

FLEXTER TESTUDO SPUNBOND POLYESTER MINERAL FLEXTER TESTUDO SPUNBOND POLYESTER FLEXTER TESTUDO SPUNBOND POLYESTER 25 FLEXTER TESTUDO SPUNBOND BIARMATO

ELASTOPLASTOMERIC DISTILLED POLYMER-BITUMEN WATERPROOFING MEMBRANES
BASED ON DISTILLED BITUMEN AND POLYOLEFIN COPOLYMERS

GRANTS **LEED** CREDITS

| CATEGORY | CHARACTERISTICS | | | ENVIRONMENTAL | | | | | | METHOD OF USE | | | | |
|-------------------|-----------------|------------------|-----------|---------------|----------|---------------|------------|---------------------|--------------------|-------------------|---------------------|---------|-----------------------|---------------------------------------|
| | | | | | | | | | | | | | | |
| ELASTOPLASTOMERIC | WATERPROOF | REACTION TO FIRE | ECO GREEN | ASBESTOS FREE | TAR FREE | CHLORINE FREE | RECYCLABLE | NON DANGEROUS WASTE | EXHAUSTED OIL FREE | TORCH APPLICATION | HOT AIR APPLICATION | NAILING | COLD ADHESIVE BONDING | APPLICATION WITH MOLTEN BLOWN BITUMEN |

* For waterproofing membranes with TEXFLAMINA underface finish only

DESCRIPTION

FLEXTER TESTUDO (2003 version) is the new family of INDEX polymer bitumen waterproofing membranes, whose quality is certified and constantly monitored by ITC-CNR with the "Technical Assessment for Use Document".

The **FLEXTER TESTUDO** membranes are the first to be certified in compliance with the most recent UEAtc Directives of December 2001 (UEAtc Technical Guide for the assessment of Roof Waterproofing System, made of Reinforced APP or SBS Polymer Modified Bitumen Sheets) whose test methods have been updated with the new EN European legislation. The characteristics of the membranes are highly superior with respect to the limits envisaged by the old and new legislation.

FLEXTER TESTUDO was the first membrane to be certified by the ICITE in compliance with the UEAtc common European Directives, drawn up for the first time in 1984, and has obtained numerous recognitions from other prestigious European institutions, such as the CSTB in France, the UBAtc in Belgium and the BBA in Great Britain. Now, after about 20 years' controlled production, periodically certified with three-yearly updates, the production range has been further improved with the introduction of the new composite polyester non-woven fabric reinforcements, stabilised with fibreglass, which give the membranes better dimensional stability in order to meet the most restrictive requirements of the new UEAtc European Directives. The family of membranes was then integrated with 3 mm thick membranes that combine the safe installation of a certified multi-layer arrangement with reduced environmental impact, offering a modern energy and resource-saving solution. The production range has also been enriched with a high mechanical resistance type, **FLEXTER TESTUDO 25**, suitable for the most hard-wearing uses such as waterproofing car park terraces paved with

asphalt. The technical data for uses under asphalt can be found in the specific technical data sheet. The mix that unites the membranes has been tested through twenty years' certification and is based on distilled bitumen, selected for industrial use, with a high content of elastomeric, plastomeric and metallocene co-polymers to obtain a "phase inversion" compound. The continuous phase is formed by a polymeric matrix in which the bitumen is finely dispersed even if this is the most consistent ingredient. This configuration determines the properties of the product, which are more similar to those of the polymeric material to which the bitumen adds superior adhesion and water resistance.

FLEXTER TESTUDO membranes have been grouped together in a single "Agreement" that envisages the following types.

| Membrane | Thickness | Waterproofing system | Walkability | Allowed slope |
|------------------|-----------|---------------------------|---|---------------|
| FLEXTER TESTUDO | 4 mm | Single or Multiple-layers | Limited to ordinary maintenance without suitable heavy protection | Class I |
| SPUN. POLYESTER | 3 mm | Multiple-layers | | |
| FLEXTER TESTUDO | 5 mm | Single or Multiple-layers | | |
| SPUN. POL. 25 | 4 mm | Single or Multiple-layers | | |
| FLEXTER TESTUDO | 4 mm | Single or Multiple-layers | | |
| SPUN. BIARMATO | 3 mm | Multiple-layers | | |
| MINERAL FLEXTER | 4 mm | Single or Multiple-layers | | |
| TEST. SPUN. POL. | 3 mm | Multiple-layers | | |

