

> EVALUATION

The technical evaluation of photovoltaic processes

Due to their increasing use in buildings, photovoltaic panels have to be globally evaluated both electrically and functionally (resistance to wind, water tightness, safety of persons, etc.). CSTB mobilizes its skills to satisfy manufacturers' needs for the photovoltaic processes evaluation. The EvalIE (Evaluation of Energy Installations) team is responsible for investigating Technical Assessments.

Contact

EvalIE > EVALUATION OF PHOTOVOLTAIC PROCESSES
cstb-photovoltaique@cstb.fr

HEADQUARTERS

84, AVENUE JEAN JAURÈS | CHAMPS-SUR-MARNE | 77447 MARNE-LA-VALLÉE CEDEX 2
TÉL. (33) 01 64 68 82 82 | FAX (33) 01 60 05 70 37 | www.cstb.fr

CSTB
le futur en construction

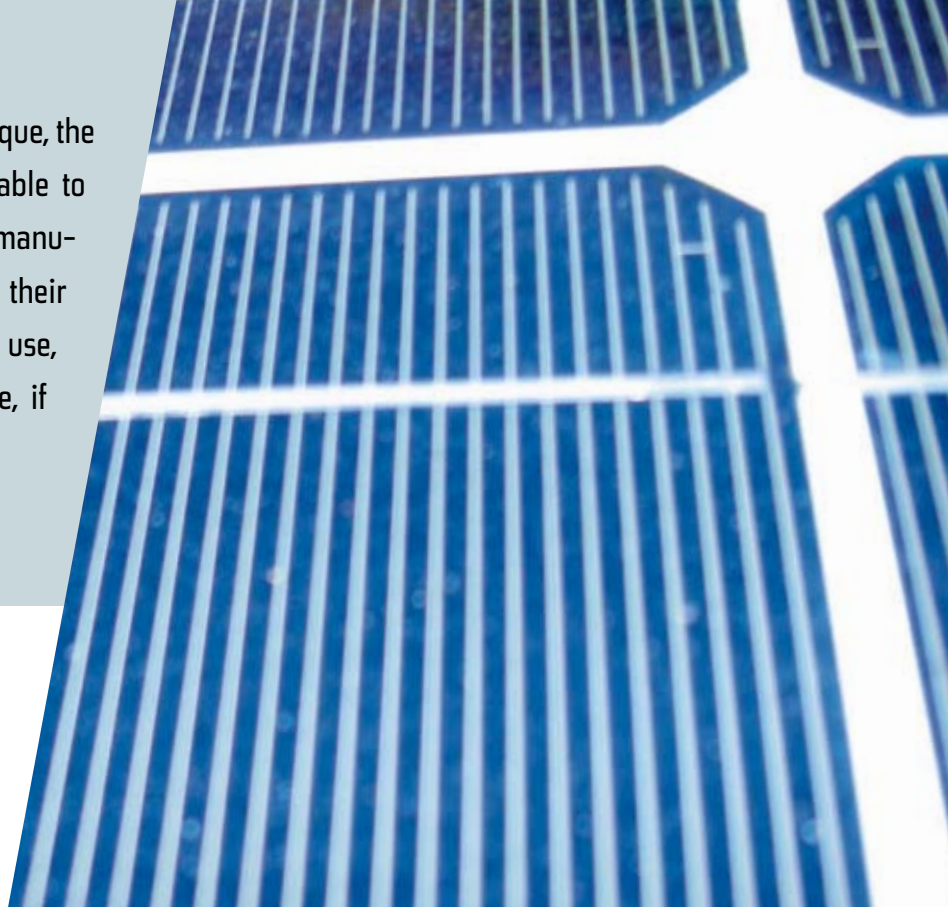
CENTRE SCIENTIFIQUE ET TECHNIQUE DU BATIMENT | MARNE-LA-VALLÉE | PARIS | GRENOBLE | NANTES | SOPHIA ANTIPOLIS

AGENCE LINEAL | CRÉDITS PHOTOS : CSTB | AVEC L'AUTORISATION DES FABRICANTS | MAI 2010 | 500 EXEMPLAIRES

CSTB
le futur en construction

CENTRE SCIENTIFIQUE ET TECHNIQUE DU BATIMENT | MARNE-LA-VALLÉE | PARIS | GRENOBLE | NANTES | SOPHIA ANTIPOLIS

Since photovoltaic is an innovative technique, the Technical Assessment procedure is applicable to it. This spontaneous approach enables manufacturers to evaluate technical aspects of their processes in terms of suitability for use, durability and feasibility in the structure, if they wish to do so.



Experimental means

CSTB has different evaluation facilities in Sophia Antipolis, Marne-la-Vallée, Grenoble and Nantes, on which photovoltaic processes can be tested depending on the planned use (roof, façade, glass roof, etc.).

Support from all CSTB resources and professionals in the subject

CSTB's EvalIE team is dedicated to the evaluation of innovative energy processes. It works in close cooperation with other CSTB experts such as specialists in the building envelope, fire safety, climatic loads, etc.

A multidisciplinary Specialised Group (GS 21) was also created to work on "Photovoltaic processes". This Group is composed of experts in different subjects (photovoltaic, electricity, roof, roof covering, façade, lightweight construction, glazing, etc.) and issues Technical Assessments optimising expertise and deadlines.

The Technical Assessment

The Technical Assessment applies to the implementation of a photovoltaic panel composed of a photovoltaic module and its assembly system. It also aims at the photovoltaic electric field, limiting itself to the DC part. Therefore the assessment is not applicable to inverters nor to the AC part and possibly its connection to the electrical network.

There are two essential prerequisites before the investigation of the Technical Assessment can be started :

- Every module technology to be evaluated shall comply with standard NF EN 61215 (crystalline silicon) or NF EN 61646 (thin layers), and test reports concerning it shall be provided for support.
- Modules shall also be designed for Class II electrical safety according to standard NF EN 61140 for each technology to be evaluated.

These systems may also be certified (by CERTISOLIS, subsidiary of CSTB and LNE), thus confirming the Technical Assessment procedure.



BOILING WATER IMMERSION BENCH (picture 1) > Boiling water immersion tests for photovoltaic laminated glass panels according to standard NF EN ISO 12543-4.

SHOCK BENCH (picture 2) > Shock resistance tests according to standards NF P 08-302 and NF EN 12600 on balustrades, façade elements, glass roof, built-up cladding.

SIMULATED AGING BENCH UNDER UV (picture 3) > Simulated aging test of photovoltaic laminated glass panels under UV according to standard NF EN ISO 12543-4.

JULES VERNE CLIMATIC WIND TUNNEL (picture 4) > Full-size mock-up tests for the study of wind effects associated with other climatic parameters.

FIRE REACTION AND RESISTANCE BENCH (picture 5) > Thermal loads from processes for fire reaction and resistance test.

WIND, WATER, AIR PENETRATION TEST BENCH (picture 6) > Wind resistance tests according to standard NF EN 12179, on water tightness and air permeability tests.

PRESS > Mechanical tests: tension, compression, 3-point bending, 4-point bending, peel test, pull-through test.

BALUSTRADE BENCH > Resistance tests on balustrades under static loads according to standard NF P 01-013.

NATURAL SUNSHINE BENCH > Exposure of modules to natural sunshine with temperature records within the assembly and the current-voltage curve.