



Production of Light and Colorful Solar Cells with Self-cleaning Properties

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One of the Chinese companies that produce solar cell nanoproducts has introduced dye-sensitized solar cells to the market, which are 50% lighter than other products and have a higher performance. One of the advantages of the solar cells is their self-cleaning property that has a deep impact on the performance and life of the solar cell.

[Jiangsu Runner PV Technology](#) has produced self-cleaning solar cells that are 50% lighter than the current technologies and their energy waste is four times lower. The product, known as RN195M, is very strong and resistant against impacts. Compared with solar cells in which glass has been used, this product is much stronger and it is fireproof too.

Due to the nano-scale self-cleaning surface, maintenance of the solar cells is simple and they have a longer life. With varied applications, these solar cells have a better performance than the solar cells in the market.

- 1- Hydrophobic feature of the surface
- 2- Self-cleaning ability
- 3- Reduction of light deflection on the surface

Hydrophobicity and self-cleaning features of these solar cells minimize the negative effects of the weather and climatic conditions. Studies show that these solar cells produce 8% more energy than the solar cells without a nanocoating, because the nanocoating prevents the formation and accumulation of pollutants and algae on their surface. The self-cleaning surface causes the pollutants on the surface to be washed away by the rain quickly.

In addition to 195M model, the company has produced another model with 220p and 245P capacities. On the products

list of the company, solar cells with various powers from 195W to 400W can be seen.

Another advantage of this company's products is that the solar cells are presented in various colors. While most of the solar cells in the market are dark, these cells are available in a variety of colors. This advantage is manifested when the solar cells are going to be used in the buildings' façade. Another advantage of this product that makes it superior to the current technology is that it does not need a frame and the solar cells do not require a frame for installation. Therefore, both the installation time and the cost decrease.

At present, many companies produce solar cells in [China](#). According to the Nanotechnology Products Database (NPD), 246 nanoproducts have been recorded in the solar cells section of the bank, and [China](#) ranks first with 57 products.

Among the Chinese companies that produce nanoproducts with regard to solar cells, 50 products are related to solar cells, 6 products to solar chargers, and 1 product is related to solar shields. There is a serious competition in [China](#) to produce such products in a way that 30 solar cell nanoproducts in this country have hydrophobic properties and 19 products have self-cleaning layers.

Analysis of the Chinese companies that produce nanoproducts for solar cells shows that Risun Technology Company has the highest diversity with 11 products.

According to the data from Nanotechnology Products Databank, [United States](#) has the second rank after [China](#) with 49 products that are related to solar cells until the end of January 2017. [Germany](#) with 43 products, [Italy](#) with 21 products, and [Switzerland](#) with 12 products have the next ranks.

Comparing the Chinese and American companies shows that the companies of both countries have generally used titanium dioxide nanoparticles to reinforce solar cells. However, the American companies approach is to make flexible solar cells and most of the American products have the flexibility feature, while Chinese products are mostly waterproof. After flexibility, lightness is the main feature in the American products. Studying German products in the databank shows that the German companies that use nanoproducts in solar cells focus more on the self-cleaning aspect to the extent that 40 out of 43 German products are self-cleaning. Therefore, it can be said that the Chinese companies are after waterproof aspect, American companies are after flexibility aspect, and German companies are after the self-cleaning aspect of the solar cells.