

TPedge – the foil-free PV module

Your advantage – cost reduced PV module

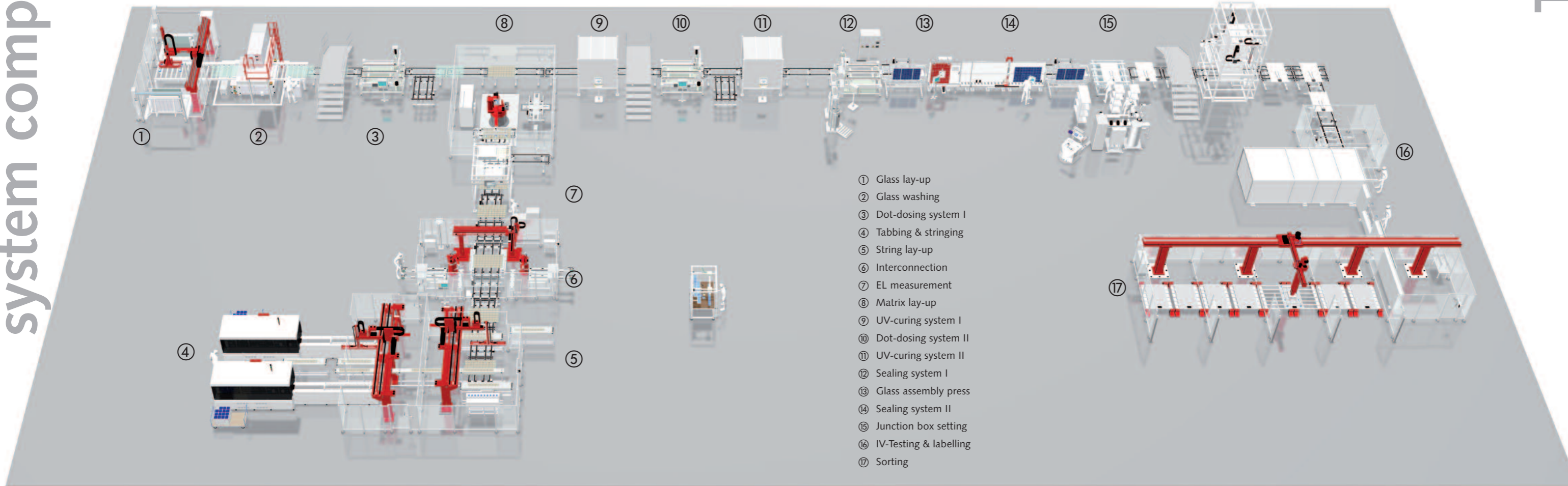
- ◆ Efficient PV module has 60 cells without frame, foil and backsheets
- ◆ Up to 32 % cost reduction in PV module manufacturing
- ◆ Very short cycle time down to 45 seconds per module
- ◆ New encapsulation system reduces stress from the solar cells
- ◆ Less energy consumption in PV module manufacturing
- ◆ Less material consumption
- ◆ Less waste – all module components easy to recycle



TPedge module manufacturing on highest level

- ◆ Highly efficient production line for 60 cells TPedge modules
- ◆ No thermal stress during the production process as no lamination required
- ◆ New encapsulation system with proven machines from the insulating glass manufacturing process
- ◆ No batch production

- ◆ Available as turnkey line with production capacities
 - 90 seconds cycle time per module
 - 45 seconds cycle time per module



Competence at all stages of PV production



With more than 30 years of experience and an extensive process know-how across the entire value chain, centrotherm photovoltaics is the leading technology and equipment provider to the PV industry.

Within the group centrotherm cell & module bundles the core competence, which is the development of highly efficient solar cell and module technologies as well as the appropriate solutions for industrial manufacturing.

Our strength lies in our comprehensive research and development along with its fast transfer into mass production.

Our integrated R&D platform enables us to harmonize processes and to fine-tune production flows to enhance module performance and to lower the total cost of ownership.

The experts in encapsulation technology

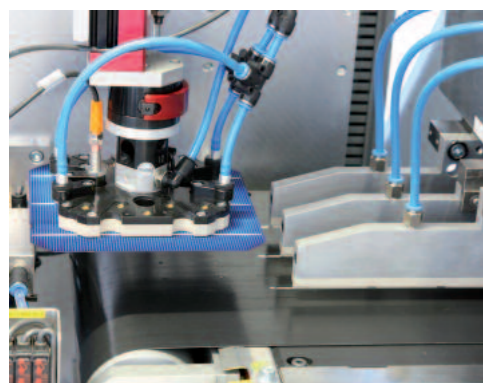


Bystronic glass symbolizes innovation with machinery, plants, systems and services for glass processing focussed on tomorrow's market. From basic requirements through to entire customized installations

Bystronic glass provides pioneering solutions – naturally, all in the highest quality.

Bystronic glass supplies its well-proven machine technologies also in important areas of the photovoltaic industry.

