Senersun Premium Quality Program

The most advanced Quality Control program
ever implemented by a solar panel manufacturer

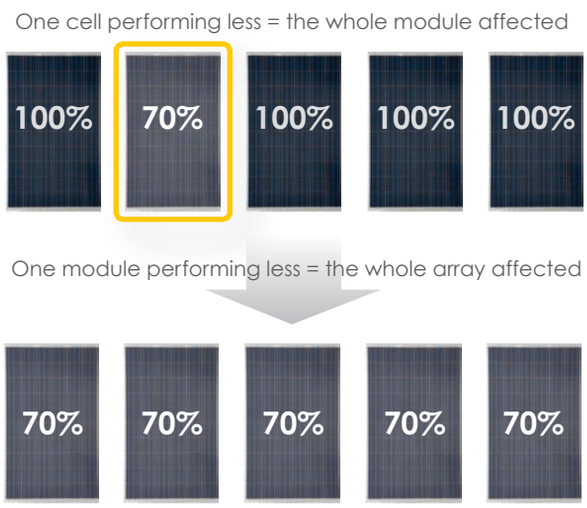
senersun
we mean quality

Why we created Senersun Premium Quality Program

i. Because the good performance of a solar system lies on the quality of EVERY solar panels, not just 95% of them.

In any electrical system, the element from which the current is the lowest determines the current generated by the whole system. In short, the weakest rules. In a PV module, less current in a cell means a reduction of the current in the whole module. This phenomenon will spread to the range of modules installed, connected in series…

This phenomenon, called "weakest link" effect, can be caused by natural objects creating shadows on the panels, but also by a broken cell in the module, which will affect the whole panel's performance and have consequences on the entire system's output.



In short, only one single solar cell broken in one solar panel can reduce the performance of your whole system by up to more than 30%. This is the reason why we find it critical to deliver 100% defect-free solar panels.

ii. Because no other solar panel manufacturer is willing to commit on delivering 100% of defect-free solar panels like we do.

STS Certified reported in 2012 having found more than 8% of defective panels among the 77,000 solar panels they had tested the year before, from the largest to the smallest manufacturers.

At Senersun, our commitment to quality is absolute. Our panels have been systematically certified by STS since 2010, and we have decided to strengthen our commitment by creating our own QC program in cooperation with them, called "Senersun Premium Quality Program" (SPQP).

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What Senersun Premium Quality Program lies on

i. Senersun quality requirements: going beyond industry standards
Exisiting safety and quality standards are necessary but they do not suffice to guarantee the long-term performance of solar panels. Senersun has therefore developed its own exhaustive quality standards, which cover the whole scope of quality on a solar panel, from the determination of what is a micro-crack to the assessment of the packaging. Like no other solar panel manufacturer, Senersun applies these standards to every solar panel, to guarantee the most sustainable generation of electricity that a solar panel can produce.

ii. Tests performed on EVERY solar panel, in compliance with our quality standards
Senersun commits to apply its Premium Quality Program to EVERY solar panel. Because it is impossible for a manufacturer to guarantee the quality of all its products by only testing a few samples, we test 100% of our solar panels and only ship products that comply with our standards.

Senersun Premium Quality Program's features

i. In-house quality, performed by Senersun
Our factory is certified ISO compliant (9001:2008: Quality Management System), and features automated production lines. In-house, our solar panels are submitted to a first series of intensive tests, including 3 EL tests (before and after lamination, and after production) and Flash test. This stringent in-house QC enables us to detect quickly potential defects, and save time during production, while managing our costs. All the tests are performed on high-end equipment.

ii. In-house inspection by STS Certified
A team of experts from STS Certified is present at our factory, during production. STS Certified's experts control the compliance of the production process with our quality standards.

iii. 100% re-test at STS QC Center
After production, each Senersun solar panel is sent to STS facility. Every characteristic of the product is checked on each panel, from cell quality (100% EL test), performance (100% Flash test + analysis of the curve), to technical and visual quality. Components and packaging are also controlled.

