Advanced Waterbased Coating Systems for Concrete Roofs & Facades

www.abolinco.com
Moisture & Concretes:
Absorption by Masonry Walls and Roofs and Resulting Damage

When mineral building materials come into contact with water, they absorb an amount which depends on their porosity. The result is various forms of damage, including:

- Penetration of moisture through the wall
- Cracks caused by swelling and shrinkage
- Damage caused by frost and de-icing salt
- Destruction of concrete caused by corrosion of the reinforcing steel
- Efflorescence and salt damage caused by hydration and crystallization
- Lime leaching
- Rust stains and curtaining
- Dirt pick-up and curtaining
- Attack by fungi, moss, lichens and algae
- Chemical corrosion, e.g. binder transformation caused by acidic gases (SO₂, NO₂)
- Impaired thermal insulation*

Treating Concrete in General

Prior to coating a concrete surface, the concrete shall be clean and dry. Loose concrete should be removed or repaired before coating. A primer is used on concrete to seal the pores of the concrete and aid in the adhesion of the coating. The coating manufacturer should be contacted for a recommended primer. If a release agent or curing compound has been used on the concrete surface, inform the coating manufacturer, as these may inhibit the adhesion of the primer and coating.

What is Concrete?

Concrete is a mix of cement, fine aggregate such as sand, coarse aggregate such as gravel, water, admixtures and air.

Heat Performance of Concrete

Concrete roofs are excellent heat batteries. Heat from the sun can take up to 4 hours to dissipate and can degrade the performance of air-conditioning equipment.

Problems Related to Concrete Roofs and Facades

Concrete Roofs and Facades are prone to cracking, crazing, scaling or spalling.

Cracking — Shrinkage cracks occur when there is too much water in the mix. Compaction cracks are caused by substrate settling below the slab. Stress cracks occur when the slab is subjected to extreme loads.

Crazing — Also referred to as alligating, it is usually non-structural as it does not penetrate more than a few millimeters below the surface.

Spalling — Breaking away of concrete at joints or steel reinforcing, and may be structurally significant. If may be caused by moisture attack on the rebar.

Many of these forms of damage can be prevented, or at least reduced or kept at bay for longer, by means of impregnation. Creation of a water-repellent zone considerably reduces the uptake of water and aggressive substances; the masonry remains dryer, and is consequently less prone to the kinds of damage referred to above.

* Thermal Conductivity and Moisture:
Moisture has a huge influence in the insulating properties of building materials. 5% moisture in concrete roofs walls can reduce the insulating properties of the building material by 50%.
COOL BARRIER advanced Waterbased Systems
Cool Barrier Grip, Cool Barrier Grip Nano, Cool Barrier Roof, Cool Barrier Roof Optimum, Cool Barrier Facade

**CONCRETE ROOFS A System:**

<table>
<thead>
<tr>
<th>Product</th>
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<tbody>
<tr>
<td>COOL BARRIER GRIP</td>
<td>Penetrating</td>
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<tr>
<td>COOL BARRIER GRIP NANO</td>
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<tr>
<td>COOL BARRIER ROOF</td>
<td>D.F.T 500 Microns</td>
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**CONCRETE ROOFS B System:**

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**CONCRETE EXTERNAL WALLS System:**

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**COOL BARRIER WATERBASED SYSTEM**

- Saves energy by reducing the needs for cooling
- Contributes to “Urban Heat Island” mitigation
- Mitigates the consequences of the Global Warming phenomenon
- Creates thermal comfort conditions
- Saving money by reducing the billing costs for energy
- Decreases the stress heating of the construction
- Increasing the durability of the roof and minimizing the costs for restoration
Cool Barrier Grip

Characteristics

This is a solvent free emulsion primer based on a mixture of silane and siloxane, intended for the “water-repellent treatment” of surfaces, which are then coated using Cool Barrier Facade or Roof. The product is distinguished by its excellent properties of penetration. Cool Barrier Grip stabilizes chalky and sandy surfaces and reduces their absorbency.