APPLICATION FIELDS

The long-lasting mechanical resistance and elasticity properties, as well as the stability at high and low temperatures of the Flexter Testudo membranes allow them to be used as sealing elements in **single or multiple layers**, both protected and visible, in the building trade and civil engineering, both for new jobs and for refurbishments:

- On all sloping surfaces, both flat and upright and on curved surfaces (class I).
- On different types of laying surfaces: concrete



EN 13707 - REINFORCED BITUMEN SHEETS FOR ROOF WATERPROOFING

- **Under layer or intermediate layer in multi-layer systems without permanent heavy surface protection**
 - FLEXTER TESTUDO SP. POLYESTER
 - FLEXTER TESTUDO SP. POLYESTER 25
 - FLEXTER TEST. SP. POL. BIARMATO - 4 mm
- **Upper layer in multi-layer systems without permanent heavy surface protection**
 - FLEXTER TESTUDO SP. POLYESTER - 4 mm
 - FLEXTER TESTUDO SP. POLYESTER 25
 - MINERAL FLEXTER TEST. SP. POLYESTER
- **Exposed single-layer**
 - FLEXTER TESTUDO SP. POLYESTER - 4 mm
 - FLEXTER TESTUDO SP. POLYESTER 25
 - MINERAL FLEXTER TEST. SP. POL. - 4 mm
 - FLEXTER TEST. SP. POL. BIARMATO - 4 mm
- **Single-layer under heavy protection**
 - FLEXTER TESTUDO SP. POLYESTER - 4 mm
 - FLEXTER TESTUDO SP. POLYESTER 25
- **Under heavy protection in multi-layer systems**
 - FLEXTER TESTUDO SP. POLYESTER - 4 mm
 - FLEXTER TESTUDO SP. POLYESTER 25
 - FLEXTER TEST. SP. POL. BIARMATO - 4 mm

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

- **Membranes for foundations**
 - FLEXTER TESTUDO SP. POLYESTER
 - FLEXTER TESTUDO SP. POLYESTER 25

laying surfaces, site-cast or prefabricated on metal or wooden roofing, on the most widely used thermal insulation systems for the building industry.

- For the most varied uses: terraces, flat and sloping roofs, under tile, foundations also earthquake proof, car park roofs, water works, ecological works, tunnels, subways, bridges and tarmac, dielectric and acid-proof coatings.

CERTIFICATIONS



Technical Assessment for Use Document
DVT-0010
ITC



CSTB AGREEMENT
CSTB

HOW TO MAKE A "COOL ROOF" COVERING AND INCRE

The MINERAL REFLEX WHITE treatment

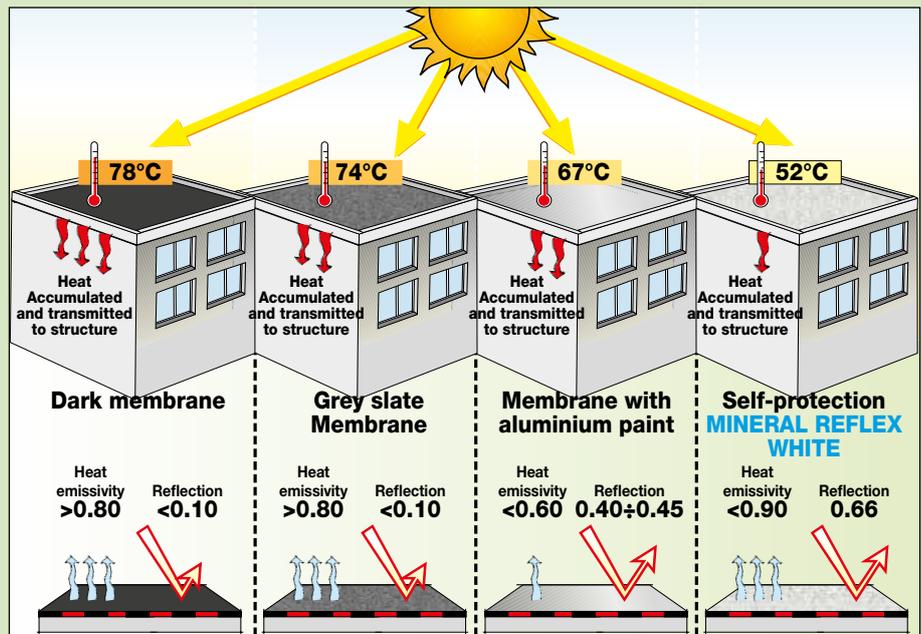
The **MINERAL FLEXTER** membranes are produced with the topside self-protected with grey slate granules but can also be requested with special white mineral finish consisting of **MINERAL WHITE REFLEX** ultra-reflecting ceramic granules with high saturation and brightness.

