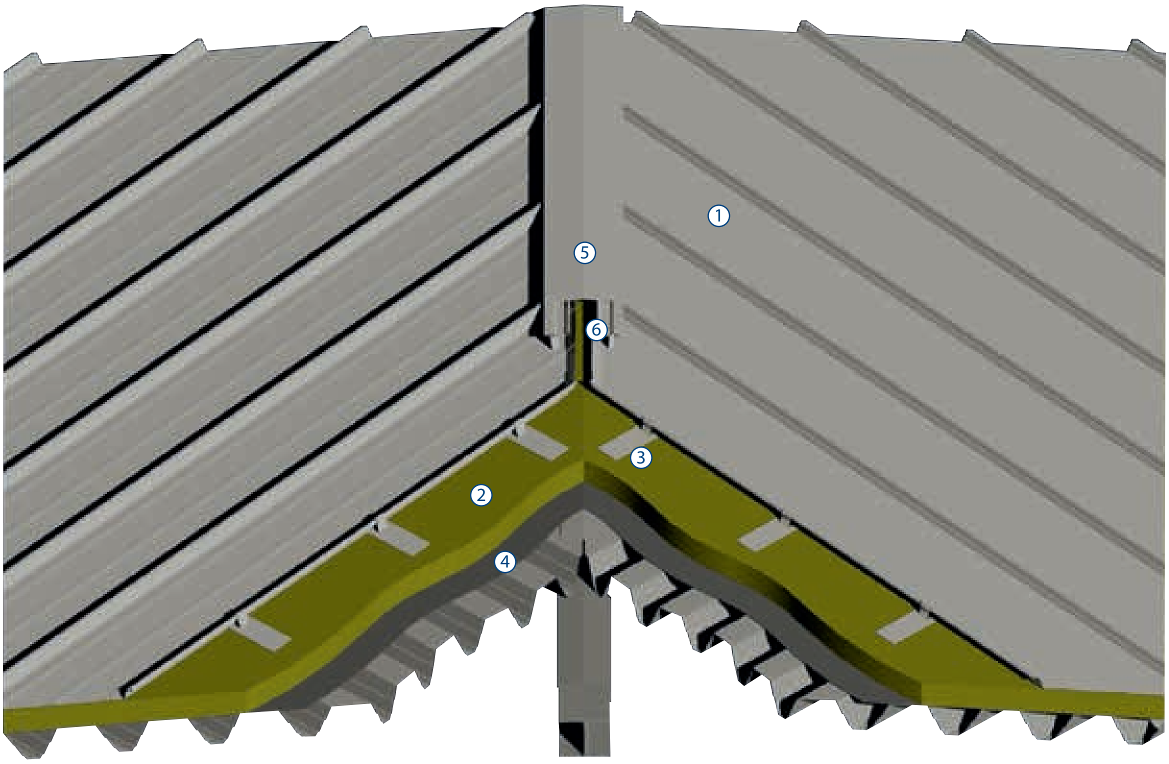
Ridge cap for single pitch roof with roof overhang on timber boarding



① Single pitch ridge cap
② Closure
③ Profile filler - top side
④ Stopping plate
⑤ RIB-ROOF
⑥ Standard clip / directional clip
⑦ Wooden counter / transverse lathing with thermal insulation
⑧ Vapour barrier membrane
⑨ Trapezoidal profiles with bracing on edge
⑩ High diffusion-open protective sheet
⑪ Timber boarding minimum t = 24 mm

4.2 Arris

Arris are finished in a similar way as a double pitch ridge. The closures aren't equipped at our factory with notches for profiled sheet ribs (▶ high seams). These will be marked on site and cut with plate shears in order to reach an optimal fitting. The construction details of ridge caps can be used in the general sense.



① RIB-ROOF
② Rigid insulation boards
③ Clip border
④ Vapour barrier membrane
⑤ Cover sheet for arris
⑥ Suspended profile for arris

Analogous to a ventilation ridge cap, there can also be used a ventilated cover sheet for arris utilizing a ventilation closure (delivery without notches).

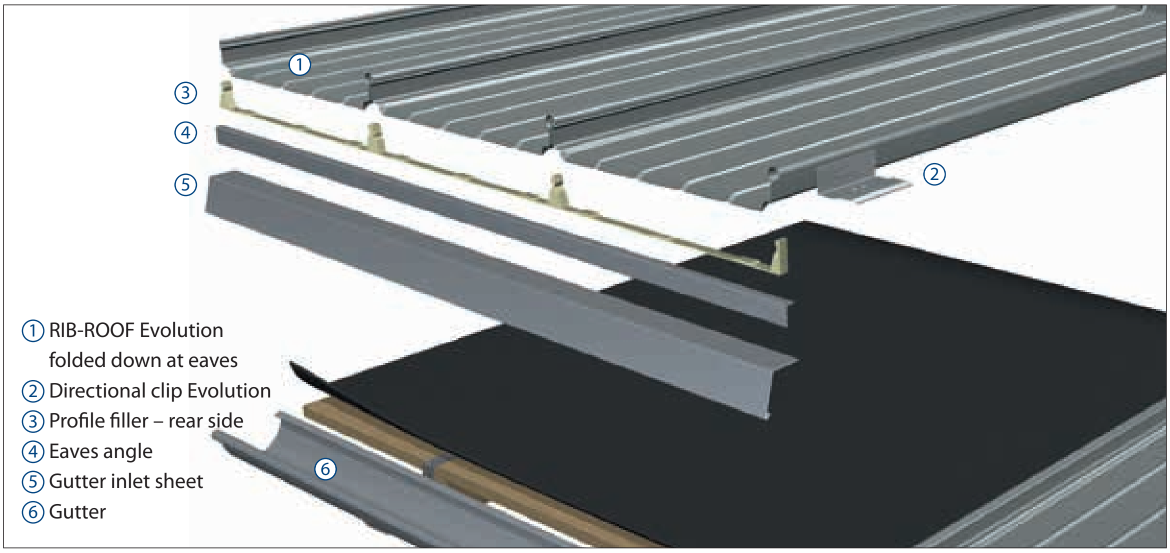
4.3 Eaves

There is a multiplicity of gutter varieties which are used in different countries and regions. They shouldn't be described here in detail.

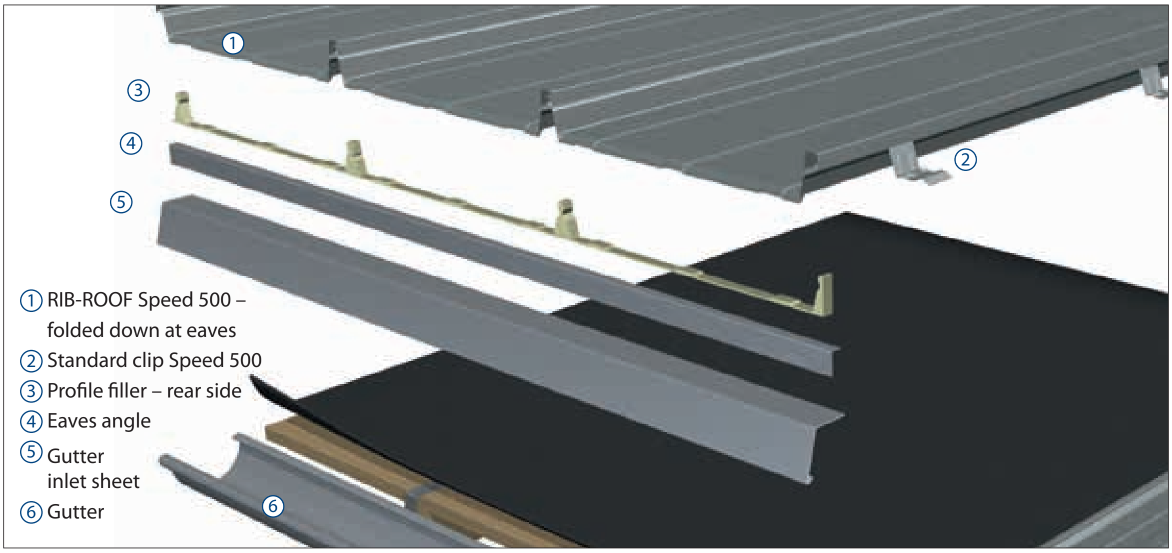
The external hung gutter is the easiest verge design. The classical gutter in semicircular or box-like shape is fastened with gutter brackets on the eaves plank. We assume that you know about the installation technique according to DIN 18339 – plumbing works. For ventilated roof constructions, a formation of air inlets (at least 4 cm airflow cross section) below eaves is given. Additional profile filler can be fastened at rear side due to optical reasons.

The eaves sheet (▶ gutter inlet sheet) forms the connection of the roof to the gutter and should be made with a cutting of 333 mm.

