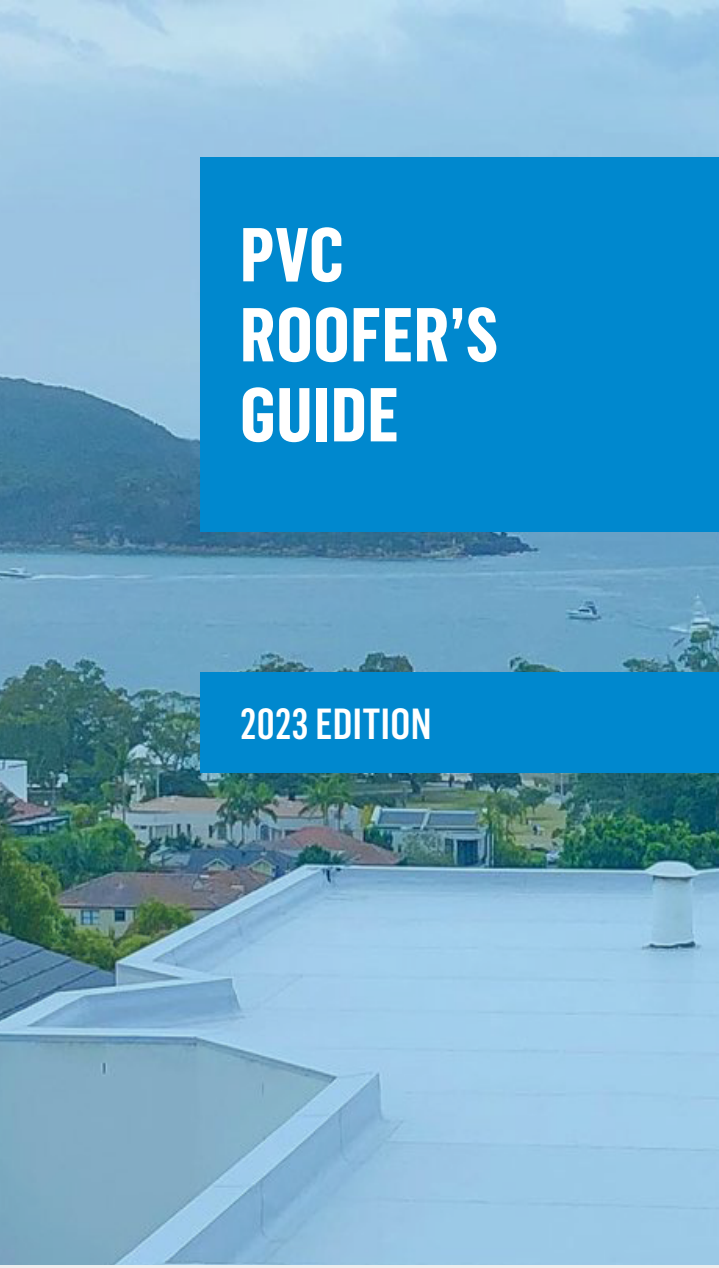


PVC ROOFER'S GUIDE

2023 EDITION

SOPREMA

INTRODUCTION

INTRODUCTION

The quality of a roof construction depends on several factors that must function together towards a common objective: ensuring the long-term performance of the waterproofing system.

The main role of a roof is to keep the building dry and protect it from the weather. In addition, the roof assembly must be designed to ensure continuous waterproofing through all elements of the building envelope. The vertical roof elements, as well as the waterproofing of the various roof details and penetrations, must therefore be addressed with the same care as the sealing of the roof field surface. Next to rain, the roof must also withstand internal condensation and water vapor migration to prevent the roof components from deteriorating over time.

In addition to protecting against the weather, the roof components must be stable and properly fixed to the structure. The fastening and adhesion methods must allow the roof assembly to withstand thermal cycles and live loads in order to limit the material deformation that could compromise the waterproofing. Beyond stability of the materials, the roof system must also bear the normal negative pressures exerted by the wind.

Several factors shall be considered so a roof meets its long-term performance objectives while working as expected:

- The selection of appropriate materials
- The correct design of the roof assembly
- The proper installation of roof system components
- The regular maintenance of the roof

The main purpose of this PVC Roofers Guide is to present the best practices regarding the installation of PVC-P (PolyVinylChloryde Plasticised) synthetic waterproofing membrane systems as recommended by SOPREMA.

As a preamble to the installation methods, the General Information section summarises SOPREMA's requirements regarding surface preparation, membrane layout, slope and other elements to be considered when designing or building a roof. These requirements, unlike product installation methods, must be followed to meet the requirements of SOPREMA warranties. For more information on this subject, please read the "General Conditions for Roofing Warranties" in the Warranty section of the SOPREMA website.

In this version of the guide, emphasis has been put on the installation steps for the different types of SOPREMA Single-ply PVC-P membranes. Descriptions are organised by adhesion methods:

- Loose laid
- Mechanically fastened
- Bonded with cold adhesive

The PVC Roofers Guide also introduces methods for installing components other than membrane, namely insulation panels, support panels, and other main accessories.

In conclusion, this PVC Roofers Guide contains information that is relevant to all installers, professionals in charge of assembly design, site inspectors, project managers, estimators and any other person involved in roof construction and looking for answers regarding the installation of SOPREMA's main roofing products.

TABLE OF CONTENTS

GENERAL INFORMATION

1.0. GENERAL INFORMATION

1.1. MANUFACTURING PROCESS

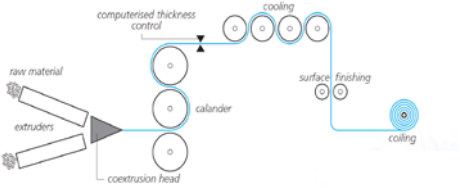
The manufacturing processed for this wide range of PVC materials are quite diversified, and specifically include:

1.1.1. Coextrusion

In this process, the mixture of material components (resins, plasticisers, stabilisers, pigments, etc.) in each extruder is introduced through a hopper into a cylindrical chamber.

Here it is heated up and pressed by worm screws into a co-extrusion head, where the single extruders converge, and then it is laminated in a calender. The liner thickness is automatically adjusted by electronic equipment that controls the opening of the extrusion head and of the calender.

The material thus obtained is a single-layer homogeneous, non-reinforced liner, with high tensile properties and high resistance to static and dynamic puncturing. This process can also produce two-colour, single-layer membrane with a signal layer.



NOTE: This diagram merely gives an idea of the process and is not indicative of the actual lay-out and methods used at the SOPREMA's proprietary plant.

1.1.2. Caste Spreading

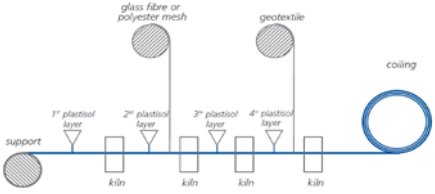
This is a manufacturing process that creates waterproof membranes in which the reinforcement becomes an integral part of the liner.

At room temperature, a spreading head lays a substrate of a mixture of liquidviscous state products called ***plastisol***. This contains resins, plasticisers, stabilisers, pigments, etc. and determines the final characteristics of the waterproof liner.

After gelation (a melting process achieved by raising the temperature inside the ovens), the plastisol solidifies.
The spreading and gelation process is repeated on line four times in a row.

Thus, membranes manufactured by the spreading method are composed of four differently formulated layers. An internal reinforcement, either polyester or glass mesh, is inserted between the second and third layers.

This manufacturing system establishes a molecular bond between the four layers creating a homogenous and flexible single-layer liner that can be combined with a thermally treated geotextile layer that improves its gripping characteristics or allows it to be laid on materials that are not chemically compatible with PVC-P. The spreading process can also produce two-colour, single-layer membranes with a signal layer.



NOTE: This diagram merely gives an idea of the process and is not indicative of the actual lay-out and methods used at the SOPREMA's proprietary plant.

1.2. STORAGE

FLAGON PVC membranes are delivered on site in rolls, on flat, ventilated pallets. They should be stored in a dry place or, if this is not possible, they should be protected against dampness, rain and snow using waterproof sheets.

1.3. MEMBRANE SELECTION

	FLAGON S	FLAGON SR	FLAGON SV	FLAGON SFC
Ballasted roof system not subject to pedestrian traffic			■	
Ballasted roof system subject to pedestrian/vehicular traffic		■		
Ballasted roof system for roof garden			■	
Mechanically fixed roof system		■		
Mechanically fixed roof system on thermal insulation		■		
Fully adhered system on thermal insulation				■
Fully adhered system on reinforced concrete				■
Fully adhered system- renovation bituminous waterproofing				■
Exposed vertical surfaces		■	■	
Detailings	■			

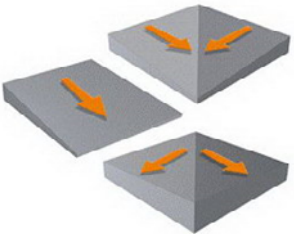
1.4. LABELLING

All FLAGON PVC membranes have a white label identifying the membrane, its thickness, dimensions, and batch number.

