

FLATCON® Module

Fresnel Lens All-Glass Tandem Cell Concentrator Module

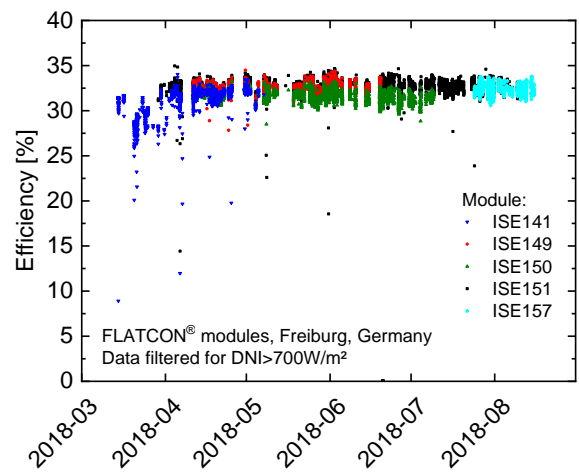
The FLATCON® module technology has been designed to meet the world's highest conversion efficiencies from sunlight to electricity while being manufacturable in large volumes.



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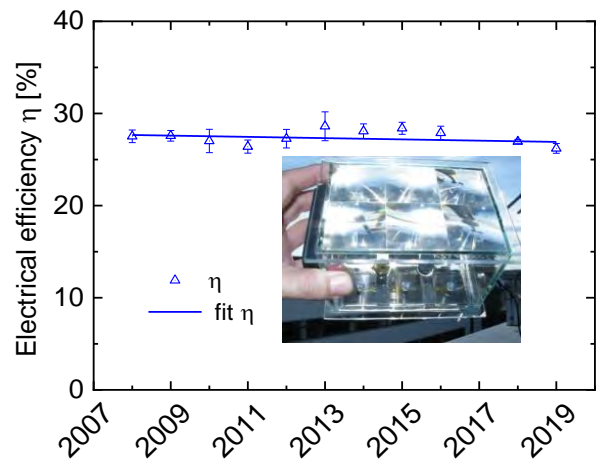
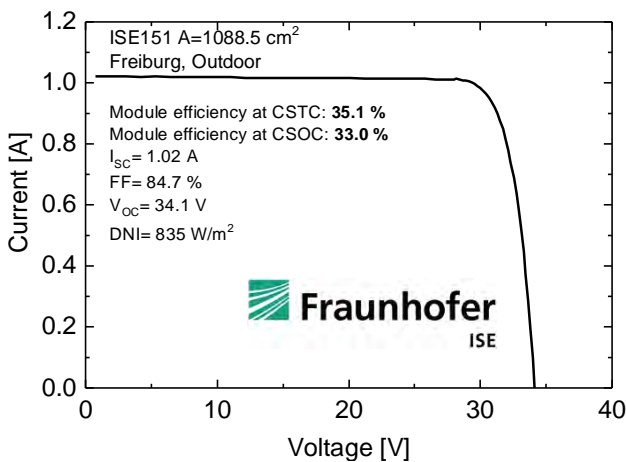
FLATCON®	Standard Configuration
Lens aperture	22.7 cm ²
Primary optics	Silicone-on-Glass
Secondary optics	Reflective
Geometrical concentration factor	321
Module dimensions	Approx. 21 x 60 x 12 cm ³

High performance of FLATCON® CPV modules measured outdoors at Fraunhofer ISE for several months.



Proven reliability by outdoor performance tests since 2008 (example FLATCON® test module with 6 cell-lens units).
Observed average degradation: 0.25 %_{rel}/year (±0.18%)²⁾

Rated module efficiency of FLATCON® module with state-of-the-art triple-junction solar cells¹⁾.



²⁾ Ref: Wiesenfarth et al, CPV-15 conference, Morocco, AIP Conference Proceedings 2149, 030007 (2019); <https://doi.org/10.1063/1.5124184>

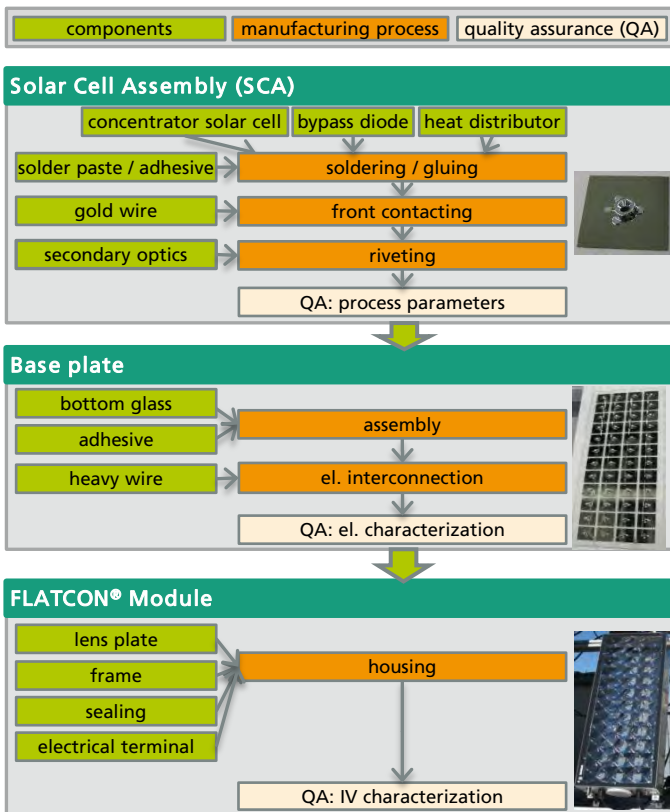
¹⁾ With concentrator standard operating conditions (CSOC), concentrator standard test conditions (CSTC) according to IEC according to IEC 62670-3

FLATCON® Module

Concentrator PV at Fraunhofer ISE

The FLATCON® CPV module technology has been developed at Fraunhofer ISE for more than two decades. We have gained experience in designing, manufacturing and characterization of all components from the solar cell to optics, and assemblies as well as investigation of reliability. We operate the unique Con-TEC (Concentrator Technology and Evaluation Center) laboratory which allows for the manufacturing of prototype modules, including new components and manufacturing processes. We also have significant experience in industrial manufacturing requirements.

We support the entire process chain for manufacturing FLATCON® modules:



Requirements for outdoor operation:

- mounting to precise 2-axis tracking system (accuracy $\pm 0.1^\circ$)
- dry air ventilation to protect from humidity
- respect for local safety and disposal requirements (contains III-V semiconductor materials)

Commercial components to build FLATCON® modules are available from:

- concentrator solar cell (AZUR SPACE Solar Power GmbH)
- Silicone-on-Glass (SoG) Fresnel lens (ORAFOL Fresnel Optics GmbH)
- contact us for further supplier details for: substrates, reflective secondary optics, production equipment

At Fraunhofer ISE we offer:

- transfer of the FLATCON® technology to local industrial production
- adaptation of the module design to customer requirements
- characterization and analysis of components and module performances
- reliability testing indoor and outdoor
- prototype manufacturing and development of components (concentrator solar cells, optics) and modules

