



# **Installation Guidelines for WOLFIN M Synthetic Roofing and Waterproofing Membrane**

## Installation Guidelines for WOLFIN M

(PVC-P-BV roofing and waterproofing membrane, reinforced in the middle with a fibre glass mesh. Certified according to EN 13956 Waterproofing of roofs and EN 13967 Waterproofing of buildings. In addition the relevant national standards for waterproofing of roofs and waterproofing of buildings must be considered.

### 1. Determining the local conditions

#### 1.1 Condition of the deck substrate and requirements for the load-bearing structure

- Inspect and approve the dead loads for the roofing layers.
- Cast-in-situ reinforced concrete decks and precast concrete decks are to be checked for their suitability before work commences.
- The surfaces should be dry, flat, run continuously without interruption and be free of honeycombing and foreign bodies.
- Joints between prefabricated concrete decks must be fully mortared (exception: building expansion joints).
- Deck substrates such as sarking boards, plywood, trapezoidal steel sheet, etc. must be sufficiently stiff and installed on a load-bearing substructure.

Defects arising from the provision of services by other contractors, insofar as they can be identified during a visual inspection and which could negatively influence the design and function of any subsequent work, **must be reported in writing before the provision of your own services.**

#### 1.2 Condition of the roofing layers for refurbishment work

In order to be able to determine the condition of the existing roof construction, it will be necessary to cut core samples through the old roof layers. This will facilitate the inspection of the vapour barrier, adhesion to the deck substrate and the adhesion of individual layers to one another, the resistance to moisture penetration of the thermal insulation, any possibly existing cavities, blistering, etc.

Before issuing an invitation to tender, the builder should commission a roof condition survey of the existing roof construction. Otherwise any necessary additional tasks that are not contained in the project specification may have to be approved based upon a supplementary quotation.

#### Attention:

Thermal insulation materials below the vapour barrier have a negative effect on the dew point location. When carrying out waterproofing measures on hollow core slabs, aerated concrete, pumice concrete or similar, the heat-insulating layer must be augmented so that the point at which condensation may occur is located above the vapour barrier. The dew point location and the water vapour/diffusion conditions must be established!

### 2. Installing WOLFIN M

#### 2.1 Information on storage

The rolls are to be protected from moisture until they are used. Do not store the rolls directly on the surface of the roof but always raised (pallets).

#### 2.2 Preparing the surfaces

Alongside the previously described requirements for the load-bearing structure, it must be ensured that the surfaces have been thoroughly cleaned and any standing water removed before the subsequent construction of the additional roofing layers.

When laying the membrane directly on rough substrates, concrete, screed or wood, it is always necessary to use a WITEC PES 300 g/m<sup>2</sup> protection fleece.

#### 2.3 Loose laying

The WOLFIN M roofing and waterproofing membranes are loose laid, welded at the seams and secured in place with either a ballast of gravel with a grain size of 16/32 mm, interlocking preformed concrete stone elements (no parquet stones) or concrete slabs on a protective layer or gravel cover secured against wind lift in accordance with EN 1991.

In the case of gravel that does not meet the standard (sharp-edged or sharp pieces of broken gravel) or if the gravel is applied through blasting, a protective layer of e.g. WITEC PES protection fleece (300 g/m<sup>2</sup>) is to be laid on the waterproofing.

Suitable coverings, which at the same time provide protection against wind lift, can consist of green roofs, preformed concrete stone elements (on a protective layer and a sand bed), concrete slabs (on gravel, support pads or mortar bags) or screed with a tile covering (on sliding support made out of double 0.2 mm thick PE film). In general, linear fasteners must be fitted in all roof channels (valleys, gulleys), in front of all upstands (such as parapets, walls, roof protrusions, steps, etc.) and on roof trims (see 2.6).

## 2.4 Mechanically fixed laying

Loosely lay the WOLFEN M waterproofing membrane and mechanically fix it in place in the area where the seams overlap by at least 10 cm using mechanical fixings (e.g. plate fasteners and screws).

When laying the membrane on flammable insulating materials, a fire protection layer made out of fibreglass (min. 120g/m<sup>2</sup>) is required.

Assessing the required number of fastening elements can generally be carried out using a separate calculation of the wind load in accordance with EN 1991 for the specific building.

WOLFEN's technical department can if requested carry out the necessary wind uplift calculations to determine the frequency of mechanical fasteners. Should these calculations be requested they will be made available to the customer once an order has been placed.

