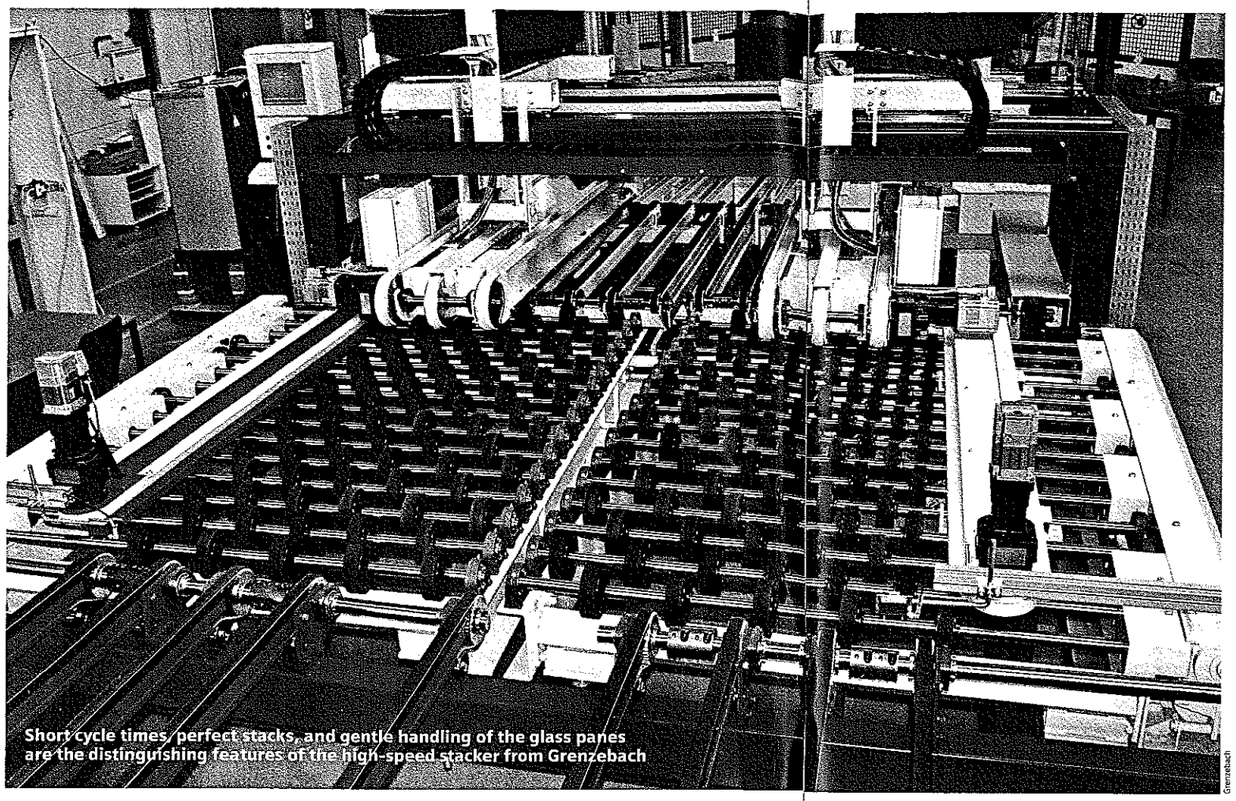
High-Speed Stacking with Simotion D

Fast Stacker



Short cycle times, perfect stacks, and gentle handling of the glass panes are the distinguishing features of the high-speed stacker from Grenzebach

Grenzebach

Grenzebach Maschinenbau GmbH has developed a high-performance stacker for flat glass that can handle panes of different sizes. The distributed solution of Simotion D and Sinamics S120 enables the implementation of an unloading unit that removes the glass panes gently and quickly from the transport line.

When it comes to material flow systems for the flat-glass industry, the name Grenzebach stands for trend-setting technologies. The latest example from this company based in southern Germany is a high-speed stacker that is used especially in the American glass industry. Panes of different finished sizes are produced on the cutting line – from window glass to automotive glass to building glass. The demands on the stacker are therefore high. The smaller the panes, the faster the stacker has to operate. The large number of panes to be transported on the line also requires a very efficient device.

The stacker can be run either in clocked mode or continuous mode. A complete batch of glass panes is transferred from the conveyor belts of the glass line to the roller track. There, a fan generates an air current that sucks the panes onto a belt. On the belt, the position of the glass pane is measured exactly and any skew is corrected. In clocked mode, a clocked ram at the end of the belt presses the pane down and at the same time, slides interrupt the air current. The pane is then pressed down onto a packet table. In continuous mode, the pane does not stop but the clocked ram is activated at a defined position and the pane is released from the air current. When a packet of glass panes is complete, it is transferred to a swing rake, which swings it to a robot. The robot sets it down on a glass rack.

