

CERAMIC PRO[®]

NANOCERAMIC TECHNOLOGY

SOLAR PANEL BROCHURE



Easy maintenance and a boost to efficiency with solar panel coatings

The use of solar power is rapidly increasing in Africa, and it is becoming a more and more common solution for residential and industrial space heating and water heating. Africa has one of the best chances of the production of high amounts of solar power due to the climate, and there are enough open spaces in Africa to set up numerous solar power plants. It is therefore crucial to guarantee that solar panels can absorb the maximum amount of sunlight to

produce electricity efficiently.

What a solar panel coating does to the production capacity?

At its most simple, a solar cell converts sunlight into electricity. Natural constraints on solar cell productivity (such as the second law of thermodynamics) prohibits a 100% efficient cell. In fact, the world record for efficiency, set in 2014, is a mere 46%. Therefore, when it comes to solar cell efficiency, every little helps. Improved efficiency is the result of a combination of properties of a solar panel coating which can be:

Self-cleaning

Contaminants like bird droppings and pollution do not adhere to it. This also makes the coating anti-dust and prevents the growth of mould. A little rain is all it takes to remove dirt and grime.

Hydrophobic

In rainy climates this is particularly beneficial. The hydrophobic coating allows water to flow more easily from the panel surface and reducing the negative effect of inclement weather. The hydrophobic solar panel coating also reduces ice build-up allowing the panel to function all year round also during the African winters.

Anti-reflective

An anti-reflective layer increases the amount of light transmitted through the surface of the panel and thus increases efficiency.

Easy to clean and maintain

With the self-cleaning properties of hydrophobicity, the coating requires far less maintenance to ensure efficiency.

Provides long-lasting protection

The coating is durable and can withstand different weather conditions.

Two methods to enhance efficiency with a solar panel nano coating

The common feature of solar panel coatings is that they are nano coatings. A nano coating is one which uses nanomaterials like titanium dioxide or silica to form an ultra-thin protective layer on a substrate. When applied,

the coating will form a chemical bond with the substrate, and the miniscule size of the particles means that it more densely 'wets' the surface. In short, it adheres incredibly tightly and closely, creating a seamless barrier between the substrate and the environment. There are two main methods of boosting performance through coating:

Hydrophobic coating: A nano coating works because of the way the particles organise themselves and bond with the surface. The surface of the coating is hydrophobic in one of two ways: Either it has extremely low surface energy (which means very low molecular attraction), or the surface is highly textured with peaks and troughs. Substances cannot adhere to the 'wet' low surface energy, and a textured surface means not enough surface area is available for substances to adhere to. Both these surface types repel water, dirt, and dust, and prevent the growth of mould.

Anti-reflective (AR) coating: An anti-reflective coating for solar panels is a nano coating which reduces the reflection and glare produced by an uncoated solar panel. It does this by reducing the difference in the refractive index between air and glass. When light hits the coated glass, there is a far higher rate of transmission than when it hits uncoated glass. The anti-reflective solar coating is also silica-based, which gives it added protective properties including being hydrophobic, easy to clean, weather resistant, and mechanically robust.

Increased need for innovative nano coating for solar panels

New technologies are being announced all the time. Thin film technologies in particular, are an area of huge growth. Thin film technologies include spray on, printable, and perovskite cells. Perovskite cells are sprayable solar cells, soluble in a variety of solvents. This could mean that printing solar cells like we currently print books is possible, in the near future.

Perovskite cells are particularly exciting because scientists have managed to achieve a rapid increase in efficiency in just a few years, already almost matching traditional silicon-based cells. Related technology also allows integrating solar cells into coatings which makes solar glass possible. This can be used on skyscraper windows and on other high-rise buildings.

Another nano coating innovation allows solar cells to catch sunlight no matter the direction of the panel. Traditionally, solar panels are angled towards a certain direction, in order to produce energy most effectively. This coating uses regulated nano structures to capture and direct sunlight, enhancing the efficiency of the solar panel.

Solar panel coating specialists in South Africa

There are thousands of solar panels across Africa, and with that kind of market demand there are naturally many solar panel coating manufacturers to meet it. Solar panel protective coatings can be applied aftermarket or OEM, but an anti-reflective solar panel coating is more commonly applied OEM. An example is Ceramic Pro, who provide an AR coating (as well as an anti-soiling coating) for solar glass which is applied at the glass producer. Ceramic Pro also produces an AR coating for OEM, applied to the glass before tempering.

For more information about a solar panel coating for your project, get in touch! Our experts are here to help. Call the number below and let us know the details of your request. After consulting with our coating partners, we will connect you with a coating solution for your needs.