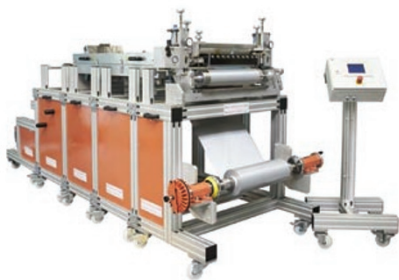


A flexible system for making flexible photovoltaic cells

SOLAR COATING MACHINERY

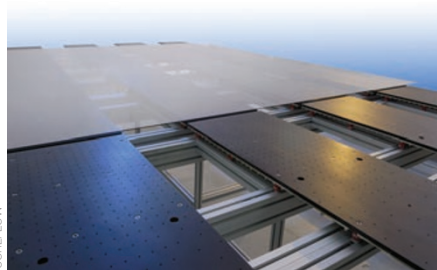


www.solarcoating.de

German company Solar Coating Machinery has developed a modular pilot line for the production of flexible solar cells. Called Click&Coat, the system is made up of 12 units, which click together to form a pilot line. These are a winder unit, coating unit, infrared dryer unit, flotation unit, sintering unit, vacuum unit, bath unit, another winder unit, edge-guiding unit, slitting unit, laminating unit and an edge-sealing unit. The company claims its pilot lines can be used to scale up from research to production volumes and suit a variety of photovoltaic technologies, including amorphous silicon, dye-sensitized cells, organic, copper indium selenide (CIS) and copper indium gallium selenide (CIGS). The company says that its products are particularly suitable for manufacturing flexible solar cells, performing encapsulation, packaging and substrate bonding.

Non-contact solutions for handling crystalline wafers and solar glass

COREFLOW



www.coreflow.com

Israeli company CoreFlow has developed a number of non-contact solutions for the transport, handling, and processing of crystalline wafers and solar glass substrates. CoreFlow's air-cushion solutions enable high-speed handling and transport (up to 100 m per minute) for large thin-film solar substrates. This non-contact procedure enables very high

process speeds and reduced vibration during the manufacturing process, resulting in improved throughput and higher manufacturing latitude. CoreFlow's Pressure Atmosphere technology floats substrates with an air gap of up to 300 μm in size to ensure non-contact, and is ideal for most inline and offline transport applications. The Pressure Vacuum system is ideal for critical process zone applications, such as laser-scribing and surface-inspection stations. The company claims its systems can enable higher material throughput and minimize glass stress and damage during manufacturing.

Metallization furnace combines solar-cell drying and firing in one unit

www.btu.com

The company BTU International has introduced a metallization furnace that combines solar-cell drying and firing in one unit for optimized throughput and reliability. The most recent addition to the PVD-600 Series furnaces, the PVD624, combines the rapid thermal processing of a 600 Series Solar Cell Firing Furnace and a D-900 Series Dryer as an integrated system. By combining drying and firing in one unit, the solar cells transfer directly from the dryer into the furnace without additional handling. This improves efficiency by saving factory floor space and reducing automation costs. In addition, the PVD-624 offers greater throughput with the use of a wider, 24-inch belt. The PVD-624 also features highly effective, closed-loop convection cooling, which enables precise control of cooling rates. This new design also provides a significantly advanced water cooling system. Quartz tubes set in a herringbone pattern maximize thermal uniformity throughout the PVD624. Individually removable, sliding side ports in each zone allow easy cleaning below the belt, and an enhanced exhaust design helps to provide superior uptime.

Flexible laser system processes thousands of silicon wafers per hour

www.innolas.de

The ILS 700 laser system from German company Innolas is a dedicated tool for processing monocrystalline and polycrystalline silicon solar cells. Examples of the laser-processing techniques available with the system are: laser edge isolation, laser-fired contacts processes, micro through-hole drilling,

SiN and SiO₂ ablation, downsizing, surface modification, laser scribing and surface structuring.

This gantry-type machine enables the processing of wafer sizes ranging from 100 mm \times 100 mm to 210 mm \times 210 mm, selected using a software program. Process performance does not degrade as the wafers increase in size, and automatic laser treatment of pseudo square formats is also possible. The machine can be supplied in various configurations, including a version that suits integration into fully automatic manufacturing lines.

The system offers the possibility of integrating up to two laser sources in one machine for processing two wafers simultaneously or for subsequent processing with different laser sources and wavelengths. This guarantees flexibility and a very high throughput of up to 2,000 wafers per hour, depending on the application.

System combines water and laser cutting in one operation



SYNOVA

www.synova.ch

Swiss company Synova claims its Laser MicroJet can cut photovoltaic cells without affecting electrical efficiency or inducing chips, burrs, mechanical stress or damage from heat. This technology enables omnidirectional cutting, drilling, scribing, grooving, edge grinding, thinning, marking and other specific applications for thin photovoltaic cells.

The Laser MicroJet combines the advantages of both water and laser cutting in one operation. Using the difference in the refractive indices of air and water, a laser beam is guided to the workpiece within a thin jet of water, which acts as a light guide.

Laser MicroJet technology enables the beam to be guided over a distance of up to 10 cm. The water jet cools the substrate while removing the molten material from the cut and avoiding contamination. The result is accurate cutting of porous or layered materials, with minimal thermal and structural distortion and a finely cut edge.