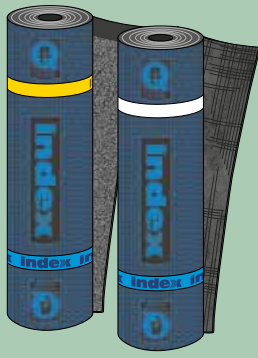


# TESTUDO PLURI MINERAL TESTUDO PLURI

MULTI-LAYER COMPOSITE POLYMER-BITUMEN WATERPROOFING MEMBRANE



GRANTS *LEED* CREDITS

CATEGORY	CHARACTERISTICS			ENVIRONMENTAL							METHOD OF USE				
<b>CE EP</b> COMPOSITE ELASTOPLASTOMERIC	<b>WATERPROOF</b>	<b>REACTION TO FIRE</b> Reazione al fuoco	<b>ECO GREEN</b>	<b>ASBESTOS FREE</b>	<b>TAR FREE</b>	<b>CHLORINE FREE</b>	<b>RECYCLABLE</b>	<b>NON DANGEROUS WASTE</b>	<b>EXHAUSTED OIL FREE</b>	<b>TORCH APPLICATION</b>	<b>HOT AIR APPLICATION</b>	<b>NAILING</b>	<b>COLD ADHESIVE BONDING</b>	<b>APPLICATION WITH MOLTEN BLOWN BITUMEN</b>	

\* For waterproofing membranes with **TEXFLAMINA** underface finish only

## 1 PROBLEM

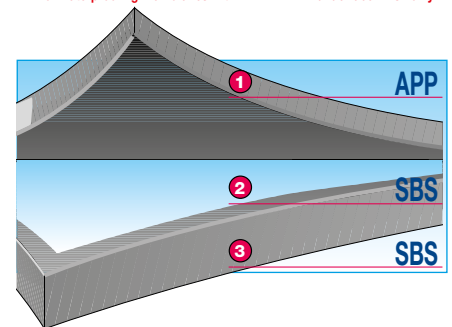
These polymer-bitumen membranes consist of a reinforcement, generally non-woven polyester fabric and/or glass felt, impregnated and coated with a single mixture made of distilled bitumen with the addition of two different types of polymers, usually classified in two large categories as APP-modified bitumen membranes and SBS-modified bitumen membranes.

The APP-modified bitumen membranes have a high level of heat resistance and can be directly exposed to sunlight, whereas the SBS-modified bitumen membranes, considerably more elastic and flexible even at low temperatures, soften at a lower temperature than the

others and, being sensitive to UV rays, must be protected with flakes or mineral granules in exposed waterproof coverings.

In most cases the fields of use for the two categories of membrane are the same, except that SBS- modified bitumen membranes are preferred for particularly cold climates or where high elasticity is required, and APP-modified bitumen membranes are better for applications in hot climates and where a visible covering is required with a smooth upper side, without mineral protection.

Traditional production techniques allow membranes with a unique waterproofing mass to be manufactured. INDEX research has developed an innovative technology to produce a composite membrane (reinforced with



a composite reinforcement) with a thickness made up of several layers of different types positioned in various ways depending on the different specific uses.

## 2 SOLUTION

**TESTUDO PLURI** is a composite waterproofing membrane with diversified mixtures of multi-layer polymer bitumen in which the reinforcement is impregnated with SBS-bitumen.

The lower layer in contact with the laying surface is also made of SBS-modified bitumen, while the upper layer consists of elastoplastomeric APP-modified bitumen. The elastomeric mixture of the lower side possesses very high ultimate elongation, and excellent resistance to ageing.

The elastoplastomeric mixture which makes up the protective layer of the upper side of the sheet is UV-resistant, supplemented with thermal shock stabilisers and has a high softening point.

**TESTUDO PLURI** is reinforced with a special non-woven polyester composite prefabricated fabric

stabilised with glass fibre.

The glass fibre ensures the dimensional stability of the membrane when hot and considerably reduces its shrinkage, a negative feature of normal polyester non-woven fabric reinforcements.

The polyester fibres are completely impregnated and coated with an elastomeric mixture using an exclusive procedure which guarantees absolute waterproofing, high resistance to tearing and impact.