Depending on the geometry of the trapezoidal steel sheet, the number of mechanical fixings required may be greater in practice. The WOLFEN M membranes are to be adapted to these requirements. Therefore, it may be necessary, for example, to start with single or multiple strips of the WOLFEN M waterproofing membrane around the outside before the maximum width of the membrane can be used or to additionally fix the WOLFEN M waterproofing membranes in place in the centre of the membrane and to weld a strip of WOLFEN M over this fastener.

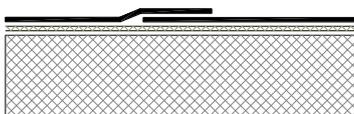
It is also generally necessary when using mechanical fixing that linear fasteners (peel stop bars) are fitted in all roof channels (valleys, gulleys), in front of all up-stands (such as parapets, walls, roof protrusions, steps, etc.) and on roof trims (see 2.6).

## 2.5 Seam overlaps and joining techniques

### 2.5.1 Loose installation under ballast

The seam overlap must be at least 40 mm wide and welded to a width of at least 20 mm when using hot air welding or a width of at least 30 mm when using solvent welding. Both welding techniques deliver the same results.

It is absolutely prohibited to use an adhesive.

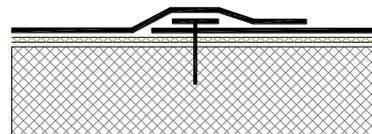


## 2.5.2 Mechanically fixed installation

The arrangement of the fastening elements must be carried out so that there is still a clearance of 2 cm to the edge of the membrane. The seams between the individual membranes should be overlapped so that a welding area of at least 4 cm still remains in front of the fastening elements.

In front of the fastening elements, the membrane seams are to be welded to a width of at least 20 mm when using hot air welding or a width of at least 30 mm when using WOLFEN solvent welding agent. Both welding techniques deliver the same results.

It is absolutely prohibited to use an adhesive.



If national requirements need a greater width seam overlap or welding zone, these requirements have to be noted.

## 2.5.3 End joints and pre-cut sections

In the case of end joints and pre-cut sections, the membranes are to be welded as previously described. In order to prevent the formation of capillaries where there are multiple overlaps (T-butt joints), the welding areas at the transition to the underlying membrane are to be chamfered and pressed using a pressure roller at right angles to the seam line (hot air welding). When using solvent welding, these areas must be separately welded using hot air welding equipment.

**General:** Carry out test welds on the WOLFEN M membrane before completing the welding work!

## 2.5.4 Sealing the seams

WOLFEN liquid should be used to seal the welded and inspected seams. (WOLFEN liquid is excellent for indicating defective welds). When using WOLFEN M waterproofing membrane, all seam edges with exposed fabric are to be sealed using WOLFEN liquid.



## 2.6 Measures for absorbing horizontal forces in the waterproofing layer or additional measures required for changes in the angle of the roof slope over 3° (5.2 %)

Irrespective of information contained within other guides, linear fasteners using WOLFEN coated metal sheet profiles, WOLFEN peel stop bars or galvanised steel sheet (thickness > 0.75 mm) should be fundamentally fitted for waterproofing using WOLFEN M roofing and waterproofing membranes in front of upstands in the waterproofing layer and in the case of changes in the angle of the roof slope > 3°.

The fasteners used for absorbing the exerted tensile force are to be compatible with the type and strength of the substructures. The fastenings must be assessed for tensile forces of at least 2.5 kN/m.

If auxiliary structures or substructures are required to absorb the tensile forces, these are to be fixed in place in such a way that they absorb the tensile forces from the linear fasteners.

For this reason, it may be necessary to increase the number of mechanical fixings. If required, an individual building-specific calculation is to be carried out.

The types of fastenings listed in the following table have proven themselves in practice.

**Table 2.7**

Substructure	Object for fastening	
	Wooden plank (thickness > 3 cm, width > 8 cm)	WOLFEN coated metal steel sheet bracket, horizontal leg min. 40 mm
<b>Reinforced concrete</b>	Dowel 10 mm with screw 8 mm, spacing 30 cm or Spike twister from SFSintec, spacing 30 cm	Expansion rivet 4.8/26 mm, spacing 15 cm or Spike twister from SFSintec, spacing 20 cm
<b>Lightweight concrete</b>	Nail anchor 8 mm, spacing 30 cm	Nail anchor 8 mm, spacing 12 cm
<b>Wooden beams wooden sarking / chipboard</b>	Wood screw 8 mm, spacing 30 cm	Wood screw 4.5/30 mm, spacing 15 cm
<b>Trapezoidal sheet metal</b>	Self-drilling screw 4.5 mm, spacing 20 cm	Steel blind rivet 5 mm, spacing 12 cm

Mechanical fixing types that are compatible and approved for the substructure are to be used. The mechanical fixings must be installed so that they do not exert any damaging effect on the waterproofing membranes.

