

# Installation Guide for Waterproofing Membranes

Polyfin® (FPO/TPO) and O.C.-Plan® (ECB)



PRACTICAL

RELIABLE

SUSTAINABLE

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## 1. Products

### 1.1 Polyfin® Roofing and Sealing Membranes (FPO / TPO)

Polyfin® is a single ply roofing and sealing membrane, consisting of Flexible Polyolefines respective Thermoplastic Polyolefines (FPO/TPO). The raw material is a plastomer. Polyfin® is easy to handle and an excellent choice for sealings in new constructions and refurbishment jobs. Polyfin® exists in different derivatives with glass fleece reinforcement, with or without polyester fleece backing, as self-adhesive membrane and as homogenous material – for that reason there is always a solution for any application method. Polyfin® membranes are available in a thickness from 1.6 mm to 2.0 mm. The thickness of the material has an influence on the physical properties and the long-term performance.

Products (FPO/TPO) >	Polyfin® 3016 <sup>5)</sup> glass fleece reinforced	Polyfin® 3018 <sup>5)</sup> glass fleece reinforced	Polyfin® 3020 <sup>5)</sup> glass fleece reinforced	Polyfin® 4230 <sup>1)</sup> glass fleece reinforced and polyester fleece backed, with welding edge on one side
Application Method ∇				
Loose Laid and Ballasted, with or without traffic usage	✓	✓	✓	✓
Loose laid and Mechanically Fixed	✓	✓	✓	✓
Strip Bonding	–	–	–	✓
Full Bonding	–	–	–	✓
Colours <sup>3)</sup>	light grey, grey, white, black			
Thickness [mm]	1.6	1.8	2.0	3.0 <sup>2)</sup>
Width [mm]	2100/1500/1050/750/ 525/350/250	2100/1500/1050/750/ 525/350/250	2100/1500/1050/750/ 525/350/250	2100/1050/525
Length per Roll [m] <sup>4)</sup>	20	20	20	20

1) With one sided or both sided fleece free 40 mm welding edge available

2) Including fleece backing

3) Special colours on request (white: SRI 90, SRI 100)

4) Special length materials on request

5) Also Polyfin® 3016/3018/3020 FR-membranes if special fire resistance performance is demanded

Polyfin 3016/3018/3020/4230 roofing and sealing membranes were evaluated in accordance to the DGNB-criteria and meet the requirements of the chapter 6 characteristics (risks for the local environment) – they achieved the highest quality level! Polyfin 3016/3018/3020/4230 also meet the Credit Requirements of the LEED system.

# Products

Products (FPO/TPO) >	Polyfin® 5024 SK <sup>1)</sup> glass fleece-reinforced bottom-sided self-adhesive coating, welding edge on 2 sides	Polyfin® 5028 SK <sup>1)</sup> glass fleece reinforce bottom-sided self-adhesive coating, welding edge on 2 sides	Polyfin® 1020 Unreinforced, homogenous material
Application Method ∨			
Loose Laid and Ballast- ed, with or without foot traffic usage	–	–	For roof outlet- and pipe penetration collars, also for corner patches
Loose Laid and Mechan- ically Fixed	–	–	
Strip Bonding	–	–	
Full Bonding	✓	✓	
Colours <sup>3)</sup>	light grey		light grey
Thickness [mm]	2.4	2.8	2.0
Width [mm]	1050	1050	525
Length per Roll [m] <sup>3)</sup>	15	15	15

1) Welding edge in a width of 40 mm on one or both sides

2) Special colours on request

3) Material in special length on request

The advantage with our Polyfin® products is the enormous flexibility. They are very easy to adapt to local conditions and are thus easy to install. Because they have a good elongation, they will adapt optimally to all weather conditions. The long life-time is the basis for the good price – performance ratio of our products.

## Product Properties

- Suitability approved by independent institutes
- Suitable for potable water applications in acc. to the KTW – guide line
- PVC free
- Free of plasticisers
- Quality controlled in acc. to ISO 9001:2008 (TÜV-certification)
- CE-certified in acc. to EN 13956 and EN 13967
- Resistance against spread of fire and radiant heat for tested build-ups
- Hail resistant
- Ozone resistant
- Compatible to bitumen and polystyrene
- Root and rhizome resistant in acc. to the FLL-testing method
- Easy installation and application
- The hot air welding with a large welding temperature window ensures homogeneous joints and does not require any further joint sealing measures



## 1.2 O.C.-Plan® Roofing and Sealing Membrane (ECB)

O.C.-Plan® is a synthetic roof and waterproofing membrane made from the material ECB (Ethylene Copolymer Bitumen). This is thermoplastic can be welded and reshaped by thermal heat.

O.C.-Plan® is available in different thicknesses with central glass fleece reinforcement, with or without polyester fleece backing, with one-sided or double-sided welding edge or as a self-adhesive membrane. Depending on your choice, you will be able to cover any type of application and detail, from loose lay with ballast, adhesive bonding or by mechanical fastening – with O.C.-Plan® you will always have the right membrane for your project.

Products (ECB) >	O.C.-Plan® 3020 <sup>5)</sup> Glass fleece reinforced	O.C.-Plan® 4230 <sup>1)</sup> glass fleece reinforced and polyester fleece backed, with welding edge on one side	O.C.-Plan® 4125 <sup>1)</sup> glass fleece reinforced and polyester fleece backed, with welding edge on one side	O.C.-Plan® 5028 <sup>2)</sup> glass fleece reinforced bottom-sided self adhesive coating, welding edge on 2 sides
Application Method ∨				
Loose Laid and ballast- ed, with or without foot traffic usage	✓	✓	✓	–
Loose laid and mechani- cally fixed	✓	✓	✓	–
Strip Bonding	–	✓	–	–
Full Bonding	–	✓	✓	✓
Color <sup>3)</sup>	black			
Thickness [mm]	2.0	3.0 <sup>3)</sup>	2.5 <sup>3)</sup>	2.8 <sup>3)</sup>
Width [mm]	2100/1500/1050/750/ 525/350/250	2100/1050/525	1050	1050
Length per roll [m] <sup>4)</sup>	20	20	20	15

1) Welding edge in a width of 40 mm on one or both sides

3) Incl. fleece backing

2) Welding edge in a width of 40 mm on one or both sides

4) Special length material on request

5) Also O.C.-Plan® 3020 FR- membranes if special fire resistance performance is demanded

Product (ECB) >	Application Method	Thickness [mm]	Width [mm]	Length per Roll [m]
O.C.-Plan® 1025 Unreinforced, homogenous material	For roof outlet and pipe penetration collars, also for corner patches	2.5	525	15

O.C.-Plan® has a standard thickness of 2.0 mm. The thickness is directly related to the life-time and the safety of our membranes. Independent tests have shown clearly that correctly applied O.C.-Plan® membranes have a **minimum life expectancy of 30 years**.

## Product Properties

- Tested reliability by a track record of more than 50 million square meters over the past 35 years
- Quality approved to ISO 9001:2008 (TÜV-certification)
- CE certification in accordance to EN 13956 and EN 13967
- Resistance against spread of fire and radiant heat for tested build-ups
- Hail-resistant
- Free of PVC
- Ozone-resistant
- Radon-resistant
- Compatible to bitumen and polystyrene
- Root- and rhizome-resistant in accordance to the FLL testing method
- Easy installation and application
- The hot air welding with a large welding temperature window ensures homogeneous joints and does not require any further joint sealing measures

## 1.3 Environmental Product Declarations (EPD)

The FPO/TPO-products Polyfin 3016/3020/4230 and the ECB-products O.C.-Plan 3020/4230 are certified with officially approved EPD's (Environmental Product Declaration) in accordance to the I.B.U. Guide Lines (Institut für Bauen und Umwelt e.V.). ISO 14025 and EN 15804 are the standards on which the EPD's are based on.



Polyfin 3016/3020

Polyfin 4230

O.C.-Plan 3020

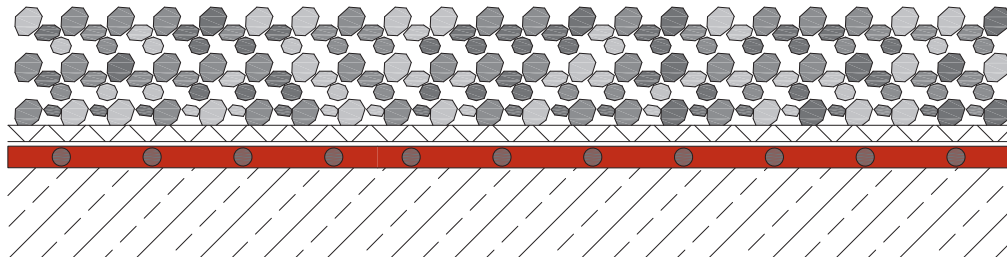
O.C.-Plan 4230

## 1.4 Installation Methods

- a) *Loose laid with ballast, such as gravel, concrete slabs, roof garden system build-ups*

**Polyfin®** 3016/3018/3020/4230

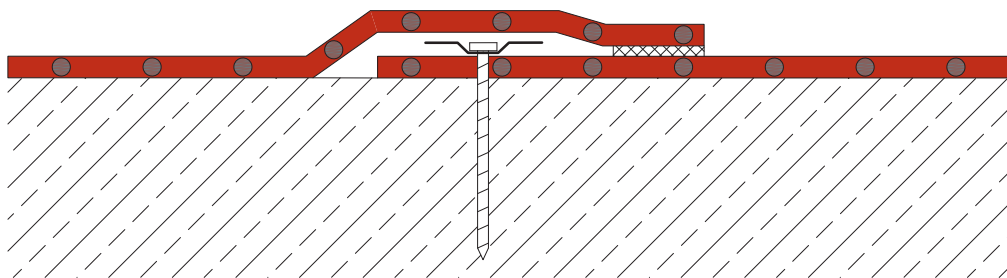
**O.C.-Plan®** 3020/4125/4230



- b) *Loose laid and mechanically fixed*

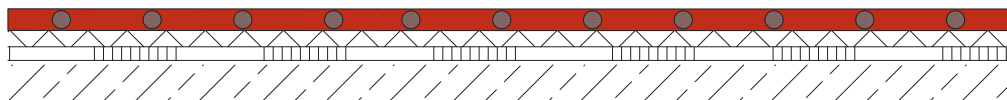
**Polyfin®** 3016/3018/3020/4230

**O.C.-Plan®** 3020/4125/4230

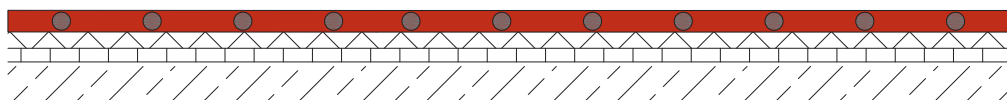


- c) *Strip (wise) or fully (hot melt bitumen) bonded*

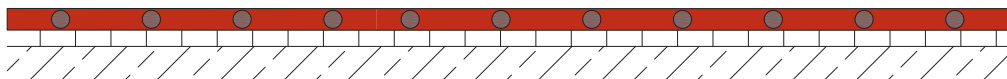
**Polyfin®/O.C.-Plan®** 4230 partially bonded with Polyfin PUR-adhesive



**Polyfin®/O.C.-Plan®** 4230, **O.C.-Plan®** 4125 fully bonded with hot melt bitumen



**Polyfin®** 5024 SK, **Polyfin®/O.C.-Plan®** 5028 SK self-adhesive fully bonded





## 1.5 Standards, Rules and Guide Lines (Germany)

DIN 18531 (Sealings for Flat Roofs)	DIN 18807, partl 1 to 3 (Steel Deckings)
DIN 18336 (Sealing Works) = VOB	DIN 4102 (Fire Performance)
DIN 18338 (Roofing Works) = VOB	DIN 4108 (Condensation Protection)
DIN 1991-1-4: 2005 / NA: 2010-12 (Wind Loads)	German Energy Saving Regulation EnEV
DIN 18195, parts 1 to 10 (Structural Waterproofing)	Flat Roof Guide Line of the ZVDH (National Roofing Contractors Federation of Germany)
	Guide Line for Plumber Works at Roofs

## 1.6 CE-Certification, Surveillance and Testings

DIN EN 13956 (Roofing Membranes)
DIN EN 13967 (Sealing Membranes)
DIN EN 13501-1 (Classification of Construction Products – Fire Performance)
DIN EN 13501-5 (Classification of Construction Products – Fire Performance, Build-up Classifications)
DIN V ENV 1187 (Fire Performance, Testing Procedures)
DIN 4102-7 (Classification of Construction Products – Fire Performance, Build Up Classifications)

# Equipment & Tools

## 2. Equipment & Tools

### 2.1 Hot Air Hand Gun



- Hot Air Hand Gun
- VDE-tested, 230 Volt, with variable temperature control
- Up to + 620 °C with a flat nozzle, width = 40 mm
- Heat capacity  $\geq$  1400 Watt

### 2.2 Automatic Welding Machine



- Self-moving hot air welding machine
- 200 V / 4200 Watt,
- 230 V / 4600 Watt and
- 400 V / 5700 Watt
- VDE-checked, with variable temperature control up to + 620 °C and variable movement velocity
- Width of nozzle and pressure roller must be 45 mm

#### Warning:

At cable length  $\geq$  50 m at 230 V and  $\geq$  100 m at 400 V the use of mobile power aggregates is recommended to avoid power loss.

### 2.3 Checking the Welding Temperature

- The welding temperature should be approx. + 500 °C up to + 600 °C at the nozzle exit of the hand welding machine
- A suitable measuring tool must be available at all times to control the welding temperature.



### 2.4 Machines for Mechanical Fixing

For the correct execution of straight line fixing we recommend:

- Suitable electric screwdriver / drill with locked guide rails
- Aiming guide as well as magazines for screws and washers for optimal productivityTools

### 2.5 Tools

For the proper application of Polyfin® / O.C.-Plan® the below listed tools are necessary:

- Hot air hand gun, hot air automatic welding machine
- Silicone pressure roller, width 40 mm
- Cutting knife with hook shaped or trapezoidal blade
- Pair of scissors
- Wire brush
- Folding rule
- Temperature measuring device



## 3. Substrate

### 3.1 General Substrate Conditions

It is the duty of the applicator to check the substrate – in particular the surface – for their suitability. Recognized deficiencies of previous applications can be complained in accordance to national procurement regulations (e.g. in Germany DIN 1961, VOB/B) provided that they could affect the own installation work.