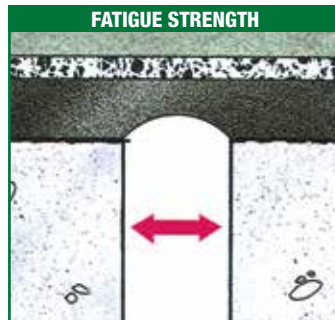
The elastomeric layer of the lower side has excellent elasticity even at low temperatures and will therefore resist the fatigue generated by the alternating cycle of opening and closing movements of any cracks that should form on the laying surface to which the membrane is bonded. It also ensures excellent adhesion to conventional building materials, to polymer-bitumen membranes, and also to oxidised bitumen coatings and old bituminous coverings.

The membrane is applied by a torch and so the lower side of **TESTUDO PLURI** is coated with Flamina, a hot-melt film with high and fast heat-shrinkage when coming into contact with heat.

The upper side is coated with Texflamina, the new multifunctional textile finish made of non-woven polypropylene fabric, which is also easily melted and can be painted immediately after ap-



**TESTUDO PLURI's** resistance to ageing is guaranteed by the upper APP-bitumen layer



The underside in SBS-bitumen and the continuously extruded polyester fibre reinforcement guarantee **TESTUDO PLURI's** excellent fatigue strength

**INTENDED USE OF "CE" MARKING SPECIFIED ACCORDING TO THE AISPEC-MBP GUIDELINES**

**EN 13707 - REINFORCED BITUMEN SHEETS FOR ROOF WATERPROOFING**

- Sub-layer or intermediate layer in multi-layer systems without permanent heavy upper protection (visible)  
- TESTUDO PLURI
- Upper layer in multi-layer systems without permanent heavy surface protection (visible)  
- TESTUDO PLURI  
- MINERAL TESTUDO PLURI

**EN 13969 - BITUMEN DAMP PROOF SHEET INCLUDING BITUMEN BASEMENT TANKING SHEETS**

- Membranes for foundations  
- TESTUDO PLURI

## ADVANTAGES

- It combines the advantages of APP-modified bitumen with those of SBS-modified bitumen.
- Longer life compared to APP- and SBS-bitumen membranes.
- Can be painted immediately.

## TECHNICAL CHARACTERISTICS

	Standard	T	TESTUDO PLURI	MINERAL TESTUDO PLURI
Reinforcement			"Non-woven" composite polyester stabilized with fibreglass	"Non-woven" composite polyester stabilized with fibreglass
Thickness	EN 1849-1	±0,2	4 mm	-
Weight MINERAL	EN 1849-1	±15%	-	4.5 kg/m <sup>2</sup>
Roll size	EN 1848-1	-1%	1x10 m	1x10 m
Watertightness • after ageing	EN 1928 - B EN 1926-1928	≥ ≥	60 kPa -	60 kPa -
Peel resistance L/T	EN 12317-1	-20%	600/400 N/50 mm	600/400 N/50 mm
Shear resistance L/T	EN 12311-1	-20%	700/500 N/50 mm	700/500 N/50 mm
Maximum tensile force L/T	EN 12311-1	-15% V.A.	40/45%	40/45%
Elongation L/T	EN 12691 - A		1 250 mm	1 250 mm
Resistance to impact	EN 12730 - A		15 kg	15 kg
Resistance to static loading	EN 12310-1	-30%	160/200 N	160/200 N
Resistance to tearing (nail shank) L/T	EN 1107-1	≤	-0.30/+0.10%	-0.30/+0.10%
Dimensional stability L/T	EN 1109 EN 1296-1109	≤	-15°C -10°C	-15°C -10°C
Flexibility to low temp. • after ageing	EN 1110 EN 1296-1110	≥ -10°C	100°C 90°C	100°C 90°C
Flow resist. at high temp. • after ageing	EN 1297		Test passed	-
UV ageing	EN 13501-1		E	E
Reaction to fire Euroclass	EN 13501-5		F roof	F roof
<b>Thermal specifications</b>				
Thermal conductivity			0.2 W/mK	0.2 W/mK
Heat capacity			5.20 KJ/K·m <sup>2</sup>	5.40 KJ/K·m <sup>2</sup>

Compliant with EN 13707 in terms of the resistance factor to steam penetration for reinforced polymer-bitumen membranes, the value of  $\mu = 20\ 000$  may be considered, unless declared otherwise.

