icobit

icoper star®

One component, solar reflective, white, seamless waterproofing membrane for protection against water ingress and heat

Solar reflective

icobit.com

CE EN 1504-2 | EN 1504-2 (C) PI-MC-IR

icoper star

Solar reflective

CERTIFIED PRODUCT
EMISSIONS INTO INDOOR AIR
A+

B_{ROOF} (t1) (t2)

PONDING WATER RESISTANT

UV Resistant

Hail Resistant

One component, white, seamless membrane in water dispersion made of ponding-water resistant, solar reflective elastomeric resins. The resulting waterproofing system exhibits low heat buildup and contributes to improving thermal insulation.
Suitable for flat and sloped roofs, concrete slabs, old built-up roofing, sheet metal, PU-foam insulated roofs.

Uses

ICOPER STAR reduces the solar heat buildup over asphalt, concrete or metal roofing, thus decreasing the perceived indoor temperature.
Thanks to its Solar Reflectance Index SRI of 103, ICOPER STAR like other Cool Roof materials allows a significant energy saving while renovating old asphalt roofing or waterproofing exposed roofs.
ICOPER STAR reflects 80% of solar radiation, which reduces the roof surface temperature by 50%, compared with dark colors.
The above allows reducing the cooling load and related energy costs. Moreover, a greater Albedo, the reflected portion out of the total solar radiation, increases solar panel efficiency.

Benefits of Cool Roofs

- Lower roof surface temperature
- Better living and working comfort
- Reduced cooling energy costs
- Improved solar panel energy output

Features / Benefits

- Its ponding water resistance makes it suitable for low-slope and flat roofs.
- 400% Tensile Elongation.
- Crack bridging ability at low temperature.

- Can be walked over for ordinary maintenance.
- Anti-carbonation protection of reinforced concrete.
- Certified BROOF (t1) (t2) in accordance with EN 13501-5.
- One component, ready to use, quick, safe and easy to apply.
- VOC content rated A+ (very low emissions).
- Contributes to obtaining LEED® credits.
- Excellent UV resistance: no topcoat required.
- Appropriate resistance to industrial and marine environments.
- Opened packaging can be resealed and stored for further use.
- Hail resistant.

Solar Reflectance Index "SRI" 103

Solar Reflectance "ρ_e": 0.83

Solar Absorptance "$\alpha_{e,average}$": 0.17

Emissivity "ε": 0.90

Surface preparation

• Clean thoroughly and remove dust, loose material or non-adhering particles, grease, oil, formwork release agents and any contaminant that may affect proper adhesion.
• Substrate must be cured, clean, dry, sound, solid and not exposed to rising damp, negative hydrostatic pressure or evaporative flows.
• Joints and substrate cracks must be treated appropriately as per industry standards: control and isolation joints, floor-to-wall as well as any vertical transitions must be sealed with ICOJOINT MS silane modified polymer or with ICOARM BUTYL TAPE self-adhesive sealing tape.
• Check for proper operation of rainwater drains and roofing details in accordance with European Standard EN 12056.

- **Concrete** Ensure that the surface finish is appropriate and suitable to receive waterproofing. Allow newly placed concrete to cure fully.
New substrates must be primed with a coat of ICOPER STAR diluted with 50% water and applied at a rate of approximately 300 gr/m^2.
Existing concrete or porous substrates, once the surface has been cleaned and repaired, must be treated with the one-component ICOFISS bonding primer at a rate of approximately 250 gr/m^2.
Consider applying to lightweight concrete slabs according to their nature and water absorption rate. Ensure that the surface is smooth, dry and dimensionally stable; even out by using a controlled shrinkage mortar and apply ICOBLOK two-component epoxy primer (see TDS).
- **Bitumen** Clean thoroughly and remove peeled-off protective paints. Check for proper bonding to the substrate, especially in the upstands and seams, which must be torched down if not in full adhesion. Built-up roofs that tend to delaminate or creep need to be repaired by removing the affected area and patching it with a portion of fresh bitumen membrane.
Prime smooth-surfaced membranes with ICOFISS applied by brush or roller at a rate of 100 gr/m^2.
Mineral-surfaced membranes must be primed with a coat of ICOPER STAR diluted with 50% water and applied at a rate of approximately 300 gr/m^2.
Given the tensions and expansions that may occur on asphalt substrates, it is recommended to reinforce the waterproofing layer with ICOARM TNT ROLL