The load-bearing construction must comply with all local technical regulations, especially in regards to load capacity, flexibility, anchoring, water drainage etc. Expansion joints must also be correctly designed and installed (see chapter 6).

In accordance to flat roof regulations roof areas should have a continuous slope towards the water outlet. We recommend a slope of at least 2%. Roofs without slope are also possible but only as a special construction. Water outlets should always be placed at the lowest areas.

### 3.2 Profiled Steel Decking as Substrate

In accordance to DIN 18807 only galvanized sheets with factory-made corrosion protection should be used. The thickness should be minimum 0.88 mm. The wickets of the profile must have the same height in accordance with flat roof regulations.

In the center, the deflection must not exceed  $L/300$ . When transporting the material it is therefore important to ensure an even load distribution.

Shear panels are structural functioning disks from which the structural integrity of the entire building depends on. On these shear panels changes which might affect adversely the structural functionality must not take place. Likewise, it must be ensured that components added underneath the profiled metal deck have no influence on the statics of the whole construction. Roof penetrations such as vents, drains etc., are to be reinforced through the use of coated metal sheets. For dome lights, chimneys, A/C equipment it must be confirmed and documented that there are no structural changes.

### 3.3 Concrete as Substrate

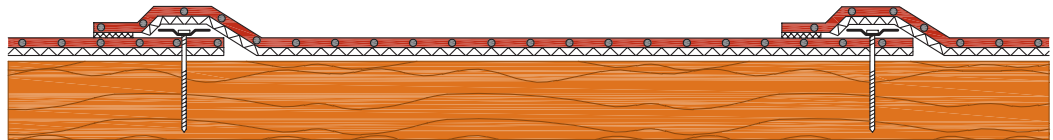
Concrete roofs as well as slope areas have to be sufficiently cured and dry on the surface in accordance with flat roof regulations. The surface has to be abraded, plain and free of rock pockets, cracks, sharp gratings and nibs.

## 3.4 Pre-Cast Concrete Elements

The applied concrete elements have to provide a plain surface. Construction joints must be sealed and closed. The supporting joints (butt ends) should be covered with protective strips and fastened mechanically against movement.

## 3.5 Timber Decking and Wooden Derivatives

The wooden construction must be protected against moisture. When laying wooden construction materials, the thermal co-efficient should be observed. The thickness of the boards must be able to withstand the expected load and the distance of the supports should be calculated accordingly, the boards should be at least 24 mm thick when using wood and 22 mm when using derived timber products. Timber boards should not be wider than 16 cm. The chip wood boards (such as OSB) must all be with tongue and groove and always be jointed together. The maximum board length should not exceeded 2.5 m. The requests for wood protection should be observed. Used impregnation (salt based) or other protection must not have any damaging effect on the roof construction.



Polyfin 4230 mechanically fixed on timber decking

## 3.6 Roof Refurbishment

Before any renovation can take place, several openings in the existing roof down to the load bearing layer should be made to ensure its integrity (Vapour barrier condition, thermal insulation thickness, moisture condition of the thermal insulation and possibility of drying out the roof construction if moisture is present).

### Bitumen Substrate

Waves, blisters and other factors causing unevenness should be mechanically removed and levelled. In some cases a protective layer may be required.

### Protection against Condensation Water Risks

Before commencing a planned roof renovation it is vital to ensure that the structure is sound and capable of retaining its function.

## 3.7 Refurbishment of Old Single Ply Sealings

We recommend contacting POLYFIN for individual assessment and advice.

## 3.8 Vapour Barriers

Because of unexpected change of use of the building, we always recommend using a vapour barrier on thermal insulated roofs. We recommend using products made of PE-foil, Sd value > 100 m or the self-adhesive, reinforced multi-layer aluminum such as POLYFIN BLD and BLD SK, water vapour diffusion resistance of approx. Sd > 1500 m. The vapour barrier must be fixed at all terminations and brought up to the top edge of the thermal insulation. Vapour barriers must also be professionally connected to all drains and penetrations. The vapour barriers should be laid loose with overlaps of approx. 10 cm and sealed absolutely tight with a suitable double-sided adhesive tape. At all junctions PE-vapour barriers have to be sealed absolutely tight using double-sided butyl adhesive tape. Above air-conditioned rooms all junctions and covered seams have to be sealed with butyl adhesive tape.

For concrete substrates and above air-conditioned rooms, we recommend using a Bitumen vapour barrier with an aluminium layer reinforcement. If the vapour barrier also serves as an air barrier, it is vital to ensure that all overlaps and terminations are tightly sealed.

On profiled steel decking structures and over air conditioned rooms we recommend the application of the self-adhesive, reinforced multi-layer aluminum vapour barrier Polyfin BLD SK. The vapour barrier must be properly flashed to all penetrations and up-stands.

## 3.9 Thermal Insulation Materials

Only materials which are temperature and dimension stable and which are suitable and firm enough to be walked on when installed underneath the waterproofing should be used. Foam boards should be with tongue and groove - or installed in two layers with staggered joints. PUR/PIR boards must be fixed in accordance to the requirements of the insulation board manufacturer. On profiled steel deckings, the insulation also has the function to bridge the gaps of the bottom corrugations. For that reason the minimum thickness should be chosen in accordance to the table below – independent from the requirements regarding the thermal conductivity.

Clear width between the top corrugations [mm]	Recommended Minimum Thickness of the Insulation [mm]		
	EPS	PUR/PIR	Mineral Wool
70	40	40	50
100	50	50	80
130	60	60	100
150	70	60	120
160	80	70	120
170	90	80	140
180	100	80	140

Recommended minimum insulation thickness on profiled steel deckings

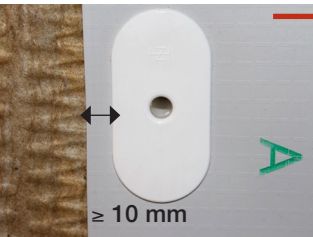


## 4. Installation

### 4.1 General Information

Polyfin® / O.C.-Plan® are roofing and sealing membranes which can be homogenously welded by thermal heat. Polyfin® / O.C.-Plan® can be installed exposed without any surface protection.

The roof sealing must be mechanically fixed to the substrate in the field area, in front of all roof edges, parapets and up stands and valleys in accordance to the Flat Roof Guide Lines:



- Mechanical fixings in the field area: The minimum amount is always 2 pcs./sqm. – independent from the theoretical amount to uptake the windloads. The minimum distance from the edge of the washer plate to the edge of the membrane must not underrun 10 mm (see picture)!
- The mechanical perimeter fixing in front of roof edges, parapets, up stands, valleys, penetrating elements etc. can be carried out with single membrane fasteners, metal rails or angles of laminated metal. The minimum amount is 4 fastening elements / linear meter independent from the theoretical amount calculated to uptake the windloads in these areas.

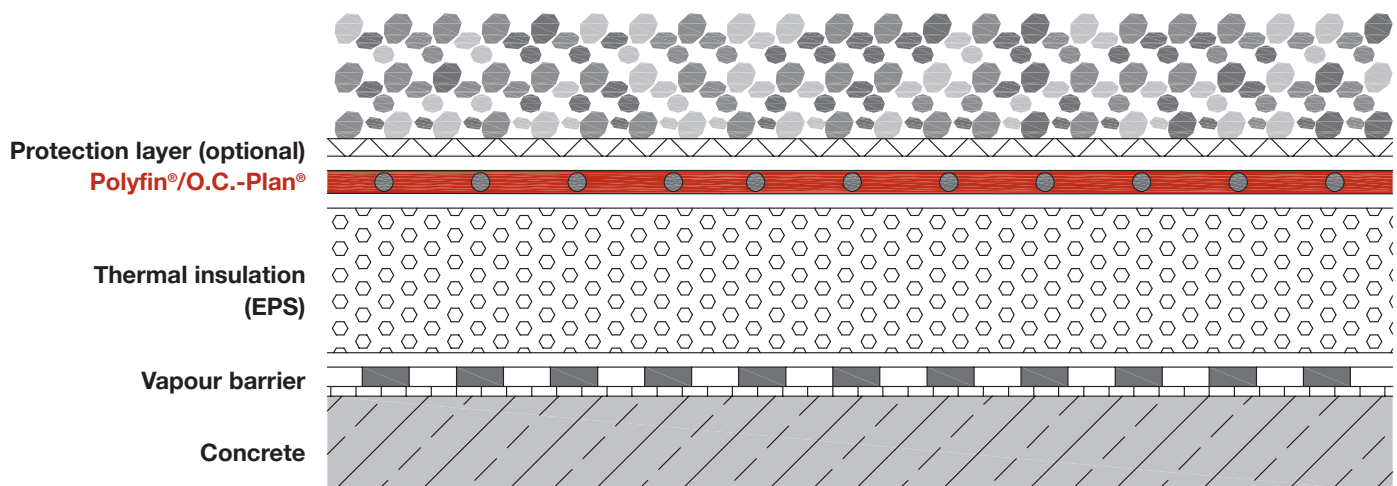
Polyfin® / O.C.-Plan® are compatible to polystyrene and bitumen. For that reason, they are ideal materials for the refurbishment of failed bitumen sealings.

Small quantities of ponding water do not have a negative influence on the physical properties and the life expectancy of Polyfin® / O.C.-Plan® roofing and sealing membranes.

### 4.2 Loose Laid with Ballast

#### 4.2.1 New Construction

Roll out Polyfin® / O.C.-Plan® membranes and place the next membrane with an overlapping of  $\geq 5$  cm and then weld. Lay the next roll with an overlapping of  $\geq 5$  cm, weld and so on. When lying loose on polystyrene insulation boards, the overlapping should be increased so that melting and subsequent damage of the polystyrene is avoided.



# Installation

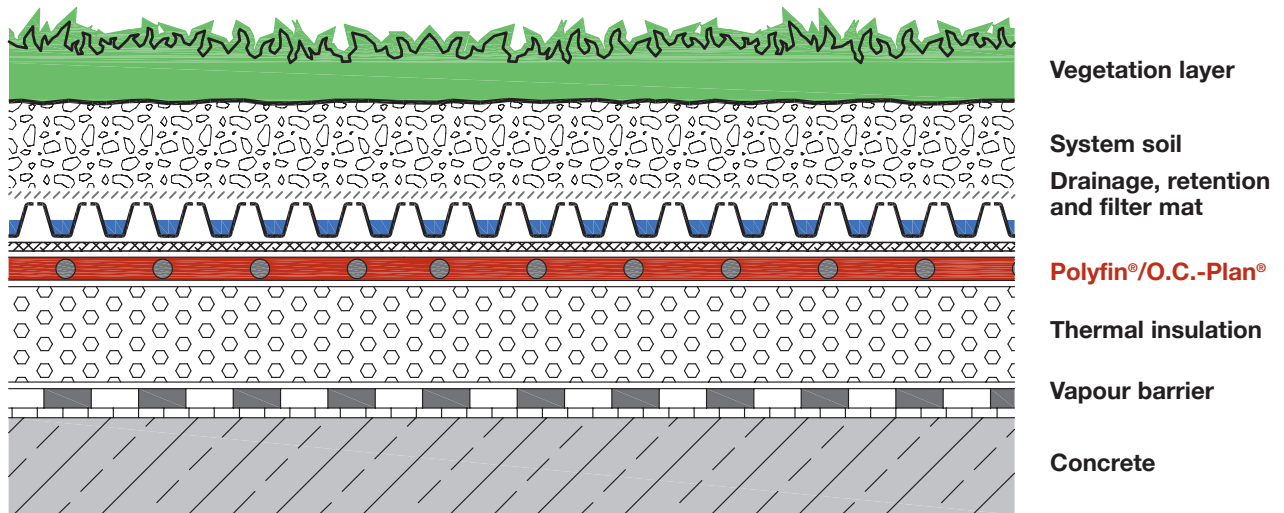
Immediately after the application, the ballast to protect against wind up lift should be placed!

A protection layer has to be applied in accordance to the flat roof guidelines.

The ballast placed should be in accordance to the flat roof guidelines resp. DIN EN 1991-1-4: 2005 / NA: 2010-12 (Wind loads – Germany).

## 4.2.2 New Construction – Roof Garden System Build Up

Polyfin® / O.C.-Plan® are root resistant (FLL test). The application of Polyfin® / O.C.-Plan® should be done as described in 4.1. After completion of the waterproofing works, the protective layers are to be placed.



Immediately after that the ballast should be placed to protect the build up against wind up lift.

The ballast placed should be in accordance to the flat roof guidelines resp. DIN EN 1991-1-4: 2005 / NA: 2010-12 (Germany - wind loads).

It is recommended to seal off the roof into segments and verify these through an application plan or photo..

## 4.2.3 Inverted Roof

Verify whether a protection layer in accordance to the flat roof guidelines is required.

The application of Polyfin® / O.C.-Plan® should be done as described in chapter 4.1.