The panels offered by Senersun all comply with Senersun Premium Quality Program.

Senersun Premium Quality Program

SPQP

Certified by STS

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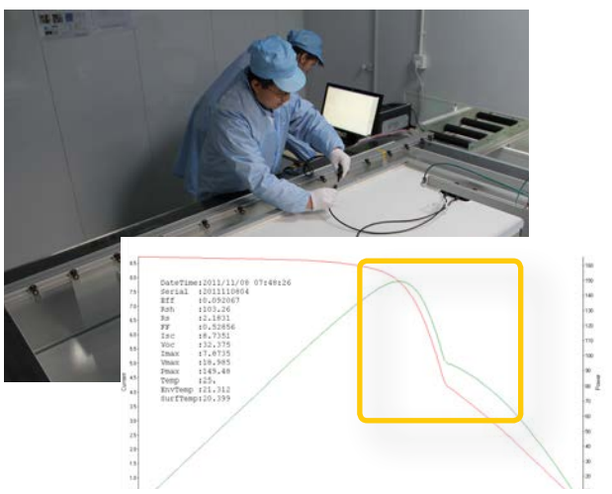
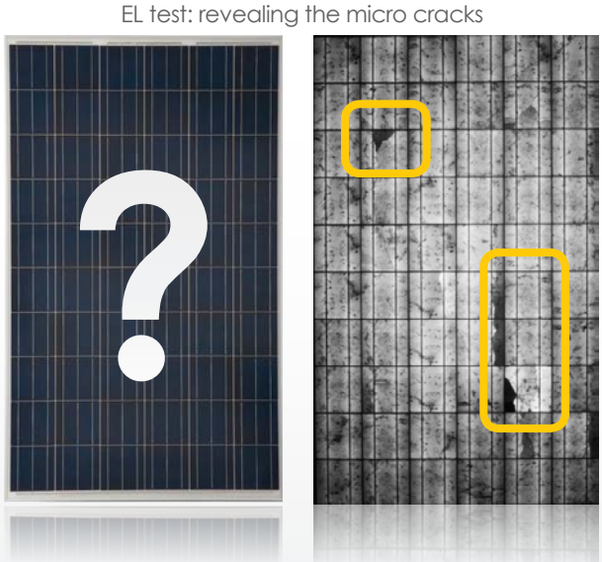
Learning more about the tests



Defective IV curve

EL test: revealing the micro cracks



Flash test: assessing the panels performance
The Flash test is performed on a sun simulator. Light is projected on the panel, to enable the determination of the power generated by the panel. This test is obviously necessary to determine the power output of a panel, but paying attention only to the power is misleading, a careful analysis of the curve is also critical to assess the sustainability of the panel's performance.

Analysis of the curve
The Flash test not only assesses the actual power of the panel, but also provides you with its IV curve. A panel of which the Flash test revealed no problem in terms of performance may not produce the same power everyday, because of a poor cell connection that a broken IV curve will reveal. Senersun is the only company analysing the IV curve of all its panels.

100% EL test: our solution to guarantee no broken cell
Acting as a sort of X-Ray of the panel, the Electro-luminescence (EL) test is the best way to spot micro cracks in solar cells, which will prevent the cell from working as expected.

On the opposite picture, you can see a panel of which the EL test revealed the presence of micro-cracks. A panel may have passed a Flash test because the cracks do not impact the panel's performance yet, but defects are dynamic: they will increase with time and climatic conditions. Quickly, the cracks will spread in the cells and reduce the panel's power output.

Senersun is the only company having 100% of its products submitted to an EL test performed by a third party, and therefore able to guarantee free-of-crack solar cells, for a guaranteed power output.

The tests mentioned above are part of the 50 points of control checked on each panel during Senersun Premium Quality Program.

Senersun Premium Quality Program, the most advanced Quality Control.

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A question about Senersun Premium Quality Program?

Please feel free to contact us at info@senersun.com if you have any question or comment about our program.

www.senersun.com

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