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**Onduline®**  
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## System BITULINE®



*Torch on Waterproofing Membrane*

- *Effective Waterproofing*
- *High Technology*
- *Broad Range of Products and colors*



**Onduline®**  
AVRASYA A.Ş.

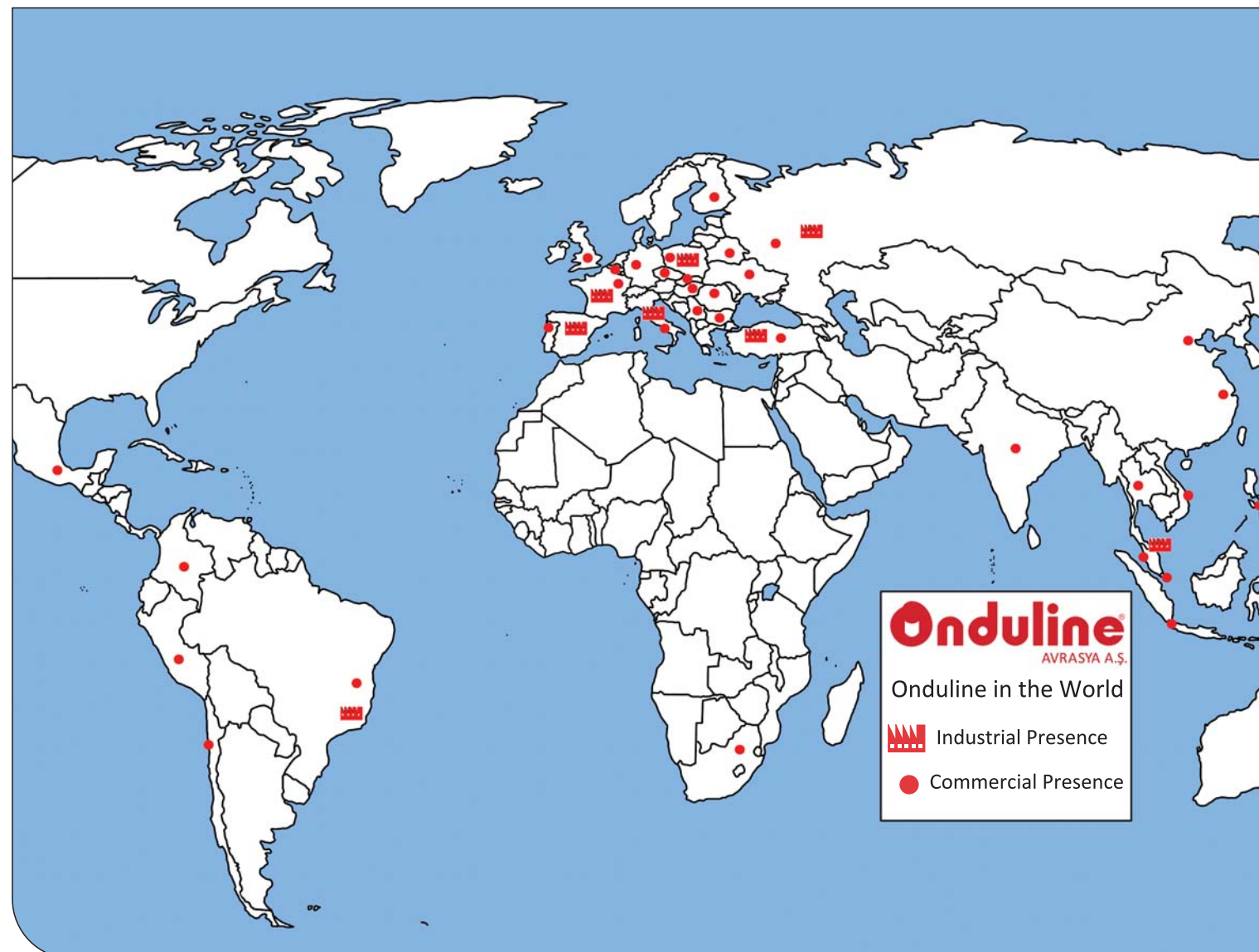
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## ONDULINE GROUP - ONDULINE AVRASYA

Onduline Group, the world leader in cellulose-mineral and bitumen based roofing and siding sheets, while pursuing activities in Eurasia since many years, decided in 1994 to directly invest in Turkey and Onduline Avrasya was established as a subsidiary of the Group in Istanbul in August of the same year.

Beginning from its foundation, the product range which was limited to Onduline roofing sheets only, was intensively developed resulting today in a range inclusive of those for the roofs and foundations, in a way to meet all the requirements of the end users, with related products and systems.

As a result of continuous research and development activities, Onduline Avrasya keeps the principle of serving the market by offering a large but innovative range, made of complementary products in compliance with each other. With especially innovative products developed for undertile insulation, like specially profiled undertile sheets and lastly the ardoise system with Isoline, versatile roofing systems are supplied. The headquarter being situated in Istanbul, the production units of Onduline Avrasya are located on 120.000 sqm total area, in Sapanca/Adapazarı, where roofing & siding sheets and membranes are produced according to world standards. Apart from ISO 9001 and ISO 14001 Quality standards Onduline Avrasya figures among the first companies in the sector possessing CE marking for all the product range. Onduline Avrasya beyond keeping its leader position in the local market since 15 years is pursuing the goal of becoming the leader in the 25 countries of Eurasia...