It is recommended to take pictures of the labels when products are delivered onsite.

1.5. SLOPE

The slope of all roofing systems must be at least 1%. The roof slope must be even and continuous towards the drains.



There must be a gentle slope around the drain to prevent the membrane from wrinkling at this location when it is applied.

When the lowest level of the roof is a junction between structural elements, install backslope crickets to direct the flow of water towards the drains.

1.6. THE DIFFERENT SUBSTRATES

Surface preparation depends not only on the type of membrane installed, but also on the type of substrate. Special care must be taken according to the substrate type: concrete, wood or metal. The following section presents the particularities of several materials not manufactured by SOPREMA that are commonly found in construction projects. In such cases, these are recommendations only and approval may be required from the substrate manufacturers.

SUBSTRATE TYPE
CONCRETE
Structural concrete
Cellular concrete
Soundproofing concrete
WOOD
Plank
Plywood
OSB
Pressure-treated wood
Surface-treated wood
Cross-laminated timber (CLT)
METALS
Steel deck
Prepainted steel (flashing)
Galvanised steel
Stainless steel
Aluminium
Copper

1.6.1. Concrete Surfaces

Concrete must be fully cured before membrane application, or have no more then 7% of moisture content.

Consult the contractor who poured the concrete for more details about concrete curing on a specific project.

A minimum curing time of 14 days is generally required in summer. A longer period may be required in other seasons. Curing time also depends on the thickness and density of the concrete.

Surfaces must be dry, clean, and free of loose particles, formwork and curing products, irregularities, slurry, laitance etc.

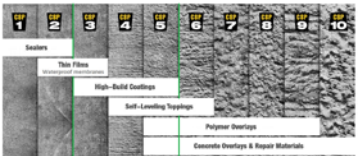
Concrete slabs must always be prepared according to type of membrane installed.

Surfaces must have a concrete surface profile (CSP as per the International Concrete Repair Institute) of 3 to 5 for all types of PVC-P membranes.

Protrusions along concrete formwork and construction joints must not exceed 5 mm.

All holes over 5 mm must be filled with fast-setting concrete, depending on the surface condition.

Suggested tool: Concrete profile international evaluation tool.



1.6.2. Wood Deck

1.6.2.1. Planks

Wood decks are usually made of softwood, with sap.

If this type of deck is made of old planks, the surfaces may be irregular, and the presence of used nails and screws could carry a high risk of membrane perforation.

To prevent problems related to this type of substrate, it is recommended to install cover boards mechanically fastened or bonded with **DUOTACK** adhered to the planks before the application of the membrane.

1.6.2.2. Plywood Boards

Although this type of wood carries little risk linked to resin or old mechanical fasteners, membrane delamination or wrinkles may occasionally occur at the junctions of the boards when using a fully adhered system.

Wrinkles typically appear soon after installation of the membrane, particularly when humidity in the boards evaporates.

To prevent this occurrence, SOPREMA recommends installing cover boards mechanically fastened to the plywood boards before application of the membranes.

1.6.2.3. Oriented Strand Boards (OSB)

Like plywood, this type of wood also presents little risk associated with resin or old mechanical fasteners. However, when this type of board is used, the surface treated against moisture should always be installed face down.

If not, an adhesion test must be performed to ensure that the treated surface does not affect membrane adhesion and is comparable to untreated surfaces.

1.6.2.4. Treated Wood

Pressure-treated wood, whether fire or humidity resistant, is not required in SOPREMA's waterproofing systems. However, when used, the following recommendations apply:

Cold adhesive-bonded membranes can be installed on pressure-treated wood.

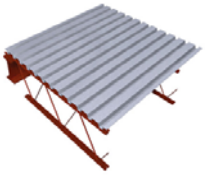
Surface-treated wood (with a preservation treatment applied using a paint brush or roller) is not an appropriate substrate, no matter what type of membrane is installed. The treatment compromises adhesion of the waterproofing membrane to the wood. However, you may treat the surface of the cut ends of pressure-treated wood.

1.6.2.5. Cross-Laminated Timber (CLT)

For cross-laminated timber deck it is better to install a cover board mechanically fastened or bonded with DUOTACK adhered to the planks before application of the membrane.

1.6.3. Steel Deck

Gypsum boards, concrete boards or thermal insulation boards installed on a steel deck must have a bearing capacity based on the space between the top flutes (deck flute spanability).



1.7. FASTENING METHODS

To ensure the performance of roofing materials that are mechanically fastened, bonded with adhesive or ballasted, it is very important to use the appropriate quantity of mechanical fasteners, adhesive or ballast according to the roof zone.

The roofs are divided into three zones:

- The roof surface;
- The roof perimeter;
- The roof corners.

For most projects, the required number of mechanical fasteners and amount of adhesive varies from zone to zone.

For more details about the required quantity of adhesive or mechanical fasteners, consult the SOPREMA Wind Uplift Resistance reports according to AS/NZS 1170.2:2021 Structural Design Actions, Part 2: Wind Actions, available from your local SOPREMA representative.

A separation layer should be installed between the roof membrane and the ballast layer (FOR COMPLETE INSTALLATION INFORMATION, PLEASE CONSULT YOUR LOCAL SOPREMA REPRESENTATIVE)

The wind uplift resistance of protected systems is obtained through the ballast. This weight keeps the system in place during heavy rains. Before laying the ballast material, always install either a filter layer or a drainage panel. Finally, to make sure that the structure is sufficiently resistant, the load capacity must be assessed by an engineer.

The responsibility for determining the weight required for a particular project and for selecting a type of ballast material must be assumed by the project designer or project manager.

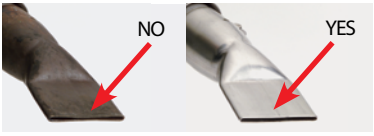
REQUIRED QUANTITY OF BALLAST DEPENDING ON INSULATION THICKNESS				
	MINIMAL BALLAST WEIGHT			
	REGULAR DRAIN		CONTROLLED FLOW DRAIN	
Thickness of insulation panel mm	Field Surface kg/m²	Perimeters, Corners and Penetrations kg/m²	Field Surface kg/m²	Perimeters, Corners and Penetrations
50 AND LESS	50	60	60	
75		84	101	
100		108	141	
125		132	182	
150		156	222	
175		180	283	
200		204	304	

1.8. EQUIPMENT

The following tools are necessary to install FLAGON PVC membranes: hot air manual hand welder with 20 mm and 40 mm nozzle, automatic welding machine (Verimat), 40 mm rubber roller, 6 mm brass roller (penny roller), scissors, a chamfering for + 1.8mm and seam probe tester.

1.8.1. Tool Condition

Ensure the nozzle is clean and uniformly open across its entire width.



1.8.2. Indicative Temperature

The above temperature and speeds are average for welding our PVC membrane. Site conditions and ambient temperatures can affect these levels.

MODEL	20 mm Nozzle	40 mm Nozzle	VARIMAT
Temperature	450° C	500° C	550° C to 570° C
Speed	-	-	200 to 250 cm/ minute

1.9. MEMBRANE LAYOUT

The following recommendations generally apply to all membranes in order to obtain high-performance waterproofing. If some acceptable exceptions or alternatives apply to particular products, they will be addressed in this guide in the Installation Section of the membrane type in question.

The layout of the membranes is traditionally done by offsetting each end lap joint (figure 1). However, there is an alternative method with the use of overlapping strips centred on the end lap joints. A **300 mm** strip overlapping membrane allows FLAGON PVC membranes to be installed without offsetting the end lap joints (figure 2).

