

GlassFocus

SIEMENS

ideas for glass production and glass machinery

September 2006
English edition



**Trends in
the glass industry**

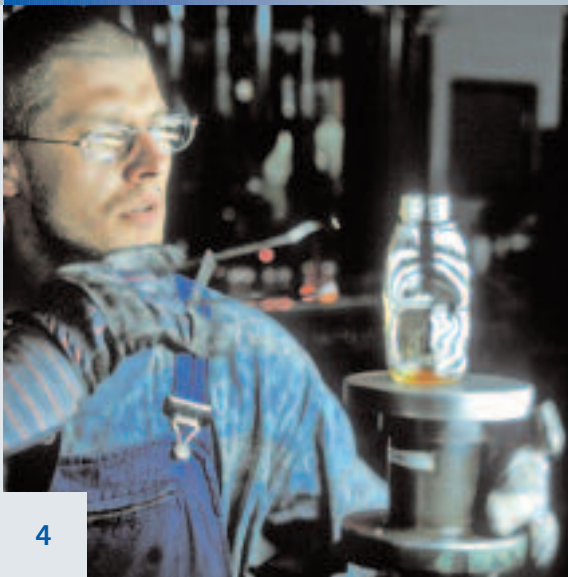
Case studies

Partners

**Products
und technologies**

150 years of Siemens in the glass industry

Innovative by Tradition



4

Siemens has been an active player in the glass industry for 150 years – an additional incentive for Siemens to continually prove itself as an expert, innovative, and reliable partner to the glass industry



6

Grenzebach uses Simotion D to control high-performance stackers for float glass



9

The manufacturing line for glass insulators designed by WALTEC employs integrated Siemens drive technology

TREND

Glass industry

4 Innovative by Tradition

Siemens – partner of the glass industry

CASE STUDIES

Float Glass

6 Fast Stacker

High-Speed Stacking with Simotion D

Hollow glass

8 Future-Safe Bottle Production

Simotion D in the hollow-glass industry

Hollow glass

9 Hard to Break

Totally Integrated Automation in insulator line in China

Hollow glass

10 Clear Advantages for Complex Requirements

Simotion and Sinamics control IS machines

Hollow glass

12 Fit for Retrofitting

Sinamics S120 for group drives

Glass Cutting

13 Maximum Accuracy for Batch Size 1

The new all-rounder for milling architecture and automotive glass

Further Processing

14 Everything under control

Glass grinding with Simatic S7-300 and Simatic MP270

Laser Scribing

15 High-Precision Cutting for Everyday Needs

Laser scribing is conquering the cell phone display market

Glass Cutting

16 Investing in the future on the Bosphorus

Professional glass cutting with Sinumerik 810D and fully integrated user interface

Further Processing

18 More Than Drilling and Milling

Maximum flexibility and short cycle times thanks to Simotion D

Totally Integrated Automation

24 State-of-the-Art Packaging

Process optimization and modernization with Simatic PCS 7 at Vetropack

Totally Integrated Automation

26 The Right Choice

Quinn Glass selects Siemens to equip new glass plant

International Projects

28 Repeat Success

Asahi Glass benefits from international project expertise

Totally Integrated Power

31 All-In-One Power

Integrated solution brings new Bulgarian glass plant online

Totally Integrated Power

32 Power Up

Saint-Gobain Belgium awards major project to Siemens

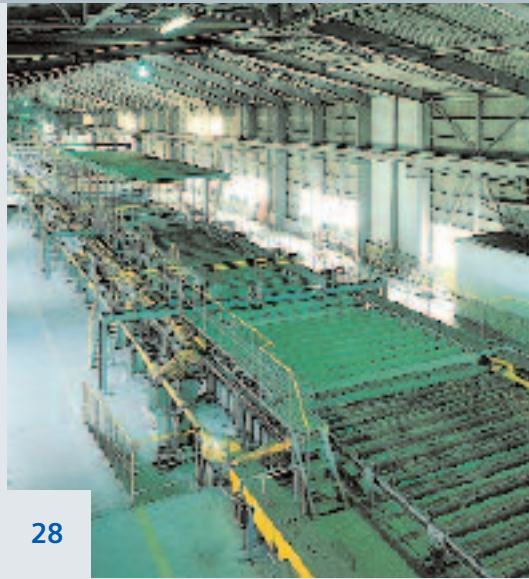
Asia

33 A Bright Future

Siemens-Luoyang cooperation nets promising first results



WALTEC



Asahi Glass Co., Ltd.

28

Asahi Glass Co., Ltd., the world's leading glass manufacturer, and Siemens have been working together successfully to equip glass works all around the world

38 **Totally Integrated Automation** **Smooth Transition**

Totally Integrated Automation at Saint-Gobain in Herzogenrath

SOLUTIONS

12 **Hollow glass** **Controlled motion into the Lehr**

Lehr loader upgrade with Simotion D425

30 **Power supply** **Power Package**

Integrated solutions for power supply systems

PARTNER

17 **Glass Processing** **Optimized Glass Cutting**

Fully integrated user interface for stand-alone cutting tables

35 **Glass industry** **Growing Together**

Siemens partner network aligns skills and expertise

36 **Glass industry** **Stable, Long-Term Relationship**

STG and Siemens: Successful partnership for the glass industry

19 **PRODUCTS**

34 **SHORTLIST**

39 **DIALOGUE**

Dear readers,

This year Siemens is celebrating a special anniversary: 150 years in the glass industry – not only as an innovative and reliable partner in the equipping of glass factories, but also, which far fewer people actually know, as a glass producer. We therefore have firsthand knowledge of what it takes to be successful in the fiercely contested international glass market.

The fine opportunities – for example, the large demand for glass for automobiles, the building industry, and the food and beverage industry in Asia and Eastern Europe, or rapid growth sectors such as ultrathin glass – are countered by intense competition and increasing cost pressure. Glass manufacturers are faced with the challenge of reliably producing the required quality with optimum exploitation of all resources.

Innovative technologies for quality assurance and process control, which we also develop for the glass industry together with our partners, can open up new potential for rationalization.

We, the Siemens Glass Team, support our customers – glass manufacturers, further processors, system planners (EPCs), machine manufacturers (OEMs), and engineering consultants supplying the industry worldwide – with an extensive and innovative product portfolio, tailor-made solutions, and our experience and expertise in the glass industry. From America to Asia and from Europe to Australia and Africa, we are close to our customers, together with our partners, who use our products and solutions for tailor-made glass systems and glass machines that allow them to optimize production and further processing.

We show you how our customers benefit from working with Siemens and our partners in a few selected examples in this issue – from page 6 on for glass machine construction and from page 21 on for glass production. We hope these case studies will give you a few valuable ideas.

Bernhard Saftig

Siemens Glass Team
Head of the Glass Competence Center

Ralph Burgstahler

Sales/Marketing
Automation Glass Processing Machines



Siemens – partner of the glass industry

Innovative by Tradition

Established more than 150 years ago as a small, two-man workshop, Siemens is now one of the largest and most successful companies in the global electronics industry. Less known, however, is that Siemens has a long history not only as a supplier of electrical and electronic systems to the glass industry but also as a glass producer and still produces glass today in one of its businesses. This tradition is a strong incentive for Siemens to continually prove itself as an expert, innovative, and reliable partner to its customers in the glass industry.

Werner Siemens established a joint venture in Berlin with mechanical engineer Johann Georg Halske. Named Telegraphen-Bauanstalt von Siemens & Halske. This joint venture has developed into a global corporation that is active in more than 190 countries with over 420,000 employees. Less known, while his brother Werner was establishing his business, Hans Siemens founded a glassworks in Dresden that, thanks to innovative technologies and ideas, was to revolutionize the world of glass production. Production continued almost uninterrupted into the 20th century. As a co-founder of its subsidiary Osram, Siemens still produces more than 90 percent of the glass used in lightbulb production there.

Technology for the glass industry

Continuing its long and close association with the glass industry, Siemens is driven to create technological innovations

in the areas of automation, drive, and energy. For more than 50 years, Siemens has worked closely not only with leading international glass manufacturers but also with machine builders, engineering companies, and technology partners to develop and implement leading-edge, effective solutions for the challenges facing the glass industry.

For this purpose, Siemens has aligned its wide portfolio of solutions for industries in an Industry Suite dedicated to the glass industry. The Industry Suite Glass offers an integrated and seamlessly inter-operating range of products, systems, and services for almost all power and automation requirements of the glass industry – whether in float glass, hollow glass, fiberglass, monitor glass, or consumer glass, from machine control to manufacturing execution, from process instrumentation and analysis to process control systems. The Industry Suite Glass also includes solutions for product and material logistics, process optimization, and power supply.

Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) form the core of the Siemens Industry Suites, serving as the basis for customer and industry-specific solutions in automation and energy supply. TIA and TIP provide glass manufacturers and glass machine producers with many benefits. The high level of standardization reduces the time to commissioning, simplifies servicing and maintenance, and cuts implementation costs.

Partnership, trust, and commitment

With booming markets in Asia and eastern Europe on the one hand and extreme cost pressures in the established markets on the other, the glass industry recognizes that speed and efficiency are crucial. The construction industry is an important stimulus

for the glass industry: Float glass as an important base material for windows and façade elements, glass blocks as a rediscovered design element, and fiberglass as an insulation material are among the market sectors clearly experiencing growth. In addition, young markets with strong growth, such as ultra-thin glass, are showing strong momentum. On the other hand, increasing international competition and greater use of substitution products like PET and cartons are increasing price pressures in the traditional markets of the glass industry. This is particularly noticeable in the hollow-glass sector.

In an increasingly globalized market, glass producers and processors need partners who can provide global advice and support on a worldwide scale. Therefore, technology is only one part of the Siemens portfolio for the glass industry. To provide its customers in the glass industry with the support they need to achieve their aims, Siemens has packaged its expertise in the Competence Center Glass, which tailors solutions and products to meet customer and market needs. The Siemens Glass Team coordinates all activities for the glass industry worldwide, aligns them with the wide range of Siemens solutions, and regularly exchanges its experiences. Thus, Siemens is able to ensure that its customers in the glass industry always receive the best possible solutions.

Committed to tradition

Despite its scientific curiosity and innovation, Siemens is proud of its traditional values – and with good reason. For its customers in industry and infrastructure, the primary focus of Siemens is establishing sustainable partnerships and a high degree of reliability. Customer confidence in the company, its portfolio, and its reliability is crucial to Siemens' commercial success – a fact recognized back in 1884 by Werner von Siemens when he wrote in a letter to his brother Carl, "I will not sell the future for today's profit." That motto applies just as much today as it did then – particularly in Siemens' relations with the glass industry. ■

More information:

www.siemens.com/glass

High-Speed Stacking with Simotion D

Fast Stacker

Grenzbach Maschinenbau GmbH has developed a high-performance stacker for flat glass that handles panes of different sizes flawlessly. 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 Grenzbach 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 automobile glass to building glass. The demands on the stacker are therefore high. The smaller the panes, the faster the stacker has to cope with the volume. The large number of panes to be transported on the line also requires a very efficient device.

The stacker operates 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 the 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. Grenzbach therefore chose the drive-based Simotion D445, which already has a Sinamics S120 integrated as a regulating module, for the pro-

totype. The most efficient member of the Simotion family is predestined for distributed use in high-performance multiaxis machines. Grenzbach 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 offered 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.



Grenzebach

Simotion – ideal for mechatronic solutions in the glass industry

The Simotion motion-control system unites motion control, PLC, and technology functions in one system. The many application possibilities for Simotion range from simple speed governing to complex multi-axis 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 may be well above 100 with the bus cycle time still a 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

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 in the shortest possible time that met all the company's requirements. 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. ■

More information:

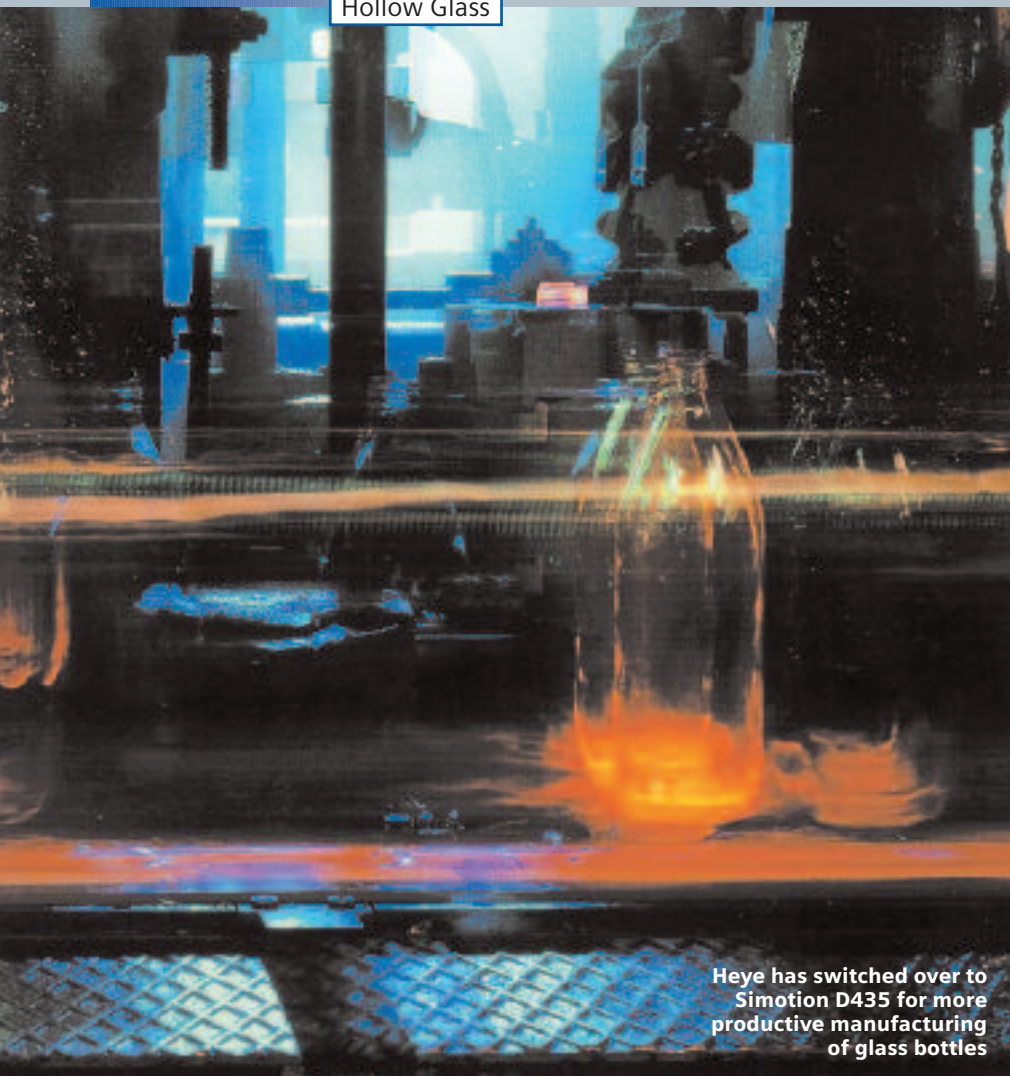
www.siemens.com/glass

www.siemens.com/simotion



Siemens AG

Hollow Glass



Heye has switched over to Simotion D435 for more productive manufacturing of glass bottles

Heye International GmbH

Simotion D in the hollow glass industry

Future-Safe Bottle Production

Hollow glass specialist Heye International uses the drive-based Simotion D variant on the IS machine as a feeder drive and conveyor drive for the discharge of the glass bottles. The Simotion motion control system is perfect for optimum synchronization of the large number of axes and is also easy to integrate with existing systems.

The shears are the central component of an IS machine and play an important role in the quality production of hollow glass. The glass gob created by the plunger is cut off precisely by the shears. In the next process step, the gob distributor passes on the gobs to the sections where they are shaped into bottles. These are taken over by a conveyor system and trans-

ported to the lehr loader, which feeds them into the annealing lehr. Highly precise motion control with absolute reproducibility is necessary for this.