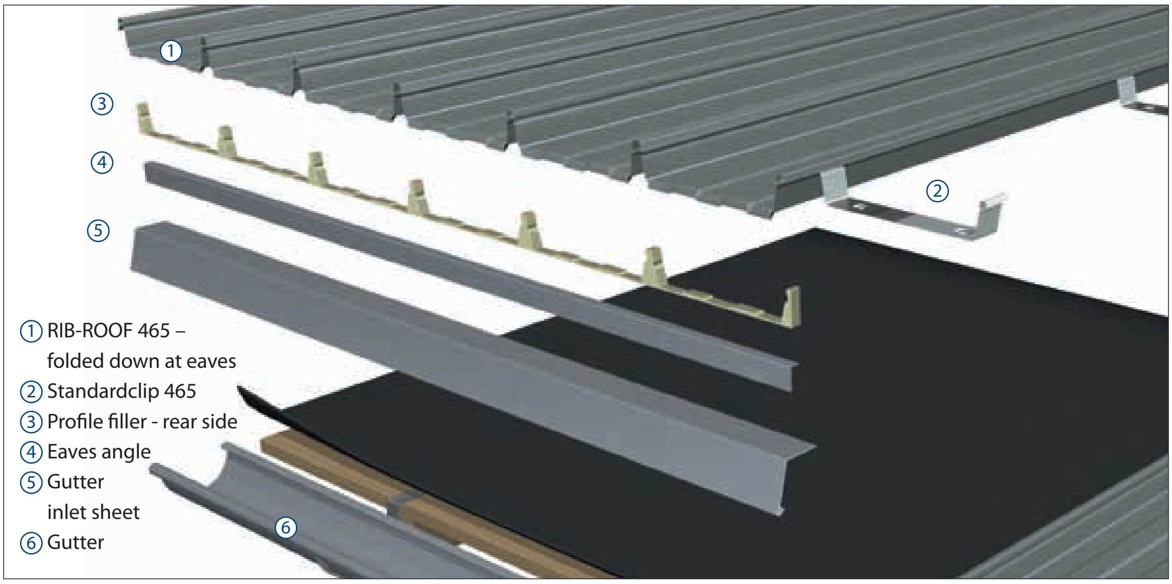
RIB-ROOF Evolution



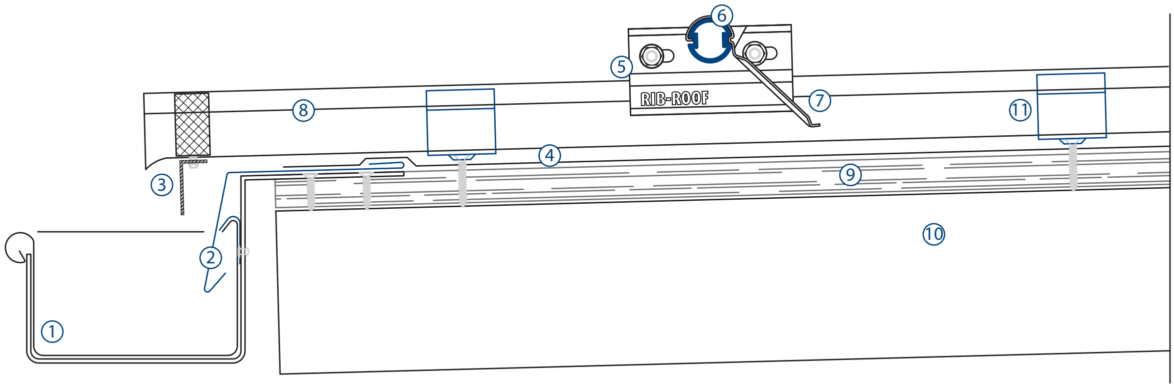
RIB-ROOF Speed 500



RIB-ROOF 465

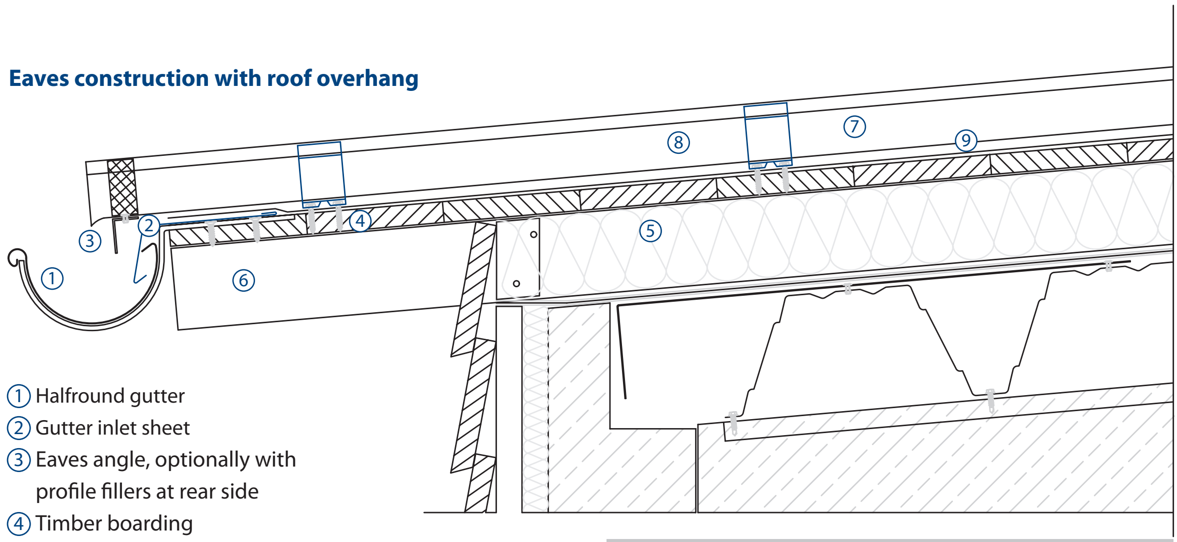


Detail box gutter with snow guard and ice stopping system



① Box gutter
② Gutter inlet sheet
③ Eaves angle, optionally with profile fillers at rear side
④ High diffusion-open protective sheet
⑤ Snow guard bracket with nose
⑥ Snow guard pipe with nut Ø 32 mm
⑦ Ice stopper
⑧ RIB-ROOF – folded down at eaves
⑨ Timber boarding
⑩ Rafter
⑪ Standard clip / directional clip

Eaves construction with roof overhang



① Halfround gutter
② Gutter inlet sheet
③ Eaves angle, optionally with profile fillers at rear side
④ Timber boarding
⑤ Thermal insulation
⑥ Eaves rafter
⑦ RIB-ROOF – folded down at eaves
⑧ Standard clip / directional clip
⑨ High diffusion-open protective sheet

The first row of clips has to be installed as closely as possible to eaves (followed by gutter channel/gutter inlet sheet, please refer to latter details)

The high diffusion-open protective sheet or other separation layers cover the eaves sheet in order to divert eventually arising secondary water which accumulates itself in the gutter. The gutter overhang of the profiled sheets depends on the drawings in chapter 4.3 (at least 30 mm). After installing the profiled sheets, water-loaded bottom booms have to be feather-edged with tools for folding up and down profiled sheets to the gutter.

Alternatively, a roof overhang with an overhanging directional profile can be realized with RIB-ROOF Evolution and RIB-ROOF Speed 500.

Securing of eaves against wind load with RIB-ROOF 465

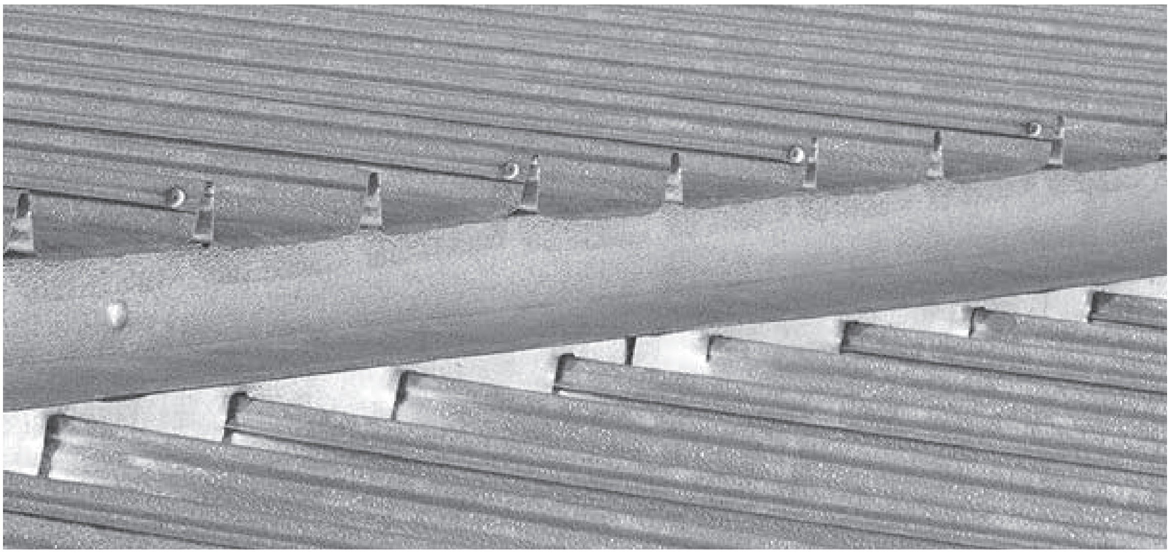
Eaves formations with sloped steps are used as a creative element in architecture or with extreme long profiled sheets. The detailed construction single ridge roof applies, in the general sense, to the rising wall.

The securing of eaves against higher wind load on eaves is carried out when there is an overlapping seam with rivets.

▶ Please refer to chapter 4.4 "Sloped steps".

4.4 Sloped steps

Sloped steps are used as a creative element of architecture or with extremely long profiled sheets. In the general sense, the details of a single pitch ridge to a rising wall are applied. The sloped step has to be protected against penetrating pelting rain by means of installing an eaves strip.



4.5 Verge

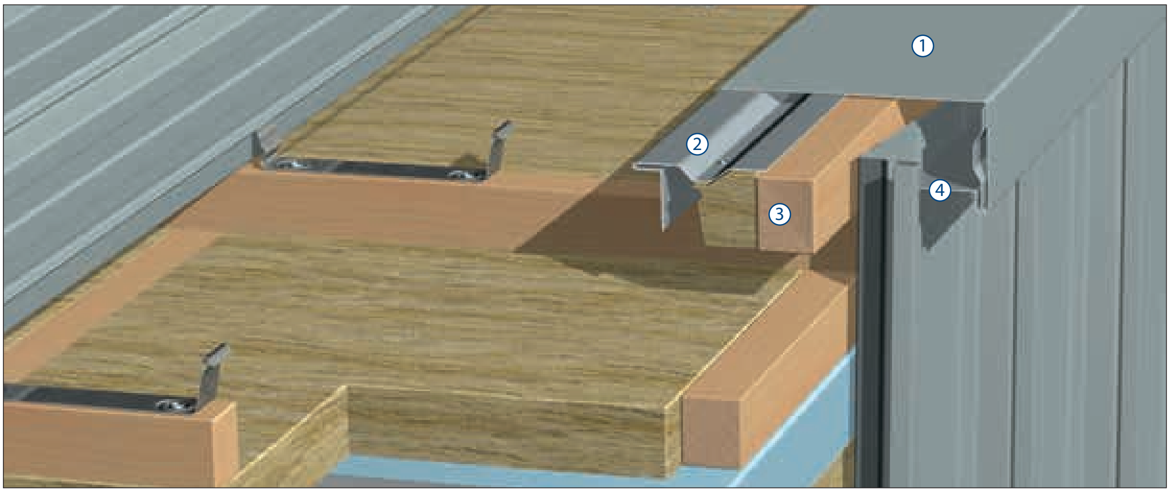
The profiled sheet at the edge ends in one of the three possibilities:

- With a **large rib** (▶ top chord): the profiled sheet is covered by a cover sheet for verge which is fastened with blind rivets (distance approx. 50 cm) on the top chord. The connection has to take place at a distance of approx. 75 mm to sliding clips in order to enable the dilatation of the profiled sheet.

Important: The distance of the encroaching cover sheet up to the top chord has to be sized sufficiently so that the penetration of rain by means of capillary sized can be avoided.

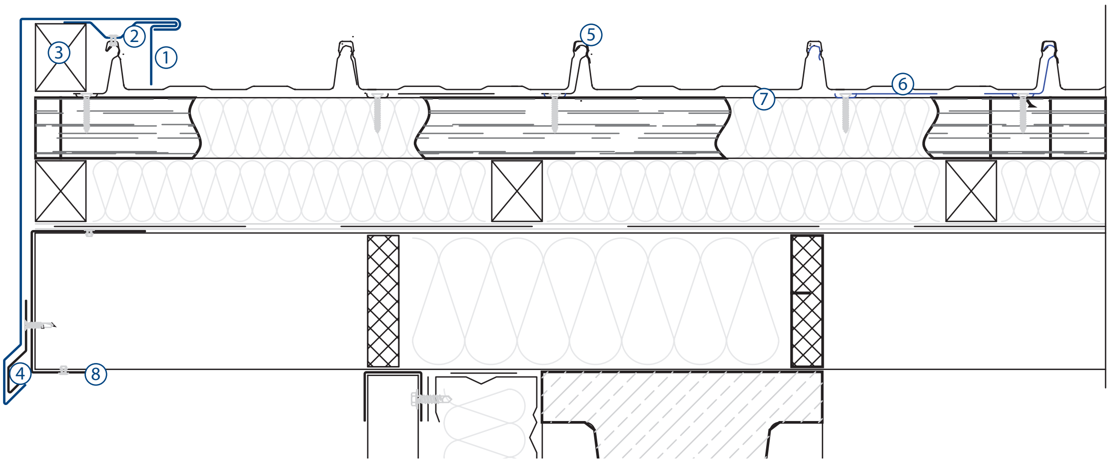
- With a **small rib** (▶ top chord): the edge profiled sheet is fastened with an end clip on the substructure, further installation has to be carried out as before-mentioned.

- **Installation by craftsmanship:** the bottom boom of the edge profiled sheet is bended at the edge at an angle of 90° to a water seam. Afterwards, the verge sheets are folded onto the edge profiled sheet.



1 Cover sheet for verge
2 Suspended profile
3 Verge plank
4 Stopping plate / closure

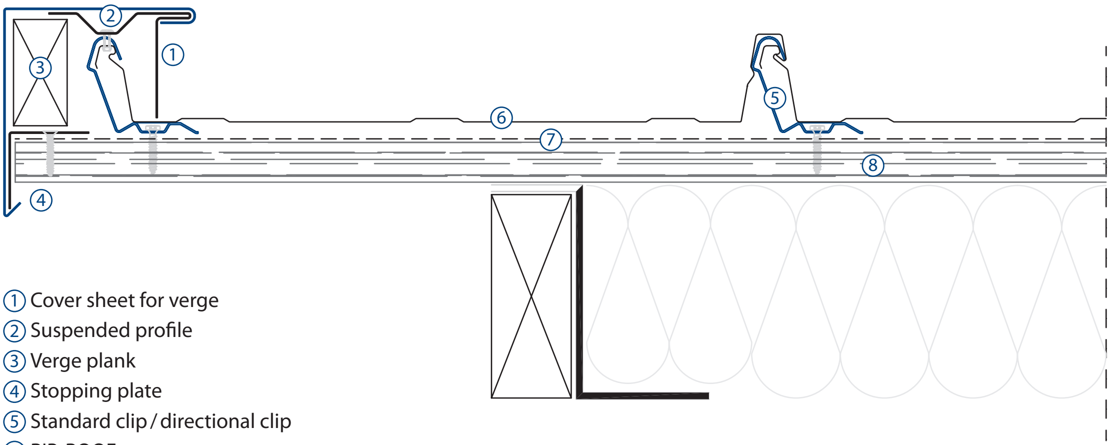
Cover sheet for verge with roof overhang on trapezoidal profiles



① Cover sheet for verge
② Suspended profile
③ Verge plank
④ Stopping plate
⑤ Standard clip / directional clip
⑥ RIB-ROOF
⑦ High diffusion-open protective sheet (optionally)
⑧ Trapezoidal profiles with edge profile

The installation of a verge plank as a support and a stopping plate on the façade is recommended in all structures in order to avoid material expansions which may lead to corrugation and unpleasant deformations of the cover sheets for verge. The connection of the cover sheet for verge is folded by craftsmanship or installed with stopping plates.