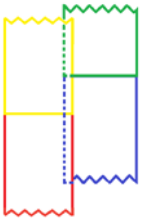


Figure 1

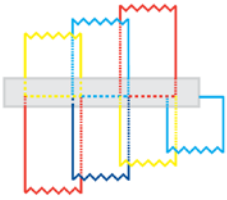


Figure 2

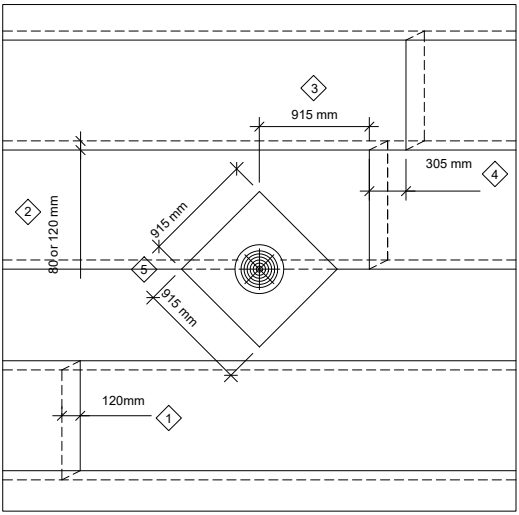
General recommendations:

- Ensure membrane has been properly preconditioned (Packaging intact, stored in good condition, ...)
- Place the rolls where they will be used. Always start at the lowest point of the roof.
- Unless otherwise stated, side laps should be at least 80 mm or 120 mm following the lines provided for this purpose according to the type of membrane used.
- End laps must be 120 mm or side by side with 300mm strip.
- For flashing membranes, the overlap on the field membrane shall be 150 mm.
- In order to prevent excessive thickness of membranes, the end laps must be offset by at least 305 mm. The same rule applies for the overlapping of flashing membranes with the membranes of the field surface.

1.9.1. Sheet Layout on Horizontal Roof Surfaces

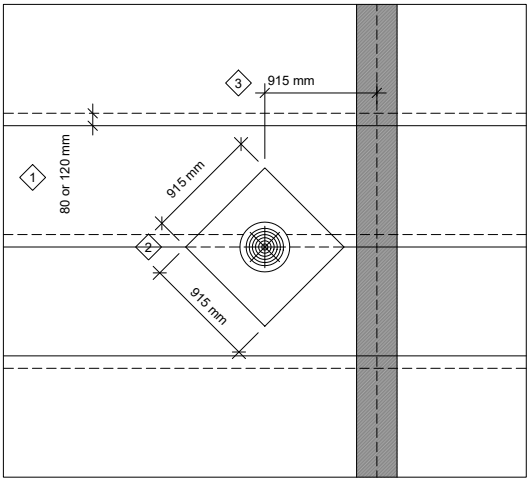
INTERIOR SLOPE WITH DRAIN

Traditional Method



1. End lap joints
2. Side lap joints
3. Minimum distance between the centre of the drain and end lap joints on base sheet membranes overlapping the drain
4. Minimum distance between end lap joints of base sheet membranes that are overlapping
5. Dimensions of the reinforcement membrane at the drain

Alternative Method with 300mm strip



1. Side lap joints
2. Dimensions of the reinforcement membrane at the drain
3. Minimum distance between the centre of the drain and end lap joints on membranes overlapping the drain

1.9.2. Placement of PVC Membranes

Unroll the membrane making sure the side lap joint is aligned with the centre of the drain (Figure 1);

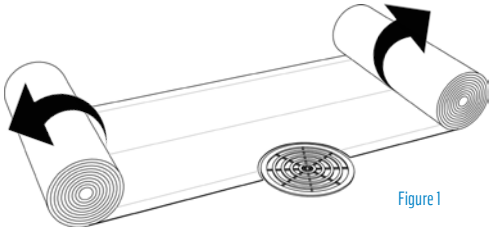


Figure 1

Re-roll one end towards the centre;

Install this first half of the membrane;

Proceed with the opposite half.

When working on the end laps, it is important to cut at an angle the corner of the membrane located on top of the end lap joint which will then be covered by the adjacent roll.

Install a reinforcement membrane diagonally (45°) around drains.

1.9.3. Temporary Waterproofing

If the full application cannot be completed within the same day, a temporary waterproofing must be done cautiously on all field surfaces, perimeters and curbs. An uncompleted waterproofing installation can compromise the integrity of the materials by allowing water infiltration.

The use of a sealant bead at the end of the membranes carries a risk of infiltration and is not recommended.

It is always recommended to install the flashing sheets immediately after the field surface sheets are laid. However, if site organisation does not allow it, the following methods are recommended:

Turn up the sheet of the field surface by approximately 50 mm on the permieters and curbs. Otherwise, a 150 mm piece of membrane must be installed at all transitions after the sheet is installed on field surfaces. This will allow a temporary sealed system to be obtained before applying the sheet to the flashings.

For temporary waterproofing on field surfaces, it is better to use a self-adhesive membrane strip to waterproof between the PVC sheet and the vapour barrier or the deck. Work should be paused so that water runoff is directed opposite to the sections of insulation and membranes already installed.

1.9.4. Layout of Flashing Membranes

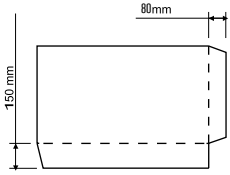
SOPREMA requires no minimum height when creating a junction between a roof and a vertical upstand. However, the membrane termination must be perfectly sealed with a metal flashing or a termination bar.

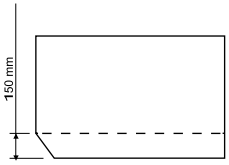
Upstands must be covered with 1 m wide membrane strips installed vertically. The overlaps of the flashing membrane must be offset so that the membranes covering the vertical face of the flashing do not coincide with those covering the field surface.

For flashing sheet membranes, the overlap on the sheet of the field surface shall be 120 mm.

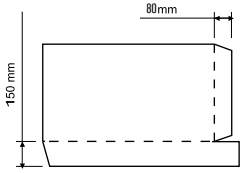
1.9.5. Membrane Cutting Suggestions

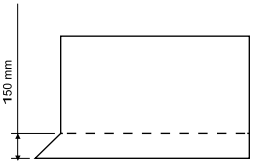
Inside corners





Outside corners





INTERNAL CORNER

EXTERNAL CORNER

MULTIPURPOSE CORNER

Prefabricated corners are mandatory at every angle, whether interior or exterior, at the transition of the field surface.

1.9.6. Control Test Procedures

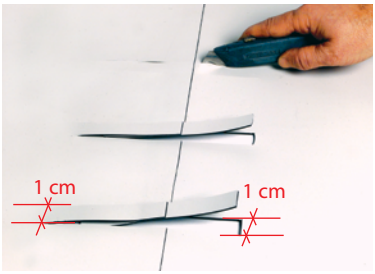
Before proceeding with the entire area, it is crucial to ensure a proper sealing of the overlap, and to verify the correct settings of the hot air welder. This preventive measure is essential to avoid any potential seam failures and to ensure a successful installation.

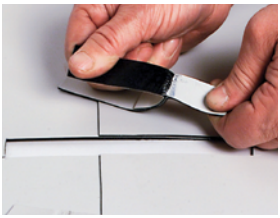
Destructive test:

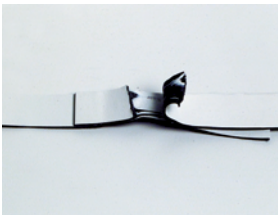
Cut out a 1 cm section of the welded membrane. Apply pressure to the weld by pulling on the two ends of the sheet as illustrated in the picture.

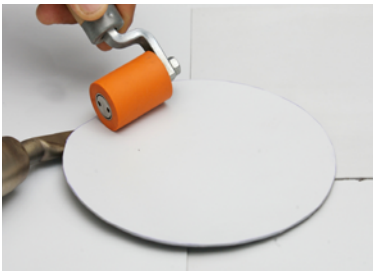
The membrane must fail outside the welding seam. This control must always be carried out each day on a sample weld before the installation of the waterproof membrane commences.

Install a patch to repair the area tested.







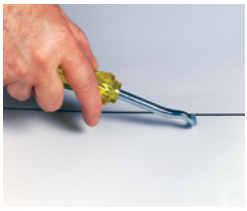


Non destructive test:

Carry out the test, using the welding tester (seam probe) on cooled material.

Pass the seam probe along the welding line, exerting sufficient pressure to identify defective seams.

In the case of defective seams, follow the seam cleaning procedure prior to rewelding as necessary. In extreme situations, it is necessary to weld a 15 – 20 cm strip over the existing welding line after cleaning.



1.9.7. Damage Repair

Should accidental damage occur after installation, repairs are simple.

Cut a patch of FLAGON SV/SR to completely cover the cut and round the corners with scissors.

Trace the circumference of the patch onto the surface.

Clean the surface of the membrane with a new cloth and FLAGON PVC CLEANER.

Spot-weld, pre-weld and weld the patch in place.

MEMBRANE INSTALLATION METHODS

2.0. MEMBRANE INSTALLATION METHODS

Limitations

There is no temperature limit for PVC membranes. This is why they can be installed efficiently even in winter conditions.

However, in very cold weather, some special work methods are recommended to ease their installation.