On the membrane a layer of thermal insulation made from extruded polystyrene (XPS boards) is placed. The boards should be with tongue and groove and be placed tightly in a brick bond pattern. On top of the insulation a layer of polyester fleece or hydrophobic vapour open textile is placed as a filtering layer. **Immediately after placing the fleece, the ballast should be placed to protect against wind up lift.**

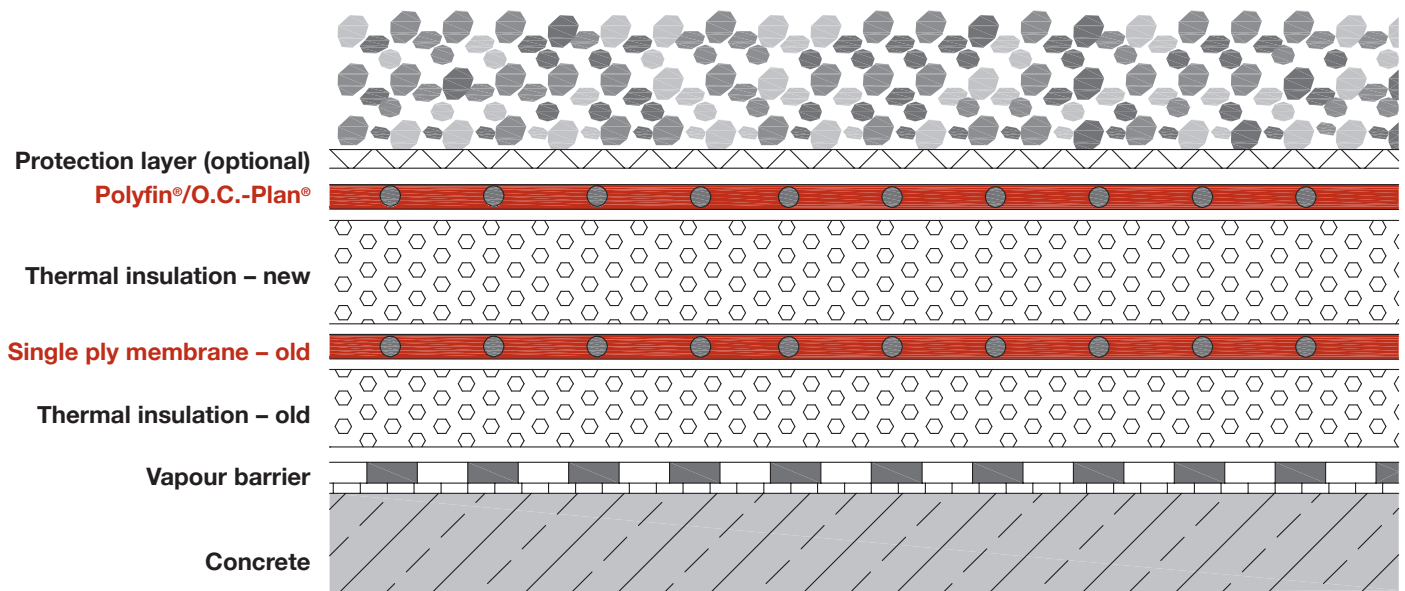
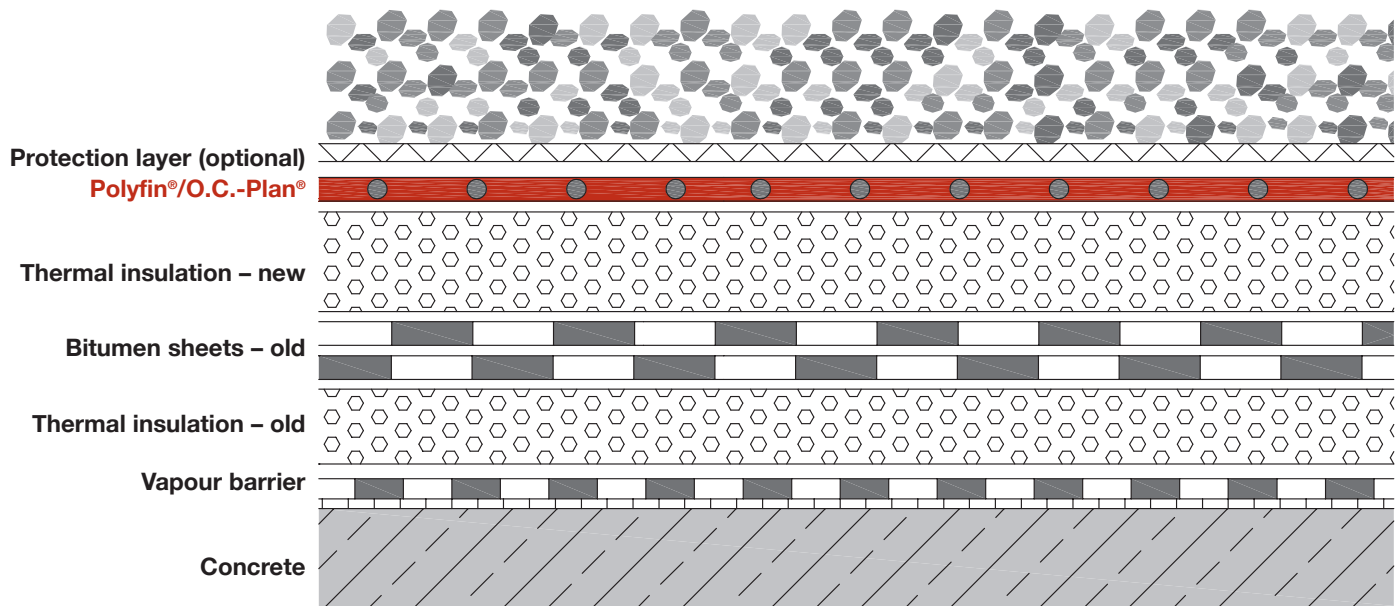
The ballast placed should be in accordance to the flat roof guidelines resp. DIN EN 1991-1-4: 2005 / NA: 2010-12 (Germany - wind loads).

It is recommended to seal off the roof in segments and verify these through an application plan or photo.

## 4.2.4 Refurbishment – Bitumen Roof and Single Ply Roof

As Polyfin® / O.C.-Plan® are fully bitumen compatible, they are particularly suitable for renovation of such. Therefore the normally used separation layer can be avoided. When renovating using ballast then the membranes can be laid as described in 4.1. However, before commencing it is important to verify whether an additional thermal insulation layer and / or a protection layer is required. **Immediately after the application the ballast to protect against wind loads should be placed.**

The ballast placed should be in accordance to the flat roof guidelines. When ballasted, a fire protection layer between Polyfin® / O.C.-Plan® and EPS insulation is not necessary.



A protection layer between ballast and membrane is probably necessary (see Flat Roof Guide Line). The ballast must be calculated in acc. to the Flat Roof Guide Line resp. DIN EN 1991-1-4: 2005 / NA: 2010-12 (Wind loads, Germany – national standards and regulations must be observed).

## 4.3 Loose Laid and Mechanically Fixed

### 4.3.1 Fixings – General Information

Only fasteners which have been tested for this specific purpose should be used (self-tapping screws, wood screws or anchor systems with the corresponding load spreading washers). The washer/screw combination must have an official ETAG 006 approval. The systems must be corrosion-protected, made of non-ferrous metal or of form-stable, weathering and temperature-resistant plastics.

Only screws which do not screw themselves out through self-induced movements or vibrations should be used.

The pull-off strength of each of the fasteners to the load bearing structure should be minimum 0.4 kN per piece.

In case of the refurbishment of thermal insulated roof build-ups corrosion resistant (stainless steel) fasteners must be used in accordance to the Flat Roof Guide Line, respective national regulations.

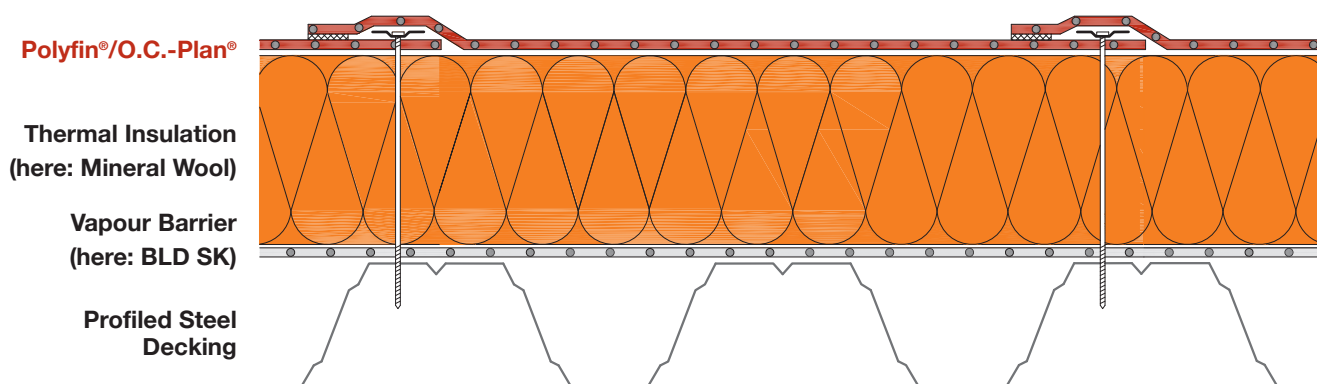
### 4.3.2 Installation – General Information

On profiled steel deckings and timber boardings, the membranes have to be installed across the profile direction, resp. across the longitudinal direction of the boarding. The highest wind loads always occur in the corner zones and the external perimeter zones. For that reason the calculated fastener amount will be higher than in other areas of the roof.

For edge and corner areas it is often an advantage to use narrower sheets to facilitate a higher number of fasteners placed uniformly to the membranes. The field area is normally done using wide sheets (see sketch in 4.3.5). Alternatively, wider membranes with intermediate fixing lines plus cover strips could be applied..

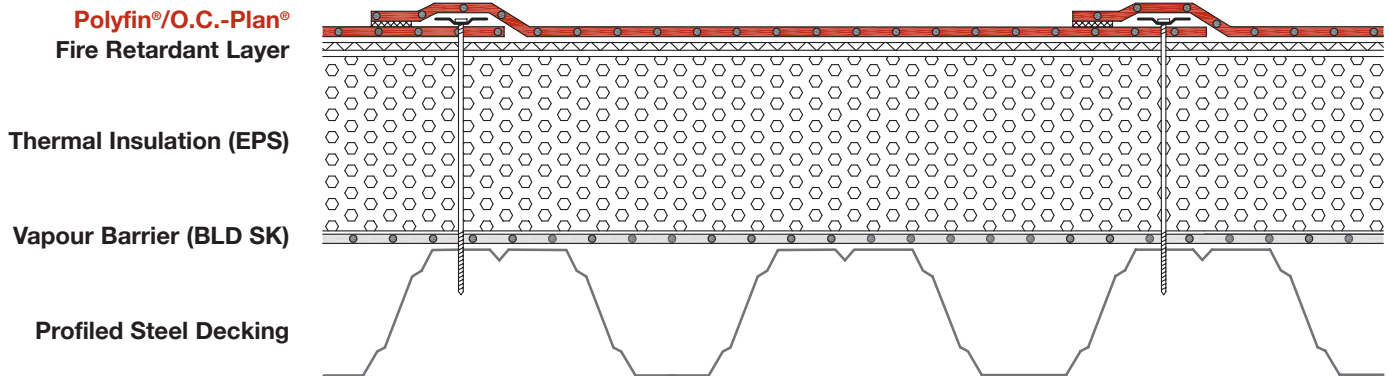
### 4.3.3 Light Industrial Roof with Steel Decking as Substrate

With this application method, all the layers are fixed firmly to the load-bearing structure in one single operation. On profiled metal decks, the thermal insulation boards should be placed in cross direction to the profile direction, the waterproofing membranes as well. The minimum thickness of the insulation should be in accordance to flat roof guidelines to avoid damage caused by stepping on areas between the corrugations of the profiled metal deck. The compressive strength of the insulation material must be sufficient for the mechanical fastening and be permanent to withstand damage. The waterproofing sheet overlapping should be made in accordance to fastener width, welding width and 1 cm safety distance to the fastener (s. sketch in 4.3.4).



# Installation

In case of loose laid and mechanically fixed Polyfin® / O.C.-Plan® membranes on EPS insulation, a fire retardant layer must be installed between insulation and membrane (glass fleece 120 g/m<sup>2</sup> , non-flammable).



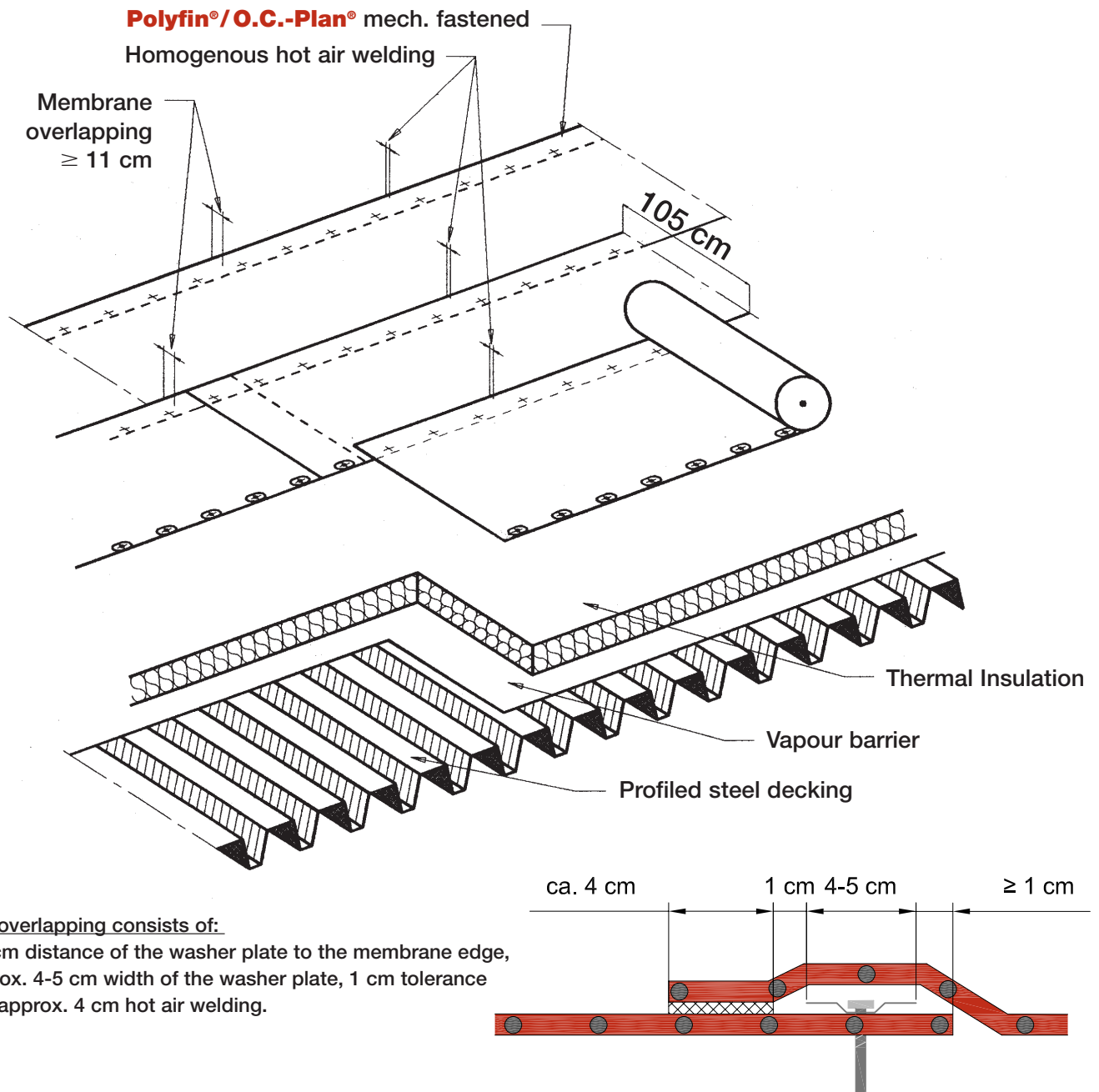
The distance and amount of fasteners must be calculated in accordance to the national requirements, resp. DIN EN 1991-1-4: 2005 / NA: 2010-12 (Wind loads – Germany).