As an alternative to fastening with linear profiles, it is also possible to use approved individual fasteners (plate fasteners and screws) with a maximum spacing of 250 mm on buildings with a height of up to 12 m without internal pressure (for steel sheet profile / wooden material type vapour barriers e.g. WITEC SK vapour barrier membrane, with air-tight lateral connection) and not in exposed locations.

It is not permitted for these fastenings to be additionally used for protecting the roofing layers against wind uplift. If connections and finishes are completely made out of WOLFEN coated metal sheet profiles, these will also serve at the same time to absorb horizontal forces.

## 3. WOLFEN coated metal sheet and profile system

### 3.1 WOLFEN universal coated metal sheet system

WOLFEN coated metal sheet profiles are required as connecting and trim profiles for wall connections, roof trims, etc. when laying WOLFEN M membranes.

They are cut and formed from WOLFEN coated metal sheet plates.

There must be a 5 mm wide gap left between adjacent profiles. This gap is to be sealed over with at least 25 mm wide duct tape for expansion zones and welded tight with at least 100 mm wide strips of WOLFEN IB.

Joint connectors are additionally required for coated metal sheet verge flashing. The required fasteners for absorbing the horizontal forces are described under Section 2.6.

Coated metal sheet profiles, such as verge flashing profiles, must be connected to the substructure in such a way that they can withstand the relevant wind loads. If required, an individual building-specific calculation is to be carried out in accordance with EN 1991. When installing on cement-based substrates, a separating layer made out of e.g. WITEC PES protective fleece 300 g/m<sup>2</sup> should be fitted.

Depending on the width of the external vertical leg of the coated metal sheet profile and the height of the building, it may be necessary to install additional wind tape or continuous flashing.

## 4. Connections to upstands and roof edges

Connections to walls, angular protrusions, etc. must extend at least 150 mm above the upper edge of the roof covering (gravel cover, panel covering, earth covering, etc.) for roof slopes up to 5° and at least 100 mm for steeper roof slopes.

The height of the roof edge must extend at least 100 mm above the upper edge of the roof covering (gravel cover, panel covering, earth covering, etc.) for slopes up to 5° and at least 50 mm for steeper roof slopes.

The external vertical leg (cover plate) for covers or verge flashing profiles must overlap the upper edge of the rendering or cladding by at least 50 mm for buildings with heights up to 8 m, by at least 80 mm for buildings up to 20 m and by at least 100 mm for buildings over 20 m. The drip edge on the cover plates must be aligned at a distance of at least 20 mm from those building components to be protected.

Connections and finishes are generally to be made windtight. A suitable method for achieving this is e.g. to lay wind sealing tape under a coated metal roof trim. Roof edges should have a distinct incline to the roof side so that atmospheric contaminants do not collect but run off with the rainwater.

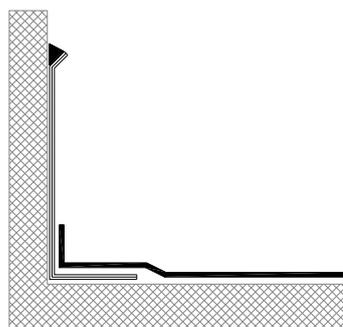
### 4.1 **Connections to upstands with WOLFEN coated metal sheet profiles**

Position and install the horizontal leg. The horizontal leg of the profile is bent at an angle of 100° so that its front lip will also nestle against the horizontal surface even if the shape of the substructure is not continuously straight. It is fastened in place on the lower edge of the vertical or horizontal leg in accordance with the guidelines in Table 2.7.

On the upper vertical edge, the coated metal sheet profile must be additionally fixed in place at a spacing of 250 mm, the fastening points must be welded tight using WOLFEN IB discs.

Weld the WOLFEN M waterproofing membrane from the surface of the roof onto the coated metal sheet profile.

Protect against any water running behind the profiles using Ceresit F173 Construction Silicon or a proprietary silicone sealant.