More than 90% of roofs are dark in colour and the roof surface reaches temperatures of around 80°C through solar radiation, which also negatively affects the photovoltaic panels installed on them, whose performance decreases as the temperature rises.

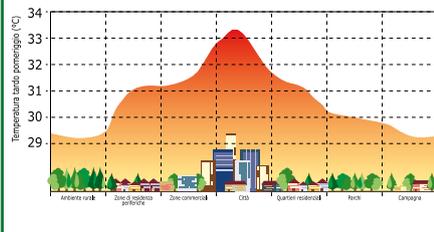
The technology to increase the roof's reflection of the sun's rays, called "Cool Roof", is one of three strategies (cool roof, green roof and cool pavements) for reducing urban heat islands that were studied at length in the United States. Recent studies at the Lawrence Berkeley National Laboratory published in March 2014 showed, with a cost/benefit comparison, the superior effectiveness of the cool roof compared to the green roof in combating climate change. The cool roof is three times more reflective than the green roof and they estimated that if all the roofs in the world were white it could reduce the Earth's temperature by at least 1°C.

The increase in solar reflectance of the roof surface using specific surface treatments of the waterproof covering allows you to **reduce its temperature**, and consequently prolong the life of the waterproof covering, **improve the efficiency of the photovoltaic panels**, save energy from air conditioning in summer in the rooms below, and at the same time **increase the albedo**, since the incident radiation fraction is reflected from the roof surface and produces **the benefit of increased performance of the PV system also during dimmer daylight hours**. The choice of white for the mineral self-protection of the **MINERAL FLEXTER** membranes, that we recommend should be of the self-protected type with **MINERAL WHITE REFLEX** ultra-reflecting ceramic granules, is the first applicable strategy to increase the reflection of solar radiation; the figure shows the temperatures recorded in Northern Italy in July 2007 under differently-protected bituminous surfaces.

The self-protection of the **MINERAL FLEXTER** membrane with **MINERAL WHITE REFLEX** ultra-reflecting ceramic granules with high



URBAND HEAT ISLANDS EFFECT



saturation and brightness prevents further surface painting that also could affect its behaviour towards fire and also allows you to create a cool roof that fulfils the criteria of solar reflectance **above 0.65** as required for "cool roof" flat roofs in **Annex 1 of the Interministerial Legislative Decree of 26/06/2015 in force since 01/10/2015**.

The **MINERAL WHITE REFLEX** protection, with a Solar Reflectance Index **RSI = 80%**, certified by the EELab of the University of Modena and Reggio Emilia, meets the **CAM minimum environmental criteria for flat roofs in the Ministerial Decree of 24 December 2015 in force since 2 February 2016 in point**

Solar Reflectance Index

MINERAL REFLEX WHITE
SRI*=79÷81

* SRI according to wind speed:
low wind=79%, medium wind=80% and high wind=81%.

The increase in the reflectance and emissivity provided by the **WHITE REFLEX** paint applied to the waterproof covering

| Surface | Reflection | Emissivity |
|---|--------------------|---------------------------|
| Dark membrane | <10% (<0.1) | >80% (>0.8) |
| Painted aluminium membrane | 40÷45% (0.40±0.45) | <60% (<0.6) |
| Self-protected membrane MINERAL REFLEX WHITE | 66% (0.66) | <90% (<0.90) |

2.2.3 (SRI ≥ 78), those provided for by the **ITACA Protocol standard UNI/PdR 13.1:2015 CRITERION C.6.8. (SRI ≥75)** and those of the **Protocol LEED GBC ITALY "To design, build and renovate institutional and commercial buildings"** of 2009 updated on 9 February 2016 under the item **SS CREDIT 7.2 - HEAT ISLAND EFFECT (SRI ≥78)**.