Simotion brings enormous advantages

Heye International GmbH in Oberkirchen has automated its IS machine with Simotion. The internationally active provider of

technologies, machines, and systems for the hollow glass industry installed the drive-based Simotion D435 version, in which the entire motion-control functionality is integrated directly into the regulating module of the multiaxis Sinamics S120 drive, for the machine's motion control and logic functions. The 1FK7 compact servo motors with their robust resolver encoders provide the ideal supplement to the drive range.

The most important function of Simotion in the hollow glass manufacturing process is operating the electronic cam profiles. These allow the shears to be controlled by a high-precision motion-control system, and the downstream units can be synchronized with the clock of the shears to take over the glass gob for further processing at the right time. The exact movement of the cam profiles guarantees a constant gob size – which is indispensable for optimizing quality and productivity in the manufacture of hollow glass. Different gob forms can be created for different products. With Simotion, the machine axes can be controlled and accurately synchronized with a single system. In addition, only one engineering system is required, which reduces training and commissioning effort.

Integration into the existing automation environment

Ease of operation is guaranteed by the locally installed, Windows CE-based Touch Panel TP 270 or a master visualization system. Thanks to built-in interfaces such as Ethernet and Profibus, almost unlimited operation and visualise is possible. Simotion D is linked to the main control and the distributed Simatic ET 200M periphery via the standard Profibus DP bus system. Open interfaces and possibilities for expansion, such as the communication modules for ET 200M, allow easy integration into the existing automation environment.

The system is already operating successfully in numerous machines, and this positive experience is encouraging Heye to automate more and more parts of the system with Simotion D. ■

More information:

www.siemens.com/glass

www.siemens.com/simotion

Totally Integrated Automation in insulator line in China

Hard to Break

WALTEC Maschinen GmbH (formerly J. Walter Co. Maschinen GmbH), based in southern Germany, recently supplied the power-hungry Chinese market with a complete line for glass insulators. To ensure that the insulators can withstand high environmental stress and are safely within the required power ratings limits, the glass must be carefully treated and hardened. This thermally sensitive process places the highest demands not only on the process control, but also on the precision of the controller system.

The 30-meter-long production line that the glass machine specialist WALTEC has developed for the Chinese market begins with an electronic feeder/shears system. That is where the plunger doses the glass, which has a temperature of approximately 1,100°C, cyclically into ten molds located on a rotary indexing table. In this process step, two servo-controlled Simovert Masterdrives Motion Control (MC) frequency converters ensure that two different gob weights can be precisely dosed one after the other at identical cycle times. The electronic cam disk function integrated into the drive guarantees a very precise and reproducible gob weight with feeders and shears. The rotary indexing table synchronizes the

movement of the ten molds into the hydraulic pressing station, where the glass items are formed. Following the pressing process, an eccentrically rotating stamp is used to roll a system of grooves into the still formable glass. The insulators are allowed to cool down to and then kept at a temperature of between 500 and 600°C in a gas-heated annealing lehr, as this is the best preparation for the subsequent hardening process.

Integrated controller and drives for perfect control

The glass insulators are quenched in the hardening machine by air cooling. This produces a defined internal tension in the glass, which lends extreme stability to the

insulators. The insulators are then cooled on 20 rotating plates, each with a dedicated spindle driven via a separate axis. Since this requires only speed control, WALTEC uses the distributed Micromaster 440 drives for this task. Due to their sophisticated vector control, the Micromaster drives ensure the highest possible motion control quality – even with sudden load changes. All axes as well as the main drive for the rotary indexing table and the furnace line are driven via the modular Simodrive 611 converter system. This comprises feeder, control, and drive modules, which can be combined in individual drive formations and rapidly tailored to the drive rating of and number of axes on the respective machine. All drives communicate via Profibus DP.

To control the complex and time-critical processes on the temperature-sensitive line, WALTEC requires a system in which all components interact optimally. A Simatic S7-318 serves as the central controller, as it is able to work at full capacity in ambient temperatures of 40 to 50°C during 24-hour operation. The user is able to simply enter the parameters for the individual plant components on the Simatic Multipanel MP370 graphical display.

Once the glass insulators have passed through all the hardening stages, they are so strong that they could withstand a fall from a height of two meters without breaking. ■

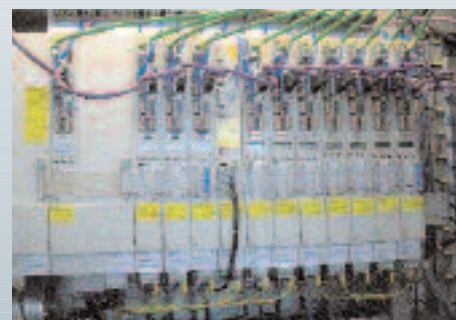
More information:

www.siemens.com/glass

www.siemens.com/motioncontrol



GlassFocus 2006



All pictures: WALTEC

The drives for the many axes of the plant use Simodrive 611 converters

Shock cooling with air: the glass insulators receive their high stability in the annealing machine

Hollow glass



Simotion and Sinamics control IS machines

Clear Advantages for Complex Requirements

Sklostroj increased productivity in container glass production by switching to Simotion and Sinamics

The glass industry is increasingly replacing application-specific control engineering with mechatronic solutions that increase productivity. The Czech company Sklostroj Turnov CZ c.r.o. has recently introduced the Simotion and Sinamics automation and drive platforms on its IS machines. Thanks to its real time capability and scalability, the system is ideal for controlling complex multi-axis machines in container glass production.

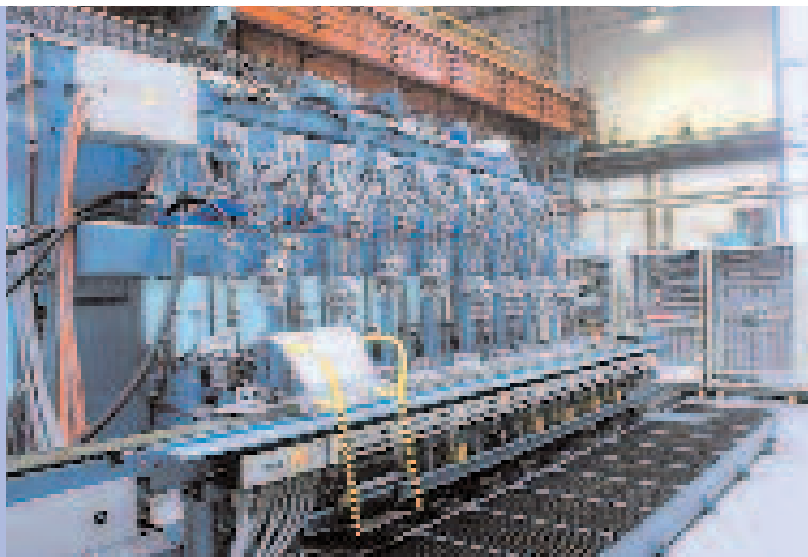
Continuous operation in harsh production conditions, with extremely high performance standards – the requirements on machine and process controllers in glass container production are demanding and, for a long time, could only be met using special control engineering. Sklostroj Turnov CZ s.r.o., one of the world's leading manufacturers of container glass machines, is setting new standards for productivity by offering the Simotion motion control system as an option alongside the existing control engineering on its latest generation of IS (individual section) machines. In the glass industry, there is an increasing tendency towards replacing mechanically coupled motions and application-specific control engineering with standardized mechatronic solutions.

Ideal for glass: Simotion

Simotion offers benefits especially when real-time requirements such as e-timing,

motion control and logic need to be dealt with simultaneously. The system is just as reliable and real-time capable as the conventional technology. And that is not all. At the hot end of container glass production – molding – factors such as throughput, availability and robustness are critical. In addition, there is a trend towards using mechatronic drives for functions that were once reserved exclusively for pneumatic drives, demanding even more performance from the controller. As a result, an increasing quantity of real-time I/Os with more and more electrical drives need to be co-ordinated. High-precision motion control with absolute reproducibility is mandatory.

Simotion's scalability means that only one system is needed for all aggregates at the hot end. Simotion ensures that the plunger forms even gobbs, the shears have a high dynamic response, work extremely accurately and cut at the right moment and that the gob distributor reliably supplies all



All pictures: P. Korber

A servo-driven inverter reduces wear in the section

The latest generation of IS glass molding machines with 49 servo axes is controlled with Simotion D

sections. The sections highlight another advantage of Simotion – the pneumatic and servo-electrical aggregates are combined into a single control system. As a result, the advantages of electrical motion control, in terms of reproducibility and reduced wear on molds and aggregates are combined with simple and cost-effective pneumatics. Finally, the conveyor belts and servo feeders are also perfectly synchronized.

Proven in everyday operation

The new Simotion system is being employed for the first time on an IS machine that will be used to form bottles in Russia. Sklostroj will only be using standard components that demonstrate proven excellence in other sectors. “We use the drive-based Simotion D435 for axis control and as the e-timer (electronic cam control system) for all sections,” explains Rolf Themann M.B.A., Technical Director at Sklostroj. “This compact design makes it particularly attractive for us because the control module is directly integrated into the Sinamics S120 drive yet simultaneously controls the entire distributed real-time I/O peripherals.”

The Simotion controllers communicate with one another and with the distributed Simatic ET 200M peripherals via Profibus DP using the motion control profile. This is ideal for precise synchronization of multiple axes and achieves reproducibility in the microsecond range. Communication between the Simatic WinCC SCADA system

and the individual controllers is via Industrial Ethernet. A separate SQL server is connected to the WinCC system via OPC for recipe management.

Service personnel can access the machine controller on a robust mobile PC from any location using an encrypted connection. The PC has a wireless connection to the controller via a Scalance W WLAN switch.

The Profibus system reduces both the amount of wiring required and the number of interfaces on the machine, thus minimizing susceptibility to faults. Central data management simplifies product optimization and preventive maintenance. Open Profibus DP and Ethernet interfaces allow third-party systems to be integrated. This flexibility has a positive impact on operation, as process data, messages and alarm signals can be sent to a superior controller or process control system for analysis and archiving. In the future, Sklostroj is planning to implement Profinet with IRT (isochronous real-time), which enables even more streamlined bus solutions by running operator and control data on the same bus system.

Maximum system availability

The Sinamics S120 family represents an optimum solution in regions with a weak mains power supply. The active infeeds have a stabilized DC link set to 600 volts. This allows short-term voltage drops of up

to 50 percent to be compensated with no effect on machine productivity. As a result, optimum system availability can be achieved despite power supply fluctuations. The Simotion CPU is powered by an uninterruptible 24 volt Sitop power supply. In case of a power supply failure, this can control the system until it can be shut down safely.

The Sinamics S120 system concept also reduces downtimes. As all data for a group of drives is stored on a single Compact Flash memory card, a programming device is not necessary when replacing a Sinamics component. The firmware, program and parameters are automatically read from the CF card as soon as power is restored to the drives.

The new automation and drive technology allows Sklostroj to make significant cost savings in terms of training and spare parts storage. For example, in the PCS 7 process control system the ET200M peripheral components are used for melting and for batch conditioning. Meanwhile, the worldwide Siemens support network ensures a rapid service response. ■

More in formation:

www.siemens.com/glass

www.siemens.com/simotion

www.siemens.com/sinamics

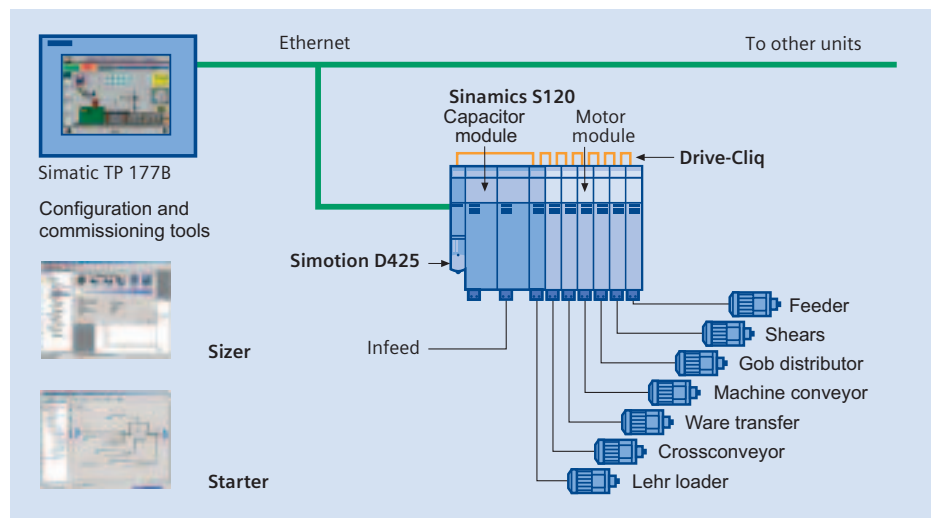
Sinamics S120 for group drives

Fit for Retrofitting

Group drives have a long tradition in the glass industry. Previously, in order to ensure the angular synchronism important for the IS machine, several motors were operated on one converters. Since the mid-1980s, the Simovert converter system has controlled angular-locked synchronism using several separate converters, forming a universal three-phase drive with the Siemosyn synchronous motors.

Updating proven machines

It is now possible to easily achieve transmission synchronism with motion-control systems and the associated wide range of



The Sinamics S120 drive system meets all the requirements of the glass industry

motors, such as servo motors and compact asynchronous motors. However, when systems are being modernized, retrofitting is frequently required to retain proven motor designs and update only the drive-specific controllers with the latest technology.

Best suited for this is the Sinamics S120 drive system, which controls both asynchronous and Siemosyn synchronous motors at a precise frequency. In association with the Simotion motion-control system, sensor-free transmission synchronism

is also possible for synchronous motors via the U/f mode. Control of the synchronism is performed by the drive-based Simotion D425, which also provides the user with a full-fledged PLC, with the result that an additional PLC is no longer required.

More information:

www.siemens.com/glass

www.siemens.com/sinamics

Lehr loader upgrade with Simotion D425

Controlled Motion into the Lehr

Sheppee International Limited, a British supplier of hot glass container handling systems, is currently developing a prototype Lehr loader unit designed to provide more accurate glass transport control during the manufacturing process. Whereas previous system generations had relied on a variety of mechanical and electronic drive systems, the new model features a Simotion D425 motion control system.

With well over 50 years of experience in the industry, Sheppee International provides equipment and solutions for customers throughout the world. The newly developed Triflex

T2 3-axis Lehr loader pushes rows of recently formed hot glass containers off one moving conveyor, through 90°, onto another moving conveyor for transport into an annealing Lehr.

Fast and flexible bottle handling

Although Sheppee's Triflex machines, equipped with electronic drives, have been in operation for over 12 years, the company realized that the control technology has limits and therefore opted to equip the prototype unit of the new T2 model with a Simotion D425. Simotion offers tremendous cam design flexibility and very precise motion control. Optimized axis synchronization ensures a high level of motion repeatability whilst also providing increased speed and operational flexibility. The energy efficient control system also offers Sheppee a future-proof software plat-

form that is easy to install and use. A Simatic OP 177B operator panel with WinCC flexible visualization software was installed to provide the operator with excellent operational flexibility, also enabling users to immediately conduct diagnostics to aid in troubleshooting.

The new Triflex T2 Lehr loader is designed to achieve higher production speeds on any production line, from below 100 BPM to well over 700 BPM and cycle speeds of 1 to 24 machine cycles per minute. The company also notes such benefits as the standardized automation platform, the worldwide sales and support network, remote dial in assistance and reduced spare parts handling.

