

FUNCTIONAL COATINGS INCREASE YIELD OF SOLAR POWER PLANTS

Anti-reflective coating

4 to 8 percent of the vertical incident light is reflected off the surfaces of conventional photovoltaic modules and solar thermal collectors and is lost for power or heat generation. This loss is even more pronounced at times of oblique incident light, such as during morning or evening hours or generally in winter.

An anti-reflective coating developed at the Fraunhofer Institute for Silicate Research ISC can significantly reduce reflection losses and increase the energy yield. For photovoltaic modules, the annual yield can be increased by up to 6 percent, for solar thermal collectors even up to 10 percent.

Advantages at a glance

- Higher energy yield during the winter season and when the sun is low
- Fast return of investment
- Easily adaptable to different panel types
- Robust and climate-proof (tested according to current standards)
- Self-cleaning through wind and rain
- Suitable for safety glass

Anti-soiling coating

Surfaces of solar panels tend to soil in high environmental impact areas, e. g. in urban agglomerations or near industrial zones, or in desert regions where dust levels are high. Soiling can affect a plant's performance by up to one third. Cleaning costs accumulate fast, especially for larger plants or in areas where water is scarce.

Fraunhofer ISC has developed a special anti-soiling and self-cleaning coating. Anti-reflective properties can also be added to further boost conversion efficiency.

Advantages at a glance

- Self-cleaning through wind and rain
- Low production costs
- High transmission
- Robust and climate-proof (tested according to current standards)
- Thermally stable and durable
- Suitable for safety glass
- Very thin coating (far below 1 μm)
- Non-sticking effect due to special surface structure

Adjustable properties in one single coating

The properties of the coating can be tailored to meet the operating conditions at any destined area. Thus a combination of the two functions anti-reflective and anti-soiling is possible. Additionally, Fraunhofer ISC has a number of local partners for the production of the coating at an industrial scale.

Fraunhofer ISC now plans to take this technology to the next level and make it available for façade glazings in order to make better use of daylight within buildings.



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