APPLICATION GUIDE
BITUMINOUS MEMBRANES

Version 2 (06/2021)

BUILDING TRUST

CONTENTS

Bituminous Membranes

1 SCOPE

This publication is intended to provide the instructions to enable the correct execution for a successful waterproofing system composed by bituminous membranes.

2 IMPORTANT CONSIDERATIONS

2.1 TRANSPORT
Usually the pallets are covered with a sheet of very thick heat-shrink polythene, but long journeys on uneven roads and sharp braking can cause the rolls to tip up. This problem can be avoided by running ropes through the rows of pallets, crosswise to the width of the bed of the lorry. The ropes must be properly tight and suitably protected to not leave marks on the rolls.

2.2 LOADING/UNLOADING
During handling, the material must be treated with care to avoid the rolls being crushed and prevent contact with sharp or pointed objects. In low temperatures, violent impacts must be avoided as they can break the membranes.

2.3 STORAGE
Product must be stored in original unopened and undamaged sealed packaging in dry conditions and temperatures between +5°C and +35°C. Store in a vertical position. Do not stack pallets of the rolls on top of each other or under pallets of any other materials during transport or storage. Always refer to packaging.

2.4 ON SITE HANDLING
Keep on site only the rolls strictly necessary for laying during the day. Set the rolls upright on a smooth and flat surface. Use a crane to lift the rolls onto the roof, keeping the pallet complete and intact and using suitable lifting gear. If the packs have to be opened and the rolls lifted loose, use suitable lifting gear with the crane and in any event set the rolls upright after lifting. Do not use ropes to tie and lift the rolls.

2.5 CONSERVATION
It is advisable to store the pallets in a dry place, sheltered from the sun. In the summertime, pallets with heat-shrink wrapping exposed to the sun can quickly reach a temperature of around 70°C. This causes progressive blackening of the talc coating or mineral granules from the top downwards on the rolls, until the point where the coils on the roll stick together causing an unpleasant aesthetic appearance.

In the case of membranes reinforced with polyester non-woven fabric, the heat also causes the ends of the rolls to begin to shrink and thus wrecks the membrane. The exposure to heat causes progressive and predictable loss of flexibility and can cause cracking or difficulty on unrolling the material.

In winter, the rolls should be stored for 24 hours at a temperature above +5°C before laying. Avoid leaving the rolls in the open overnight.

Only the rolls that will be applied during the day should be brought onto the site.
A good rule is always to “rotate” the stock and not to keep rolls for more than 12 months.

2.6 CLIMATIC CONDITIONS FOR APPLICATION

Some types of products carry a symbol of a sun or a pine-tree printed on the label to identify the period in which should be used. The membranes with the sun symbol should be applied in the summer months, while those with the pine-tree in winter.

If not applied in the recommended application period, the efficiency of the product is not reduced, but it does create drawbacks and disadvantages when laying, such as excessive softness when the "winter product" is applied in the summer and excessive stiffness and difficulty in unrolling the "summer rolls" when used in the winter.

The products should therefore be applied in favorable atmospheric conditions.

Rain, frost, snow and high humidity can interfere with the adhesion of the membrane to the substrate and at the overlaps. With temperatures below +5°C it is very likely that there will be ice on the surface to be covered and the rolls will be more difficult to unroll. As a result, moisture trapped between the membrane and the substrate can lead to the formation of bubbles. In these conditions, it is better not to apply the material.

In summer, in hot countries, and especially when it is being laid over thermal insulation, it is advisable to apply the material in the coolest part of the day, avoiding the hours in the middle of the day when the sun is at its hottest.

2.7 WASTE DISPOSAL

The generation of waste should be avoided or minimized whenever is possible. For further information about specific products, please refer to the respective current Safety Data Sheet. These materials and its container must be disposed in a safe way. Disposal of this product and any by-products should at all times comply with the requirements of local environmental protection and waste disposal legislation and any relevant local authority requirements. Avoid dispersal of spilled material and run-off, including contact with soil, waterways, drains and sewers.

3 EQUIPMENTS

- Gas cylinder (propane)
- Burner
- Connections with pressure regulator
- T square, to cut uniformly the membranes
- “Delfino” knife or similar
- Rigid HDPE core
- Hot air machine or hand burner

3.1 PERSONAL PROTECTION EQUIPMENT

The handling and storage must follow the Safety Data Sheet instructions. Any specific local regulations and/or requirements must be fully complied with. Generally, we recommend to use glasses, gloves and protective clothes.

4.1 SUBSTRATE PREPARATION

The supporting structure must be of sufficient structural strength to apply all new and existing layers of the roof build-up.