More information:

www.siemens.com/glass

www.siemens.com/simotion

The new all-rounder for architecture and automotive glass

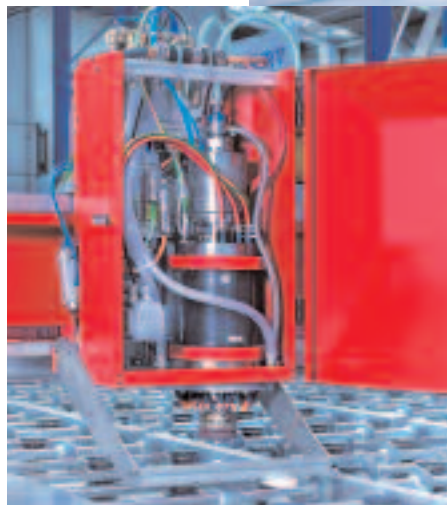
Maximum Accuracy for Batch Size 1

To reflect the latest developments in the architectural and automotive glass sector, Benteler Maschinenbau now supplies a CNC machining center that can perform all machining steps, even on large panes of glass. To meet customer requirements for unlimited flexibility and high performance, the company uses Sinumerik 840D and a new motorized spindle specially designed for machining glass.

The proportion of contour panes with a batch size of 1 is continuously increasing the construction and furniture glass sector. The new Benteler CNC machining center, an intelligent extension to the proven Benteler portal drilling machine incorporates a range of technical innovations that reflect this trend. The glass pane is positioned automatically by the lateral roll guide rail and laser measurement, completely eliminating the need to adjust stops. To ensure secure fixing during machining, the individual suckers are selected automatically for each contour pane. The high performance spindle for grinding, polishing and milling is mounted on a stable portal that can be moved in the direction of transport, allowing all contour points to be reached. To drill the pane, it is moved into the drilling portal with its two independent double-sided drilling spindles and 20 different pairs of tools.

High speed and accurate processing

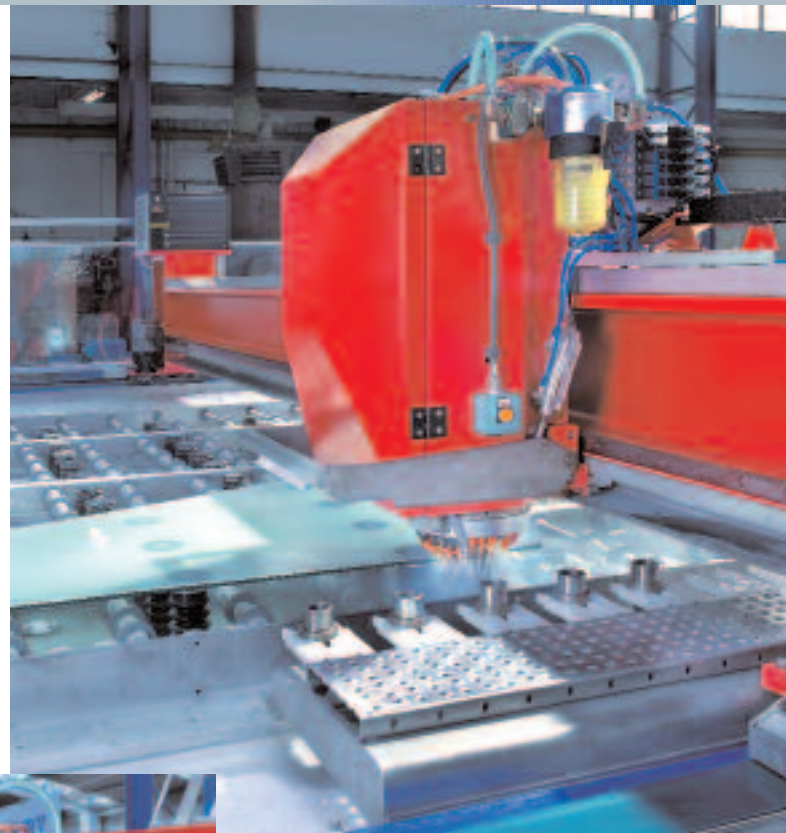
The CNC Sinumerik 840D provides perfect control for these complex processes. The processing programs can be created easily using the CAD/CAM software from Benteler.



The motorized spindle includes all mechanical elements, such as sensors, cooling and tool clamping mechanism

Alternatively, there is an option of importing programs created externally.

The system is available in various sizes corresponding to the customer's product range. The largest machines can continuously machine glass with dimensions of between 400 x 800 millimeters and 3.3 x 7.3 meters. The resulting time savings are considerable as a new pane can be moved in and positioned while the finished pane is still being transported to the next process, for example washing. That is where the strengths of the Sinumerik become evident – the multi-channel capability of the 840D allows several panes to be processed simultaneously.



With the compact motorized spindle, Benteler can mill even large panes of glass quickly and accurately

All functions in one compact unit

For milling and grinding, a 12-kilowatt motorized milling spindle is being used for the first time. This mechatronic unit combines Siemens system expertise in control engineering on machine tools with the long-standing experience in motorized spindle construction of Weiss Spindeltechnologie GmbH. The complete motorized spindles comprise all mechanical elements such as sensors, cooling and tool clamping mechanism. With a variable speed of up to 15,000 RPM, the built-in 1FE synchronous motor ensures a good surface quality for grinding. Compared to conventional belt-driven solutions, the spindle runs extremely quietly and smoothly.

Benteler Maschinenbau is convinced that their innovative machine featuring a combination of CNC control and a motorized spindle provides the optimum solution for flexible machining of flat glass panes. ■

More information:

www.siemens.com/glass

www.siemens.com/sinumerik

Glass grinding with Simatic S7-300 and Simatic MP270

Everything Under Control

The customers of the Italian company Z. Bavelloni benefit from a new automation concept that the company has developed in cooperation with Siemens for its double-edge grinding machines. Thanks to the flexible and modular software, the machines achieve perfect grinding results.

Flat glass processing is an important function of many of the machines in the extensive product line of Z. Bavelloni SpA, a subsidiary of the Finnish Kyro Group. The VX EVO double-edge grinding machines have been developed using sophisticated technical solutions in order to meet all the specific glass processors' needs like for example the ability to process large panes precisely, as required by the building industry.

A wide range of models with different working widths and number of spindles are available. On a base frame with one fixed and one moving cross-bar, the glass is transported over four individually operated high-quality belts that are powered by two maintenance-free 1 FK7 compact synchronous motors. Simodrive 611U converters are used as the drive system. The motors are electronically synchronized, thereby ensuring improved synchronization and greater reliability at lower maintenance costs than conventional drive shaft solutions. By using 8, 10, or 11 spindles and an additional oscillating side spindle, the operator is well prepared for the most demanding tasks. In addition devices for tools automatic set-up can be installed.

High performance paired with versatile functionality

To control the double-edge grinding machines, Z. Bavelloni chose the Simatic S7-314-C 2DP CPU. The S7 expandability enables plant internal network integration, for example, with in-house production and management software. Thus, production data can also be easily transferred from a remote location. This is particularly beneficial for end customers with larger or multiple sites.

Thanks to the flexibility and scalability of the Simatic S7 CPU, Z. Bavelloni was able to significantly improve the productivity and functionality of its innovative grinding machines. The modular software design of the machine enables easy integration of further machine modules. During operation, the Simatic Multi Panel MP270B offers users numerous functions to improve grinding results.

For example, users can select step-by-step part processing with automatic size adjustment or adaptation of "standby" stations using a preset list. Reading bar codes to optimize the importing of machine data and the importing and exporting of machine data via the Ethernet card can also be performed directly on the MP270B.

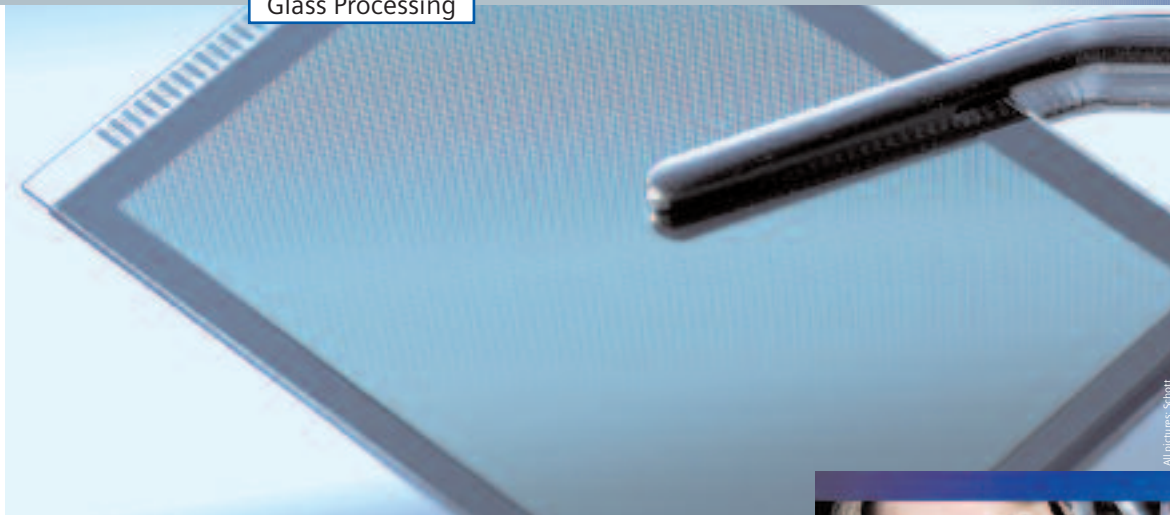
The standardized Simatic control architecture ensures optimum cutting results and high level of efficiency. It also ensures that access to spare parts poses no problems. ■

More information:

www.siemens.com/glass

www.siemens.com/motioncontrol

Glass Processing



A case for laser scribing: cell phone displays require ultrathin glass with strong edges

Clean cut: glass can be cut dust-free with the laser

Laser scribing is conquering the cell phone display market

High-Precision Cutting for Everyday Needs

MDI Schott Advanced Processing GmbH has developed a laser scribing technique for display manufacture that is far superior to mechanical glass cutting. A key prerequisite for the splinter-free "scribing," which can be performed in clean rooms, is a very flexible control and drive technology.

As a result of its joint venture with the Japanese Mitsubishi Diamond Industrial Co. Ltd. (MDI) in mid-2005, the Mainz-based glass manufacturer Schott AG now offers a wide portfolio of conventional machines as well as laser cutting machines. In the field of laser cutting, MDI Schott AP has gained ground above all in the cell phone display market in the last 12 months. Because cell phones are becoming thinner and thinner, increasingly thinner and therefore stronger displays are required. Glass thicknesses of 2 x 0.3 millimeters are common, and even thinner displays are being developed.

Schott AP's "laser scribe and break" technique makes display production more rational and flexible. Displays are produced under clean-room conditions because even the slightest contamination can destroy the glass surfaces that have already been coated with the electrically active components. Unlike conventional cutting meth-

ods that generate glass dust, laser scribing works without contact and therefore without dust: a focused CO₂ laser beam heats up the glass along the cutting line, which is then cooled down again immediately. No microtears occur on the surface during embrittling and pretensioning of the glass, and there are practically no microparticles when the material is broken afterward. The resulting edge is extremely precise and strong.

Adjustment to the micrometer

For the automation of the machine, MDI Schott AP uses a Sinumerik 840D CNC and the wear-free, maintenance-free 1FN3 linear motors and 1FW3 torque motors. The direct drives meet the requirements of clean-room class 1000 and interact optimally with the Simodrive 611D converter system. The high degree of positioning accuracy and great bonding force that can be achieved with this drive technology

enable MDI Schott to achieve accurate alignment of the material to the micrometer. To achieve a constant cutting depth, the intensity of the laser beam is controlled based on the belt speed.

There is a trend towards using glass as a preferred display material in electronic devices. For these applications, a strong glass edge is also very important, and the varying contours make great demands on the control system. Thanks to its flexibility and scalability, Sinumerik 840D is also ideally suited to these future tasks in terms of its functionality and performance.

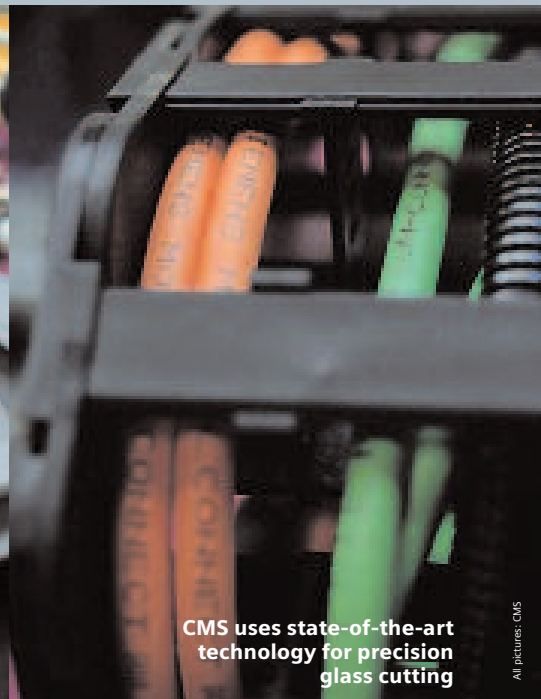
Flexible design

To meet customers' varied requirements, the machines have a modular structure and can therefore be combined in individual line solutions or stand-alone processing stations with little engineering effort. The uniform Profibus architecture, with its extensive diagnostic functions, is just as important to Schott as the compatibility with different HMI systems. The company also makes individual user interfaces with Asian characters. ■

More information:

www.siemens.com/glass

www.siemens.com/sinumerik



CMS uses state-of-the-art technology for precision glass cutting

All pictures: CMS

Professional glass cutting with Sinumerik 810D and fully integrated user interface

Investing in the Future on the Bosphorus

On the stand-alone glass-cutting tables of the Turkish company CMS, jumbo-sized glass plates can be cut into straight or shaped parts with an accuracy of a few tenths of a millimeter. Since being equipped with the modern, compact Sinumerik CNC control, the machines cut even more accurately and the cutting speed is three times as fast. In addition, a fully integrated user interface that unites cutting optimization and machine operation makes the new system extremely user-friendly.

CMS MAKINE SANAYI VE TICARET A.Ş. (CMS), which specializes in machines for the glass industry, offers a wide range of products. One of the most important pillars of the company is the cutting tables. Whether for windows, furniture glass, or flat glass products for the building, sanitary, or automotive industry, the FCL Octopus 6032 stand-alone glass-cutting table cuts oversized plates into highly accurate parts by CNC control.

CNC controlled for a better cut

The desired cutting shape is transferred to the Sinumerik 810D control, which cuts the glass with a cutting wheel along the rail-

controlled main x- and y-axes. Since, for a perfect result, the cutting wheel, the c-axis, must be guided tangentially to the desired shape, Sinumerik 810D has an integrated tangential control. At CMS, the “gantry function” – the parallel drive in the x direction – compensates the spindle pitch errors or reverse batches that tend to occur, especially with larger cutting tables. With the aid of the speed-dependent analog output and the Simatic S7 PLC integrated into Sinumerik, cutting pressure, cutting oil, and cutting speed can be optimally set. The “look ahead” speed control also guarantees a high cutting speed even over short traverse lengths.

The CMS table is also characterized by a high level of usability. The operation of all machines and the optimization of the glass size cutting take place via an integrated interface. The Optiplan HMI, made by HANIC, has been specially developed for stand-alone tables and offers intuitive machine operation and professional cutting optimization all in one. The benefit for the end user: from receipt of the order to delivery, discard glass is largely avoided and the valuable raw material is used efficiently.

Discs cut more accurately and faster

CMS states that since the company began working with Sinumerik controllers, the quality of the cut glass panes has increased significantly. Unlike previous solutions, Sinumerik allows the dimensions to be corrected and entered into the machine as a correction. The cutting speed has also been notably increased, to 130 meters per minute – three times faster than before. The company is delighted with the increasing number of orders as a result.

CMS is also relying on the successful partnership with the local Siemens sales office in Istanbul for other machines such as insulated glass lines and machines for processing safety glass. ■

More information:

www.siemens.com/glass

www.siemens.com/sinumerik

Fully integrated user interface for stand-alone cutting tables

Optimized Glass Cutting

By optimizing the cutting process, glass manufacturers can use raw glass formats most efficiently and avoid unnecessary scrap. Hanic, a partner of Siemens for many years, has developed the Optiplan 4 HMI software, which is easy to use even without NC knowledge because it combines the previously separate worlds of cut optimization and machine operation in a user-friendly interface.