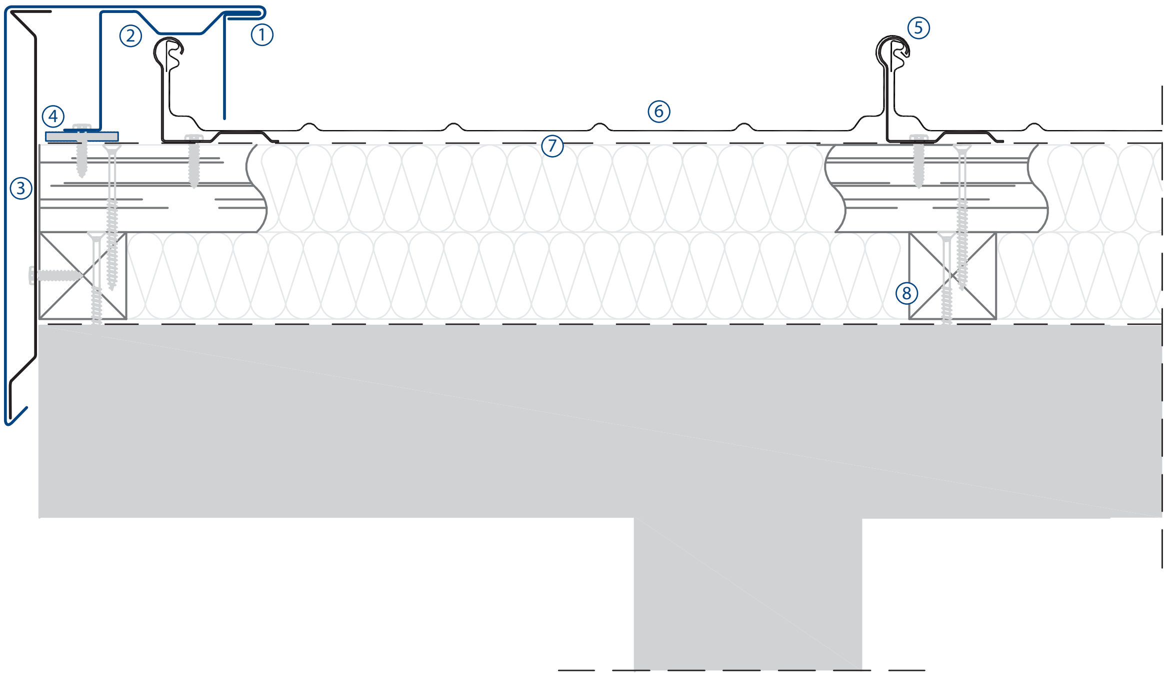
Cover sheet for verge with roof overhang on timber boarding



① Cover sheet for verge
② Suspended profile
③ Verge plank
④ Stopping plate
⑤ Standard clip / directional clip
⑥ RIB-ROOF
⑦ High diffusion-open protective sheet
⑧ Timber boarding minimum 24 mm

The installation of a verge plank as a support and a stopping plate on the façade is recommended in all structures in order to avoid material expansions which may lead to corrugation and unpleasant deformations of the cover sheets for verge. The connection of the cover sheet for verge is folded by craftsmanship or installed with stopping plates.

Cover sheet for verge with roof overhang with directional clip/directional profile



1. Cover sheet for verge
2. Suspended profile
3. Stopping plate
4. Pressure-tight height adjustment
5. Directional clip/directional profile
6. RIB-ROOF
7. High diffusion-open protective sheet (optionally)
8. Transverse- and counter lathing

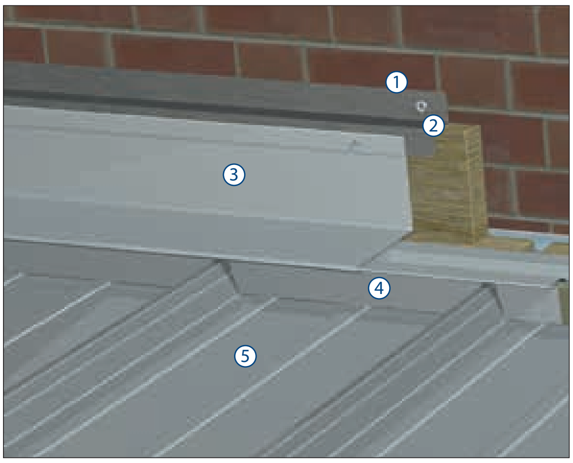
4.6 Wall connection at ridge/at side

Wall connection with attica cover sheet at ridge

An overhang strip, which is supplied with sealing tape or permanently elastic joint material and then pressed together by screw connection, has to be cut into the wall when connecting brickwork and rendered facades. The overhang strip has to be processed before plastering.

A closure is used when a **single pitch ridge is connected to a rising wall. The wall connection at side on a brickwork** takes place by means of utilizing a suspended profile (for verge). The details for verges apply here in the general sense.

You can complete the wall connection with an appropriate structural **attica cover sheet at ridge**. The overhang strip isn't needed in this case.



Wall connection at ridge

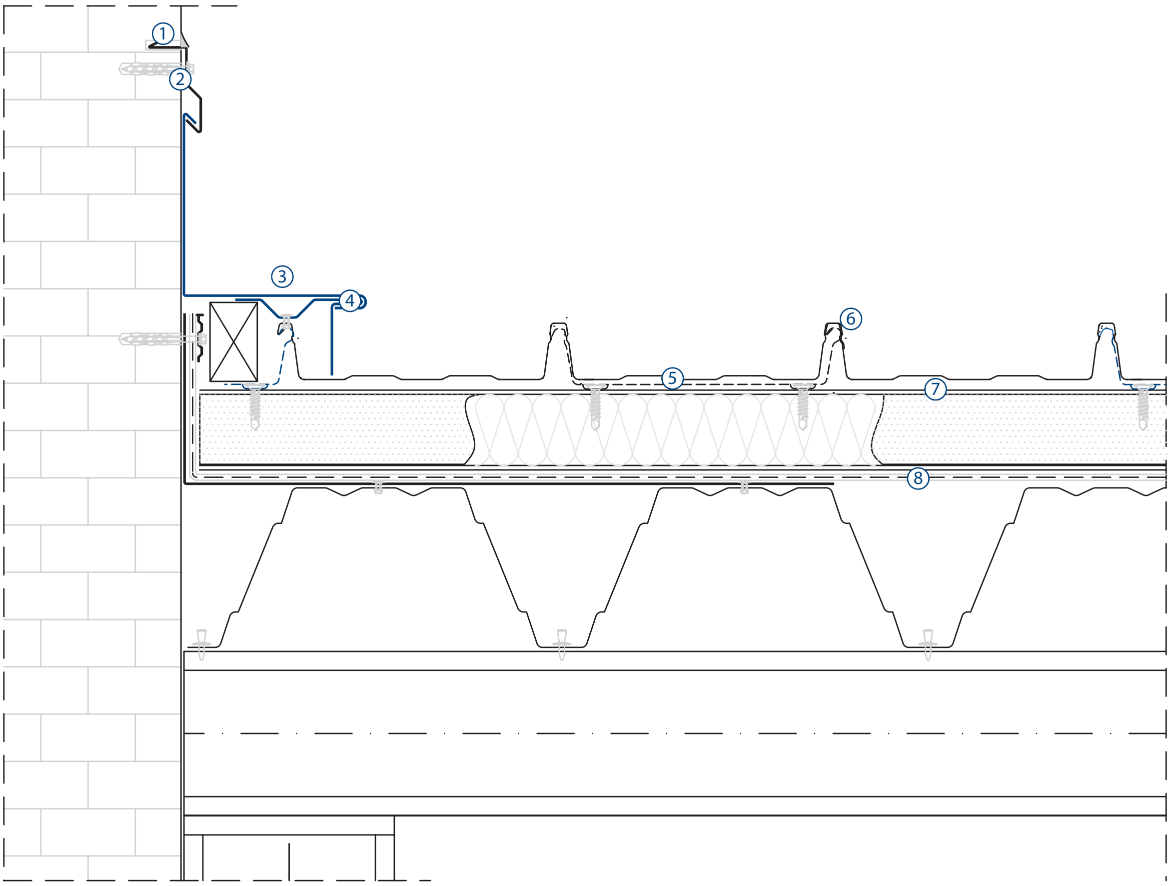
1. Sealing joint
2. Overhang strip (rendered strip)
3. Wall connection
4. Closure
5. RIB-ROOF

The wall connection at side is installed on metal, brickwork and other façade constructions either parallel or tapered to the profiled sheets.

The construction details for verges apply here in the general sense. The overhang strip (rendered strip), as mentioned in section 4.1.2 (single pitch ridge on a rising wall), is to be used when exposed concrete, brickwork or plastered walls have to be connected to it. With **roof pitches of less than 25°,** the connection height of 15 cm shouldn't be below them.

The connection on an attica at side requires a detailed connection in two parts. Therefore, the connection to the profiled sheets has to be carried out as mentioned above. The flashing of a tapered sheet has to be folded into the bending at edge of the connection at side by craftsmanship.

Wall connection at side on brickwork or plastered façade



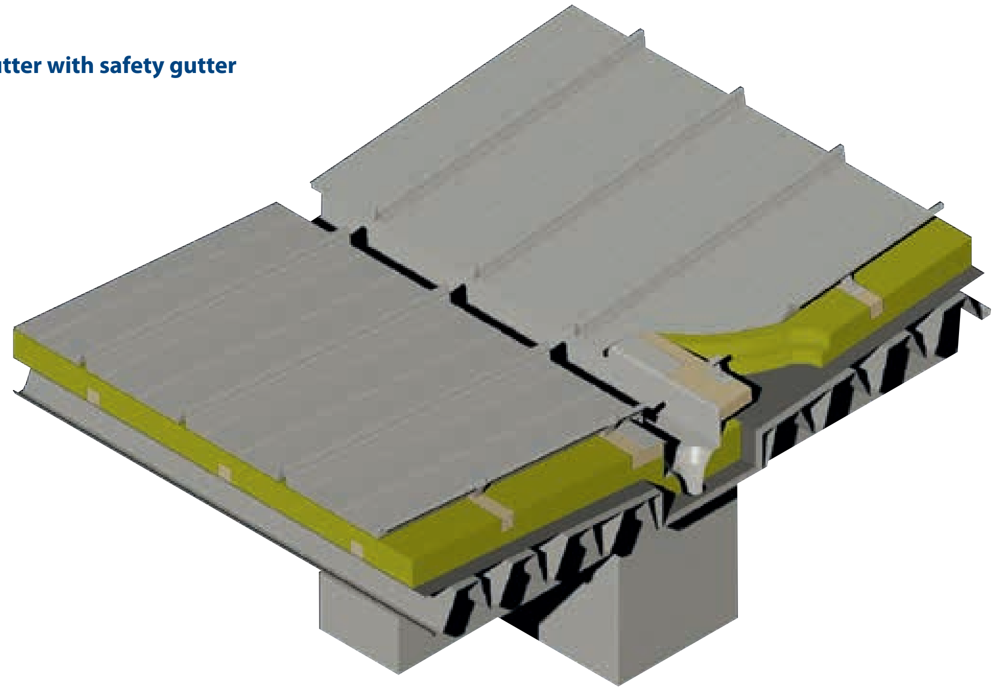
1 Sealing joint
2 Overhang strip (rendered strip)
3 Wall connection at side
4 Suspended profile
5 RIB-ROOF
6 Standard clip / directional clip
7 High diffusion-open protective sheet (optional)
8 Vapour barrier membrane

