What’s PERC solar cells? What’s the difference between the Standard and PERC solar cells?

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In the past year, VSS has updated all flexible solar panels and folded solar panels to the latest and most efficient (21.5-22.5%) PERC solar cells.

Most of our customers don’t know why PERC solar cells are difference from conventional solar cells. A summary of key information is prepared for you to understand the PERC solar cell.

PERC Solar Cell Features

1. Outstanding surface quality.
2. Advanced diffusion technique ensuring the homogeneity of energy conversion efficiency of the cell.
3. Advanced PECVD film forming, providing a dark blue silicon nitride anti-reflection film of homogenous colour and attractive appearance.

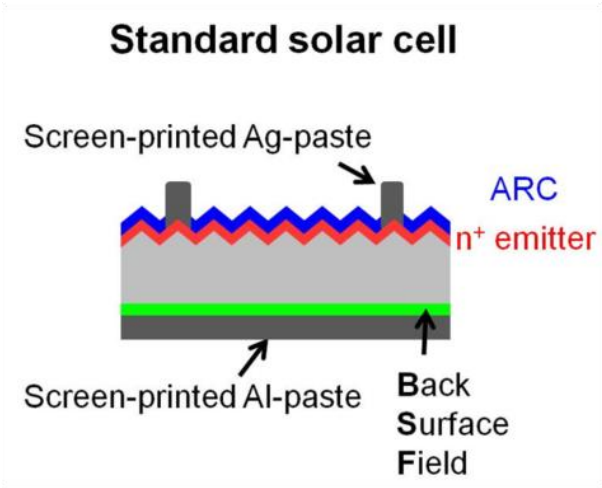
4. High quality metal paste for back surface and electrode, ensuring good conductivity, high pulling strength and ease of soldering.
5. Efficiency-increasing 4-busbar and 5-busbar technology that optimises electricity collection and ensures optimal electricity yield from your system.
6. First-rate efficiencies and superlative output consistency.
   7. Excellent anti-PID performance (under the following conditions: 60°C, 85% humidity, -1000V, 96 hours).
7. Lower power loss through encapsulation. Appropriate electrical performance parameters (high voltage and low voltage). Current evaluation and positive tolerance for the cell performance compensation guarantee a very low loss from cells to modules.
8. Outstanding solderability. Application of double-printing technology in production improves solderability.
9. Meticulous tolerance and quality checks guarantee a constantly high solar cell output capability and the resultant excellent quality of solar modules.

What does PERC mean?
Literally, it stands for Passivated Emitter and Rear Cell. You also find the term Passivated Emitter and Rear Contact.

What is it?
PERC cell technology defines a solar cell architecture that differs from the standard cell architecture that has been in use for three decades and that is usually featured in all photovoltaic manuals.

Standard Solar Cells
As of today, the vast majority of crystalline solar cells produced follow the structure presented hereunder. The standard solar cell makes up around 80% of the world market
From top to bottom:

- Screen printed silver paste to form the contacts
- Anti-Reflective Coating
- Phosphorous diffused, boron doped silicon wafers that form the P-N junction
- Aluminium Back Surface Field (Al-BSF)
- Screen printed aluminium paste



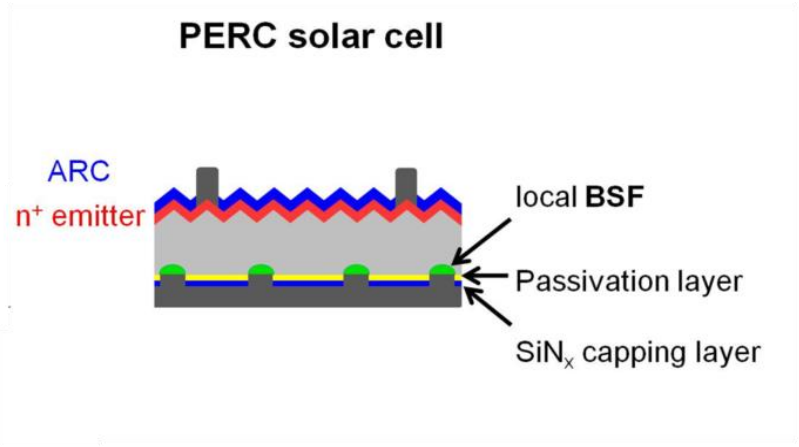
Source: Institute for Solar Energy Research Hamelin (ISFH)

PERC Solar Cells

PERC, which stands for Passivated Emitter and Rear Cell or Passivated Emitter and Rear Contact, is a new technology aimed to achieve higher energy conversion efficiency by adding a dielectric passivation layer on the rear of the cell.

The structure of a PERC solar cell from top to bottom:

- Screen-printed Silver paste front contact
- Anti-Reflective Coating (ARC)
- Silicon wafers that form the P-N junction
- Local Aluminium Back Surface Field (Al-BSF)
- Dielectric passivation layer
- SiNx Capping Layer
- Screen-printed Aluminium paste layer



Source: Institute for Solar Energy Research Hamelin (ISFH)

The dielectric passivation layer contributes to the increase of efficiency by:

Reducing electron recombination – electron recombination blocks the free flow of electrons through the cell, reducing efficiency. The extra passivation layer makes the flow of electrons steadier and more consistent thereby producing additional electric current.

Increasing the solar cell's ability to capture light – unabsorbed light is reflected by the passivation layer back to the solar cell for a second absorption attempt to produce additional energy making the cells more efficient.

Reflecting specific wavelengths that normally generate heat out of the solar cells – certain wavelengths are absorbed by the rear layer of the solar cell accumulating heat and reducing efficiency. The additional passivation layer reflects these wavelengths out of the solar cell maintaining the temperature of the solar cell.

PERC solar cell technology is more straightforward as they only differ slightly from standard solar cells. It's also more cost-effective as it allows energy output to be maximized due to more efficient energy conversion.

Monocrystalline solar cell 6" (156.75 x 156.75), 4BB (4-busbar) and 5BB (5-busbar)