

An international standard laboratory for fabrication and characterization of both crystalline silicon and amorphous silicon solar cell has been set up.

This laboratory has all the facility for fabricating industrial standard 6” crystalline silicon solar cells and amorphous silicon solar cells. Facilities have also been created for structural , optical and electrical characterization of the fabricated cells .

The solar cell fabrication facilities consist of Texturization system, oxidation-diffusion furnace , PECVD units for silicon nitride antireflection coating and amorphous silicon fabrication , screen printing units for contacts , drying and firing furnaces , RF sputtering units and electron beam evaporation units for thin film deposition etc.

The characterization facilities consist of surface profilometer, Field Emission Scanning Electron Microscope (FESEM) , Atomic Force Microscope (AFM), Four Probe resistivity measurement unit , cryostat for dark and photoconductivity measurement , carrier lifetime measurement setup, solar spectral response measurement set up, solar cell I-V measurement unit , Micro Photo Current Decay(μ -PCD) system, time resolved Photoluminescence measurement set up etc .

Elaborate multi gas handling, gas detection , compressed air flow , chilled DI water supply and sophisticated security protocols for the sophisticated laboratory have also been created.

For enabling R&D for enhancement of efficiency on both crystalline and amorphous silicon solar cells, facilities have also been created for plasmonics and nanostructures. These include a chemical laboratory for making metal (silver) and dielectric (silica, titania) nanoparticles , premium planetary ball milling.

The created solar cell fabrication , characterization and chemical laboratory for nanoparticles is equipped for not only the industrial grade solar cell research but also for the fundamental level research which is unique in nature and is not available anywhere in India including the IITs.

An innovative excellent facility for the design, fabrication, testing & measurement of different types of solar photovoltaic systems have been setup at RABI KUTIR, a unique demonstration of Building Integrated Photovoltaic unit, designed & developed by CEGESS and inaugurated by the Honorable Governor of West Bengal. This laboratory has all the facilities for carrying out R& D work on solar photovoltaic systems where world class solar array simulators and other facilities for designing and fabricating LED based systems, grid - tied inverters etc have been installed.



[Video of Cegess](#)

Major Materials and Device Processing units

- Clean Room Equipment and accessories
- Wet Texturization Bench
- Oxidation/ Diffusion Furnace
- Multizone PECVD Cluster unit
- Screen Printing machine
- Drying and Firing Belt furnaces
- E- Beam evaporation apparatus
- RF Sputtering units
- Laser Scriber
- Spin coating unit
- Planetary Ball Mill
- Deionized water system

Major Characterization Equipments

- Solar Simulator and Spectral Response setup
- Four probe resistivity apparatus
- Scanning probe microscope
- FESEM
- Thickness profilometer
- Optical microscope with image analyser

Major Equipments for SPV Systems

- 30 kW Solar Array Simulator
- 30 kW Grid Simulator
- Agilent source meters
- Data acquisition system
- Grid Tied Inverters