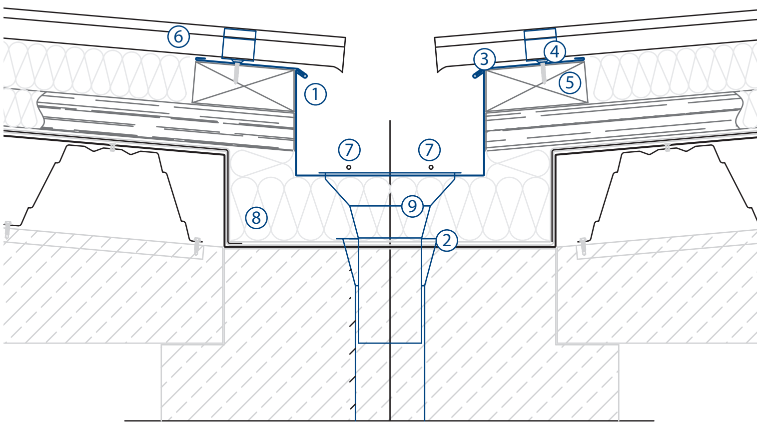
4.7 Internal gutter

Internal gutters are special constructions. Therefore, we recommend to absolutely follow the following **safety measures:**

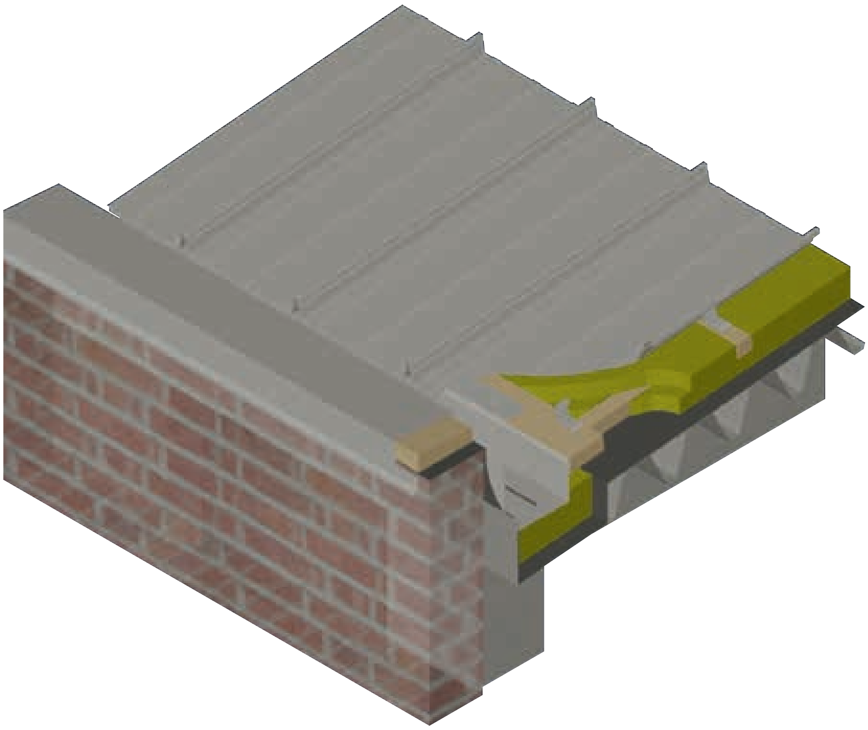
- The **sizing** of the gutter and downpipe (where applicable emergency overflow) has to be carried out according to DIN 18460 or DIN 1986-100 and enables a professional installation and cleaning. The amount of outlets (at least 2) has to be doubled from the arithmetical result.
- The **length expansions** have to be guaranteed with an appropriate amount of extension elements.
- The **outlets** have to be made funnel-shaped and connected to the supporting and water-loaded gutters. According to DIN 1986-100, the run-off capacity has to be reduced arithmetically by 50% when using gutter sieves.
- The installation of the gutter has to be adapted in connection with **thermal-insulated roof constructions** (use rigid insulation boards).
- The minimum distance between supporting and water-loaded gutter should be at least 20 mm.
- A **gutter slope** of at least 5 mm/m should be guaranteed.
- The gutter has to be **kept clear from snow** by installing a snow guard system and thermostatically controlled gutter heating.
- Conclude a **maintenance agreement** with the client.
- Moreover, the standards for plumbing works have to be adhered, published by the Central Association for Sanitary, Heating and Air Conditioning, St. Augustin.

Internal gutter with safety gutter

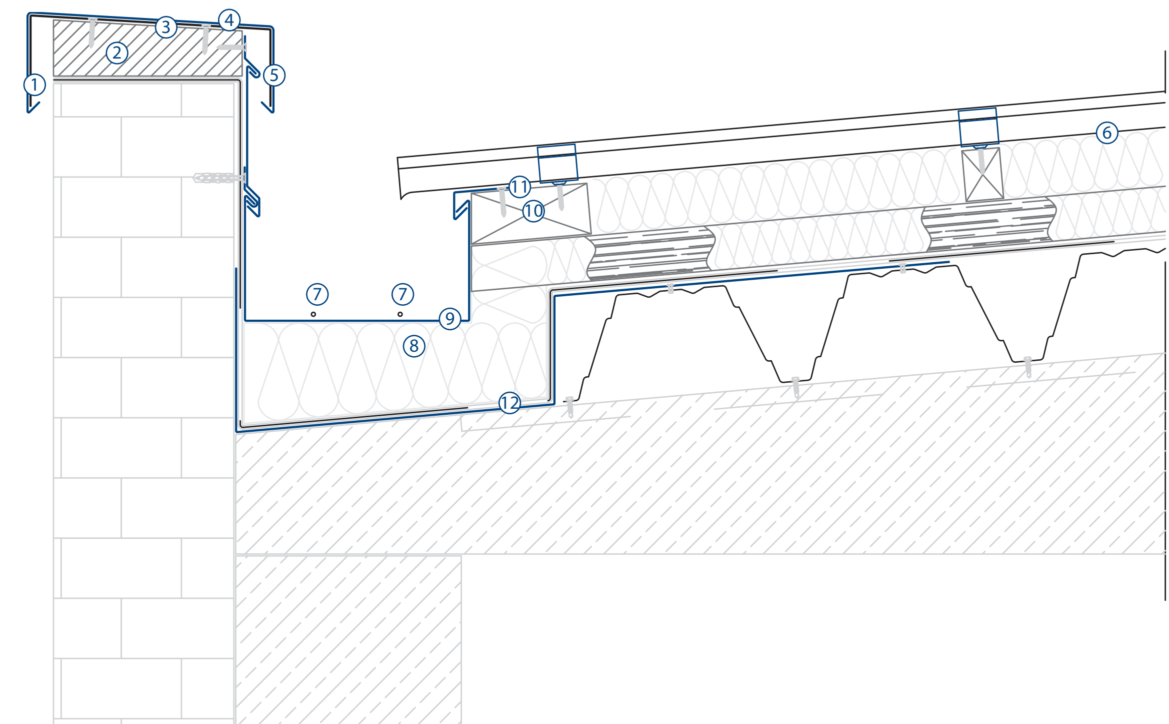




1 Water-loaded gutter
2 Safety gutter
3 Gutter inlet sheet
4 Standard clip / directional clip
5 Wooden plank
6 RIB-ROOF
7 Gutter heating (optional)
8 Rigid insulation board
9 Outlet in two parts, welded with tapered inlet



Attica with wall connection and attica gutter

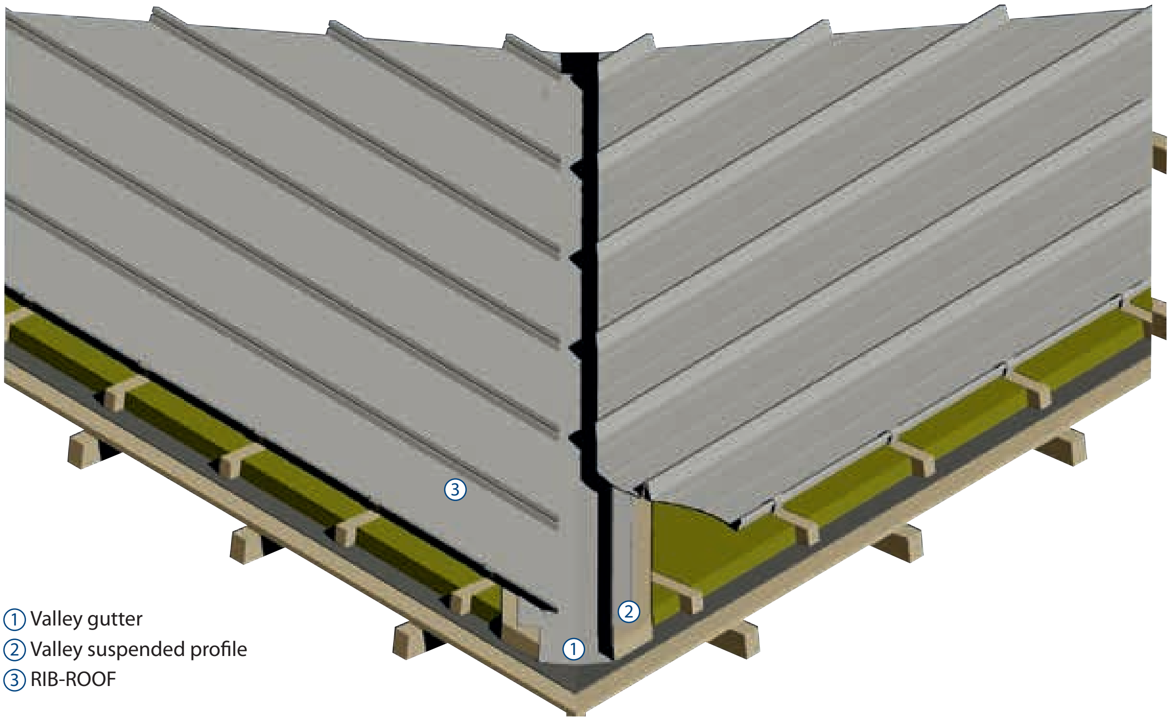


1 Stopping plate
2 Wooden attica plank
3 Separation layer
4 Attica cover sheet
5 Attica connection sheet
6 High diffusion-open membrane (optional)
7 Gutter heating (optional)
8 Rigid insulation board
9 Water-loaded gutter
10 Wooden plank
11 Standard clip / directional clip
12 Load-bearing safety gutter

4.8 Valleys

The detail of valleys depends on length and slope. Latter is, as a rule, lower than the connecting roof pitch. The valleys should be made reinforced with roof constructions with a **pitch of < 7°**.

This installation detail already has to be considered when planning. The basic rules of an internal gutter apply here in the general sense.