## System BITULINE®

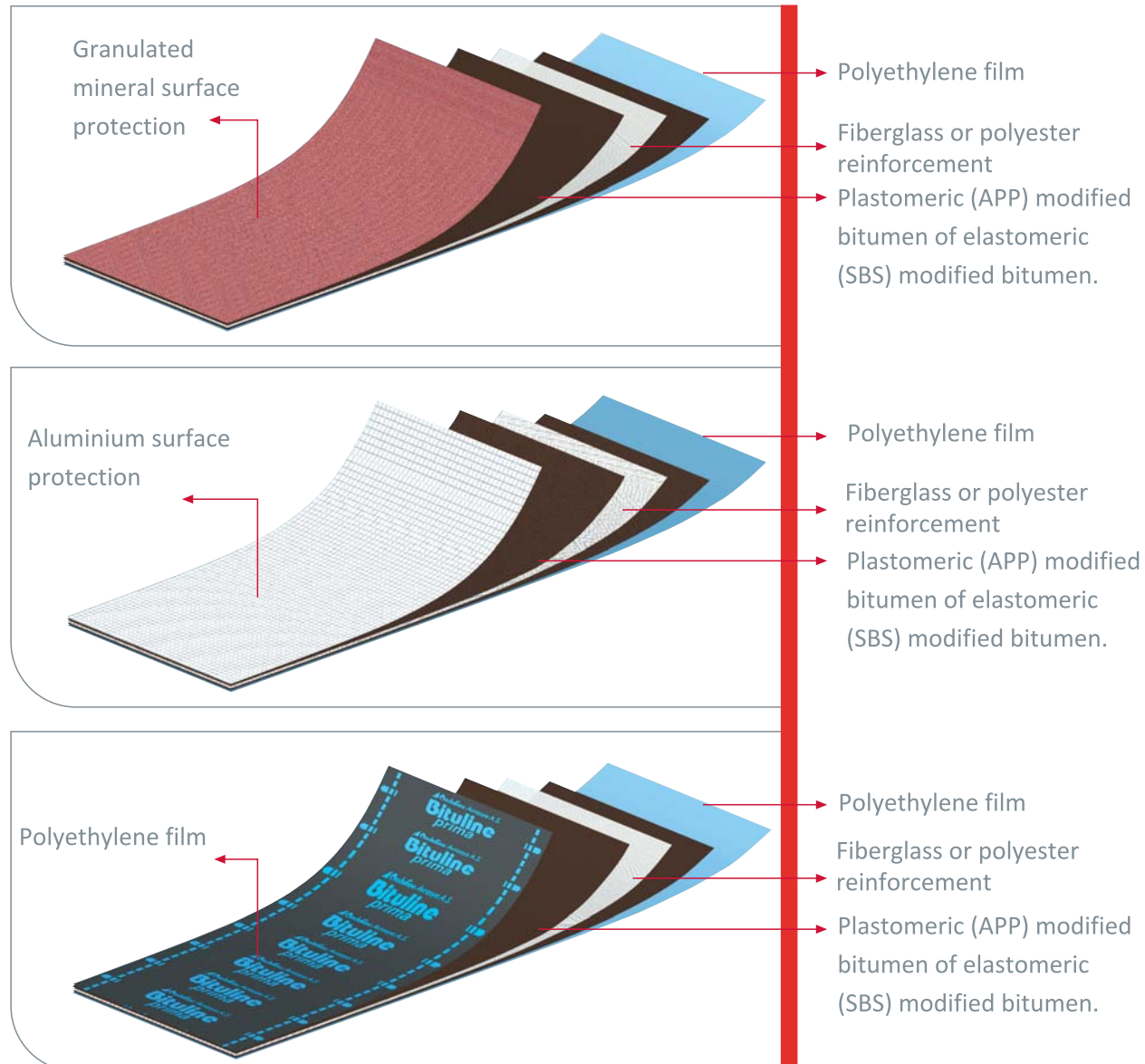
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The System Bituline's scope is the use of torch applied modified bituminous waterproofing membranes Bituline and its accessories in various waterproofing needs. Bituline membranes are used for waterproofing of flat and low sloped roofs, terraces, wet surface floorings, underground surfaces such foundations, basements and pools, roof gardens or of particular engineering structures such as multistorey parkings, highway or railway bridges.

## ADVANTAGES

- Bituline membranes, the fundamental element of waterproofing, are manufactured of high quality bitumen modified with polymers and reinforced with polyester or fiberglass of different thicknesses and whenever required with various coatings on the surface and therefore have a broad product range enabling the selection of the most ideal material that fits best to a particular application need.
- Thanks to the modified bitumen, insulation retains its flexibility even under very low temperatures, free of any cracks, while loosening rather late and thus maintaining its form under high temperatures. This is why Bituline System may be used safely under any climatic conditions.
- The fact that Bituline membranes are manufactured using a state-of-the art technology equipment at a factory environment ensures homogeneous waterproofing as well as integrity of materials in terms of quality which eliminates any insulation risks due to difference in performance, as common with the traditional systems implemented through application by laying of product mixes prepared in site.
- The membranes are combined together by fusion welding and then simply bonded onto the desired surface. This welding technique makes waterproofing permanent. The waterproofing of the Bituline system is also complete at joints.
- The reinforcement set into the membranes increases the tensile strength and pressure resistance of the waterproofing. System Bituline is thus available for use safely at such locations where levels of exposure to mechanical stresses are considered high, such as motorways, bridges, road pavements, etc.
- Available with granulated mineral or aluminium coated with a wide range of colors, Bituline membranes are especially ideal for use as a final coat waterproofing material as they are not affected from airborne particles of chemical and biological nature and are resistant to UV beams. Bituline membranes provides aesthetically attractive surfaces at all times.





## HIGH QUALITY PRODUCTION

Bituline membranes are produced in modern plants under the guarantee of Onduline Avrasya member of french ONDULINE GROUPE. In obtaining the indispensable characteristics of a high quality waterproofing membrane, which are “durability”, “flexibility” and “longevity”; the high grade bitumen, polymers and reinforcement felt play an important role together with the special computerised formulation, developed by “Onduline Groupe” and Onduline Avrasya.



The environmentally friendly technologies used have enabled Onduline Avrasya to receive various environmental awards and to be granted the ISO 9002 and ISO 14001 certificates.



All Bituline waterproofing membranes are produced in conformity with EN 13707 “Flexible sheets for waterproofing- Reinforced bitumen sheets for roof waterproofing” and EN 13969 “Flexible sheets for waterproofing- Bitumen damp proof sheets including bitumen basement tanking sheets” harmonized standards in compliance with the directive 89/106/EEC of the European Economic Community and are marked **CE**

TS EN 13707  
TS EN 13969







### BITULINE® prima

The “Prima” series consist of plastomeric membranes modified with “Atactic Polypropylene” (APP). Bituline Prima membranes are in compliance with the cold and warm weather conditions of mild climate zones (minimum -5°C) offering economic and reliable waterproofing systems with a wide spectrum for different types of buildings. Minimum 150 gr/m<sup>2</sup> of polyester reinforcement are used in “Prima” PP series and minimum of 50 gr/m<sup>2</sup> of fiberlass reinforcement are used in “Prima” PG series.

### BITULINE® Extra

The “Extra” series consist of plastomeric membranes modified with “Atactic Polypropylene” (APP). Bituline Extra EP membranes series having increased their tensile strenght with minimum of 180 gr/m<sup>2</sup> of polyester reinforcement perform better at high and low temperatures in regions with extreme climatic conditions (minimum -10°C) with its flexibility and durability. Minimum of 60 gr/m<sup>2</sup> of fiberlass reinforcement are used in “Extra” EG series.