**Note: when using small-sized insulation boards, the flat roof guidelines should be followed (additional fixings to keep the insulation boards in place might be necessary).**



## 4.3.4 Asymmetrical Fastening System

All fasteners have to be set in the overlapped membrane edge. The distance of all fasteners from the membrane edge must always be equal (in min. 1 cm).

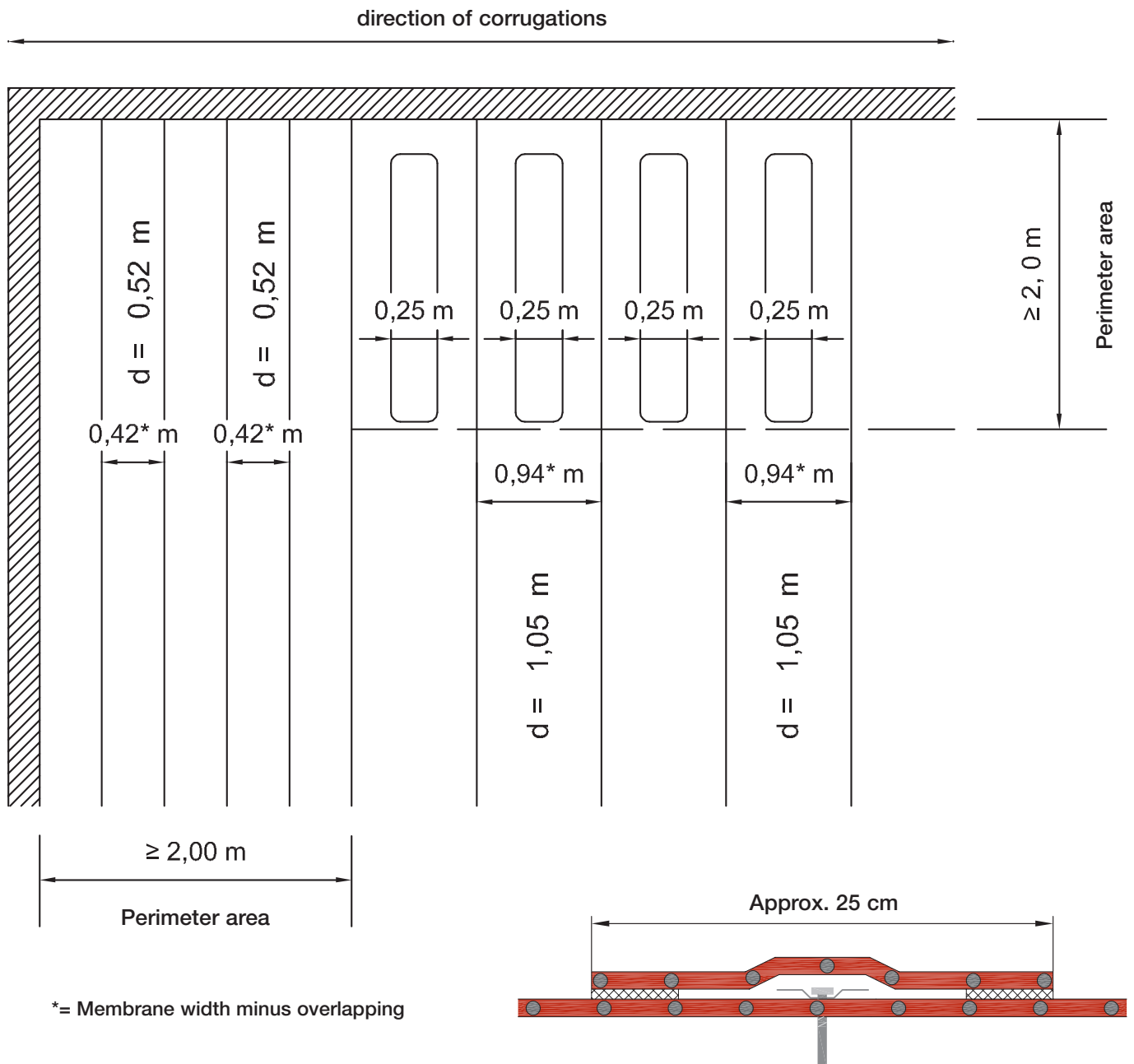


The overlapping consists of:  
 $\geq 1$  cm distance of the washer plate to the membrane edge,  
 approx. 4-5 cm width of the washer plate, 1 cm tolerance  
 and approx. 4 cm hot air welding.

The width of the overlapping is determined by the fastener type, the welding machine, safety distances and job site tolerances.

## 4.3.5 Symmetrical Fastening System

This system is mainly used as intermediate fixing method in perimeter and corner areas instead of using smaller membrane widths. The intermediate fixing lines are covered by Polyfin® / O.C.-Plan® 3020 strips, width approx. 25 cm. Shown in the sketch below: Polyfin® / O.C.-Plan® in a combination of asymmetrical seam fastening with intermediate fixing lines.



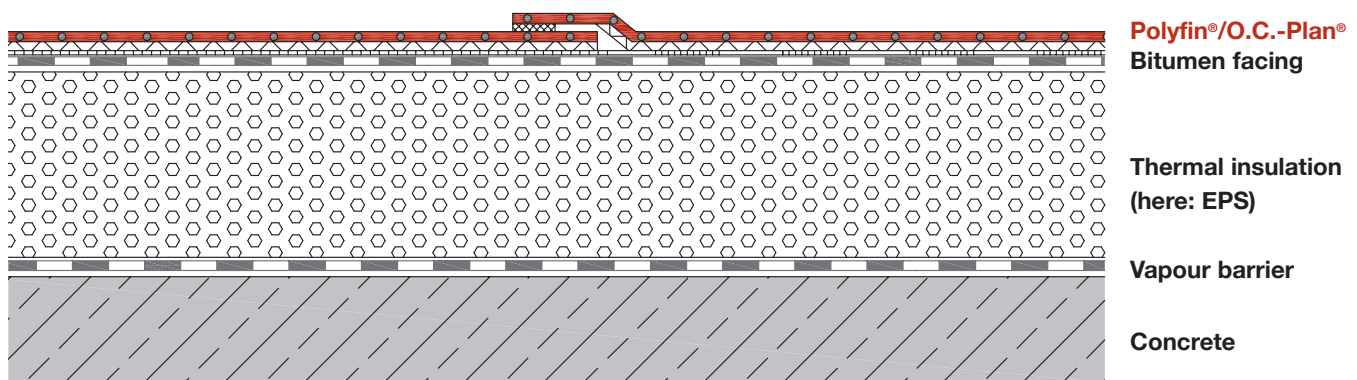
## 4.4 Adhered Application

### 4.4.1 General Bonding Information

Bonding is done if loose laying with ballast or loose laying and mechanical fixing is not economic. When bonding, all layers of the roof construction are to be bonded with each other. Suitable adhesives are polyurethane adhesives and conventional hot melt bitumen mastic. Please follow the instructions for use of the adhesive manufacturer.

Adhesive quantities acc. to technical department of POLYFIN AG. Use only Polyfin® and O.C.-Plan® fleece-backed membranes. Ensure that the fleece layer is dry during application.

The adhesive fixing method should only be used when the substrate is round, firm and free of contaminants – this is particularly important when renovating existing roofs where old roofing layers might have insufficient strength to serve as a suitable substrate.



The overlapping should be at least 5 cm. Since the membranes are hot air welded, one should ensure that the welding edges are free of adhesive and other contaminants which will impair welding.

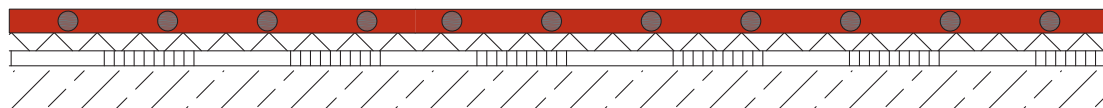
In case of refurbishment projects, bonding on the already existing build (bitumen) up is only possible if all layers are still stable in place.

Regarding the ambient temperature during the application, the restrictions of the adhesive manufacturer must be observed.

### 4.4.2 Strip Bonding Bonding with Polyfin PUR-Adhesive

The PU adhesive must be free of solvents and approved for use in roof constructions.

The adhesive is applied in strips on a suitable substrate. Adhesive manufacturers, guidelines must be strictly observed (Adhesive quantities acc. to recommendation of the technical department of POLYFIN AG). Regarding requirements to the substrate, please see chapter 3.



Regarding the substrate please observe point 3. Polyfin® / O.C.-Plan® 4230 are placed onto the liquid adhesive and pressed firmly to the substrate. Please observe the instructions from the adhesive manufacturers carefully. Do not prepare an area larger than can be covered within the reaction time of the adhesive. Corrections of already laid sheets can be made within 10 – 20 minutes, depending on adhesive and climatic conditions.

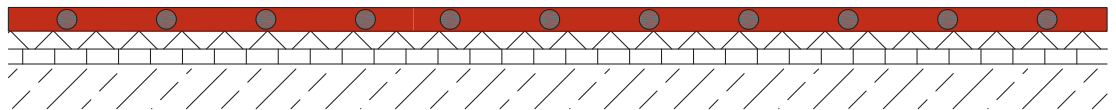
At edges and terminations all sheets should be mechanically fixed to the substrate. To avoid that the adhesive strips can be seen on the surface, the applicated membranes have to be rolled with a suitable weight. The adhesive has to be applicated in straight strips, not in sinuous lines. When bonding FPO membranes with PUR-adhesive slight discolourations may arise on the surface. These discolourations do not have any influence on the function or the life-time of the membranes.

**Note:**

As PU adhesives have limited or no early adhesive strength, it is important to secure the sheets using ballast against wind up-lift during adhesive curing. Small marks on the sheets where adhesive strips are placed underneath are possible.

## 4.4.3 Fully Bonding by Hot Melt Bitumen (Hot Melt Bitumen with approx. 180-200 °C)

Polyfin® 4230 / O.C.-Plan® 4230 / 4125 are fully bitumen-compatible and can be bonded to the substrate using hot bitumen. Please select bitumen type according to roof slope. Polymer-modified and solvent-free bitumen can also be used. When bonding coloured FPO membranes with bitumen, slight discolourations may arise on the surface. These discolourations do not have any influence on the function or the life-time of the membranes.



**a) Cold bitumen mastic plastified by torch**

The bitumen mastic is poured onto the substrate and spread evenly using a rake. After cooling down, the waterproofing sheets are rolled out and aligned correctly, then rolled back halfway. The bitumen (not the sheets) is then heated and melted using a conventional gas flame torch in the entire sheet width, the sheet is then pressed firmly and homogeneously into the melted bitumen. After completion the second half of the sheet is rolled back up and the procedure is repeated.

**b) Bitumen sheet melting method**

For the melting method, in the first step torch-on bitumen felts are applied to the substrate. Then the surface of the installed bitumen sheet gets plastified by a gas flame torch, and Polyfin® 4230 / O.C.-Plan® 4230 / 4125 are rolled into the plastified bitumen.

**c) Brush application method**

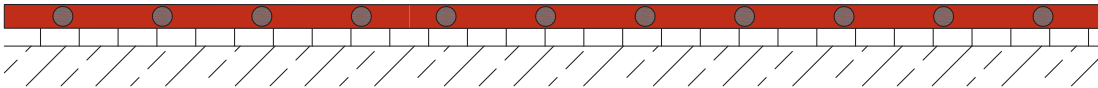
Use only Polyfin® 4230 / O.C.-Plan® 4230 / 4125 for hot bitumen application. The sheets are rolled out, aligned and rolled back halfway. The brush is then dipped into the hot bitumen mastic and placed directly on the substrate right in front of the rolled-up sheet. The sheet is then rolled and pressed firmly so that a layer of bitumen always is continuously “pushed” in front of the roll.

**NOTE:**

It is absolutely necessary that there is no contamination by bitumen in the seam areas of Polyfin® 4230 / O.C.-Plan® 4230 / 4125 !

## 4.4.4 Fully self-adhesive bonding using Polyfin® SK- / O.C.-Plan® SK

The substrate must be dry, firm, clean, free of oil, grease and other contaminants which may affect the bonding adversely. The surface should be smooth, even and without depressions and protrusions. If such are present they should be removed beforehand. Pouring joints and tie holes should be filled with suitable mortar beforehand. Depending on substrate, a bitumen primer might be required. Roll out the Polyfin® SK / O.C.-Plan® SK membrane, align correctly with 5 cm overlapping, remove the release film while pressing the sheet to the substrate using a roller or broom. Roll out the next membrane and align in that way that the 5 cm adhesive-free edge overlaps the previous membrane. Remove the release film while pressing the sheet to the substrate. The seam connection is done by hot air welding. Transversal endings of rolls need to be sealed with an overlapping strip of Polyfin® / O.C.-Plan® 3020.