Cut optimization is a key success factor in glass processing today. Especially with stand-alone glass cutting tables, the ideal is to perform cut optimization directly on a PC at the machine. The partnership between Hanic and Siemens makes this possible. With Optiplan 4 HMI, Hanic has developed optimization software that runs on the same hardware as the actual human machine interface program. Siemens offers control systems for this in which the machine operation is PC-based (e.g., Sinumerik 810D, 840D), as well as NC and HMI PC-based concepts (e.g. Sinumerik 840Di).

The integration of close-to-machine operation and classic optimization in a software package provides the machine operator with intuitive, multilingual machine operation. Complicated handling to load optimized cutting data into the NC from a

disk, flash memory card, or data file is no longer necessary because this takes place fully automatically. If the glass breaks during cutting, it can be recut immediately. The classic machine control panel has been reduced to a few hardware keys and is instead reproduced in the software, enabling easy, multilingual operation. The user needs to provide only a few basic inputs to enter the optimizing position of the glass panes. The order header data, like basic data for the position input, are taken from the stored master data. After the optimizing position has been entered, the glass is immediately available, sorted automatically according to type and thickness and in the form of optimization groups.

The shapes integrated into the model catalog of Optiplan 4 HMI are entered in graphic mode by the user. Important processing information such as edge process-

ing on rectangles or models as well as free contours can also be entered, and it is also possible to import DXF files. The grinding allowances necessary for cutting are added to the cutting dimensions.

Maximum glass utilization for every shape

In the automatic optimization of the individual glass types, it is possible to change cutting-table parameters or other parameters such as broken edges or minimum breaking distances. Hanic achieves a high glass yield by using sophisticated algorithms, with the specified restrictions taken into account. The optimization result is displayed to the user graphically and contains information about the achieved yield or waste, planned area, number of pieces, and necessary raw formats. The operator can then intervene at any time to influence the result.

Easy machine operation

After the optimization strategy has been accepted, the CNC data are generated automatically and loaded into the program memory of the Sinumerik controller. The machine operator then only needs to press the "Start" button and the glass is cut. The machine operation addresses everything from actual value displays to machine setup masks to alarm management to simulation. Last but not least, Optiplan 4 HMI is designed to be multilingual. It is already available in German, English, Chinese, Russian, and other languages.

Hanic GmbH

Hanic GmbH develops software solutions for the flat-glass industry. With Optiplus, Optifer, Optwin, and Optiplan, all glass-relevant processes can be optimized.

Company headquarters:

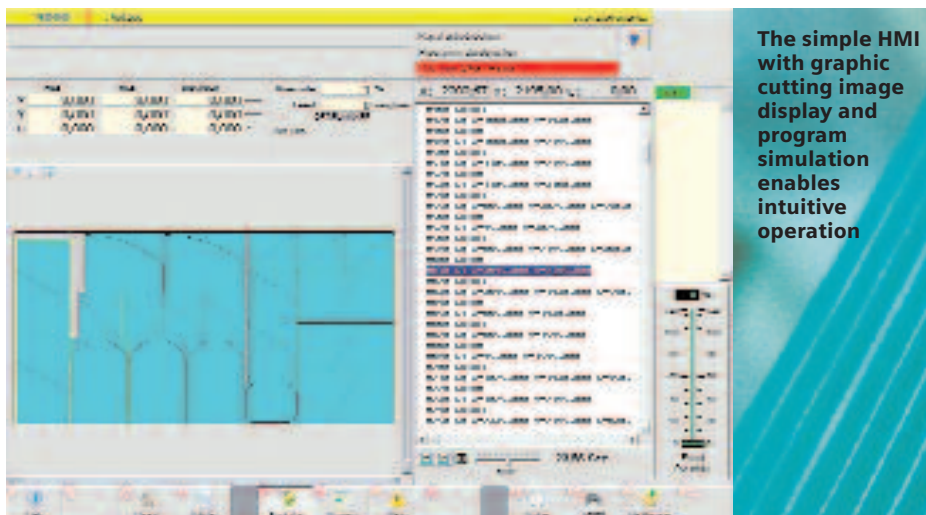
Josef-Hausmann-Str. 10
D-44866 Bochum-Wattenscheid
Germany

Employees: 29

Founded: 1983

Contact:

Rainer Feuster
Phone: +49 (0) 2327 8369-0
Fax: +49 (0) 2327 8369-1 99
E-mail: rainer.feuster@hanic.de



The simple HMI with graphic cutting image display and program simulation enables intuitive operation

More information :

www.siemens.com/glass

Maximum flexibility
and short cycle times
thanks to Simotion D

More Than Drilling and Milling



The new Francesca FC 32M 3300 MILL from Forvet can process glass panes up to a size of 3,300 x 8,000 millimeters

All Pictures: Forvet

Last year, the Italian company Forvet, which specializes in the manufacture of drilling machines, launched a glass-processing machine that can process two glass panes simultaneously. The Simotion D motion-control system with Sinamics drives ensures the flexibility and speed of the NC machining station.

Forvet SRL is a market leader in the glass-processing industry thanks to its innovative ideas and high-tech solutions, along with many years of experience. The company's wide range of models covers different customer requirements and glass sizes. A key distinguishing feature of the Forvet drilling machines is the drill spindle heads with several spindles. With their high-quality components and efficient software, they provide the machines maximum flexibility, which is in high demand on the market.

Last year Forvet successfully developed the Francesca FC 32M 3300 MILL, the only

machine worldwide that can process and remove either one large glass pane (max. 3,300 x 8,000 millimeters) or two smaller glass panes (max. 1,600 x 4,000 millimeters) simultaneously without intermediate steps. The machine is equipped with 32 tools. These are installed in four heads that can be operated independently of each other or parallel in coordination. Simultaneous processing of the glass panes with four tools considerably reduces cycle time.

For greater productivity, the Francesca FC 32M 3300 can be combined with the Forvet Chiara grinding and polishing machine or another two-blade grinding machine, which doubles the output.

Great flexibility and minimal downtime

The NC machine is equipped with 24 axes, and utilizes both servo and standard asynchronous motors. The very compact design is achieved with the help of the double-axis modules of the Sinamics S120 drive platform. The "Drive-CLIQ" drive interface enables distributed design setup as well as fast engineering and efficient servicing. Thanks to the Structured Text

programming language, functions such as synchronous tasks, portal operation and the execution of special cam profiles are conveniently configured. The operator interface, which was implemented using Simatic WinCC flexible, allows for easy user operation with several languages on the Simatic Panel PC 577.

The machine is distinguished not only by its enormous flexibility in glass processing. It also shortens the downtime when a "spot job" – a job that has to be executed within a short time and with short notice – needs to be slotted in. The operator can then choose between two options: either to remove a tool from the revolver head and insert a new one, or to temporarily use another revolver head to avoid production process interruption and thereby require less time. All of these work steps are automatically controlled and adjusted with the help of a Simotion D445 motion control system.

More information:

www.siemens.com/glass

www.siemens.com/simotion

Sinumerik solution line

Control Platform for Glass Processing

The Sinumerik solution line (sl) control family is the new platform and ideal solution for glass processing. It consists of the Sinumerik 802D sl compact panel CNC, the PC-based Sinumerik 840Di sl, and the "flagship," the universal, drive-based Sinumerik 840D sl. An important property of the Sinumerik solution line is its scalability – in terms of the hardware, the software, and the area of operation. The new controls can therefore be optimally adapted to the various machine designs.

The new Sinamics S120 drive system is distinguished by its scalable power range, functionality, and design. Tiered function packages address all areas of application. The selection of different designs such as internal air cooling, external air cooling, and liquid cooling open up many new application opportunities for the machine manufacturer. Extensive possibilities for distributed configurations and flexible system structures are available via Ethernet, Profibus, and Drive-Clq. The controls can easily be integrated into system networks via Industrial Ethernet and Profibus. As a result, operation and an integrated diagnostics and service function can be implemented much more flexibly.

The right model for every application

Like its predecessor Sinumerik 802D, Sinumerik 802D sl is an operator panel control that combines NC and PLC control as well as HMI functions in one device. It can be wired at low cost and commissioned easily and quickly. Optimum connectivity is guaranteed by three onboard communication ports: Ethernet to connect to the master systems, Profibus to connect to the periphery, and Drive-Clq to connect to Sinamics S120.

Sinumerik 840Di sl is a fully PC-based numeric control based on the PCU 50.3

industrial PC with the Windows XP operating system and the MCI 2 motion-control interface board. Both the Sinamics drive system and the distributed periphery are linked by 12-megabaud Profibus DP with motion-control functionality and real-time capability. Analog drive interfaces in packs of four are available as an option. Thanks to the openness of the HMI and PLC, the user can create individual technology solutions.

The efficient universal solution Sinumerik 840D sl consists of an NC unit (NCU) with embedded CNC, HMI, PLC, regulation, and communication functions. If higher performance is desired in the field of HMI, the Sinumerik PCU 50.3 Industrial PC can be added. A maximum of four distributed operator panels are operated by one NCU/PCU at a distance of up to 100 meters. A special strength of the Sinumerik 840D is the consistent openness of the HMI and NC core. This enables numerous functional extensions and can facilitate new areas of application for which automation solutions have not been available. ■

More information:

www.siemens.com/glass

www.siemens.com/sinumerik



Sinumerik 840D sl – the flexible, universal system



Sinumerik 840Di sl – the PC-integrated, flexible system



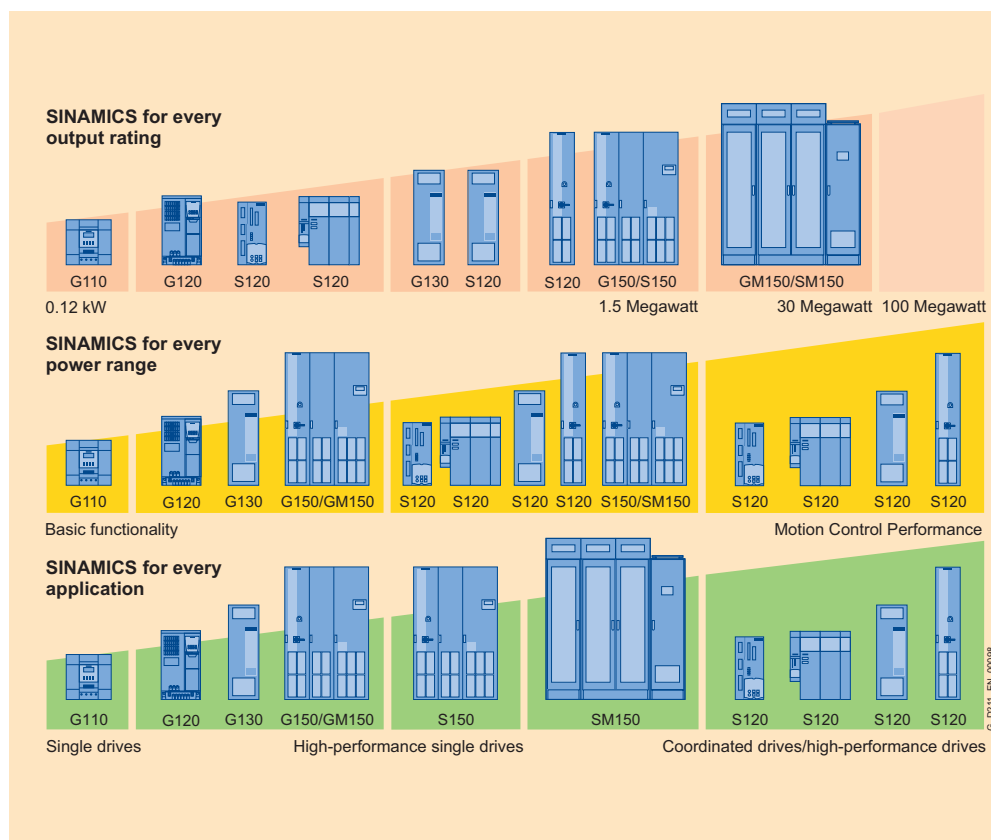
Sinumerik 802D sl – the compact panel CNC

All pictures: Siemens AG

Sinamics and Profinet

Modularity in the Drive Assembly

In modular machines, drive and automation functions are increasingly being designed as distributed functions. The intelligence available in drive solutions can take over more and more tasks due to increasing processor performance, and standardized Ethernet-based fieldbuses provide the necessary data exchange.



The Sinamics drives are scaled according to power, function, and the complexity of the application

The intelligent drive systems are especially suitable as an automation platform when modular machine designs need to be implemented. For the independent scaling of functionality and electrical power, the control module and power modules of the drives must be selectable as separate modules. The independent dimensioning of the power modules allows the flexible scaling of the drive solution to varying load situations, while the engineering for very different applications relies on the same resources, with a uniform control module for all applications. This principle is implemented consistently in the drive system Sinamics S120. In distributed automation topologies, for example, a Simotion D module takes over the control of the Sinamics S120 axis assembly, which is then used in place of the Sinamics control module. Control functions and motion control are then also available in addition to the control directly in the drive.

Simple automation structures and the efficient utilization of existing resources demand the flexible application of intelli-

gence and functionality. The Sinamics S120 drive system is tailor-made for this development because it interacts smoothly with the machine manufacturer's favorite automation topology, whether industrial PC, controller, or drive-integrated. Wasted resources at the drive level are therefore a thing of the past. This flexibility is supported by the automation system. The Simotion motion-control system covers all three important hardware platforms – controller, PC, and drive – in a broad performance range. In every one of these configurations, the machine manufacturer is supported with one consistent tool environment, from the development work right through to the remote diagnosis and maintenance over the whole life cycle of the machine.

Real-time communication with Profinet

Profinet, the extensive and open Industrial Ethernet standard, is available as a communication standard for distributed intelligent automation solutions. It also allows the integration of distributed field devices

and, together with component-based automation (CbA), forms the basis for distributed intelligence in modular plant construction. With Profinet, safety-related components can also be integrated easily with the Profisafe protocol. In addition, field level, control level, and IT level will be even more closely linked in the future. Profinet relies on a consistently scalable solution for real-time communication. This includes the time-uncritical transfer of production data; communication with the peripheral units in real time (RT), with response times of 5 to 10 milliseconds; and isochronous real time (IRT), which demands cycle times of less than 1 millisecond and jitter accuracies of 1 microsecond for time-critical motion control applications. Open IT standards and TCP/IP can be used simultaneously and unrestrictedly by the same channel. ■

More information:

www.siemens.com/glass

www.siemens.com/sinamics

www.siemens.com/profinet

Pyrometric temperature measurement Noncontacting Monitoring

Noncontacting pyrometric temperature measuring methods are becoming increasingly important in the monitoring and optimization of energy-intensive glass melting and forming processes. However, since pyrometric temperature measurement employs an optical measuring method, a clean lens and free field of view for the pyrometer are prerequisites for correct temperature measurement.