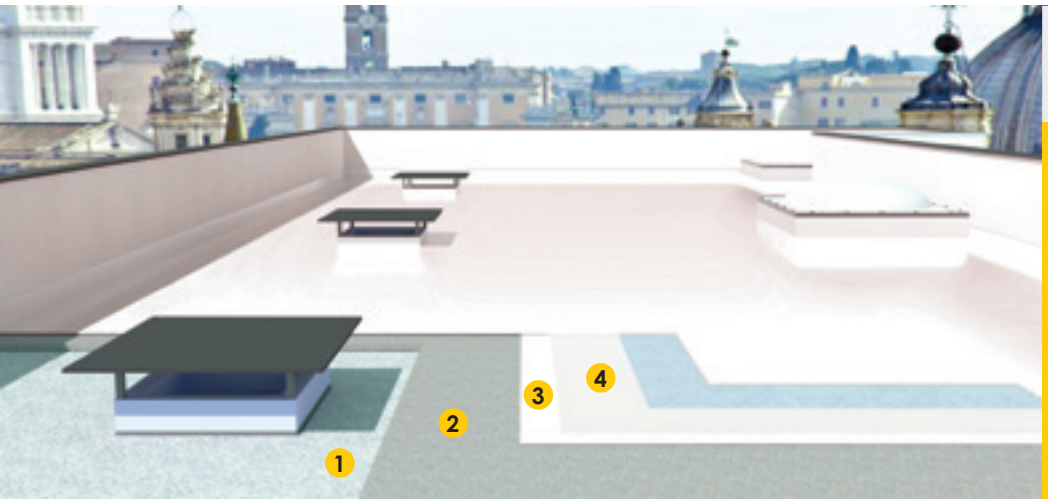
nonwoven geotextile embedded between the first and second coat of ICOPER STAR.
- **Metal**: Remove oxidized spots and apply ICOPOX PM 102 rust inhibiting primer at a rate of 150 gr/m^2.
No priming is required on rust-free, painted metal substrates.
Seal all overlaps, fixing points and waterproofing details with ICOARM BUTYL TAPE self-adhesive sealing tape placed over the seams.

Application instructions

Once the substrate has been accurately prepared and the primer has properly dried, apply two or more coats of ICOPER STAR at an overall rate of not less than 2 kg/m^2 using a roller, brush or airless spray machine (see relevant box). Allow to cure before applying the next coat. The areas that are potentially subject to extra mechanical strain should be reinforced with ICOARM TNT non-woven fabric. The waterproofing layer must be turned up and terminated at least 10 cm on any adjacent vertical surfaces. Tools can be cleaned with water while product is fresh or with nitro thinners once hardened.

