One-stop handling and processing equipment partner

Davide Cigna outlines Bottero's expertise in the supply of technical solutions to manufacturers and processors of solar glasses.

A global provider of solutions in the design, production and installation of glass technologies and equipment for more than 50 years, the Bottero Group employs 1200 people at production facilities in Italy and China, as well as maintaining a service and sales network in more than 90 countries. PV glass manufacturers are offered a solutions approach from the exit of the glass from the furnace to the packing of finished products.

Demand for solar glass is growing daily throughout the world and the glass industry is changing rapidly to keep pace. More than 400,000 tonnes of solar glass was made into solar modules in 2009 and the critical criteria of solar glass is becoming increasingly demanding.

Collectively, Bottero has installed more than 100 lines for float and patterned glass production and for glass coating. This experience includes handling and unloading solutions to manage every dimension of glass and real-time supervision and optimisation systems to improve line productivity. Increasingly, these contracts have been designed specifically for solar glass production.

The company's cold ends for PV patterned glass, for example, represent cutting edge technology. Thanks to dedicated engineering for this specific glass type, some of the most advanced cutting technologies from float glass, flexible unloading solutions and a dedicated control and Scada system, Bottero has become a partner to many of the world's leading PV glass manufacturers, with more than 25 cold ends expected to be in operation by 2011.

Robot loading.

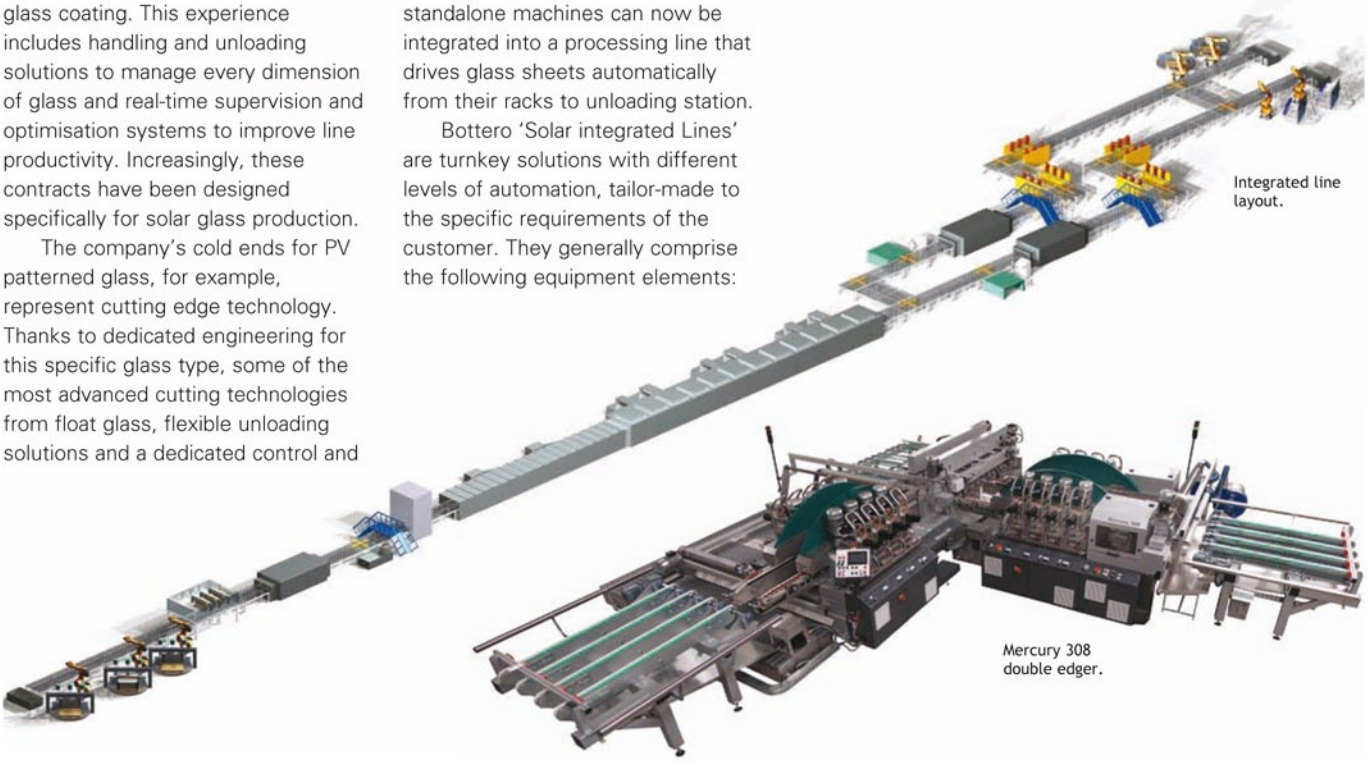
Patterned cutting bridge.

DIVERSE PROCESSING PORTFOLIO

A diversified portfolio of glass processing machines is available, including cutting tables, grinding and drilling machines. Standard standalone machines can now be integrated into a processing line that drives glass sheets automatically from their racks to unloading station.

Bottero 'Solar integrated Lines' are turnkey solutions with different levels of automation, tailor-made to the specific requirements of the customer. They generally comprise the following equipment elements:

- Loading systems with robots, stackers or standard loaders to load the glass on the line.
- Cutting and breaking equipment, to cut glass sheets to required dimensions.
- Conveyors and handling solutions to transfer the glass sheet along the process.
- Grinding machines (Gemini and the recently introduced Mercury series) to refine glass edges after cutting.



Integrated line layout.

Mercury 308 double edger.

- Drilling machines.
- Automatic buffer systems (LIFO/FIFO) for intermediate operations.
- Washing machines to fine-wash the panes before entering the hardening process.
- Unloading and packaging systems for finished product.

The glass comes to the line on racks and is loaded automatically on the first conveyor via stacking machines, standard loaders or robotised systems. The cut-to-size glass sheet is then moved automatically to a Bottero double edging machine for pencil edge finishing.

The company's extensive glass grinding experience has been integrated within the Mercury double edger machine, its latest top level machine, introduced at glasstec last year. The Gemini-based grinding machine technology has been upgraded to raise productivity and comply with the demands of the solar glass industry. Features include:

- Grinding speeds of up to 20m/min for pencil edge finishing.
- Servo corner dubbing faster than the standard version.
- Cup wheel changes 'on the fly', without production stoppages, thereby reducing downtime.
- Automatic recovery on the cup wheels to reduce maintenance times.

After processing, the sheets are sent to the washing machine, to be cleaned and rinsed before entering further downstream processes (eg toughening or TCO coating). At the end of the line, the glass is unloaded from the line to the rack via robots, stacker machines or standard loaders.

Bottero lines can also automatically manage the positioning of interlayers between sheets on the rack. Proven automatic solutions are provided for paper and cotton string options, the most widely used in the PV industry.

The entire line is managed and controlled by PLC system and supervised by Bottero production management software, which monitors the line in real time, warning about anomalies, tracking production and storing all process data for every sheet. The most advanced application can also optimise cutting patterns, including several customisable reports for production and statistical analysis and the creation of historical production databases.

Also available is TCO coating handling equipment, offline cutting lines and sorting systems to manage different patterned and float glass materials. ■

770DMW drilling unit.

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