COOL ROOF PRODUCTS
&
COOL ROOFING TECHNOLOGY

Mineral Thermo-Reflective Coatings

Warm in winter time and cool in summer time!

All around your home……also on the roof!

DIY your coatings

transpiring
internal/external

washable
roofs and terraces

waterproofing

Solaria Universal ES

- **applied to exterior** walls and on buldings' roof reflects up 90% of solar radiation producing an interior cooling effect up to 10°C.
- **Applied to interior** surfaces, inhibits heat-loss through the walls.
- **Correctly applied** on patio pavings, it provides thermal insulation and waterproofing.

Laboratori Ecobios s.r.l.

Zona industriale, lotto 14/A - 73033 Corsano (Le) - Tel./Fax +39 0833.533080

www.leuc.it - labo@ecobios-solaria.it

Solaria Energy Saving is a multi-mineral **milk and wine-vinegar thermo-reflective emulsion** employed in order to protect residential and industrial buildings from thermal solar radiation; in this way contributes to the reduction of the **Urban Heat Island** effect in cities and also to get buildings' energy saving.

Application Field

Thermo-reflective **painting** of residential, commercial and industrial buildings;
Thermo-reflective **waterproofing,** also through EIFS, of roofs and paved roofs;
Thermo-reflective **encapsulation** of asbestos-cement coverings.

Application Method

Int./Ext. Walls:

first: 1coat of Primer Ecobios LIB; **second:** 2 coats of Solaria Universal ES.

Roofs/Coverings:

first: 1coat of Primer Ecobios LIB; **second:** 2 coats of Solaria Universal ES; **third:** 1coat of EcobioSun.

The applications of **2 coats** of Solaria Universal ES must, in every cases, be preceded by the application of 1 coat of Primer Ecobios LIB and completed by 1 or more coats of EcobioSun in cases of finishing of roofs, flat roofs and asbestos-cement coverings.
Blend Solaria Universal ES with max 5% water in roller applications, and max 10% in spray applications; without adding any water on the non-sorbent supports.

Colouration: alkaline-resistant colours.

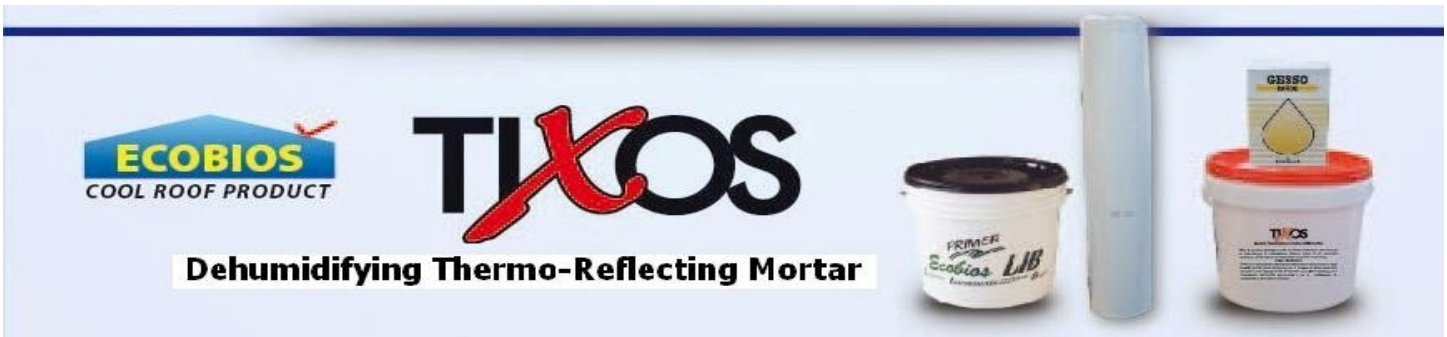
Technical Data: Solaria Universal ES is an alkaline paint based on a multimineral milk and wine-vinegar emulsion up to 70% and vinyl-acrylic emulsion up to 30% having: **ph value= 11,5 and specific weight: 1,36.**

Consumption: with 1L of Solaria Universal ES nearly 4,25sqms of surface can be treated.

Laboratori Ecobios s.r.l. produces a milk and Mediterranean grapes vinegar based paint, with which it is possible to create a multi-mineral and no-thermal film which, being applied on buildings, improves their passive resistance to solar radiations and enables:

- **to create eco-friendly and energy saving buildings,** resisting to solar radiation and thermal range;
- **to encapsulate the asbestos-cement** covering without washing them from mould and lichens before;
- **to waterproof and thermally insulate terraces** and patio pavings, even if protected by sheaths, or even replacing these later ones.