(†) Thickness measured on the selvage according to EN 1849-1, tolerance ±10%.

plication. This finish ensures excellent adhesion of water-and solvent-based paints and so there is no need to wait for any depletion of oxidation products on the bituminous surfaces.

If the membrane remains exposed, a light-coloured paint such as WHITE REFLEX, INDECOLOR COOL REFLEX or SOLARIS type is always recommended, especially if laid over insulation, both to reduce the thermal shock and to help to insulate the roof. The paint should be applied within a week of laying the membrane.

To prevent the detachment or non-uniformity of the paint applied to the central part of the membrane over time, where the Texflamina remains intact, compared to the paint applied close to the overlaps, where the Texflamina is affected by the reflection of the sealing flame, care must be taken to limit the extension of the reflection, possibly using a welding torch with a flat

nozzle that can be placed under the overlap, or better still a hot air gun.

A version called MINERAL TESTUDO PLURI with the upper side coated with slate granules is also available. The slate is hot-bonded to the external layer in APP-modified bitumen, ensuring strong and lasting adhesion. In order to seal the membrane overlaps, the sheets are produced with a side strip of approx. 8 cm without slate granules on the upper side.

### APPLICATION FIELDS

**TESTUDO PLURI** is used to waterproof building roofs, for both new builds and renovations, as well as for waterproofing foundations.

**TESTUDO PLURI** is applied in single layers or as a finishing layer in a multi-layer system. The high mechanical

strength, flexibility, thermal stability and durability of **TESTUDO PLURI** mean it can be used on roofs subject to considerable dimensional variations in both hot and cold climates.

Given its mainly elastomeric nature, even when bonded in total adhesion **TESTUDO PLURI** is resistant to the fatigue generated by the cyclical movements of cracks that open on the laying surface.

The strong seals obtained for both the side and end joints on the smooth upper side guarantee perfect bonding even on flat areas and in the presence of stagnant water.

**MINERAL TESTUDO PLURI** is used as the finishing layer for an exposed covering where its decorative effect can be appreciated.

## PRODUCT FINISHING



**EMBOSSING FLAMINA.** The embossing on the lower surfaces of the membranes finished with Flamina film makes it possible to lay the product precisely and quickly, forming a smooth surface when melted with the torch. It indicates the correct melting temperature and lets the film retract faster. The embossing also enables optimal vapour diffusion; in spot bonded and loose laid installation, in the points where it remains intact, preventing blisters and swelling.



**"TEXFLAMINA" PP NON-WOVEN.** Multifunction, protection finishing material made up of a non-woven flame-melting synthetic-fibre fabric, coupled to the upper face of the membrane. It prevents coils from sticking to the roll, improves foot traffic resistance during installation, enhances the adhesion of paints, glues and extends their life.



**SELF-PROTECTION WITH SLATE GRANULES.** On the visible face of the membrane, a protective coating made up of slate granules of various colours is hot bonded. This mineral shield protects the membrane from ageing caused by UV rays.

• FOR ANY FURTHER INFORMATION OR ADVICE ON PARTICULAR APPLICATIONS, CONTACT OUR TECHNICAL OFFICE • IN ORDER TO CORRECTLY USE OUR PRODUCTS, REFER TO INDEX TECHNICAL SPECIFICATIONS •

index

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Slate membranes may change colour depending on the storage periods. The membrane goes away within 2-3 months for the colour to be corrected to the original colour. The same is true regarding the maintenance of colour and the different colourings that can occur among the variously exposed areas of the covering based on the types of artificial colouring.

The numerous possible uses and the possible interference of conditions or elements beyond our control, we assume no responsibility regarding the results which are obtained. The purchasers, of their own accord and under their own responsibility, must establish the suitability of the product for the envisaged use.

The figures shown are average indicative figures relevant to current production and may be changed or updated by INDEX at any time without previous warning. The advice and technical information provided, is what results from our best knowledge regarding the properties and the use of the product. Consulting