Do not re-roll the membrane as tight as you would during the summer. The last two metres of the membrane will be easier to weld if it is rolled more loosely.

Conditioning of Membranes

It is recommended to completely unroll the membrane 10 to 15 minutes before the installation, regardless of the temperature. This procedure releases the tension accumulated in the membrane during manufacturing and eases the application for the installer.

When the temperature is below 0 °C, it is recommended be stored in a warm, heated storage protected area for optimum performance.

Before beginning to weld, pay special attention to the following points:

Know the product you are welding: its thickness, reinforcement, and type of underface (plain or fleece back). This information can be found on the product TDS.

Know the type of material to which you are installing this product: directly to concrete, to another membrane, or to a board.

Take into consideration the weather conditions. The speed of welding depends on the temperature, humidity and wind conditions.

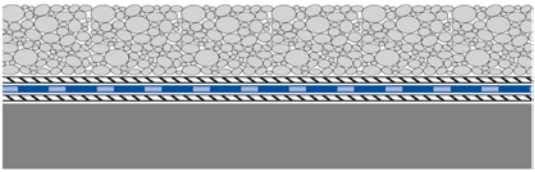
Welding speed decreases in cold, humid weather, and increases in hot, dry weather. The speed may even vary over the course of a day. To control these differences, just perform a few tests when you are ready to install the first roll, or whenever conditions change (for example, perform a destructive test to verify the welding quality).

The weld will be more effective if the movement of hot air gun, is continuous.

2.1. TYPE OF ROOF BUILD UP

2.1.1. Non-insulated Roof System or Cold Roof

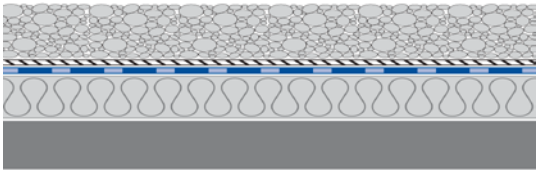
This refers to those roofs that do not require the inclusion of thermal insulation.
Either ballasted or exposed roof systems can be used.



2.1.2. Insulated Roof System or Warm Roof

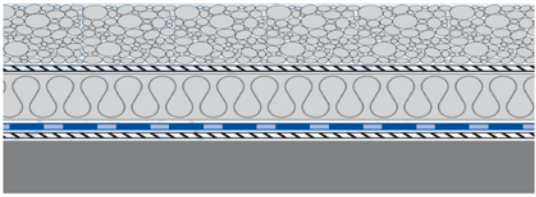
Roof build-up with the insulation element placed underneath the waterproof layer. Either ballasted or exposed waterproof systems can be used.

Unlike a Cold Roof deisgn where the insulation is only placed between rafters, a Warm Roof has an insulation layer accross the entire roof, preventing any thermal bridging and providing a better thermal performance while avoiding condensation issues.



2.1.3. Inverted Roof

Roof build-up with the insulation element placed above the waterproof layer. Only ballasted roof systems can be used for inverted roofs.

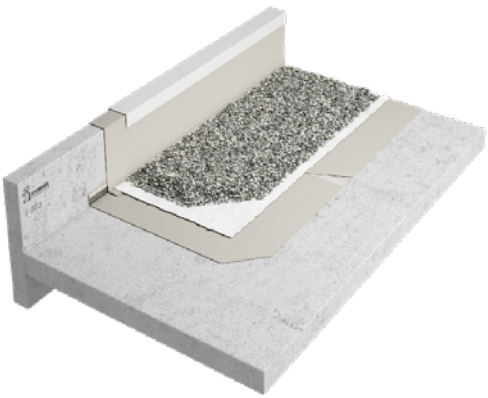


2.2. INSTALLATION METHODS

2.2.1. Loose Laid (Ballasted) PVC Membranes

The waterproof layers used for a ballasted roof system are laid independently of the substrate. Ensuring adequate overlaps (as per Technical Data Sheets), place the dry, waterproof layers in sequence. If homogeneous membranes are laid (ballasting for vehicular traffic or roof garden), fix the waterproof sheets along the roof perimeter using a predrilled bar. This perimeter fixing is made using the FLAGON pre-drilled bar, in galvanised steel with 20/10 thickness.

The positioning of the fixing bar, horizontally or vertically, at the foot of the brickwork, is related to the existence and thickness of the insulation element, as well as to the nature of the substrate (i.e. it cannot be made horizontally in the presence of light concrete



piers).

2.2.2. Fully Adhered (Glued) PVC Membranes

FLAGON PVC field membranes may be adhered for new and roof recovery applications.

Adhered FLAGON PVC field membranes are glass or polyester reinforced, and are bare or fleece-backed.

Refer to the safety data sheets and product data sheets for additional information.

DO NOT INSTALL fleece backed membranes where the fleece is wet/damp from improper storage or exposure to moisture.

This laying method involves spreading FLEXOCOL A89 single-component polyurethane adhesive over the whole gluing surface using a spreader or roller.

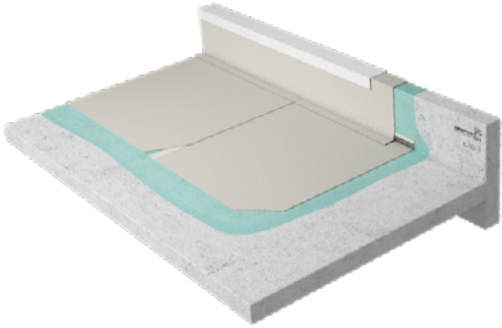
The use of FLAGON PVC membranes combined with a treated geotextile (back fleeces) improves the adhesion and distributes the stress and movements caused by the elements above the membrane or by the structure. If the substrate is particularly dry, you need to moisten it by spraying water on the surface to be glued.

Methods for laying the membranes differ according to the type of substrate on which they are to be installed.

Examples are as follows:

2.2.2.1. Non-insulated Roof

Carry out a precautionary check ensuring the surface is clear, dry and as smooth as possible. The surface should provide adequate support for the waterproofing system.



The waterproof liner is glued directly to the substrate using FLEXOCOL A89 polyurethane adhesive. The amount of glue to be used is approx. 300/350 gr/m2 (depending on the porosity of the substrate) and is spread over the substrate using a spreader or roller.

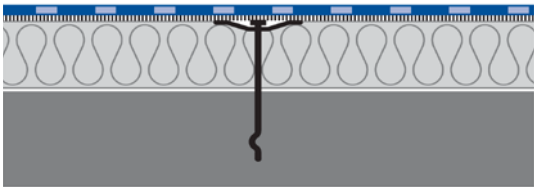
Lay the waterproofing membranes, allowing an adequate side overlap for welding. After finishing the placement of the horizontal membranes, proceed with the vertical upstand and details.

2.2.2.2. Roof with Insulation Boards

The insulation boards should be mechanically fastened (in compliance with the manufacturer's instructions) to the supporting surface, by fixing screws and washers.

Fleece-backed FLAGON waterproofing membranes are then glued onto the insulation panels using FLEXOCOL A89 polyurethane adhesive.

The amount of adhesive to be used depends upon the type of board used ranging from 300/400 gr/m², and is spread over the substrate using a spreader or roller. Proceed as described above at point 2.2.1.



2.2.2.3. Re-roof with Bituminous Layers

In this case, the existing bitumen has failed. In the case of an existing felt system with a mineral slate surface finish, the surfaces must be thoroughly cleaned before laying the new FLAGON PVC waterproof liner.

Proceed as described in section 2.2.2.2.

2.2.3. Mechanically Fixed PVC Membranes

Preliminary note:

In the case of a substrate made of profiled metal sheet, the waterproof sheets should be fixed at right angles to the longitudinal rib of the metal profile. With a concrete substrate, the waterproof sheets can be laid both perpendicularly and transversally.

The basic criteria for the fixing design are: nature of support, shape of the roof, building height, wind speed of the area, topography of the area.

Wind loadings affect all roof surfaces. The design criteria to overcome these factors relates to three areas; perimeter, corners and field zones.

The distance between each single fixing and the number per m² for each area are established during the design phase of each project.

The roof perimeter zone is the most vulnerable to wind, which is why it is essential to add an extra fixing line with a pre-drilled

galvanized steel bar at the base of the perimeter upstand.

Since the corner zone is most susceptible to wind, it needs a greater number of fixing points compared to other areas. For further information and detailed cal details and precise calculations, please get in touch with our Technical Offices.

The corner zone is the most heavily affected by the wind, and therefore it requires the largest number of fixing points. For more information and detailed calculations, please contact our Technical Offices.

