SOLAR GLASS SHIELD

# About Us

**SHRIJA SOLAR GLASS SHIELD PRIVATE LIMITED** was earlier known as **SHRIJA INTERNATIONAL.** Started in year 2015 with the objective to serve solar industry to overcome the challenges faced by all the stake holders in Cleaning of the Solar Plants (both rooftops and ground mounted).

Solar Plant Owner, EPCs or O&M all have one common challenge, keeping solar plant (Panel Glass) clean. Cleaner the panel more the is power generated from them.

Our Cleaning technique and range of products help all the stake holders to keep their panels clean and dust free for as many as 2-3 years depending upon severity of local climate and surrounding conditions.

These products are easy to apply and can save up to 50% cleaning cost and 75% cleaning efforts.

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# Current Challenges

**Hard Water** – Most of the times borewell water is used to wash solar panels as it is easily available. Borewell water has high content of Calcium, Magnesium and various minerals which once dried, leaves white marks. These marks are so hard that it forms bonding with the surface of the solar panel glass and stops sunlight from reaching solar cells which produces energy.

**Construction Dust** - This problem is generally faced by panels which are installed either near any upcoming area or near to any construction site. Construction dust, mainly due to Cement, Bricks and sand particles settles on the Solar panel and forms bonding with the panel glass. Further due to humidity the bonding becomes sticky and then harder once dried.

**Metal Dust** – Metal dust is found near any industrial area where metal forging , foundries are very active, This type of dust is very tough to remove and is hard to clean thereby hampering power generation of the plant.

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# Current Challenges

**Chemical Dust** - Chemical layers are found if the plant is near chemical plant or and industrial area which has chemical or Pharma factories around. Again formation of these layers are very fast and cleaning it frequently is herculean task.

**Salt Layers –** The formation of salt layer on the solar panel glass is very common if the solar plant is near Sea Shore or Costal area, again getting mixed with the humid climate its forms thick salt layer within no time.

**Algae, Tree Leaves and etc. –** These are the most common one's found in India as had been cause of concern for long time.

**Bird Droppings** – Solar panels are installed either on the roof top or at the open land area which can receive sunlight, these solar panels are very easy target of pigeons for bird droppings.

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# Product Technology and Overview

## SOLAR GLASS SHIELD

**Solar Glass Shield** is a Nano Technology based Super-hydrophobic solution with particle size of 100-150 nm. This solution after application on the solar panel glass, forms a Nano layer (invisible to the naked eye) which protects the solar panel glass from being susceptible to any / all kinds of bonding and impurity which settles on the surface of the Solar Panel Glass.

This Indigenously developed solution proven as effective on the surface of the solar panel glass for span of 24 to 36 months after application.

Solutions is Chemically neutral and does not have any effect on the glass surface, Aluminum frame or the sealant of the solar glass panel and is specially formulated for the Solar Plants which are commissioned in India.

**"Super Hydrophobic" – The quality to Repel Or Fail to Mix with Water**
**"Super Hydrophobic Effect" is also known as "Lotus Effect"**

