



## Thin Films

European Commission Joint Research Centre

European Solar Test Installation (ESTI)

<b>Location of the infrastructure :</b>	Ispra (VA), Italy	<a href="http://re.jrc.ec.europa.eu/esti">http://re.jrc.ec.europa.eu/esti</a>
<b>Contact person :</b>	H. Müllejans	Phone : E-mail : <a href="mailto:harald.muellejans@ec.europa.eu">harald.muellejans@ec.europa.eu</a>

**Objectives :**

- Calibration of thin film and high efficiency silicon devices under an ISO 17025 accredited system, with traceability to the World Radiometric Reference
- Development of improved device performance characterisation procedures

**Main features :** ESTI is a European reference laboratory for the verification of the power and energy generation of advanced photovoltaic devices through the development of experimental methods suitable for international standardisation.

The facilities relevant to calibration of thin film devices include:

- Steady state simulators, Class AAA, max device size 30 cm x 30 cm
- Oriel spectral response system
- Flash simulators, Class AAA, for spectral response, I-V and TCO measurements on modules
- Large area steady state simulator for devices up to 200 cm x 200 cm (from 2013)
- Long pulse (80 ms) simulator for devices up to 130 cm x 200 cm (from 2013)
- Outdoor calibration set up
- Light soaking under controlled temperature conditions

**Limitations or constraints :** Users would assist in the performance of a focussed series of experiments and analysis following an agreed programme. They would be supported by experienced ESTI scientists and technicians.  
Within certain limits, users' costs for travel and subsistence may be covered by the JRC

**Typical services or results :**

- Calibration of prototype devices
- Studies on improved testing methods and procedures leading to reduced uncertainty bands
- Indoor- outdoor comparisons

**Examples of research projects :**

- Studies on calibration procedures for tandem modules
- Studies on stabilisation requirements for calibration of thin film devices
- Intercomparisons for lab performance assessment