The substrate must be uniform, firm, smooth and free of any sharp protrusion or burrs, clean, dry, and free of grease, oil, dust and loosely adhering particles.

In the case of concrete and hollow-core substrates, it is advisable to allow a curing period of 8 days to 3 weeks, depending on the season, before laying. If the substrate is an old membrane, make sure that it can be retained. First, however, remove unstable and perished parts, separate any protective sheet metalwork and flatten any bubbles etc.

The complete system must be designed and secured against wind uplift loadings.

4.2 PRIMING

Apply the primer according to the type of substrate at the correct consumption to the prepared surface and allow to dry before next application stage. Refer to the individual Product Data Sheets.

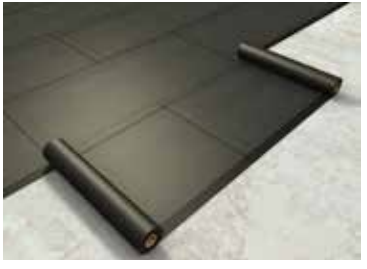
The appropriate primer must be chosen considering the type of substrate: cementitious, metal, wood, old floors, etc., but in all cases is recommended due its function of prepare the receiving surface and increase the adhesion between the membrane.

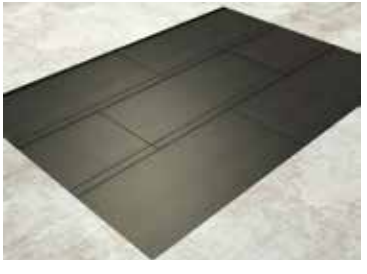
4.3 ALINGMENT

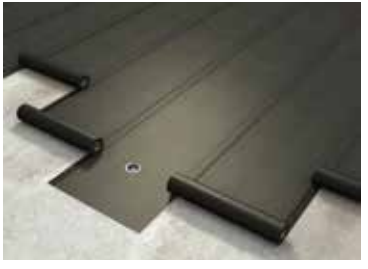
Unroll the roll and align it before torching or bonding.

Each membrane must be laid parallel to each other and must be staggered by at least 1 m to avoid coinciding joints. The end-to-end overlaps must always be alternate, never arranged along a single line.

Always start on the lowest height of the slope and with the drains, the downpipes or other details.







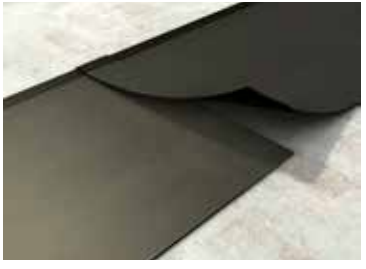
4.4 OVERLAPS

The lateral overlap is the joint that runs in the direction of the length of the sheets and the end overlap is the joint along the shorter side of the sheet.

At the end overlap, a corner of the membrane measuring 10 cm per side must be cut off at an angle of 45°. Always refer to the individual Product Data Sheet in order to verify the correct size of the overlapping, but should be at least 6 cm on lateral and 10 cm on the end.

The overlaps must be welded with great care until a trickle of melted mixture about 1 cm wide can be seen coming out along the line of the overlap.

Do not fill the joints with trowel, spatula or other tool, because the reinforcement of the membrane can be affected, weakening it. In addition, the upper protective layer is removed and the reinforcement can be left exposed.



4.5 TORCHING

Use a gas burner to heat the substrate and the backing film on the underside of membrane. When the backing film starts to melt, the membrane is ready to stick.

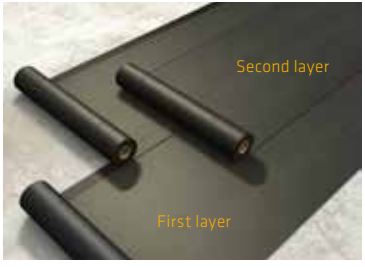
Flame heating must bring retraction of the film and flattening of the embossing, but heating the membrane any further can damage the polyester reinforcement, which melts at 260°C, causing retraction, undulations, curling or, in the most serious cases, puncture. Insufficient heating, on the other hand, can cause insufficient adhesion to the base between the layers or on the overlaps.

The torching of the rolls must heat the membrane and the substrate at the same time, concentrating on the roll and the overlapping.

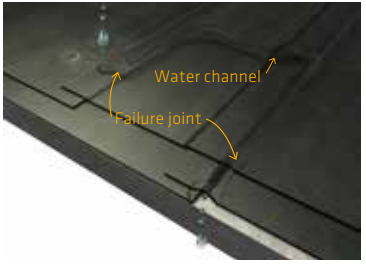
Whereas the lateral overlaps require adhesion zones free of grit, at the end overlaps the mineral-coated surface must be heated with a certain persistence so that melting consequently takes place over an area corresponding to the width of the overlap, with consequent melting of the bituminous mastic underneath.