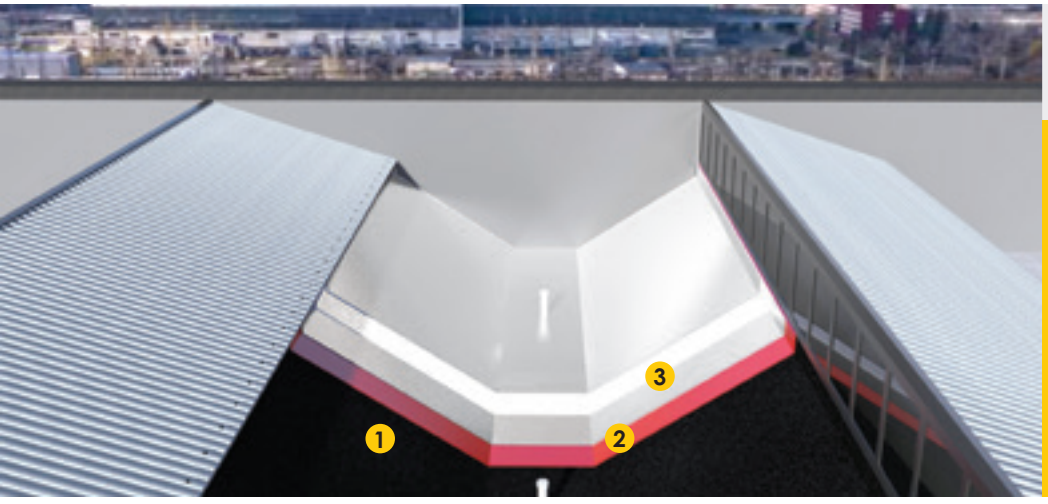
FOCUS ON AIRLESS

Airless machines allow spraying ICOPER STAR. Piston and diaphragm machines exist that draw the spraying medium directly from its original container via means of a suction hose. These machines do not need air as driving propellant but use the pressure generated by an internal pump to push the product through the hose and into the spraying gun.
Airless application allows speedy coverage: 800-1000 m^2 (2 operators/ 8 h).



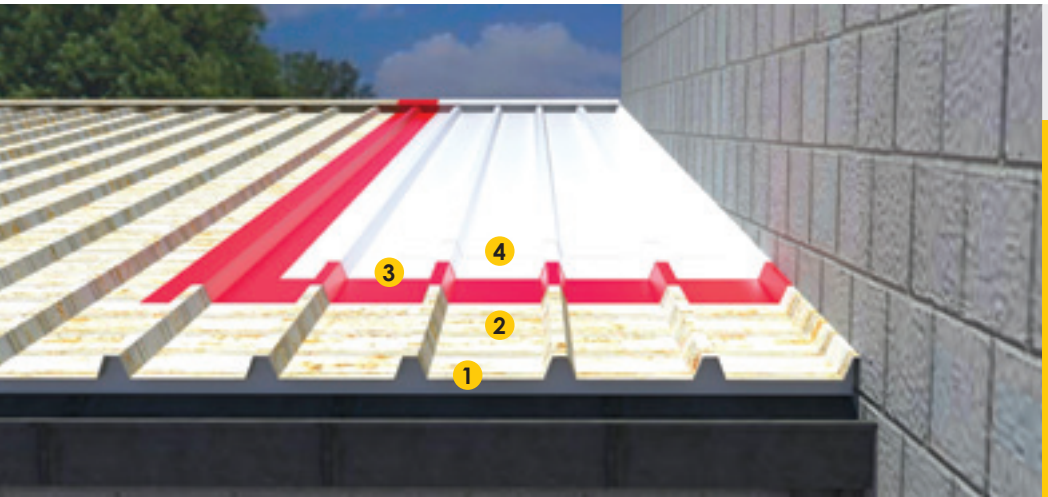
Exposed flat roof

BUILD UP
1) Load carrying element: roof slab
2) Slope layer: reinforced concrete screed
3) Primer: ICOPER STAR diluted with water
4) Waterproofing: ICOPER STAR in two coats (reinforced with ICOARM TNT - *where appropriate*)



Weathered built-up roof

BUILD UP
1) Old waterproofing layer: built-up roofing membrane
2) Primer: ICOFISS
3) New fully adhered waterproofing: ICOPER STAR in two coats reinforced with ICOARM TNT

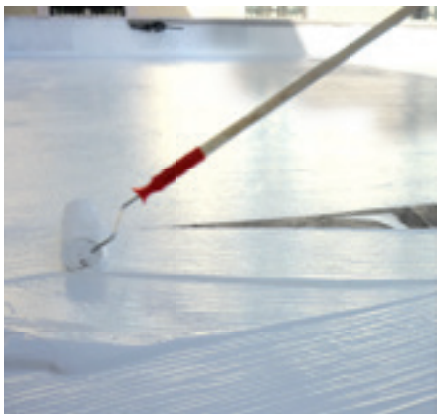


Corrugated sheet metal

BUILD UP
1) Load carrying element: steel beams
2) Substrate : insulated metal panels
3) Rust inhibiting layer: ICOPOX PM 102
4) Waterproofing: ICOPER STAR