The advantages of MINERAL REFLEX WHITE self-protection

- It increases the efficiency of photovoltaic panels.
- You avoid painting operations and it is more durable.
- It extends the life of the waterproof covering
- It improves comfort and you save on the costs of summer air conditioning.
- It reduces the temperature of urban heat islands and also power consumption and therefore emissions of CO₂.

IMPROVE THE PERFORMANCE OF PHOTOVOLTAIC SYSTEMS

REPLACING A ROOF SURFACE WITH MEMBRANE WITH MINERAL REFLEX WHITE SELF-PROTECTION



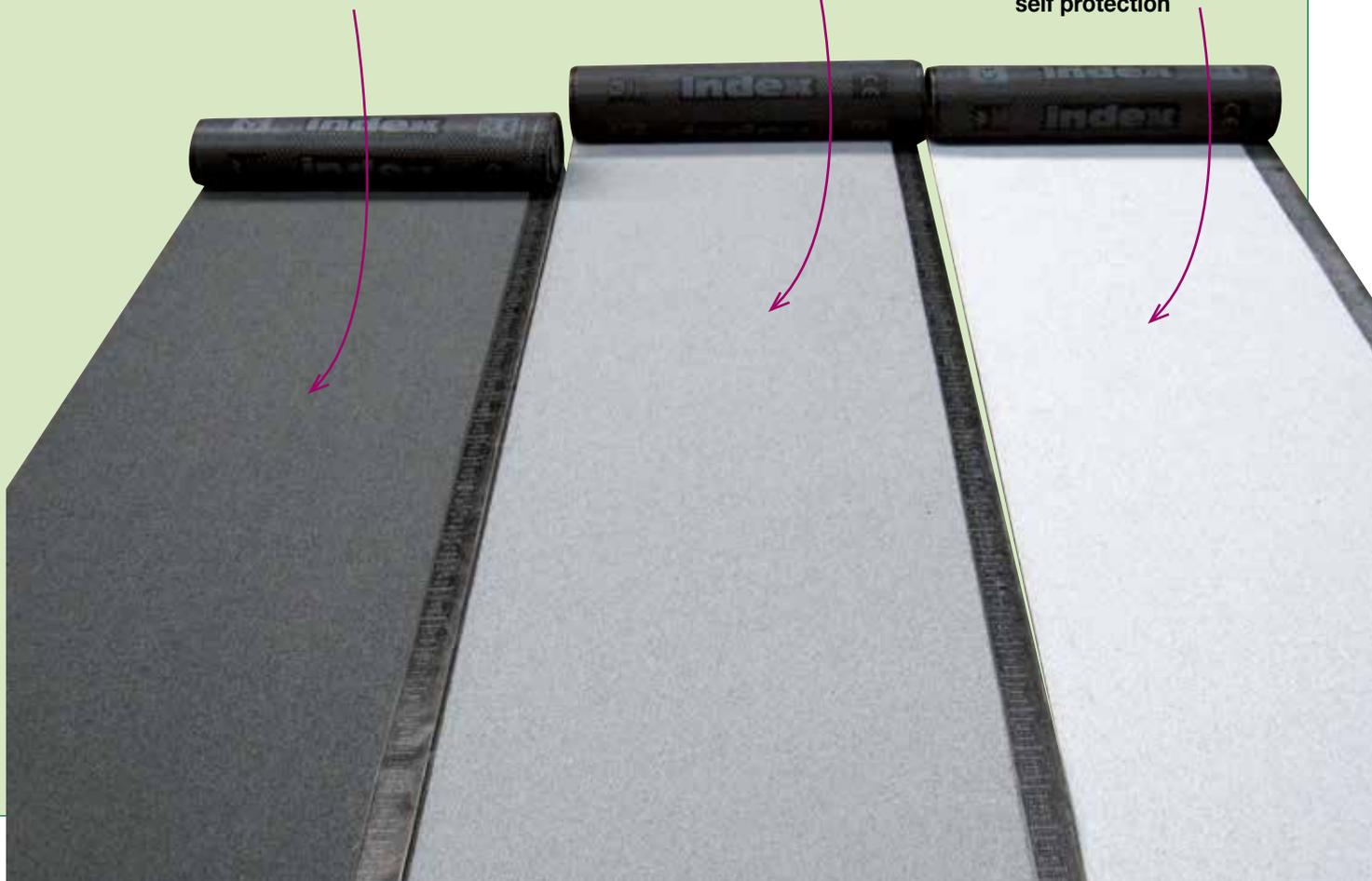
REFERENCES



Membrane with natural slate finish

Membrane with standard white slate finish

Membrane with **MINERAL REFLEX WHITE** self protection



TECHNICAL CHARACTERISTICS

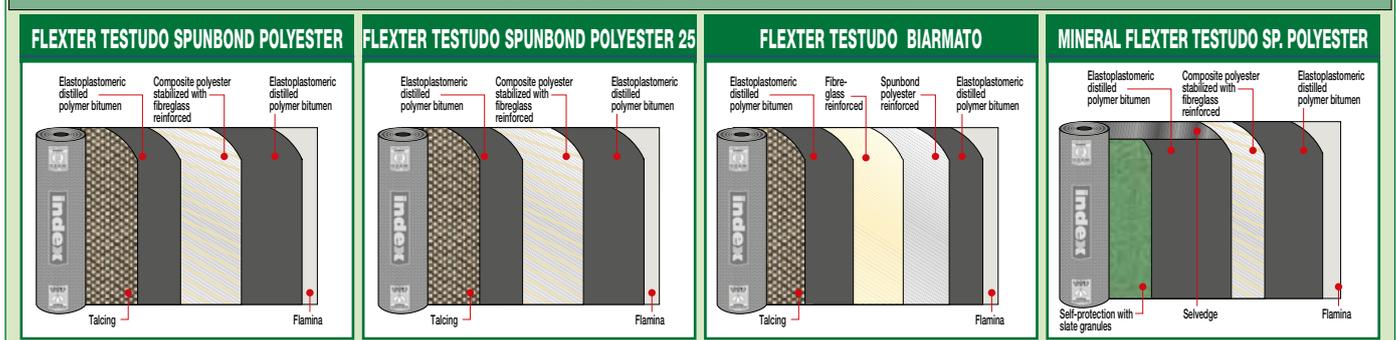
| | Standard | T | FLEXTER TESTUDO SPUNBOND POLYESTER | | MINERAL FLEXTER TESTUDO SP. POLYESTER | | FLEXTER TESTUDO SP. POLYESTER 25 | | FLEXTER TESTUDO BIARMATO | |
|--|-----------------------------|------------|--|-----------------|--|-----------------|--|-------------------|--|-----------------|
| Reinforcement | | | "Non-woven" Spunbond polyester fabric stabilized with fibreglass | | "Non-woven" Spunbond polyester fabric stabilized with fibreglass | | "Non-woven" Spunbond polyester fabric stabilized with fibreglass | | "Non-woven" Spunbond polyester fabric stabilized with fibreglass | |
| Thickness | EN 1849-1 | ±0,2 | 3 mm | 4 mm | 3 mm | 4 mm | 4 mm | 5 mm | 3 mm | 4 mm |
| Roll size | EN 1848-1 | -1% | 1x10 m | 1x10 m | 1x10 m | 1x10 m | 1x10 m | 1x10 m | 1x10 m | 1x10 m |
| Watertightness • after ageing | EN 1928 - B EN 1926-1928 | ≥ | 60 kPa | 60 kPa | 60 kPa | 60 kPa | 60 kPa | 60 kPa | 60 kPa | 60 kPa |
