

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

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Medium & Low temperature stable solar absorber tubes for solar thermal applications

Overview

Medium and low temperature solar collectors play an important role for increasing energy efficiency in concentrated solar thermal power (CSP) such as solar water heater, solar dryer, solar desalination and steam generation for various industrial applications. For such application, a large surface area of solar absorbers with high spectral selectivity is required to collect the energy at a useful rate. Moreover, generation of solar receiver tubes by an economic way is very important to reduce the cost of the solar thermal power generation system.

Key Features

- High selective properties (Solar Abs ~95%; Spectral emittance ~0.12)
- Low heat loss property: ~0.14 at 300°C
- Temperature stability: < 300°C
- Corrosion stability: > 200 hrs withstand in salt spray test
- High mechanical stability, Long durability and highly enhanced weather protection



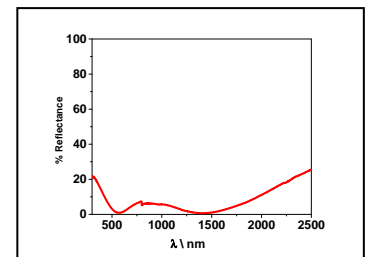
Image of single and two layer tandem absorber tubes developed by a cost effective process

Potential Applications

- Solar water heater /Solar dryer
- Solar desalination
- Steam generation for various industrial applications
- ORC solar collector based power generation

Intellectual Property Development Indices (IPDI)

- Performance and stability are validated at laboratory scale
- Scale up of coating, sol preparation and coating development is completed
- Prototype module fabrication for field test is underway



Solar absorptance of two layer tandem absorber tube

Status	1	2	3	4	5	6	7	8	9	10
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Major Patents/Publications

1. Indian patent Application no. 2142/DEL/2015, date of filling: 15.07.2015.

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