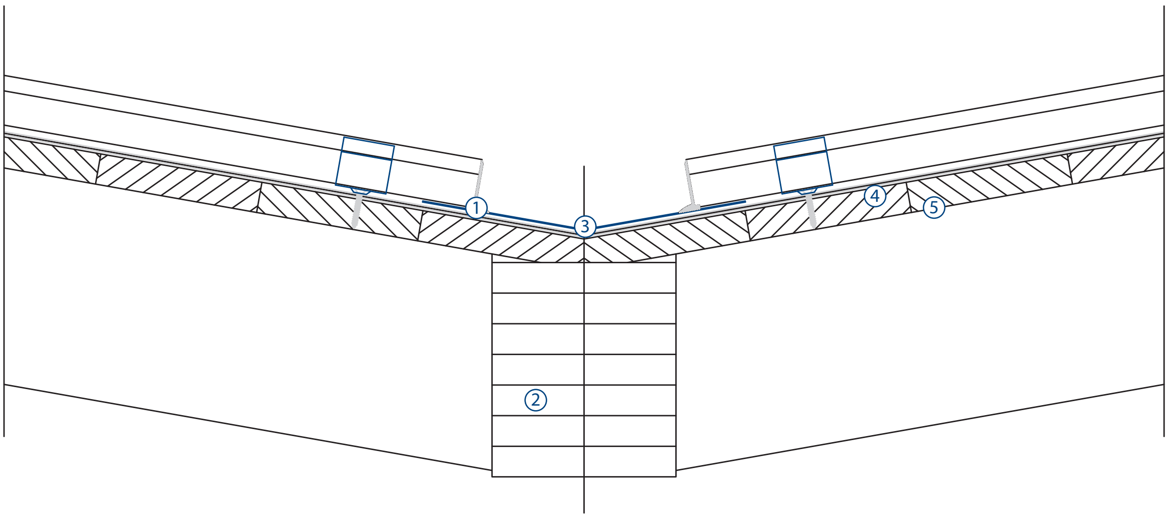


① Valley gutter
② Valley suspended profile
③ RIB-ROOF

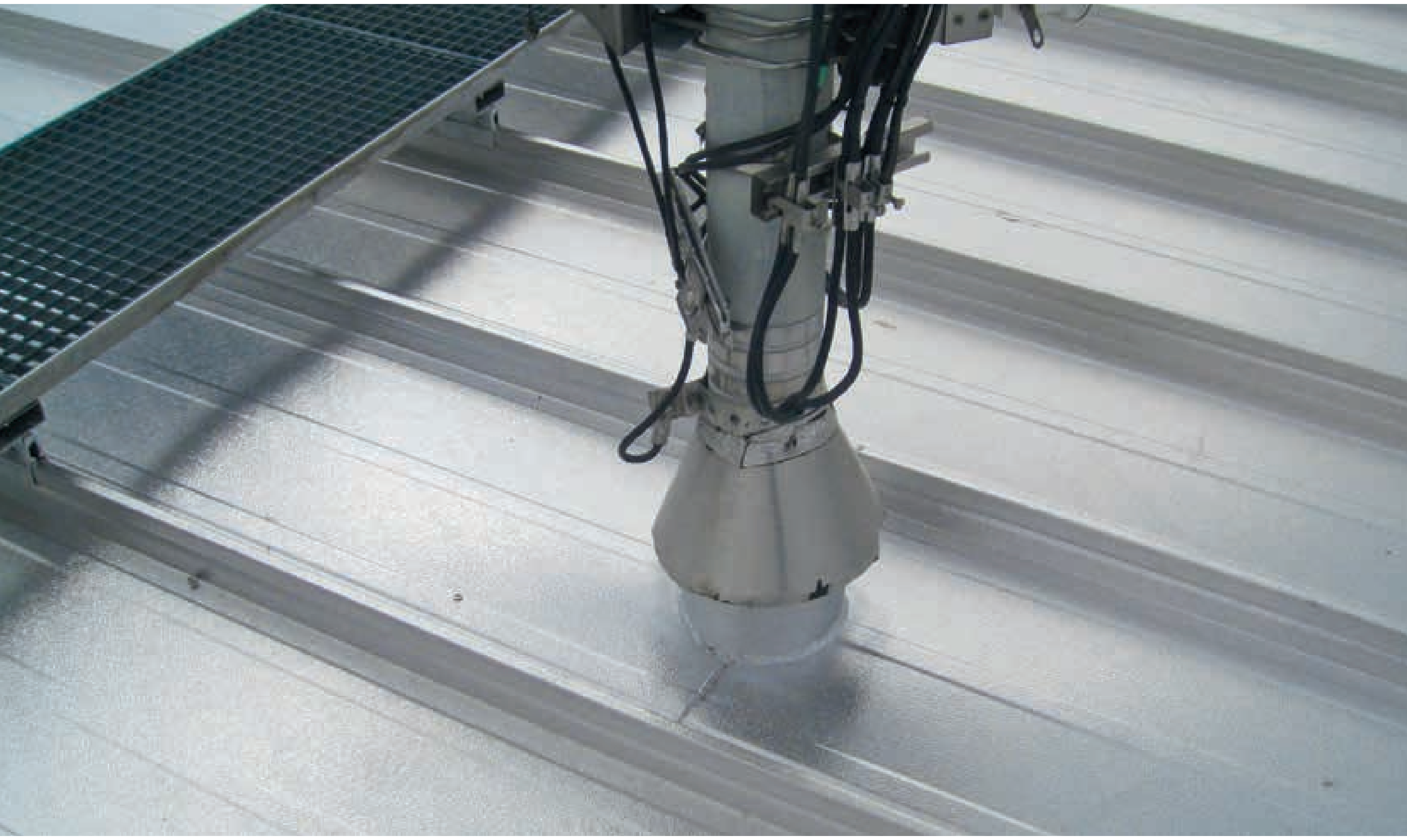
Since the valleys have to absorb length expansions of the inletting profiled sheets, the connections have to be installed according to above-shown image or images in chapter 4.7 respectively.

The connections are made by means of double cross fold and sealing layer or by soldering (titanium zinc and copper) or welding (aluminium) with roof **pitches of less than 7°**. A double cross fold is sufficient with **pitches of more than 7°**.

Welded valley gutter



① RIB-ROOF and welded valley gutter
② Valley / arris rafter
③ Valley gutter aluminium
④ High diffusion-open separation layer
⑤ Timber boarding



4.9 Roof penetrations

Roof penetrations and their enclosures are made, according to their material, either by craftsmanship or are welded/soldered water-proof. They require utmost care and professional expertise in plumbing technique.

According to the **leaflet "Bonding in plumbing technique"**, published by the Central Association for Sanitary, Heating and Air Conditioning (ZVSHK) in 53757 St. Augustin, Germany, the bonding of metals is also a possible alternative plumbing technique. Single-component polyurethane adhesives are usually used when plumbing.

The water diversion and dilatation in length of profiled sheets in the area of penetration have to be guaranteed by suitable measures. The height of enclosures depends on the roof pitch, as a rule, 15 cm aren't undercut.

Edging as plug-in system

For minimum roof pitches please refer to Chapter 2.4

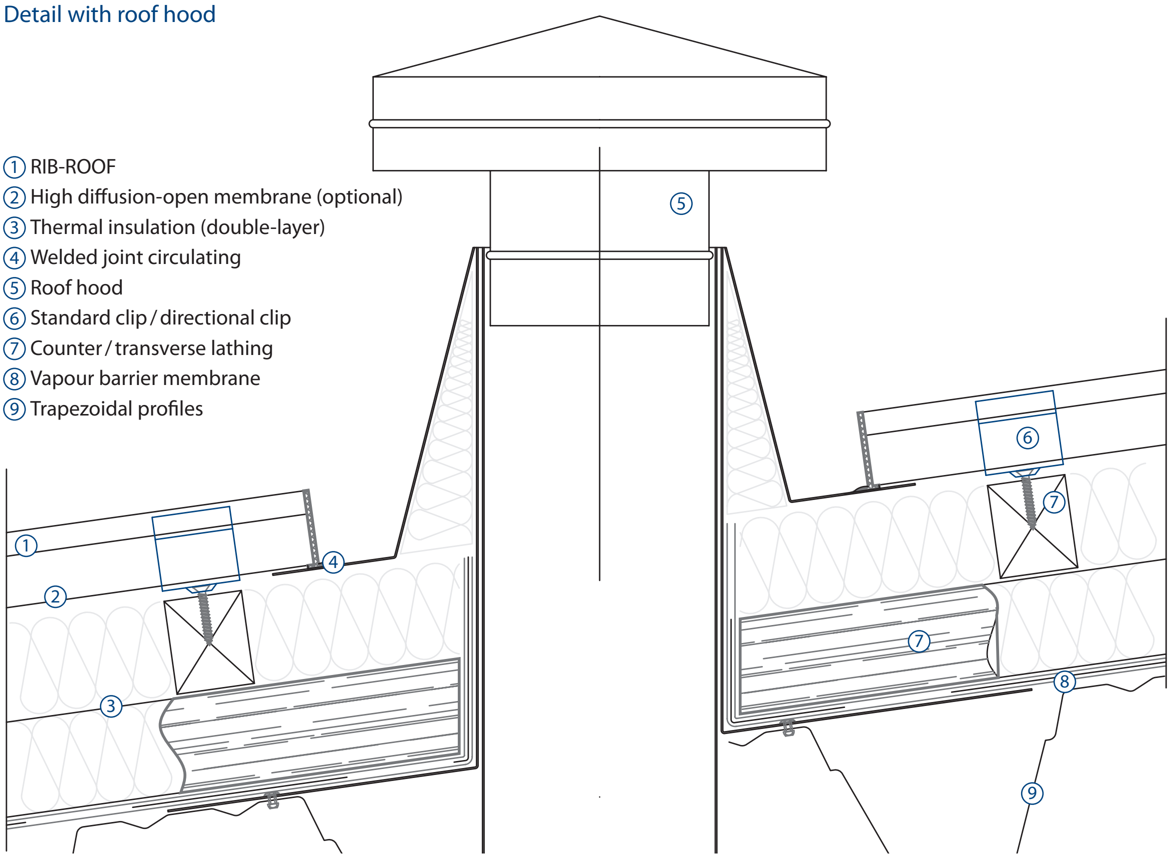
4.9.1 Round roof penetrations

Round roof penetrations are sealed with pre-assembled, tapered outlets into the roof (sealing rivets and suitable metal glue, soft and hard soldering, welding, bonding). The upper sealing is carried out by means of a cuff which is taller than the lower outlet.

The substructure has to be protected temporarily with **appropriate materials against fire** (wood) and **damage** (protective membrane) when soldering or welding.

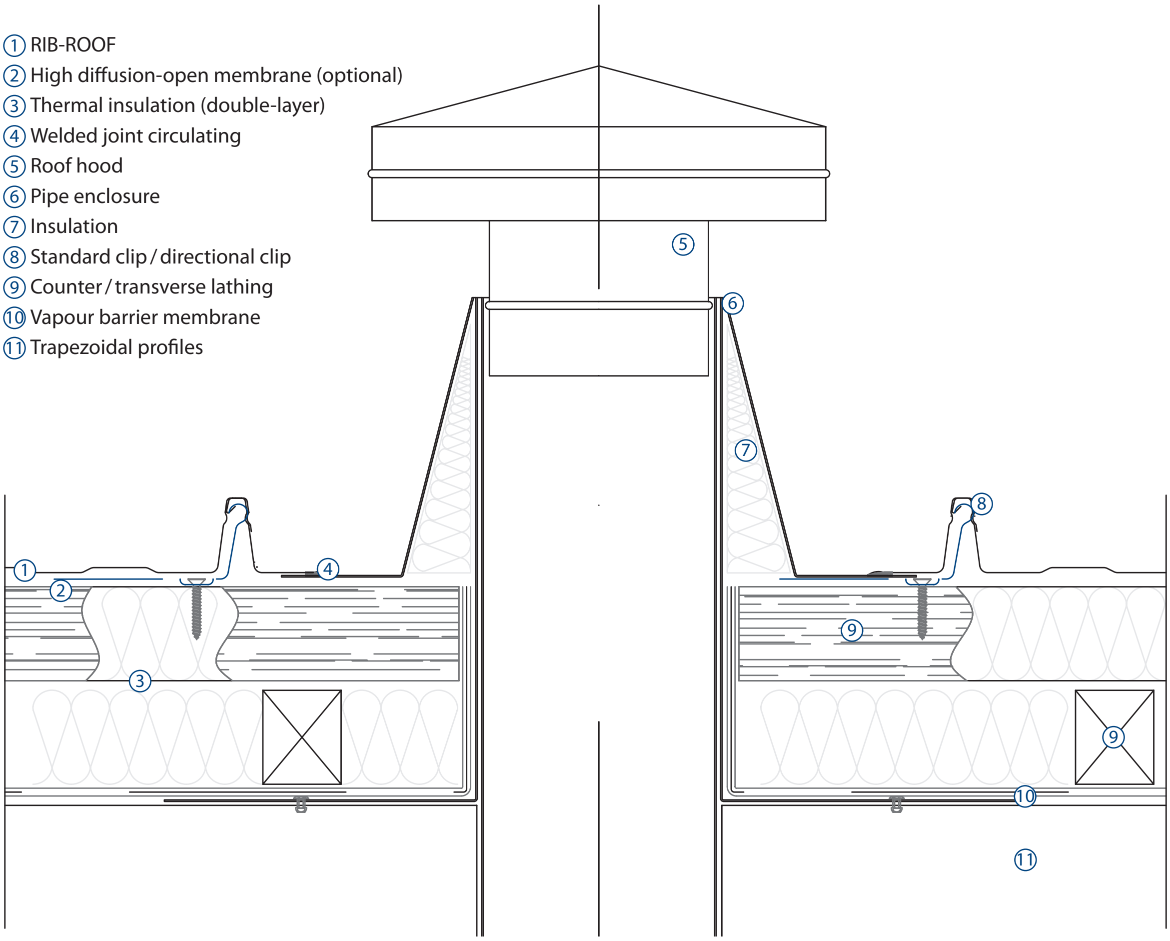
Welded room vent pipe
Detail with roof hood