The Bituline EP410 is an especially formulated “Heavy Duty” membrane for use in the waterproofing of highways pavements, road bridges, viaducs etc. And a minimum of 250 gr/m<sup>2</sup> of polyester reinforcement is used to perform maximum tensile strenght in extreme mechanical conditions.

The Bituline EP410 has been also tested by LCPC (Laboratoires Central des Ponts et Chaussées-French Public Works Research Laboratory) in France and General Directorate of Highways - Technical Research Laboratories in Turkey for use in several road pavements and bridges projects



### BITULINE® Maxima

The “Maxima” group contains elastomeric membranes modified with “Styrene Butadiene Styrene” (SBS). Having the highest possible flexibility even at lowest temperatures (minimum -20°C) and increased their tensile strenght with minimum of 180 gr/m<sup>2</sup> of polyester reinforcement, Bituline Maxima MP series membranes are especially suitable for cold climates and are also ideal for “bundle” type foundation waterproofing against underground water subject to pressure as well as for roofs subject to high vibrations or dilatation. Minimum of 60 gr/m<sup>2</sup> of fiberlass reinforcement are used in “Maxima” MG series.



### BITULINE® Aluminium

Aluminium foil finish membranes of the Bituline Extra group EG30A and EP30A are used as the final layer material like the granulated finish types. Their technical specifications are identical to Extra group. This type is also used for flashing details of the roof like valleys, hidden gutters, etc.



### BITULINE® Antiracine

The Bituline Anti-root EP300 Anti-racine and EP400 Anti-racine membranes are used for intensive or extensive roof planting of gardens and are resistant to root perforation or



penetration damages. The Bituline Anti-racine membranes have been tested during two years by University of Applied Sciences Research Institute of Horticulture-Germany by FLL method and granted FLL root resistance Certificate.



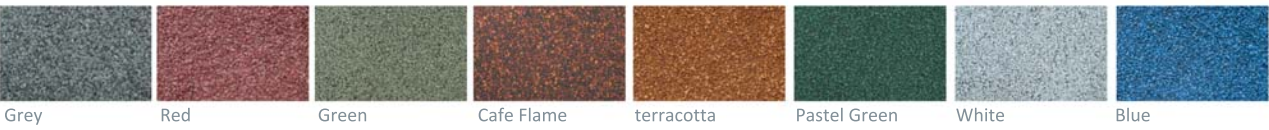
### BITULINE® tropica

The “Tropica” series consist of plastomeric membranes modified with “Atactic Polypropylene” (APP). Bituline Tropica membranes are in compliance with and warm weather conditions of mild climate zones (minimum 0°C) offering economic and reliable waterproofing systems with a wide spectrum for different types of buildings. Minimum 150 gr/m<sup>2</sup> of polyester reinforcement are used in “Tropica” PP series and minimum of 50 gr/m<sup>2</sup> of fiberlass reinforcement are used in “Tropica” PG series.

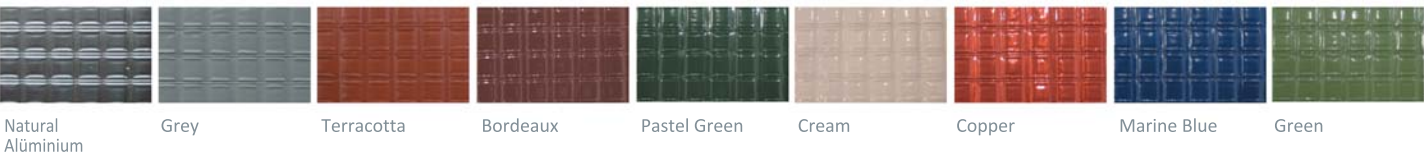


COLORS

Prima - Extra - Maxima



Aluminium



	Bituline 2 mm Prima - Extra Tropica PG200- EG200	Bituline 2 mm Maxima MG200	Bituline 3 mm Prima - Extra Tropica PG300- PP300- EG300-EP300- EP300 ANTIRACINE	Bituline 3 mm Maxima MG300-MP300	Bituline 4 mm Prima-Extra-Tropica PP400-EP400- EP400 ANTIRACINE- EP410	Bituline 4 mm Maxima MP400
Lenght	1 m x 15 m	1 m x 15 m	1 m x 10 m	1 m x 10 m	1 m x 10 m	1 m x 10 m
Pallet Sizes	120 cm x 100 cm x 115 cm (±3)	120 cm x 100 cm 115 cm (±3)	120 cm x 100 cm 115 cm (±3)	120 cm x 100 cm 115 cm (±3)	120 cm x 100 cm 115 cm (±3)	120 cm x 100 cm 115 cm (±3)
Product Weigth	2,32 kg/m²	2,10 kg/m²	3,50 kg/m²	3,20 kg/m²	4,70 kg/m²	4,37 kg/m²
Total Pallet Weight	995 kg	900 kg	1000 kg	925 kg	1100 kg	1025 kg
Packing	420 m² / pallet	420 m² / pallet	280 m² / pallet	280 m² / pallet	230 m² / pallet	230 m² / pallet

	Bituline 3,5 mm Mineral Prima - Extra PG40 M- PP40 M - EG40 M -EP40 M	Bituline 3,5 mm Mineral Maxima MG40 M -MP40 M	Bituline 4,5 mm Mineral Prima - Extra PP50 M - EP50 M	Bituline 4,5 mm Mineral Maxima MP50 M	Bituline 3 mm Aluminium Extra EG30 A - EP30 A
Lenght	1 m x 10 m	1 m x 10 m	1 m x 10 m	x 1 m x 10 m	1 m x 10 m
Pallet Sizes	120 cm x 100 cm 115 cm (±3)	120 cm x 100 cm 115 cm (±3)	120 cm x 100 cm 115 cm (±3)	120 cm x 100 cm 115 cm (±3)	120 cm x 100 cm 115 cm (±3)
Product Weigth	4,1 kg/m²	3,93 kg/m²	5,2 kg/m²	4,94 kg/m²	3,54 kg/m²
Total Pallet Weight	970 kg	925 kg	950 kg	910 kg	835 kg
Packing	230 m² / pallet	230 m² / pallet	180 m² / pallet	180 m² / pallet	230 m² / pallet