Water-repellent treatment

The term “water-repellent treatment” refers to the treatment of mineral substrates, especially facades of fair faced masonry and concrete, with hydrophobic impregnating agents. The term “impregnating agent” is frequently used on its own in this context, since it is considered self evident that these agents are hydrophobic, that is, water-repellent. By definition, however, “to impregnate” just means to saturate an absorbent material with a low-viscosity, capillary active liquid. The purpose of water-repellent treatment is to protect exposed facades and roofs from moisture and attendant damage by applying a colorless, non-film-forming agent which prevents capillary uptake of water and the aggressive substances dissolved there in. Because the impregnating agent does not block the capillaries, the substrate retains its vapor permeability.

Cool Barrier Grip reduces the capillary absorption of the building which it has penetrated, but does not clog pores or capillaries. There is therefore little or no impairment of the building material’s ability to "breathe".

Cool Barrier Grip Ensures:

- Drastic reduction in water uptake
- Retention of high water-vapor permeability
- Extensive penetration
- Adequate resistance to alkalis
- Resistance to UV light
- Surfaces not rendered shiny or tacky, or caused to yellow
- Environmental compatibility

Way of Action:

Unlike film-forming coatings, such as those based on acrylic, polyurethane or epoxy resins, organo-silicon water repellents do not seal the pores at the surface of mineral masonry, but simply form a very thin layer on the pore walls (Fig.).

Way of Application:

For use externally and internally on chalky, sandy and strongly absorbent surfaces.

Application:

Apply with a brush.

Surface:

The surface should be dry, free of contaminants and release agents. Remove loose layers.

Coating Structure:

Use Cool Barrier Grip undiluted. Prime strongly absorbent surfaces twice while still wet.

Coverage:

One litre will cover approx. 5,0 -6,0 m². This is equivalent to approx. 150-200 ml/m² per coat. Determine exact quantities by means of test coats.

Application Temperature:

At least +5°C air and surface temperature during application and drying.

Drying:

The surface is dry and can be recoated after approx. 8-10 hours at +20°C and 65% rel. humidity.

Equipment Care:

Rinse thoroughly with water immediately after use.

Compatibility:

Do not mix with other materials.
Cool Barrier Grip Nano

Characteristics

Nanotechnology based water-based acrylic emulsion, suitable for the waterproofing of vertical and horizontal mineral substrates, which are then coated using Cool Barrier Facade or Roof Coatings.

Way of Action:

It deters the appearance of capillary cracks, the growth of fungus and mould, as well as the creation of salts. It contributes to the maintenance of the aesthetic perfection of the surfaces that it is applied without shining or influencing their natural beauty and texture. It protects surfaces for long time spans while it facilitates their regular cleaning from mudrain as well as atmospheric pollutants and smog deterring their infiltration in the surface porous. Odourless, user and environmentally friendly.

Due to the special properties of nanoparticles which are included in its composition, the product adheres deeply into the surface without blocking transpiration and at the same time fills the porous of the substrate, preparing a smooth basecoat for the final top coating.

TECHNICAL SPECIFICATIONS

Cool Barrier Grip Nano is thoroughly stirred and uniformly applied on the substrate by brush, roller or spraying, until full impregnation. In most of the case surfaces, a second layer is required. The second layer is applied once the first layer has been dried.

Consumption: 100-200 ml/m², depending on the absorptivity of the substrate.

Packaging: Cool Barrier Grip Nano is available in plastic containers of 10 lit.

Storage: Shelf-life in sealed containers is at least 12 months, in frost-free conditions.

Cleaning of tools: Tools must be cleaned with water immediately after use.

Remarks: Temperature during application must be between +5°C to +35°C. The product should be completely dry before covering.

Cool Barrier Grip Nano after has been dried is almost transparent. Therefore, when the surface is not going to be covered, Cool Barrier Grip Nano should always be applied under trial because it can change the aspect of the surface.

Surface preparation: The surface to be primed must be dry and free of dust, grease, dirt etc.

Form: liquid

Color: Translucent

Density: 1,00 kg/lit

pH: 8,5


Cool Barrier Grip Nano Ensures:

- Drastic reduction in water uptake
- Retention of high water-vapor permeability
- Very good penetration
- Adequate resistance to alkalis
- Surfaces not rendered shiny or tacky, or caused to yellow
- Excellent adhesion and cohesion effect
- Environmental compatibility
Abolin Cool Barrier Roof for low slope and steep Roofs is an excellent quality waterbased elastomeric waterproof coating based on a “cool” raw materials technology. It forms an extremely high reflective mat surface that blocks the incoming solar radiation and remains cooler, contributing to the saving of energy for cooling needs. It is specially formulated to retain its elasticity, even in low temperatures ranging between -20ºC to 80ºC. ASTM 6083 Compliant.

