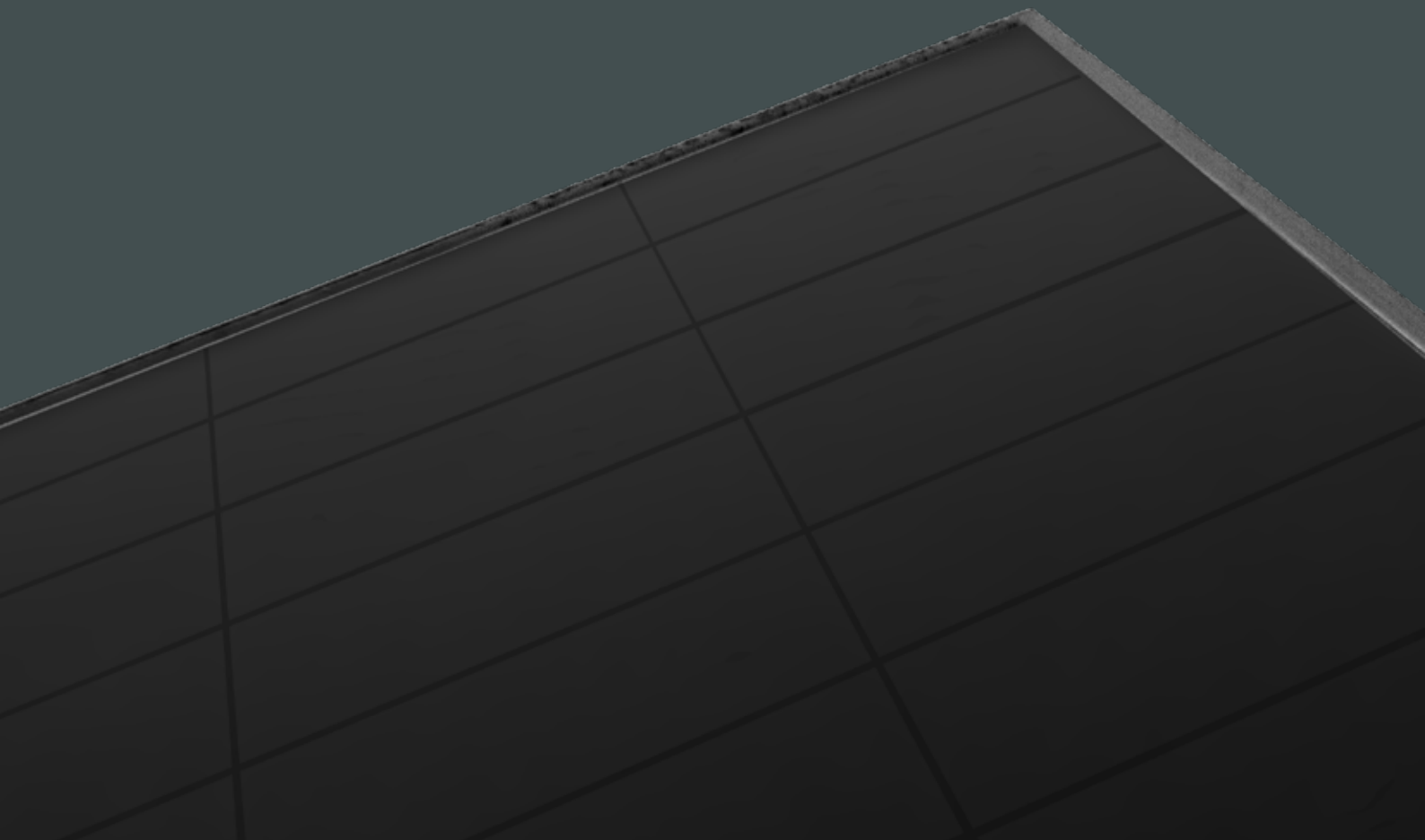
solar fabrik

Creating a Powerful Future



BC technology

Technics explained

Back Contact technology

Back contact modules are a special type of solar module in which all **conductor tracks on the cell are connected on the rear side** – in contrast to conventional modules, where the current conductors (busbars) are also visible on the front side.

This makes it possible to conduct the generated electricity via contact points on the rear side of the cell. The front remains completely **free of metal conductors**. On the one hand, this innovative technology enables an **aesthetic appearance** without any sources of interference on the front of the module. On the other hand, it enables **increased light yield**. Furthermore, initial findings indicate a reduction in degradation.

Advantages

+ **Higher efficiency**
  The completely shadow-free front of the cell provides more active surface area – this means: more light absorption, more energy yield.

+ **Reduced potential for errors**
  The rear contact minimises the risk of microcracks and contact problems on the front. The advantage: fewer failures and longer service life.

+ **BesBetter temperature stability**
  Back contact cells feature optimised heat management and deliver stable performance even at higher temperatures.

