



**Module Performance**

**ENEA**

**PV Module Qualification laboratory**

**Location of the infrastructure :**

Portici (NA) Italy  
Piazzale E. Fermi 1

<http://www.ene1.portici.enea.it/ProveModuli.aspx>

**Contact person :**

Michele Pellegrino

Phone : + 39 081 7723267

E-mail : [Michele.pellegrino@enea.it](mailto:Michele.pellegrino@enea.it)

**Objectives :**

- Indoor and outdoor qualification, module's lifetime and quality evaluation

**Main features :**



Description of the infrastructure:

The activities are focused on two main topics:

i) module's quality evaluation , ii) reliability and life time estimation.

The laboratory is appointed to partially carry out some tests on PV modules according with the Standard IEC 61215 "Crystalline silicon terrestrial photovoltaic (PV) modules - Design qualification and type approval" and with the standard IEC 61646 "Thin-film terrestrial photovoltaic (PV) modules - Design qualification and type approval", according to the types.

Available Characterization techniques:

- I-V characteristic in the dark and under illumination (Class A large area solar simulator Pasan IIIb from Belval S.A.) at STC,
- NOCT Performance analysis.
- Mechanical tests ; Visual inspection,
- Dry and Wet insulation; Light soaking
- Capacitance vs. applied voltage and Frequency,
- Frequency Response Analysis, Electric isolation
- Infrared analysis, Thermal characteristics analysis.
- Optical transmittance analysis,

Available accelerated tests :

- damp heat, humidity freeze and thermal cycling tests - 40°C up to 90 °C in temperature and 0-90 % for the relative humidity;
- salt spray corrosion test in a temperature range between room temperature and 55°C and R.H range between 50% and over the saturation condition .
- UV test to test long term exposure to ultra violet radiations (A and B part of the spectrum) with adjustable climatic parameters (temperature: 20-80 °C, relative humidity: 20-90 %). The maximum irradiance on the testing plane (2 x 1.2 m<sup>2</sup>) is 250 W/ m<sup>2</sup>

**Services currently offered by the infrastructure:**

In order to provide a good technical support , "PV modules testing lab" has been recently authorised to perform experimental tests over modules for the quality evaluation for both research and application. The activity is realized in collaboration and for Research Centres & Universities, private companies and PV modules producers;,, dealers, sellers, local or central Public Institution.