Many axes controlled on a distributed basis

Thirty axes must be controlled in this complex mechanical process, and all must interact perfectly. Grenzebach therefore chose the drive-based Simotion D445, which already has a Sinamics S120 integrated as a control module, for the prototype. The most efficient member of the Simotion family is predestined for distributed use in high-performance multiaxis machines.

Grenzebach chose Simotion because, among other reasons, the close-to-drive solution needs no master controller. This criterion is important for the company because the stacker is available not only as part of a line but also as a stand-alone machine. In the American cutting line, a Simatic S7-400 takes over the line controller, and Profinet links Simotion and the periphery.

The safety aspect is also important in fast clocked systems. To prevent accidents on the running machine, the ET 200S-IM151-7F-CPU intelligent peripheral module is linked to Simotion via Profibus. A fail-safe PLC is already integrated into this variant, which controls the safety-relevant switches in the safety fence and the emergency stop circuits.

Simotion – ideal for mechatronic solutions in the glass industry

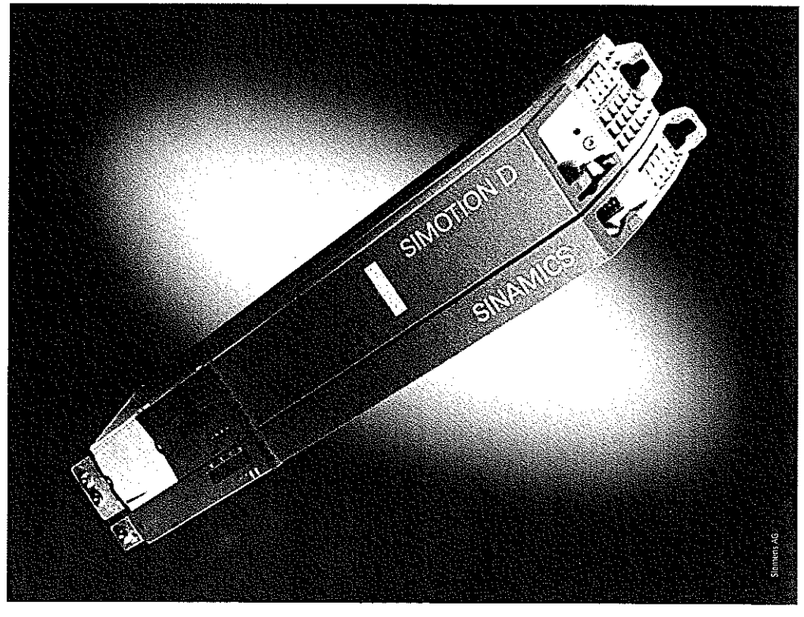
The Simotion motion control system combines motion control, PLC, and technology functions in one system. The many application possibilities for Simotion range from simple speed control to complex multiaxis machines in which numerous individual axes must be put into operation. Simotion is therefore the ideal control solution for glass machines.

Another strength of Simotion is its scalability. With the Profibus isochronous bus system and Ethernet-based Profinet with IRT, multiple Simotion controllers can easily be synchronized. The number of synchronized axes can reach over 100, while the bus cycle time remains at one millisecond. The user can choose between three different platform versions, depending on the system requirements and personal preference: the drive-based version Simotion D, the controller-based version Simotion C, and the Industrial-PC version Simotion P. The Scout engineering system enables engineering of motion control, logic, and technology tasks in one integrated system and provides all the necessary tools. Functions range from programming to parameterization, and from the commissioning of the control and drives to easy diagnosis of faults. With Scout, the user also gets graphic support for hardware and network configuration, as well as a graphic programming language (Motion Control Chart, MCC). In addition to MCC, the high-level Structured Text (ST) language is available for the logic programming, as are contact plans (KOP) and function plans (FUP). The runtime software is flexible and scalable due to reloadable technology functions.

Compelling prototype

In order to be able to produce a prototype before Glasstec 2006, Grenzebach needed an automation system that could be implemented quickly. The decision to equip the stacker with Simotion D and Sinamics S120 was made because Siemens created test software that met all the company's requirements in a very short time. The machine manufacturer is very pleased with the scalable, modular concept that was implemented by close cooperation between Grenzebach and Siemens. Because of the positive experience with the prototype, the main line will also be changed over from Masterdrives to Simotion and Sinamics in the future. ■

Moreinformation:
www.siemens.com/glass
www.siemens.com/simotion



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