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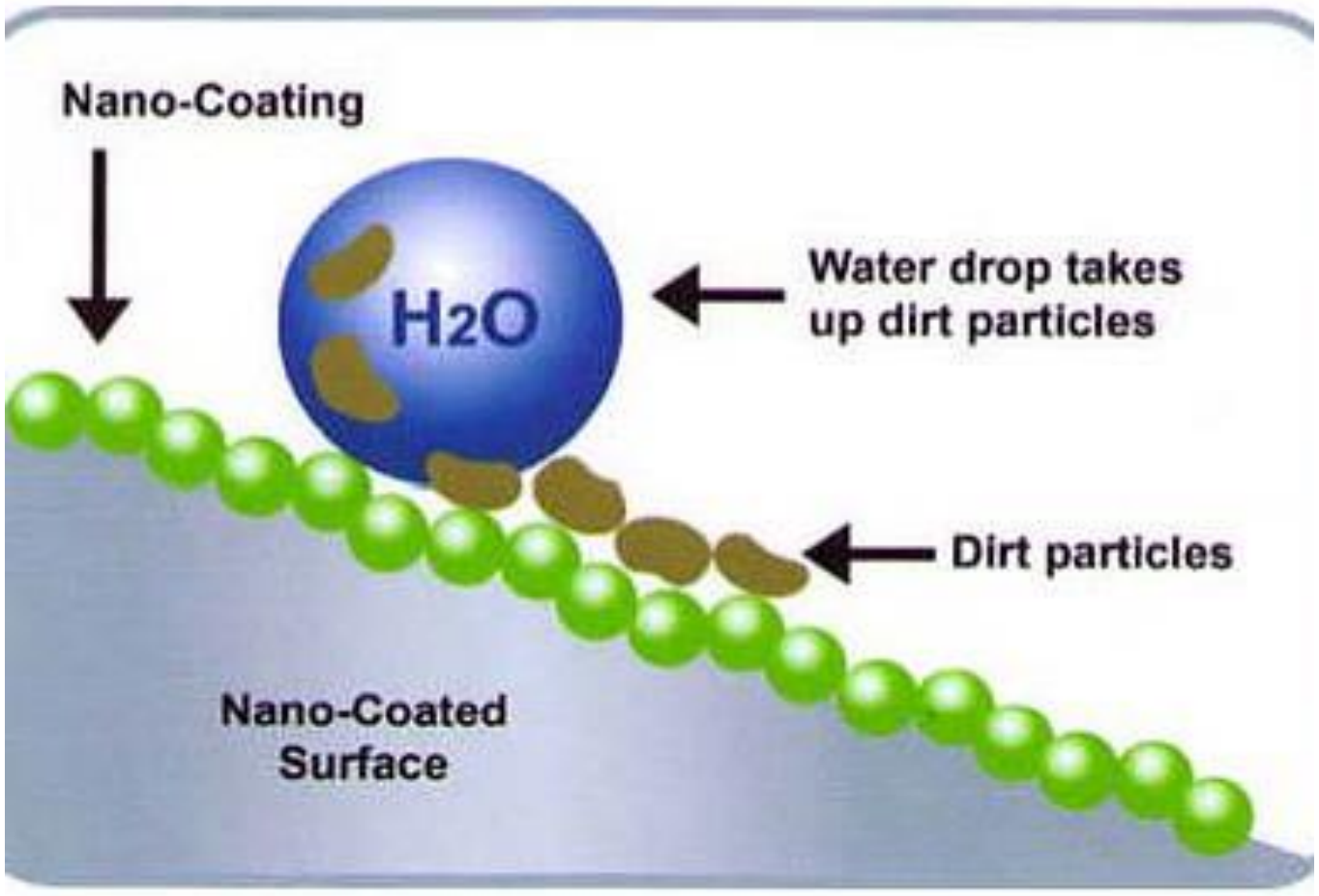
# Product Technology and Overview



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# Product Advantages

- Does not allow any kind of bonding with Solar Panel Glass
- Cleaning effort's reduces
- Cleaning Cycle reduces
- Water reductions up to 70 - 80%.
- Increases power generation by 4-5% on an average
- It stops dust ( i.e. soil, construction / chemical / metal / rubber dust or salts from hard water) and bird droppings from Bonding with Solar Panel Glass.
- Reduction in WATER USAGE, CLEANING EFFORTS and LABOUR HOURS towards cleaning, Reduces Operations & Maintenance cost of the Plant.

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# On Site Cleaning and Application Process

Initial Cleaning with “Solar Glass Cleaning Compound”

Cleaning with Pre-Cleaner Liquid.

Coating “Solar Glass Shield” solution on Panels.

New like finish to the Panel glass after the cleaning and coating application process is complete.

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# Chennai Port Trust Site Pictures

Panel covered with Salt layer.

Labour scraping salt layer every 22nd day

Left bottom corner of the panel coated with “Solar Glass Shield” and the difference after 21 days.

Left top corner coated with “Solar Glass Shield and the difference after 21 days

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# Foundry Plant Site Pictures

Panel covered with Industrial Dust as it was next to Foundry.

Few Panels of one String cleaned and then "Solar Glass Shield " applied.

Either side rows coated with "Solar Glass Shield", non-coated in between


Panels coated with "solar Glass Shield".