Mechanical fixings can be carried out by two different systems:

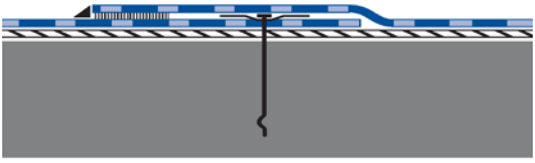
2.2.3.1. Side Lap Fixing System

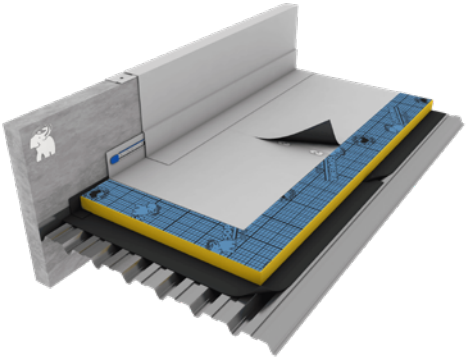
Using this system, the reinforced waterproofing membrane is fixed through the deck/substrate by appropriate fixings and distribution plates.

The membrane is fixed along its outside edge at centres determined by the wind load restrictions.

Where additional fixings are required to the perimeter and corner zones, a further row of fixings can be installed along the centre of the membrane and then overlaid with a welded strip of membrane.

The same fixing method may be applied to a pre-drilled bar system in place of fixings and pressure plates.





2.2.3.2. Bar Fixing

This system is used if the type of substrate requires the positioning of the fastening line at a pre-established centre distance, owing to defects visible underneath the roofing.

The fastening lines are placed parallel to the lengthwise axis of the line. Instead of distribution plates, a pre-drilled bar in galvanised sheet iron is used for all the fastening lines, not only for those at the base of the vertical elements.

To protect the integrity of the waterproof membrane in case of damage caused by pedestrian traffic or continuous pressure caused by overloads, with this fastening system, you always need to insert the FLAG ANTI-PUNCTURING JOINT at the junction between two adjacent bars.

This system enables the contractor to lay the waterproofing membranes on the roof and weld them together using a 5 cm standard overlap.

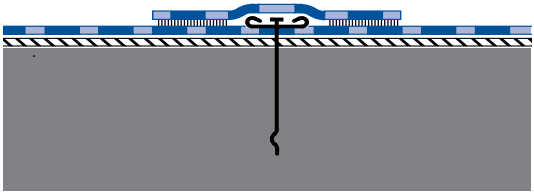
Once in position the bars are fixed at pre-determined centres, using appropriate screws, securing the membrane in place.

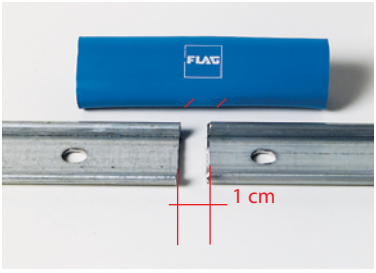
Once in place the bars are overlaid with a welded strip of membrane.

The design must provide adequate drainage between the fixing lines to allow free flow of rainwater to down-pipes and channels.

In order to prevent wind moving or damaging the membrane during the installation, this operation must be carried out during the laying of the membrane.

Provide adequate drains between the fixing lines to allow the outflow of rainwater to down pipes and channels.





2.2.3.3. Induction Welding

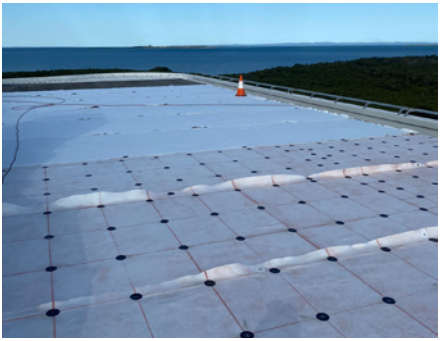
FLAGON PVC membranes may be induction welded for new and roof recovery applications.

Induction welded FLAGON PVC membranes are polyester reinforced.

The induction welding tool, fasteners and the induction welding stress plates must be approved together for use with the specified FLAGON PVC membrane.

The fasteners and stress plates are secured to the roof deck, then the FLAGON PVC field membrane is unrolled over the stress plates and induction welded to the plates.

Refer to the fastener manufacturer's installation instructions and induction welding tool operating instructions. Refer to the safety data sheets and product data sheets for additional information.



Preparation:

Thoroughly insptect all roof decks, wall substrates, nailers and other conditions at membrane terminations, transitions and penetrations.

Ensure the roof deck and all other substrate conditions are acceptable to install the appropriate fasteners.

Test the induction welding equipment by welding a sample of PVC to stress plates, ensuring settings are satisfactory. Allow the plate to cool and attempt to pull the PVC sample from the stress plates. For a satisfactory welded plate, the PVC should delaminate.

Application:

Install fasteners and stress plates as required for wind uplift requirements.

Fasten the roofing area that is to be induction welded to all plates on the same day.

Avoid locating membrane side and end laps over the stress plates. Refer to the induction welding tool operating instructions where multiple layers of membrane at seams require induction welding.

Clean side and end laps as necessary before welding seams.

Remove all membrane wrinkles and hot air weld all laps.

Ensure the induction welding plates and bottom surface of the PVC membrane are dry and free of condensation before beginning induction welding.

Locate each stress plate beneath the PVC membrane. Center the induction welder over each plate and activate the induction welding tool. Do not move the induction welder during the induction welding cycle.

Once the weld is complete, IMMEDIATELY place a specialised magnet directly over each plate. Allow the magnets to remain in place until the plates have cooled.

If there are any concerns about improper installation of induction welds, inspect the membrane attachment using a suction plate or plunger.

Fasten the perimeter of the membrane with suitable fasteners and seam plates to the deck or vertical surface at the base of the upstand, where the sheet terminates at roof edges, walls and curbs.

INSULATION INSTALLATION METHODS

3.0. INSULATION INSTALLATION METHODS

The insulation technologies offered by SOPREMA help maintain a comfortable temperature inside buildings while increasing their energy efficiency.

SOPREMA offers different types of roof insulation. The choice of insulation and its installation method is based on the characteristics and limitations of each one.

Insulation panels made of polyisocyanurate foam and rock fibres are used in self-protected sheet membrane systems (conventional) and extruded polystyrene insulation boards are generally used in protected membrane roof systems (inverted).

3.1. GENERAL INFORMATION

Insulation boards are installed in staggered rows. If the installation of the insulation boards can't be completed the same day, the site organisation must allow staggered installation to resume.

When upstands are insulated from the outside, use a cover panel before installing the membrane.

When the insulation boards are mechanically fastened, use screws and plates specially designed for insulation.

3.2. STORAGE

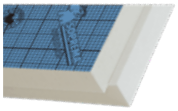
The insulation boards are typically protected by a plastic film for handling and transportation. However, this film does not provide adequate protection for long-term storage on a worksite.

To limit the storage period on site, schedule delivery shortly before the board installation date.

Follow these precautions when on-site storage is required (on the ground or the roof):

- Store pallets flat on a finished surface (gravel, pavement, concrete, etc.) rather than on a surface that can remain wet (grass, soil, etc.), and ensure they are elevated by at least 75 mm.
- Cover the pallets with waterproof tarps and shelter them from the wind.

3.3. POLYISOCYANURATE BOARDS (SOPRA-ISO)



Polyisocyanurate boards are offered with organic facers reinforced with glass fibers or with polymers coated glass fibers facers or alu foil facers like SOPRA-ISO.

3.3.1. Limitations

Polyisocyanurate boards of 1.2 m × 2.4 m must not be bonded with adhesive.

Where the sheet is mechanically fastened, mechanical fasteners must be installed on the insulation board using a minimum of four fasteners for each 1.2 m × 1.2 m panel and six fasteners for each 1.2 m × 2.4 m panel. More fasteners may be required depending on the wind-resistance.

3.3.2. Installation Methods

- Mechanically fastened with screws and plates designed for insulation.
- Bonded with DUOTACK or DUOTACK 365 adhesives.

3.4. ROCKWOOL BOARDS (SOPRAROCK)

Rockwool boards are available in high and low density. For roofing applications, high density board are recommended to alow maintenance traffic.

3.4.1. Limitations

The only way to install an element on an rockwool panel is to mechanically attach it. As a result, the rockwool panel is fastened at the same time.

3.4.2. Installation Methods

- Mechanically fastened with screws and plates designed for insulation.
- Bonded with hot bitumen.
- Bonded with DUOTACK or DUOTACK 365 adhesives.
- Loose laid.

3.5. EXTRUDED POLYSTYRENE BOARDS (SOPRA-XPS)

3.5.1. Limitations

Extruded polystyrene boards must be covered with a polyisocyanurate or mineral fibres (rockwool) board of a minimum thickness of 50 mm. This rule does not apply to the use of extruded polystyrene on an inverted roof system.

