



Different types of

solar cells

Advantages and disadvantages

Made by 3C

Liceo Scientifico Statale Niccolò Copernico

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Monocrystalline Silicon Type

Advantages

- Since the solar panels monocrystalline enumerate the tallest degree of purity of the silicon in them content they are also the most efficient. The rate of output (energy's quantity in the form of solar light that is converted in electric energy), wanders usually around the 12-19 percent. Another way to say "to tall efficiency" it is "space-efficient." Since the panels monocrystallins have the most elevated power of production, they also ask for a smaller quantity of space to get an ability desired in comparison to the other types. The panels in silicon monocrystallins usually have between the 60 and 72 cells fotovoltaics, the equivalent of a power of 120-300 Wps (watt of peak). Besides they have the tendency to last for a longer time and the greatest part of the producers from a 25 year-old guarantee on them. They usually work better of a solar panel policrystallin classified in the same category to conditions of smaller solar intensity and inferior temperatures.

Disadvantages

- The solar panels monocrystalline are the most expensive. From the financial point of view, if it has him enough space, it would be owed to choose a solar panel that is made of amorphous silicon or policrystalline. If the panel is partially covered by shade, dirty or snow, the whole circuit is broken. If an is not used micro-inverter, this could mean that the whole line of solar panels will have an output of very inferior to that nominal. To create the silicon monocrystalline, great cylindrical ingots you/they must be manufactured with the trial Czochralski. The trial Czochralski is a technique introduced in the industrial productive systems to the beginnings of the years '50, that it allows to get the growth of monocrystalline of extreme purity. In circle industrialist such trial is mainly employed in the growth of blocks of silicon, that you/they are gotten with the form of cylindrical breads. The trial takes the name from the Polish researcher Jan Czochralski, that developed him/it in 1916 while you/he/she was studying the crystallization of the metals -. Because of the geometry of these ingots, the cells in silicon monocrystalline entirely are not square, and meaningful quantity of silicon ends to be wasted. The panels monocrystalline are more efficient during the cold season, but when the temperature increases, the rate of electric conversion decreases. Solar cells of silicon policrystalline.

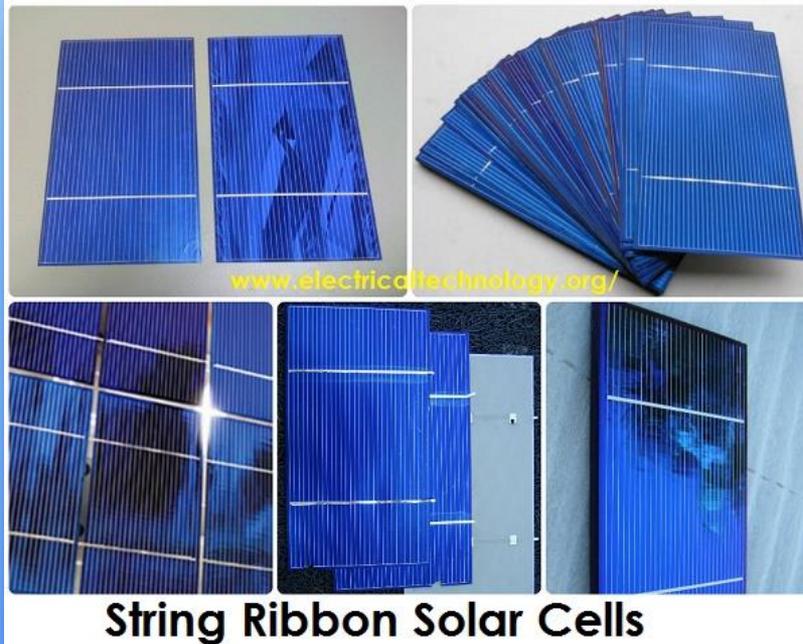
Solar cells String Ribbon Type

Advantages

- The production of panels String Ribbon requires only around halves the quantity of silicon in comparison to the panels monocrystalline and this has a meaningful impact on the reduction of the costs.

Disadvantages

- The method of production String Ribbon requires more energy in comparison to the other methods. Irony of the fate, the quantity of energy reimburses during the production you/he/she has had a meaningful impact on the increasing costs. The efficiency is notably inferior in comparison to the traditional panels in crystalline (usually around 13-14%) silicon. . This means that such panels are the least efficient ones to parity of surface of all the solar panels in crystalline silicon.



Crystalline Amorphous Silicon Type

Advantages

- Instead of wafer of silicon thick, the cells film solariums thin they cover him . of material fotovoltaics as soon as enough to cover the surface of the substrata. The solar panels in amorphous silicon use smaller quantities of silicon in comparison to both the panels mono-and polycrystalline straight. The process of production that is used for the production of cells film solariums thin in amorphous silicon it is relatively simple, easy to climb, and it asks only for small quantities of silicon. Such solar cells are therefore generally more economic than those in crystalline silicon. You/he/she can be made flexible and light. A flexible form allows to be more creative when it comes with applications. They can be positioned on curved surfaces and probably in the future to be incorporated in garments! The resistance and the flexibility of panels film solariums thin they are highly dependent from the surface to which is connected. These panels fotovoltaics offer best performances under conditions of light you worsen and they react better in cases of partial coverage, as bottom shades, dirt and snow in comparison to the crystalline panels.

Disadvantages

- The panels film solariums thin they don't last so for a long time as those mono-and polycrystalline The guarantee released by the builder is therefore usually inferior to that of the other solar panels. The amorphous solar cells have only a rate of conversion of the 6-12 percent. Nevertheless, since technology is relatively new, the rates of efficiency have attended to constantly grow thin to draw near to those some crystalline panels. The solar panels realized with this material are therefore the least efficient ones when the space looks him, which means that a great surface must be covered for having the same power of the crystalline silicon. They are also very heavier.