Precautions

• Apply at temperatures between +5°C and +35°C (41°F/95°F). Avoid applying during the hotter part of the day and to substrates that are excessively exposed to sunlight, both before and during application.
• Do not apply in case of rain, fog, dew, or if such weather conditions are imminent or expected during the curing period.
• Allow newly placed concrete to cure fully. Avoid applying ICOPER STAR to substrates that are moist or subject to rising damp and/or evaporative flows. If needed, install the specific EXIT AIR vent pipes and use the ICOBLOK primer for damp substrates.
• Avoid applying thick layers in one coat.
• If a non-woven fabric is required, ensure that the same is properly saturated in order to minimize the risk of delamination.
• Ensure that the upstands are fully bonded to sound, finished substrates and renders.
• Temperatures and moisture affect drying/curing time. The latter may become considerably longer if the product is applied close to its minimum allowed temperature.
• Dirt pickup may be reduced thanks to the ICOROOF PUR protective coating (see TDS).
• ICOROOF PUR also ensures additional chemical resistance and thus a longer life expectancy when waterproofing is carried out in very aggressive conditions, such as industrial and marine environments.



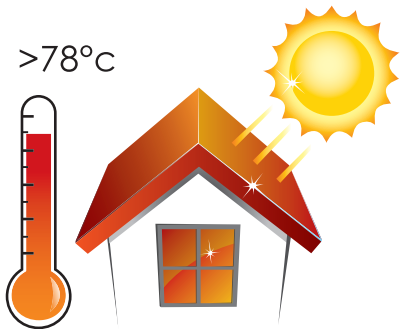
PRODUCT PERFORMANCES		
HARMONIZED STANDARD EN 1504-2:2004		
TEST METHODS	**ESSENTIAL CHARACTERISTICS**	**REQUIREMENTS**
EN 1062-6	Permeability to CO_2	S_D > 50m
EN ISO 7783-1-2	Water vapor permeability	CLASS I (S_D < 5m)
EN 1062-3	Capillary absorption and water permeability	w < 0.1 Kg/m^2 · h$^{0.5}$
EN 1542	Bond strength by pull off test	≥ 0.8 MPa
EN 13687-3	Freeze-thaw cycling without de-icing salt immersion	≥ 0.8 MPa
EN 1062-11:2002	Exposure to artificial atmospheric agents	No visible defects
EN 1062-7	Crack bridging properties	class A5 (-5°C)
EN 13501-1	Reaction to fire	Euroclass E

FOCUS

COOL ROOF DESIGN

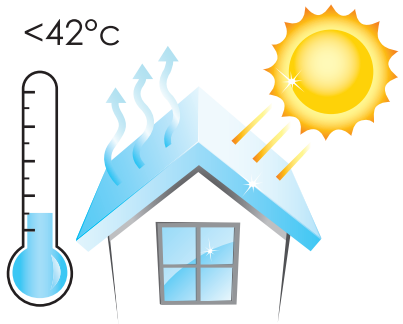
The issues of modern roofs

Dark roofs made of low-emission materials tend to absorb excess solar heat, so harming both the environment and human health. The ensuing rise in indoor temperatures leads to higher cooling energy consumption with greater release of CO_2 in the atmosphere. Which entails a higher perceived temperature in urban areas, a phenomenon known as "heat island effect".
The regulatory authorities and the relevant industry associations encourage the use of new, more sustainable, greener technologies with lower environmental impact.



Coll roofs – what they are and what purpose they serve

Thanks to the new regulations on energy certification and on the design, construction and maintenance of buildings, solar reflective waterproofing plays a leading role in turning existing roofs into cool roofs.
Such materials may be used for new waterproofing as well as the renovation and energy efficiency improvement of existing waterproofing systems. Their ability to reflect the solar radiation and to release the residual heat of a building in the form of infrared rays helps decrease perceived indoor temperatures during the hotter seasons and protects the construction elements by reducing the thermal shock they are exposed to.