The compact radiation pyrometers of the Ardocell and Ardocol series with integrated fouling monitors provide reliable meas-

The Ardocell PS and PZ pyrometers with fiber-optic cables can be used without external cooling at ambient temperatures of up to 250 °C

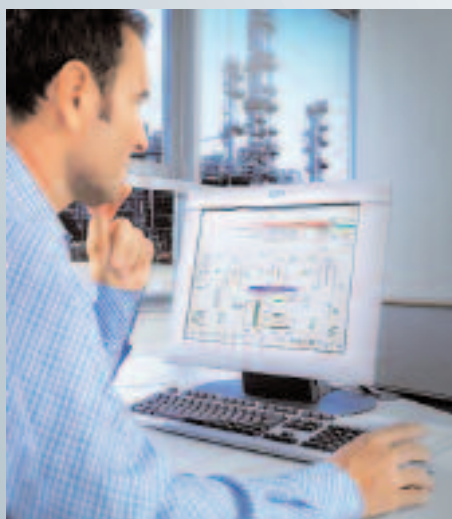
ured values even at only 10 percent of the original radiation intensity and trigger a system alert indicating the fouling problem. This feature monitors the entire measured section between the pyrometer and the target and operates on a purely electrical basis, meaning that no optical attachments, moving mechanical components, or external additional modules are required. The pyrometer is therefore wear- and maintenance-free. The Ardocell PS and PZ pyrometers with fiber-optic cables (FOC) can be used without external cooling at



ambient temperatures of up to 250 °C, thanks to their FOC optics and the steel-encased FOC. This makes the installation of an expensive and complex cooling water circuit unnecessary in many cases. ■

More information:

www.industry.siemens.com



Processes can be controlled, operated, and monitored directly via Internet/Intranet by Web functionality

Simatic PCS 7 Version 6.1 New Web Functionality

The Simatic PCS 7 process control system offers a consistent and integrated automation solution for all industries. In version 6.1, the process control system has been enhanced and extended with important features such as integrated asset management and OS Web.

With Web functionality for the operator stations of the Simatic PCS 7 process control system, processes can be controlled, operated, and monitored directly via the Internet/intranet. The user can access all process data through the PCS 7 Web server from the PCS 7 Web client – any PC with Internet Explorer. The Internet Explorer

display on the client PC corresponds to the user interface of a conventional operator station with an overview and working and keyboard area. As with an operator station, user-specific access rights can be set for the PCS 7 Web client. All Web client operating procedures are logged automatically with the name of the operator. Up to 50 Web clients can access one PCS 7 OS Web server. This enables remote operation even of complex applications. ■

More information:

www.siemens.com/pcs7

Advance Process Control More Quality and Flexibility

The greatest challenge that process engineers will face in the glass industry lies in the reduction of variable costs while maintaining product quality. Advanced process control is the most effective technology available to realize this objective,

especially for established plants. Advanced process control also helps ensure stable processes, including the optimized use of energy resources, and product quality, which are essential for process optimization.

In the area of adaptive as well as multi-variable model-predictive control used in advanced process control solutions, Siemens partners with companies such as TNO, Glass Service, STG, and UAS, implementing their expertise in advanced products. These advanced methods keep relevant variables within the required param-

eters, allow for automated and flexible process operation, obtain predictive and reproducible results, and minimize energy and raw material consumption. These functions can be integrated into the Simatic PCS 7 process control system so that both process automation and advanced process control can be operated through the same interface. ■

More information:

www.siemens.com/glass

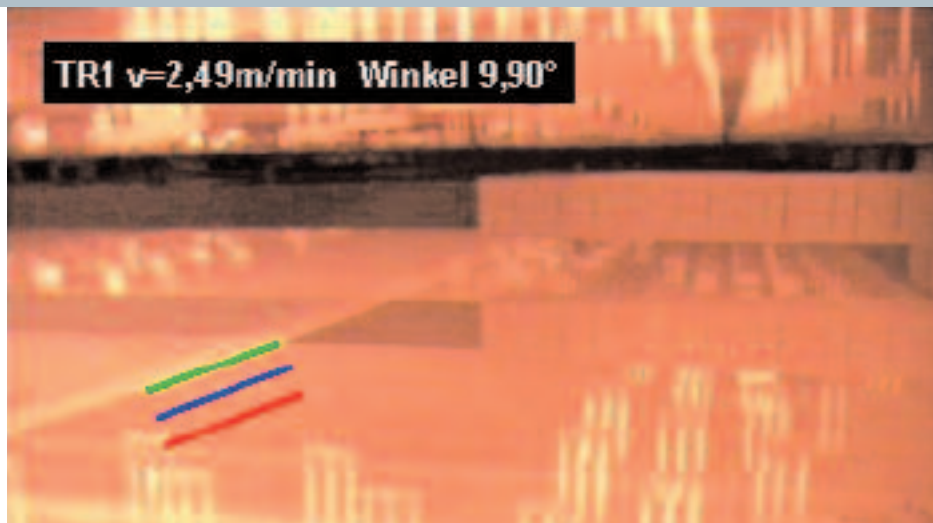
Siglas Top Roller Live Information Feed

The ViaCC video system enables showing live pictures of all cameras with the top-roller in the control station for supervision and control of production processes in the float area.

Simultaneously to the video display pictures, performance data such as flow velocity, temperature, and angle are directly faded into the video picture. Due to the direct interconnection of the automated system, a timely adequate and parallel display of video information and process data is achieved.

The operator has the option to place any picture markers into the video pictures so that orientation during the production process is better. As a result, it is possible to recognize any changes in flowing or positioning faster.

Integrated algorithms which analyze the pictures allow a width measurement which can be used to control or readjust the feeder



The measured data are displayed directly in the video pictures with ViaCC

gates. Function blocks are provided for the communication with the automation which is able to read evaluated data of the pictures and at the same time send data for automation to the video system.

For subsequent analysis, the pictures with the measuring data that is faded in as well as the orientation guides are saved in a continuous ring buffer. Further archive tools such as search engines, timeline, backup, or access to single pictures allow quick and comfortable editing.

The setup, analysis, and configuration of the complete video system is done with a configuration station that does not influence running operations.

It is possible to access the video server with any PC or notebook via LAN by using the ViaCC client software without interrupting the running operations.

More information:

www.industry.siemens.com

Siglas TFT Inspection One Hundred Percent Quality



The new sensor detects glass flaws well into the submicrometer range

The availability of large-format glass substrates plays a key role in the rapidly growing market for TFT-LCD displays. Quality and yield are critical to the success of glass and display manufacturers in global competition. The production and processing of ultrathin glass with a thickness of just a few tenths of a millimeter is particularly important. The slightest surface flaws, such as particles, occlusions, and scratches, can later lead to the failure of individual display pixels.

Because flaws that are discovered at the end of the manufacturing process are extremely costly, it is absolutely essential to check the glass substrate for flaws before processing. Siemens offers an optical inspection system especially designed for use at the cold end of the ultrathin glass

production process that has a much greater efficiency than conventional systems and enables detection of glass flaws well into the submicrometer range.

The sensor, based on a laser scanner with high-resolution scattered-light detection, picks up surface flaws on both sides of the glass substrate as well as occlusions in the glass. The most prominent feature, apart from the detection of punctiform defects, is the direction-independent detection of surface scratches. With the system's patented scan and detection optics, micro-scratches just a few nanometers wide and deep can be detected reliably in any direction. Distinguishing between defects on the front and the back is also possible as an option. The system can be cascaded to test different web widths.

More information:

www.siemens.com/glass

Sitrams LR 400 radar level-monitoring system For Demanding Tasks

The Sitrams LR 400 is a long-range FMCW radar level transmitter. It is available as a liquids version for use in liquid bulk storage vessels and as a solids version with an integral Easy Aimer ball for use with solids.

It provides excellent results even in conditions of extreme dust or with liquids with

Sitrams LR 400 provides excellent results even under harsh conditions

a low dielectric constant. It is virtually unaffected by atmospheric or temperature conditions within the vessel. ■

More information:
www.siemens.com/level



Sitrams LU 10 for ultrasonic sensors with a monitoring range of up to 60 meters

Sitrams F US ultrasonic level-monitoring system Accurate and Easy to Operate

Sitrams LU 10 is an ultrasonic long-range level monitor for liquids and solids, offering 10-point monitoring in a single unit. Key applications include chemical storage, liquid storage, and bulk solids storage.

Sitrams LU 10 has a monitoring range of up to 60 meters. The patented Sonic Intelligence echo-processing software ensures superior reliability. ■

More information:
www.siemens.com/level

Siwarex FTA weighing module Fast, Precise, and Flexible

Siwarex FTA provides calibratable and versatile weighing electronics for Simatic S7, C7, and PCS 7. It is a component of the Simatic automation system and the Simatic PCS 7 process control system, so it can also be linked to a comprehensive manufacturing execution system.

By setting a parameter in Siwarex FTA, one of the following scale types can be activated: a nonautomatic weighing instrument conforming with OIML R76 for tasks such as

hopper weighing or fill level weighing, or a platform scale; an automatic gravimetric filling instrument conforming with OIML R61 for use as a sacking system scale or filling scale; an automatic catchweighing instrument conforming with OIML R51 for single-component filling and emptying, a multi-component scale, or a static control scale for weight measurement; or a discontinuous totalizing automatic weighing instrument conforming with OIML R107, used, for example, as an emptying or loading scale. ■

More information:
www.siemens.com/weighing



The calibratable and versatile weighing electronics Siwarex FTA



Sitrams F R rotary-piston meters Proven Bestseller

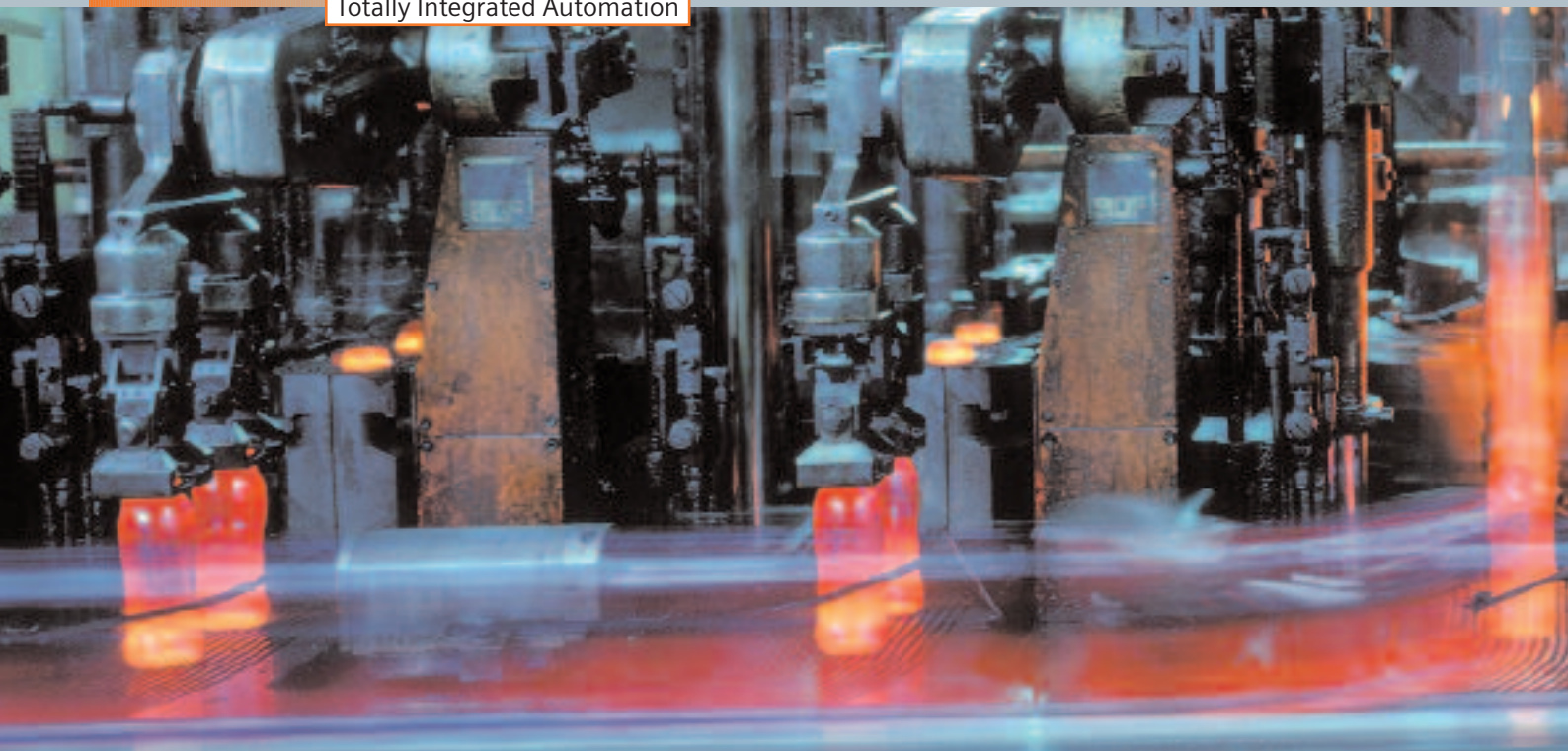
Sitrams F R rotary-piston meters are best-sellers. Although millions of them have been sold over the past few decades, they have lost none of their attractiveness. The benefits offered by their conventional mechanical measuring technique include

reliability, precision, and a robust design for measuring aggressive media and high-viscosity fluids.

That is why rotary-piston meters are still standard equipment in the glass industry. For Wiegand Glas, Siemens recently supplied 43 Sitrams F R rotary-piston meters to monitor the flow rate of heavy fuel oil used as fuel for the melting furnace. ■

More information:
www.siemens.com/flow

Proven measuring technology: Sitrams F R



Process optimization and modernization with Simatic PCS 7 at Vetropack

State-of-the-Art Packaging

In order to retain and strengthen its position in the competitive container glass market, the Vetropack Group places great importance on the consistent modernization of its production plants. Now that more than half of the company's melting furnaces have been successfully modernized with PCS 7, Vetropack is able to reap the benefits: Simatic PCS 7 provides a solid, future-proof basis for optimized process control.

The Vetropack Group, which offers a comprehensive range of glass packages for the food and beverage industry, is one of the largest container glass producers in Europe. Since the beginning of 2006, the company has also operated a glass factory in Ukraine, another major growth market. The group has seven glass-

works altogether, with a total of 17 melting furnaces producing more than 3,000 tons of glass for packaging per day.

In order to consolidate and strengthen its strong position in the market, the group pursues a double strategy: in addition to its continued eastward expansion, it is also focusing on the continuous modernization of its production plants in order to increase corporate success through optimal utilization of resources and plants, while simultaneously protecting existing investments.

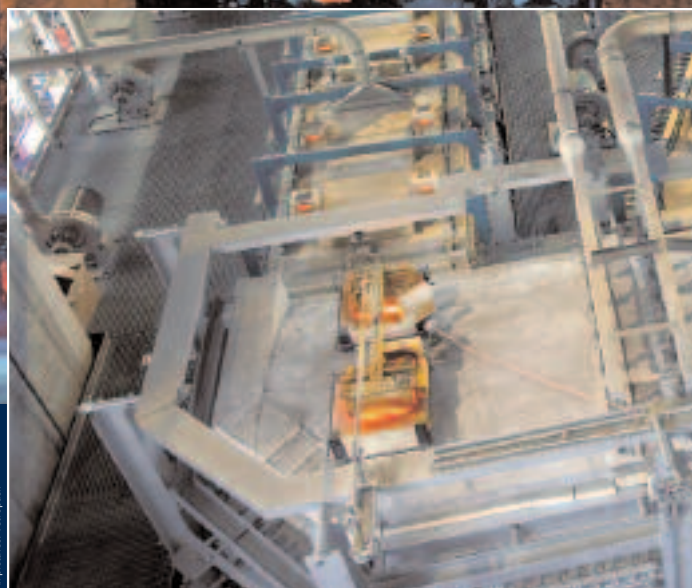
With a melting furnace having a service life of around 10 years, on average two cold repairs per year will be required throughout the company. Vetroconsult AG was established within the Vetropack Group more than 10 years ago with the purpose of carrying out engineering tasks such as the modernization of individual plants and the planning and commissioning of new melting ends. It is responsible for technical design planning and using its sound process expertise to achieve energy sav-

ings, cost-efficiency, and quality improvements, and to protect the environment.

Multiple requirements

From the basic specifications of uniformity and traceability, which, years ago, were all that was asked of a process control system in the glass industry, a veritable flood of requirements has developed: trouble-free connection of devices, simple and reliable operation, complete monitoring of the processes, linking to the SAP system, and much more. In Simatic PCS 7, Vetroconsult has found a solution that satisfies these requirements. This is why Vetroconsult has been using Simatic PCS 7 in its modernization projects for several years now.

