

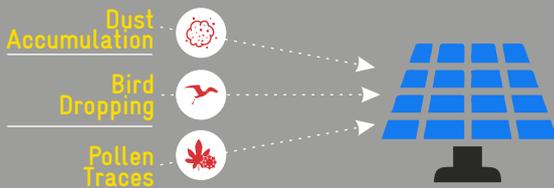


Cleaning Solar PV Panels of Solar Water Pumps

More Water and More Durability

Why is cleaning solar PV panels important?

- ▶ Many environmental factors such as pollution or vehicular movement result in dust generation and soiling over the solar panel, leading to reduction in the efficiency and energy output of the panels.
- ▶ Cleaned solar panels tend to generate optimum electricity, whereas uncleaned solar panels reduce the performance of the system and subsequently its efficiency.
- ▶ The most common types of contamination/soiling witnessed are:



Since soiling of **solar panels** result in lower generation of electricity, it is important to **clean the panels** periodically.

What happens if solar panels are dirty?



● Damage to the Panels

Hard soiling, such as accumulation of dust and soil, may lead to damaging the panel. If a single cell of the panel gets heated up due to shading (becomes a hotspot), it can potentially melt the panel.

● Increase in Losses

Annual energy losses due to soiling are reported to be up to 25%, with many studies confirming losses around 6% per year.

These two factors reduce the performance of the panels and result in lower water output of the solar water pump.

What are the benefits of cleaning solar panels ?

- ▣ Improving panel performance
- ▣ Increasing water output
- ▣ Enhancing durability
- ▣ Improving Return on Investment (ROI)

When to clean the solar panels?

The panel glass cleaning should be done early in the morning or after sunset to prevent thermal stress and cracks.

What should be the frequency of cleaning?

- Typically, once a week cleaning of solar PV panels is suggested by the vendors.
- However, depending on the site environment conditions and seasonal variations, the vendor should assess the rate of soiling and accordingly advise the farmers on the frequency of cleaning.

Which material to be used for cleaning?

- Dry or brush cleaning (including all types of soft material, such as soft micro fiber cloths, various types of soft foams, non-woven fabrics, soft brooms, soft sponges and soft brushes).
- Wet cleaning (including soft cloth, brush, detergent (non-abrasive) and clean water).
- Avoid using domestic detergents and soaps.

How to clean solar panels?

Wet Cleaning

- This is the most common method used for cleaning the panel surface. It can be done using a soft cloth or brush with clean water to remove the deposits of dust, dirt or pollen traces from the surface of the panel.

Washing

- In case of hard accumulation, such as bird dropping or plant juices on the panel surface that can't be whisked off, the panel should be cleaned by spraying clean water over the affected area and scrapping it with a hairy brush.
- Oily or sticky substance should be removed by mixing clean water with common glass cleaner and scrapping it with a hairy brush.

Dry Cleaning/Whisking

- In case clean water is not available, use a dry brush or cloth to remove deposits such as dry floating dust and leaves from the panel surface.

Things to Remember

Before Cleaning

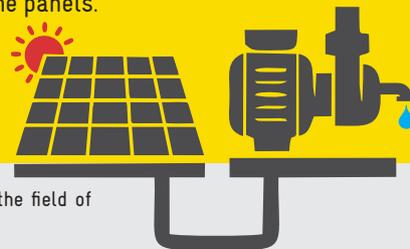
- Thoroughly inspect the panels regarding cracks, damages, and loose connections. Damaged panels should not be cleaned as it may result in an electric shock.

During Cleaning

- In areas where water scarcity is a pertinent issue, use water judiciously to clean panels and avoid wastage of water.
- Dry cleaning may lead to scratches on the panels and has to be performed in an extremely careful manner.
- Do not brush or clean the reverse side of the modules to avoid damage to connectors or junction boxes.
- For wet cleaning, de-ionised water or Reverse Osmosis (RO) water should be used to clean the modules. In case both are not available, rainwater or tap water with low mineral content can be used.
- The water must be free from sand and physical impurities that could damage the panel surface.
- Do not sit, stand or step on the modules for cleaning.
- Do not use a metal brush to clean the solar panel surface.
- Do not use corrosive chemicals to speed up cleaning.

After Cleaning

- Check for any dirt accumulation at the edges of the panels.



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