Once the membrane compound, which will form the overlap, has been melted, this will enable the two edges to be welded perfectly.

If a second layer is specified, it must be laid to straddle the overlap of the previous layer and must be bonded in complete adhesion. The burner flame must also heat the membrane already laid.



If the layers do not adhere well to each other, the water can pass through the innumerable "channels" existing. The security of a multi-layered membrane is ensured exclusively by the complete adhesion between the layers, which make it up.



If there is no cardboard tube inside of the rolls, the application can be facilitated if the sheets are wound around with a rigid plastic tube (HDPE, ø12 cm, length 97 cm), which will prevent the ovalisation of the roll during laying, particularly in summer. At the same time, the pressure exerted on the roll will be uniformly discharged over the entire contact surface with the support, facilitating the release of the melted mixture along the overlap lines and ensuring that the membrane is perfectly welded.

4.6 TORCHING ON VERTICAL AREAS

The bituminous membranes have excellent resistance to sliding under heat and do not slip even when fixed vertically to concrete surfaces.

Use the flame to heat the membrane and the surface. The material's grip is produced by cooling when the mixture in the melted layer returns to the solid state.

It may happen in the summer months that both, the membrane and the substrate, are so hot that they take a long time for sufficient cooling and full adhesion. In this case, the operator must carefully control the heating to prevent sliding of the membrane on the wall and fall.

It is also important to wait for the cooling and do not try to heat the membrane again.

If a recess has not been provided for a membrane in a vertical wall, a nailed and sealed profile must be fitted as an end finish for the membrane bonded to the wall.

Along the perimeter of the roof and on the flat, the membrane should be bonded completely to the substrate. Same when applied with slopes higher than 15°: the membrane must be mechanically attached at the top.

4.7 BONDING THE SELF ADHESIVE MEMBRANES

At one end of the sheet, peel away part of the silicone release liner from the underside and bond this part to the substrate. Then peel away the release liner sideways from the rest of the sheet to allow it to bond to the substrate. Then roll the entire surface area of the applied membrane with a suitable heavy roller ensuring any air bubbles are removed.

If the membrane is used on slopes roofs, a mechanical fixation at the top must take into consideration.

In some situations, the overlaps must be sealed with torch, welding or special adhesives. Check the available method statements.

4.8 BONDING WITH COLD ADHESIVES

Apply the adhesive at the correct consumption to the prepared surface. Refer to the individual Product Data Sheets.

The application must be done uniformly across the whole surface with a suitable spreader. The membrane must be laid directly over the adhesive whilst wet.

The overlaps must be sealed using other sealing product or by torch or welding.

4.9 BONDING WITH HOT MELT BITUMEN

The solid modified bitumen block is heated directly on the job site using a kettle with temperature control and continuous agitation. The appropriate temperature must be controlled to avoid damaging the product. Refer to the individual Product Data Sheets.

Apply the hot melt at the correct consumption to the prepared surface. The application must be done uniformly across the surface with a suitable spreader (a mop is widely used). The membrane must be laid immediately after while is still hot. Press the rolls from the center to the border to avoid the bubbles. The hot melt can also be used to seal the overlaps.

4.10 PAINTING THE MEMBRANES

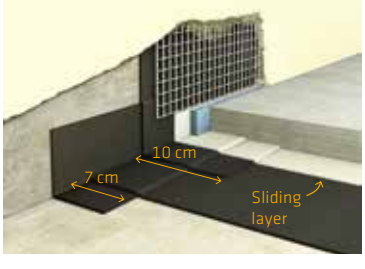
Some surfaces of membranes are not ideal for panting, such as talc or polyethylene foil. Always check the adhesion between the coating and the membrane.

Select the appropriate painting considering the compatibility between technologies.

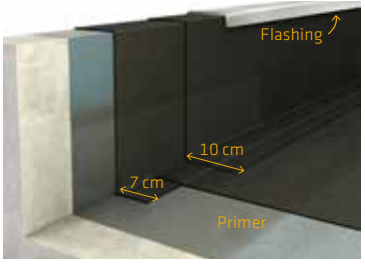
Do not paint areas of the membrane that are perpetually immersed in water.

4.11 PROTECTED UPSTANDS

If the top is prepared to house the membrane, it should be glued to its housing, which will then be covered with a metal net to provide a key to the mortar.