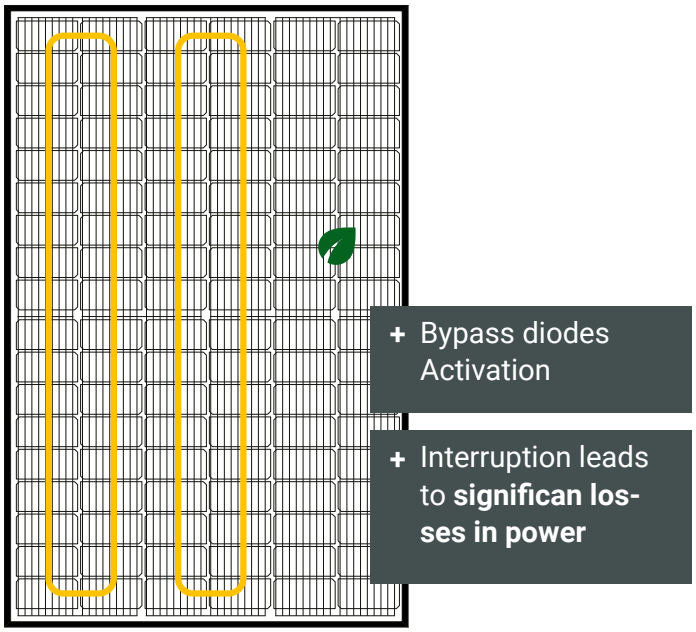
+ **Optimised current flow**
  The rear contact system allows the current to flow along the shortest path, reducing resistance and increasing electrical efficiency.

Anti-shading technology

Every solar system experiences **partial shading** at times. Depending on the incidence of light, this may be caused by a chimney casting a shadow, trees, leaves or clouds. However, the Solar Fabrik **Mono S4 Halfcut BC Full Black** features **anti-shading technology**. By way of comparison: With conventional solar power modules, the shading of individual cells already limits the power production of individual module areas. This is not the case with the Back Contact Series: here, **precise semiconductor technology maintains the flow of electricity in the module even in partial shade**. This allows unshaded areas to continue to work efficiently and significantly reduces the effects of shading – **without the need for bypass activation**.

Bipolar cell passivation

Conventional solar module

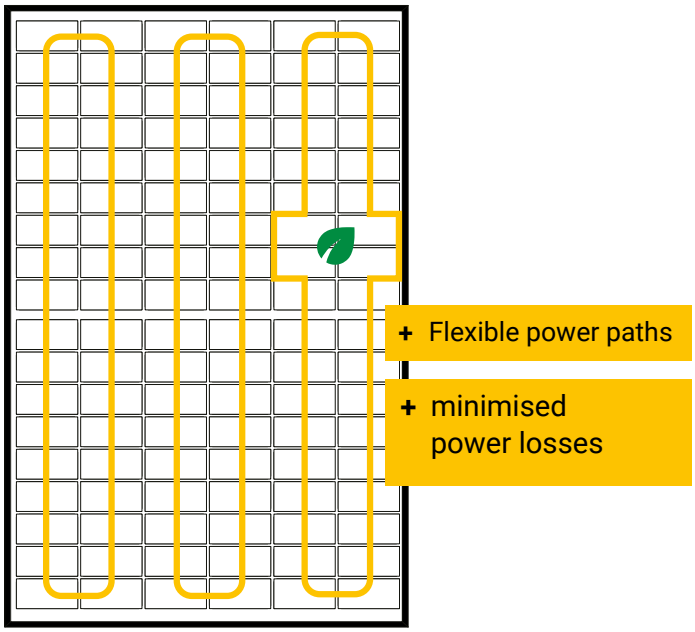


In conventional solar modules, a bypass diode is activated in the event of partial shading. This **bypasses the affected** cell group to **prevent** a rise in temperature within the module – a so-called **hotspot**. However, this also interrupts the flow of current through the shaded area, which leads to **yield losses**.

Fig.: Cross-section of a conventional cell

As the cell cross-section shows, no conductor channels are planned in the **N-junction layer (2)** that can divert the current. Therefore, there is **no way to ensure the safe functioning of the module without activating the bypass diode.**
The innovative back contact technology was developed to **bypass this circuit**.

Mono S4 Halfcut BC Full Black



Solar Fabrik's Back Contact Series features **innovative cell architecture** with an **intelligent bipolar passivation layer**. Instead of shutting down individual cell groups, the modules **can flexibly divert current via alternative paths**. This **minimises power losses** and **prevents hotspots without the use of bypass diodes**.

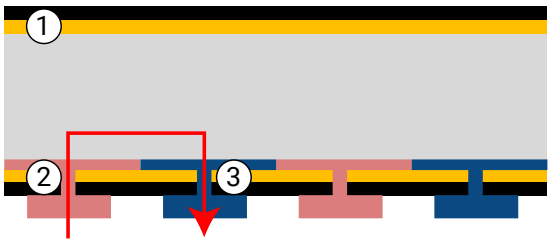


Fig.: Cross-section of BC cell

In contrast to conventional front-side passivation with **anti-reflective coating (1)**, a **bipolar layer structure** is also used here, forming a kind of **microchannel between the N (2) and P (3) transition layers**. This creates **active electrical separation** and **control of the current flow** at cell level –
even in partial shade.

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