



INSTALLATION MANUAL



INDEX

Introduction.....	02
Equipment for installation.....	03
Safety on the Building site.....	03
Logistics and handling.....	06
General instructions for installation.....	08
Weather conditions.....	10
The installation surface.....	10
Indications for the installation of membranes.....	12
Light and heavy protections.....	14
Makeovers.....	16
Execution of details.....	16
Coating of the inner corner.....	18
Coating of the outer corner.....	19
Union with an emerging cylindrical body	19
Emerging body with square section.....	20
Elements for the interstitial hygrometric control.....	20
Elements connecting to horizontal and vertical drainpipes.....	22
Vertical coatings.....	23
Skylights.....	24
Expansion joints.....	24
Thresholds.....	25
Subdividing.....	26

INTRODUCTION

GENERAL MEMBRANE's Installation Manual describes the main guidelines for the proper use of prefabricated waterproof membranes in bitumen–polymer used in the proposal of N.E.W. Systems.

This Manual is aimed at designers, applicators and operators of the building site.

It is a tool which gives the basic guidelines on the technique of use and installation of waterproof membranes, as well as their proper handling and storage. The main covered topics include directions for the installation of bitumen–polymer membranes in N.E.W. systems, in respect of safety within the building site.

While using N.E.W. systems, the requirements of this document must be monitored through the T.A.L. by the Construction Management in accordance with General Membrane, endorsed by a Declaration of Conformity.

Any technical details in this document are incorporated as examples and reflect the general high quality in the execution of detailed works. The particular executive details must still be carried out specifically in relation to the needs of the covering.

N.E.W. waterproofing systems refer to a maintenance programme described in the N.E.W. Life Manual.

Everything which has been described is in accordance with the current regulations on building site safety (Legislative Decree no. 81/2008) and installation (UNI EN 11333).

EQUIPMENT FOR INSTALLATION

The main equipment required for the installation is:

- Blowtorch.
- Connection pipe in rubber for high pressure with relative pressure regulator.
- Propane gas tank equipped with a safety valve.
- Knives with specific steel blades.
- Broom for preliminary cleaning of the support.

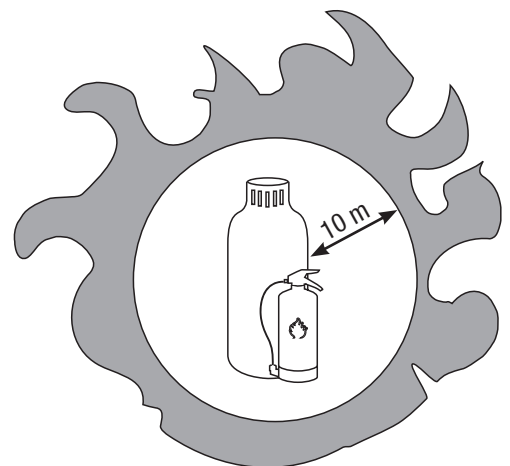


SAFETY IN THE BUILDING SITE

In the building site it is necessary that the applicators have the knowledge and awareness of any compulsory measures by Law, of prevention and protection listed in their own safety plans and of the role which these business plans have towards the Operational Plan of Safety and Coordination, issued by the authorised technician on behalf of the client.

It is recommended to keep always an adequate number of fire extinguishers of medium capacity (at least 9 kg) in the building site. For fire prevention it is important to keep a safety distance of at least 10 m between heat sources and flammable products.

Before using the propane blowtorch in areas treated with primer, you must wait for the complete drying of the latter, which can last from two up to twentyfour hours in relation to the climatic conditions and the type of product.



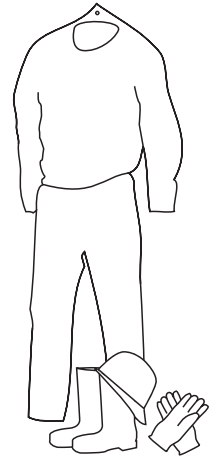
Shown below are listed some important rules to follow for the installation. All operations must be carried out under the Legislative Decree 81/2008 and further modifications.

- The blowtorch and all equipment must always be kept in good conditions and must never give any signs of aging; valves must always be cleaned.
- After all blowtorches are off, it is necessary that an authorised operator remains in the place for an hour at least, so as to make sure that there are no signs of smoke, embers or incandescent hotbeds
- Use special caution in handling the blowtorch; do not lean it against a trowel, a gas tank or a corner of the roof. The blowtorch, if on, must never remain unattended.
- Do not use the blowtorch near gas pipes, electrical cables, air-conditioning machines and flammable surfaces such as wood or EPS isolations.
- To turn the blowtorch on, only electrical lighters are allowed.
- Use a small blowtorch to fix small details. The blowtorch must always be provided with a valve with an indicator.
- Before turning the blowtorch off, the gas valve must be closed, then, when all the gas in the tube is burnt, you can close the blowtorch valve too.
- When you are on the roof, you must ensure that the gas tanks are stable, avoiding their rolling across the roof and their fall to the ground in advance.
- Gas tanks must be placed in an upright position and be at least three metres far away from the flame.
- During the use, separate the gas tanks one from the other of at least 10 m.
- Do not expose the gas tank to excessive temperatures or vibrations.
- Do not heat the tanks in order to increase its internal pressure.
- Be careful near any ventilation ducts, making sure that the flame is not conveyed into the building.
- In the event of gas leaks, stop working immediately and replace the damaged parts.
- Equipment must always be deposited in the equipment box to be properly protected.
- All the measures imposed by the Fire Department on the use of this equipment on the roof must be taken.

Authorised personnel must wear appropriate suits, protective gloves, proper protective footwear and masks to protect airways from gas and combustion fumes. In the case of confined or poorly ventilated spaces, personnel must be equipped with auto-rebreather.

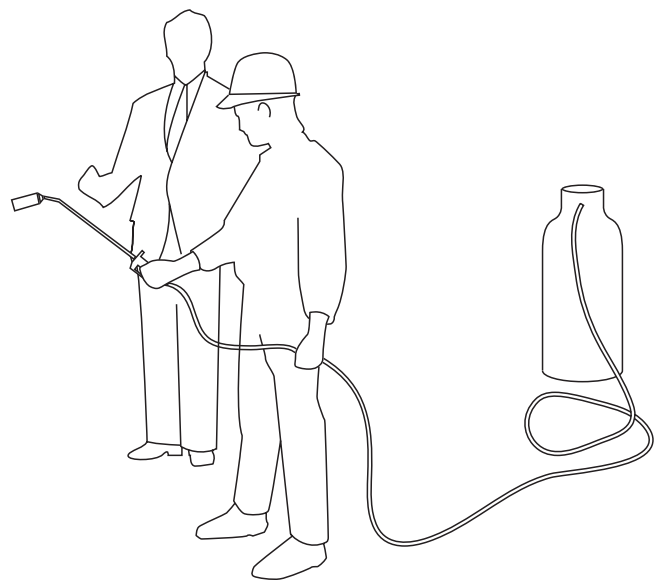
All the staff, except for the person using the blowtorch, must keep a safety distance from the flame of at least one metre. The blowtorch, when not used, must be placed with the bell facing upwards and turned off.

The valve regulating the gas pressure must never be blocked. The blowtorch must have a special valve which allows its immediate closure.



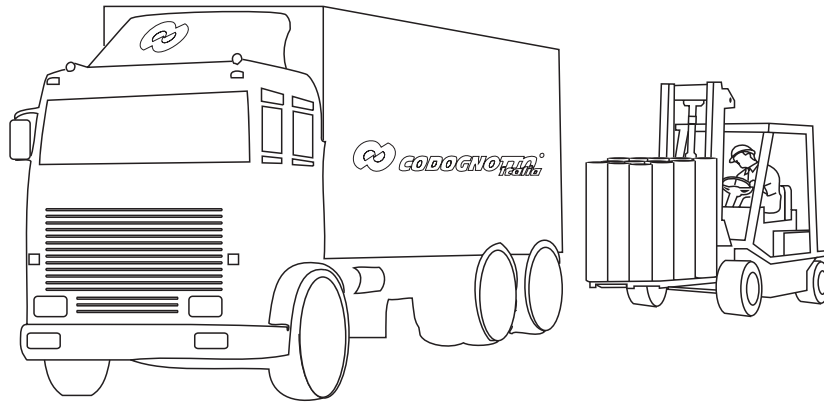
The employer must instruct the personnel on the proper use of the blowtorch and all related procedures. Particular caution should be taken in corners and in the presence of flammable materials.

The building site must be prepared with appropriate elements of access and perimeter safety or anti-fall systems in accordance with local regulations.



LOGISTICS AND HANDLING

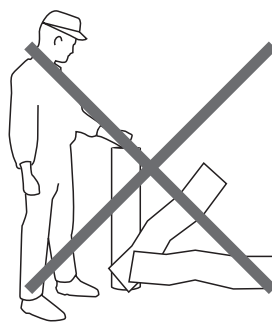
Unloading handling



Material must be treated very carefully when being unloaded.



We recommend to pay particular attention to any abrupt movements, to corners, sharp surfaces and anything that could somehow damage the material.



Particular attention must be paid to low temperatures, by trying to avoid violent hits which could break the membrane.

Storage

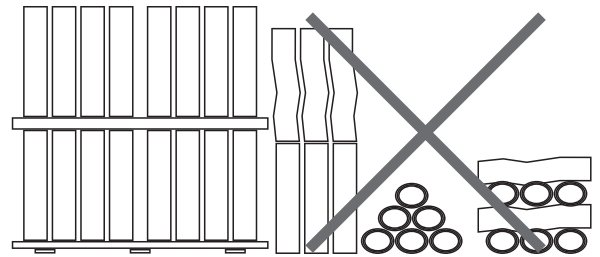
Rolls must be stored in shaded and well-ventilated areas. It is advisable to protect membranes from extremely low temperatures. In adverse climatic conditions, it is useful to stabilise the material for 24 hours in an environment with a temperature of at least + 5 ° C before performing the installation.



