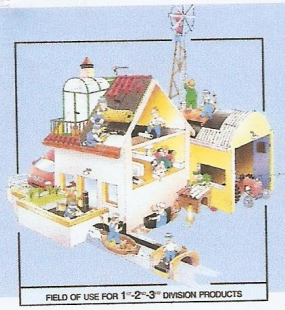


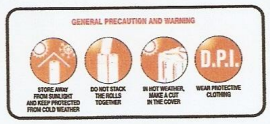
FIELD OF USE FOR 1"-2"-3" DIVISION PRODUCTS

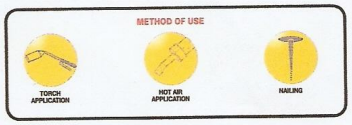
MINERAL *Design*

MEMBRANE MULTIFUNCTIONAL USE

- **TRIARMATO SPUNBOND POLYESTER**
- **POLYESTER**

WATERPROOFING MEMBRANE SELF-PROTECTED WITH CERAMIC MINERAL GRANULES IN VARIOUS COLOURS AND WITH SEVERAL TYPES OF DESIGN FOR THE DECORATION AND DEVELOPMENT OF THE "DESIGN" OF FLAT AND SLOPING ROOFS. POLYESTER/FIBREGLASS COMPOSITE REINFORCEMENT





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RM. 101 Liwag Bldg., 1258 Batangas St. Makati City
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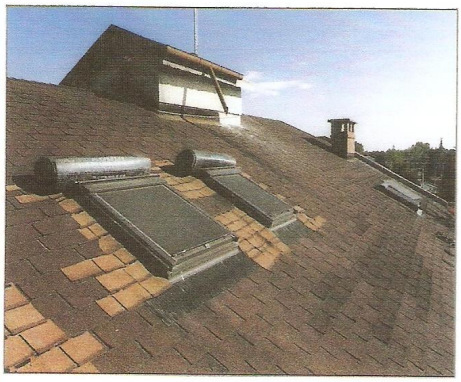
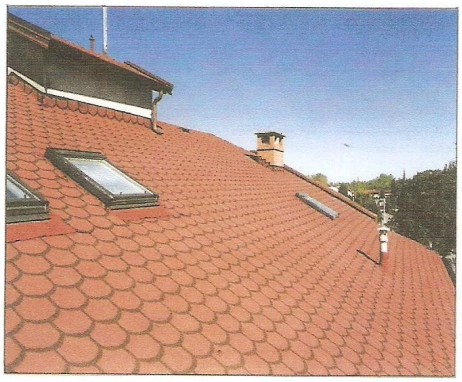
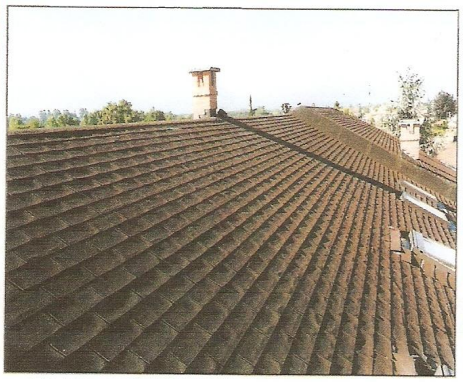
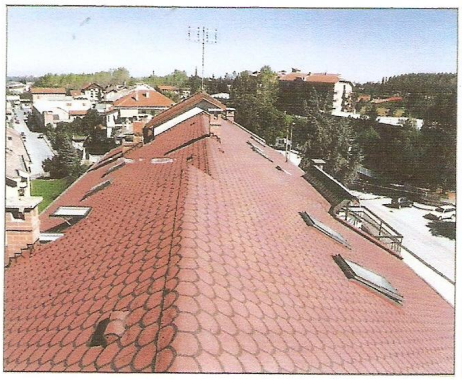
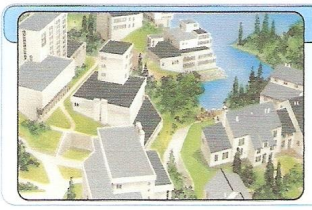
1st DIVISION
1ST LINE

MINERAL *Design*

REFERENCES OF BUILDINGS

Old	New
	
	
	

MINERAL *Design*

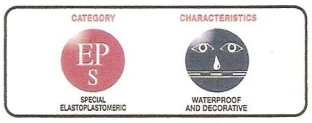


PROBLEM

HOW TO MAKE ROOFING MATERIAL FIT IN WITH THE ENVIRONMENT WITH A MORE PLEASING APPEARANCE

In cases where the waterproofing layer forms the final visible surface of a roof, problems such as the impact on the environment or meeting the aesthetic requirements of the structure may arise.

