



Product: WinGuard G

Self cleaning, super hydrophilic, anti static nanotechnology based coating for solar panels

Key benefits:

- **Antistatic**- Prevents dust accumulation
- **Super hydrophilic**- Glass surface becomes water loving
- **Increased transparency**- Enhanced anti reflective properties
- **Excellent Life**- Chemically bonds with the glass surface

Applications:

- Efficiency improvement of photovoltaics (PV)
- Reduces 90% of soiling losses
- Reduces the frequency of cleaning and maintenance
- Enhance the life of the solar infrastructure

WinGuard G

Active Self-Cleaning Nanotechnology for Enhancing efficiency and reduce maintenance costs

WinGuard G is an invisible coating based on nanostructured particles, which after application on the glass surface exhibits remarkable property: it makes the glass anti-static which repels the dust which physically settles or bonds with the glass surface. Thus, glass surfaces become self-cleaning without negatively affecting substrate's transparency, meaning that the transparency is increased as nanoparticles reduce the local roughness and dust accumulation of glass that would reflect light. WinGuard G acts as an antistatic preventing sand and dust accumulation. The action of the coating is enhanced by anti-fogging properties. Due to its hydrophilic properties, Water cannot form droplets that scatter light and the fogging effect is prevented in high humidity/low temperature conditions.

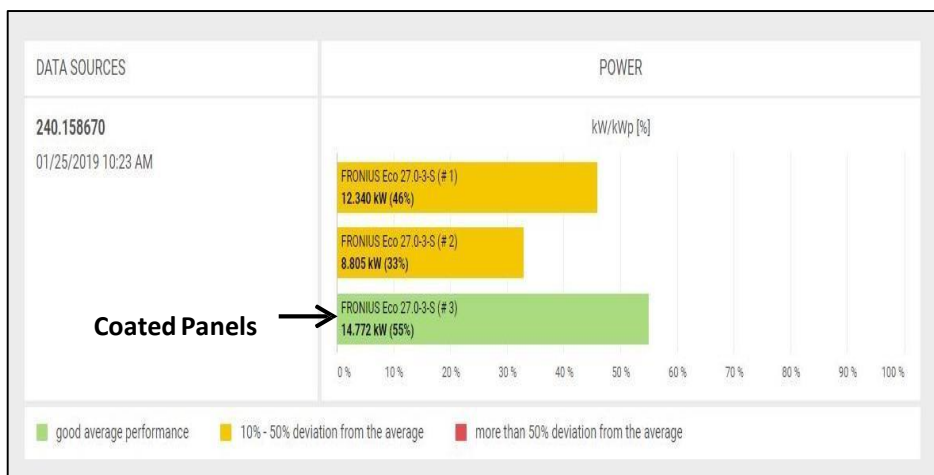
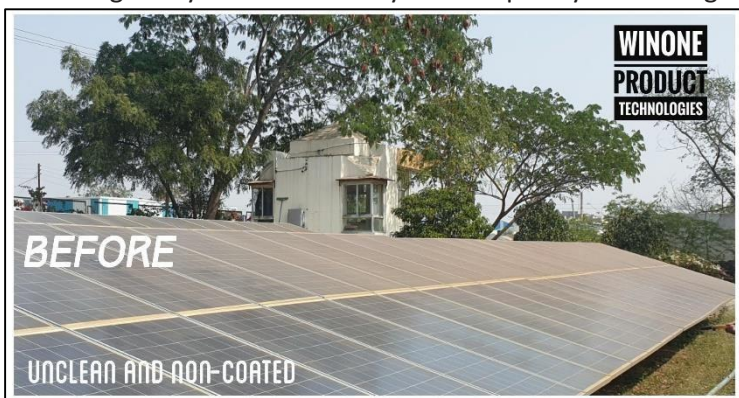


After 3 month of application

- Helps produce more power during low sunlight period. (mornings & evenings).
- Due to its wetting property, water will clean the glass with higher efficiency.

Which are the benefits for photovoltaics (PV) systems?

The application of WinGuard G on photovoltaics increases the efficiency about 2% just after application. This is due to the transparency increase of protective PV panel glass: the coating reduces the surface roughness allowing more energy to reach the solar cell. Additionally, an increase of 3-7% is achieved as the glass surface remains cleaner, without particles, dust or stains that affect negatively the PV efficiency. The frequency of cleaning reduced by more than 50% and only water is required for cleaning.



How the effect of WinGuard G on PVs was studied?

A plant of 102kW with 3 inverter was selected. All the panels were cleaned equally. WinGuard G was applied to panels which were connected to inverter no 3 and rest were kept uncoated. During a 6 month long study period, the coated panels generated 7-8% more than the uncoated panels. The cleaning frequency of the coated panels reduced by 1/3rd. In presence of heavy pollution, the panel were cleaned without making any physical contact only with unpressurised water. The water required to clean the panels reduced by 50%.

Economotechnical study for WinGuard G

According to the product's consumption rate, materials and application costs and the increase of produced energy it is calculated that the payback period is up to 1 year! The extra produced energy after this time period will be translated to profit. The energy benefit can balance potential interests of financing or reduce ROI periods for the plants

The life of the coating will be more than 7 years but there is no need to periodic maintenance. The action of the coating is continuous under sunlight irradiation: the anti soiling activity of nanostructured particles ensures that active ingredients are not consumed during function.

Application of WinGuard G

WinGuard G is applied using a self moving brush spreader application which deposits a uniform layer of coating throughout the panel surface. The application machinery is developed by Winone Product technologies. An authorized trained team of applicators is required so as to ensure the quality of work.



Physical Properties

White, Water based suspension with pH = 9.2±0.5. Contains less than 10%w/w isopropanol. Flash Point (closed cup method): 41°C Density: 0.98±0.05 g·cm⁻³ Viscosity: 2 mPa·s, VOC content: 136 g/L WinGuard G is not an oxidant.

Safety & Storage

Highly flammable liquid and vapour. Causes serious eye irritation. Keep away from heat / sparks / open flames / hot surfaces. No smoking. Keep container tightly closed. Wear protective gloves / protective clothing / eye protection / face protection. IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothing. Rinse skin with water / shower. If eye irritation persists: Get medical advice / attention. Avoid breathing dust / fume / gas / mist / vapours / spray. Use only outdoors or in a well-ventilated area.

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