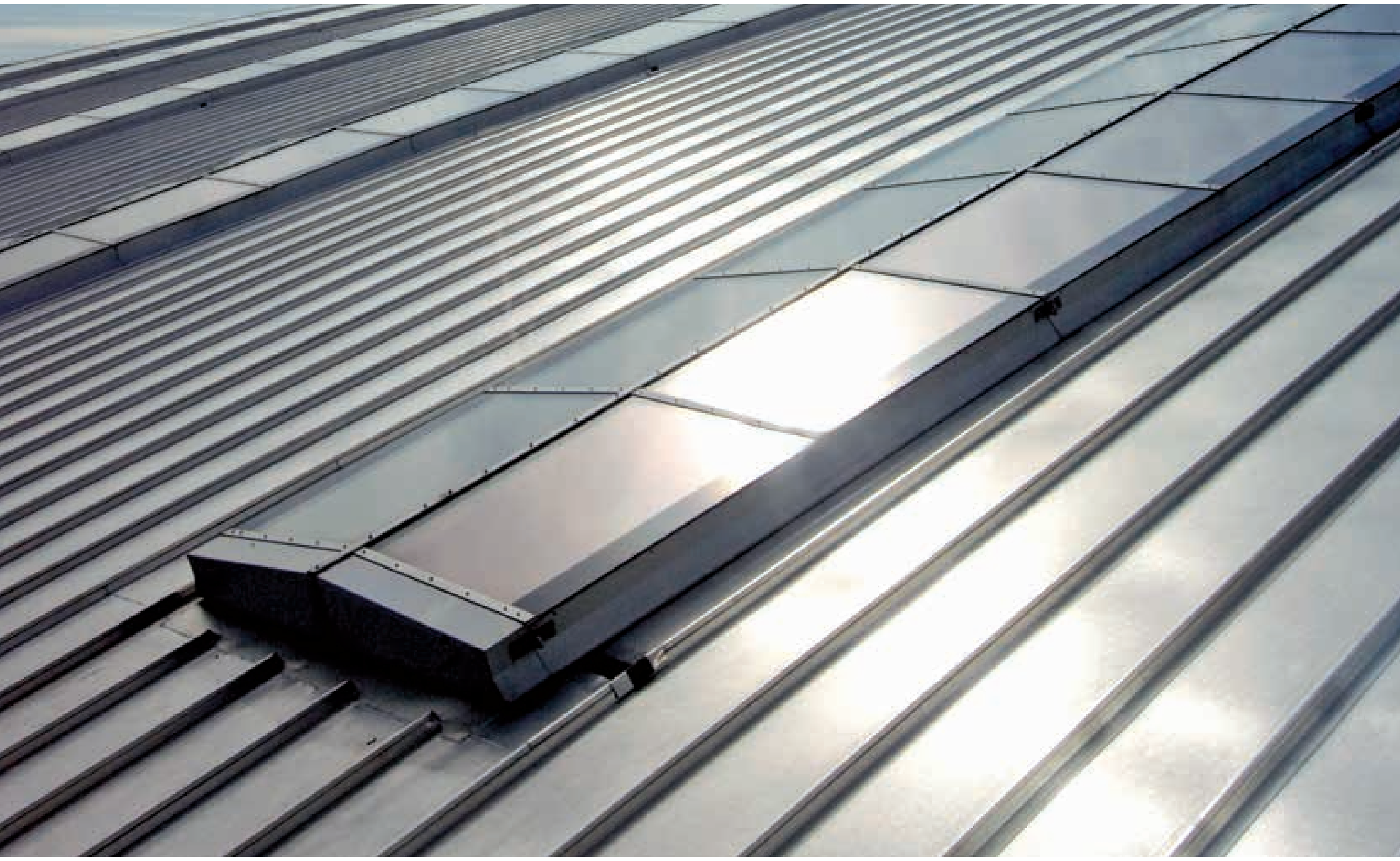
1. RIB-ROOF
2. High diffusion-open membrane (optional)
3. Thermal insulation (double-layer)
4. Welded joint circulating
5. Roof hood
6. Standard clip / directional clip
7. Counter / transverse lathing
8. Vapour barrier membrane
9. Trapezoidal profiles



Welded room vent pipe
Detail with roof hood

1. RIB-ROOF
2. High diffusion-open membrane (optional)
3. Thermal insulation (double-layer)
4. Welded joint circulating
5. Roof hood
6. Pipe enclosure
7. Insulation
8. Standard clip / directional clip
9. Counter / transverse lathing
10. Vapour barrier membrane
11. Trapezoidal profiles





4.9.2 Soaker for dome light

Smoke and thermal outlet construction

Welding of soaker:
The ribs of the profiled sheets are separated in the area of penetration at ridge and eaves on the highest point in the middle to a length of approx. 30 cm, both seams are overlapped and the created seam as well as the openings of the ribs are welded or soldered corresponding to the materials.

The requirements of the load transfer of section 4.9 apply here in the general sense. A fastening of the soakers can only be carried out if the fixed points of the profiled sheets are also located in their area.

The material expansion is obstructed from welded as well as sealed and riveted soakers.
This should be considered when planning the fixed point locations. Recommendable is e.g. the location of all fixed points in the area of the soakers instead of the position close to the ridge.

The following measures described have to be fulfilled with **larger measurements** and abdication of water-proof welding/soldering or soaker for sealing:

- ▶ Lifting up of water supply over the ribs of profiled sheets by means of installation into a higher distance construction (e.g. wooden counter lathing) in back of penetration and setting of lifted RIB-ROOF profiled sheets (with minimum roof pitches of 1.5°) below the ridge cap.
  or
  Lifting up of water supply in back of penetration up to the ribs of the profiled sheets by means of installation of a double standing seam roofing (movement joint sheets) on corresponding substructures (e.g. wooden lathing with separation layer).
- ▶ The created openings at the side have to be covered with tapered cut sheets by craftsmanship.

4.9.3 Rectular roof penetrations

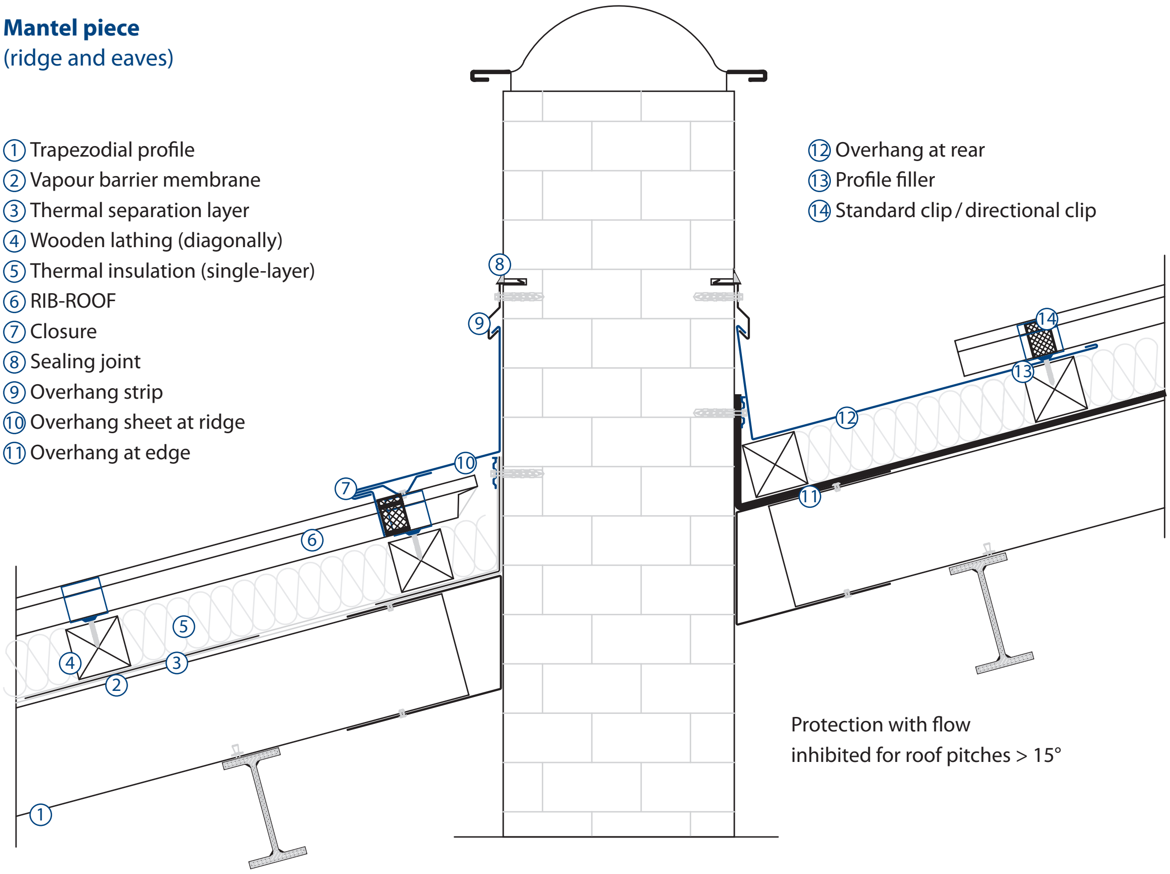
Rectangular roof penetrations (chimney-roof windows-dome light) are covered by craftsmanship with an end sheet at rear side (▶ valley board / ▶ neck moulding-carrying out with central higher placed bending for channelling water on both sides), a sheet on left and right hand side as well as a lower cover sheet (▶ front edge board) and are integrated into the roof. The height of the frames has to be a minimum of 15 cm above the profiled sheet area all the way around.

With **roof pitches of more than 15°**, an easy covering of the back sheet through the profiled sheets is sufficient.

With **roof pitches of less than 15°**, the measures, described in chapter 4.1 or 4.9.2, have to be adhered to.

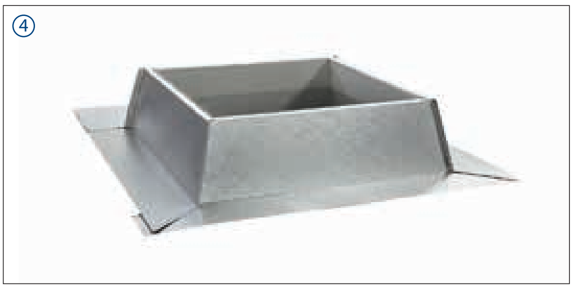
Mantel piece
(ridge and eaves)

1. Trapezodial profile
2. Vapour barrier membrane
3. Thermal separation layer
4. Wooden lathing (diagonally)
5. Thermal insulation (single-layer)
6. RIB-ROOF
7. Closure
8. Sealing joint
9. Overhang strip
10. Overhang sheet at ridge
11. Overhang at edge
12. Overhang at rear
13. Profile filler
14. Standard clip / directional clip



Protection with flow inhibited for roof pitches > 15°

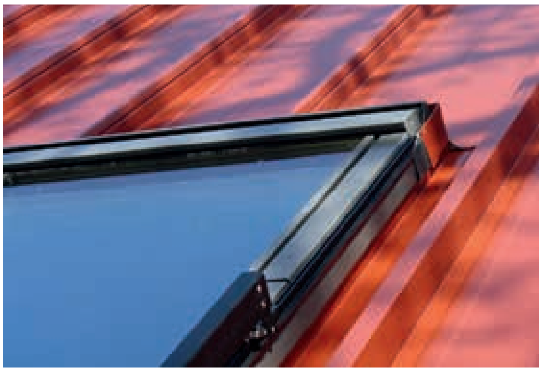
Edging as plug-in system



4.9.4 Roof Windows

For **roof pitches of more than 15°**, a sealing frame is sufficient. The soaker is integrated with circulating RIB-ROOF elements into the roof.

