

Where are the hybrid DualSun SPRING panels manufactured?

In France! Our DualSun SPRING hybrid solar panel (PVT) carries the Made in France label because it is proudly engineered and manufactured in France...

What is the origin of photovoltaic laminates of DualSun SPRING and FLASH panels?

The photovoltaic cells of the DualSun panels are manufactured and assembled in Asia. They are said to be "laminated", i.e. hot pressed against the...

Can DualSun panels be recycled?

Yes! Thanks to SOREN (former PV CYCLE), DualSun panels are 94,7% recyclable. DualSun panels have a lifespan of 25-30 years. What happens to the...

Article Overview

A Photovoltaic Dual-Electric Module, or hybrid PVT panel, simultaneously generates electricity and thermal energy, significantly improving solar energy utilization compared to standard PV panels.

Overview

A Photovoltaic Dual-Electric Module integrates photovoltaic (PV) cells on the front side to convert sunlight into electricity and a thermal collector on the back side to capture heat energy. This dual-energy approach allows the module to produce both electrical power and usable heat, such as for water heating, building heating, or snow and ice melting in urban infrastructure . By combining these functions, the module achieves a synergistic effect, improving overall solar energy utilization from around 14-19% for single-function modules to nearly 40% for dual-energy systems .

Working Principle

- o Photovoltaic Component (PV): Converts sunlight into direct current electricity using semiconductor materials. Advanced PV technologies, such as TOPCon cells, enhance efficiency and durability .
- o Thermal Component (T): A heat exchanger or fluid piping system absorbs heat generated by the PV cells and surrounding sunlight. Circulating water or other fluids reduce PV cell temperature, improving electrical efficiency and extending module lifespan .
- o Energy Distribution: Multiphysics simulations show that introducing a thermal collector can reduce PV panel temperatures by 10-30°C, enhancing both electrical output and thermal energy capture .

Advantages

- o Higher Energy Output: Hybrid PVT panels can produce 6-15 times more total energy than standard PV panels when combining electricity and heat generation .
- o Extended PV Lifespan: Heat removal prevents overheating, reducing degradation of PV cells .
- o Versatile Applications: Suitable for residential, commercial, and industrial systems, including integration



Photovoltaic Dual-Electric Module

with water heaters, heat pumps, pool heating, and ground-source systems .

o Environmental Benefits: Reduces reliance on fossil fuels, lowers carbon footprint, and mitigates urban heat island effects when integrated into pavements or rooftops .

Real-World Example

The Dualsun SPRING hybrid PVT panel is a commercial example. It features a high-performance PV front (425 Wp) and a solar-grade aluminum heat exchanger on the back (up to 940 W thermal power). The panel is designed for year-round performance, even at low temperatures, and can integrate with brine-water heat pumps to maximize energy output from rooftop surfaces .

Considerations

o Climate Dependence: Performance is optimal in sunny conditions; efficiency decreases on cloudy days .

o System Integration: Requires compatible thermal systems and fluid circulation for heat extraction.

o Cost vs. Benefit: Higher initial costs are offset by increased total energy output and long-term savings on electricity and heating . In summary, Photovoltaic Dual-Electric Modules represent a highly efficient and sustainable solar technology, combining electricity and heat generation to maximize energy utilization, reduce environmental impact, and extend the operational life of solar installations .

Solar Photovoltaic Technology Basics What is photovoltaic (PV) technology and how does it work? PV

Photovoltaic-thermoelectric (PV-TE) hybrid systems offer a platform for enhancing the energy conversion efficiency of

Dual-use photovoltaic (PV) technology represents an innovative approach to renewable energy generation, integrating solar panels

A photovoltaic module's efficiency is quantified as the ratio between the electrical power going out of the terminals and the power of

The important point in photovoltaic simulator is the effect of mathematical modeling of photovoltaic cells in the accuracy

What Are Bifacial Solar PV Modules? Bifacial solar PV modules are photovoltaic panels

Despite relying on silicon cells with the same spectral response as monofacial PV modules, the dual-sided design of



Photovoltaic Dual-Electric Module

Best Research-Cell Efficiency Chart NLR maintains a chart of the highest confirmed conversion efficiencies for

Scientists at the Fraunhofer Institute for Solar Energy Systems ISE have succeeded in

In this study, we couple heat conduction and convection from the Optics, Electrics, and Solids Modules in the

A photovoltaic system employs solar modules, each comprising a number of solar cells, which generate

In photovoltaic modules, single-glass, dual-glass and bifacial are not concepts of the same

What Is a Bifacial Solar Panel As the name implies, a bifacial solar panel is a module that has photovoltaic

What Are Glass-Glass PV Modules? Glass-glass PV modules, also known as double glass solar panels, are

TU Graz researchers have developed FLAPTrack, a dual-axis solar tracker that combines higher PV yields with

By integrating a special photovoltaic thermal energy module into the road pavement, the PIPVT system is able to

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