

Solar cells are comparatively cheap and quickly installed. But what is the right thing for the vehicle? Two systems compared.

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Solar cells are very popular with home owners in the course. They are calculated on their life and their income, by far the cheapest and unassuming energy sources. The installation succeeds and non-avionics, its operation does not require any attention. Whenever the battery voltage drops, load the solar system for self-employed, provided that the sun is shining.

But precisely because of the lies the rub: Stay out of the sun's rays, which are important for the missing rear cargo aircraft battery. The solution to this problem promise amorphous solar cells. You are just in a few clouds, especially a flat shading and sun accrue to a special performance. Pure marketing BS? RV International wanted to know exactly and compared with a proven solar panel monocrystalline solar cells and amorphous in the Real World.

How we tested Reisemobil International.

To run a comparison on an equal footing, editors chose the test modules with largely identical price. The mono-crystalline panel MT-SM 90 Mobile Technology is preserved for about 550 to 590 euros in stores, a 57-watt solar panels of Ingeniously for 429th To two prices add up the cost of the charge controller and mounting kit.

Both of their electricity from solar panels supplied by two identical on a single battery charge controller to ensure an identical voltage level.

International motorhome mounted all the modules according to the manufacturer's instructions on proper roof elements of a mobile home: the amorphous cells were therefore glued directly on the roof, the monocrystalline with spoilers, to ensure appropriate ventilation and cooling. Compressor refrigerators with two differently programmed in and secured a cut-off voltages of the battery voltage level from 11.6 to 12.9 volts. Two computer battery, incidentally, is an indispensable component in the RV showed both the battery voltage, current wattage of the equipment and the current daily output in watt hours (Wh) at. Daily quoted the tester several times the actual wattage of the two modules and the yield. In the evening the battery computers were reset to zero.

All results on the following pages.

The main strengths and weaknesses of two solar technologies at a glance

Solar or photovoltaic cells made of semiconductor materials that convert short-wave solar radiation into electrical energy. About 95 percent of all solar cells in turn are made of silicon material. The raw material silicon is found in almost unlimited quantities. Their performance is measured in watts-peak (peak to peak engt.) and refers to the yield of one square meter. This peak power reaches the plant but only under perfect conditions.

Amorphous solar cells

Called amorphous solar, thin film cells also are characterized by a non-crystalline, disordered structure. They are crystalline in comparison to much thinner and lighter, special versions are even passable. Their efficiency in the sunlight is less than that of the crystalline, but they offer advantages in stray light, high temperature, flat sunlight and cloud cover. You do not need to be ventilated, can be glued directly onto the roof of the caravan.

Crystalline solar cells

Mono Crystalline solar cell features a dark to black color. They consist of pure silicon crystals and are currently the most effective solar panels in direct sunlight. Their high efficiency, they suffer from

shadowing or even a few clouds partially. Your strength: high efficiency in a small footprint. Because they require good ventilation and cooling, they must be increased to spoilers mounted.

Table

13 days Field Test - the results: The results Wh per day are averaged results from each of several days with similar weather conditions. The values are impressive, especially in bad weather that deliver the amorphous cells are very good results.

Table

Amorphous Module	Crystallin Module
+ Very thin and light	+ Very high performance in direct sunlight
+ Accessible (not all models)	+ High Efficiency
+ Good performance in diffuse light scattering, light obscuration and cloud cover	+ Needed for the same yield less roof area than amorphous cells
+ Performance increases at high temperatures	+ Long-proven technology with performance guarantee
+ Easy installation (glue directly onto the roof)	
+ Can be due to high bending radii adapted to form the roof (alcove) + low wind noise and drag	
Negativ: is needed for the same yield more roof area than crystalline cells	Negativ: sub-needed ventilation (more complex assembly)
Negative: lower efficiency in direct sunlight than mono-crystalline modules	Negative: yield decreases at very high temperatures again slightly
	Negative: to produce significantly more silicon needed

CONCLUSION:

The Real World is an impressive: The less sunlight through shallow angle of incidence, shadowing or diffused light, such as thin clouds is available, the closer you move the nominally weaker closer to the amorphous-crystalline cells.

A fact that the impressive evidence: Over the entire test period of 13 days gave the crystalline system of mobile technology exactly 4707.3 Wh, Wh 362.1 average daily on average each delivered watt rated power 4.02 Wh per day. The performance of amorphous solar panels from Genial added in the test period to 3876.6 Wh, average daily 298.2 Wh - or viewed differently: 5.52 Wh per peak power watt. Only with unobstructed sunlight play the crystalline cells from their advantages and their pumps during peak hours maximum rated power in the battery. Would be more pure sunny days during the trial period was, therefore, the pendulum would turn out strongly in favor of the crystalline system. However, the test period was marked by changeable weather, with usually only very few if any pure sunshine hours per day. Without question, a fact which gave the advantages of amorphous cells.

With few clouds both plants power often with identical values watts. As mentioned: The test compares two systems for about the same price.

A Solid 60-watt module of Mobile Technology would be according to the manufacturer with the 57 watts of Genialsolar in terms power at eye level would be about 450 € a bit more expensive. For about 30 percent less power compared to the MT-SM 90 would be expected. In bad weather it could not catch up with the amorphous modules, sunlight would both systems provide similar values. A clear advantage of the crystalline systems: The MT-SM requires just 60 to 99.5 x 45.0 inches roof.

Amorphous or crystalline? This question can be answered not flat. For rasing roofs are light and flat amorphous cells of choice. Also in the van or the arched alcoves make malleable, streamlined modules have a good figure. Even for motorhome drivers who frequently travel to Scandinavia, they are an attractive alternative. Who has done little available space on the roof and traveled in more sunny areas, accesses to crystalline modules.