One of these projects was a comprehensive modernization in St-Prex in Switzerland at the beginning of 2006. The production facility in St-Prex, the birthplace of the Vetropack Group, manufactures primarily bottles for domestic wine, spirits, and beer producers. In conjunction with the upgrad-



The new melting furnace in St-Prex



PCS 7 provides the plant operator with all important data

ing of the green glass melting furnace, the introduction of Simatic PCS 7 should also optimize the process in order to accommodate higher energy prices and the statutory environmental protection requirements.

Increased transparency

Ingo Schulz, the Vetroconsult engineer responsible for the electrical implementation, was able not only to depend on the proven technology of Simatic PCS 7 for the modernization, but also to benefit from new functions of the control system used for the first time by Vetropack at the St-Prex plant: Web server functionality, sequencer controls linked with status controls, and a complete energy evaluation.

All parts of the plant – from the batch area and the melting furnace, the annealing lehr and fragment removal, to the infrastructure with cooling water and compressed air supply – are controlled via a standardized process control system. This automation solution demonstrates the ben-

efits of Totally Integrated Automation. It provides all of the required data to the plant operator and engineers and also facilitates a precise energy evaluation. This data forms the basis for process automation – now and in the future.

A powerful partner

Vetropack sought specific support from Germany for the engineering at its St-Prex plant: a team from STG Cottbus took on the configuration, cabinet construction, installation, and commissioning of the process control system. STG is one of Siemens' most experienced technology partners in the glass industry, having equipped glass plants with Siemens process control technology in more than 20 countries. Those in charge of the project at Vetropack were enthusiastic about the support, as the STG team brought with it sound knowledge and, in particular, detailed understanding of all the glass technology processes, from which the plant in St-Prex is now also benefiting.

Moreover, they realized that in STG Cottbus they have found a partner capable of fully exploiting all the strengths and innovations of Simatic PCS 7. Vetropack is thoroughly satisfied with the partnership and the results of the work.

Visible results

At the modernized production plant, modern melting technologies and the increased use of recycled glass from the factory's internal waste-glass processing plant make it possible to reduce the NO_x emissions and the discharge of CO₂ by around 30 percent without changing the melting capacity, thereby effectively improving the life-cycle analysis at St-Prex. ■

More information:

www.siemens.com/pcs7



All pictures: P. Körber

Quinn Glass selects Siemens to equip new glass plant

The Right Choice

With the good results from a previous project as proof of the company's system and project capabilities, Siemens was a strong contender to equip a Quinn Glass Brownfield glass bottle plant at Ince in Great Britain. An experienced project team, glass industry expertise, and a redundant system solution to ensure continuous plant operation were other factors convincing Quinn Glass to choose Siemens and Simatic PCS 7 once again – a decision they have not regretted.

The new plant at Ince includes one of the largest automated warehouses in Europe, capable of storing 282,000 pallets of filled and unfilled bottles

Quinn Glass commenced construction of the new state-of-the-art manufacturing plant in Ince, Cheshire, in September 2003. This Brownfield development is one of only a handful of plants worldwide – and the only one in the UK – that manufacture and fill glass bottles on the same site. Furthermore, the 280 million Pound Sterling investment includes one of the largest automated warehouses in Europe, capable of storing 282,000 pallets of filled and unfilled bottles.

When Quinn Glass sought a supplier for the control systems, the first company it

approached was Siemens, as Siemens had recently supplied the equipment for Quinn's new plant in County Fermanagh, Northern Ireland. Nevertheless, for an investment of this size, a first-class track record was not enough to ensure Siemens' selection, and Quinn duly considered other suppliers to ensure it was getting the best.

Plant availability a decisive aspect

In the end, Quinn decided to use Siemens again. The success of the County Fermanagh project, Siemens' dedicated team of engineers with knowledge and experi-

ence operating in the glass manufacturing industry, the Profibus compatibility, and the redundant architecture of the Siemens systems were ideal for this application with its requirement for exceptionally high plant availability.

As those responsible at Quinn Glass said, Siemens was an excellent supplier on the County Fermanagh project, bringing people who really understood glass production and technologies that enabled the tightly integrated control that Quinn needed. For the new Ince plant, the company knew it would be bringing in equip-

ment from all around Europe – Germany and Italy in particular – where Profibus is widely employed, so Profibus compatibility was also an important issue in the selection of a control systems supplier.

A key factor, however, was the redundant architecture. Because of the nature of the furnaces and associated equipment, glass manufacturing plants must operate continuously – 24/7/365. Plant availability is therefore paramount, as downtime can be extremely expensive in terms of potential irreparable damage to the plant. When Quinn Glass compared the PCS 7 with alternative systems, it saw that the redundant architecture would provide a major advantage in terms of greater plant reliability. Consequently, that technological factor, coupled with the experience Siemens has in the glass industry, was decisive for the final choice to go with Siemens.

Another factor in the decision was that the control equipment supplier had to be able to engineer and support glass manufacturing control systems throughout the entire plant life cycle. Typical of glass manufacturing facilities, the Ince plant is planned to operate for 20 years or more, yet

Quinn Glass's engineers are confident Siemens will be fully capable of assisting with any necessary maintenance and upgrading of the control system throughout the plant's life.

Integrated solution for hot and cold end

The glass container manufacturing plant at Ince has 13 production lines, and the filling hall has five lines. In total there are more than 7,500 I/O plus more than 10,000 more from drives and medium- and low-voltage equipment that are brought into the system via Profibus. The Simatic PCS 7 system easily handles this level of data.

In the County Fermanagh plant, Simatic PCS 7 controllers had been used at the hot end, but Quinn decided to make wider use of the PCS 7's flexibility and employ it in both the hot end and the cold end of the new plant, making this installation an example of the horizontal integration enabled by Totally Integrated Automation. Indeed, the Ince plant takes the automation of glass manufacturing and bottle filling to a new level, thanks largely to the versatility and excellent visualization capabilities inherent in the PCS 7.

Furthermore, the Simatic PCS 7's redundant system architecture provides improved scope for future upgrades, as both hardware and software components can be altered without interrupting production. That precludes the potential for causing damage to furnaces and associated equipment in the hot end, and it means that modifications can be made to the cold end without plant downtime.

Excellent platform

Quinn Glass is very satisfied with the results of the project and is confident it made the right decision in choosing Siemens for the Ince plant. In particular, the company approved of the proactive approach of the Siemens project team, which demonstrates the depth and breadth of Siemens' experience in this industry. In addition, because it is powerful, scalable, and flexible, the PCS 7 has proved to be an excellent platform on which to base the automation systems. ■

More information:

www.siemens.com/pcs7

Quinn decided to make wider use of the PCS 7's flexibility and employ it in both the hot end and the cold end of the new plant

Ince is one of only a handful of plants worldwide that manufacture and fill glass bottles on the same site



Asahi Glass benefits from international project expertise

Repeat Success

For several years, Asahi Glass Co., Ltd., the world's leading glass manufacturer, and Siemens have been working together successfully to equip glass works all around the world. Following projects in Iran, Belgium, and Russia, Siemens has recently successfully completed several projects for two subsidiaries of Asahi Glass. In all these projects, Asahi Glass has benefited from the established glass and project expertise with which Siemens supports its customers around the world.

Asahi und Siemens

In the last years, Siemens has executed several projects for Asahi:

At AGC Automotive:

Chuderice, Czech Republic

Roorkee, India

Tatabanya, Hungary

At Glaverbel:

Klin, Russia

Maasglas Tiel, The Netherlands

Liya Glass, Iran

Mol, Belgium

At AFG:

Cinimison, USA

Blue Ridge, USA

As long ago as the mid-1990s, Asahi recognized the huge development opportunities offered by the Russian market and acquired a percentage of the largest glass manufacturer in the country, the Bor glass plant. For the automation of a production line for flat glass, coated glass, and plate glass in Klin, near Moscow, the Siemens Group was contracted to provide the project management for all the engineering, the installation and commissioning of the automation and drive technology, the field instrumentation, and the complete energy supply, as well as being responsible for the integration of all components supplied by subcontractors. Simatic PCS 7, part of Totally Integrated Automation, was implemented as the core component of the solution.

Expertise in Russia

In Bor, around 500 kilometers east of Moscow, Asahi Glass and its subsidiaries Glaverbel and AGC Automotive operate several production lines for float glass and automotive glass, which have been successfully equipped with state-of-the-art technology since the mid-1990s.

Asahi recently decided to upgrade the power distribution in Bor. As a result of its previous positive experience with Siemens and the fact that Siemens had already demonstrated in Klin that it was familiar

with the requirements of the Russian market, Asahi decided to work with Siemens again. In bidding for this contract, Siemens held its own against well-known competitors, as Bertrand Wiart, project engineer at AGC Automotive, explains: "Several factors played a key role in the decision in favor of Siemens. In addition to the company's experience in the Russian market, which Siemens has already proven, the proposed technology – NXAir air-insulated medium-voltage switching systems and Sivacon low-voltage switching systems – matched our requirements perfectly. In addition, with Siemens we would be able to purchase all the components from one source."

In Bor, Siemens was responsible for the engineering, supplying the required components, and monitoring the installation of the systems on site. To do this, Siemens worked with a local Russian partner. The work on the new power distribution in Bor has now been concluded on schedule and to the complete satisfaction of the customer.

Another project in Hungary

At almost the same time as the project in Bor, Siemens was able to secure two orders for a new AGC Automotive plant in the Hungarian town of Tatabanya, where float glass is further processed into automotive glass. The compact gas-insulated NXPlus switching systems played a key role in tipping the

scales in favor of Siemens. Within the scope of this project, Siemens was responsible for the ordering, delivery, and commissioning of the NXPlus switching system, the Simosec systems in the 22-kilovolt range, and a total of 23 Geafol transformers, as well as the drive technology with 11 Sinamics drives and appropriate motors. Other factors key to Siemens winning this contract were the excellent glass expertise and in-depth project experience of the Siemens team.

The successful implementation of this project and the exemplary international project coordination contributed to the decision to have Siemens also supply the complete medium-voltage distribution system and process control technology with Simatic PCS 7 for the new float glass plant in India.

Proven technology and an experienced team in India

The float glass line in Roorkee is part of a glass complex that is projected to come into operation at the end of 2006. Roorkee is the fourth glass production operation of Asahi India and will, once complete, be the largest integrated glass production operation, with lines for reflective glass, mirrors, automotive glass, and float glass.

On the new float glass line in the Indian town of Roorkee, Glaverbel is using Simatic

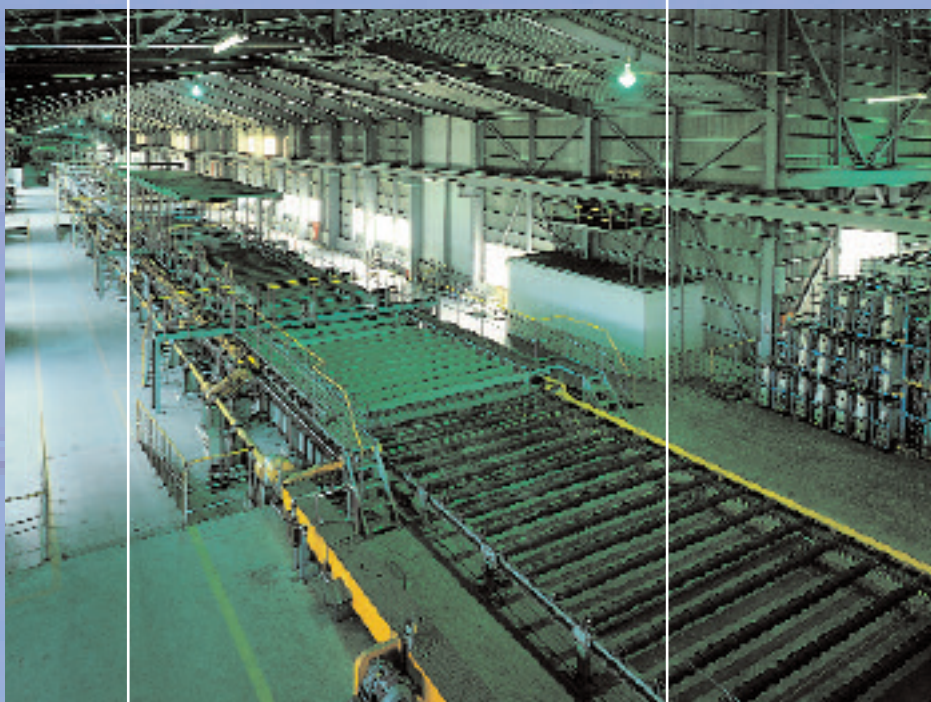
PCS 7 at the hot end. The efficient Simatic S7 controllers are being used at the cold end, which is equipped by Grenzebach, as well as in the batch house. Siemens partner STG Cottbus was responsible for the CAD designs, software engineering, cabinet construction, installation supervision, and commissioning.

With a total of 1,000 process signals, this is a typical float glass project. Around 30 percent of the signals are linked via Profibus DP and PA, including more than 40 units of the AEG Thyro-P thyristor controller. The architecture of the system in Roorkee combines the most cost-effective solution possible with a high level of plant safety. Four of the automation systems are not redundant. Instead, each of the more than 80 control loops has a hardware backup in one of the 25 Sipart DR24 hardware controllers. Each control loop utilizes the full PCS 7 functionality as a software controller and also has an independent backup in a DR24 with an independent second control output. The Profibus link to the Thyro-P heating units is fail-safe due to a modified software solution: if the bus connection is lost or reconnected, the heating will continue unchanged for the process.

The complete system was tested loop by loop in two steps in the STG testing panel, including possible error situations. As training for later system maintenance, three engineers from the plant operator took part in these tests, enabling them to familiarize themselves with the hardware and software of their new system. The system is currently being installed, with the aim of beginning production at the end of this year.

International expertise

In all these projects, Siemens was able to demonstrate to Asahi how an internationally experienced team can support a client with optimally tailored solutions from one source, thereby simplifying project handling and reducing the lead time until commissioning. This enabled Asahi to benefit both from the strengths of a globally positioned partner and from the great experience Siemens has in the glass industry. ■



Simatic technology is implemented in both the hot and cold end at Asahi Glass – consequently, the company fully benefits from Totally Integrated Automation

More information:

www.siemens.com/pcs7

www.siemens.com/processinstrumentation

Integrated solutions for power supply systems

Power Package

Efficient production processes require a reliable and uninterruptible power supply. This applies in particular to the glass industry, where quality must be reliably maintained, even during periods of peak load. At the same time, increasing energy prices require a solution that also minimizes power costs. Siemens offers a complete package of systems and solutions for all areas of power supply – from power generation to power distribution within buildings.

The production processes in glass works require a reliable power supply with efficient use of energy and a flexible mains structure. Siemens develops and realizes technically and financially optimized power-supply solutions for its customers – from the incoming supply to the consumer, and from energy management to the emergency power system.

Integrated – from medium voltage to the power outlet

Totally Integrated Power (TIP) enables Siemens to offer products, systems, and tools that consolidate all the components for power distribution in one integrated unit. TIP encompasses the entire life cycle of a power distribution plant – from planning and design to configuration and

installation to cost-effective operation. Products and systems that have been tailored to each other, with optimal interfaces, guarantee reliable operation. At the same time, standardized interfaces facilitate trouble-free linking to process control technology and building automation systems. Maintenance-free power distribution equipment, such as the gas-insulated modular NXAir and NXAirPlus medium-voltage switchgear, contributes to the reduction in life-cycle costs. At the same time, flexible solutions are being realized with TIP that can also be adapted to new requirements – an important contribution to the protection of investments.

In-house generation as an alternative

Moreover, faced with rapidly increasing

energy prices, the option of generating their own power supply capacities is becoming more and more interesting to companies in energy-intensive sectors such as the glass industry. As a result, gas turbines and generation sets as well as systems for optimal energy recovery are also included in the Siemens range of solutions for power supply.

Increase availability, reduce costs

A further aspect of power supply is the security of supply. With computer-aided information management, as offered, for example, by the Sicam PCC energy automation system, operating personnel are provided with a detailed overview of the status of the supply facilities at all times, enabling them to efficiently prevent power outages.