Warehousing/Storage

Material must be stored inside. Rolls must be stored upright on pallets or on off-the-ground flat surfaces. Find an appropriate point for the parking of pallets and a distribution of the same on the covering, considering that a pallet can weigh more than 900 kg. In no case should they be stored in a horizontal position.

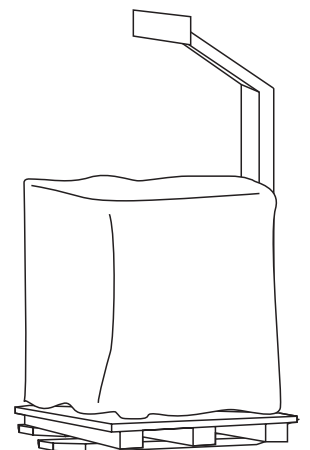
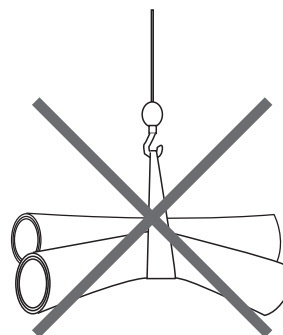
Any overlapping of pallets must be avoided as much as possible. When this is unavoidable, a rigid surface of distribution should be placed between the layers.



Handling on the building site

Rolls must be lifted with a crane on the roof, by using the appropriate accessories for lifting, in a complete package. The pallet must still have his thermal-retractable cap to ensure greater stability during its movement.

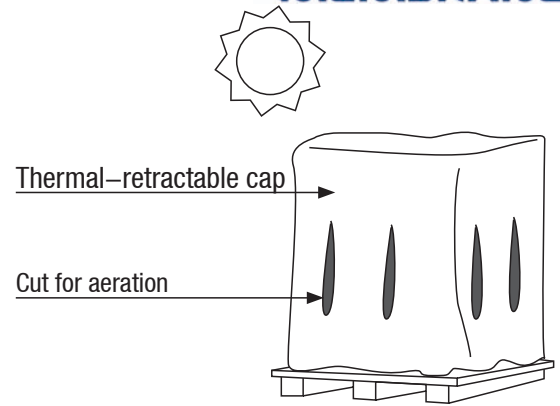
Any lifting of loose rolls through ropes or other improper accessories is to be avoided, because it can ruin the material or compromise the safety of operators. Rolls must be positioned always standing on flat surfaces with no harshnesses.



Conservation on the building site

It would be appropriate to take to the building site only those rolls to be used within the working day, given the importance of proper storage for these materials. For pallets present on the roof, the thermal–retractable cap must be always taken off or, at least, it is paramount to provide some side cuts on the same so as to help aeration and reduce the greenhouse effect that would be created within the same pallets.

It is important to shade the top of the pallets in order to decrease the temperature of the top of the rolls.



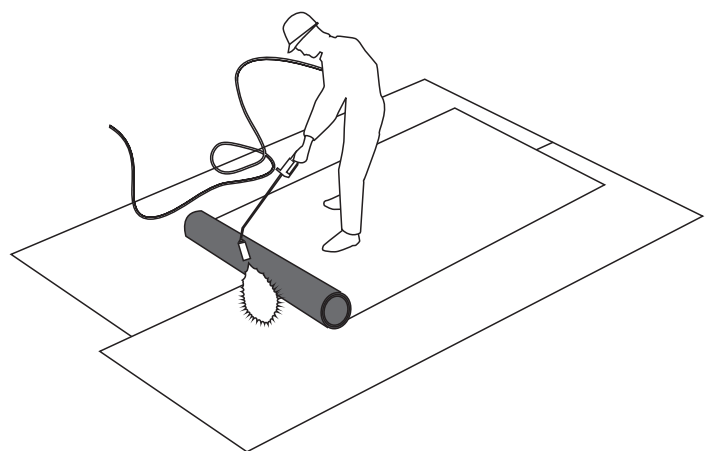
GENERAL INSTRUCTIONS FOR INSTALLATION

The following guidelines are consistent with what is prescribed in the UNI EN 11333 – 1 and EN 11333 – 2 regulations. There are three different types of installation of the waterproof layer:

- TOTAL ADHERENCE
- SEMI-ADHERENCE
- INDEPENDENCE.

According to the project needs, the most suitable type of installation will be chosen depending on several factors or intended uses of the covering:

- The type of support; for instance, in case of discontinuous prefabricated structures in partial exposure, the solution in independence or semi-adherence is preferred for the first membrane. Next ones will always be welded in total adherence.
- The covering morphology; for instance, for very inclined layers, total adherence and mechanical fixing are chosen.
- Full exposure; in this case design will consider whether or not to adopt the total adherence of the first membrane rather than other methods of laying. In any case, whatever the type of installation is, it will always be assisted by the obligation of the waterproofing system in accordance with UNI EN 11442 considering the resistance of the system to wind extraction according to EN 16002.



UNI EN 11333 - 1 - 2 - Installation of flexible membranes for waterproofing - Training and qualification of personnel.

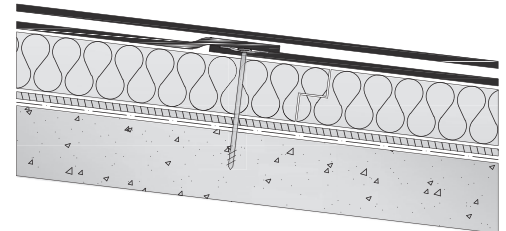
UNI EN 11442 - Parameters for the design of wind resistance of continuous coverings.

UNI EN 16002 - Flexible membranes for waterproofing - Determination of the resistance to wind load of mechanically fastened flexible membranes for the waterproofing of the roof.

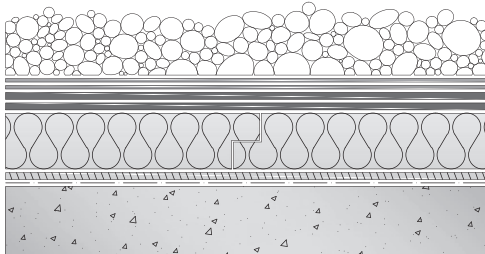
For the application in TOTAL ADHERENCE, the installation surface must be initially treated with bituminous primer. The application will be performed by unrolling the membrane on the installation surface, by heating the contact point between the surface and the membrane by putting more emphasis on the latter.

In case of application on steep slopes ($\geq 40\%$ without insulation, $\geq 20\%$ with insulation), total adherence must be assisted by mechanical fixings properly sized to avoid any dragging of the waterproof layer.

At the turn of joining lines of prefabricated roof tiles, locations of likely differential movements between the cracks of the installation surface, before applying the membrane in total adherence, it is necessary to lay some bands of General TM pontage with width of 20 cm, welded only on one side, made up by a 4 mm thick membrane reinforced with polyester, which have the function to share the fatigue movement present in those particular points on a wider area, safeguarding the functionality of the covering.



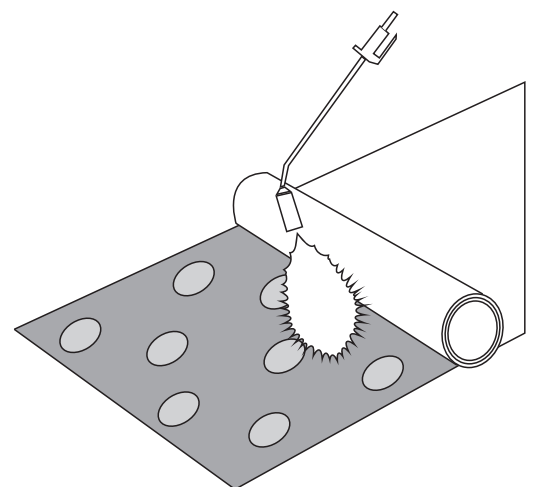
The INDEPENDENCE installation must provide along all the perimeters and emerging bodies the total adherence for at least 1 m or, alternatively, a specific mechanical fixing for points or lines having a minimum centre-to-centre distance of 30 cm.



Generally, in the INDEPENDENCE installation, the resistance to wind extraction and to the depression of the membrane is ensured by a heavy protection, such as gravel, paving, etc. This type of installation is limited to flat roofs with slopes up to 5%, which can bear the resulting overload.

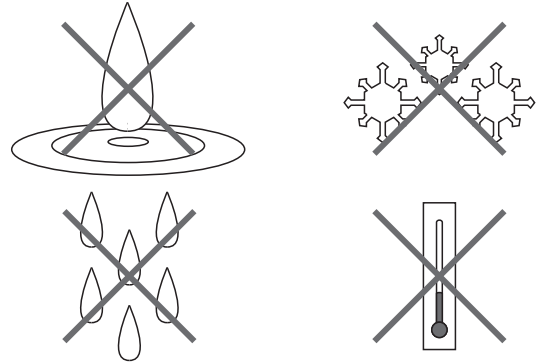
The INDEPENDENCE installation can include some functional layers to compensate for any needs of protection, sliding or separation.

As regards the application in SEMI-ADHERENCE, the membrane is fixed with points to the installation surface. The installation in SEMI-ADHERENCE must provide along all the perimeters and emerging bodies the total adherence for at least 1 m or, alternatively, a specific mechanical fixing for points or lines. For the installation in semi-adherence, we recommend to use multi-perforated layers such as Pegasus Spot, which ensure the controlled adherence of the subsequent membrane to the support.



