

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

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



Cost-efficient Solar Receiver Tube Technology for Low and Medium Temperature Solar Thermal Applications

Overview

Indian industrial sector needs both power and thermal energy for their manufacturing processes. Recently, Indian industries shown interest in exploit renewable energies, especially solar energy, due to their economic and environmental-friendly advantages. In this regard, centre for solar energy materials, ARCI has developed a cost-effective selective coating to convert solar radiation into a heat which can be used for low and medium temperature industrial process heat applications. We followed a facile wet chemical route using a combination of novel chemical oxidation, sol-gel and nanoparticle coating methods. The developed high selective receiver tube offers good mechanical strength along with high corrosion resistance. The high-performance cost-effective receiver tube with a capability of facile upscaling attracting many industries and technology has been transferred to an Indian industry as non exclusive basis (Greenera Energy India Pvt. Ltd).

Key Features

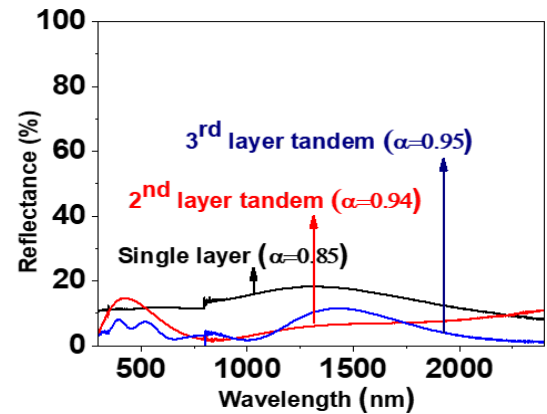
- High selective properties (Solar Absorptance ~95%; Spectral emittance ~0.12)
- Low heat loss property: ~0.14 at 250 °C
- Temperature stability: < 250 °C
- High corrosion resistance > 200 hrs withstand in salt spray test (ASTM B117)
- High mechanical stability

Potential Applications

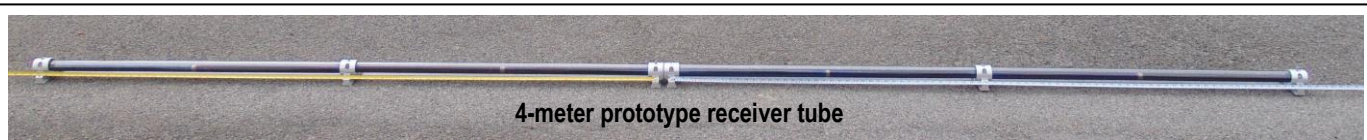
- Solar hot water & Sea water desalination
- Solar drying and Cooking
- Space and Swimming pool heating
- Solar cooling
- Industrial process heat applications
- Power generation

Major Patents/Publications

- Filed an Indian patent application no 2142/DEL/2015 on 15/07/2015



0.5-meter tandem absorber



4-meter prototype receiver tube

Intellectual Property Development Indices

IPDI*	1	2	3	4	5	6	7	8	9	10
Status										

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