The cold-applied adhesives that contain solvents can damage polystyrene insulation. SOPREMA therefore does not recommend using a system with membranes bonded with this type of adhesive if the roofing system includes polystyrene insulation. This includes protected membrane roofing systems.

Do not install extruded polystyrene boards if they can't be covered the same day.

3.5.2. Installation Methods

- Mechanically fastened with screws and plates designed for insulation.
- Bonded with **DUOTACK** adhesives.
- Loose laid.

Install a separation layer before installing the FLAGON PVC membrane. On inverted roofs, the separation layer will be installed after the FLAGON PVC membrane.

When a polystyrene board is used on a protected membranes roof, it is installed loose laid on the roof. The ballast placed on the roof keeps the boards in place. Install a filter cloth or an open-diffusion drainage board over the polystyrene panels.

SUPPORT PANELS INSTALLATION METHODS

4.0. SUPPORT PANELS INSTALLATION METHODS

Support panels are used in most roofing systems with bonded membranes. They provide additional stability to the roof system as well as better resistance to fire, hail, wind, mildew, and compression depending on the type of panel. It is therefore important to choose the right support panel according to the needs and requirements of the project.

4.0.1 Limitations

Support panels must be quickly covered after their installation and can't be left exposed to the weather.

Support panels are installed in staggered rows. If the panel installation can't be completed the same day, the site organisation must allow staggered installation to resume.

4.0.2. Storage

Some support panels are protected by a plastic film for handling and transportation. However, this film does not provide adequate protection for long-term storage on a worksite.

To limit the storage period on site, schedule delivery shortly before the installation date of the support panels.

Respect the following precautions when on-site storage is required (on the ground or the roof):

- Store pallets flat on a finished surface (gravel, pavement, concrete, etc.) rather than on a surface that can remain wet (grass, soil, etc.), and ensure they are elevated by at least 75 mm.
- Cover the pallets with waterproof tarps and shelter them from the wind.

4.1. HIGH-DENSITY POLYISOCYANURATE BOARDS

4.1.1. Installation Methods

- Mechanically fastened with screws and plates designed for insulation.
- Bonded with DUOTACK adhesive.

4.2. WOOD FIBRE

4.2.1. Installation Methods

- Mechanically fastened with screws and plates designed for insulation.
- Bonded with DUOTACK adhesive.

4.3. PERLITE

- Mechanically fastened with screws and plates designed for insulation.

ACCESSORIES

5.0. ACCESSORIES

FLAGON PVC roofing systems offer a wide range of hot air weldable accessories, such as vents, outlets, scuppers, and internal and external corners. These help enhance the installation process by reducing the required time.

Note: In order to comply with the SOPREMA Warranty, SOPREMA accessories must be installed.

DRAINI dropper

Flag metal termination profile

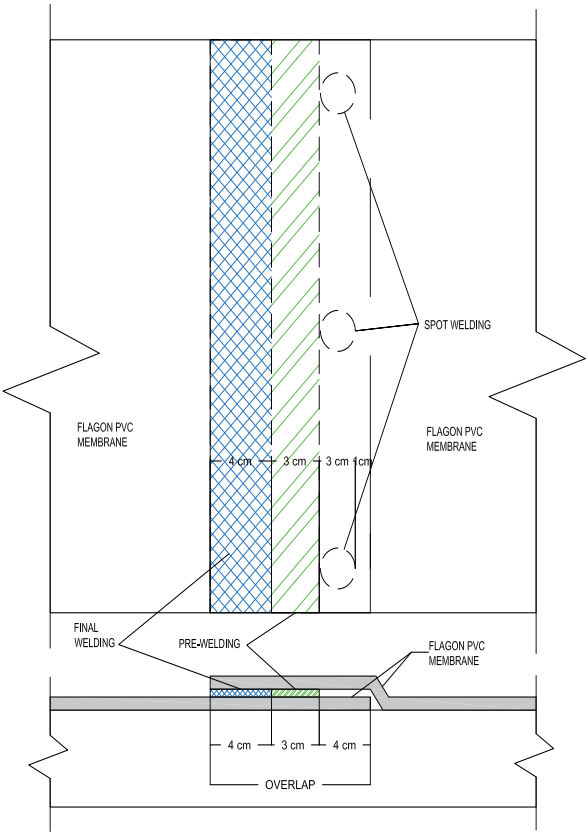
Decorative profile

Soprasolar pedestal

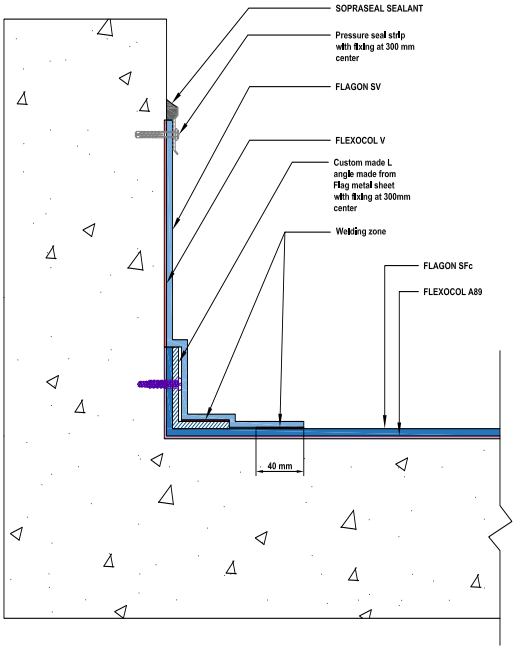
DETAILS

6.0. DETAILS

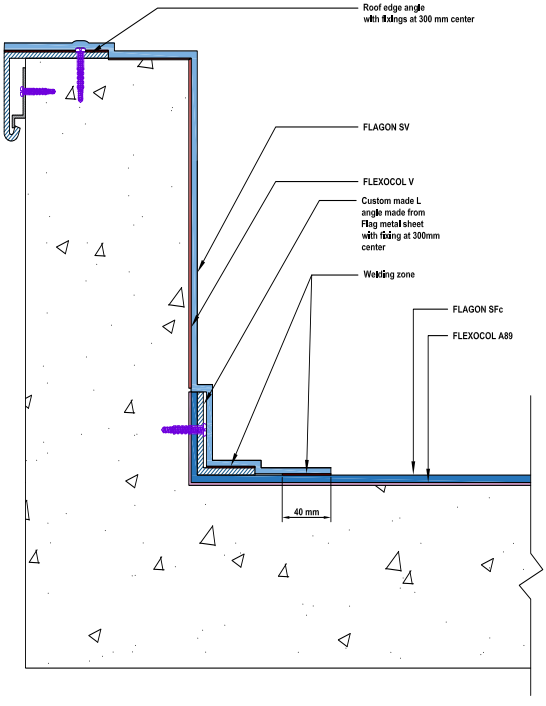
6.1. SC1 - WELDING SCHEMAT



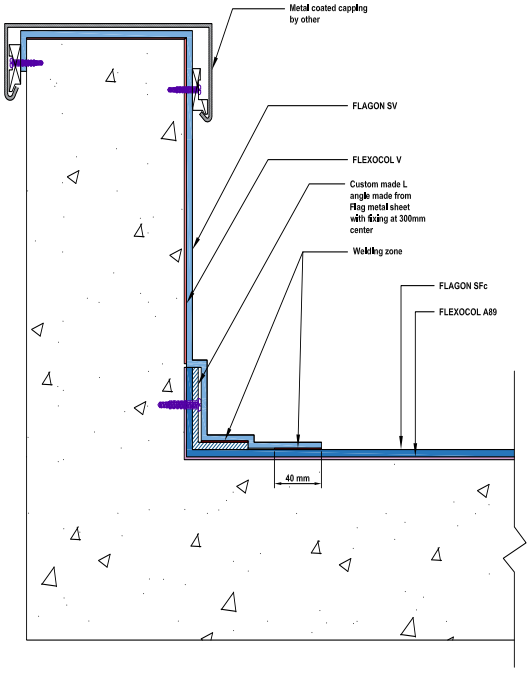
6.2. UP1 - UPSTAND WITH PRESSURE SEAL TERMINATION STRIP



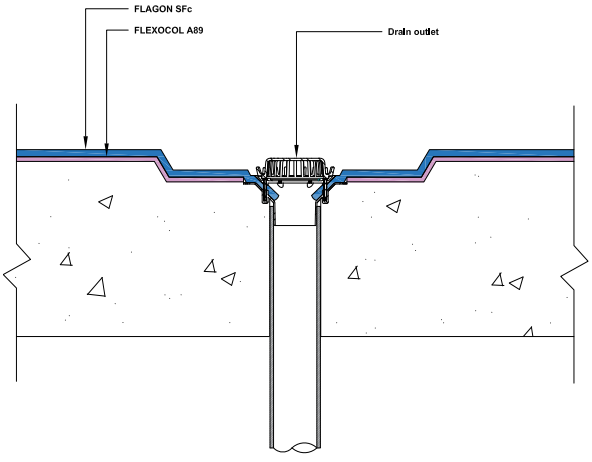
6.3. UP2 - UPSTAND WITH ROOF EDGE TERMINATION PROFILE