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# Case Study

**Location :** Nashik (Mumbai - Agra Highway)
**Irradiance Zone** : Nashik, GHI : 5.51 Kwh/Sqm/Day.
**Plant Age :** 4 Years.
**Dust Level :** Very Heavy dust due to busy Mumbai – Agra Highway
**Plant Capacity:** 21KW

| Parameters | Before Application | Performance after Solution applied. |
|---|---|---|
| Generation | 65-70 Units Per Day | 85 to 110 Per Day. |
| Rated or Estimated Generation (GHI) | 86.75 Units / Day | 94.4 Units / Day |
| Cleaning Cycle | Weekly | 40 Days |

**Results Achieved:** Power Generation Increased by 9% than the standard Estimate

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# Case Study

## Benefits / Rewards:

1) Clean Panels due to reduction in soiling / dust bonding with panel glass
2) Easy to clean (only water and Microfiber cloth to used for cleaning)
3) Additional Generation Of Power (by 9%)

## Savings:

1) Water usage reduced by 80%
2) Labour Hours reduced by 80%

| Description | Before Application | After Application |
|---|---|---|
| **Water Usage / Year** | 14400 Liters / Year | 504 Liters / Year |
| **Labour Hours / Year** | 240 Hrs / Year | 14 Hrs. / Year |
| **Labour Cost / Year ( Estimated. @Rs. 500 per Day )** | Rs. 20000 | Rs. 2100 |

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# Case Study

**Implementation Partner at Nasik**

**Name:** Infirencon Energy Private Limted
**Contact:** Vikramaditya Dandekar
**Cell No.:** 7767091409
**Address**: 6, KITHIRA Apartments, Chitrangan Society, Savarkar Nagar, Gangapur Road, Nasik – 422013.
**Website:** www.infirencon

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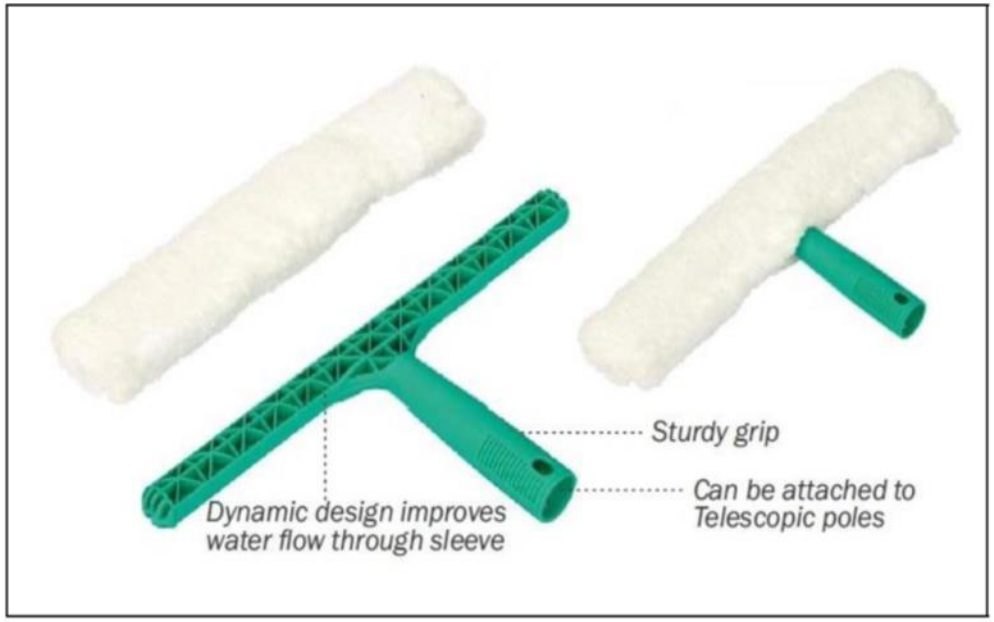
# Cleaning Equipment's

Telescopic Poles

| Height(mt) | Sections |
|---|---|
| 2.5 | 2 |
| 4 | 3 |
| 6 | 3 |
| 11 | 3 |




Hand Held Tangy

Tangy for Scotch Brite

Scotch Brite

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# Customers

Croda India Company Private Limited

Aries Agro Limited

Hinren Technologies Pvt. Ltd.

infiRENCON Energy Pvt. Ltd

Sunrise Solar & Agro India Pvt Ltd

Plasmaberry Solar Private Limited

Relayon Solar Private Limited

Sootless Energy Private Limited

Sudarshan Saur Shakti Private Limited

Systemic Electric Private Limited

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# Customers

Laksh Solar

Greenroots Renewable Energy

Enertia Sun Power Pvt. Ltd.

Excelsior Engineering Solutions

Smart Roof Solar Solutions Pvt.Ltd

Renewatt Energy Private Limited

Success Impex Pvt Ltd

ECE (India) Energies Private Limited

Prozeal Infra Engineering Private Limited

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# Contact Us

## Shrija Solar Glass Shield Private Limited

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