This invention has been awarded the golden medal and the compliments by International Jury to the **33rd International Salon of Inventions Of Geneva**, in addiction to the trophy of **Swiss Chamber of Commerce For Italy**, as the best Italian invention shown at the Salon.



Technical Sheet

Knifedout waterless TIXOS with 30% of chalk Alabastrine fast setting and apply with plastering trowel thin thicknesses on a glass-veil film from 30/45 gr/sqm previously applied with Primer Ecobios LIB.
If you need many thicknesses, TIXOS must be sandwiched between Primer Ecobios. LIB.
Finish the application with a hand roller / brush TIXOS diluted with water.

With a TIXOS tin 5kg knifedout with 1,5kg of alabastrine gypsum fast setting it's possible to dehumidify about 13sqm of humid walls.

Primer Ecobios LIB is a styrene acrylic emulsion suitable for the treatment of facades and terraces. Has an excellent resistance to abrasion, water, alkali and washings; is a plasticized product that maintains its elasticity over time; its **ph** value is 7,9; its **specific weight** is **1,05**.

Application method: Primer Ecobios LIB can be roller or spray applied. It may be blended with water in the following measures:

- of 20% on: buildings external walls, roofs, flat roofs, patios and asbestos-cement coverings;
- from 30% to 40% on internal walls of houses; without adding any water in case of: ceramics, porcelains, tiles, glass, plastic, metal;

The application of the glass-film 30-45gr/mq with the Primer Ecobios LIB must be made **before** of the mineral coatings

Colouration: in order to give some consistency to coloured hues of Solaria Universal ES we suggest also to colour the Primer Ecobios LIB.

Consumption: with 1L of Primer Ecobios LIB nearly 8sqms of non-rough surface can be treated. The consumption increases up to 50% in case of rough surfaces.

Storage: do not expose the tin to scorching sun and to the cold and freeze.

EcobioSun is a water dispersion of a styrene acrylic copolymer specially suitable for:
the treatment of alkaline, cement and fibre cement surfaces of highly resistant exterior walls; bitumen shingles and wall coverings; facades and terraces.

EcobioSun is capable to hold charges and pigments; has an very excellent resistance to abrasion, water, washings and alkali; its adhesion capacity is far higher than the norm; colours are brighter and full.

Application Field: EcobioSun must be absolutely applied on dried Solaria Universal ES layer in order to confer him brightness, elasticity and resistance, as well as on the Primer Ecobios LIB in order to treat surfaces for waterproofing.

Application method: Spray upon the Solaria Universal ES layer an EcobioSun glaze obtained by 30% watering it down.