| Peel resistance L/T | EN 12316-1 | -20 N | - | 50 N/50 mm | - | 50 N/50 mm | 50 N/50 mm | 50 N/50 mm | 50 N/50 mm | 50 N/50 mm |
| Shear resistance L/T | EN 12317-1 | -20% | 750/600 N/50 mm | 750/600 N/50 mm | - | 750/600 N/50 mm | 900/800 N/50 mm | 900/800 N/50 mm | 500/500 N/50 mm | 500/500 N/50 mm |
| Maximum tensile force L/T | EN 12311-1 | -20% | 850/700 N/50 mm | 850/700 N/50 mm | 850/700 N/50 mm | 850/700 N/50 mm | 1 000/900 N/50 mm | 1 000/900 N/50 mm | 650/550 N/50 mm | 650/550 N/50 mm |
| Elongation L/T | EN 12311-1 | -15% V.A. | 50/50% | 50/50% | 50/50% | 50/50% | 50/50% | 50/50% | 50/50% | 50/50% |
| Resistance to impact | EN 12691 - A | | 1250 mm | 1250 mm | - | 1250 mm | 1500 mm | 1500 mm | 1000 mm | 1000 mm |
| Resistance to static loading | EN 12730 - A | | 20 kg | 20 kg | - | 20 kg | 25 kg | 25 kg | 20 kg | 20 kg |
| Resistance to tearing (nail shank) L/T | EN 12310-1 | -30% | 200/200 N | 200/200 N | 200/200 N | 200/200 N | 250/250 N | 250/250 N | 200/200 N | 200/200 N |
| Dimensional stability L/T | EN 1107-1 | ≤ | - | -0.30/+0.30% | - | -0.30/+0.30% | -0.30/+0.30% | -0.30/+0.30% | -0.10/+0.10% | -0.10/+0.10% |
| Flexibility to low temp. • after ageing | EN 1109 EN 1296-1109 | ≤ +15°C | -20°C -20°C | -20°C -20°C | -20°C -20°C | -20°C -20°C | -20°C -20°C | -20°C -20°C | -20°C -20°C | -20°C -20°C |
| Flow resist. at high temp. • after ageing | EN 1110 EN 1296-1110 | ≥ -10°C | 140°C 140°C | 140°C 140°C | 140°C 140°C | 140°C 140°C | 140°C 140°C | 140°C 140°C | 140°C 140°C | 140°C 140°C |
| UV ageing | EN 1297 | | - | Test passed | - | - | Test passed | Test passed | Test passed | Test passed |
| Reaction to fire Euroclass | EN 13501-1 | | E | E | E | E | E | E | E | E |
| External fire performance | EN 13501-5 | | F roof | F roof | F roof | F roof | F roof | F roof | F roof | F roof |