Liquid waterproofing in cool roof design

A cool roof can be obtained thanks to the use of liquid chemical compounds in white color filled with special additives that enhance the surface thermal reflective properties.
These products may be used for waterproofing exposed flat roofs or for improving the energy efficiency of existing asphalt roofing.
Their ease of application makes them suitable also for irregularly shaped substrates such as dome roofs or corrugated sheet metal, which would be impossible to waterproof with built-up roofing membranes.
Furthermore, applying by airless spray gun improves efficiency and reduces installation time.

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EXTERNAL FIRE PERFORMANCE OF ROOFS

BROOF rating and solar roofs

When it comes to fire safety, roofs and roof terraces are the most vulnerable areas of a building due to both rising flames and the fact that roofing materials may fuel the fire.
In addition to internal factors, a fire can also be caused by external factors, such as windblown cinder from neighboring building fires or electrical faults in solar systems and related wiring.

The BROOF certification carried out using the test methods (t1), (t2), (t3), (t4), in accordance with EN 13501-5, provides the specific fire performance rating for roofs and roof coverings exposed to external fire.
Roofs lacking an external fire performance assessment (FROOF) can achieve that thanks to the use of specific waterproofing systems that allow obtaining a BROOF classification recognized within the European Economic Area.

ICOPER STAR is classified BROOF (t1), (t2) in accordance with European Standard EN 13501-5 "Fire classification of construction products and building elements – Part 5: Classification using data from external fire exposure to roofs tests".

Local regulations in several countries require such performance for all roofs, and especially when a photovoltaic (PV) system is installed.
In brief, when the roofing and/or cladding elements are not incombustible (Class 0 and Class 1) or when a fire resistant layer cannot be interposed between the solar panels and the supporting surface, a specific fire spread risk assessment is required for a PV system to be installed: roofs that are rated BROOF (t2), (t3), (t4) are considered appropriate for the installation of Class-2 solar panels or equivalent.

ICOPER STAR ASSIGNS BROOF CLASS TO ROOFS AND ROOF COVERINGS

The use of ICOPER STAR, classified BROOF (t2), allows roofs to obtain the fire performance required for installing a photovoltaic system.

FOCUS

ENVIRONMENTAL SAFEGUARDS

LEED Certification

LEED (Leadership in Energy and Environmental Design) is the most widely used green building rating system in the world. Conceived by the USGBC (U.S. Green Building Council), it provides a framework for healthy, highly efficient and cost-saving green buildings.
It is a globally recognized "voluntary" certification system for sustainable architecture.
LEED is applicable to existing buildings and new construction intended for any use (residential, commercial, healthcare, offices, schools, etc.) and is available for all building scales (interior spaces, buildings, homes, cities, communities) and all building phases (new construction, interior fit outs, operations and maintenance, core and shell).
Projects pursuing LEED certification are awarded points for green building strategies across several categories. Based on the final score, a projects achieves one of four LEED rating levels: Certified, Silver, Gold or Platinum.
Building products and materials are an essential part of the process, as they allow achieving credits.

GREEN BUILDING COUNCIL SOCIO ITALIA

icobit is partner of GBC Italia

Icobit contributes significantly to achieving LEED certification especially through the use of products of the Icoper Line, which are eligible for points earning across different credit categories of the LEED v4 Manual.

CREDIT	POINTS
SS - Heat Island Reduction	up to 2 points
EQ - Low-Emitting Materials	up to 3 points

VOC Emissions into indoor air

The following must be complied with in order to meet one of the prerequisites for construction works provided for in EU Regulation No. 305/2011 on Construction Products (former Council Directive 89/106/EEC), and namely Requirement No. 3. – HYGIENE, HEALTH and ENVIRONMENT –: "The construction works must be designed and built in such a way that they will, throughout their life cycle, not be a threat to the hygiene or health and safety of workers, occupants or neighbors, nor have an exceedingly high impact […] on the environmental quality or on the climate […], in particular as a result of any of the following: […] (b) the emissions of dangerous substances, volatile organic compounds (VOC), greenhouse gases or dangerous particles into indoor or outdoor air; […]"
The level of emissions into indoor air of volatile substances posing an inhalation toxicity hazard is rated on a scale from A+ (very low emissions) to C (high emissions).

