

International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)

Balapur P.O., Hyderabad – 500005, Telangana, India



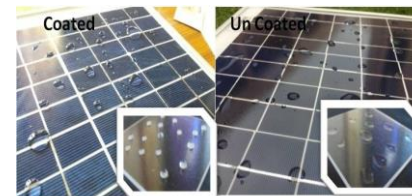
Technology of Easy to clean coating for self-cleaning of PV panels & other applications

Overview

Self-clean (easy to clean) technology is generally related to protect the solar devices from dust/dirt, corrosion and all sorts of weather conditions. PV panels are very important solar devices traditionally mounted outdoors on rooftops or in wide open spaces where they can maximize their exposure to sunlight. Unfortunately, this type of outdoor placement of the devices is subjected to substantially constant weather and moisture exposure. Due to this constant and extended exposure to the devices are preferably designed for using many years of stable and reliable operation without failure due to moisture damage. A general challenge is finding one protective coating (single layer) that has best-in-class qualities of self-clean property (easy to clean property), high weather and mechanical stabilities, no loss in transmittance/power conversion efficiency after deposition on PV panels and curable by ambient conditions. ARCI's new technology will provide solution for the above-mentioned issues.

Key Features

- Low cost production (simple coating technique / easy scalable / curable by ambient temp.)
- Highly transparent coating (no loss in transmittance / power conversion efficiency after deposition)
- Super hydrophobic property: > 110° water contact angle
- High weather stability (withstand long duration accelerated test (IEC 61646))
- High mechanical stability
- Low dust deposition compared to bare and other commercial coated samples

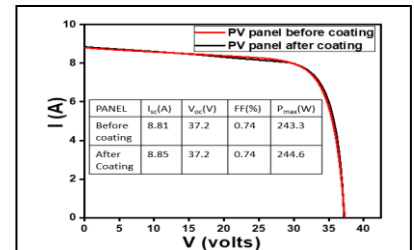
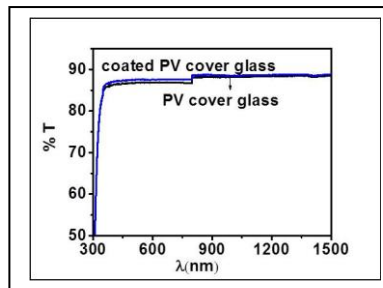


ARCI Nano coating on PV panel & glass (insert) compared with bare PV panel & glass

Potential Applications

- PV panels & reflectors employed in CSP
- Optical lenses
- Video display panels
- Architectural glasses
- Textiles
- Plastic & concrete surfaces
- Ceramic tiles

Optical trans. of PV cover glass & power conversion efficiency of PV module



Certified by CPRI Bangalore

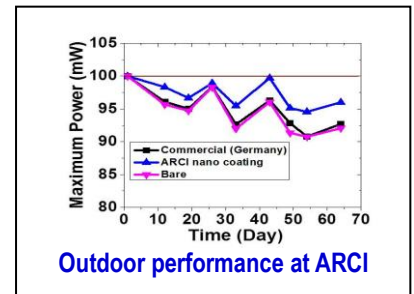
Major Patents/Publications

Indian patent Application no. 402/DEL/2014, date of filling: 13.02.2014.

Indian patent Application no. 201911009429, date of filling: 11.03.2019.



Easy to coat by spray and wipe



Outdoor performance at ARCI

IPDI*	1	2	3	4	5	6	7	8	9	10
Activities	Basic concepts and understanding of underlying scientific principles	Short listing possible applications	Research to prove technical feasibility for targeted application	Coupon level testing in simulated conditions	Check repeatability/consistency at coupon level	Prototype testing in real-life conditions	Check repeatability/consistency at prototype level	Reassessing feasibility (IP, competition technology, commercial)	Initiate technology transfer	Support in stabilizing production
Status										

*IPDI: Intellectual Property Development Indices

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