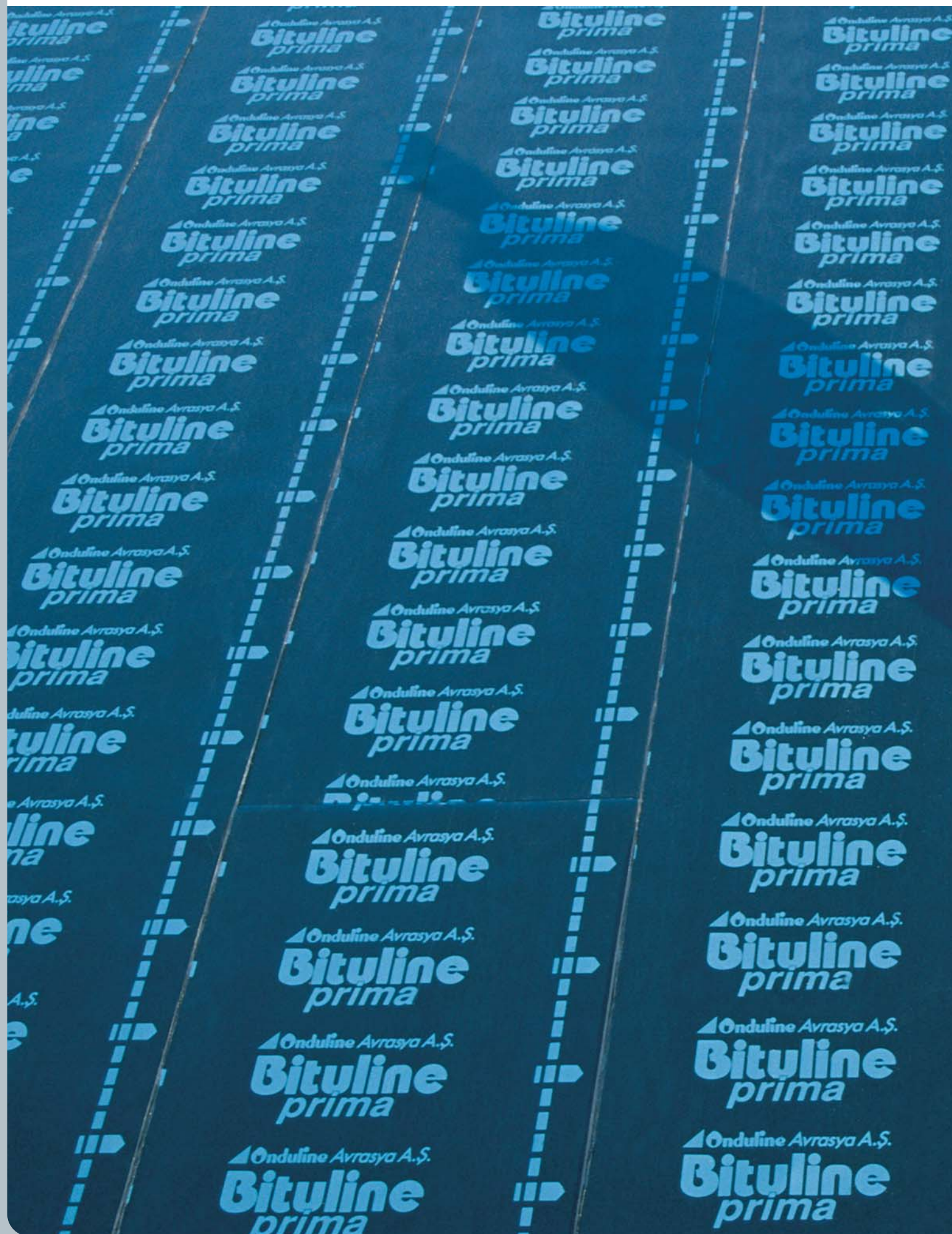
**Storage Conditions**  
Pallets should never be placed onto each other.  
Direct exposure to rain and sun must be avoided.  
Pallets should be stored in a closed area.













## APPLICATION GUIDELINES



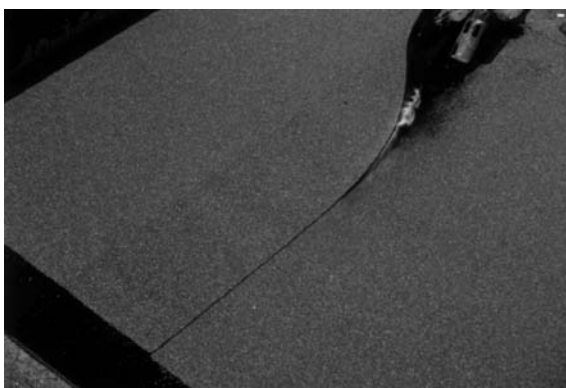
The rolls should be stored in upright position. Do not store under direct sunlight. If the use of materials in cold weather is desired they should be stored at standard room temperature for 24 hours before application in order to render workmanship easy and sound. No applications should be made under cold weather conditions where the temperature tends to fall below +5°C. Bituline waterproofing membranes have No specific hazards for human and environmental under normal use conditions and they do not contain any dangerous substances.

The application of Bituline in two layers, the sublayer being reinforced with fiberglass and the second layer with polyester is considered to be a good practice when waterproofing is to be made on flat roofs with inclinations up to 5°C. The selection of the type and thickness of the membrane to be applied depend on the characteristic of the type or mode of utilization of the building and to the climatic conditions prevailing in the area. Excessive care should be taken to ensure that application surface on which the membrane is to adhere is clean and dry at time of application and a single layer of undercoat Bituline Primar should be applied to the surface to ensure a good retention. In full adhesion technique all the surfaces along which the upper membrane layer