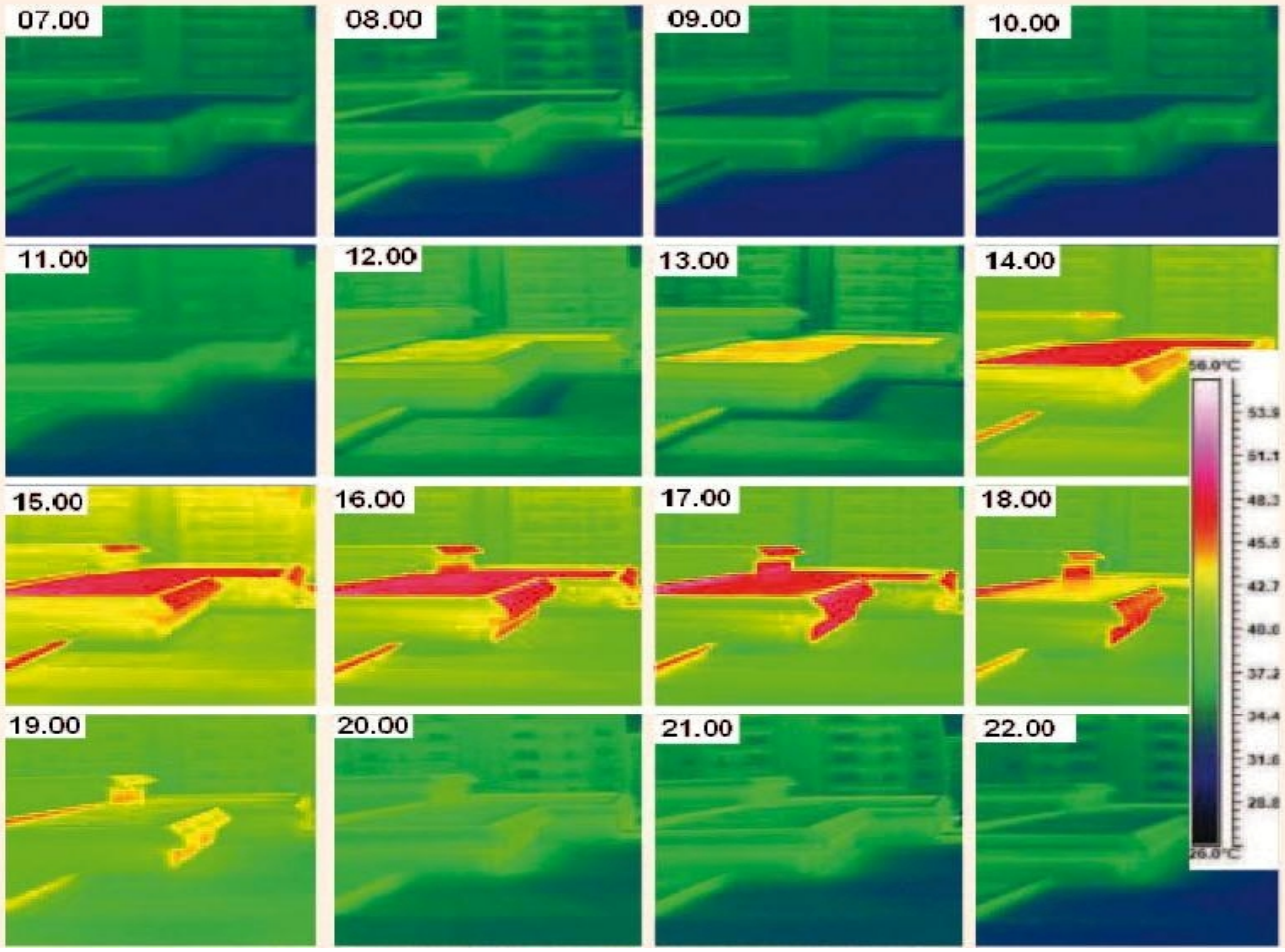
Film temperature: EcobioSun starts forming a film at 5C°.

Emulsion plasticization: the addition of Primer Ecobios LIB allows to obtain very flexible films without using external plasticizer; its ph value is 7,5; its specific weight is 1,05.

Consumption: with 1L almost 12sqms of Solaria Universal ES layer can be treated.

Storage: do not expose the tin to scorching sun and to the cold and freeze.

Solaria Universal: Thermografic analysis



solar time	T white	T tile	T air
7	24,5	29	26,3
8	23,5	28,9	25,6
9	26,5	32,5	31,1
10	29	37,5	31,4
11	30	45	34,3
12	30	47	37,8
13	39,5	53	32,7
14	40	55,5	33,5
15	40,5	55	31,3
16	37	52	32,1
17	36,5	49	32,7
18	35,5	46	30,8
19	29,5	38	27,3
20	27,5	35	27,4
21	25,5	33	27
22	25,5	32,5	26,6

The infrared measures , run every hour from h07.00a.m. to h22.00p.m. in a test in Trapani in the Cool Roofs project, demonstrate the behaviour of the thermo-reflective coating Solaria Universal ES on the terrace of about 700 square meters all a sunny day long; in particular we can note as the temperature of the surface of the thermo protected terrace is below ambient temperature up to h13.00p.m.; by that time and up to h20.00p.m. is a little higher; from h20,00p.m. the terrace cools all the heat as it was at the h07.00a.m. There are great temperature difference, throughout the day, between the terrace treated with Solaria Universal ES and that one no treated whose hot surface has been shown by the red colour.

COOL ROOFS PRODUCTS AND COOL ROOFING TECHNOLOGIES - First Part -

Technical Report for the waterproofing and thermo refracting treatment of: screed coats, slated and/or tarred membranes and porous and/or rough surfaces.

The thermo-refracting roofs, terraces and paved roofs carried out with **Solaria Universal Energy Saving,** a milk and wine vinegar formulated paint, is performed with a technology consisting of a multilayer coating cycle spread out over four steps:

Step I: Screed coat hardening.

