SYSTRON's single-sourced vertical glass processing and robot automation

A leader in today's trends towards versatile, automated solutions, SYSTRON offers advanced vertical high-level glass processing machines that will reduce cycle times, minimise handling and mitigate any operational delays associated with the current shortage of skilled workers.

More and more customers in the glass industry are relying on robot automation to reduce cycle times and optimise quality.

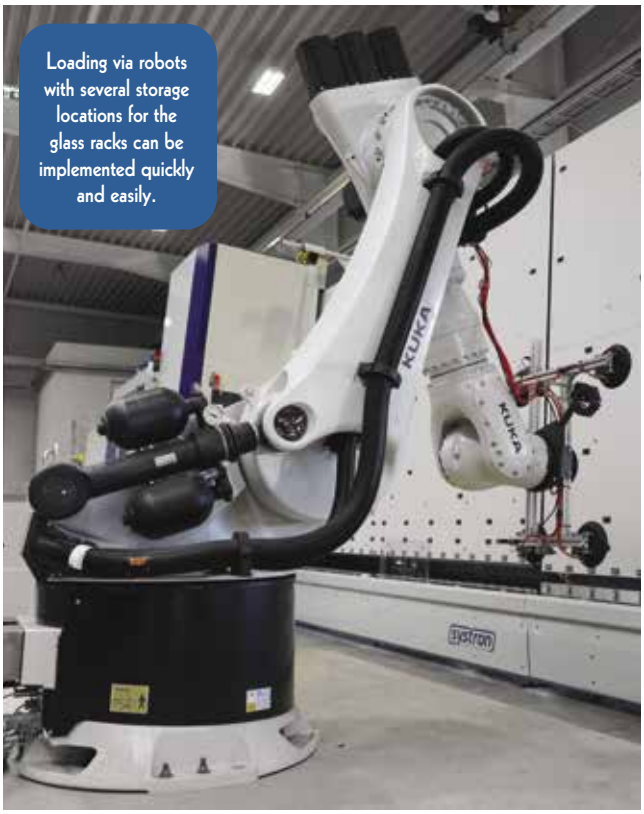
It's no secret. Among the most popular automation options out there, the robot ranks high. It's hardly surprising. Robots require only modest space and they increase quality - all thanks to minimised handling, a reduction of rejects and optimised planning. Here's why robot cells, specially-tailored to the requirements of the flat glass industry, were developed for the automatic loading of Systron's processing machines.

Three robot types comprise this selection:

- The individual solution, with 2 pick-up stations for L-racks - resulting in minimal cycle times for high-speed seaming systems and glass dimensions of up to 3.5 x 2.5 m.
- The unit integrated within other automated Systron solutions, such as L-rack, storage or the harp rack options.
- Autonomous operation - for the removal of waterjet cut-outs.

KUKA ROBOTS

Given that KUKA robots can be integrated within the Systron control unit with no added interface, the glass machine manufacturer works only with these products. Reinhard Gruber, person-in-charge for software development at Systron explains: "Thanks to the KUKA. PLC mx automation 3.3 option, we can control the KUKA robot just like any of our conventional axes. This way we achieve maximum flexibility and performance." Due to mass movements caused by inertia, robot size strongly depends upon the size of the glass to be manipulated. "We mainly use robot sizes between the KUKA KR60 and KR500. As such, 3.5 x 2.5 m glass panes reaching up to 12 mm in thickness, as well as those of 3 x 2 m that reach up to 19 mm, can be manipulated." Here Gruber adds that "moving larger glass is feasible - only it's disproportionate, since the robot would then need to be enormous."



Loading via robots with several storage locations for the glass racks can be implemented quickly and easily.

WHEN IS A ROBOT COST-EFFECTIVE?