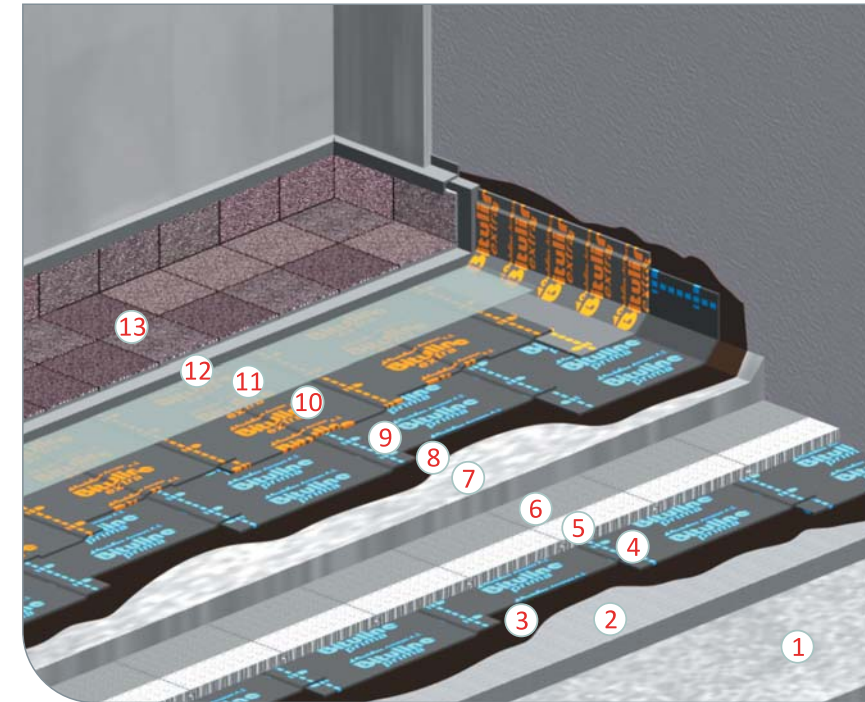
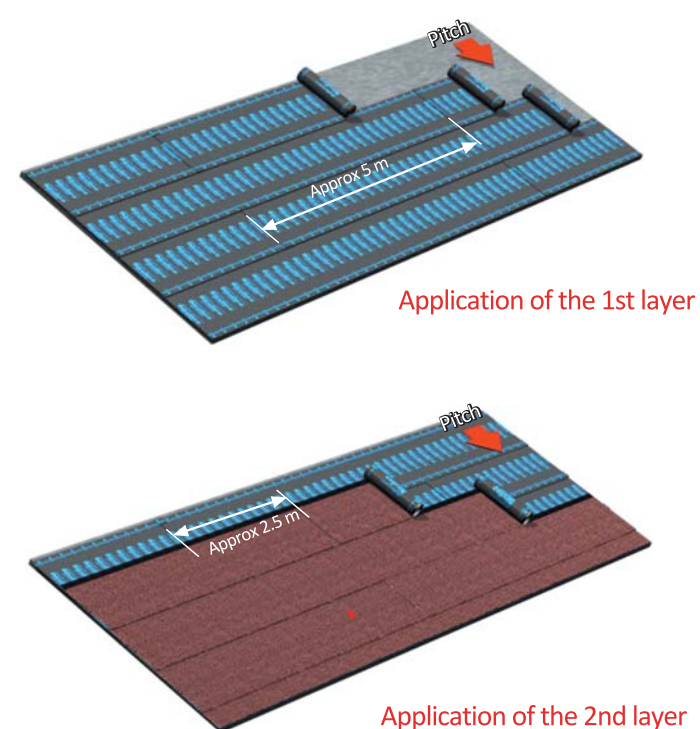
are treated with fusion welding technique using a welding torch.

When Bituline Perfor is used the membrane shall facilitate an ideal vapor distribution as it will adhere onto the ground on a pointwise basis. However, Bituline Perfor should be laid avoiding any material overlaps and should never be adhered to the application surface at a prior time. The fusion weld should be applied to the first membrane layer coming over and appropriate measures should be taken to ensure that the bitumen melt due to fusion adheres to the surface perfectly after passing through the holes of Bituline Perfor.

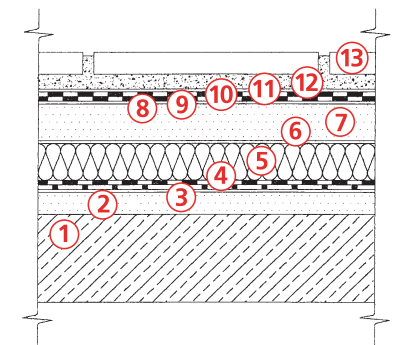
Bituline rolls should be aligned so that they overlap one another by 10 cm both at length and width. While overlapping mineral coated membranes at length the granules must be scrapped off completely followed by their heating using the welding torch and embedding them into the membrane to produce an overlapping length of 15 cm.



Rows of membrane should be performed perpendicular to the direction of slope in all layers while care is taken to avoid intersection or overlapping of joints to the extent possible, employing the deviation technique.

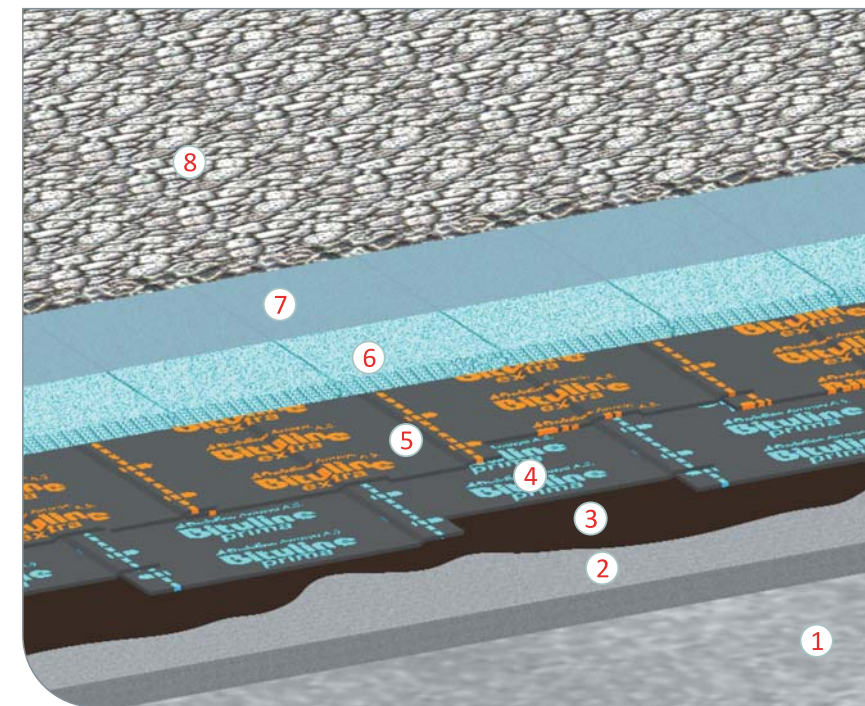


- 1- Concrete pavement
- 2- Leveling screed (if needed)
- 3- Primer
- 4- Vapor barrier (linear and pointwise adhesion)
- 5- Heat insulation material
- 6- Polyethylene folio
- 7- Sloping concrete
- 8- Primer
- 9- 1st layer of Bituline with polyester reinforcement
- 10- 2nd layer of Bituline with polyester reinforcement
- 11- Geotextile as separating layer
- 12- Mortar
- 13- Tiles

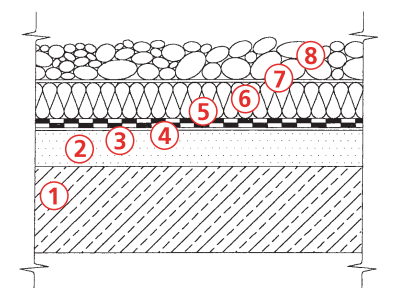


### Passable Roofs

At terrace type open roofs insulated with the conventional system the heat insulation layer is placed under the waterproofing layer where there is a wide variety of options to use for this purpose. Including glasswool or rockwool with a minimum density of 150 kg/cbm and XPS extruded or EPS expanded polystyrene foams with a minimum density of 30 kg/cbm.