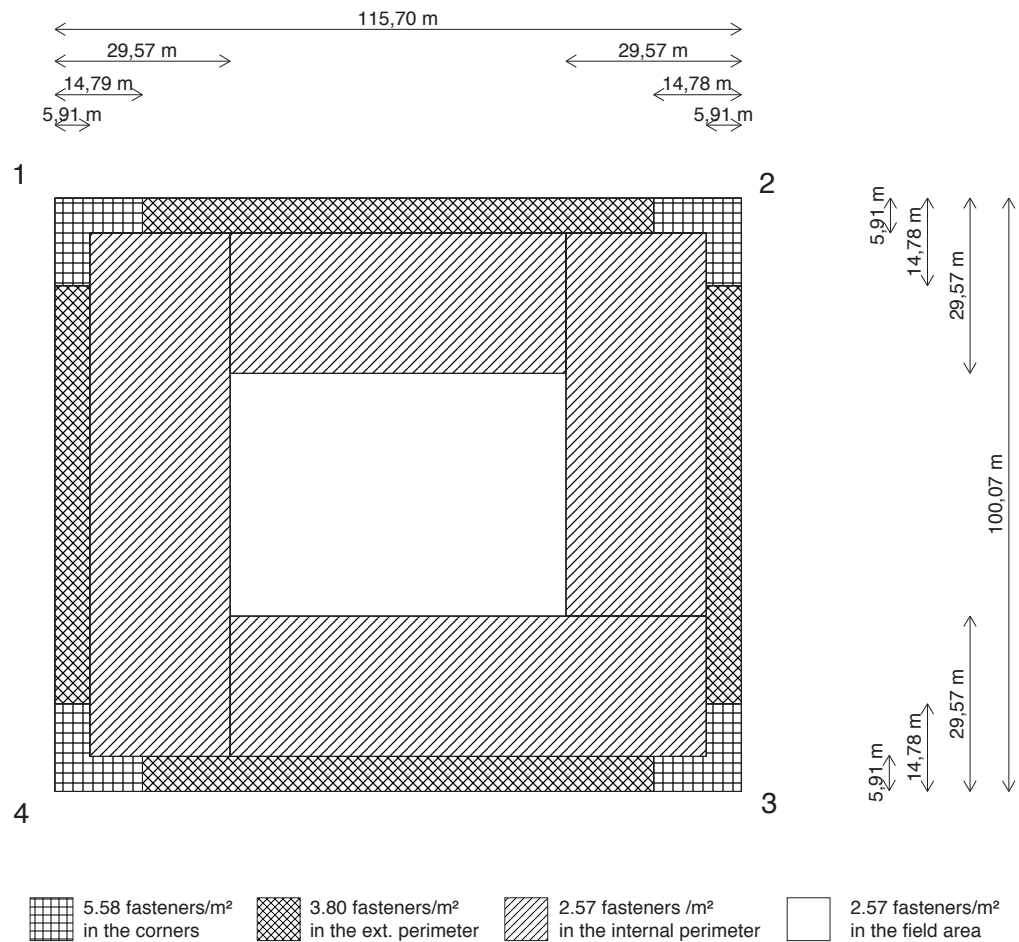


## 4.5 Calculation of the wind loads

The wind loads have to be calculated in accordance to EN 1991-1-4: 2005, respective national requirements. The calculation distinguishes between middle, inner edge, outer edge and corner area. The POLYFIN AG offers project-related calculations in accordance to the German National Attachment of the DIN EN 1991-1-4. The installation guide lines of the fastener manufacturer must be observed.



## Example calculation for a building with rectangular top view



### Note:

Attached installation plan must be observed.

## 5. Seam Joint Welding

Our roof membranes are thermally welded together using hot air welding machines. The overlapping sheets are homogeneously plasticized and joined together under pressure.

Temperature, roller pressure and speed while welding are important parameters and must always be adjusted to the ambient working temperature. Multiple adaption of the welding temperature may be necessary with changing ambient conditions. Dependent on this the welding can be done within a temperature range of + 350 °C up to + 650 °C.

The welding of Polyfin® / O.C.-Plan® is a homogeneous joining method without using plasticizers. A correctly welded joint is absolutely weathering stable and does not require any further treatment.

# Seam Joint Welding

Before commencing work, test welding should be completed to ensure welding quality.

The overlapping distance for both manual and automatic welding is 5 cm in which the edge must be kept clean before welding to ensure a complete bond (see 4.1). All membranes with a polyester fleece or self-adhesive backing have a fleece or self-adhesive free selfedge of approx. 4 cm. Butt joints of the sheets have to be covered with a strip of Polyfin® / O.C.-Plan® 3020, width min. 12 cm.

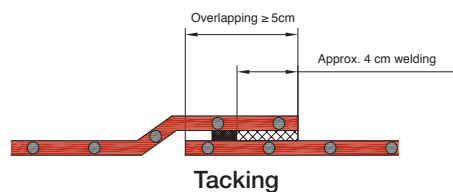
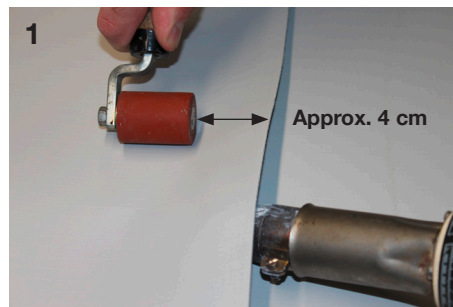
The POLYFIN AG offers related to practice courses in working with the materials.

## 5.1 Hot Air Welding

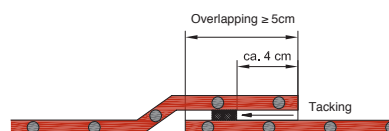
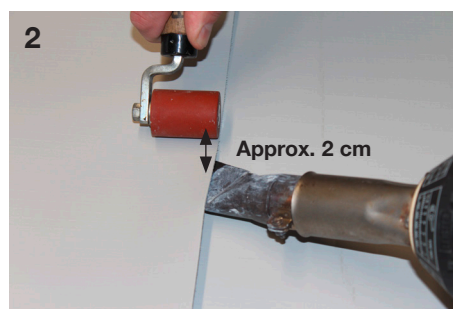
### 5.1.1 Welding by Hot Air Hand Gun

Set the temperature of the hot air hand gun (such as e.g. Leister Triac) to recommend + 500 °C up to + 620 °C. The welding is usually done in 2 steps:

- I. The upper sheet in the overlapping is fixed, approx. 5 cm from the edge, by pressing the silicone roller (see sketch 1) on the edge of the underneath sheet to create a thin tacking line. This tacking line ensures that during the main welding process no hot air escapes and the necessary welding temperature is maintained which ensures homogeneous welded seams. This additionally ensures a proper laying of the membranes.



- II. The main welding is then done on the remaining width of approx. 4 cm. In this case, the welding unit and the silicone roller are moved in a slow continuous movement along the seam (see sketch 2). After welding, turn down the temperature of the welding machine, but keep the blower on until the air is no longer hot (preserves the heating elements).



Seam joint connection by homogeneous hot air welding

When using polystyrene insulation sheets the overlapping area has to be increased in order to avoid damages caused by hot air.

# Seam Joint Welding

## 5.1.2 Welding by Automatic Welding Machine

Switch on the machine and adjust the temperature to recommended + 500 °C up to + 600 °C. The welding is done in one continuous operation. It is not necessary to make the pre-welding (tacking) line as when using manual hot air hand guns as the automatic welders have a special heat shield system which ensures that the sheets are pressed together and no hot air can escape. The welding speed is adjustable and will be determined by the ambient temperature.

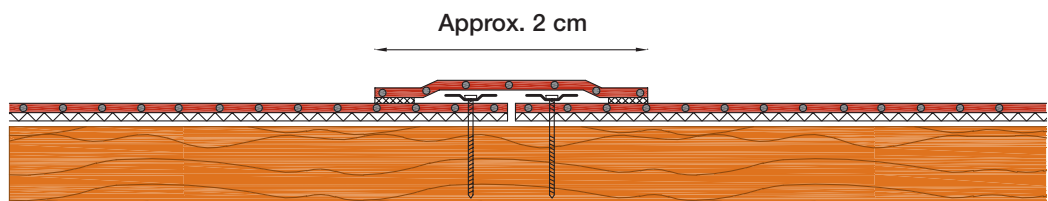


## 5.2 Welding Seam Control

Before commencing work, test welding must be completed to determine the ideal welding parameters and to ensure welding quality. A seam control can be done by using a suitable hook and by a peel test. Both seam control and peel test can only be done after sufficient cooling-down of the welding seam (24 h). The membrane temperature should then be < 20 °C.

## 5.3 Transversal Seam Joints

The membranes at transversal seam joints of Polyfin® / O.C.-Plan® 4230 membranes should be properly fixed on each side. Finally the joint has to be covered by a Polyfin® / O.C.-Plan® 3020 strip, width approx. 25 cm, hot air welded on both sides to connect the membranes (see sketch below).



## 5.4 Connection of New Membranes to Already Applied Membranes

New membranes may be joined together with already weathered membranes.

The surface of the already weathered membrane only has to be cleaned using a one-hand angle grinder with a rotating wire brush to remove all accumulated dirt and patina layers.

Welding of the new material can be done as described in 5.1.1.

## 5.5 Change Overs to Other Materials

Please consult with the Polyfin AG.

## 6. Flashings – General Information

Connections to roof waterproofing are done using strips of Polyfin® / O.C.-Plan® 3020. According to Flat Roof guidelines, all connections and terminations must be structurally fastened to prevent horizontal forces from damaging the membranes. The sheets must be fastened with singular fasteners (but min. 4 pc. per linear meter) or Polyfin® / O.C.-Plan® metal sheet corners (mech. fixed every 20 cm). Rigid connections of two structurally separated sheets should be avoided. Damages caused by shear and tensile loads can be avoided by installing sensible details designed to cope with these movements. All these connections should be wind proof. All details must be constructed in such a manner that no water can run behind or underneath the sheets. At junctions individual seams facing the direction of water flow cannot be avoided. This does not constitute a disadvantage for hot air welded seams.

The connection of the flashing strips to the field membrane must not be more than 20 cm from the up-stand. Flashing strips can be loosely laid, fully bonded with contact adhesive W or fully self-adhesive bonded in case of Polyfin 5024 SK, 5028 SK or O.C.-Plan 5028 SK.

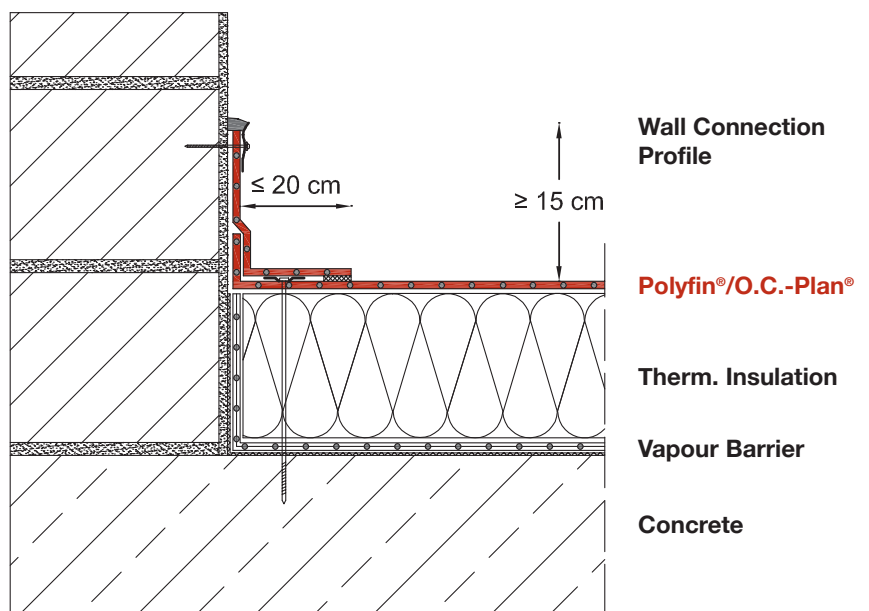
To seal the profile, suitable sealants or mastics can be used.

A perimeter fixing in front of all upstands and penetrations must be carried out by single membrane fasteners (4 fasteners / lm), metal bars (5 fasteners / lm) or laminated metal strips (5 fasteners / lm).

Also in valleys with a change of the direction of  $\geq 3^\circ$  from horizontal, a perimeter fixing is necessary. Wall connections have to be fixed all 20 cm.

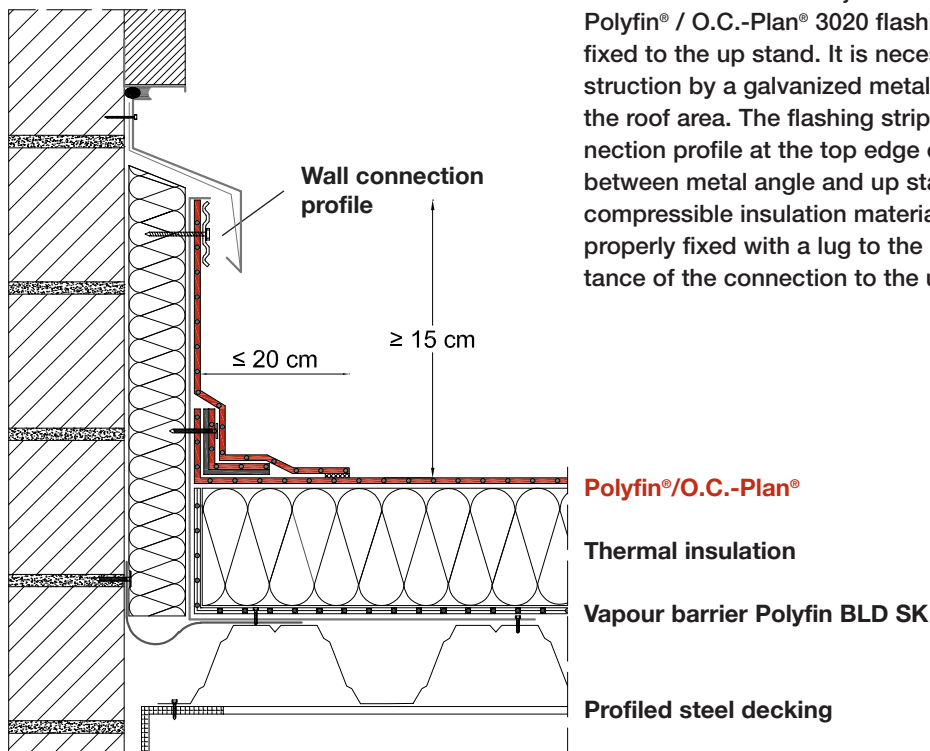
### 6.1 Wall Flashing Without Movement Joint

The Polyfin® / O.C.-Plan®- must be mechanically fixed directly in front of the upstand. The Polyfin® / O.C.-Plan® 3020 flashing strip must be loose-laid at the upstand and fixed at the upper edge by a wall connection profile. The top edge of the wall connection profile must be sealed with suitable mastic. In accordance to the Flat Roof Guide Lines, the connection height should be  $\geq 15$  cm above roof surface (membrane resp. ballast – worst case). The flashing strip must cover the perimeter fixing and has to be hot air welded onto the field membrane. The maximum distance of the connection to the upstand is 20 cm. The top edge of the wall connection profile must be properly sealed with suitable mastic.