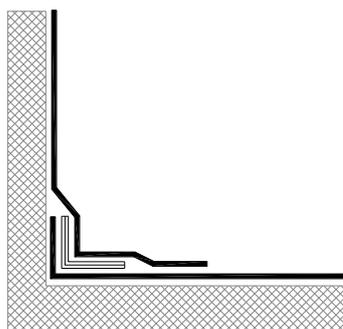


### 4.2.1 **Installation with adhesive in the junction between the roof and upstands**

Run the WOLFEN M waterproofing membrane from the surface of the roof along the foot of the upstand approx. 8 cm up the vertical plane. Install linear fasteners in the junction between the roof and the upstand using mechanical fixings with countersunk heads that are suitable for the respective substructure in accordance with Table 2.7.

Cut strips of WOLFEN M waterproofing membrane to the required dimensions. Apply TEROTECH Spray Adhesive or TEROKAL 914 contact adhesive to the underside of the membrane and the surfaces of the building elements and allow to air dry.

Correctly align the connecting membrane and stick it down without any creasing to the substructure. The connection to the waterproofing membrane on the surface of the roof is made using hot air welding or solvent welding.

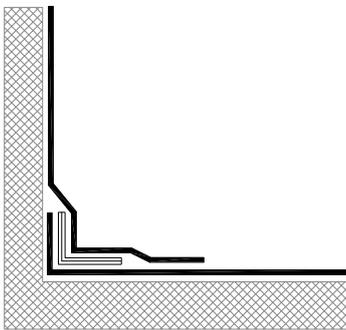


## 4.2.2 Loose installation in the junction between the roof and upstands

Run the WOLFEN M waterproofing membrane from the surface of the roof along the foot of the upstand approx. 8 cm up the vertical plane.

Install linear fasteners in the junction between the roof and the upstand using mechanical fixings with countersunk heads that are suitable for the respective substructure in accordance with Table 2.7.

Cut strips of WOLFEN M waterproofing membrane to the required dimensions. Correctly align the connecting membrane and fasten or weld it to the upper flashing. The connection to the waterproofing membrane on the surface of the roof is made using hot air welding or solvent welding.



## 4.2.3 Loose installation in the junction between the roof and thermally insulated upstands

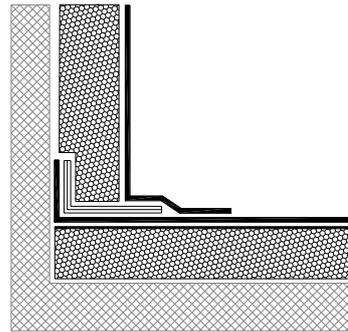
Run the WOLFEN M waterproofing membrane from the surface of the roof along the foot of the upstand approx. 8 cm up the vertical plane.

Install linear fasteners made out of WOLFEN coated metal sheet (horizontal leg at least 5 cm + the thickness of the insulation material) in the junction between the roof and the upstand using mechanical fixings with countersunk heads that are suitable for the respective substructure in accordance with Table 2.7.

Cut strips of WOLFEN M waterproofing membrane to the required dimensions.

Correctly align the connecting membrane and fasten or weld it to the upper flashing. The connection to the waterproofing membrane on the surface of the roof is made by welding the coated metal sheet bracket to the surface membrane using hot air welding or solvent welding.

When laying the membrane on flammable insulating materials, a fire protection layer made out of fibreglass (min. 120g/m<sup>2</sup>) is required.

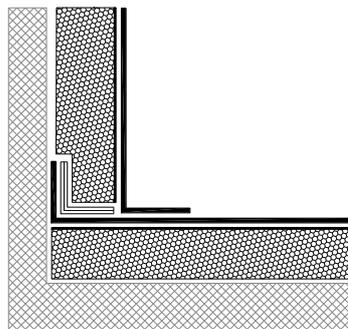


## 4.2.4 Installation with adhesive in the junction between the roof and thermally insulated upstands

Run the WOLFEN M waterproofing membrane from the surface of the roof along the foot of the upstand approx. 8 cm up the vertical plane.

Install linear fasteners in the junction between the roof and the upstand using mechanical fixings with countersunk heads that are suitable for the respective substructure in accordance with Table 2.7.

Cut strips of WOLFEN M waterproofing membrane to the required dimensions. Apply TEROKAL 914 contact adhesive to the underneath of the membrane and the surfaces of the building components (coated insulation plate) and allow to air dry. Correctly align the connecting membrane and stick it down without any creasing to the substructure. The connection to the waterproofing membrane on the surface of the roof is made using hot air welding or solvent welding.