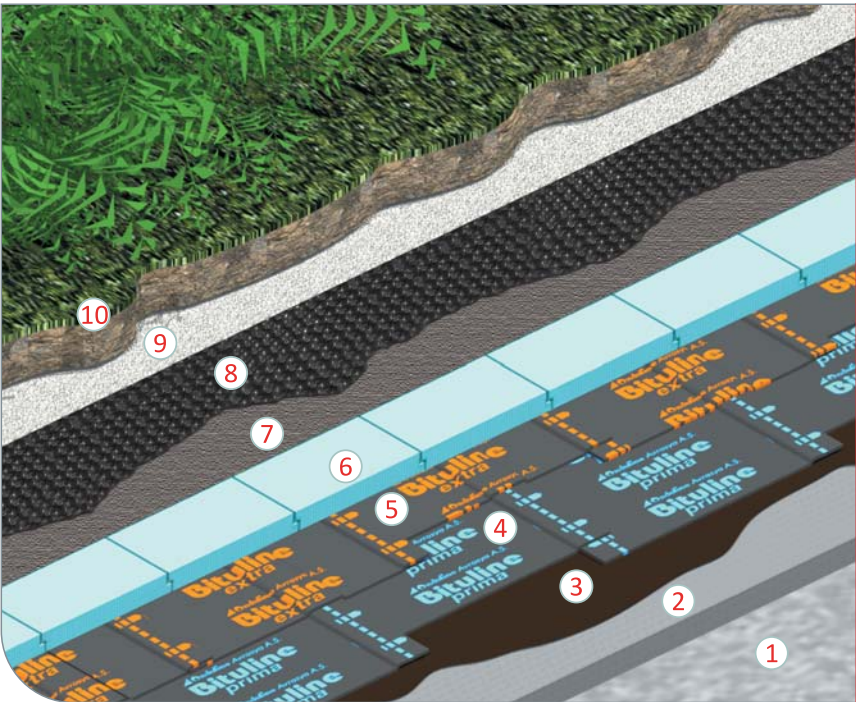
- 1- Concrete pavement
- 2- Sloping concrete
- 3- Primer
- 4- 1st layer of Bituline with fiberglass reinforcement
- 5- 2nd layer of Bituline with polyester reinforcement
- 6- XPS Extruded polystyrene heat insulation board
- 7- Geotextile as separating layer
- 8- Gravel



### Non-Passable Roofs

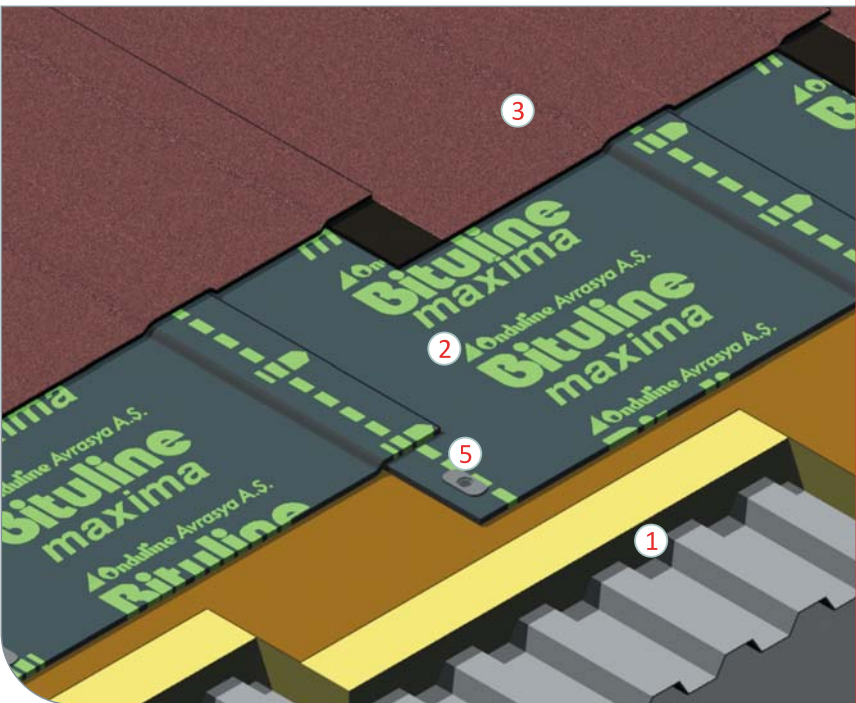
In inverted roofing systems there is no need for using of a vapor barrier as the heat insulation layer stands above the waterproofing. On the other hand, heat insulation should be absolutely provided by employing a waterproof material (i.e.XPS) and consideration should be given to the fact that a certain amount of heat loss would occur due to the passage of rain water discharged underneath the heat insulation layer.





Roof Gardens

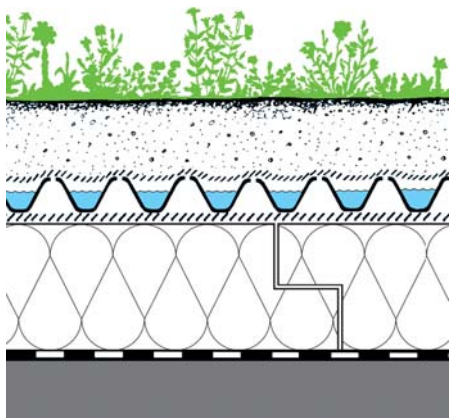
Both the classical and inverted waterproofing systems may be applied to passable or non-passable roofs or roof gardens.



