

The ENEA logo features the word "ENEA" in a bold, white, sans-serif font. To the left of the text is a stylized graphic of a sun or starburst with a bright yellow center and a blue, glowing aura.

AGENZIA NAZIONALE
PER LE NUOVE TECNOLOGIE, L'ENERGIA
E LO SVILUPPO ECONOMICO SOSTENIBILE



6th International Broadband Intercomparison

ENEA – Trisaia activities on solar thermal applications

Vincenzo SABATELLI

ENEA – Research Centre Trisaia
Solar thermal qualification and certification test laboratory
email: vincenzo.sabatelli@enea.it

Trisaia, 25 May 2016

Accredited Laboratory from 2003:



LAB N° 1346



The Laboratory performs:

- Efficiency tests both on glazed and unglazed solar collectors according to European (**EN 12975**) and international (**ISO 9806**) standards
- Reliability and durability tests (Internal pressure resistance, Internal and External thermal shock, etc.) according the same standards

Furthermore, the laboratory is able to assess the daily and annual performance of solar domestic hot water systems according to **EN 12976** and **ISO 9459** standards.

Finally, Laboratory is member of the **Solar KeyMark** Network.

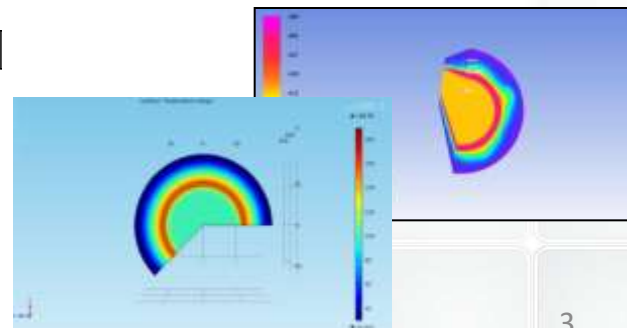
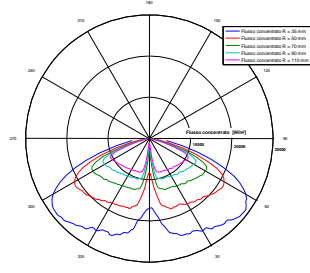
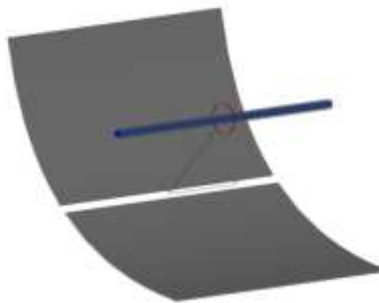


Facilities and activities

Test facility allows to perform efficiency characterization of concentrating solar collector according to European and International Standard (EN 12975 – ISO 9806)

Concerning the activities:

- **Support to the industrial sector** on development and energy optimization of prototypes (CPC systems, mini and micro-CSP, Linear-Fresnel systems, dish/Stirling systems)
- **Development of optical and thermo-fluid dynamic models** for the analysis and planning of new components, finalised to the improvement of marketable products
- **On-site testing** of concentrating solar components and plants for accessing to national incentives («Conto Termico»)



Facility for testing medium temperature solar collectors

Ongoing activities

- Different types of **small scale concentrating collectors** for medium temperature applications have been qualified:
 - PTC collectors
 - Linear-Fresnel systems
 - Dish/Stirling systems
- **Main outputs:**
 - Efficiency curve determination
 - Evaluation of optical properties (transversal and longitudinal IAM)
 - Qualification test for checking the correct functioning of protection systems
- **Typical test conditions:**
 - Orientation: E-W
 - Thermal Fluid: diathermic oil
 - Temperature range: 100 – 300° C
 - Flow-rate: constant
 - Measurements performed at solar noon to make negligible end-losses effects



Facility for testing medium temperature solar collectors

On-site test of large scale collectors

Given the wide range of types and sizes of concentrating systems available on the market, when the module size to be characterized exceed the maximum capacity of ENEA Trisaia test facility (upper thermal power limit of 25 kW), **our laboratory performs field tests at the installation site.**

In order to achieve this objective, **suitable testing methodologies have been developed**, taking into account that:

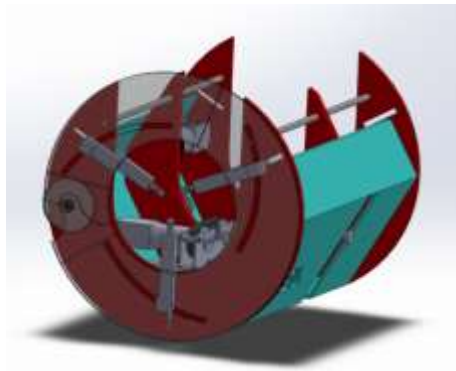
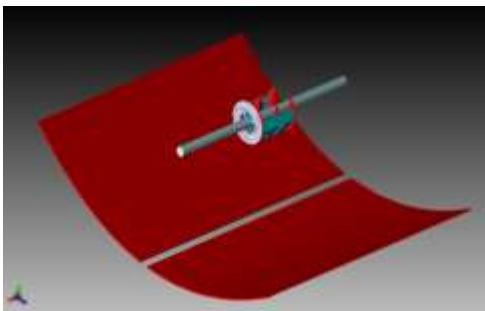
- It is not always possible to carry out tests in steady state conditions
- It is difficult to reproduce conditions of stability of the thermo-fluid-dynamic parameters comparable to those obtainable with laboratory measures
- It is not always possible to run tests at solar noon, situation that requires the need to introduce corrections for taking into account the IAM effects
- The system during its normal operation is often in transient conditions



R&D activities

In the frame work of the activities of **ENEA Solar Thermal Division**, our laboratory is involved in different national and european projects concerning:

- Development and testing of **innovative thermal storage systems** for medium temperature applications (solar cooling, process heat production)
- Development of new **type of receivers** optimised for operating temperature ranging from 100 - 250° C
- Development and testing of devices for the **measurement of concentrated solar flux** on cylindrical receivers



Thanks for your attention



For more informations ...



**Agenzia nazionale per le nuove tecnologie,
l'energia e lo sviluppo economico sostenibile
Centro Ricerche TRISAIA**

Laboratorio di certificazione collettori e sistemi solari

<http://www.enea.it>

<http://www.trisaia.enea.it>