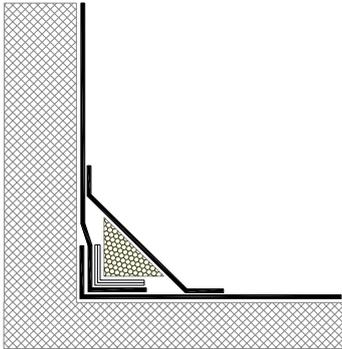
## 4.2.5 Wedges

If a wedge needs to be fitted to the foot of upstands, proceed as follows: Run the WOLFEN M waterproofing membrane from the surface of the roof along the foot of the upstand approx. 8 cm up the vertical plane.

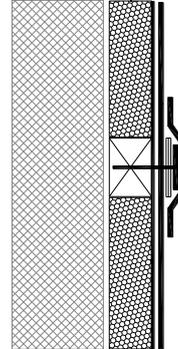
Run WOLFEN M waterproofing membrane vertically along the foot of the upstand and approx. 5 cm into the horizontal plane.

Install linear fasteners in the junction between the roof and the upstand using mechanical fixings with countersunk heads that are suitable for the respective substructure.

Insert the wedge made out of mineral fibres or rigid polyurethane foam and then weld over with a correspondingly wide strip of WOLFIN M waterproofing membrane.



A strip of coated metal sheet (cut to a length of 7 cm, 2-sided 1 cm, folded by 180°) or a peelstop bar for example WITEC Rail KF is then to be installed (fastening distance 20 cm). A strip of WOLFIN IB waterproofing membrane is to be welded over this intermediate fastening.

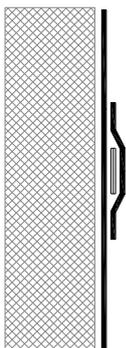


## 4.3 Intermediate fastening

In the case of connection height greater than 50 cm (loose laid connecting membranes) and greater than 100 cm (connecting membranes laid with adhesive), it is necessary to fit an additional intermediate fastening halfway up the connection height.

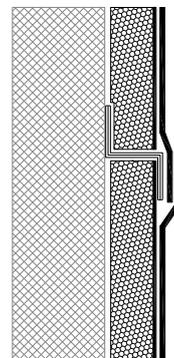
### 4.3.1 Intermediate fastening to upstands

A strip of coated metal sheet (cut to a length of 7 cm, 2-sided 1 cm, folded by 180°) or a peelstop bar for example WITEC Rail KF is to be installed half way up the connection height (fastening distance 20 cm). A strip of WOLFIN IB waterproofing membrane is to be welded over this intermediate fastening.



### 4.3.3 Intermediate fastening to thermally insulated upstands with coated metal Z-profile

A Z-shaped coated metal sheet profile is to be installed half way up the connection height (fastening distance 20 cm). The two-pieces of the connecting membrane are to be welded on to it.



### 4.3.2 Intermediate fastening to thermally insulated upstands with fixing bar

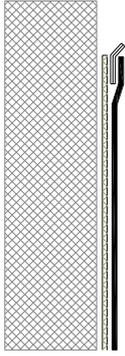
An auxiliary construction consisting of a timber section (dimensions: at least 5 cm x the thickness of the installed vertical layer of thermal insulation) or similar is required half way up the connection height.

## 4.4 Flashing on upstands

### 4.4.1 Flashing with coated metal sheet

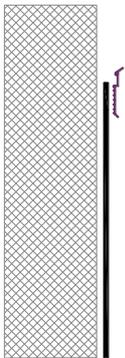
The upper flashing of the connection is created by fitting WOLFIN coated metal sheet profiles (fastening distance 20 cm), together with joint sealer to prevent any water running behind the profiles using Ceresit F 173 Construction Silicon.

The WOLFIN vertical waterproofing membrane is then welded in this case to the coated metal sheet profile.



## 4.4.2 Flashing with termination profiles

The upper flashing of the connection is created by fitting termination profiles, together with joint sealer to prevent any water running behind the profiles using F 173 Construction Silicon.

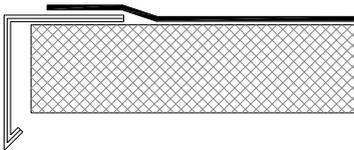


## 4.5 Roof edges

### 4.5.1 Roof edges for eaves

Install WOLFIN coated metal sheet eaves profiles of a suitable shape and mechanically fix flush to the external edge of the building (fix the horizontal leg every 15 cm).

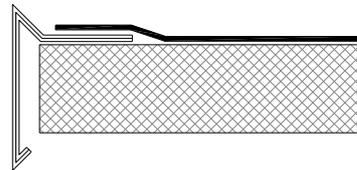
Weld the WOLFIN M waterproofing membrane from the surface of the roof onto the horizontal leg and over the fastening points on the leg.