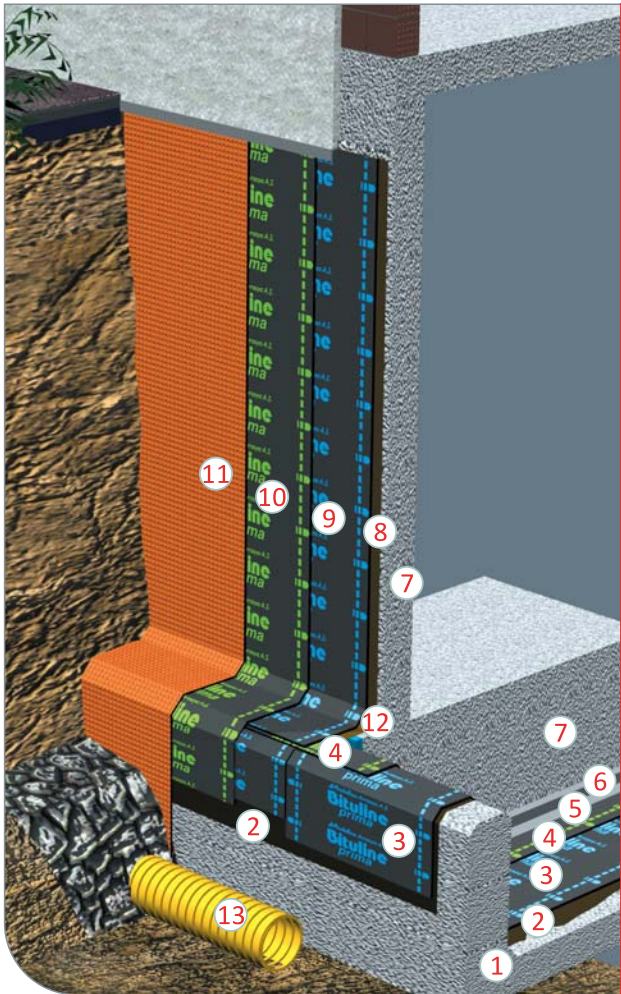
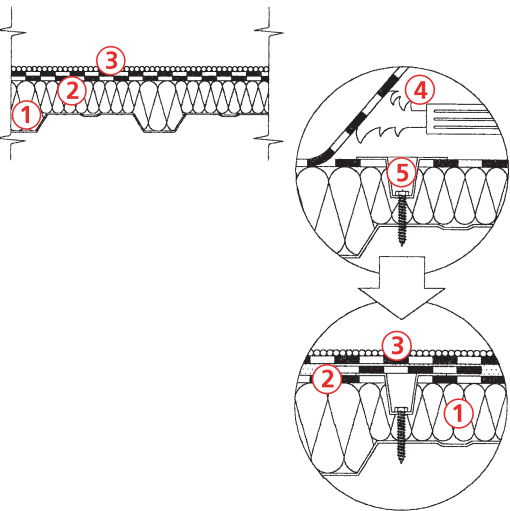
Oversheeting of light Metallic Roofs.

For waterproofing of light metallic roofing systems commonly used for covering concrete, heavy prefabricated or steel systems, the sublayer membrane is fixed onto the roof panel applying mechanical means. A membrane layer coated with granulated mineral is employed as the second layer. Here a s a widely flexible moving roof system is concern it is essential that membranes with high elastomeric characteristics should be preferred.

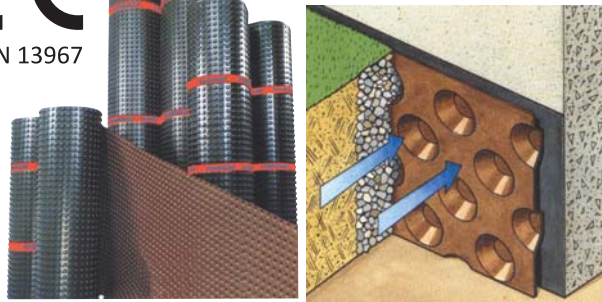
- 1- Reinforced concrete flooring
- 2- Sloping concrete
- 3- Primer
- 4- 1st layer of Bituline with fiberglass reinforcement
- 5- 2nd layer of Bituline with polyester reinforcement
- 6- XPS Extruded polystyrene heat insulation board
- 7- TGV 21
- 8- Floradrain FD 25
- 9- Geotextile as separating layer
- 10- Soil



- 1- Kraft paper covered heat insulated light metallic roof panel
- 2- 1st layer of Bituline with polyester reinforcement
- 3- 2nd layer of Bituline with mineral surface protection and polyester reinforcement
- 4- Adhesion using torch
- 5- Mechanicak fixing



- 1- Precast concrete
- 2- Primer
- 3- 1st layer of Bituline with polyester reinforcement
- 4- 2nd layer of Bituline with polyester reinforcement
- 5- Geotextile separation layer
- 6- Protective concrete
- 7- Reinforced concrete system
- 8- Primer
- 9- 1st layer of Bituline with polyester reinforcement
- 10- 2nd layer of Bituline with polyester reinforcement
- 11- Fondaline HDPE membrane
- 12- EPS or XPS Heat Insulation
- 13- Drainage pipe



Protection of the Foundations and Basements

Fondaline, made of HDPE “high density polyethylene” is used for the draining of ground water and the protection of the underground waterproofing systems against damages caused by ground pressure. Its strong and flexible naps resist against the mechanical impacts caused by the back filling of the ground avoiding any kind of damage on the surface of the waterproofing layer. The air gap created by the naps of Fondaline between the ground and building parts like basement walls or floors is ideal for all kinds of drainage.

The underground parts of buildings must be protected against damp and ground water. This is not only necessary for a comfortable use of the building but also for safety reasons. Humidity leads to the corrosion of the steel. When rust affects the reinforcement of the concrete the structure system is also damaged and this can be dangerous for the stability of the building especially in critical situations like earthquakes. Therefore, foundations and basements have to be waterproofed. Moreover, the waterproofing materials are very sensitive. If not properly protected, they are under the risk of being damaged during the back-filling of the building site. Fondaline’s tough but flexible body absorbs mechanical impacts of ground parts like stones and gravel and prevents any such damage on the waterproofing layer even if they might hit the wall. Furthermore the air gap created by Fondaline’s naps links the ground water to the drainage tube on the bottom. In places where there is no risk of ground water, Fondaline is also efficient if it is used as a single layer for damp proofing. During the life-time of the building Fondaline continues to protect the underground walls also against the attacks of roots and most chemicals which might be harmful for underground building parts.

Fondaline has to be placed so that the black side touches the wall, the brown side the soil. Rolls can be applied horizontally or vertically depending on the depth of the building. Overlaps of 10 cm are necessary. Until the back-filling the position of Fondaline has to be fixed so that no damage occurs on the waterproofing by any kind of fixing element . For this purpose the system consisting of self adhesive nails and washers can be used. If needed, the system can also be combined with hard-board insulation panels like XPS or EPS. Fondaline can be nailed directly to concrete only on levels where there is no risk of infiltration of damp or ground water.