WEATHER CONDITIONS

Adverse weather conditions (rain, snow and humidity) can affect the application; if temperature drops below +5° C, the installation should be stopped. Similarly in summertime, in countries with a hot climate, the installation on thermal insulation should be avoided during the hottest hours.

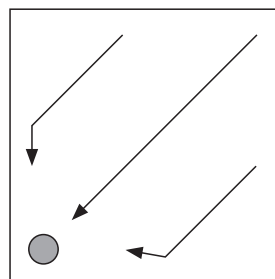
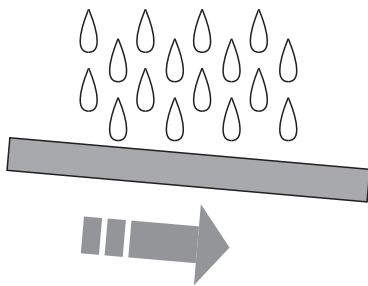


THE INSTALLATION SURFACE

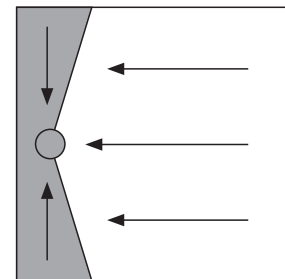
For a proper application and to ensure excellent performances, the support must have a requirement of minimum slope for the drainage of rainwater (1.5%). As well, it must be flat, without harshnesses, well-cohesive, dry and clean, with a suitable surface roughness suitable for the acceptance of the waterproof stratigraphy. For installation surfaces in later-o-concrete or concrete, you must wait for them to dry for a period which, depending on the outdoor thermal-hygrometric conditions, can vary from 8 days to 3 weeks.



The realisation of a layer with functional slope is paramount for the duration of waterproofing.

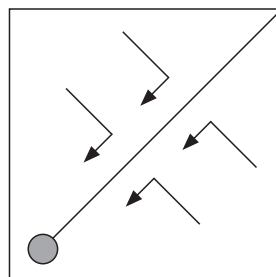


Roof with one slope

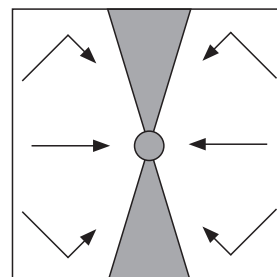


Roof with one slope

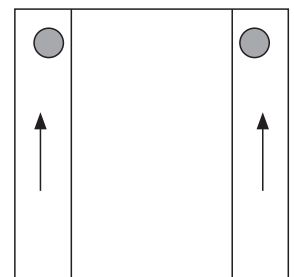
The surface is to be divided into drainage areas, fractionated by ridge lines, each of which provided with draining pipe union.



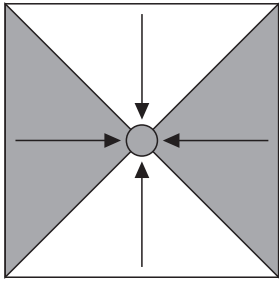
Roof with two slopes



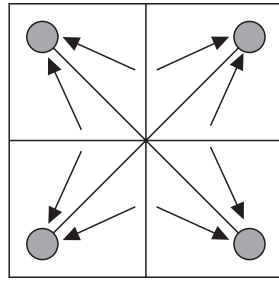
Roof with two slopes



Roof with two slopes



Roof with four slopes

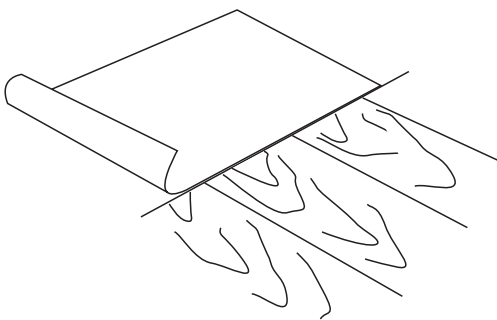
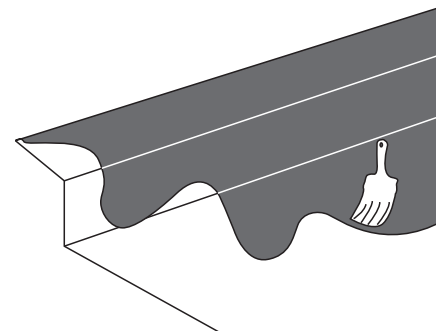


Diamond-pointed roof

Each area must have an area between 100 and 150 sqm with a maximum distance of rainwater journey of 15 – 20 m from the drain with slopes variable from 2 to 5%. In particular, the sizing of drains must be directly related to the served area. For an area of 50 sqm, the diameter of the drainpipe must be 80 mm at least, for an area of 100 sqm the diameter must be 100 mm at least, for an area of 150 sqm the diameter must be 150 mm at least.

Installation surface in concrete

For an excellent adherence, the installation surface should be treated previously with a layer of bituminous primer of about 300 – 500 g/sqm and you should wait for its complete drying, which, depending on weather conditions and the type of product used, can vary from 2 up to 24 hours. It is paramount that the surfaces to be painted are as dry as possible, without oil or chalking dust. The primer will penetrate into the concrete surface by fixing the powder, but shall in no case create a continuous film. The visual presence of patches of different colour does not indicate a lack of conformity of the installation.



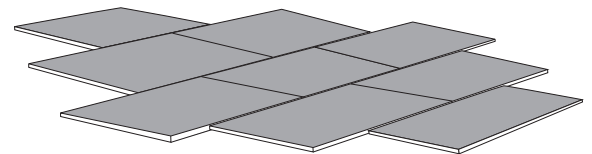
Installation surface in wood

The installation in total adherence on wooden roofs must be carried out with the use of adhesive or thermal-adhesive membranes fixed under seldge. In the case of dry installation, it will be appropriate to provide functional layers of separation fixed directly or under the seldge of the first membrane, able to accommodate the membranes in total adherence safeguarding the covering.

Using insulating panels

If the application includes the total adherence on thermal-insulating panels, it is necessary to use pre-coupled plates (GENETHERM B).

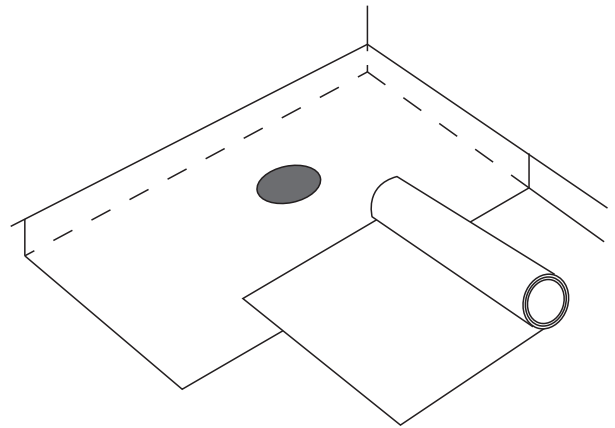
Panels will be bound to the installation surface, depending on the intended use of the covering, by means of mechanical fixing directly on the panel (pre-coupled) or in correspondence of the overlapping of the first waterproof layer. In the case, instead, of ballasted coverings, the installation of the membrane on the insulating panel will be carried out in independence by using a panel of the GENETHERM N (naked plate) series, whilst also providing for the mechanical fixings on the perimeter and on technical volumes, over the first membrane. In order to avoid any accidental damage to GENETHERM N during the welding operation with flame of the overlapping, use a layer of PEGASUS P dry-installed on the isolating, or pay special attention during the welding operation. In the case of rectangular panels, the installation direction of the membrane will have to be transverse compared to the insulating panel.



INDICATIONS FOR THE INSTALLATION OF MEMBRANES

The unrolling of waterproofing clothes should always start from the lowest point, where the drain pipe union or the gutter is, and then proceed upwards by unrolling the membrane along the installation surface.

The installation direction of membranes depends on the slope. On the whole, the following rule can be applied:



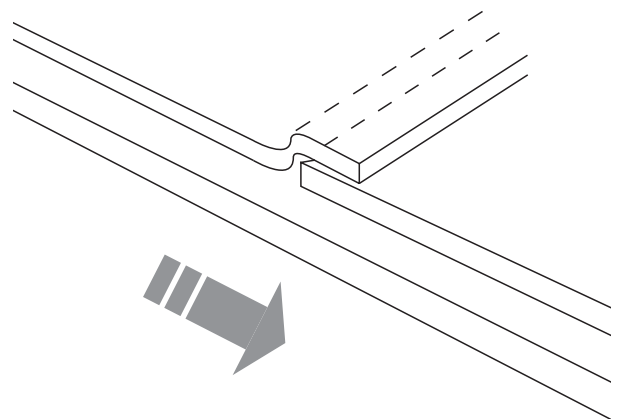
- With coverings having sub–horizontal slope ($\leq 5\%$) or slightly inclined slope ($\leq 10\%$), the installation direction of watertight membranes can be both longitudinal and transverse compared to the roof slope.
- With coverings having inclined slope ($> 10\%$), the installation direction should be longitudinal compared to the slope.

The longitudinal overlapping must be of at least 10 cm and those ahead of at least 15 cm. During the welding of continuity overlaps, you should work in order to create a uniform leakage of a small curb of melted compound lying between 5 mm and 15 mm, index of proper sealing and welding in the points of the overlapping of membranes as provided for by UNI EN 11333 – 2 regulation. The welding of the overlap and the consequent leakage of the curb of melting can be performed at the same time of the adhesion of the membrane to the installation surface through pressure by the operator's foot on the welding area, or by subsequently heating the area to be sealed and using a pressure roller.