Furthermore, Siemens also offers tools for effective energy management. By means of a detailed consumption and load analysis, which uses information from the process control system and the power supply, peak loads can be avoided and power consumption controlled in such a way that the cost of the energy required remains as low as possible, without impairing production. As electrical power comprises a considerable portion of operating costs, these investments pay for themselves very quickly. ■

More information:

www.siemens.com/tip



Integrated solution brings new Bulgarian glass plant online

All-In-One Power

When the leading Turkish glass manufacturer Sisecam decided to build a new glass plant in the northwestern Bulgarian town of Targovishte, it turned to Siemens to handle the complete power engineering. The new plant offered Siemens an excellent opportunity to demonstrate its unique competence as a “one-stop shop” with a comprehensive portfolio of products and solutions.

The technical bid requirements made by Sisecam Group, currently ranked 15th among all of the glass producers worldwide in terms of total revenues, called for a turnkey solution with type-tested certified cabinets. The stringent customer targets stipulated a low-cost solution that ensured on-time delivery at minimum risk,

good quality, as well as matching and/or converting compatibilities with Bulgarian standards. Sisecam also expressed a preference for vacuum circuit breakers. Most importantly, everything had to be from a single source.

Full glass production scope

Valued at a total of 220 million US dollars, the Greenfield project actually consists of two state-of-the-art plants: a flat glass as well as a tableware plant. Moreover, Sisecam has also built a glass treatment facility at the same location. The daily output of the flat glass facility alone is estimated at 725 tons. Annual production of the tableware plant at the site is expected to reach 150 tons, or approximately 235 million glass articles, making Bulgaria the leading glass producer in Eastern Europe.

Both facilities are located at the same site, and thus share common utilities. The scope of the Siemens contract included supply of the medium-voltage and low-voltage cabinets, the entire cabling and erection of all of the equipment supplied, the power transformers of tableware plant, transformers for the roof heating and their control cabinets, as well as the installation of a SCADA system. The hardware and software solution saw the integration of 8BK20 medium-voltage cabinets with vacuum circuit breakers, 8PT Sivacon low-voltage cabinets and third party components. The entire power supply solution for medium and low voltage was supplied by Siemens,



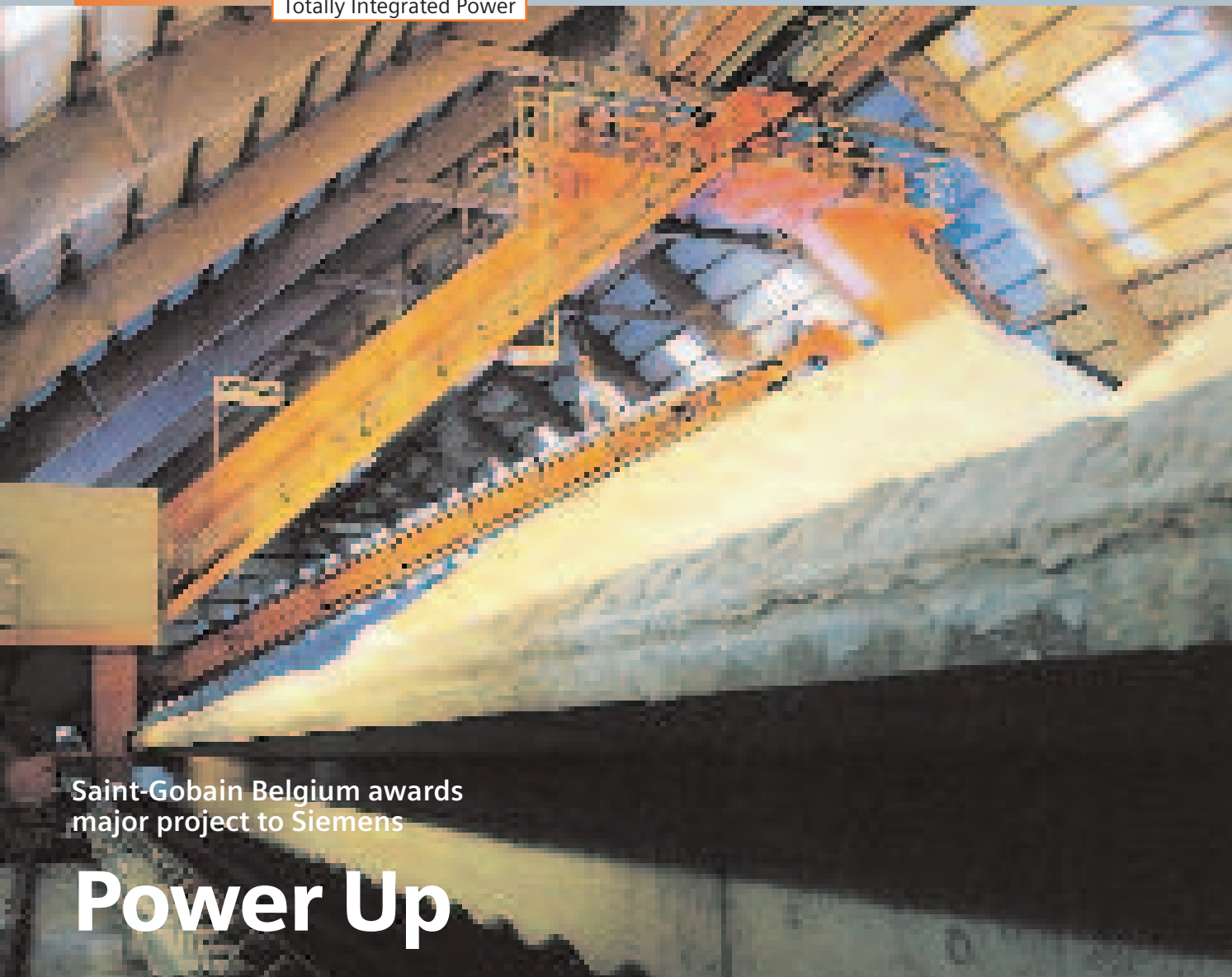
The new flat glass and tableware plants are located in the Bulgarian town of Targovishte

including services for project management and field cabling as well as erection work support. Consequently, the project offered Siemens an excellent opportunity to demonstrate the unique “internal synergies” the enterprise possesses as a “one-stop shop.”

Successful commissioning

Both plants have been inaugurated with participation of representatives of Bulgarian government, municipality and top management of Sisecam Group. This project has been awarded by OECD as the biggest greenfield project in the territory. Moreover, the plants will reduce unemployment at Targovishte – another positive social affect of the project. ■

More information:
www.siemens.com/tip



Saint-Gobain Belgium awards major project to Siemens

Power Up

Siemens AG

Saint-Gobain has awarded Siemens a contract to completely renew the power distribution system of one production line for float glass at its Auvelais site in Belgium. The project is to be completed in 2007.

The aim of the project is to completely renew the power distribution system for float glass line "A" at the Auvelais site. The existing system is based on equipment provided by multiple vendors.

Technical and solution expertise

Management at Saint-Gobain opted for Siemens as a partner for this major project based on Siemens' technical expertise and the solution proposed. "We chose Siemens for several reasons," explains Fabian Pipart,

project manager at Saint-Gobain. "A clear benefit for us was the fact that we could use Siemens as a one-stop shop, with a single contact partner. The competitive price was also an important factor in our decision." From a technological point of view, the Saint-Gobain group has been familiar with Siemens equipment for a long time. Another key selling point was the effective cooperation with Olivier Vincent, the international account manager of Saint Gobain France.

Turnkey project

Saint-Gobain and members of the Siemens group have worked together in the past, but this project is a first for Siemens in Belgium, where it enters a field previously dominated by competitors.

The contract includes the supply of medium-voltage distribution systems

with gas-insulated NXPlus switchgear, as well as Sivacon low-voltage switchboards. Siemens will provide services including overall project management, supply of equipment, engineering, installation on site, and commissioning – making the project a turnkey solution.

On track

The entire float line project will be executed over a period of two years and will be completed in April 2007. The project is currently running smoothly, with all work on track for commissioning in early 2007. With this project, the Siemens team in Belgium is continuing the successful project partnership between Saint-Gobain and Siemens. ■

More information:
www.siemens.com/tip



Siemens-Luoyang cooperation nets promising first results

A Bright Future

The cooperation agreement between Siemens and China Luoyang Float Glass Group, signed in 2004 during the International Glass Exhibition in Beijing, has netted first positive results. The company, a major Chinese float glass manufacturer, had been awarded a government contract to build a ultrathin float glass plant in China. The contract proves to be beneficial for Siemens as well. Similar to four other Luoyang float glass operations, the plant will also be equipped with Simatic PCS 7 technology.

As one of only two large-scaled Chinese glass manufacturing enterprises, the China Luoyang Float Glass Group has grown into a powerful force in terms of economic profitability, business strength, product quality and market reputability. Since its founding in 1956, Luoyang has emerged as one of the largest Chinese industry groups. Its marketing network spans across all of China as well as more than 40 countries and regions, including Great Britain, the US, Japan, the Republic of Korea as well and Hong Kong.

Luoyang is also one of the most progressive Chinese companies. Regarded as an industry trendsetter, the company is the

only Chinese glass manufacturer to produce float glass thicknesses ranging from 0.7 to 25 millimeters. Currently operating a total of nine float glass lines, the company annually produces more than 18,000 weight cases of float glass, or some 10,000,000 square meters of glass.

Cutting-edge control technology

In order to strengthen their leading position, Luoyang signed an Advanced System Integrator cooperation with Siemens in 2004. The agreement was expected to form the foundation for a fruitful cooperation. By the end of 2005, a total of four new glass plants are being built by Luoyang that will

be equipped with Simatic PCS 7 in the hot end. Moreover, Siemens will also supply motion control and drive technology for the cold end.

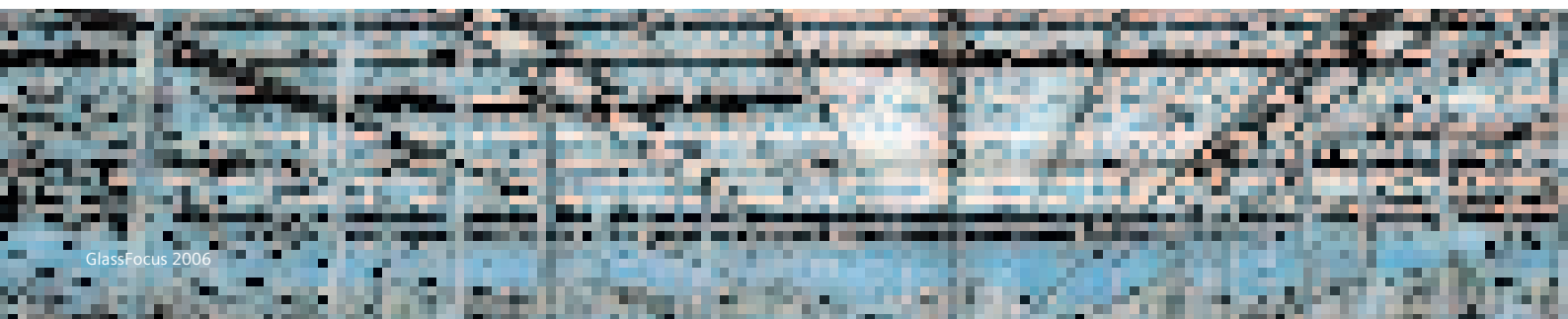
The first plant is a plant in Algeria that will produce 600 tons of float glass per day. Another two new float lines in China are also automated with the latest version 6.1 of Simatic PCS 7. The highlight project, however, is a facility for producing ultrathin glass. The plant was built in 1998 and was at that time the first production facility for ultrathin glass in China. This facility is currently being modernized, and will also use Simatic PCS 7 for process control.

A win-win situation

The new plant is not the first joint effort between Luoyang and Siemens, and the equally efficient and positive cooperation will continue to ensure optimum production output at the Luoyang production sites. The company particularly benefits from the many advantages provided by Totally Integrated Automation, including increased reliability and substantial cost reductions over the entire lifecycle of its float glass lines. ■

More information:

www.siemens.com/pcs7



Project support for Schott TFT LCD glass substrate production in Korea

Perfect Support

The international technology company Schott intensifies its activities in the booming flat panel display market. Recently, Schott has founded a joint venture for processing large TFT LCD glass substrates with the leading technology company Kuramoto Seisakusho Co. Ltd. from Japan. The 90 million Euro plant will be built 70 kilometers south of Seoul in the Ochang science park. Series production will start at the end of 2006.

Schott has contracted a team from Siemens for project support in a dedicated post-processing unit in Ochang. For the electrical engineering, water technology, media, power supply and building technology packages, Siemens is responsible for evaluating the quotations of the general contractor that have been invited for the bid and helps Schott clarify technical aspects, gives contract support in Korea and supports transferring the basic engineering to the general contractor.



Schott AG

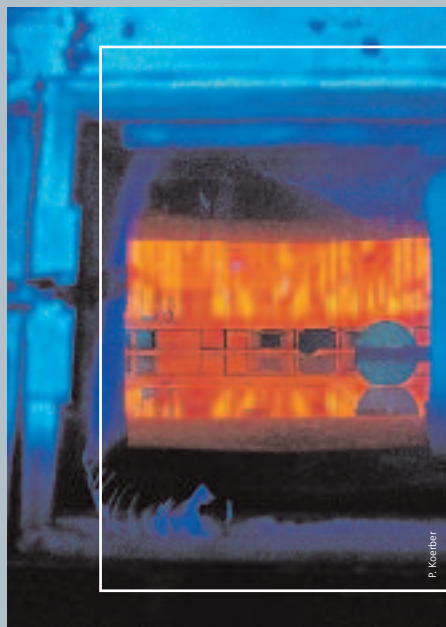
Strategic cooperation in Asia

Networking for Success

Together with China Triumph International Engineering Company (CTIEC) and the EPC Toledo Engineering from the U.S., Siemens is equipping two new float glass plants in Indonesia with a capacity of 900 tons of float glass per day.

This project is the result of two strategic cooperations: In 2005, CTIEC and Siemens signed a cooperation agreement. Later that year, CTIEC founded a joint venture with Toledo Engineering to integrate the broad and focused know-how of both companies for the Asian glass industry.

The project is presently being executed. Simatic PCS 7 is used as a process automation system. The Indonesian project is the second joint project of CTIES and Siemens. CTIEC is quite pleased with the results of the cooperation with Siemens and in 2005, awarded Siemens with the Excellent Supplier Award for excellent support and price/performance ratio. CTIEC intends to also use Siemens products for motion control, process instrumentation and power distribution.



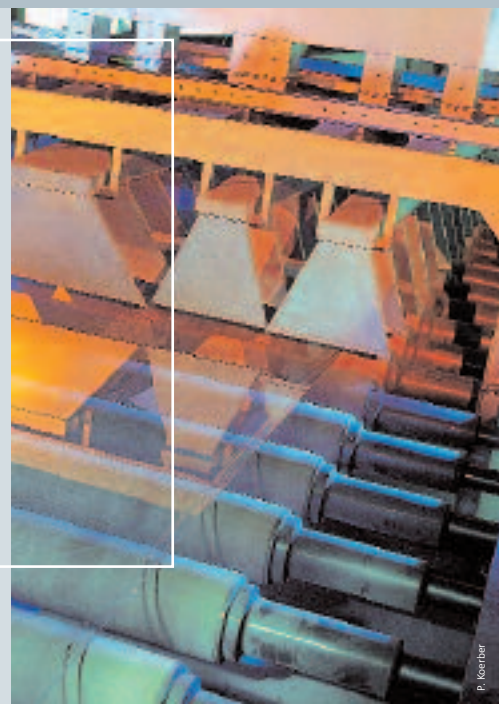
P. Keerber

PicVue modernizes TFT glass substrate production with Siemens technology

Role Model

PicVue Optoelectronics International Inc., a subsidiary of Taiwan-based STN LCD maker, PicVue Electronics Limited, was established in 2000. The company's first plant for TFT glass substrate was built in 2001 and started production in the second quarter of 2002.

