



## ISO17025 Accredited Laboratory

The KACST PV Solar Reliability Laboratory is an ISO 17025 Accredited Laboratory under National Accreditation Body – ACCREDIA with Lab No 1538 and GCC Accreditation Center (GAC) with lab. No. 0046 (both under ILAC-MRA). KACST PV Lab is the first laboratory of its kind in the Middle Eastern Region, capable of testing PV solar products under rigid IEC- specified test conditions. Accreditation with GAC is under way as well. The PV Laboratory is located in the Kingdom of Saudi Arabia, near the capital city of Riyadh. The area is called "Solar Village" and has a long history of solar energy research and development. The test equipment selected for this laboratory has extended test capabilities to enable producers of PV solar products to stretch their product performance beyond current standards requirements. This ensures product life cycles of 20+ years in the harsher environments of the Middle East compared to other less harsh regions. KACST experience in the PV solar field is unique and goes back over 35 years. Already in the late 1970's KACST erected a 350KW CPV solar field. This CPV Solar field has operated for over 20 years and has provided valuable research data as well as power to neighboring villages. In addition KACST, over the last 30 years, has jointly worked on solar research projects, including a 350KW solar hydrogen plant, a 100KW thermal dish project, fuel cells and other programs in the PV and thermal solar fields. Supporting these research activities, ACST has built early-on, a sun simulator and a complete spectral analysis lab.

**Local environmental challenges:** The environment in the Middle Eastern region by far exceeds the stress imposed on standard PV solar modules. Materials and production processes for standard PV solar modules are selected and designed to achieve product life times of 25 years under average global environmental conditions PV modules installed in the Middle East are exposed to much stronger levels of

- Ambient Temperature / Temperature Cycles
- Ultra Violet Light
- Sand Storms

Temperatures near the desert can easily cycle daily between 90°C+ and near 0°C. Today's established test procedures do not account for such environmental conditions. Sand Storms appear frequently. Here too, no test procedures are in existence to simulate product behavior under such environmental conditions. It is the objective of this laboratory to define and test for harsher environmental conditions.

**Lab Facilities:** A significant area at Solar Village is dedicated for outdoor testing. It will be very essential, besides doing accelerated environmental tests to be able to perform real life tests with products exposed to the local environment. The outside test area already includes tracking capability for PV and CPV modules and has limitless options for expandability to perform life tests for clients interested in the behavior of their products under real life conditions.

**Extended Test capabilities:** Besides the required capability to comply with IEC test procedures laid out in the IEC 61215 and IEC 61730 standards, this lab has developed "Desert Protocols", tests and procedures to simulate a harsh environment. PV Modules passing these tests are prepared for longevity in this region. Below is only an example of test equipment in this laboratory.

- Thermal Cyclic Chamber (Fast): accelerated desert cycles
- Sand Spray Chamber: simulating sand storm environment
- Salt Mist and Corrosion Chamber: test at elevated temperatures
- Ammonia Chamber: simulate environments near farm land
- Mechanical Load Tester: with dynamic load test
- High Resolution Electro Luminescence Tester: for deeper analysis
- PV Module Flash Tester: AAA, LED light source



# KACST PV LAB

*Experience Meets New Technology*



## The Institute

- ✓ King Abdulaziz City for Science and Technology
- ✓ Decades of Experience in Photovoltaic Solar Applications
- ✓ Established and Operated a PV Solar Field already in the 1970's
- ✓ Long History of Research and Development in Photovoltaics

## The Lab

- ✓ Modern Test Equipment, exceeding ISO Specification Requirements
- ✓ Facilitated by State of the Art Calibration Equipment
- ✓ Facilitated by Equipment to Simulate Harsh Desert Environment
- ✓ Large Outside Test Area for PV Module Test in Real-Life Environments
- ✓ ISO 17025 Accredited Laboratory

## The Products

- ✓ Offering full IEC 61215 and IEC 61730 PV Module Tests
- ✓ Offering Accredited Sand Test IEC 600-68-2-68
- ✓ Offering Suite of Extended Tests, "Desert Protocols"
- ✓ Offering a Variety of useful PV Module Tests
- ✓ Offering Custom-Defined Tests
- ✓ Offering Salt Mist and Ammonia Corrosion Tests