TECHNICAL SPECIFICATIONS	FONDALINE <sup>®</sup> 400	FONDALINE <sup>®</sup> 500	FONDALINE <sup>®</sup> 600
MATERIAL	High density polyethylene		
COLOR	Brown (to the ground)		Black (to the building)
WEIGHT	400 gr/sqm	500 gr/sqm	600 gr/sqm
THICKNESS	0,4 mm + - % 10	0,5 mm + - % 10	0,6 mm + - % 10
LENGTH	20 m		
WIDTH	2 m		
HEIGHT OF NAPS	8 mm		
QUANTITY OF NAPS	1850 pcs/sqm		
WIDTH OF PLAIN SIDE	70 mm		
COMPRESSION STRENGTH	>100 kN/sqm	>150 kN/sqm	>250 kN/sqm
ELONGATION	% 37	% 45,4	% 43,6
TENSILE STRENGTH	5,3 kN/m	6,0 kN/m	8,64 kN/m
TEAR RESISTANCE	200 N		325 N
TEMPERATURE STABILITY	-30°C - + 80°C		
DRAINAGE GAP	5,5 L / sqm		

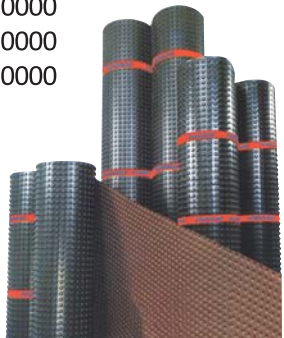


SYSTEM ACCESSORIES

Fondaline (Insulation Protector)

High density polyethylene  
Types : 400 gr/m<sup>2</sup> - 500 gr/m<sup>2</sup> - 600 gr/m<sup>2</sup>  
Pressure resistance:  
250 kN/m<sup>2</sup>; 150 kN/m<sup>2</sup>; 100 kN/m<sup>2</sup>  
width : 2 m (standard)  
length : 20 m

Code : 400: 04100110000  
500: 04110120000  
600: 04100120000



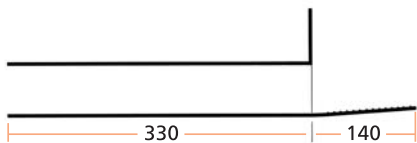
Code : 05502500000

Bituline Primer

High quality non-ionic  
bitumen emulsion produced  
in accordance with TS113.  
Packing: 17 kg Net metal  
canister.

Wall Base Rainwater Hopper

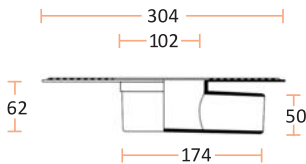
Thermoplastic rubber  
Outlet dimension: Ø100  
Depth: 330 mm



Code : 04500715000

Rainwater Hopper With Horizontal Outlet

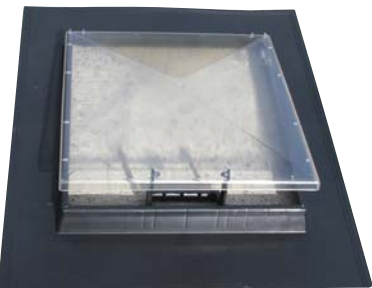
Thermoplastic rubber  
Outside diameter: 50 mm (Fits to Ø 50 PVC pipe)



Code : 04500725000

Roof Skylight

Width: 66.5 cm  
Length: 82.5 cm  
Color: Black  
Package: 5 pieces per package



Code : 05500608051



Round Leaf Trap

For vertical and horizontal rainwater  
outlets



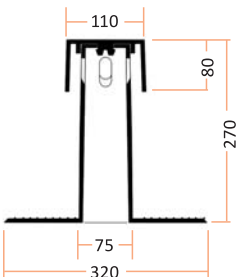
Code: 04500701000



Code : 04500730000

Air Shaft

Thermoplastic rubber  
Inside diameter: 75 mm  
Heigh: 270 mm



Inside And Outside Corner Piece

for sealing at membrane joints



Code : 04500735000

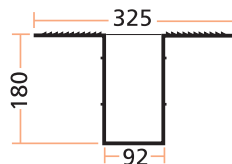
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Code: 04500705000

Rainwater Hopper With Vertical Outlet

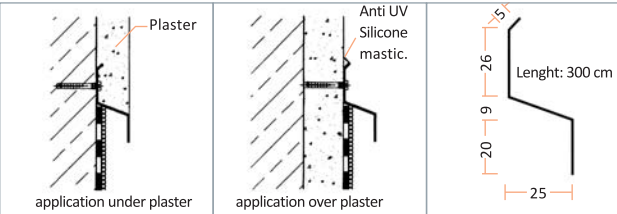
Thermoplastic rubber  
Outside diameter: 92 mm  
(Fits to Ø 100 PVC pipe)  
Depth: 180 mm



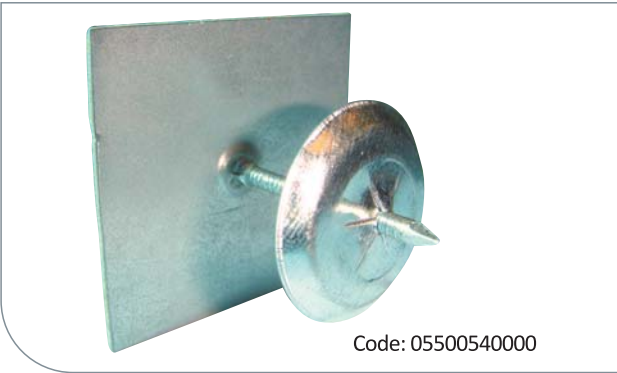




Aluminium Z-profile for finishing details  
length: 300 cm  
package: 10 pieces per package



Code : 05502630000



Code: 05500540000

Fondaline Fixing Device

for fixing Fondaline to the waterproofing membrane  
Self sticking base  
Length: 6 cm  
Packing: box of 300 pcs.

Onduline Roofing Torch

Made of durable materials for professional use  
Onduline roofing torch includes all parts necessary to torch down modified bitumen sheets in all climates.  
The kit includes: Piezo ignitor, Quick connect fittings, LP Gas Hose, Regulator, Squeeze Valve and Adjusting Valve.  
Length: 30 cm. and 40 cm.

Code: 05502520000  
05502530000



REFERENCES