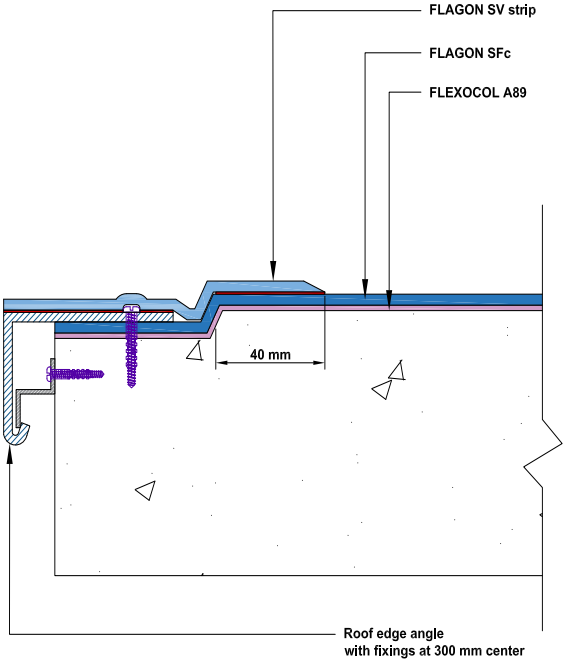
6.4. UP3 - UPSTAND WITH METAL CAPPING TERMINATION



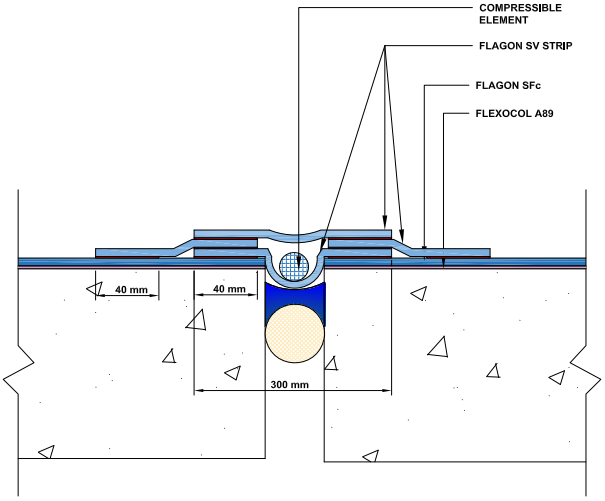
6.5. DR1 - DRAIN DETAIL



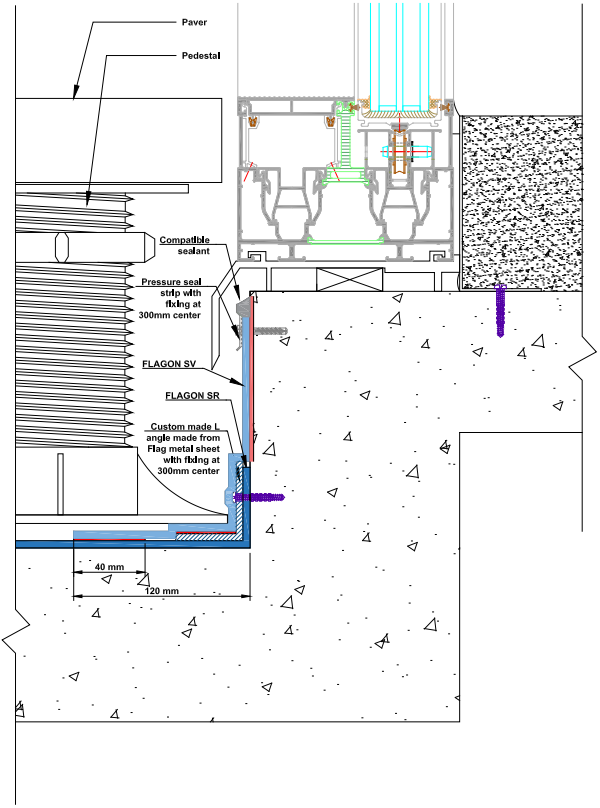
6.6. FR1 - FLAT ROOF EDGE TERMINATION



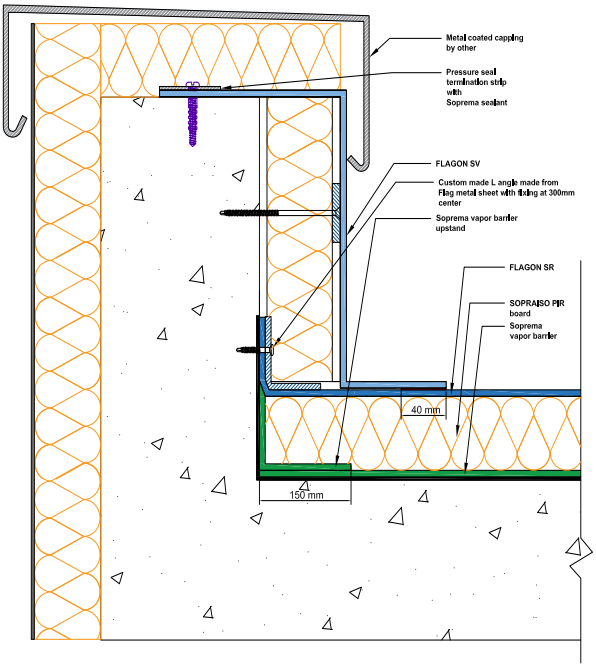
6.7. MJ1 - MOVEMENT JOINT DETAIL



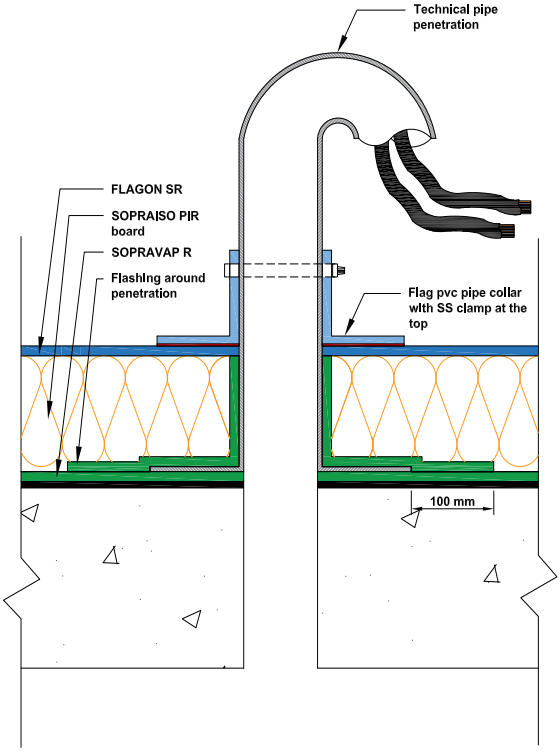
6.8. UP4 - UPSTAND TERMINATION AT DOOR



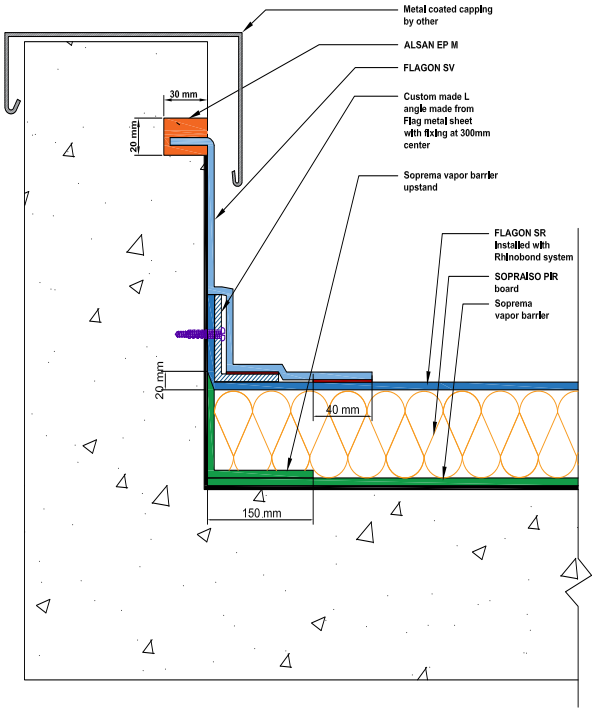
6.9. UP5 - UPSTAND WITH TOTAL INSULATION ENCAPSULATION



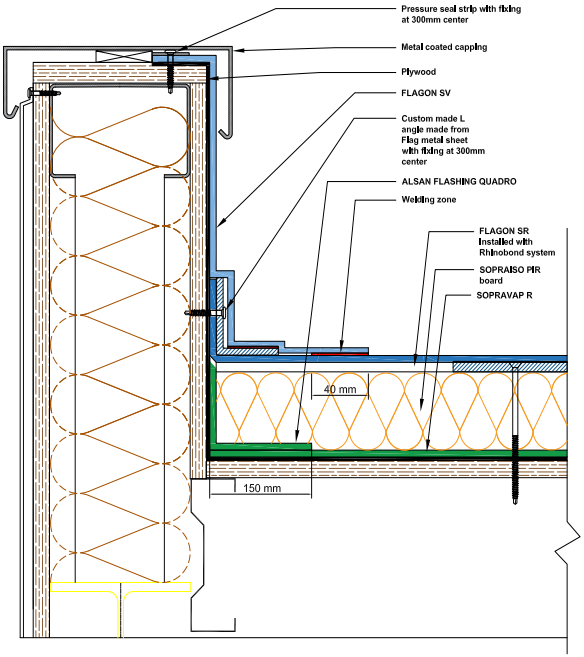
6.10. TP1 - TECHNICAL PENETRATION DETAIL ON WARM ROOF



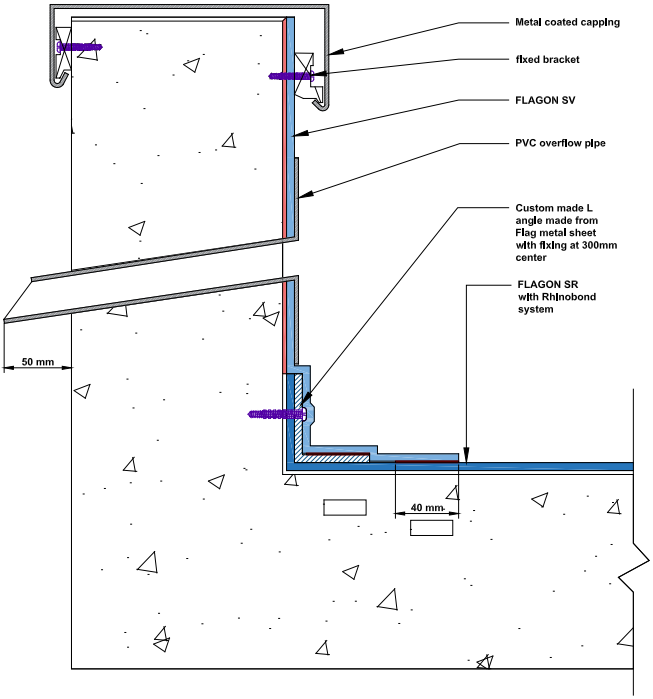
6.11. UP6 - UPSTAND TERMINATION WITH CHASE TERMINATION



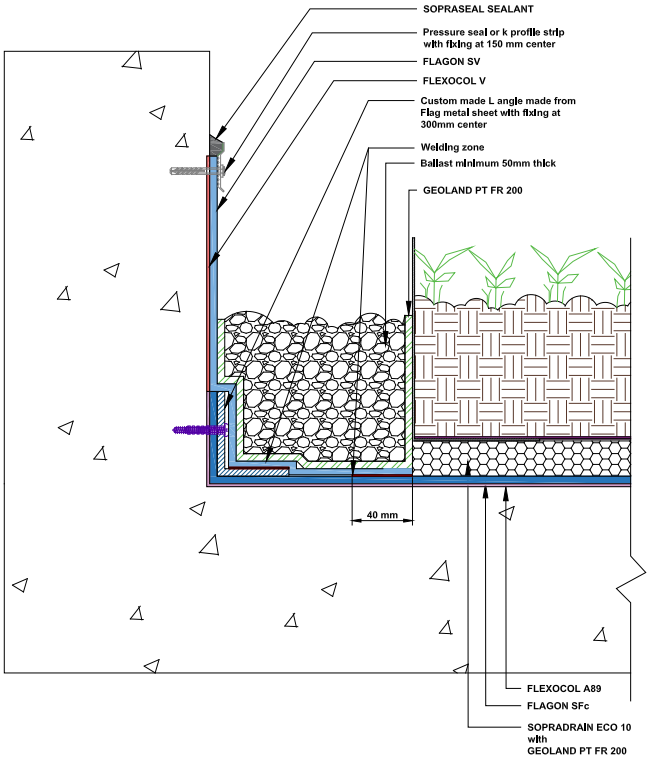
6.12. UP7 - UPSTAND WARM ROOF TERMINATION UNDER CAPPING



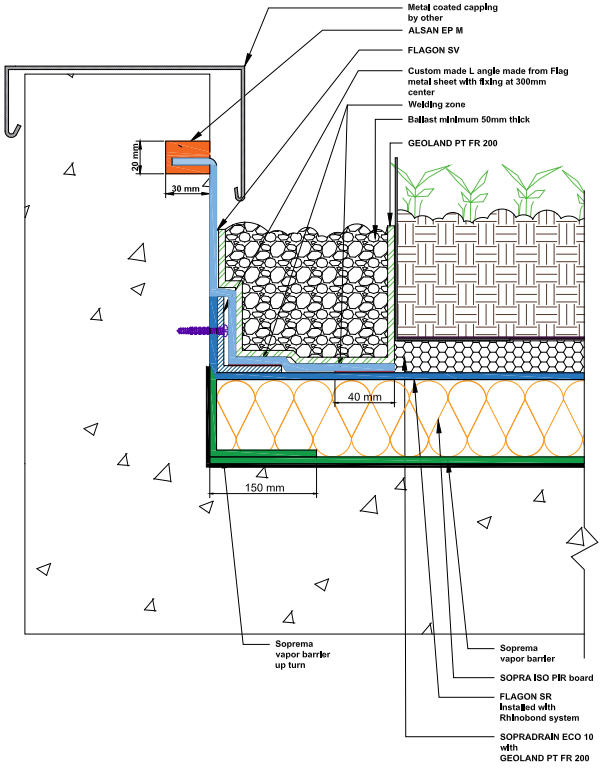
6.13. UP8 - OVER FLOW TERMINATION



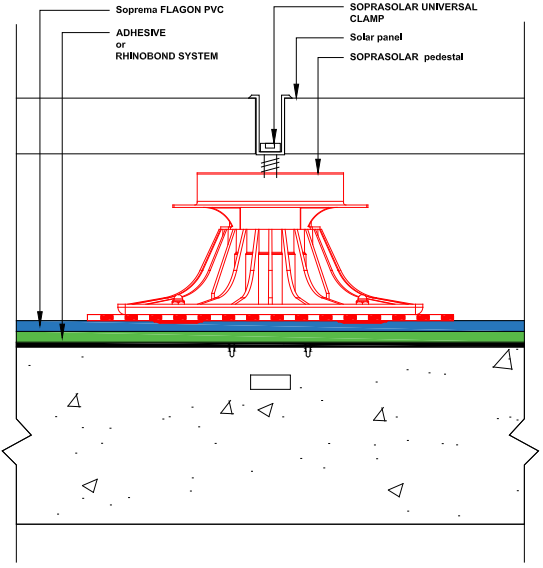
6.14. GRUP1 - UPSTAND TERMINATION DETAIL ON GREEN ROOF



6.15. GRUP2 - UPSTAND TERMINATION ON WARM ROOF WITH GREENERY



6.16. SS1 - SOPRASOLAR PEDESTAL DETAIL



INNOVATION SINCE 1908

SOPREMA has developed around the idea that the quality, durability and reliability of materials must match builders' ambitions and expectations. For more than 100 years, SOPREMA has been using its expertise to develop a variety of high-end products that meet or exceed all the requirements of the construction field.

ROOFS WALLS FOUNDATIONS PARKING DECKS BRIDGES ADDITIONAL EXPERTISE


WATERPROOFING


INSULATION


VEGETATIVE SOLUTIONS


SOUNDPROOFING


ACCESSORY PRODUCTS

SOPREMA is an international manufacturer specialising in the production of waterproofing and insulation products, as well as vegetative and soundproofing solutions, for the building and civil engineering sectors.

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