After two years of operation, PicVue decided to go for major process modifications to improve production efficiency. In the scope of this project, two orders were awarded to Siemens. The first order comprises modifications of the existing application software running on redundant Simatic WinCC servers with seven terminals and the software for the redundant controller to accommodate for changes in the furnace and heating control. Moreover, Siemens will supply and integrate new master drives, servo motors, controllers and Simatic MP 270B operator panels with the existing drives system for the glass drawing machine to increase the production rates from two to four meters per minute. The specifications developed from the modifications will also be used for the two new lines, which are already being built at the Hsinchu site.



P. Keerber



Siemens partner network aligns skills and expertise

Joint Growth

Success is always the result of constructive partnerships between the best in a field. That's why for many years Siemens has worked successfully with numerous mechanical engineers and plant designers specializing in the glass industry. As a result, glass manufacturers benefit from a coherent and integrated automation solution based on Totally Integrated Automation that covers all areas of glass production and processing.

Working with partners has a long tradition at Siemens, and not just in the glass industry. In many other areas, Siemens has also worked with companies that have made a name for themselves in very different sectors, including research and development, engineering, plant construction, systems integration, and service and support.

Maximum benefits for the customer

Technology partners, plant constructors, engineering companies, and Siemens work together, using their comprehensive prod-

uct, system, and industry expertise, to develop customized, future-proof solutions for automation and drive technology as well as power distribution – for the maximum benefit of end customers all around the world.

This collaboration is accompanied by the continual development of skills and the steady advancement of partnerships in sales and strategic and technical areas, as well as an absolute orientation to customer requirements. The collaboration thus represents confidence and quality as well – also important pillars of success in the glass industry.

Shared development and global support

Siemens supports its partners in the development of glass-technology solutions that help save energy, ensure quality, or minimize nitrogen oxides, for example. The process and automation skills of the Siemens glass team are the ideal addition to the sound technological and process expertise contributed by the respective plant constructor or technology partner.

It is very important to Siemens that the partnership covers all aspects of the business life-cycle. From system development to project implementation to spare parts

supply, partner companies are able to benefit from the global on-site presence, availability, and support offered by Siemens, allowing them to optimally support their glass customers all around the world. At the same time, close cooperation during the development phases ensures that all components – systems, machinery, and drive and automation technology – are perfectly tailored to each other.

Win-win-win

This collaboration within the Siemens partner network brings numerous benefits for all the participants: Siemens is able to expand its own portfolio of solutions, thanks to the special expertise of its partners; its partners benefit from working with an experienced global player in the glass industry in the field of automation and drive solutions; and the customer can be sure that it has received a well-engineered solution that can be seamlessly integrated into the environment of Totally Integrated Automation. ■

More information:

www.siemens.com/glass/partner

STG and Siemens: Successful partnership for the glass industry

Stable, Long-Term Relationship

The efficient use of resources and optimization of the production plants dictate today's automation requirements for the glass industry. STG GmbH in Cottbus has equipped and optimized a large number of glass production plants using technology from Siemens and has been a Siemens automation technology partner for years. Both companies benefit from this partnership, as Dr. Peter Hemmann, one of the managing directors and founders of STG, stresses.

Dr. Hemmann, STG GmbH was one of the first companies to settle in Cottbus at the time it was founded.

Peter Hemmann: That's right – we are the fifth entry in the Cottbus trade register. It really took a great deal of courage and pioneering spirit when Helmut Heelemann, Frank Hegewald (who died much too early), and myself founded STG in the spring of 1990 just after the wall came down.

But success has proved us right: as an innovative, technology-oriented company we have been on a course of growth ever since. This success is based on the methods of NO_x reduction that we had already developed before the reunification of Germany

and that we have further optimized at STG. The zirconium oxide measuring probes for oxygen, which work reliably in harsh environments with extremely high temperatures, have evolved from this. With this product we are virtually without competition worldwide.

STG GmbH is now an established enterprise. Where are your strengths?

Peter Hemmann: We employ more than 40 people and are located on the premises of a former mill in Cottbus, which gives us enough room to find creative and innovative solutions for our customers' problems such as models and methods for saving

energy and reducing NO_x emissions, optimum process control, and specific use of sensors in the heating of industrial furnaces. Although we are traditionally at home in the glass industry, we also develop individual solutions for metallurgy and ceramics. We take on all tasks relating to the repair and construction of new glass plants, from conception through engineering right up to commissioning and service.

A lot has changed in control technology since 1990. How do you cope with the constantly changing demands?

Peter Hemmann: We have worked in very close cooperation with Siemens since our

STG GmbH Cottbus

STG GmbH was founded in the spring of 1990 as an innovative, technology-oriented engineering company. Its now more than 40 employees have since created solutions for energy saving and the reduction of NO_x emissions, and for optimum process control, sensor technology, and the heating of industrial furnaces. The production sites in the Grosse Mühle Madlow, a 100-year-old historical building that STG has renovated, offer generous room for efficient engineering and the development of creative technological solutions.



Alle Bilder: Fotografin Dobere



The two directors of STG, production manager Helmut Heelemann and managing director Peter Hemmann, are proud of their company's success. This success is due in large part to NO_x reduction using zirconium oxide oxygen measuring probes that work reliably in harsh environments with extremely high temperatures

founding and are therefore always up to date with technological developments. We have equipped more than 50 plants with Siemens technology in Europe, America, and Asia. The first success was the equipping of the glassworks in Döbern, in which the Teleperm M control system was used. In 1995, we and Siemens sales made our first contacts with floatglass plants. Today we have more than 30 references in this field. Stable and long-term relationships are the basis for satisfied customers who gain significant benefits from the technology – for example, through optimized processes.

How do you find exactly the right solutions for your customers' problems?

Peter Hemmann: The most important prerequisite to finding optimum solutions and satisfying customers is understanding the process requirements down to the last detail. We have a process engineering background, and therefore automation is first and foremost an aid for optimum process control. Besides, the partnership with Siemens and our project experience give us a detailed knowledge of the capabilities of the control system that you won't find in any manual. Both of these factors create a robust, low-cost, and ultimately future-safe solution. Sophisticated redundancy con-

cepts, for example, increase plant availability. This leads in turn to the greatest possible production throughput and to higher sales for the glass manufacturer at the end of the day. The use of fieldbus technology allows significant savings in the area of wiring and creates possibilities for preemptive management of the installed assets.

We are essentially the relay in a win-win situation from which all those involved ultimately draw advantages: our customers benefit from the large network of an internationally active automation technology manufacturer and from the product improvements resulting from feedback from the different applications, and Siemens gets detailed feedback on the performance of Siemens products in glass production processes.

Since you work for customers from all over the world, you probably also have to cope with a large number of national regulations and laws.

Peter Hemmann: That's true. It's not always easy to identify and satisfy the relevant regulations. We try to understand our customer's wishes and the special requirements of the respective country in intensive meetings. We offer the necessary tools and

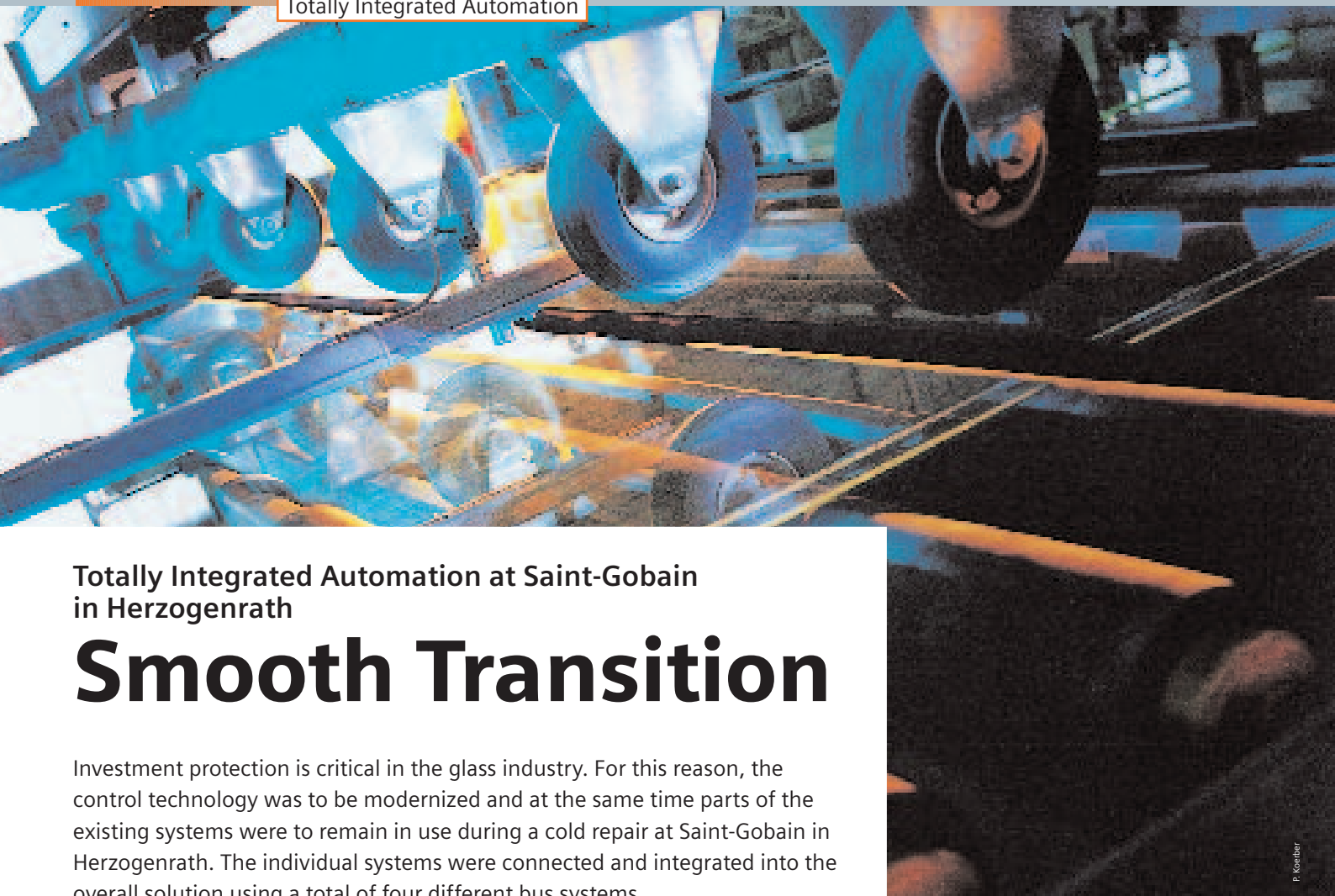
methods and have the appropriate equipment to ensure that our customers are ultimately able to gain success in the eyes of the law as well.

You have achieved a great deal with your company, STG. What is your personal vision for the years to come?

Peter Hemmann: You know, the wonderful thing about technology, also automation technology, is the continuous progress and the new challenges that it reveals – for example, new modeling techniques for automation with which system engineering can be improved. Or the use of video technologies and evaluation of the pictures to get clear evidence of the process behavior. Personally, I want to create and put my own dreams into practice so that I, and my colleagues here, continue to develop.

Dr. Hemmann, thank you for speaking with us.

More information:
www.siemens.com/glass/partner



Totally Integrated Automation at Saint-Gobain in Herzogenrath

Smooth Transition

Investment protection is critical in the glass industry. For this reason, the control technology was to be modernized and at the same time parts of the existing systems were to remain in use during a cold repair at Saint-Gobain in Herzogenrath. The individual systems were connected and integrated into the overall solution using a total of four different bus systems.

For this cold repair, Saint-Gobain again relied on proven systems and solutions. Following Stollberg and Porz, the Teleperm M process control system installed in 1987 was also changed over to Simatic PCS 7 at the Herzogenrath factory last year. Some of the I/O devices from the original Teleperm M system were to be retained. Numerous field devices from other manufacturers also had to be integrated.

Integrated solution for subsystems

The automation system, which is divided into several subsystems, covers the entire float glass manufacturing process – from the glass batch house through the tank to the cooling lehr. A total of four bus systems connect the devices in the periphery to the control systems: the pressure monitors for the coolant, for example, communicate via an AS-I bus; the low-voltage switching system with Sentron 3WL circuit breakers and

Simeas power meters communicates via Profibus DP; the pressure transmitters and field devices via Profibus PA; and the ViaCC recorders for monitoring the top rollers via Industrial Ethernet.

Modern technology in several areas

Siemens also took over the software engineering and commissioning in addition to the planning, documentation, and delivery of switch cabinets, while Saint-Gobain was responsible for converting the existing switch cabinets and the wiring.

The cold repair offered a welcome opportunity to introduce new technologies in some production areas as well. For example, the top-roller control was converted to Simatic ET 200S. Simovert Motion Control Kompakt Plus frequency converters were used as drives, and the areas of furnace, float, and annealing lehr were equipped with electrical cabinets with ET 200M. A Thyro-P thyristor actuator controlled by

Simatic PCS 7 was integrated for the power supply to the float bath heater and annealing lehr.

The top rollers are monitored with ViaCC, which transfers the video data directly to the control station. A total of four ViaCC servers and one parameterization station monitor the float belt and automatically display the penetration depth and speed in the video picture.

Successful transition

Saint-Gobain is totally satisfied with the results of the project, as project manager Hermann Josef Dittrich confirms: "At the beginning you think, 'So many different systems' – and then with PCS 7, it all goes together perfectly." ■

More information:
www.siemens.com/pcs7

online

Glass on the Internet

Find out more about the Siemens systems and solutions for the glass industry in the Industry Suite Glass Internet portal:

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team

The Siemens Glass Team: Global knowledge

The Siemens Glass Team is a network of committed employees with a keen interest in the glass industry. They support the glass industry worldwide with products, systems, and solutions for optimizing the economy and efficiency of production and ensuring product quality. Teamwork and an understanding of the problems in glass production are just as essential as the intensive consulting provided to customers in the design phase.

You can find your contact partner on the Internet or by e-mail:

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cooperation

Simatic PCS 7 at the Zwiesel School of Glass Technology

The Zwiesel School of Glass Technology trains future glass specialists in three institutes that offer a broad range of training and qualification courses. The main part of the school is a training and experimental glass plant that is used for educational purposes and for producing fine glassware such as vases and gift items.

Siemens has delivered a Simatic PCS 7 process control system for this glass plant to support education at the Zwiesel School of Glass Technology. Engineering and automation were supplied free of charge by UAS.

Consequently, future glass production technicians will have the opportunity to work with state-of-the-art automation technology during their training and will benefit from this knowledge in their careers.

www.siemens.com/glass
www.glasfachschule-zwiesel.de

GlassFocus 2006

Publisher
 Siemens Aktiengesellschaft,
 Automation and Drives (A&D),
 Gleiwitzer Str. 555, D-90475 Nuremberg, Germany
www.siemens.com/glass

Group Executive Management
 Helmut Gierse, Hannes Apitzsch,
 Dr. Peter Drexel, Anton S. Huber

**Editorial Responsibility in Accordance
with the German Press Law**
 Peter Miodek

Responsible for Technical Contents
 Ralph Burgstahler,
 Bernd Lehmann

Concept
 Christian Leifels

Publishing House
 Publicis KommunikationsAgentur GmbH, GWA
 Corporate Publishing Zeitschriften
 P.O. Box 3240, D-91050 Erlangen, Germany
 Telephone +49 (0) 91 31/91 92-5 01
 Telefax +49 (0) 91 31/91 92-5 94
publishing-magazines@publicis-erlangen.de

Editorial staff:
 Kerstin Purucker (ChR),
 Gabriele Stadlbaur

Layout:
 R. Degenkolbe

Copy editors:
 Irmgard Wagner

DTP: Doess, Nürnberg
Printed by: Wunsch Offsetdruck GmbH

Jobnumber: 002100/RÖE64

Circulation: 5.000

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