## 6.2 Wall Flashing with Movement Joint

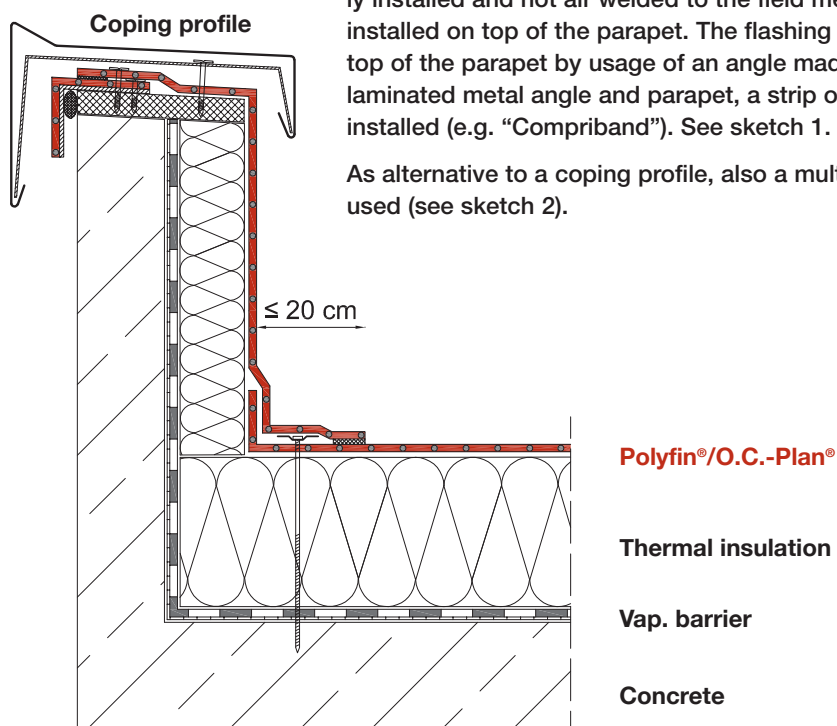
In case of a movement joint between roof and up stand, the Polyfin® / O.C.-Plan® 3020 flashing strip must not be directly fixed to the up stand. It is necessary to build an auxiliary construction by a galvanized metal sheet angle, which is fixed on the roof area. The flashing strip must be fixed by a wall connection profile at the top edge of the metal angle. The joint between metal angle and up stand must be filled with suitable compressible insulation material. The vapour barrier must be properly fixed with a lug to the up stand. The maximum distance of the connection to the up stand is 20 cm.



## 6.3 Parapet Flashing without Movement Joint (standard)

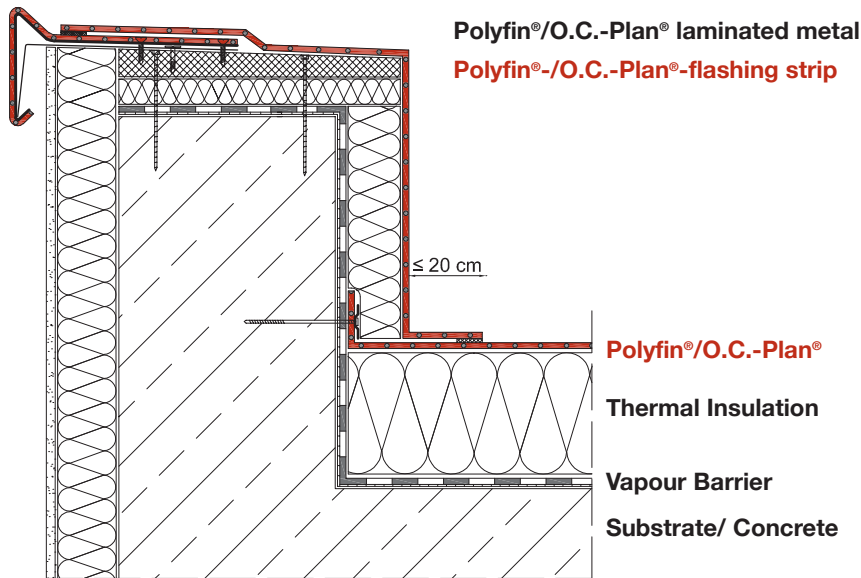
The principle is equal to the wall flashing. Different: The Polyfin® / O.C.-Plan® 3020 flashing strip gets mechanically fixed on the top of the parapet. Then it's loosely installed and hot air welded to the field membrane. Finally a coping profile gets installed on top of the parapet. The flashing strip must be connected wind proof on top of the parapet by usage of an angle made of Polyfin laminated metal. Between laminated metal angle and parapet, a strip of pre-compressed sealing tape must be installed (e.g. "Compriband"). See sketch 1.

As alternative to a coping profile, also a multiply folded laminated metal sheet can be used (see sketch 2).



# Flashings

A coping profile must be installed with falls of  $\geq 2\%$  to the roof area.



Sketch 2

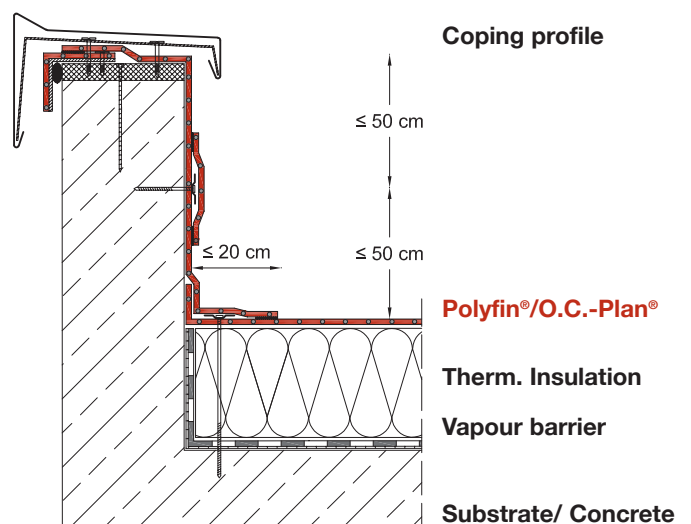
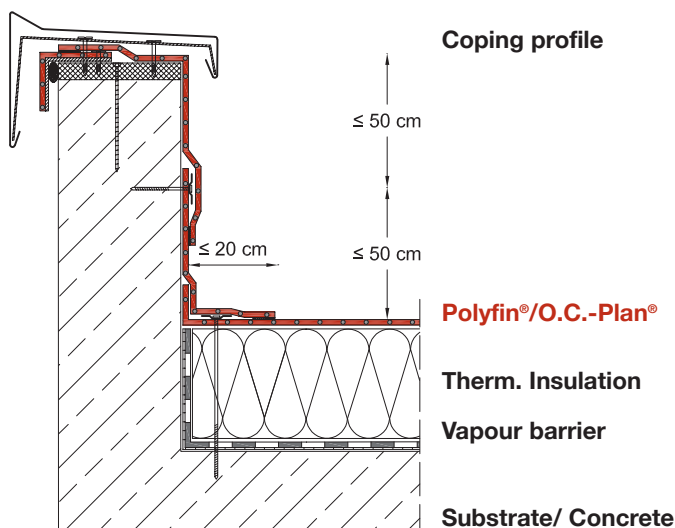
## 6.4 Flashing to High Parapet

If the height of the parapet exceeds 50 cm, the vertical flashing strip must be fully bonded to the substrate and mechanically fixed on the top of the parapet. Another opportunity is to loosely lay the flashing strip and to make a mechanical intermediate fixing.

It can be carried out as 2-part covered connection (left sketch below), or as single flashing strip with intermediate fixing plus coverstrip (right sketch below). As fastening elements, suitable wall connection profiles plus screws (5 fasteners / 1m) can be used. Also single membrane fastener washer plate/screw combinations with European Technical Approval (ETAG 006), 4 fasteners / 1m can be used.

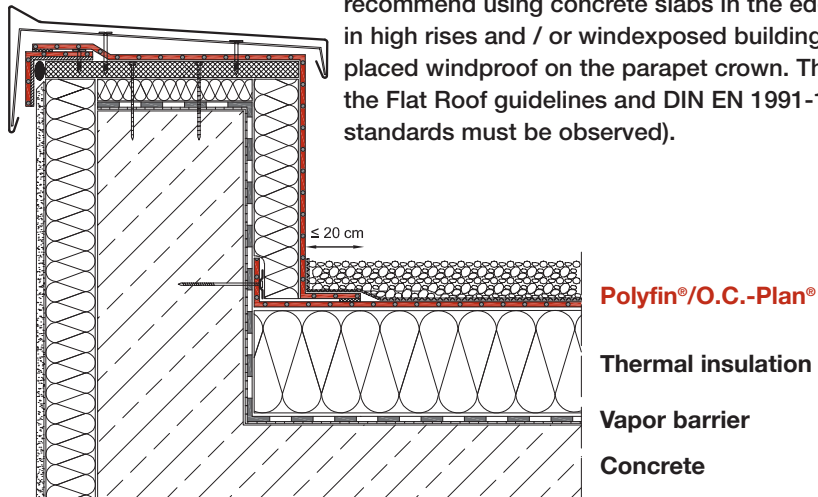
As alternative, a strip of laminated metal which is installed below the flashing strip is possible (fixed with 5 suitable screws / 1m). In this case, the flashing strip needs to be hot air welded to the laminated metal strip.

The flashing strip must be sealed wind proof on the top of the parapet (by laminated metal angle plus pre-compressed sealing tape such as "Compriband").



## 6.5 Parapet flashing on ballasted roofs

Strong wind often results in transporting of the ballast gravel. To avoid damages it is important to have mechanical fastening (single membrane fasteners min. 4 pc. per linear meter or Polyfin® / O.C.-Plan® metal sheet angles every 20 cm fixed at all penetrating elements). The linear perimeter fixation is also important to give resistance against probably occurring horizontal forces (compare flat roof guide lines). We also recommend using concrete slabs in the edge and corner areas when using this design in high rises and / or windexposed building locations. Then a suitable coping profile is placed windproof on the parapet crown. The ballast quantities are to be used acc. to the Flat Roof guidelines and DIN EN 1991-1-4 (Wind loads; national requirements and standards must be observed).



## 6.6 Parapet Flashing with Movement Joint and Coping Profile

The application has to be done as described in 6.2 (Wall Flashing with Movement Joint). A coping profile must be mounted directly on top of the parapet.

## 6.7 Parapet flashing with Movement Joint under Wall Cladding

Here the wall cladding will cover the sheet termination. The cladding must be installed in that way, that rain water cannot flow behind the flashing strip. The top parapet is then covered with a suitable coping profile. The flashing strip must be welded onto the field membrane with a distance of  $\leq 20$  cm to the parapet.

## 6.8 Verge and Roof Edge Detail

At the verges it is imperial to follow Flat Roof guidelines for correct flashings. For this, special multipart edge trim profiles as well as profiles made of POLYFIN metal sheets which allow proper connection to the waterproofing membranes for this purpose are needed.

The field membrane needs to be installed till the roof edge (including proper fixation). Then the edge trim profile, resp. folded laminated metal sheet gets fixed through the field membrane. The additional flashing strip gets clamped in the edge trim profile resp. hot air welded to the laminated metal sheet profile. Finally it must be hot air welded to the field membrane.

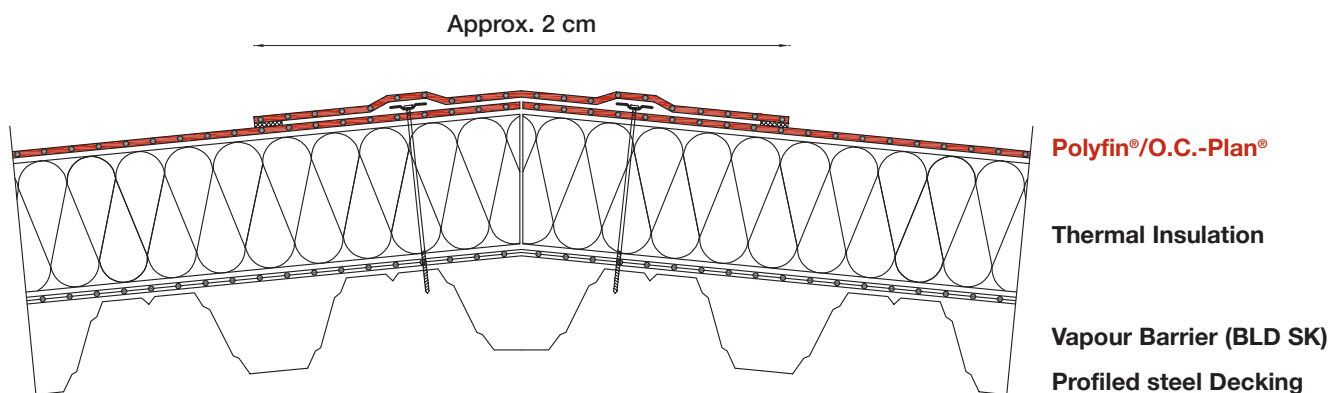
Screws for the fixation of laminated metal profiles must be set staggered to each other. Maximum distance of the screws to each other: 20 cm.



## 6.9 Ridge

At ridges with a change of direction of  $\geq 3^\circ$  from the horizontal, a proper perimeter fixation is required.

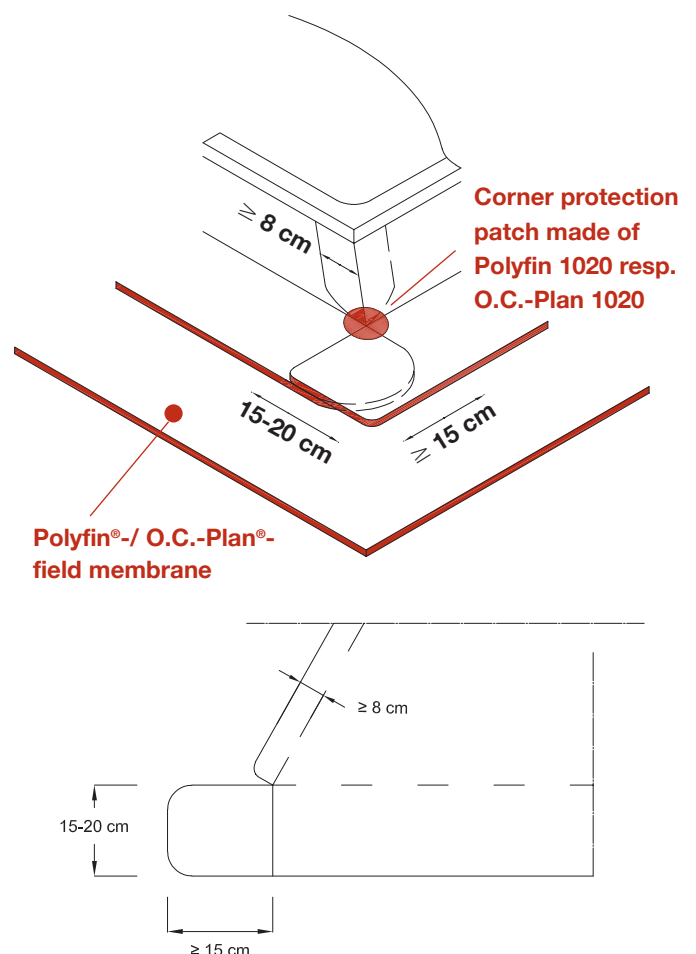
We recommend to finish with the field membranes on both sides of the ridge and to fix them mechanically by single membrane fasteners (washer plate / screw combinations with ETAG 006 approval), 4 fasteners / linear meter, in parallel direction to the ridge. Finally they should be covered with an approx. 25 cm till 52 cm wide Polyfin® / O.C.-Plan® 3020 strip which should cover the mechanical fasteners and then welded on both sides.