The use of a trowel with a rounded tip is to avoid to seal joints, as this operation exposes and weakens the frame.

As regards the junction between clothes, there must always be a kind of arrangement so as to avoid an overlapping of more than three layers.

The positioning of each layer will always consider a 50 cm longitudinal offset of clothes with the expedient of cutting the corner (about 10 cm at 45°) of the receiving cloth, in correspondence to head junctions. In addition, the second membrane must be offset by 50 cm both longitudinally and transversely compared to the first sealing layer.



Execution of the welding of current section with double layer.

P= slope
Size in cm

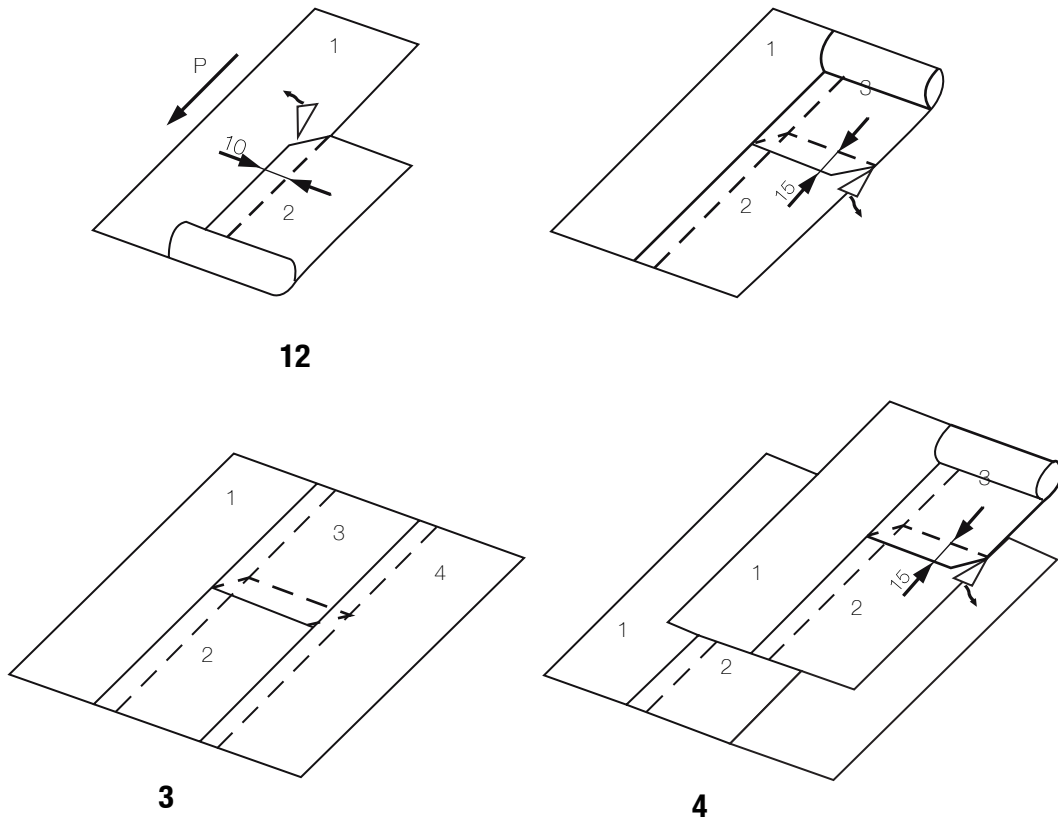
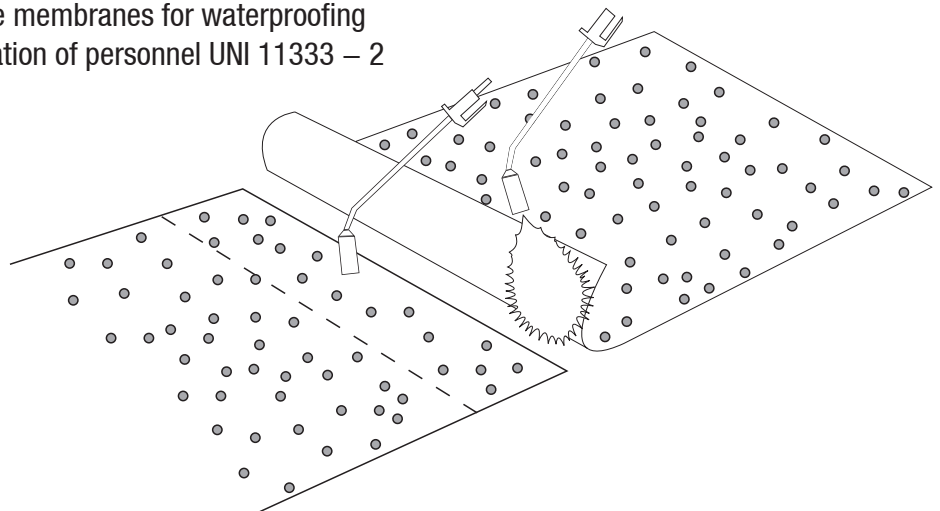


Figure 2a – Installation of flexible membranes for waterproofing
– Training and qualification of personnel UNI 11333 – 2



The leading overlaps of membranes with mineral self-protection will be performed by heating carefully the involved self-protected surface to the overlapping up to incorporate slate into the compound. This will allow a perfect adhesion between clothes.

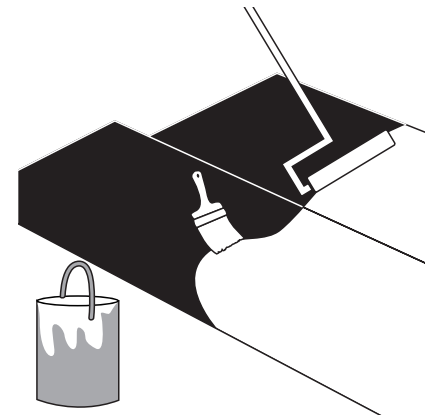
Final daily inspection

During the final inspection, it is paramount to check the flawless adherence of the continuity welds of the membrane. This is done by means of a rounded tip trowel or with a special rounded tip screwdriver which will be passed on the outer edge of the weld in order to check and verify the lack of flaws or discontinuity of the weld. If the seal is not perfect, it must be restored.

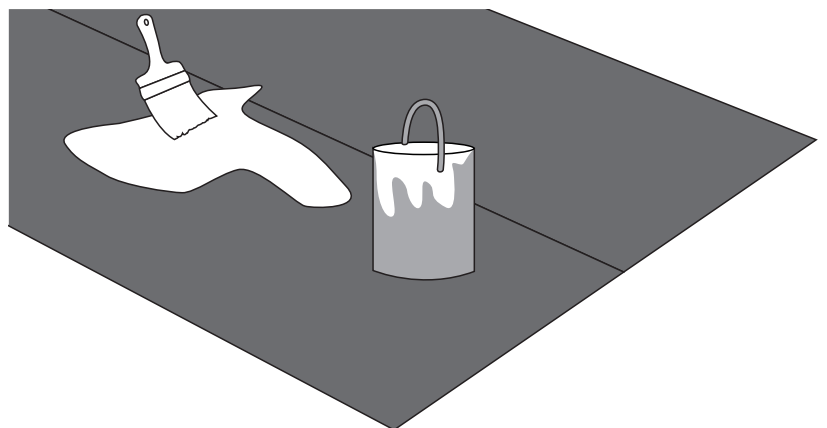
LIGHT AND HEAVY PROTECTIONS

Watertight membranes must be protected from UV rays in order to maintain their characteristics of physical–mechanical performance over time through the following ways:

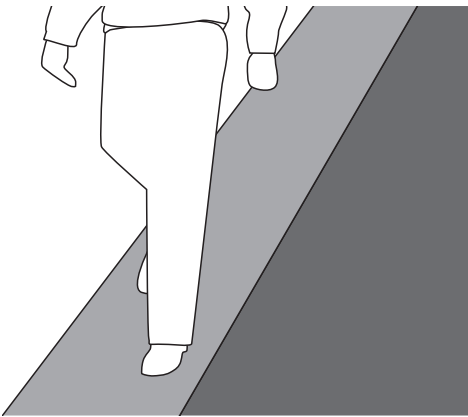
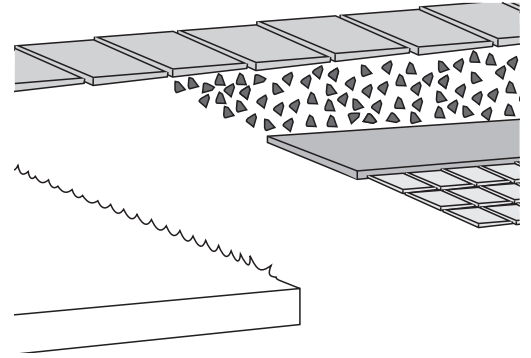
Light protection: for roofs in total exposure you can consider the use of prefabricated membranes with mineral protection in slate chips as second waterproof layer. Alternatively, a membrane without protection can be envisaged, on which a protective surface painting will be applied, after the period of oxidation (4 – 6 months). A white painting such as General Reflect Paint Plus is to prefer as it reduces the operating temperature of the waterproofing set preserving the membrane over time.



The integrity of the painting should be checked periodically to verify its status and to possibly restore it. In any case, as a general indication, it is suggested to proceed with the application of a new coat every 2 – 3 years.



Heavy protection: for ballasted roofs, the protection of the waterproof layer is made up by binders, gravel layers, concrete castings, pavements and farming soil for the realisation of roof gardens, depending on the intended use of the covering. In this case, you must adopt all the functional layers of protection, separation, sliding and drainage related to the specific waterproofing set as required by technical specifications.