This first step is really important if you need to harden friable surfaces, slated or tarred membranes, surfaces which shows micro cracks caused by thermal excursions and is performed through a previous roller/spray application of a **Ecobios LIB Elastomeric Primer** coat, 50% to 70% water diluted to the extent of 80gr/mq.

Step II: Support Waterproofing and insulation.

During this step, the elastomeric re-waterproofing of membranes or the insulation of the supports is carried out in order to anchor the milk-vinegar paint **Solaria Universal ES** by applying a roller and/or spray coat of **Primer Ecobios LIB,** fluidized with max 10% water to the extent of 120gr/mq.
The waterproofing hardening and insulation of terraces requires at least **200 gr/sqm** of Primer Ecobios LIB.

Step III: Performing the thermo-reflracting surface.

The two coats application of at least **300 gr/sqm** of eco-friendly white-coloured milk-vinegar paint **Solaria Universal ES**, fluidized with 10% water diluted if roller-applied and 20% if spray-applied, protects the waterproofing function of Primer Ecobios LIB during time, while inhibiting the heat accumulation of paved roofs.

Step IV: Protective film application.

The optimization of the Primer Ecobios LIB waterproofing function, and of the Solaria Universal ES thermo-refracting effectiveness in time is made possible by the roller and/or spray application of one or more **EcobioSun** coats to the extent of at least **100 gr/sq.m** fluidized with max. 10% water and applied onto a **perfectly dry** Solaria Universal ES surface in order to confer brightness, elasticity and resistance to it.

COOL ROOFS PRODUCTS AND COOL ROOFING TECHNOLOGIES – Second Part -

Maintenance

The ordinary maintenance of shields, membranes, roofs, terraces and paved roofs consists in verifying the integrity of the protective film realized by means of the **EcobioSun** finishing product, restoring it as the case might be. The entire painting cycle performance will not be necessary. The annual slight water jet cleaning of accumulated dust allows a more efficient reflection of solar radiation.

Note: The described cool roofing technology has been developed exclusively by Laboratori Ecobios s.r.l. and certified by ENEA Casaccia Research center.

The EIFS cycle realized using the kit Solaria Universal ES can be done on any type of material by which roofs and terraces are made, except for the pre-treatment as referred to in **Step I** in the case of friable surfaces.
The state-of-the-art **extrados encapsulation** of asbestos-cement coverings is performed following all the four steps describing the water-based paint application into the exact order and the exact quantity set out herein; the **intrados** encapsulation is performed solely following steps II and III.

In the case of waterproofed supports: ceramics, tiles, container, reservoirs, warehouses, silos, the thermo-refracting cycle must be carried out **without** adding any water.
The **interior/exterior walls** of residential buildings must be treated only using the breathable finishing paint, that is without using EcobioSun in order to avoid formations of condensation.

THERMAL SOLAR REFLECTION OF COOL ROOFS PRODUCTS

A particular product is defined "**cool**" if, when exposed to direct sunlight, it presents the following **solar reflectance** values:

> 80 = excellent
70 ÷ 80 = good
50 ÷ 70 = sufficient

further than the following **thermal emissivity** percentages:

> 80 = excellent
70 ÷ 80 = good
60 ÷ 70 = sufficient

A "**cool roof product**" is a "cool" product that, applied on roofs, terraces and buildings coats of all over the world, presents the each of the following 3 properties:

a) it contributes to the **earth cooling**: as it reflects the solar radiation in correspondence of "**short**" wavelengths, which slip to GHG (climaterants) dispersing the heat into the sidereal space.
b) it entails **energy saving** for summer climatization;
c) it strengthens the **buildings resistance** to precocious ageing due to **thermal cracks** (anti-age effect).

What is cool roofing technology?

A **cool roofing technology** is the application method of cool roofs products, which enables to add a new value to the buildings without any need to modify their construction techniques.

What is solar thermal protection?

Solar thermal protection of buildings consists in cladding the building by means of "cool“ products, i. e. products capable to reflect solar radiation during day, while re-emitting the absorbed heat during night or whenever the solar radiation intensity decreases.

Ecobios claddings completely take down the thermal overload of buildings until shade temperature is reached, after about 3 hours from the solar radiation decrease and/or termination; it may be possible that, because of the compaction phenomenon of the milk and vinegar cladding, the roof surface temperature during the night is up to 1 °C lower than that of the surrounding air.

Thank you for your attention!

Further Information:

www.leuc.it