### 4.5.2 Roof edges with WOLFIN coated metal sheet profiles

Install WOLFIN coated metal sheet verge flashing profiles of a suitable shape and fit flush to the external edge of the building (fix the horizontal leg at least every 15 cm). Depending on the height of the building and/or the height of the cover plate, it may be necessary to install wind tape or a continuous flashing.

Weld the WOLFIN M waterproofing membrane that runs to the edge of the building onto the horizontal leg and over the fastening points on the leg.



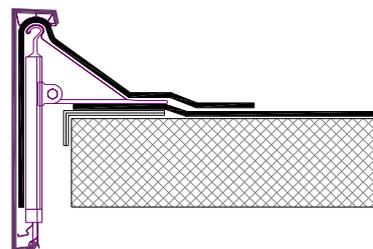
### 4.5.3 Roof edges with multi-piece metal clamping profiles

Install WOLFIN coated metal sheet brackets (e.g. 3/7cm) professionally and flush to the external edge of the building (press the 3 cm high vertical leg to the exterior of the building and fasten the 7 cm wide horizontal leg at least every 25 cm).

Weld the WOLFIN M waterproofing membrane that runs to the edge of the building onto the horizontal leg and over the fastening points on the leg.

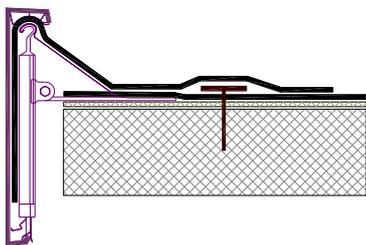
Install the basic structure of the multi-piece metal clamping profile onto at least 3 mm thick NEOPRENE discs according to the manufacturer's instructions so that the screw protrusions cannot cause any leaks in the waterproofing (also install rigid waterproof plates between the screw head and the profile mount).

Clamp the strip of WOLFIN M designed to hang in the profile in place using the corresponding mechanism and weld the free section of the waterproofing membrane.



In the case of existing multi-piece metal clamping profiles immediately in front of the basic structure of the clamping profile, fasten a strip of WOLFIN composite coated metal sheet (cut to a length of 7 cm, 2-sided 1 cm, bent to 180°) into the substructure at least every 20 cm along the WOLFIN waterproofing membrane that runs to the profile.

Clamp the strips of WOLFIN M designed to hang in the profile in place using the corresponding mechanism and weld together the free section of the waterproofing membrane and the strips of coated metal sheet.

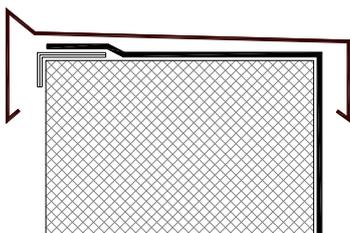


#### 4.5.4 Roof edges with wall capping profiles

Install WOLFIN coated metal sheet brackets (e.g. 3 cm/7cm legs) flush to the external edge of the building (press the 3 cm high vertical leg to the exterior of the building and fasten the 7 cm wide horizontal leg at least every 25 cm).

Weld the WOLFIN M waterproofing membrane that runs to the edge of the building onto the horizontal leg and over the fastening points on the leg.

Install the wall capping profile mount onto at least 3 mm thick NEOPRENE discs according to the manufacturer's instructions so that the screw protrusions cannot cause any leaks in the waterproofing at the top of the parapet (also install rigid waterproof plates between the screw head and the profile mount).

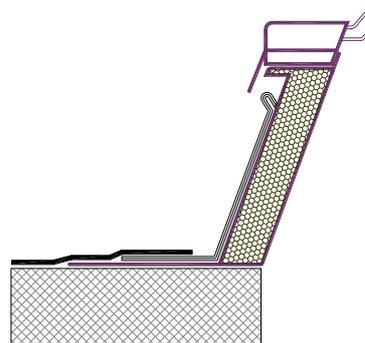


## 5 Enclosing the bases for skylights

### 5.1 Enclosing with WOLFIN coated metal sheet profiles

Fit WOLFIN coated metal sheet profiles, bent 3 times, to the vertical or slanting base. Cut the outer edges to length where required. Apply a strip of elastic joint sealer of type F 173 Construction Silicon onto the primer coating on the upper edge of the base, press the WOLFIN coated metal sheet profile into the joint sealer and fix the at least 90 mm wide horizontal leg using mechanical fixings suitable for the respective substructure every 150 mm through the horizontal flange of the base. Seal the faces and corners of the profile with 50 mm wide separating strips and weld 150 mm wide strips of WOLFIN IB over them.