Anyway, non-walkable coverings should include some walkways needed to get to the technical volumes and facilities present on the covering. These lanes will be built with pavements or additional membrane layers, easily recognisable and accessible, so as not to damage the waterproofing system.

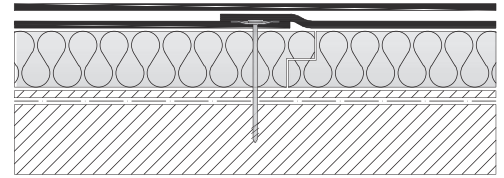
MAKEOVERS

In case of makeovers, the actually existing state can be used as installation surface of the new waterproof stratigraphy.

Before the application of the new waterproofing system, some interventions of preparation of the installation surface are necessary through the removal of wrinkles, undulations or creeps of the actual state by means of incisions or removals which can restore its flatness. The makeover will include the complete removal of vertically turned-up membranes on the perimeter to allow a complete new adhesion of the waterproofing on the vertical elevation.

If necessary, the consolidation of the old stratigraphy will occur through direct mechanical fixing before installing the new waterproofing system, or in correspondence of the overlapping of the first layer.

Before installing the new waterproofing system, you should use a multi-perforated separating layer such as PEGASUS SPOT, which will ensure the controlled adherence of the subsequent membrane to the support and the possible leakage of vapour pressures under-coat upon use of airways such as GM Aerators in the proportion of 1 pc / 25 – 30 sqm.

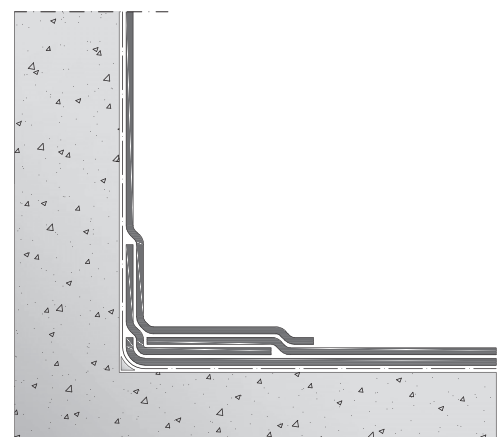


EXECUTION OF DETAILS

Hereafter, you will find some guidelines for the implementation of the most common details, which still must be made ad hoc in relation to the specific needs of the covering. The realisation of details must be studied according to the nature of the support, to the conformation and to the intended uses of the specific covering. Any additional and possible details not appearing on this document will be studied in the design phase and will be included in the technical specifications.

Vertical turn-ups

In general, corners and sharp edges on monolithic supports must be treated before installing the membrane through coves of concrete mortar or prefabricated elements. At perimeters, the membrane should be turned up on the vertical relief for a minimum height to assure a temporary watertightness. Any additional and possible details not appearing on this document will be studied in the design phase and will be included in the technical specifications.



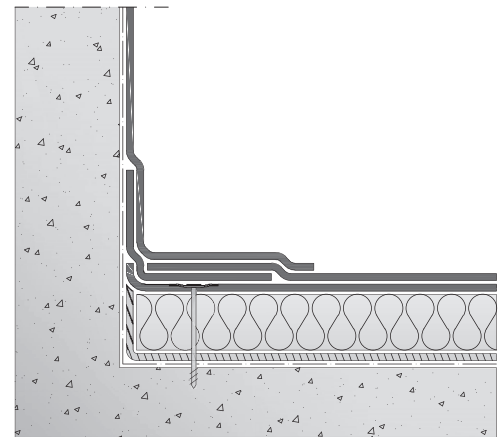
In case of use of thermal-insulating panels, for inner horizontal edges, the joining cove will be replaced by a reinforcing band. If a barrier / vapour barrier is considered, its turn-up will always exceed the amount of the next insulating panel.

The first waterproof layer must be fastened along the base of the perimeter to the base support or to the functional layer pre-placed through a fixing line (centre-to-centre distance in function of the specific intended use) or, alternatively, a torching will be considered along the first metre from the vertical wall (only in cases of dry installation).

A band of membrane applied in total adherence will seal the corner by adhering to the first sealing element coming from the horizontal surface and will rise to a minimum height, which is calculated from the quota of extrados, with measurement in relation to the intended use:

- Coverings in full exposure: 15 cm at least.
- Coverings with mobile grounded ballast (roof garden): 12 cm at least.
- Coverings with fixed ballast (walkway, fixed pavement): 10 cm at least.
- Coverings with mobile ballast (floating floors and gravel): 7 cm at least.

The installation of the second waterproof layer will come close to the vertical elevation, without making any turn-up. A closing band will cover the vertical up to its maximum elevation, until it completely covers the head of the wall or for a minimum height that exceeds the height of the first band. The upper end of the membrane must be bound to the perimeter by appropriate vertical coatings.

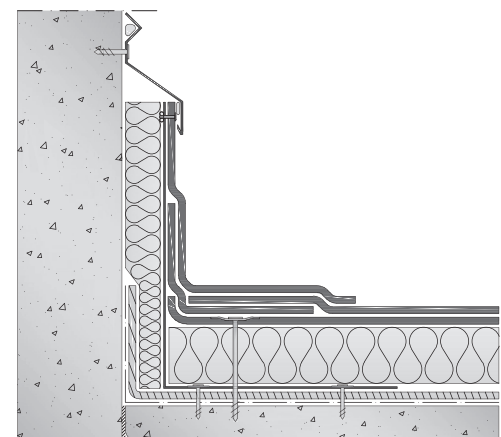


Technical Notes:

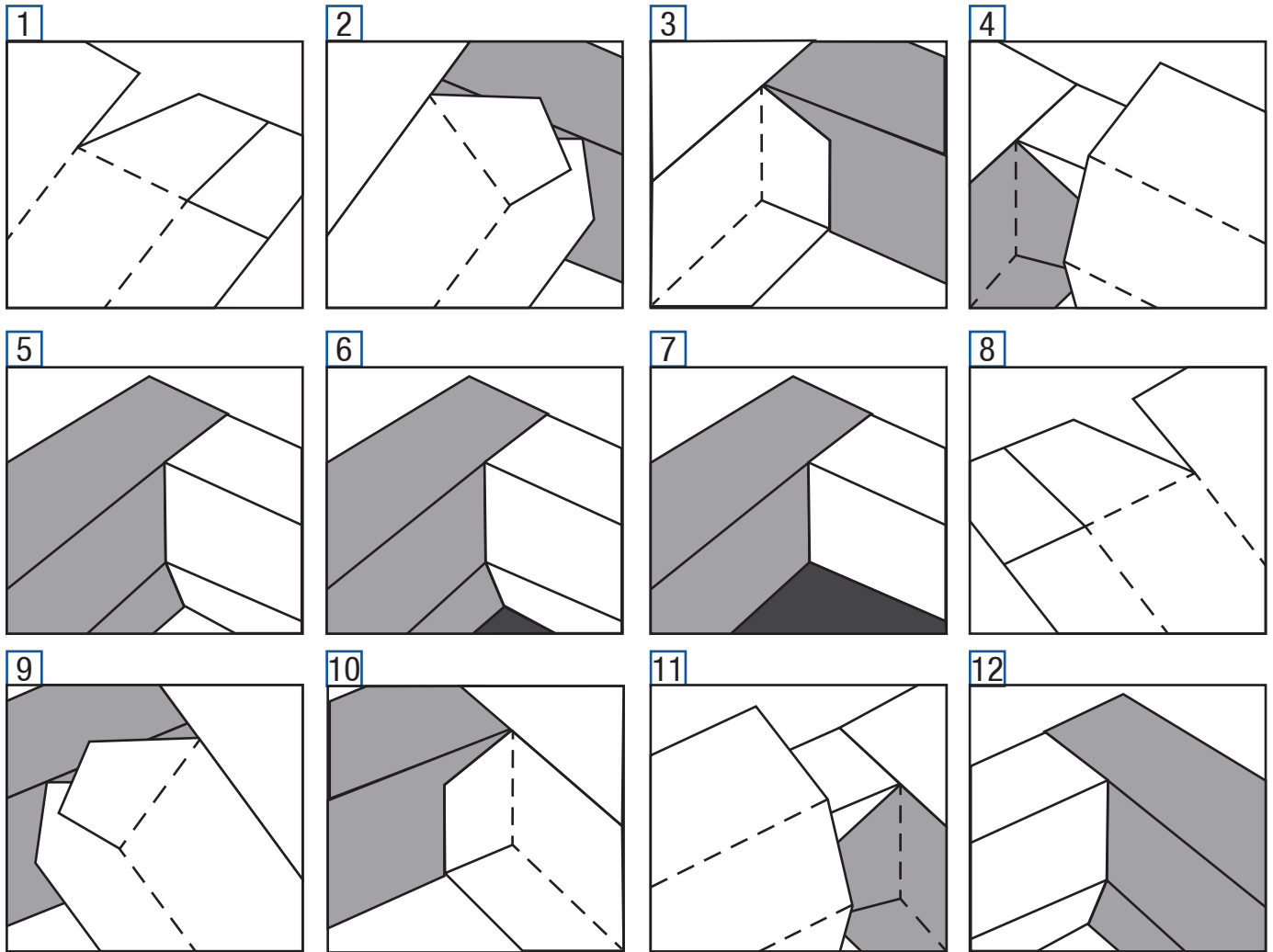
It is always forbidden to use any clothes coming from the horizontal covering surface, with continuity solution, to perform the vertical turn-up. The bands making up the vertical sealing will be created by cutting portions of membrane in a transverse direction compared to the length of the cloth, while maintaining a maximum width equal to the extent of the cloth itself (100 cm generally), which could possibly increase up to 250 cm if the installation is carried out simultaneously by two operators.