## 6.10 Flashing to Roof Lights and Linear Roof Lights

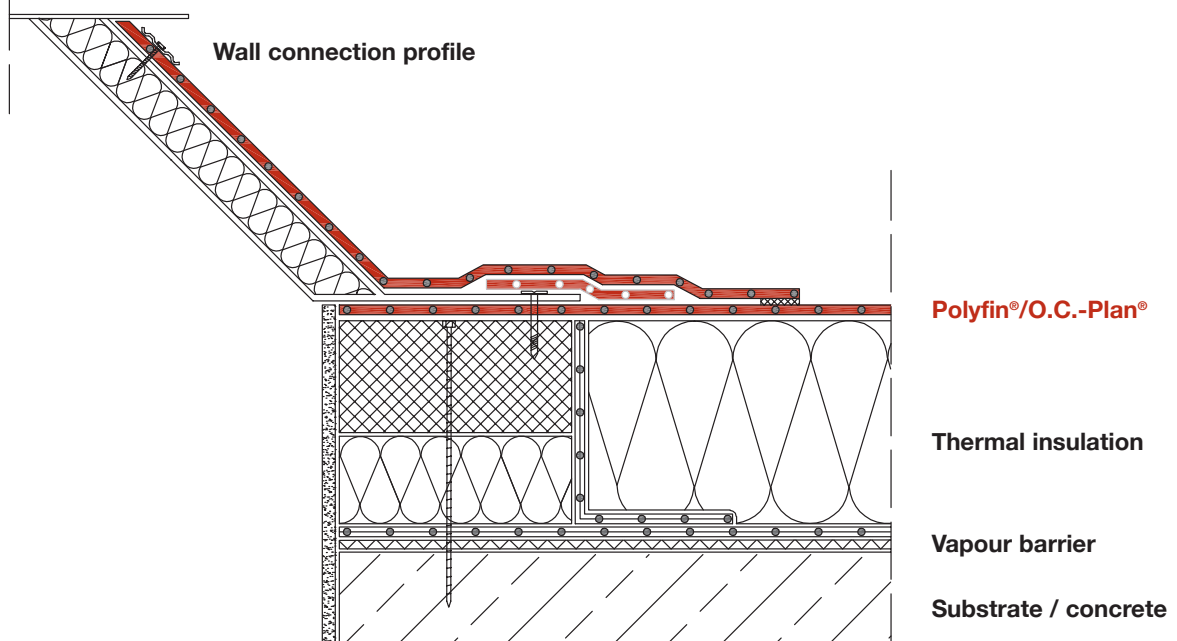
The Polyfin® / O.C.-Plan® field membranes are laid to the up going kerb (+ 5 cm to the kerb), which have got usually an angle between 50 and 70° to the field area. A linear perimeter fixing is required, as at all wall connections and parapets. The overlapping flashing strip of Polyfin® / O.C.-Plan® 3020 should be laid loose around the frame covering both the frame and the mechanical fixation. The strip is then fastened to the kerb using suitable wall connection profiles with suitable screws resp. rivets. The strip has to be welded max. 20 cm from the vertical kerb onto the field membrane. The intersection point at the corner between roof surface and frame covering has to be sealed by welding of corner protection patches (made of homogeneous material Polyfin® 1020 / O.C.-Plan® 1025 without reinforcement) from our range of accessories. The size of the corner protection patches depends on the detail which has to be sealed.

The flashing strip is also allowed to be fully bonded to the roof light kerb by Polyfin contact adhesive W. Also in this case, a mechanical fixation at the top edge by a wall connection profile is necessary.

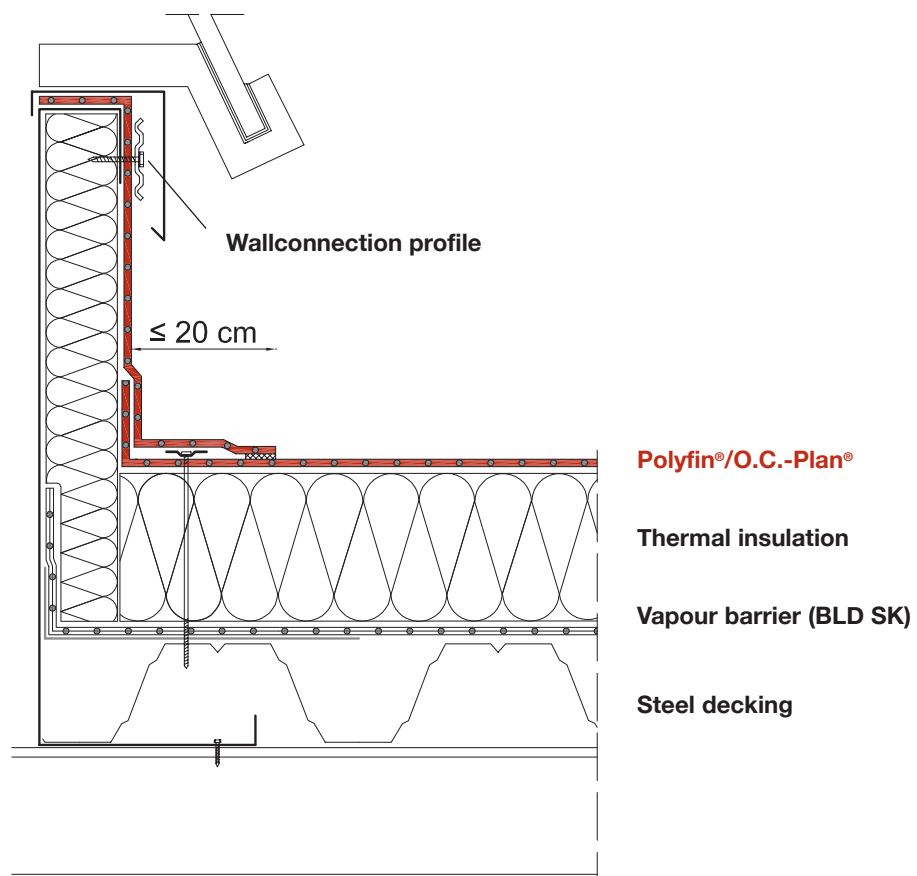


# Flashings

Flashing to roof light



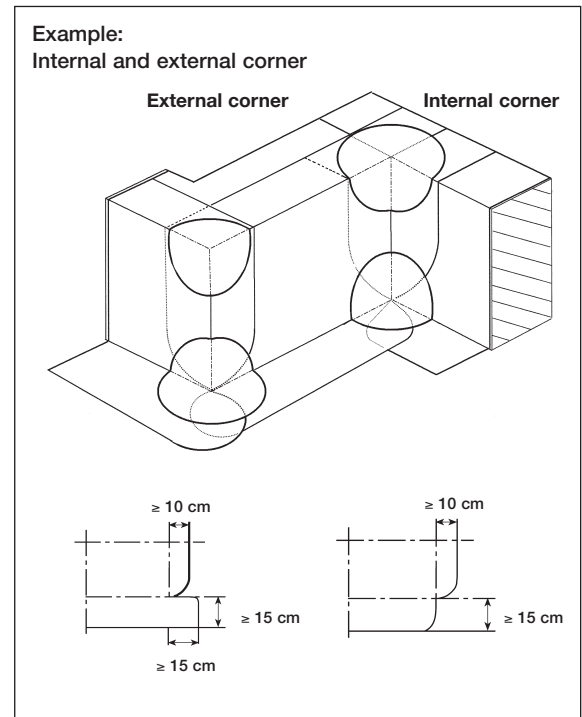
Flashing to linear roof light



## 6.11 Internal and External Corner

In corner areas Polyfin® / O.C.-Plan® 3020 strips are used around the corners and welded (see sketch). The sealing can be done by using pre-fabricated external and internal corners or round corner protections made of homogeneous material Polyfin® 1020 / O.C.-Plan® 1025. The size of the corner protections depends on the detail which has to be sealed. External corners can also be used for sealing straight angled or square roof penetrations such as ventilators or dome lights.

At internal corners, a “double counter laid fold” to save the pre fabricated corner is strictly forbidden.



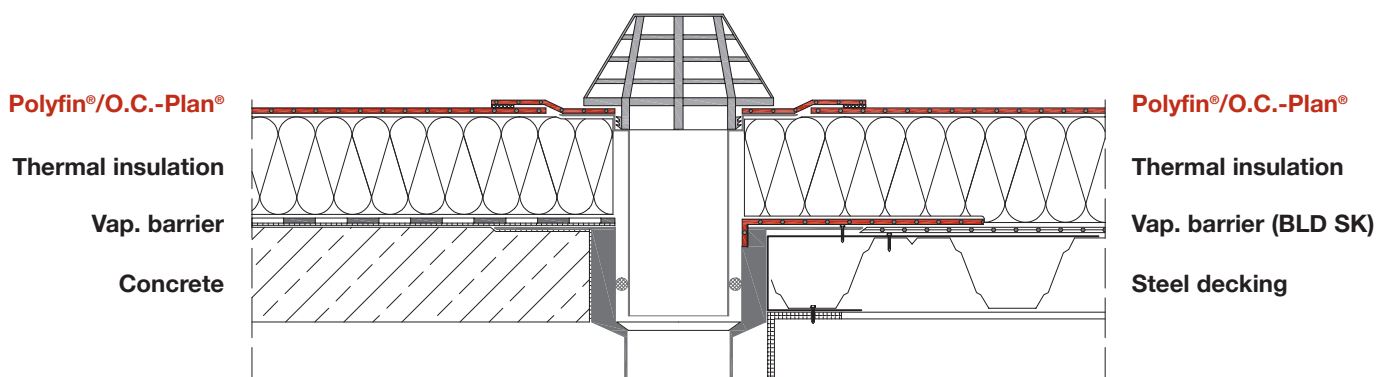
## 6.12 Flashing to Rainwater Drainage Elements

### a) Internal drainage

For this detail, pre-fabricated drains with factory-made membrane collar are recommended to be used. Using roof ventilators with mechanical fastening the connecting collar has to be exclusively carried out with homogeneous material Polyfin® 1020 / O.C.-Plan® 1025 (approx. 50 x 50 cm). The drain has to be fixed mechanically into the supporting deck. Flat Roof Guidelines state that drains must be placed with the external edge of their flange min. 30 cm from walls, parapets, joints and other separating objects. Structures separated by expansion joints must all have individual drains. For renovation, several accessories from POLYFIN range can be used.

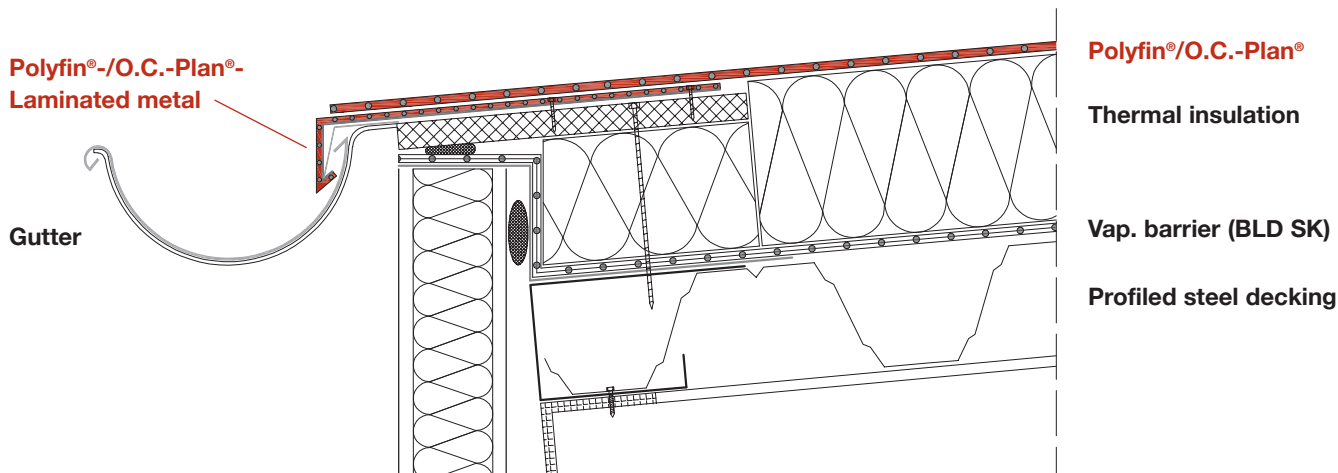
At roof outlets with clamping flange and sealing gaskets (top- and bottom gasket) Polyfin®- 3016 / 3020 / O.C.-Plan® 3020 – roofing membranes can be directly clamped in. The installation guide lines of the roof outlet manufacturer must be observed. The outlet resp. the warm roof attachment must be properly fastened to the substrate. The outlet resp. warm roof attachment must be installed at the lowest point on the roof. It is necessary to build out a little sump by cutting out the thermal insulation to provide drainage without hindrance. In case of roof refurbishment, also different accessories from the Polyfin portfolio can be used.

Attention: The drainage system must be dimensioned in accordance to national requirements. Also emergency overflows must be considered and calculated.