| Thermal specifications | | | | | | | | | | |
| Thermal conductivity | | | 0.2 W/mK | 0.2 W/mK | 0.2 W/mK | 0.2 W/mK | 0.2 W/mK | 0.2 W/mK | 0.2 W/mK | 0.2 W/mK |
| Heat capacity | | | 3.90 KJ/K | 5.20 KJ/K | 3.90 KJ/K | 5.20 KJ/K | 5.20 KJ/K | 6.50 KJ/K | 3.90 KJ/K | 5.20 KJ/K |

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.

Stated membranes may change colour depending on the storage periods. The colour may change away within 2-3 months for membranes for use in contact with the sun. The colour change does not affect the aspect of this type of membrane and cannot be the basis for a complaint. 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.

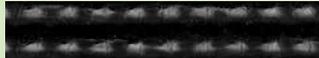
COMPOSITION OF THE MEMBRANE



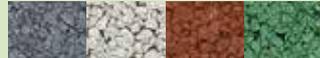
PRODUCT FINISHING



"FLAMINA" PE FOIL. Plastic protection film helping prevent coils from sticking to the roll. As it withdraws under the action of the flame right during its installation, it signals the best melting point in order to correctly glue the membrane to the brackets and rises. When not heated, it can be used as a sliding layer.



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.



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.



MINERAL REFLEX WHITE SELF-PROTECTION. A special high saturation and luminosity white mineral self-protection is applied to the face of the membrane to remain visible, which protects it from ageing due to UV rays, with high solar reflectance and very high heat emissivity. * Surface treatment suitable for application under photovoltaic systems.

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. Considering

• 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 •



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