In discontinuous supports, in order to avoid any tensions of sealing elements in correspondence of junctions between the surface and the vertical, it is advisable to consider the installation of a disconnecting metal joint along the entire perimeter. This profile will be bound to the base support by means of fixing lines.

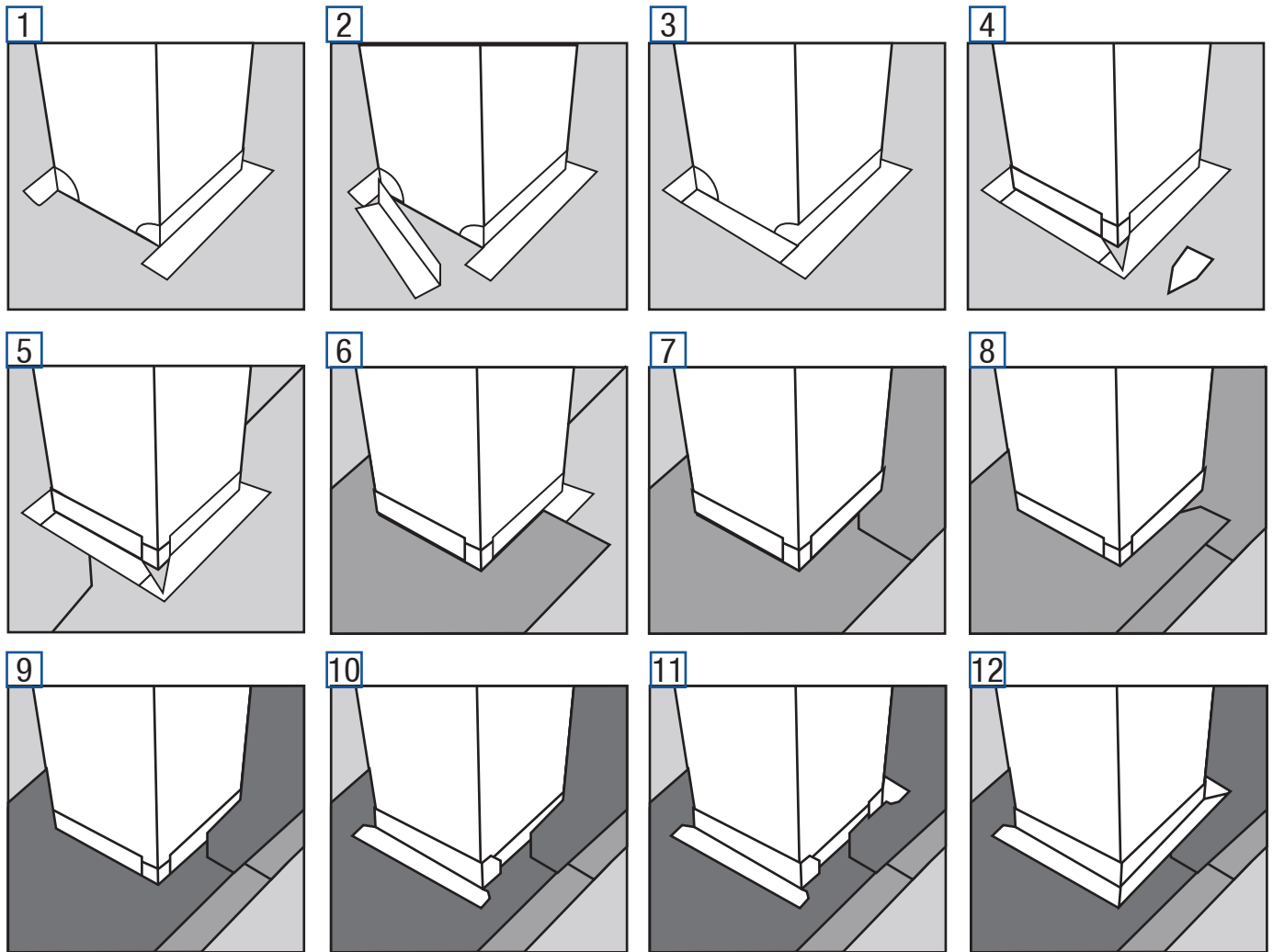
Coatings of inner and outer corners shall be carried out in accordance with the requirements in the UNI EN 11333 – 2 regulation, as shown.



