

SurfaShield nextG

Anti-Soiling, Hydrophilic & Photocatalytic Formulation for application on solar glass of photovoltaic panels

Description

SurfaShield nextG is a patented (WO2021140346 (2021)), water/isopropanol-based liquid formulation that can be spray-applied on the glass of solar panels, based on fused silicon and photocatalytic titanium dioxide nanoparticles that can offer the following distinct advantages, after applied on the glass surface of photovoltaic, solar panels:

- Anti-reflective(=transparency increase) properties attributed to glass nano/micro-roughness decrease and Fresnel diffraction effect. A 2,5-3% increase in transparency is achieved.
- Better light transmittance on high incident angle photons is attributed to the high refractive index of titanium dioxide particles. Diffuse light is better absorbed on SurfaShield nextG modified panels.
- Anti-soiling and anti-static properties are attributed to the n-type semiconducting properties of titanium dioxide particles. The maintenance effort is significantly reduced.
- Super-hydrophilic effect – No more water staining or need to use deionized water.
- The self-cleaning effect is attributed to the photocatalytic impact, especially against organic deposits (e.g., bird deposits).

Considering the environmental or ambient conditions, SurfaShield nextG can offer 3-10% extra energy output for your solar installation.

Recommended Use

SurfaShield nextG is suitable for application on the glass surface of photovoltaic, solar panels by spraying (HPLV – mostly on open field installations) or roller-blade (mostly at in-house, industrial level) application.

SurfaShield nextG is not recommended to be applied on existing hydrophobic, silicone-type coatings, as further development of dry film thickness will adversely affect the anti-reflective properties.

Key Benefits

- ☆ Anti-reflective (transparency) increase of solar glass
- ☆ Energy output increase
- ☆ Ultraviolet obstruction for weathering resistance
- ☆ Enhanced absorption of high incident angle photons for increased solar performance at diffuse light conditions (cloudy conditions or morning/evening light-time)
- ☆ Anti-static and anti-soiling properties for reduced dust or particle matter uptake
- ☆ Reduced maintenance and cleaning effort of solar glass
- ☆ Super-hydrophilic glass surface properties
- ☆ Reduction of water condensation and snow sliding, especially at high tilt angles (>25°)
- ☆ Photocatalytic, self-cleaning properties for breaking down organic deposits
- ☆ Photocatalytic, depollution of airborne contaminants

Technical Specifications

| | | | |
|-----------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------|
| Type: | Water/isopropanol-based liquid formulation based on fused silicon and photocatalytic titanium dioxide nanoparticles | | |
| Colour: | Semi-transparent, milky white | Thinner/Cleaner: | None Required/ Water or Isopropyl alcohol |
| Density: | 0,87 ±0,05 kg · L ⁻¹ | Volatile organic compounds (VOC) Content: | 574 g · L ⁻¹ |
| Touch Dry Time: | 4h @ 25°C | Full Curing Time: | 24h @ 25°C |

NanoPhos S.A.

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Application

Open-field HVLP spraying: Clean the glass surface using water, isopropyl alcohol, or a regular glass cleaner, leaving no oily residues. Avoid application in windy conditions. Application steps are as follows:

1. Make sure the solar glass surface does not exceed 40°C (104°F). If the solar glass surface temperature exceeds 40°C (104°F), it may be cooled down by hosing it off with water. Ensure that the glass surface is dry before further SurfaShield nextG application.
2. Shake SurfaShield nextG container thoroughly and transfer part of its content in an HVLP (High Volume, Low Pressure) spray gun container (HVLP guns examples: Sagola Mini Xtreme Gravity, Mini HVLP Aircap-0,8mm)
3. Use an air compressor that meets the following minimum requirements:
 - Portable mounting with an electric motor
 - 50L (13 US. Gal.) compressed air container
 - 3hp (2200W) Power
 - 330L/min (11.65ft³/min) compressed airflow
 - High-pressure output: 10bar (145psi)
 - Humidity trap(Air Compressor example: ANEST IWATA Broadbent 3hp 50L NB30C/50)
4. Install a pressure gauge between the air compressor and the spraying gun. Check that the air compressor pressure is within the recommended pressure range, depending on the type of spraying gun (typically around 4 bar or 60psi).
5. Regulate the spraying gun so that the airflow pressure and the product flow meet the recommended consumption rate of 35 m²/L (1426 ft²/US Gal.) or 28,6mL/m² (approx. one fl. oz/10ft²). The recommended consumption rate of 35 m²/L (1426 ft²/US Gal.) has been calculated considering the application of 2 cross-vertical coats. The actual consumption rate for a single coat is 14,3mL/m² (approx. ½ fl. oz/10ft²). Use a measuring cup to check the exact product amount flow per time unit.
6. Fully expand the HVLP gun spray fan. To ensure flow stability, initiate spraying outside the application area.
7. Keep the spray gun steadily, at a distance of 15-20cm (6-8inches) from the solar glass application surface. Press the spray gun trigger steadily at a position that will ensure a constant flow rate. Spray in parallel lines to cover the entire solar panel.
8. The speed of the application depends on the product flow regulation. Indicatively, spraying the entire glass surface of a photovoltaic panel (2m² or 21.5ft²) in 35s assures proper wet film formation.
9. Conclude the spraying process and release the trigger outside the application area.
10. Allow sprayed SurfaShield nextG to dry out and reapply at a cross-vertical direction to the original one. A second coat application warrants surface loading homogeneity. Rotate the spray head by ninety degrees to ensure the spraying fan plane is vertical to the spraying direction.
11. Avoid over-application for optimal anti-reflection results.

Industrial Roller-Blade application: Contact NanoPhos for precise equipment settings.

Storage

Expiration date: 12 months after production when stored and sealed in the original container. Store the containers sealed in a cool and well-ventilated place. Keep away from direct sunlight and freezing conditions. Keep far away from heat sources, naked flames and sparks, and other ignition sources. Keep containers away from any incompatible materials.

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Health and Safety

Read the label before use. Safety Data Sheets are available through NanoPhos' website www.NanoPhos.com or upon request by contacting NanoPhos through email: info@NanoPhos.com or by telephone: (+30) 2292069312.

Available Packaging

- 4L Plastic (HDPE) canisters, arranged in a 4 pieces carton box (4 x 4L arrangement).
- 1 US Gal. Plastic (HDPE) canisters, arranged in a 4 pieces carton box (4 x 4 US Gal. arrangement).
- 10L Plastic (HDPE) canisters, arranged individually.
- 2.5 US Gal. Plastic (HDPE) canisters, arranged individually.

- The Technical Data should be read in conjunction with the Safety Data Sheets. The current edition of this technical data sheet automatically cancels any previous one concerning the same product. For more information, please contact NanoPhos: info@NanoPhos.com
- The technical data sheets and the recommendations for using NanoPhos products are based on our scientific knowledge, laboratory studies, and long-term experience. Therefore, the information provided must be considered indicative and subject to constant review in relation to the circumstances and each practical application. Furthermore, the product's suitability should be examined in each case for each specific use. The end-user bears complete & exclusive responsibility for any side effects that may arise from the incorrect use of the product.
- SurfaShield is a registered trademark of NanoPhos SA.

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