To solve these problems it is now possible to use a product which, in addition to guaranteeing good waterproofing qualities, makes it possible to decorate the roof itself.



SOLUTION

MINERAL DESIGN is the new generation Index membrane which is self-protected with a mineral finish. The mineral finish is no longer in just one colour but is now supplied in various colours in accordance with exclusive Index designs.

The **MINERAL DESIGN** membranes are made up of distilled bitumen, selected for industrial use, with a high content of elastomeric and plastomeric polymer additives to obtain a phase inversion compound whose continuous phase is formed by polymers in which the bitumen is dispersed, where the characteristics are determined by the polymeric matrix and not by the bitumen even if this is the most consistent ingredient. The performance of the bitumen is therefore incremented along with the durability and the resistance to high and low temperatures while the already optimum adhesive and impermeable qualities of the bitumen remain unchanged.

MINERAL DESIGN, as well as the new decorative effects, represents as always, a valid technical instrument for long lasting waterproofing systems. It is of an advanced technical design with a new composite reinforcement which resolves the problems of dimensional stability.

The incorrect storage of rolls, leaving the membranes exposed to the sun under the polythene cover, or the uneven torching of the membrane during application and the application on insulation with a high grade of thermal resistance may result in the warping and deformation of membranes

The traditional coupling with fibreglass, resolves the problem of stability but during the application phase the bending of the membrane causes microfractures in the fibreglass which can damage the bituminous mass which coats it.

The **MINERAL DESIGN TRIARMATO** (TRIPLE REINFORCEMENT) SPUNBOND POLYESTER membrane was designed to decorate roofs so it must not warp, crack or wrinkle.

The absolute dimensional stability both before and after application is extremely important and for this reason the **MINERAL DESIGN TRIARMATO** membrane has a composite reinforcement of three layers, where the fibreglass is compressed between two layers of continuous strand, "non-woven" polyester fabric and so cannot damage the bituminous mass.

Stability is guaranteed by the fibreglass mat which limits the movement of the membrane at high and low temperatures. The bituminous mass is protected and reinforced by a "non-woven" polyester fabric.

The dimensional stability of **MINERAL DESIGN TRIARMATO** is practically the same as that of membranes reinforced with fibreglass mat, while the optimal elastic characteristics of the "non-woven" polyester fabric remain unchanged, therefore the membrane does not crack, shrink, or warp.

Furthermore, **MINERAL DESIGN TRIARMATO** is also much more resistant to nail tearing than normal membranes, so it is suitable for mechanical fixing.

MINERAL DESIGN POLYESTER is reinforced with a "non-woven" polyester fabric stabilized with fibreglass mat which guarantees stability in hot conditions, while in cold conditions it behaves like a sheet reinforced with pure polyester.

The top face of **MINERAL DESIGN** is self-protected with hot bonded and pressed ceramic mineral granules, with the exception of an overlapping side strip, protected by a strip of Flamina film which is torch welded to weld the joints. The film which melts, with a high retraction, coats the underside of the membrane guaranteeing a fast and reliable installation.

FIELD OF USE

MINERAL DESIGN represents the evolution of mineral self-protected membranes. Now designers have a new instrument at their disposal and the special designs of the membranes open up new and, until now, unforeseen possibilities for the decoration of roofs.

With **MINERAL DESIGN**, now the pitched roof of a school, a church or a block of flats may be covered in a colourful way, with a choice of many colours.

MINERAL *Design*

MINERAL DESIGN DECORATION TABLE

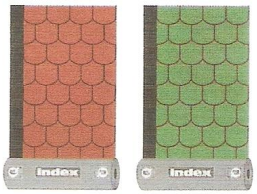
The colour combinations shown in the table are the only possible ones.