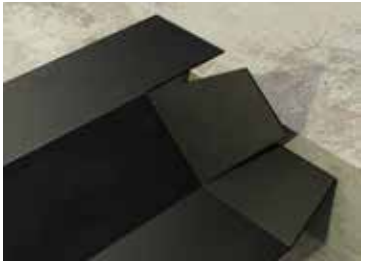
If the waterproofing membrane comes up to the top of perimeter walls, it must then be covered with a nailed flashing.

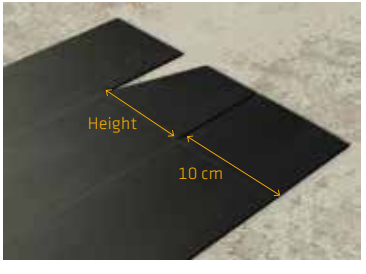


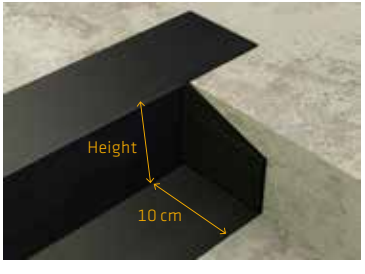
5.1 INTERNAL CORNERS

- Measure the size of the internal corner and cut a piece of the membrane, enough to cover all the foundation, height and more 10 cm of the horizontal surface. Then make two cuts according to the pictures below.

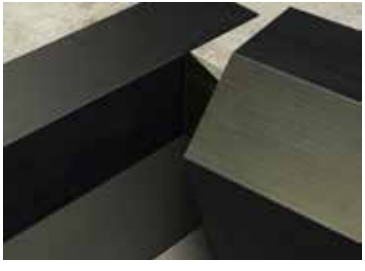
- Place the membrane on one side of the internal corner.



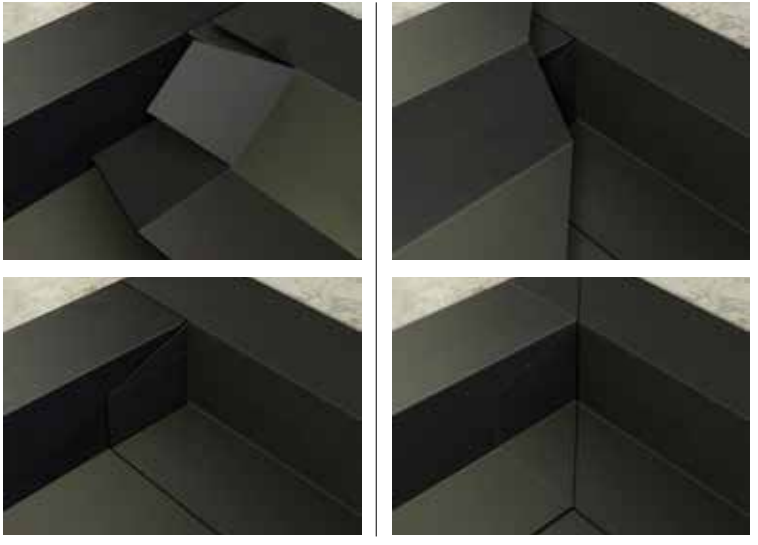




- Cut another piece of membrane, same size as the first, but without the cuts. Place it on the other side of the corner. Then proceed with the application of the first layer of the bituminous membrane.



- In case of a multilayer system, proceed with the application of the second layer following the same steps, but now starting on the opposite side of the corner.



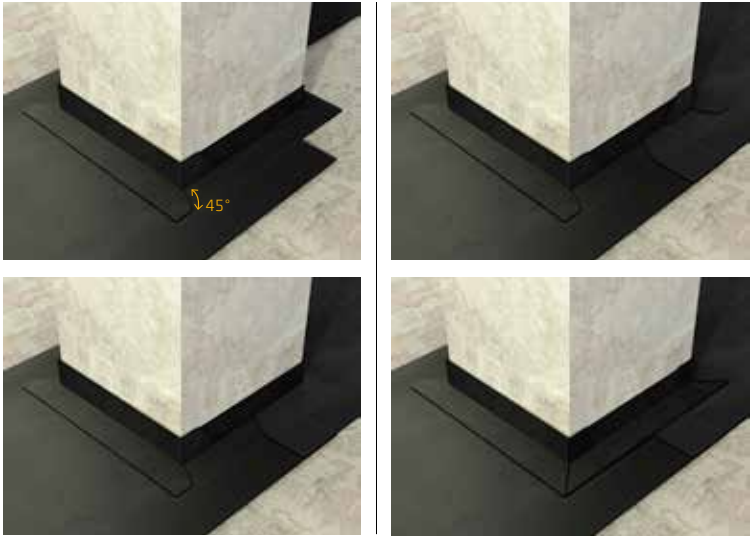
5.2 EXTERNAL CORNERS

- Measure the size of the external corner and cut two pieces of the membrane, enough to cover 10 cm of the top plus 10 cm of the surface. Then make two cuts, also with 10 cm, and apply on the corner.