Thomas Haan, Head of Sales at Systron, is in close contact with many customers who are already using robotic solutions. In his experience, "Even with a one-shift operation one sees a significant increase in robot efficiency. In conjunction with a completely automated solution that includes storage or harp racks, the degree of automation is noticeably increased. Moreover, it enables completely autonomous production, among other winning traits. The system can be run without an operator, from a few hours up to an entire eight-hour shift - a solution that brings a positive return on investment within a very short period of time."

ROBOTS FOR WATERJET CUT-OUTS IN USE AT GLASPROFI SINCE 2018

Already in 2001, Glashandelsgesellschaft Profi mbH (Glasprofi) in Luhe-Wildenau, Bavaria, began using robots for glass handling in their production. In 2018, Systron installed a proHD glass processing centre with waterjet - all in line with in- and outlet glass storage conveyors that have 20 glass slots, a washing machine and a robot to remove the waterjet cut-outs. Martin Klier, site manager at Glasprofi, said about the experience with this systron solution: "We already had confidence in robot technology. Indeed the ProHD, the 5th robot,

was already being used in our factory. Our target was to make the work process even smoother, as the processing centre should be able to work completely independently of a machine operator." Glasprofi only processes complex glass with openings or cut-outs on the proHD - mostly with a glass thickness ranging from 6-12 mm. "We mainly supply our customers with interior glass, such as kitchen splashbacks, kitchen worktops or shower doors. Everything needs to be fitted with precision. Our tolerances are within the fifteenth range," explains Klier, before adding: "The machine is running 24 hours a day, between 01h00 and 06h00, then between 14h30 and 19h00 - even completely independently. Thanks to the buffer for 20 glasses, in combination with the robot that removes any cut-outs and places them in the container, we can produce highly complex panes without the presence of an employee. Another important aspect is the increased occupational safety. Some of the water jet cut-outs are located high up or are very heavy, so the robot facilitates our daily work tremendously."

A robot for removal of waterjet cut-outs improves operator safety and increases the level of automation significantly.

Martin Klier, Glasprofi site manager, is extremely satisfied with the systron solution, including the robot, and the quality of the glass produced.

LOADING WITH AND WITHOUT A ROBOT

Glaseksperten AS from Hjørring in Denmark invested in a Systron es1 seaming and grinding machine at the beginning of this year before upgrading the machine with a robot in the middle of the year. As production manager Jacob Østergaard explains: "The monotonous and heavy loading work is stressful for the operator and with the high quantities of up to 10.000 pieces of seamed glasses per week e.g. for Velux, a robotic solution was indispensable. Operator safety is also increased by light curtains and laser scanners." Thanks to robot loading, the Danish specialists can now process an average of 180 pieces of 1x1 m of a 4 mm thickness within an hour, which equals a single seamed glass every 20 seconds." Compared to loading without a robot, we were able to increase our output by 40 percent thanks to automation. We will achieve our return on investment within a year," says a satisfied Østergaard.

Glaseksperten's Jacob Østergaard: "Thanks to robot loading, the output of our systron es1 seamer could be increased by 40 percent."

ARE THERE ALSO ROBOT UNLOADING SOLUTIONS?

Compared to loading, robot unloading is subject to still more ambitious requirements due to the spacers typically required for stacking. These are mainly made of cork, paper, cardboard, powder or rope. Systron Managing Director Franz Schachner explains the challenges: "There are certainly solutions that can be developed for all these spacers, but you also have to consider machine cycle time. With the proHD and a typical shower door production, the spacer is not a big issue as the cycle time is usually between five and seven minutes. With the es1 and a cycle time of less than 17 seconds, it's not easy to place a spacer with the same robot. Here a separate unit would be necessary." Not only. There are quality controls during glass unloading - usually still carried out by the machine operator. However, there are potential solutions with automated scanners that check final quality.

SYSTRON GmbH

systron GLASS TECHNOLOGIES

Pfarrwald 47
3354 Wolfsbach
AUSTRIA
Tel.: +43 7477 / 44 152
E-mail: office@systron.at
www.systron.at