**Performances:**

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**Special Characteristics**

- Reduces the surface temperature of the building envelope
- Improves indoor thermal comfort conditions
- Saves money by reducing the needs for cooling
- Contributes to atmospheric pollution reduction
- Contributes to confrontation of “Thermal Heat Island” phenomenon
- A barrier to ultraviolet light which prevents degradation of the roofing substrate.
- Excellent dirt pick-up resistance.
- Excellent flexibility at temperatures as low as 0º C
- Application by spray, brush or roller
- Max 10 g/litter volatile organic components
COOL BARRIER PROTECTA CLEAR is a low-build elastomeric clear top coating based on supreme water based PVDF binder that provides the ultimate in reflectivity maintenance, color stability and weather resistance over new or existing roof surfaces. Although it is highly flexible, it exhibits tough, enamel like finish that resists abrasion, biological growth, dirt, oil and all types of weather extremes.

Outstanding Water Repellency
Coatings based on Kynar Aquatec® have excellent water repellency and prevent water from penetrating the surface. Even after 200 hours of immersion, the Kynar Aquatec® coating shows minimal water pick-up. Kynar Aquatec® emulsion-based coatings have excellent substrate adhesion and resist delamination and water damage.

ABSOLUTE PERFORMANCES
COOL BARRIER PROTECTA CLEAR is an innovative technology based on acrylic-modified Kynar® PVDF resin in a convenient emulsion form. Liquid coatings formulated with Kynar® Aquatec™ deliver the durability and performance of traditional Kynar®PVDF coatings. These coatings can be easily applied to a variety of substrates, including metals, PVC, sprayed-in-place polyurethane foam and as a finish over acrylic basecoats.

Excellent Dirt Shedding
COOL BARRIER PROTECTA CLEAR pick up very little dirt. This resistance is important for all colors, but none more so that white. Figures 1 and 2 show the dirt shedding performance of COOL BARRIER PROTECTA CLEAR treated coatings compared to conventional acrylic roof coatings without protective layer.

• Excellent Long Term Color Retention
• Excellent Long Term Gloss Retention
• Excellent Resistance to UV Degradation
• Excellent Resistance to Chalking
• Outstanding Dirt Pick-Up and Stain Resistance
• Excellent Resistance to Algae and Fungal Growth
• Excellent Resistance to Chemicals and Corrosion
• Excellent Resistance to Abrasion
• Excellent Flexibility
Cool Barrier Façade

CoolBarrier Façade for steep slope roofs and external walls is an excellent quality elastomeric waterproof coating based on a “cool” raw materials technology. It forms an extremely high reflective mat surface that blocks the incoming solar radiation and remains cooler, contributing to the saving of energy for cooling needs. It is specially formulated to retain its elasticity, even in low temperatures and to withstand in difficult weather conditions such as rain, snow, UV radiation. It prevents mould and green spots and performs an excellent crack binding ability.

Cool Colours as Whites!

Architects traditionally have recognized that reflective building colours can reduce building thermal loads. Many current references equate ‘cool coatings’ with white coatings. Certainly white roofs are good reflectors of the sun’s heat. However, offering any colour as long as it’s white is not a viable design strategy.

Fortunately, COOL BARRIER technology by Abolin Co allows for the design of products that remain cool under the sun – without sacrificing colour.

Cool Barrier Façade:

- Saves Energy by reducing the needs for cooling
- Contributes to “Urban Heat Island” mitigation
- Mitigates the consequences of the Global Warming phenomenon
- Creates thermal comfort conditions
- Saves money by reducing the billing costs for energy
- Cool & Coloured
- Environmentally and user friendly

Optical Properties Cool Barrier Façade White

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<th>Standard</th>
<th>Value</th>
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Cool Barrier Technology Fights Global Warming!

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<tr>
<th>Country</th>
<th>CO₂ emission in 1990 Mt</th>
<th>Kyoto’s reduction commitment (%)</th>
<th>Requested white reflecting surface to fulfill Kyoto’s goal (km²)</th>
<th>Cool Barrier Roof White surface necessary to compensate for all CO₂ emission (km²)</th>
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