Thanks to its VOC-free formulation, the Icoper Line possesses the lowest emission level (A+), which ensures safety and compliance with Requirement No. 3. (Hygiene, Health and Environment) of CPR 305/2011.

FOCUS

HAIL RESISTANCE

Hail is a form of precipitation composed of spherical lumps of ice, known as hailstones, which can damage property, crops, and even cause bodily harm. Hail can cause significant damage to roofs and to the overlying waterproofing systems due to their poor resistance to dynamic puncture.
Like most weather events, hail is measured and categorized. For such purpose a Hailstorm Intensity Scale was developed in 1986 by Jonathan Webb, member of the UK's Tornado and Storm Research Organization (Torro), a research body specializing in severe convective weather.
The Torro Scale is a 0-10 scale that classifies hailstorms according to their impact; the latter is proportional to the hailstone size and expected fall speed. The scale begins at "no damage" and ends at "catastrophic damage".

ICOPER STAR conveys to the roofing system a hail resistance up to H7 on the Torro Scale, in accordance with EN 13583:2012 "Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of hail resistance".

PRODUCT PERFORMANCES

EN 13583:2012

Substrate type	Impact Speed	Torro Scale intensity
Rigid	≥ 41 m/s	H4 – H7
Flexible	≥ 41 m/s	H4 – H7

TORRO SCALE

SIZE CODE	DIAMETER (mm)	IMPACT SPEED (m/s)	APPROXIMATE SIZE DESCRIPTION	INTENSITY
1	5 – 10 mm	13.31 – 18.82	Pea	H0 – H2
2	11 – 15 mm	19.74 – 23.05	Bean, Hazelnut, Mothball	H0 – H3
3	16 – 20 mm	23.81 – 26.62	Small grape, Cherry, Small marble	H1 – H4
4	21 – 30 mm	27.28 – 32.61	Large grape, Walnut, Large marble	H2 – H5
5	31 – 45 mm	33.14 – 39.93	Pigeon egg, Chestnut, Ping pong or golf ball	H3 – H6
6	46 – 60 mm	40.37 – 46.11	Chicken egg, Small peach or apple, billiard ball	H4 – H7
7	61 – 80 mm	46.49 – 53.25	Ostrich egg, Medium-sized orange, Large peach or apple, Tennis ball, Baseball	H5 – H8
8	81 – 100 mm	53.58 – 59.53	Large orange, Grapefruit, Softball	H6 – H9
9	101 – 125 mm	59.83 – 66.56	Melon	H7 – H10
10	> 125	> 66.56	Coconut	H8 – H10

TECHNICAL DATA

PRODUCT FEATURE	MEASURE	UNIT
Type of product	one component, water based	
Density	1.35	g/ml
Solid content	71 (± 2%)	%
Service temperature	–20 to +90 (–4 to +194)	°C (°F)
Solar Reflectance (ρ_e)	0.83	
Solar Reflectance Index "SRI" (ASTM E1920-11)	103	
Waiting time between coats (+23°C, 50% R.H., breezy)	minimum 3	hours
Curing time (+23°C, 50% R.H., breezy)	minimum 24	hours
Tensile elongation at break (7 days, +23°C, 50% R.H.)	400	%
Tensile strength (7 days, +23°C, 50% R.H.)	2.0	MPa
Tensile elongation at break (7 days, +23°C, 50% R.H.) with ICOARM TNT	50	%
Tensile strength (7 days, +23°C, 50% R.H.) with ICOARM TNT	5.0	MPa
Determination of hail resistance (EN 13583:2012) – rigid substrate and flexible substrate	≥ 41	m/s
Artificial aging	pass	
Water impermeability	no penetration	
Number of coats	minimum 2	
Spread rate per coat	1.0	Kg/m²
Dry film thickness (2,2 Kg/m²)	1.0 (± 0.1)	mm
Shelf life	18	months

Safety measures

See SDS

Storage

Store in a dry, well-ventilated place at temperatures above freezing.

Colors

White

Please contact our technical support at:
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PACKAGING

APPLICATION METHODS

BRUSH

ROLLER

AIRLESS SPRAY

ICOPER STAR EN 0224

Notes

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