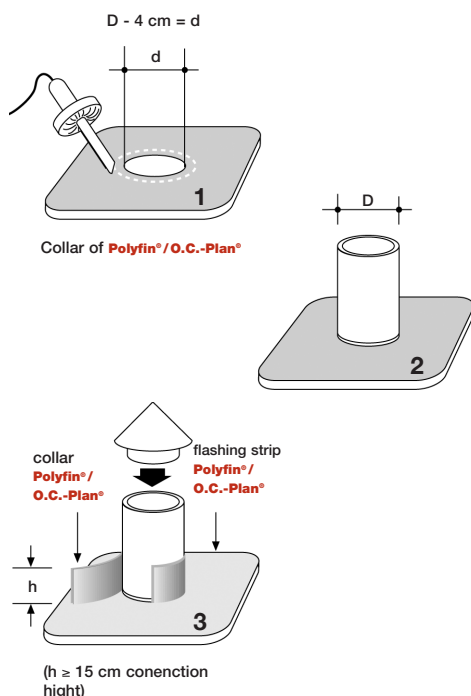


## b) External drainage by bracket mounted gutters

The drip angle (Polyfin® / O.C.-Plan®- laminated metal) must be properly fastened to gutter board (all 15 cm staggered to each other). Depending on the geometry of the drip angle, stiffening profiles might be necessary. At the transversal joints, the drip angles must be fastened by suitable screws with a distance of approx. 5mm to joint on each side. The transversal joints must be sealed with membrane strips (width  $\geq 15$  cm) made of Polyfin® 1020 / O.C.-Plan® 1025. Between the hot air weldings on both sides, there must be left an unwelded expansion zone above the joint. The field membrane can be directly hot air welded on the Polyfin® / O.C.-Plan®- laminated metal angle



## 6.13 Flashing to pipe penetrations

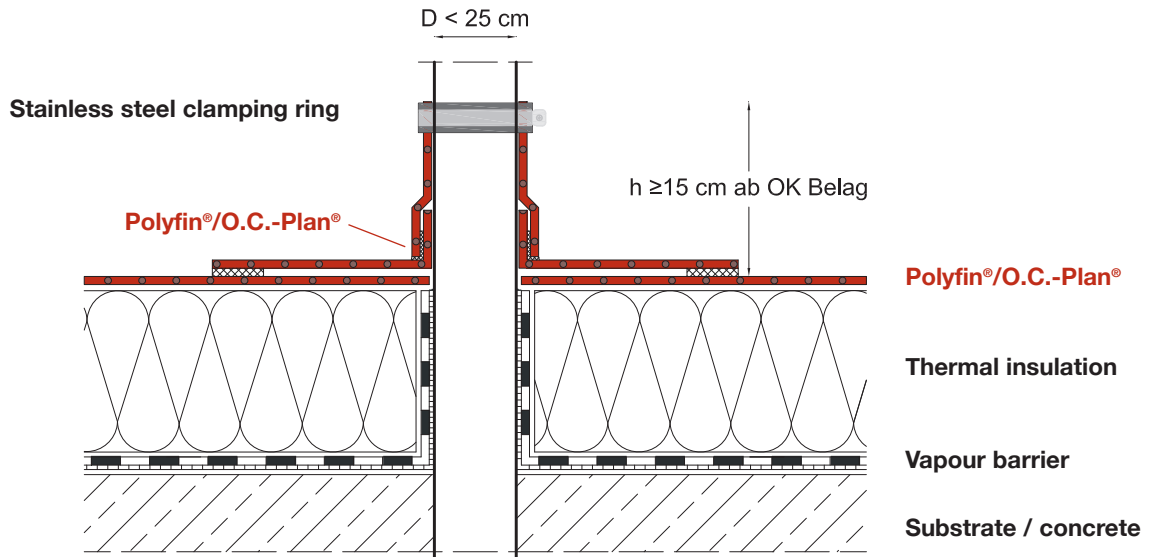


Pipe penetrations are normally sealed using standard parts from our accessories range – or from a flange approx. 50 x 50 cm and a collar made from Polyfin® 1020 / O.C.-Plan® 1025. In the middle of the flange a hole must be cut. The hole should be approx. 6 cm smaller than the pipe diameter. Using a hot air hand gun, the flange is heated to make it pliable and plastic so that it easily can be slotted onto the protruding pipe [1]. In some cases it is easier to make this shape adjustment on a loose pipe with the

same diameter. Because of the smaller diameter in the membrane collar, the collar material stands up a few centimeters at the pipe [2]. The collar must be welded to the field membrane. The flashing strip can now be installed and hot air welded to the up standing material from the collar [3]. On the top edge, the flashing strip must be fixed by using a clamping ring (see sketch on top of page 35).

# Flashings

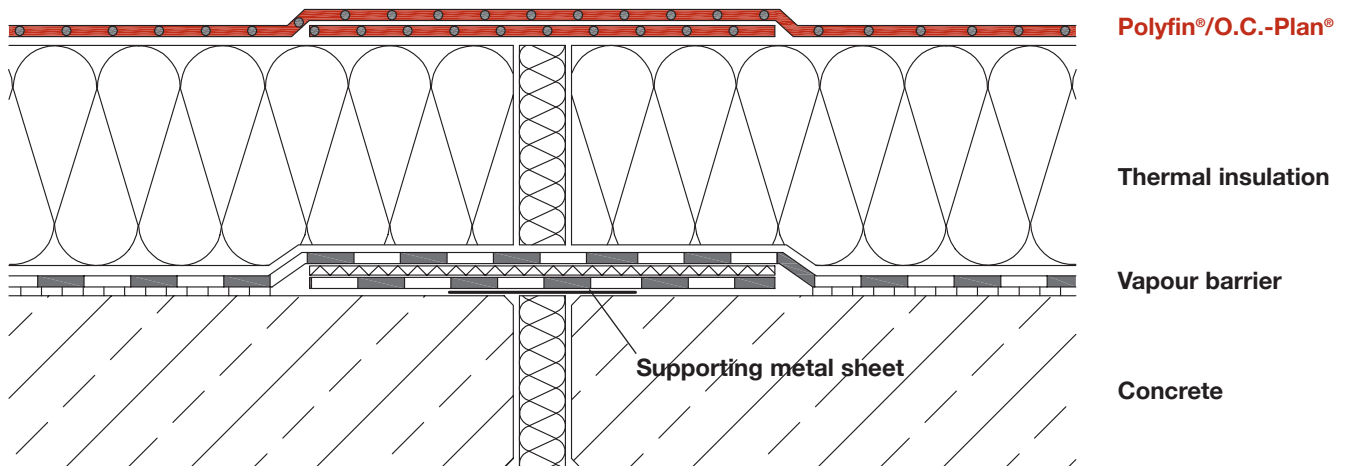
If the pipe diameter exceeds  $\geq 25$  cm, the Polyfin® / O.C.-Plan® field membrane needs a perimeter fixing by single membrane fasteners with ETAG 006 approval.



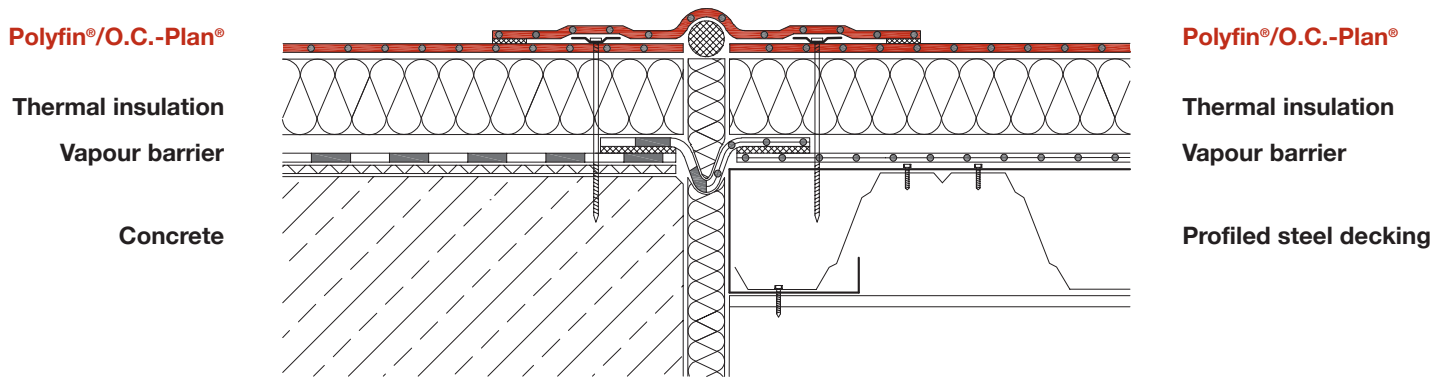
Rectangular penetrating elements such as chimneys, ventilators etc. must be flashed like wall connections or roof lights.

## 6.14 Structural Joints and Movement Joints

The layer structure of the roof must have joints wherever there are joints in the underlying structure of the building. Their nature depends on the anticipated settlement. Structural and expansion joints should normally be designed as high points. They must not run through openings for projections through the roof and must not approach closer than 50 cm to such points.



Example movement joint type 1 (in accordance tot he Flat Roof Guideline)



Example for expansion joint type 2 in acc. to the Flat Roof Guidelines

## 7. Separation Layers and Protection Layers

Our roofing membranes are plasticiser- and PVC-free and do not require any separating layers when in contact with e.g. bitumen and polystyrene as they are fully compatible. Wood preservation chemicals are not to influence the roof construction in a dangerous way. Suitable separating layers are e.g. raw glass fleece, plastic fleece, PE-foils etc.

### 7.1 Thermal Protection

When using Polyfin® / O.C.-Plan® for waterproofing in civil construction underneath e.g. asphalt (road and bridge construction) please contact the technical department of POLYFIN AG.

### 7.2 Protective Layers

Rough and uneven surfaces can probably damage the waterproofing and therefore often require a protective layer beforehand. Suitable protective layers are polyester fleece. Bituminous surface may also require a protective layer. When Polyfin® / O.C.-Plan 4230 is used, the protective layer can eventually be omitted. One layer thermal insulation could also serve as protection layer. If heavy and/or pointed objects are to be placed above the waterproofing sheets, suitable protection between membrane and ballast/objects is required. Rubber granulate mats are commonly used for this purpose.

### 7.3 Anti Friction Layers

When concrete is applied directly on the waterproofing sheets as per German Standard DIN 18195, part 10 e.g. 2 layers of 0.25 mm PE-film each have to be used as separating layers. Other kinds of anti-friction layers acc. to recommendation of the technical department of POLYFIN AG.

## 7.4 Corrosion Protection in Case of O.C.-Plan – Roofing Membranes

Through intensive UV light and humidity organic residues can be formed on the surface of the waterproofing sheet. These residues combined with bituminous materials (also ECB – Ethylen Copolymer Bitumen) can lower the pH value of the surface water and can under adverse situations cause a corrosion acceleration of zinc, copper, aluminium and iron materials. We recommend using gutters and drains of plastics, stainless steel, plastic coated metal or to coat all metal parts which may come in contact with the surface rain water with suitable paint or protective coatings. Please observe local regulations for corrosion protection. Protection coatings have to be maintained frequently.

## 7.5 Health and Safety

Always observe local safety regulations. When welding membranes in small closed rooms, ensure adequate ventilation.

## 7.6 Dangerous-Materials Class

Polyfin® / O.C.-Plan® products are not dangerous goods (see also Material Safety Information Sheet – Safety Data Sheets are not required) Polyfin® / O.C.-Plan® are environmentally friendly and are not hazardous to waters (no detrimental effect on ground water or for animals). When welding or burning POLYFIN membranes no dioxins, furans or corrosive gases are released.

## 7.7 Fire Classification

Polyfin® / O.C.-Plan® have been tested in different build up's in accordance with all common roofing regulations to conform with the class of "Hard Roofings" = resistance against fly ashes, sparks and radiant heat in accordance with DIN 4102, Part 7 and European norm DIN ENV 1187 (Broof (t1), (t2) and (t3), depending on the build up, slope and the material. As a construction material, Polyfin® / O.C.-Plan® are classified under class E to DIN EN 13501, Part 1. Test certificates are available upon request.

## 7.8 Fire Retardant Layer

On mechanically fixed roofing membranes installed on polystyrene insulation (EPS), raw glass fleece 120 g/m<sup>2</sup>, A2 (non-combustible) , are suitable as fire protection layer. (in case of O.C.-Plan 3020, Polyfin 3016 – 3020).

## 7.9 Storage

Polyfin® / O.C.-Plan® can be stored on construction sites, rolls must be standing – if laying then only one layer. They must be stored on an even and clean substrate. Polyfin® SK / O.C.-Plan® SK must be stored standing on pallets and protected against UV light as the adhesive mastic is not to be exposed to constant UV light, the rolls should be used within 6 months from production date.



## 7.10 Reflecting Inradiation

In front of reflecting claddings such as bright metal surfaces and glass facades, partially temperatures of  $> 100^{\circ}\text{C}$  may occur – which might damage the roof sealing.

To prevent this, suitable measures must be undertaken. In front of strongly reflecting claddings this could be a heavy surface protection such as gravel or concrete slabs. Reflecting metal surfaces can be coated by dark and mat paint.

If dark rubber mats are put on the sealing in front of reflecting facades and claddings, ballast (gravel, green roof system build up...) must be installed immediately. Otherwise a heat accumulation might occur between membrane and rubber mat- which might damage the membrane.

To prevent the damage of the roofing membrane, it is also possible to install a  $\geq 150\text{ g/m}^2$  polyester fleece between rubber mat and roofing membrane.

For Polyfin® / O.C.-Plan® as sealing layer below asphalt, see chapter 7.1 „Heat Protection“.

## 7.11 Working Temperature

In general it is possible to handle and to hot air weld Polyfin® / O.C.-Plan® membranes down to an ambience temperature of  $0^{\circ}\text{C}$ . At temperatures  $< 0^{\circ}\text{C}$  it is recommended to stop the installation.

## 8. Additional Important Remarks

Always comply with all relevant regulations such as Flat Roof guidelines, Plumbing regulations, Safety Regulations and all manufacturer instructions for accessories, parts and tools.

Information given herein is based on present knowledge and more than 40 years experience with these materials. A liability claim for a specific item used under a specific situation or confirmation on suitability for a specific application can only be honored if this has been given in writing by POLYFIN AG. The wide range of applications for these kind of products always requires experience and competence of the user of these.

As our material warranty only can be applied when the above mentioned regulations have been strictly adhered to, we strongly recommend to contact POLYFIN AG and request separate confirmation for situations where regulations cannot be adhered to – or are non existing.

This is particular important for situations where conditions deviate from the instructions and regulations given and mentioned within this manual.

This installation guide loses its validity with the publication of a new version of this installation guide.

The general terms and conditions of the POLYFIN AG are valid.

## 9. POLYFIN-Accessories

The POLYFIN AG offers many accessories as ideal solution for several details in combination with Polyfin® und O.C.-Plan® roofing- and sealing membranes.

In our flat roof accessories brochure information about prefabricated corners, collars, drainage elements and vent pipes can be found.

The flat roof accessories brochure and other brochures and data sheets can be downloaded on the Polyfin website [www.polyfin.de](http://www.polyfin.de)



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