When the base for the skylight is fitted with flashing, the vertical or slanting legs are pushed underneath or clamped in place. If the flashing is rainproof, there is no need for the elastic joint sealer. Weld the WOLFIN M waterproofing membrane from the surface of the roof onto the horizontal leg and over the fastening points on the leg.



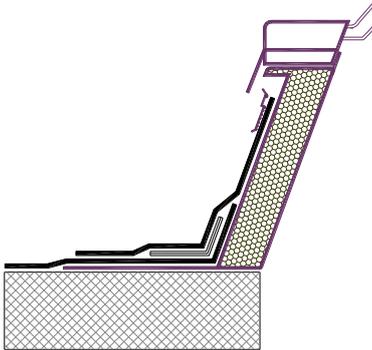
### 5.2 Enclosing with WOLFIN M waterproofing membrane

Run the WOLFIN M waterproofing membrane from the surface of the roof approx. 8 cm up the base for the skylight, install linear fasteners in the junction between the roof and the upstand through the horizontal flange of the base for the skylight using mechanical fixings with countersunk heads that are suitable for the respective substructure.

Cut strips of WOLFIN M waterproofing membrane to the required dimensions. Apply TEROTECH Spray Adhesive or TEROKAL 914 contact adhesive to the underneath of the membrane and the base for the skylight and allow to air dry.

Correctly align the connecting membrane and stick it down without any creasing to the base for the skylight. Run connecting strips of WOLFIN M waterproofing membrane horizontally onto the waterproofing membrane on the surface of the roof and weld together.

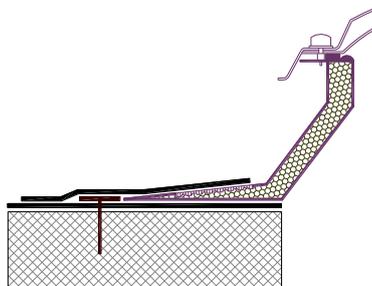
For the upper connection, see section for flashing on upstands.



## 5.3 Connecting to bases with rigid PVC frames

### Type 1: with fastening in the junction between roof and frame

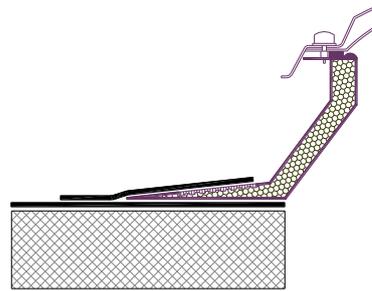
Fix WOLFIN coated metal sheet profiles (with a single fold) every 150 mm through the waterproofing membrane on the surface of the roof into the substrate at least 20 mm in front of the base for the skylight. The connection to the waterproofing membrane on the surface of the roof is made using a separate strip of WOLFIN IB.



### Type 2: without fastening in the junction between roof and frame

Run the WOLFIN M waterproofing membrane from the roof up to the edge of the opening for the skylight (opening of the shell construction).

Once the skylight has been installed, weld strips of WOLFIN IB waterproofing membrane (1.5 mm thick) onto the rigid PVC frame and at least 50 mm wide onto the waterproofing membrane on the surface of the roof.



## 5.4 Enclosing round skylight bases, conical

In the case of 150 mm high bases, produce a sleeve made out of WOLFIN IB (at least 80 mm larger than the largest diameter of the base for the skylight), cut a round opening in the middle (opening approx. 100-200 mm smaller than the upper diameter of the base for the skylight), lay it loosely onto the base and use a low propane gas flame to heat up a section around the base measuring at least 200 mm wide. Once the edge has been heated so that the membrane is malleable, pull the flange over the base for the skylight and allow it to cool. Tightly wrap a 1.0 mm stainless steel wire around the upper edge and tie in place. Then fold the protruding section of the flange downwards and weld it tightly in place using hot air welding. Apply a strip of elastic joint sealer of type F 173 Construction Silicon onto the primer coating on the upper edge. Wrap a stainless steel wire around the lower edge, as described above, and then initially weld over it every 200 mm using a WOLFIN IB disc, 50 mm, so that it is fixed in position.

Weld the sleeve to the waterproofing membrane on the surface of the roof. Heat up strips of WOLFIN IB, to cover the wire covering, with a low propane gas flame or hot air (which makes the membrane more flexible), allow to cool and professionally weld in place both on the horizontal and also the slanting plane.

