CHILL SKYN

Technical Data Sheet

ChillSkyn PolyFrost™

Solvent-based poly (vinylidene fluoride-co-hexafluoropropene) [$P(VdF\text{-}HFP)_{HP}$] polymeric coating

Description

ChillSkyn PolyFrost™ is a solvent-based $P(VdF\text{-}HFP)_{HP}$ coating specifically designed to achieve passive daytime radiative cooling 24/7. Through a phase-inversion process occurring after the coating application, evaporation of the solution's solvent/non-solvent components yields a hierarchically micro/nanoporous structure that enables reflecting a majority of incident solar light while strongly emitting excess heat within the range where the atmosphere is transparent to IR radiations (8 to 13 µm).

Applications

- "Super Cool" Roofing
- Refrigerated Shipping
- Transportation (Delivery Vehicles, Buses, Trains, Recreational Vehicles, etc.)
- Shaded structures (Awnings, Canopies, Tents, Enclosed Infrastructures, etc.)
- Cooling panels to assist HVAC systems

Benefits

- High solar reflectance (R_S ~ 0.96) and long-wave infrared emittance (ε_{IR} ~ 0.97) resulting in positive cooling power of ~ 100 W/m^2 under sun irradiation and sub-ambient cooling by ~ 6 °C, which helps reduce energy costs and prolong coated surface life
- UV light resistant
- Applicable on any surface (plastics, metals, wood, fabrics, etc.) and manufacturable as freestanding
- Hydrophobic
- Resistant to weathering and fouling

- Long term durability to weathering conditions (demonstrated 8 months outdoor without significant reduction of any of the coating properties)
- Ease of cleaning (with water)
- Applicable by spray and roller

Physical properties

Appearance	Liquid, translucent
Solids (Wt. %)	10
pH	~ 7
Density, g/ml	~ 0.9

Health and Safety Considerations

The coating as provided is a liquid solution containing mainly acetone as well as water and P(VdF-HFP) polymer. P(VdF-HFP) and water are not classified as hazardous by the GHS under the standard and recommended conditions of storage and use. These components are therefore not dangerous. Please refer to the SDS of acetone for all chemical health and safety hazards related to the product (Example of Acetone Safety Datasheet).

The high acetone content in the solution makes it an extremely flammable liquid and vapor. The vapor may cause a flash fire and is easily ignited by heat, spark, or flames. It can cause eye irritation, is harmful if swallowed, and may enter the lungs if swallowed or vomited. Prolonged or repeated skin contact may cause drying, cracking, or irritation, while high vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract.

Safety Ratings:

Health: 2, Moderate	Reactivity: 0, None
Flammability: 3, Severe	Contact: 2, Moderate

Handling

The product must not be handled or opened near a flame, sources of heat, or ignition sources and should be

	protected from direct sunlight. Proper personal protective equipment (see SDS) should be worn, and the product should be used only in well-ventilated areas with good air exchange and exhaust system. Avoid contact with skin, eyes, and clothing when handling and do not breathe vapors, spray mist, or ingest. Do not eat, smoke, or drink when using and take preventive measures against static discharge. Always keep away from incompatible materials, handle under good industrial hygiene/safety practices and wash hands thoroughly after handling. Containers of this material may be hazardous when empty because they retain product residues (vapors, liquids). Always observe all warnings and precautions listed in the product Safety Datasheet.
Storage	Store in a cool, dry, ventilated area. Keep away from flames, ignition sources, heat, and incompatible materials. Always store the product in the original container. Keep containers tightly closed and upright. Keep away from food, drink, animals, and out of the reach of children. Ground container and transfer equipment to eliminate static electric sparks. Comply with all national, state, and local codes about the storage, handling, dispensing, and disposal of flammable liquids.

Contact us if you have any questions:

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