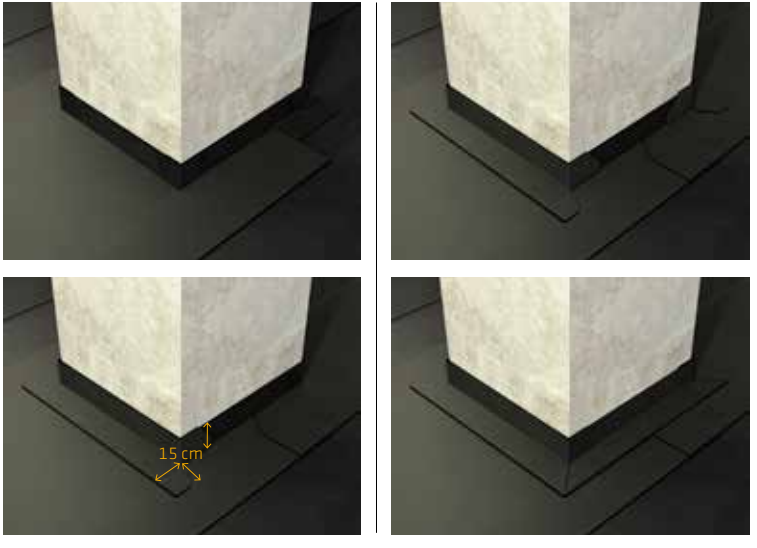
- Cut two more pieces of the membrane and place onto the corner.

- Cut another piece of the membrane enough to cover the entire corner angle. This must be done for all the corner joints. Then proceed with the application of the first layer of the bituminous membrane.

- Apply again another piece of membrane on top of the fisrt layer, now on the opposite side of the corner. In this case, the overlapping should have an angle of 45°.



- In case of a multilayer system, proceed with the application of the second layer directly onto the first one and finish with the corner details, which must be 5 cm higher than the one below (vertical and horizontal).



5.3 VERTICAL DRAIN

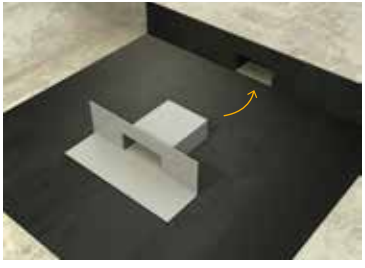
- Cut a piece of the membrane enough to cover 20 cm^2 of the surface of the drain. Then apply it onto the substrate.

- Place the drain and cover with another piece of membrane, half size of the first one. Then proceed with the application of the first layer of the bituminous membrane.

- In case of a multilayer system, proceed with the application of the second layer directly onto the first layer, but in the cross direction.

5.4 HORIZONTAL DRAIN

- Cut a piece of 1 m^2 of the membrane and apply it onto the substrate, covering the drain. Then insert the accessory.



- Cut and apply another piece of the membrane, enough to cover 15 cm higher than the size of the drain and more 10 cm on the top. Cut more two pieces of the membrane, enough to cover 10 cm of the top and the surface. Then apply on both sides of the drain.

- Proceed with the application of the first layer of the bituminous membrane, which cannot cover the drain area.

- In case of a multilayer system, proceed with the application of the second layer following the same steps of the first layer.

5.5 PROTRUDING ROUND ELEMENT

- Cut a piece of the membrane with 20 cm width and enough length to cover the entire round element. On one side, make cuts with around 30° according to the picture below. Apply onto the substrate, but leaving the joints free.

- Cut a square with 8 cm side and place it onto the center of the joint, bonding both sides.

- Cut another piece of membrane, same size as the first, and bond on the opposite direction. Then proceed with the application of the first layer of the bituminous membrane.

- In case of a multilayer system, proceed with the application of the second layer directly onto the first layer.

5.6 ROOF VENT

- Apply the first layer of the bituminous membranes, making a cut where the roof vent will be installed.

- Install the roof vent and bond the base with a piece of the membrane with diameter 10 cm larger.

FOR MORE BITUMINOUS MEMBRANES INFORMATION:

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