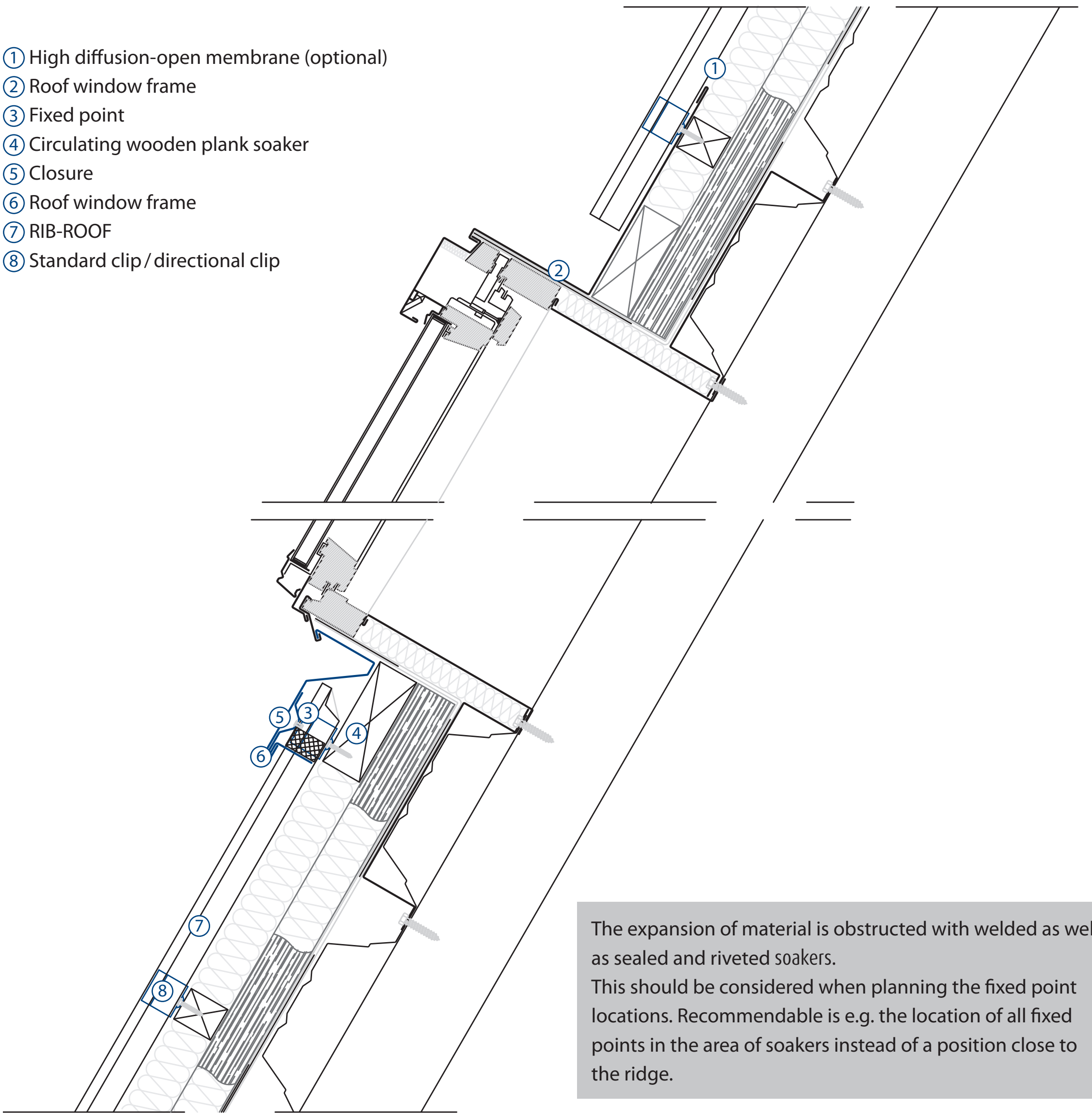
A profiled sheet overlapped on rear side has to be made according to section 3.4/transvesal joint.



The profiled sheets which are directed to the eaves have to be folded up in the bottom boom and fastened with fixed points in order to avoid slipping. This area is covered with a pre-assembled front edge board of the soaker. The sealing of the profiled sheet transversal joints has to be effected as before mentioned.

In an **area of roof pitches of more than 1.5°**, welding or soldering of soaker is necessary with suitable materials. The profiled sheets are laid onto the flange of the soaker in course of roofing and the circulating joints are densely welded or soldered, respectively. The reverse profiled ribs which are directed to eaves are sealed with the same technique.

1. High diffusion-open membrane (optional)
2. Roof window frame
3. Fixed point
4. Circulating wooden plank soaker
5. Closure
6. Roof window frame
7. RIB-ROOF
8. Standard clip / directional clip



The expansion of material is obstructed with welded as well as sealed and riveted soakers.
This should be considered when planning the fixed point locations. Recommendable is e.g. the location of all fixed points in the area of soakers instead of a position close to the ridge.

4.10 Photovoltaic on RIB-ROOF

The following details have to be considered when planning and installing:

- **Snow drifts and formation of ice:**
  Before planning it has to be guaranteed that there will not arise snow drifts in bulk and large formation of ice between the PV modules due to a partially shaded and/or transversal frame in extreme winter conditions. With raised PV modules this can especially lead to flow inhibition or can reduce the effectiveness of the modules.

- **Freezing melting water:**
  In winter times it could be possible at snow-covered roofs that in sunlit areas defrosting takes place. The resulting melting water is collected on its way towards eaves in the shaded areas of snow accumulation between the raised PV-modules. When the temperature later goes down, especially at night, the melting water freezes together with the snow accumulation which then results in ice formation what, in turn, implicates further intensification of flow inhibition, especially with changing melting and frost periods.

Please also refer to the IFBS quality leaflet "Solar technique in light metal trade". Advice for planning and structure, August 2012

- **Prefer roofs with thermal insulation:**
  Sufficiently insulated roofs and dome lights/light tapes without any larger thermal bridges and without non-insulated roof overhangs are preferred, so that the above-mentioned problems can be avoided during winter.

- **General recommendation:**
  A roof with highly diffusion-open protective sheets is the best solution with raised systems for snowy regions. A realization of eaves with an at least 3 m wide, highly diffusion-open protective sheet is here the minimum solution.

There are three options when building new buildings, renovating roofs and refitting roofs with RIB-ROOF metal roofing systems with regard to photovoltaic systems. You are free to decide the architectural guidelines and project-related calculations of profitability. You can decide what's the best solution for your project. We are pleased to inform you about this in detail!

1. PV-modules parallel to the roof

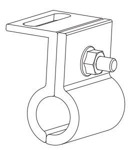
Installation parallel to the roof

Additional roof load approx. 15 – 35 kg/m²; all common PV-modules and substructure systems can be used

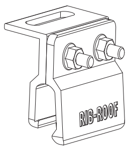
The substructure for an installation of PV-modules parallel to the roof is installed with RIB-ROOF solar brackets perforation-free onto RIB-ROOF profiled sheets.

Solar bracket

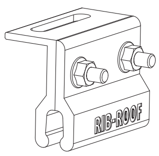
RIB-ROOF Evolution



RIB-ROOF Speed 500



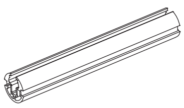
RIB-ROOF 465



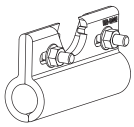
A design load of FZ = 0.5 kN or the higher value indicated in the General System Authorization Z-14.4-774 can be taken for one RIB-ROOF solar bracket in the case of wind suction. Solar brackets mustn't be installed directly in the area of clips, so that a length expansion of the profiled sheets is guaranteed. Tightening torque for screws 20 Nm.

Solar pipe (substructure)

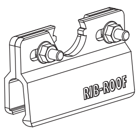
Solar pipe



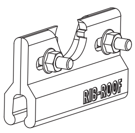
RIB-ROOF Evolution



RIB-ROOF Speed 500



RIB-ROOF 465



Solar pipe substructures, consisting of solar pipe fixed with snow guard bracket, on metal profiled sheets for further fastening with nut stone/hammer-head screw, e.g. for PV modules.
Installation is to be carried out on top boom without penetrating the profiled sheets.

2. Raised PV-modules

Raised installation

Additional roof load approx. 15 – 35 kg/m²; all common PV-modules and substructure systems can be used
The substructure for an installation of raised PV-modules is installed with RIB-ROOF solar brackets penetration-free onto RIB-ROOF profiled sheets.

The orientating of the PV-modules can be optimized above the substructure on the pre-assembled installation angles of our RIB-ROOF solar brackets according to their direction and roof pitch.

Note:
In order to avoid formation of ice in snowy regions, special measures have to be taken.

3. Building-integrated solar film

The RIB-ROOF metall roofing systems with a light and flexibly attachable solar film.
You gain a quality product tested by Zambelli that can be installed both on already existing roofs as well as on the new ones.

4.11 Lightning protection

RIB-ROOF metal roofs with colour-coating also form a natural element of our lightning protection system. The investigation report can be downloaded on www.zambelli.com

The solar brackets made out of aluminium (uncoated), are also applicable as brackets for lightning protection according to DIN EN 50164-1, test category N.

4.12 Snow guard and ice stopping system and tread supports

Snow guard systems are fastened with system-proof brackets, without penetration, of the profiled sheets on their ribs. They stop snow which lies on the roof and avoid possible snow slide. Snow guard systems are also used to relieve and keep the internal roof gutter clear of snow and ice.
The generated shear, revoked by the snow on the roof, is eventually distributed to several snow guard rows. Double snow guard pipes aren't used any more.

The resulting ice sheets which may occur when snow melts are prevented against slipping (photographs on previous page or images on next two pages) below the snow guard pipes (outside diameter 32 m) by means of ice stoppers.

The screws (at least M8 x 40 mm) are out of non-corrosive material. The given tightening torque for screws is 20 Nm.
The amount and distance of snow guard rows (refer to following table) depend on the roof pitch and local snow load.

Distances of snow guard rows

Calculated on the basis of the General System Authorization by the construction authorities No. Z-14.4-774 with the lowest of all the values for steel/aluminium.

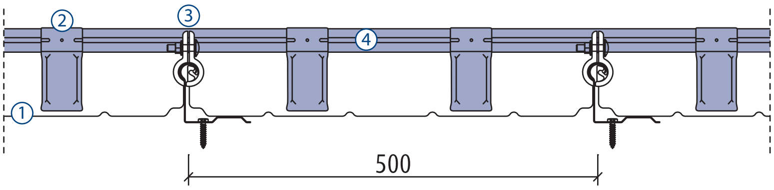
RIB-ROOF Speed 500/RIB-ROOF Evolution steel							Snow load S_i	RIB-ROOF Speed 500/RIB-ROOF Evolution aluminium						
5°	10°	15°	20°	25°	30°	35°		5°	10°	15°	20°	25°	30°	35°
28.61	14.36	9.63	7.29	5.90	4.99	4.35	$0.75\ kN/m^2$	41.46	20.81	13.96	10.56	8.55	7.23	6.30
21.46	10.77	7.23	5.47	4.42	3.74	3.26	$1.00\ kN/m^2$	31.09	15.61	10.47	7.92	6.41	5.42	4.72
17.16	8.62	5.78	4.37	3.54	2.99	2.61	$1.25\ kN/m^2$	24.88	12.49	8.38	6.34	5.13	4.34	3.78
14.30	7.18	4.82	3.65	2.95	2.49	2.17	$1.50\ kN/m^2$	20.73	10.40	6.98	5.28	4.27	3.61	3.15
12.26	6.15	4.13	3.12	2.53	2.14	1.86	$1.75\ kN/m^2$	17.77	8.92	5.98	4.53	3.66	3.10	2.70
10.73	5.38	3.61	2.73	2.21	1.87	1.63	$2.00\ kN/m^2$	15.55	7.80	5.24	3.96	3.21	2.71	2.36
9.54	4.79	3.21	2.43	1.97	1.66	1.45	$2.25\ kN/m^2$	13.82	6.94	4.65	3.52	2.85	2.41	2.10
8.58	4.31	2.89	2.19	1.77	1.50	1.30	$2.50\ kN/m^2$	12.44	6.24	4.19	3.17	2.56	2.17	1.89
7.80	3.92	2.63	1.99	1.61	1.36	1.19	$2.75\ kN/m^2$	11.31	5.68	3.81	2.88	2.33	1.97	1.72
7.15	3.59	2.41	1.82	1.47	1.25	1.09	$3.00\ kN/m^2$	10.36	5.20	3.49	2.64	2.14	1.81	1.57

RIB-ROOF 465 steel							Snow load S_i	RIB-ROOF 465 aluminium						
5°	10°	15°	20°	25°	30°	35°		5°	10°	15°	20°	25°	30°	35°
30.76	15.44	10.36	7.84	6.34	5.36	4.67	$0.75\ kN/m^2$	44.58	22.37	15.01	11.36	9.19	7.77	6.77
23.07	11.58	7.77	5.88	4.76	4.02	3.51	$1.00\ kN/m^2$	33.43	16.78	11.26	8.52	6.90	5.83	5.08
18.46	9.26	6.22	4.70	3.81	3.22	2.80	$1.25\ kN/m^2$	26.75	13.42	9.01	6.82	5.52	4.66	4.06
15.38	7.72	5.18	3.92	3.17	2.68	2.34	$1.50\ kN/m^2$	22.29	11.19	7.51	5.68	4.60	3.89	3.39
13.18	6.62	4.44	3.36	2.72	2.30	2.00	$1.75\ kN/m^2$	19.11	9.59	6.43	4.87	3.94	3.33	2.90
11.54	5.79	3.88	2.94	2.38	2.01	1.75	$2.00\ kN/m^2$	16.72	8.39	5.63	4.26	3.45	2.91	2.54
10.25	5.15	3.45	2.61	2.11	1.79	1.56	$2.25\ kN/m^2$	14.86	7.46	5.00	3.79	3.06	2.59	2.26
9.23	4.63	3.11	2.35	1.90	1.61	1.40	$2.50\ kN/m^2$	13.37	6.71	4.50	3.41	2.76	2.33	2.03
8.39	4.21	2.83	2.14	1.73	1.46	1.27	$2.75\ kN/m^2$	12.16	6.10	4.09	3.10	2.51	2.12	1.85
7.69	3.86	2.59	1.96	1.59	1.34	1.17	$3.00\ kN/m^2$	11.14	5.59	3.75	2.84	2.30	1.94	1.69

Distances of snow guard rows in meter, according to snow load on the roof Si according to DIN 1055-5 and roof pitch.
Maximum clip distance RIB-ROOF 465 = 465 mm or RIB-ROOF Speed 500 / RIB-ROOF Evolution = 500 mm

The stated values are arithmetical **maximum values**. We recommend a reduction of distances by 30 % in specific cases.