COLORS TABLE

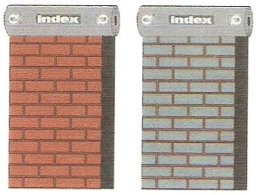
• NATURAL • RED • DARK BROWN • GREEN

• TILES

• OVAL SLATES

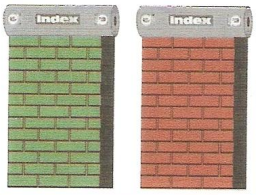


• BRICKS



• CHECKERBOARD

• SHINGLES



• DUCKS IN FLIGHT

Minimum purchase order 500 m².

• RHOMBUS

• AZTEC SUN

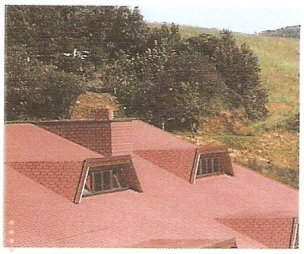
Minimum purchase order 500 m².

• WINDING FANTASY

• MILITARY CAMOUFLAGE

MINERAL Design

REFERENCES OF BUILDINGS

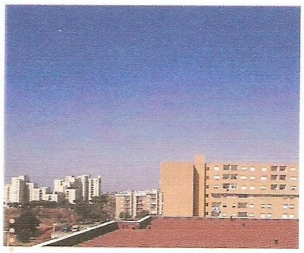


• MINERAL DESIGN - Shingles

• MINERAL DESIGN - Oval slates

• MINERAL DESIGN - Tiles and checkerboard

• MINERAL DESIGN - Shingles



• MINERAL DESIGN - Checkerboard

• MINERAL DESIGN - Tiles

REFERENCES AND INSTALLATION DETAILS

• MINERAL DESIGN - Tiles

• MINERAL DESIGN - Oval slates

• MINERAL DESIGN - Oval slates

• MINERAL DESIGN - Oval slates

• MINERAL DESIGN - Oval slates

• MINERAL DESIGN - Tiles

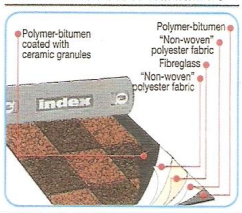
TECHNICAL CHARACTERISTICS

	MINERAL DESIGN POLIESTERE	MINERAL DESIGN TRIARMATO
Reinforcement	Composite reinforcement made from "non-woven" polyester, stabilized with fibreglass	Three layer composite: fibreglass layer between 2 layers of "non-woven" continuous strand Spunbond polyester fabric
Areic mass	4.5 kg/m²	4.5 kg/m²
Dimensional stability at 120°C (EN 1110)	Stable	Stable
Flexibility at low temperature (EN 1110) (¹)	-15° C	-15° C
Tensile strength Long./Trans. (EN 12311-1) (²)	650/500 N/5 cm	750/650 N/5 cm
Ultimate elongation Long./Trans. (EN 12311-1) (²)	45/50%	50/50%
Shear resistance of the joints (EN 12317-1)	≥ 500 N/5 cm or breakage outside the joint	≥ 500 N/5 cm or breakage outside the joint
Resistance to tearing	200 N	250 N
Puncture resistance (UNI 8202)	Static/Dynamic	Static/Dynamic
• on cement	PS_4/PD_4	PS_4/PD_4
• on expanded polystyrene	PS_4/PD_4	PS_4/PD_4
Dimensional stability in hot conditions Long./Trans. (EN 1107-1)	-0,25 /+0,10%	-0,20 /+0,10%
Impermeability to water (EN 1928)	≥ 60 kPa	≥ 60 kPa

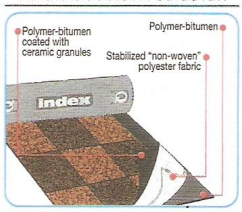
(¹) Test carried out on the underside. (²) Nominal value tolerance conform to UEAtc directive for polymer-bitumen membrane, January 1984.
According to prEN 13707 standards (August 1999) " 5.3.2. as vapour barrier resistance factor μ for reinforced polymer-bitumen membranes can be taken as value > 20,000.

COMPOSITION OF THE MEMBRANE

MINERAL DESIGN TRIARMATO



MINERAL DESIGN POLYESTER



PRODUCT

FINISH

EMBOSSING. 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.

MINERAL PROTECTION. 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.

DIMENSIONS AND PACKAGING

MINERAL DESIGN POLYESTER
MINERAL DESIGN TRIARMATO

WEIGHT kg/m²	ROLL SIZE mt	N. of rolls per pallet
4,5	1×10	25