In the case of bases higher than 150 mm, cut out trapezoidal segments and weld them together or roughly create a truncated cone with an overlap at the top and bottom, cut to shape, put in place and proceed as previously described. Instead of stainless steel wire, it is also possible to use galvanized steel wire that is coated in plastic.

## 5.5 Enclosing fans in skylight bases

Enclosing radial or axial fans can only be done using WOLFIN coated metal sheet profiles, which are sealed with a strip of elastic joint sealer of type F 173 Construction Silicon onto the primer coating and welded together with strips of WOLFIN IB or heat formed flanges.

## 6. Connecting to drains

The standard method is to connect the WOLFIN waterproofing membrane to the WOLFIN stainless steel drainage elements available in the WOLFIN system. Using this method, the membrane sleeve available from the factory is welded onto or under the relevant WOLFIN membrane using hot air welding or the WITEC solvent welding agent.

In the case of drainage systems from third party manufacturers (laminated WOLFIN IB sleeve, rigid PVC, loose-fixed flange), the relevant processing guidelines issued by the manufacturer must be observed. Also see here the current WOLFIN installation instructions.

Note: National Standards must be observed.

## 7. Enclosing pipes

The standard method is to connect the WOLFIN waterproofing membrane to the WOLFIN stainless steel vent pipes available in the WOLFIN system. Using this method, the membrane sleeve available from the factory is welded onto or under the relevant WOLFIN membrane using hot air welding or the WITEC solvent welding agent.

Sealing/enclosing pipes can also be achieved using hand cut sections of WOLFIN IB membrane. The pipe firstly needs to be encased with a WOLFIN IB membrane and hot air welded at the overlap. A sleeve of WOLFIN IB membrane or a heat formed flange with an opening in the middle that has been made after warming is pulled over the pipe and the membrane covering and then welded together with the waterproofing membrane on the surface of the roof and the membrane cover around the pipe. The upper flashing is achieved using a hose clamp suitable for the circumference of the pipe and sealed with F 173 Construction Silicon joint sealer.

Also see here the current WOLFIN installation instructions.

## 8. Building expansion joints

Expansion joints are construction joints that need to be carefully taken into account when waterproofing the roof and selecting the roofing layers. The vapour barrier as well as insulation, waterproofing and, where relevant, usable surface layers need to be installed so that they can accommodate movements in all three possible dimensions without causing any

damage. Depending on the type and size of the movements, it is necessary to differentiate between Type I joints and Type II joints.

### Type I joints

are joints for slow, unique or rare movements:

- of 15 mm exclusively vertical to the waterproofing.
- of 20 mm exclusively parallel to the waterproofing, although only 10 mm when shearing also occurs in the waterproofing level.
- of 15 mm with a combination of settling and expanding, although only 10 mm when shearing also occurs in the waterproofing level.

In these cases, it is possible to run the waterproofing layer across the joint when laying the membrane loosely. If the waterproofing layer is laid directly over the joint, protective strips are to be arranged under the waterproof layer. The protective strips can be omitted if there is an effective separating layer fitted between the waterproofing layer and the substrate. Depending on the range of the movement, the waterproofing membranes are to be supported in the area around the joint.

### Type II joints

are joints with quickly moving and often repetitive movements, as well as joints according to Type I where the stated dimensions have been exceeded.

Joints of Type II are to be individually planned in each case and adapted to the local conditions and requirements. Joints of Type II are generally to be raised out of the water-carrying level using insulating wedges or upturned beams. Parts of the roof surface that are separated due to the arrangement of a Type II expansion joint are to be drained independently of one another.

Please contact our Technical Department when Type II expansion joints need to be created. We will submit a building-specific design proposal that is based on the expected movement and the type of installation used for the waterproofing membranes.

## 9.0 Notes

The current WOLFIN Installation Guidelines are to be observed at all times when using WOLFIN M waterproofing membranes and WOLFIN system accessories.

The above information corresponds to the latest technical standards. Furthermore, they correspond to our current understanding gained through the development and production of WOLFIN M, as well as the findings from the practical use of the product.

Other local conditions or the use of a combination of materials that are not described in these installation guidelines may have an influence on the functionality of the product. Sufficient practical tests should be carried out.

Any fitting of the waterproofing membranes that deviates from these guidelines as a result of changed local conditions or combinations of materials requires our written approval, otherwise we accept no liability for the suitability of our waterproofing membranes for the described applications.

All previous versions become invalid upon publication of these installation guidelines.

If any questions arise, you should seek expert advice.

### Technical Hotline

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