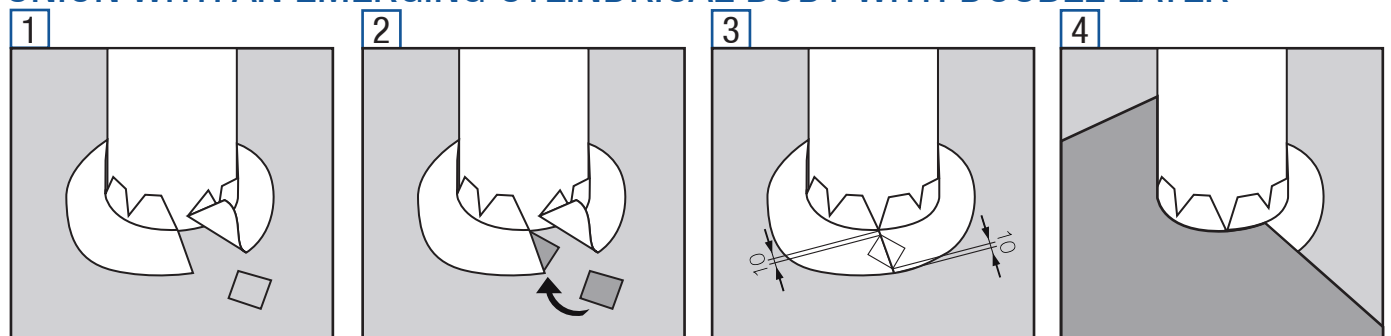
COATING OF THE INNER CORNER



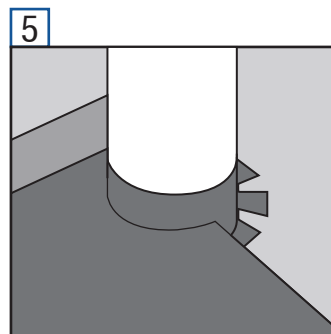
COATING OF THE OUTER CORNER



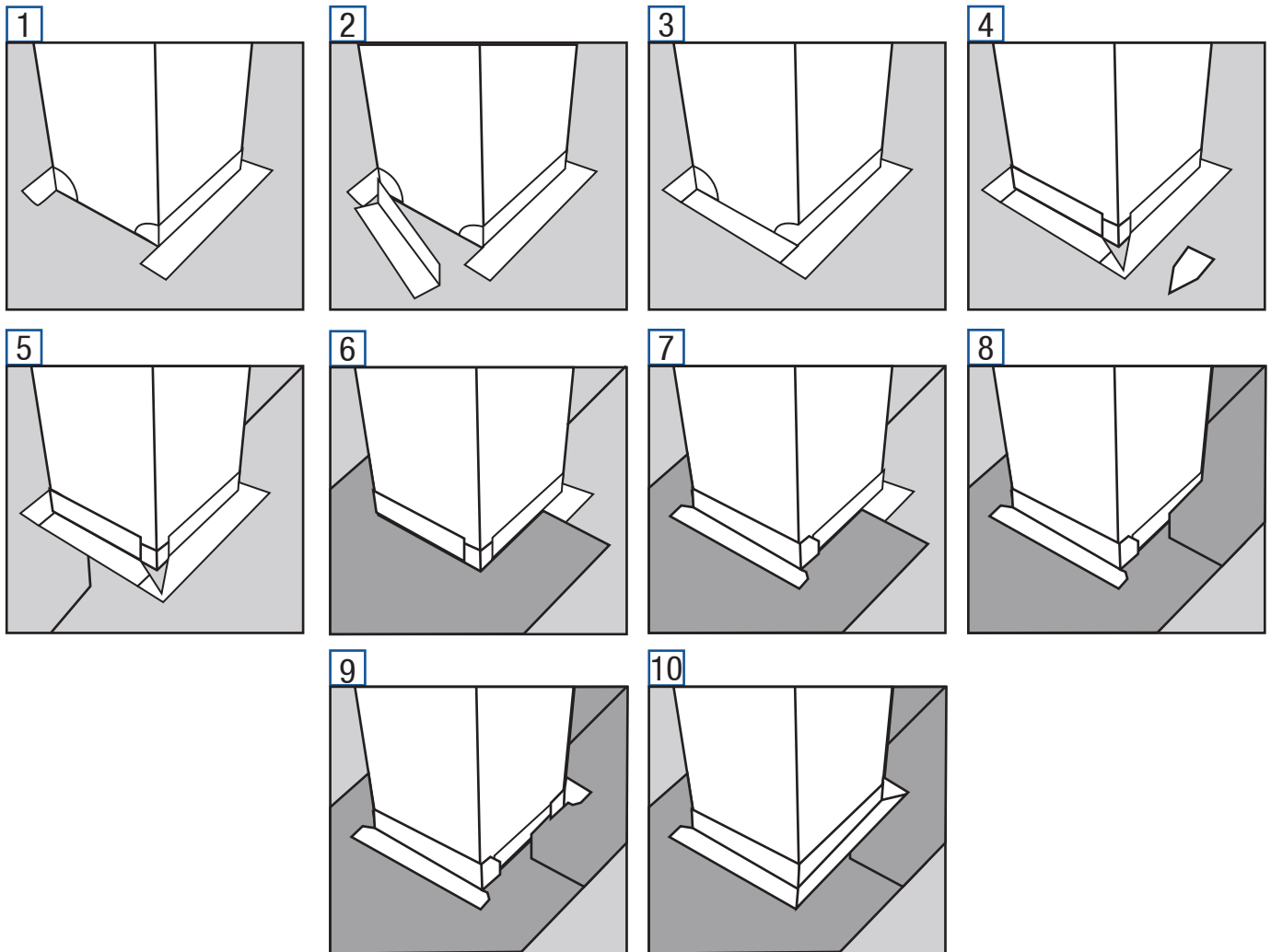
UNION WITH AN EMERGING CYLINDRICAL BODY WITH DOUBLE LAYER



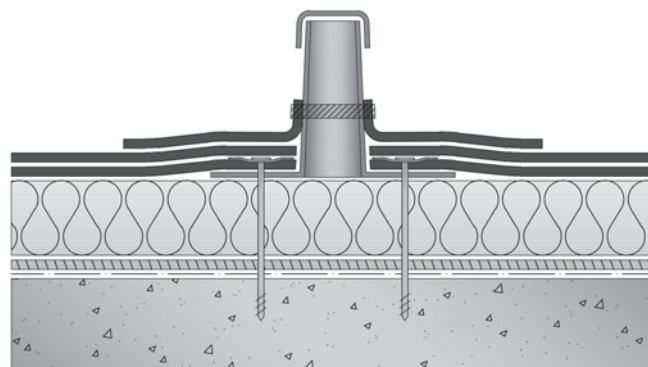
Dimensions in cm



EMERGING BODY WITH SQUARE SECTION

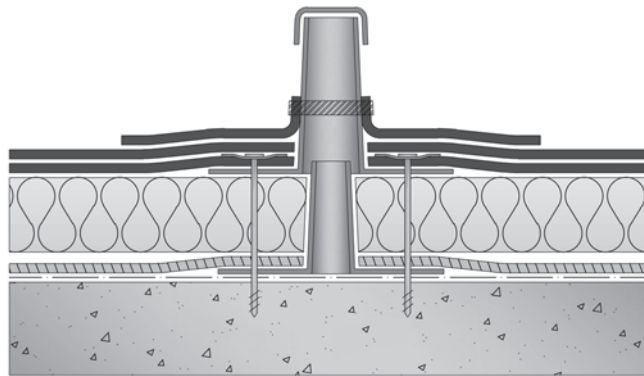


ELEMENTS FOR THE INTERSTITIAL HYGROMETRIC CONTROL

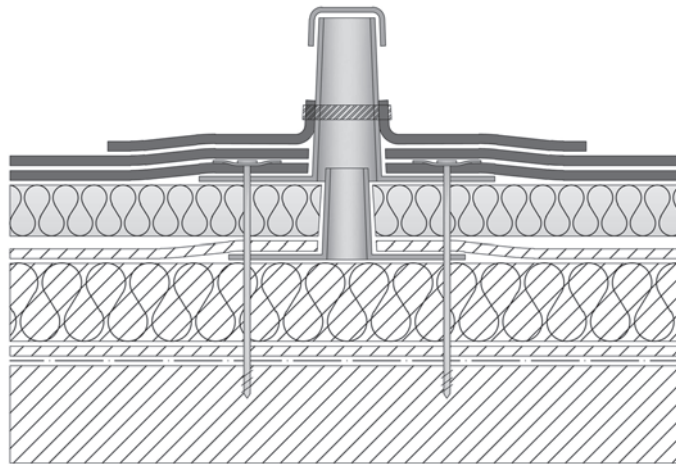


On the surface, there will be the placement of prefabricated vents in conical trunks, fairly distributed, such as GM Aerators, at the rate of 1 pc / 25 – 30 sqm. The individual vent chimneys will be dry placed over the thermal-insulating panel.

The constraint of aerators must be performed with mechanical fasteners to the support, at the rate of 3 pcs / aerator, after interposition of the first waterproof layer and its welding on the flanges. The second layer will be laid in adherence to the first. The complete sealing of the vent will be secured by a patch of membrane which will penetrate the trunk of the aerator until it is laid down and applied in total adherence on the extrados of the waterproofing system, turned up on the height of the conical trunk of the vent and tightened by a metal band around the cone. The patches of the membrane will be perforated through cross cut during the installation, or they may be provided with prefabricated central punching.

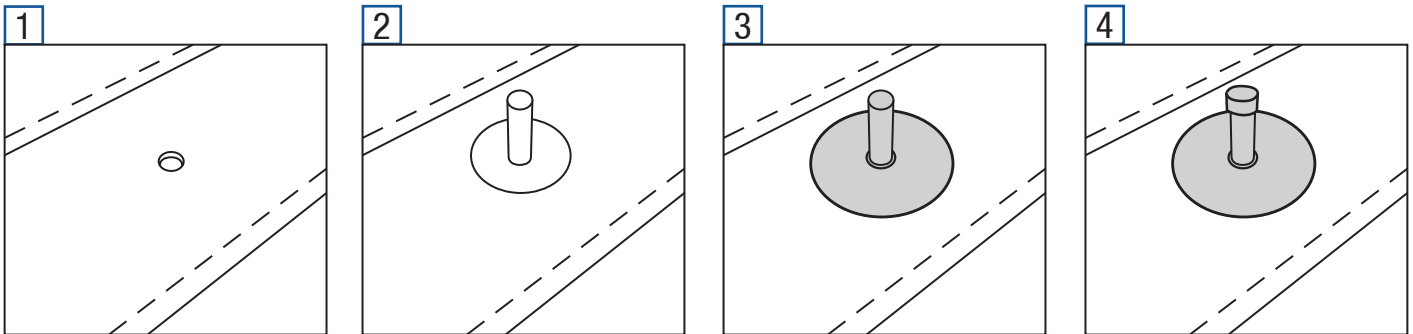


GM Aerators can be single or with double coaxial body through the coupling of GM Double Aerator, depending on the need to evacuate vapour only from the extrados of the thermal-insulating element or even below the layer controlling the specific vapour.

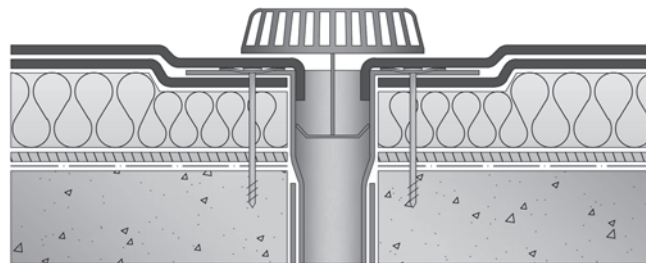


In case of makeovers, it will be necessary to use the vents to allow the emission of any water vapour which can get stuck between the old and the new waterproof stratigraphy.

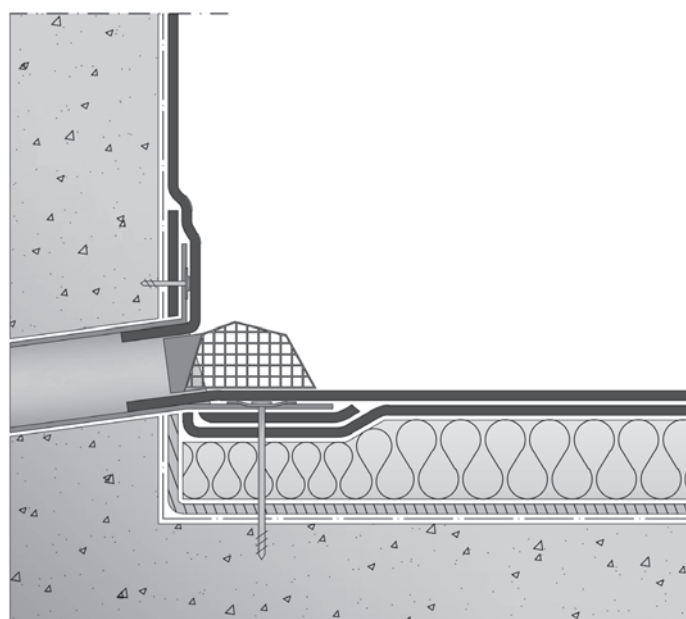
The installation of aerators should be carried out in accordance with the requirements in the UNI EN 11333 – 2 regulation, as shown below:



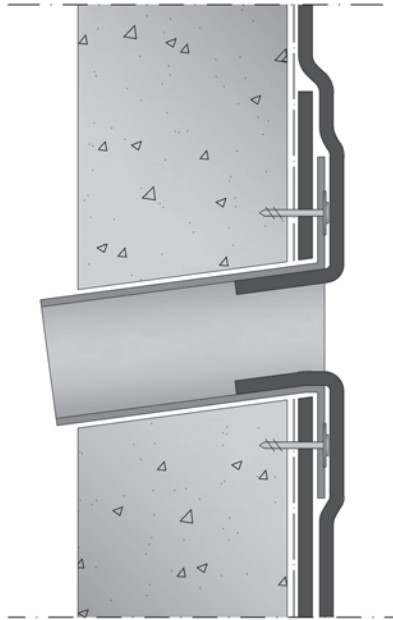
ELEMENTS CONNECTING TO HORIZONTAL AND VERTICAL DRAINPIPES



The connection to drainpipes will be carried out with prefabricated and rigid drain pipe–unions such as GM Unions, compatible with the performed waterproofing, with diameter and length of the stem suitable for joining the descendants in the structure. They shall be provided in sufficient number to guarantee a safe drainage of rainwater from the roof.