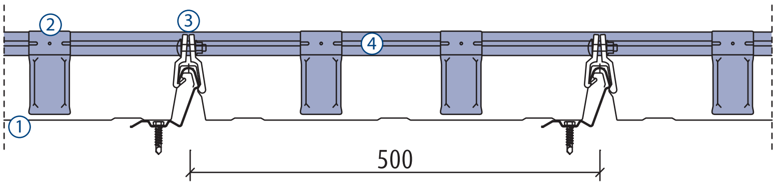
Snow guard system with ice stoppers RIB-ROOF Evolution



① RIB-ROOF Evolution
② Ice stopper
③ Snow guard bracket with groove
④ Snow guard pipe with groove Ø 32 mm

- **Ice stopper 4.0 pc/m**
- **Snow guard bracket 2.0 pc/m**

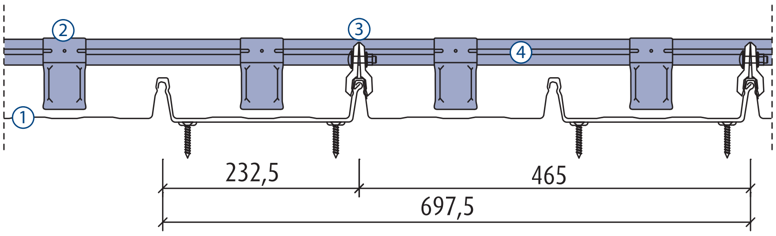
Snow guard system with ice stoppers RIB-ROOF Speed 500



① RIB-ROOF Speed 500
② Ice stopper
③ Snow guard bracket with grovoe
④ Snow guard pipe with groove Ø 32 mm

- **Ice stopper 4.0 pc/m**
- **Snow guard bracket 2.0 pc/m**

Snow guard system with ice stoppers RIB-ROOF 465



① RIB-ROOF 465
② Ice stopper
③ Snow guard bracket with grovoe
④ Snow guard pipe with groove Ø 32 mm

- **Ice stopper 4.0 pc/m**
- **Snow guard bracket 2.0 pc/m**

Snow guard/solar bracket RIB-ROOF 465 is to be installed on overlapping seam!

Pipes for length expansion to be installed each other with pipe connector at a distance of 10 mm as a minimum.

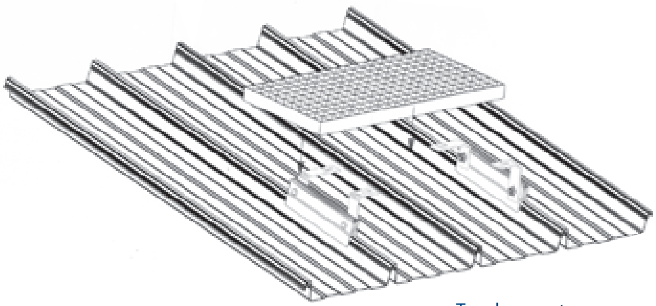
Snow guard systems, tread supports and solar brackets mustn't be installed directly in the area of clips, so that a length expansion of the profiled sheets is guaranteed. Tightening torque for screws 20 Nm.

Snow guard raising element

For photovoltaic/solar systems, we generally recommendour snow guard raising elements for stable elevation of the snow guard systems.

The distance between the snow guard rows can be increa-sed by 25 % or 50 % when using the snow guard extension element for 1 or 2 additional pipes.

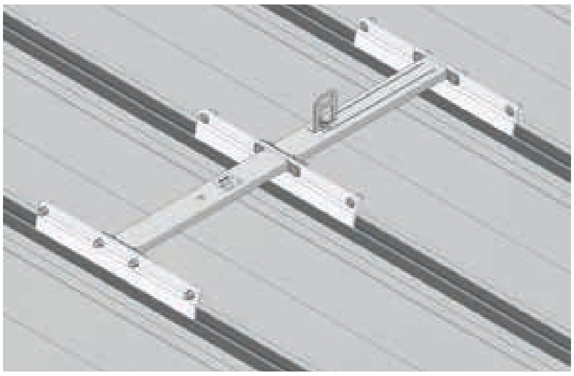
Walkways



Tread supports
RIB-ROOF 465

4.13 Fall arrest system

Fall arrest system with single anchor point
A single point on a roof (e.g. chimney) can be reached by a stationary anchor point. The starting point is fixed given. The person, to be secured, latches with his personal safety equipment and has high degree of movement when carrying out necessary works. Single anchor points can also be combined with fall arrest systems.



LUX-top GBD-Z 500 stationary single anchor point

Fall arrest system
Fall arrest systems provide a high degree of working comfort. The person can latches with his personal safety equipment at any point. The operator enjoys for greater movement by means of movable intermediate brackets and end lock sets. The professional association therefore recommends to favour complete fall arrest systems towards numerous single anchor points.

corner bracing element 90° usable as inner corner, external corner and on edge corner

intermediate bracket movable rope intermediate bracket approx. 220° (therefore accessible on both sides) and stainless-steel rope 8mm

end bracket fall absorption with spring pre-tension (approx. 0.75 kN) and indicator fixation

4.14 Green roof

Completion of the RIB-ROOF metal roof system with extensive greening as a complete system. This system is particularly suitable for flat and flat sloping roofs in residential construction and for commercial buildings in urban areas.

Compatibility	RIB-ROOF Speed 500 and RIB-ROOF Evolution
Roof pitch	from 1.5° to 45.0°
Dry weight	approx. 15-20 kg/m^2
Saturated weight	approx. 80 kg/m^2
Layer thickness	100 mm
Substrate type:	growth height of moss-sedum 1 – 3 cm
Water retention	up to 80 %
max. water retention capacity	60 l/m^2

1 Pre-cultivated vegetation layer
2 Growth mat made of binder-free rock wool
3 Serparating fleece layer
4 Grainage and storage layer
5 Metal roofing systems RIB-ROOF with special sealing tape

The whole green roof construction is planned by Zambelli, is factory-made and will be transported to a building site in a ready for installation form (inculding technical support).

Sweep the RIB-ROOF profiled sheets.

Install the drainage and storage layer tightly butted without overlapping and with the holes facing upwards. Ensure that the edges of the drainage and storage layer are positioned under the RIB-ROOF profiled sheet seams.

Roll out the filter fleece crosswise to the roof pitch over the drainage and storage layer.

Roll out the Green Roll growing media tightly crosswise to the drainage and storage layer. Leave out the gravel strips or areas. Cut the Green Roll growing media to size if required.

Thoroughly water the Green Roll growing media. Apply Urbanscape slow-release fertiliser evenly on the surface (approx. 30 - 35 g/m²).

⑤

First align the Sedum Mix vegetation layer, then roll it out carefully and tightly crosswise to the Green Roll growing media. If necessary, cut the Sedum Mix vegetation layer to size using scissors or a utility knife with a hooked blade. Ensure that the Sedum Mix vegetation layer covers the entire Green Roll growing media.

Notice

Thoroughly water the entire system (Vegetation layer & Green Roll).

- Premium systems (40mm Green Roll): approx. 49 litres/m²
- Standard systems (20mm Green Roll): approx. 37 litres/m²

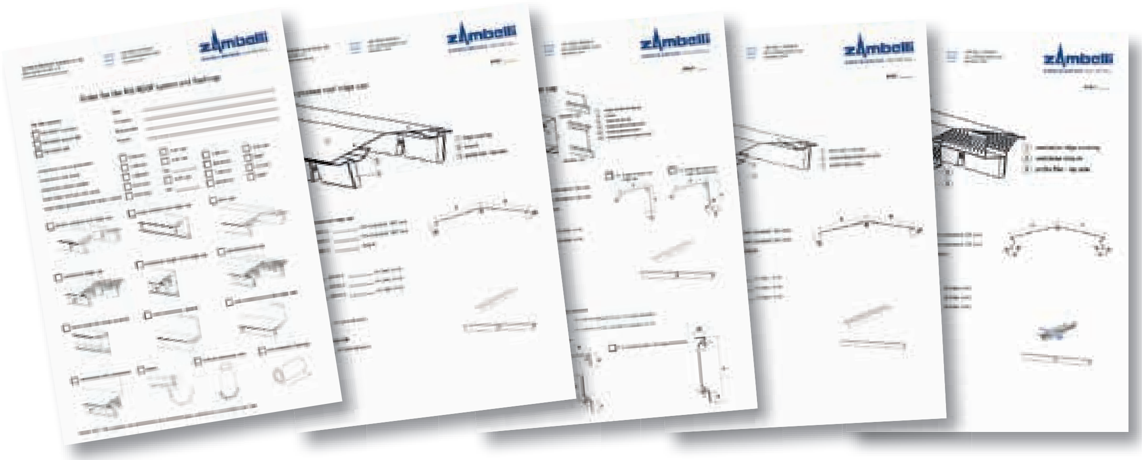
Observe the service & maintenace instructions:

download-ribroof-en.zambelli.com

4.15 Order forms

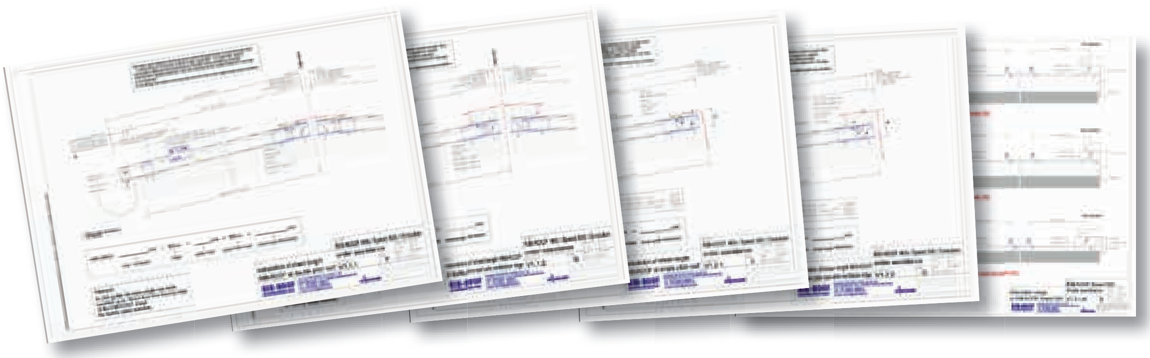
Order form for flashings

You will find detailed drawings with standard measurements in our oder form at order-form-flashings.zambelli.com



Order form for profiled sheets

You will find detailed drawings with standard measurements in our oder form at order-form-profiledsheet.zambelli.com




OUT

EINFACH
MACHEN.
AUS
METALL.

Zambelli
RIB-ROOF GmbH & Co. KG

Hans-Sachs-Straße 3 + 5
94569 Stephansposching
Germany

TEL +49 9931 89590 - 0
E-MAIL rib-roof@zambelli.com

www.zambelli.com