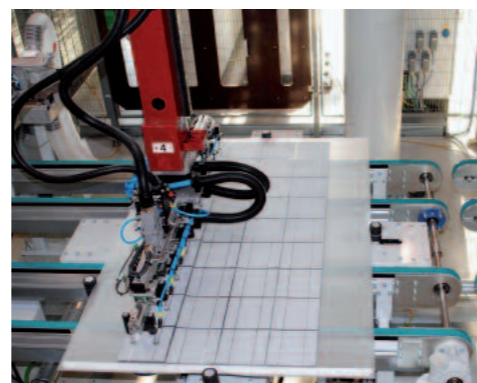
As well-known experts in encapsulation technology Bystronic glass can contribute significantly ensuring the customers' systems run smoothly and effectively. Bystronic glass is an international brand with globally operating companies that support their customers on site and through its own sales and service companies.



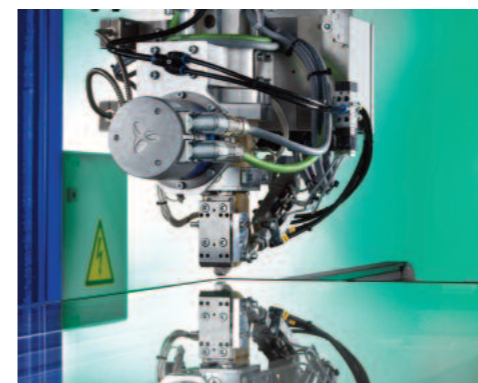
Vacuum handling for precise cell alignment



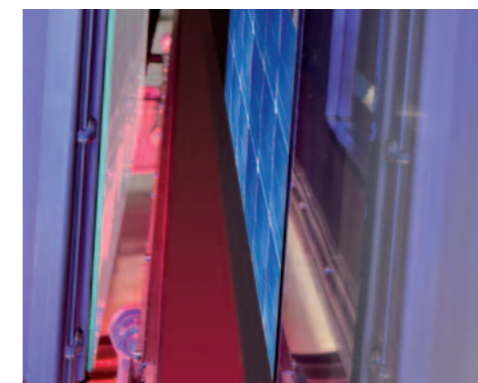
Soft touch soldering system



Automated string positioning robot



High-precision butyl application at the edge of the substrate glass

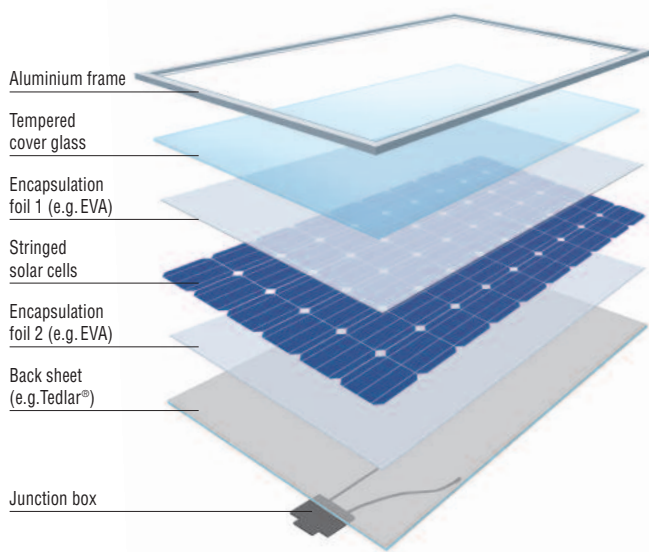


Automatic assembling and pressing of TPedge module

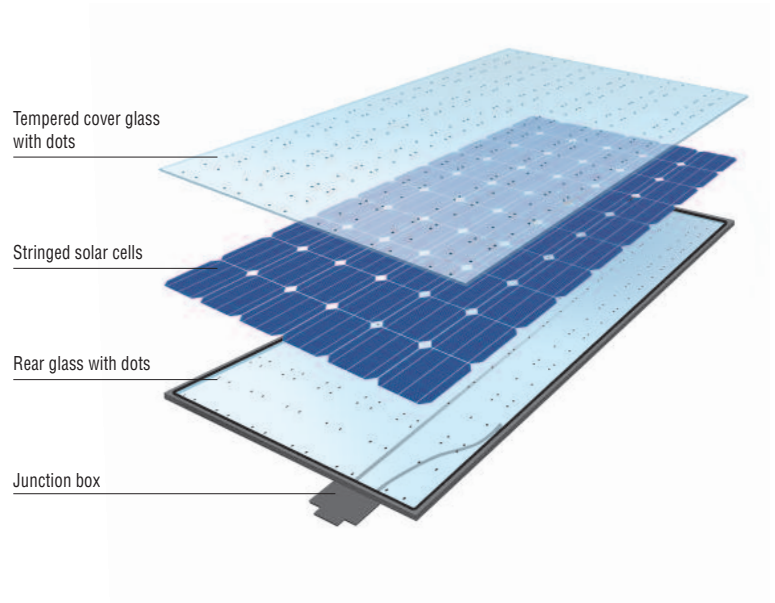


Automatic, homogeneous sealing of TPedge module

Traditional wafer based PV module



New TPedge module



Cost comparison without cells