Surface and corner nozzles will be coherently placed on the lowest points of the covering and, if possible, the spot where they are placed must be lower than the installation surface in order to facilitate the disposal of water. Drains will be placed in total adherence over the first waterproof layer, and they will also be bound to the base support by appropriate mechanical fasteners, at the rate of 3 pcs / union. The second layer making up the sealing element must be shaped and welded within the cone of the draining nozzle.



“Overflow” drains will be carried out on the vertical elevations of perimeters at the height of about 10 – 15 cm over the quota of the horizontal surface. Membranes must accommodate the element and be welded onto the cone of the “overflow” union, similarly to what described for the drains placed on the surface.

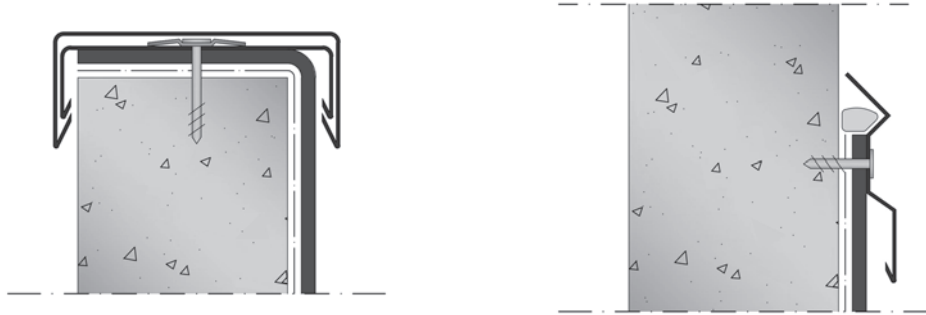
The unions will be provided with leaf-proof “net” such as GM Leaf-proof or snap-fit anti-gravel grid such as GM Anti-gravel, inclusive of flaps.

Technical Notes:

In areas with high rates of rainfall, we recommend using drainpipes with a glass graft and “o-ring” sealing gasket on which the stem of the draining nozzle is fixed, thus preventing an overflow.

The installation of draining nozzles must be performed in accordance with the requirements in the UNI EN 11333 – 2 regulation.

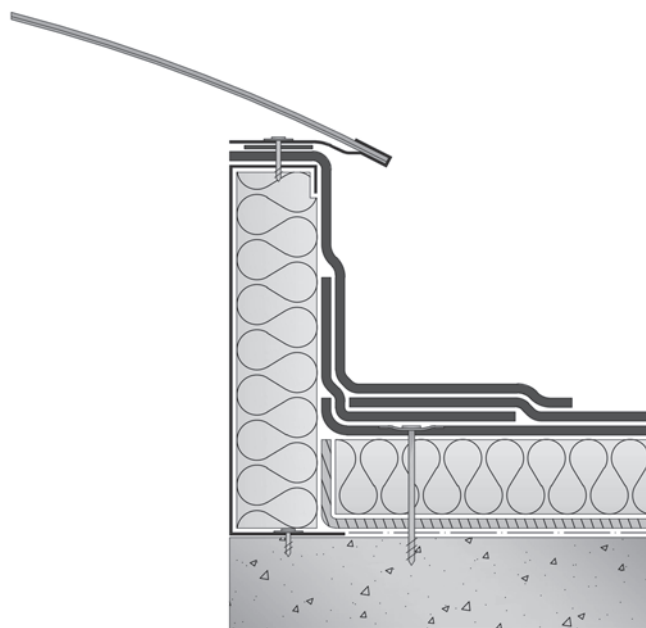
VERTICAL COATINGS



The top of the band of membrane turned up on the vertical must be bound to the perimeter by appropriate outline and coating tin-smitheries sealed against air and water and suitably shaped according to the building site requirements, due to the shape of the type of vertical turn-up.

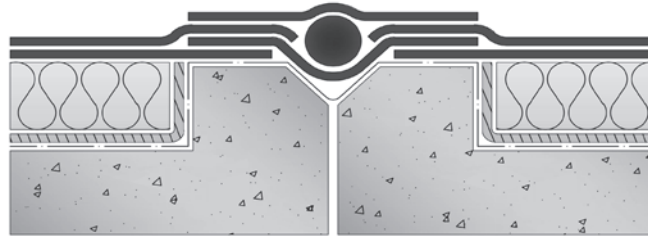
The coating profile can cover the head of the wall or fasten the membrane in its upper end to the vertical elevation.

SKYLIGHTS



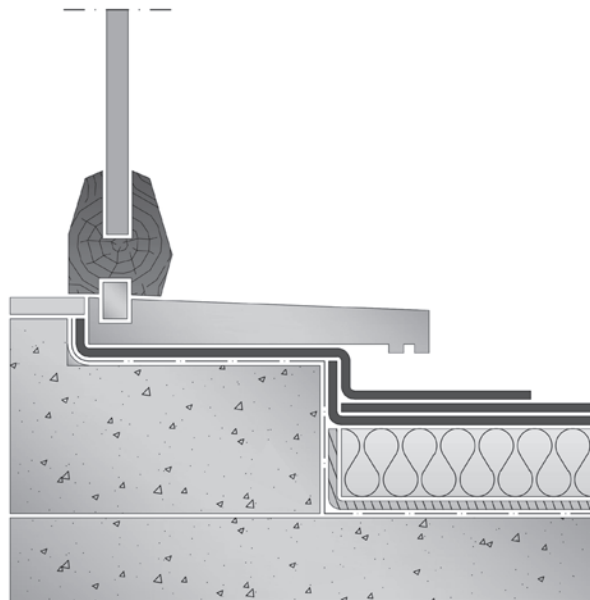
Membranes must be turned-up on the vertical of the skylight in a way similar to what described for the vertical turn-ups of the perimeter, providing always a fixing line along the base and turning up the closing band up to cover the head of the vertical entirely. The skylight bracket will be mechanically fixed on its top, after the interposition of windproof tape in compressible material (netting polyethylene or polypropylene).

EXPANSION JOINTS



Structural joints must be properly sealed by laying a band of membrane in total adherence along the intersection lines of discontinuous elements, thus joining together the sealing element making up the first waterproof layer coming from adjacent elements. The creation of such a pontage must be carried out with suitable abundances, so as to accommodate a small compressible “sausage” inside. Subsequently, the laying of the second waterproof layer will be performed, which will end near the compressible element. A closing band will be applied in total adherence on its extrados, completing the sealing along the structural joint.

THRESHOLDS



Watertight membranes must be turned up in all the vertical confinements compared to the installation surface of the threshold. The height of the turn-ups must always be greater than the sliding surface of the sealing element. The sub-threshold waterproofing will be jointed to the sealing layers coming from the horizontal surface through the installation in total adherence. Membranes are to be applied throughout the whole installation surface of the access thresholds and turned up on the vertical elevations for a minimum height of 20 cm.

Technical Notes:

If, because of timing, the application of the threshold should be expected before the waterproof stratigraphy, the sub-threshold waterproofing will still be placed before the threshold itself and an abundance will be left for its later connection to the sealing elements, placed on the horizontal surface of the covering.

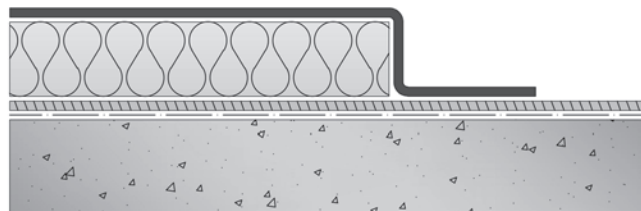
The sub-threshold must not be damaged during the laying operations, by using, for the anchoring of the threshold itself, materials compatible with the sealing element (layers of sand, mortar, glues, etc.), or in any case materials with no organic substances and solvents.

SUBDIVIDING

The practice of subdividing will have an extension in accordance with the intended use:

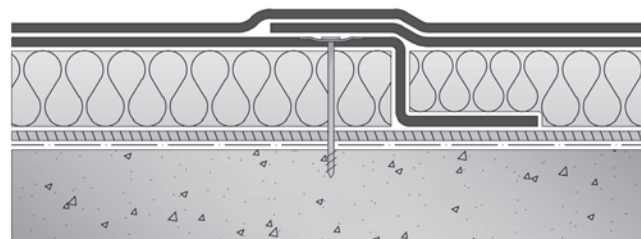
- Roofs in total exposure / simple = wide areas 500/600 sqm.
- Removable ballasts (clay, gravel, square tiles) / average difficulty of moving = average areas 300/400 sqm.
- Barely removable ballasts (roof gardens) / moderate difficulty of moving = small areas 100/150 sqm or smaller according to requirements imposed by the project.
- Stable or unmovable ballasts (fixed driveways and walkways) / difficult or impossible removal unless through wrecking = very small areas 50/60 sqm or smaller according to requirements imposed by the project.

During the application of the current section, a hermetic connection will be created between the sealing element making up the first waterproof layer and the support or the bituminous barrier / vapour barrier, placed in total adherence on the base support, with creation of reduced and confined sector of watertight covering.



The connection will be created by turning up the first waterproof layer downwards compared to the insulating panel and welded with continuity solution, for at least 15 cm, on the installation surface or on the element controlling the vapour diffusion placed on the horizontal plane.

The location for the subdividing will be pinpointed by the specialised installation company on a specific map issued by the Construction Management, in accordance with the drainage of rainwater. The subdividing will be stationed at the maximum quotas of slope and will close near the minimum quotas in correspondence of descending drainpipes.



The current section of the waterproofing system will restart with the base stratigraphy next to the vertical created by the confinement, and then will descend again at the next subdividing line.

Technical Notes:

The subdividing system is supplied with physical or electronic controlling systems.