

What are the different types of solar photovoltaic cells?

Types of Solar Photovoltaic Cells

Solar panels convert energy from the sun into the electricity we use in our homes, to power the lights on our streets, and the machinery in our industries. They can be seen on an industrial scale in solar farms and more discreetly on the roofs of our own houses.

Solar Panels at a glance

- Most photovoltaic solar panels are silicon based or a variation of.
- There are several different types of solar panel including tiles, film, and lightweight.
- The main difference in solar panels is the purity or alignment of the silicon. The more perfect the alignment of molecules of silicon the better it is at converting sunlight into electricity.
- Obviously, the more efficient panels are the more expensive, but this should not be your primary reason for choosing one type over another.

Monocrystalline silicon solar panels

The most effective of the solar PV cells with 15% efficiency*, monocrystalline silicon is therefore the more expensive option. They require less space than other cells simply because they produce more energy and can yield up to four times more power than thin-film solar panels. They also last longer than other panels and perform better at low light.

The main disadvantage is the cost which often means that it's not the first choice for homeowners. It can also be affected by dirt or shade, which can break the circuit and the production process is often seen as wasteful because the cells have to be cut into wafers.



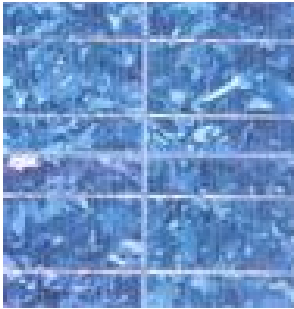
Monocrystalline silicon

Typical efficiency 15%. One of the most effective **PV cells** currently available on the market, and consequently among the most expensive they are cut from a single silicon crystal.

Polycrystalline (or multicrystalline) solar panels

With an efficiency of 13%, polycrystalline solar panels are often seen as a better economic choice, particularly for homeowners. They are made from a number of smaller silicon crystals that are melted together and then recrystallized. The process to create them is simpler and less wasteful than with monocrystalline panels. They do suffer more at high heats that can reduce their lifespan but overall perform just as well as their more expensive counterpart.

The main disadvantage for polycrystalline solar panels is that you need more of them because of the lower energy conversion efficiency.



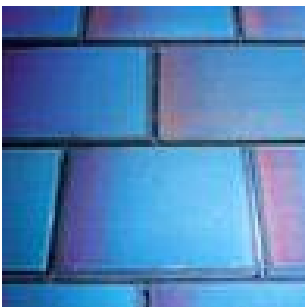
Polycrystalline (or multicrystalline) silicon

Typical efficiency 13%. Although cheaper to produce and slightly less efficient than monocrystalline cells, polycrystalline cells are still cost-effective, they are made from a number of smaller silicon crystals which are melted or recrystallised.

Amorphous/thin film solar panels

At 7%, thin film solar panels are among the least efficient on the market but they are the cheapest option. They work well in low light, even moonlight, and are made from non-crystalline silicone that can be transferred in a thin film onto another material such as glass. The main advantage is that it can be mass produced at a much cheaper cost but is more suitable for situations where space is not a big issue.

The main disadvantage for thin film solar panels are not generally used for residential purposes and will degrade quicker than crystalline cells.



Amorphous/thin film silicon

Typical efficiency 7%. One of the least efficient cell types on the market, and consequently the cheapest. Amorphous cells work well at lower light levels and can even generate electricity from bright moonlight, they are made from non-crystalline silicon and transferred as a flexible film onto another surface such as glass.

Hybrid silicon solar panels

With an efficiency of 18%, hybrid solar panels are made from a mix of amorphous and monocrystalline cells to generate maximum efficiency. There are a variety of types of hybrid cells and they are still very much at the research and development stage which is why they are currently a more expensive option.



Hybrid silicon

Typical efficiency 18%. The most expensive PV cell type available on the market, but also the most efficient, it uses a combination of monocrystalline and amorphous cells for maximum efficiency.