

GlassFocus

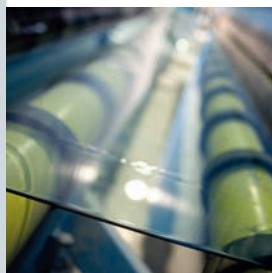
The Magazine for the Glass Industry

2008

SIEMENS

Efficiency on the Move

Integrated solutions for energy efficiency and productivity



W. Geyer

Increasing requirements call for flexibility and efficiency

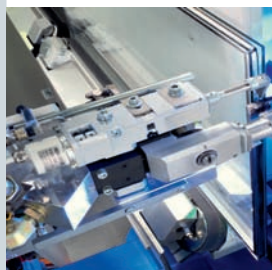
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Dear Readers:



Bernhard Saftig
Director Competence
Center Glass



Ralph Burgstahler
Business Development
Automation of
Glass Machines

A key challenge currently faced by many glass producers is how to reliably produce the required quality while optimally utilizing all resources. The innovative technologies for quality and process control that we have developed for the glass industry in collaboration with our partners can offer new potential for rationalization in this field. And, of course, energy efficiency is the big optimization issue in glass production.

Siemens offers a broad product portfolio aimed at reducing the power consumption of machinery in the glass industry. In addition, innovative technologies and new coating processes also help make the modern and versatile material of glass a true energy saver.

We at the Siemens Glass Team support glass manufacturers and finishers as well as engineering, procurement and construction companies serving the industry (EPCs), mechanical engineers (OEMs), and engineering firms worldwide with a comprehensive and innovative product portfolio, tailored solutions based on Totally Integrated Automation, expertise in the glass industry, and a comprehensive range of services.

Our customers benefit from fruitful collaboration with our partners, who use our products and solutions to optimize the production and finishing of customized glass plants and glass machinery. You will find a few examples of this close cooperation from page 10 onward.

We hope you enjoy the read.

Bernhard Saftig *R. Burgstahler*

■ Trends in the glass industry

Efficiency on the Move

Rising energy costs, increasingly tough competition, more stringent requirements for product quality and emerging new markets demand both flexibility and efficiency from companies in the glass industry that wish to seize the opportunities presented by the global market.

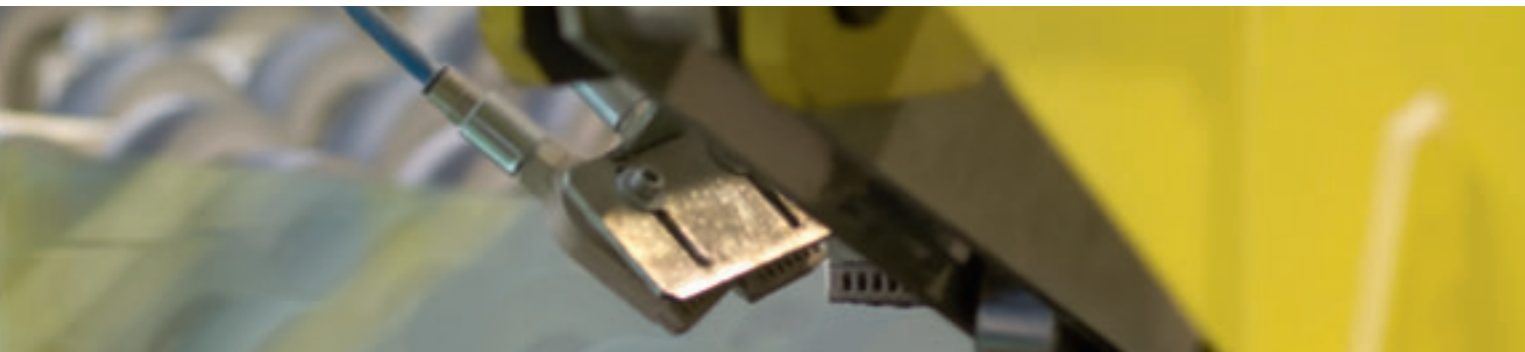
The central theme in the glass industry is, without a doubt, energy efficiency. As is the case for all energy-intensive industries, the glass industry is battling rapidly increasing energy costs. At the same time, it is facing growing public pressure to contribute to climate protection. These two issues are the main drivers for achieving optimal utilization of energy resources in the glass industry.

Efficient utilization of energy

Although glass production is energy-intensive due to the physical processes involved, process improvements can result in considerable savings. The float process has improved its energy efficiency by a factor of two since its invention 50 years ago. This improvement, combined with many pollution control mea-

asures, has contributed to a 54 percent reduction in carbon dioxide (CO₂) emissions from the process in the same period. Glass technology manufacturers were early adopters of energy-efficiency measures in industrial production and offer innovative solutions that can lower operating costs effectively and preserve the environment – for example, new burner technologies for the hot refinement of container glass, new filtration systems that can reduce the water consumption of plate-glass cleaning systems by half and new insulation technology for furnaces, which significantly improves the heat radiation.

Siemens provides energy-intensive industries with services, products and systems aimed at increasing efficiency – for example, energy audits that help reveal unnecessary consumption and potential savings. Process heat recovery systems, which utilize process



Focusing on glass production. Optimal energy and resource utilization combined with maximum marketable product yield



Pictures: W. Geyer

heat for steam and power generation, make it possible to generate some of the electrical power required for glass production from the waste process heat. Energy management tools that are part of Totally Integrated Automation help the glass industry analyze and optimize its energy consumption. The energy-saving and variable-speed motors and drives from Siemens contribute to this, enabling a 30 to 50 percent savings in the electrical power required for the drives, depending on the application. Another option is to recover kinetic energy in the drives and feed it back into the grid as electrical power. To do this, Siemens has developed products such as the Smart Line Modules and Active Line Modules of the Sinamics S series. Not only can they be used to feed power back into the grid, but they also enable equipment and units to share and exchange drive energy from different motors, thereby reducing the burden on the power supply. As a result, the connected load of IS machines in hollow glass, for example, can be reduced by almost 70 percent. In addition, the power consumption of the machine is reduced by almost 50 percent.

Quality increases efficiency

Efficient production means not only optimizing energy use but also increasing the product yield as well as reducing rejects and waste during the process. Working with various technology partners, Siemens develops solutions that make it possible to increase glass yield – thanks to optimal process control in the furnace, float bath, and annealing lehr as well as in glass processing. Precise cutting control and optimal edge trimming with state-of-the-art motion control solutions from Siemens reduce the amount of cullet.

However, glass is not just a material that consumes a great deal of energy in its production. In buildings and cars, glass can also help conserve energy. In the summer, coated glass protects building interiors from solar heat, thereby reducing the load on air-conditioning systems. High-quality insulating window systems with new, slender frame profiles and triple insulation glass or vacuum glass can considerably reduce window heat loss during the cold season, thereby reducing heating costs. These are just two examples of glass innovations that have opened up ►►



Glass for the automotive industry. As the glass surfaces in vehicles increase, so do the demands placed on glass characteristics

- » completely new market opportunities. Coated and laminated glass will play an ever greater role in such innovations, as these types of glass can be made tougher or given special optical or mechanical properties. In this sector, automotive glass is still one of the major sources of innovation. Automotive design trends point to still greater usage of glass in the future because the glass surfaces in vehicles are constantly increasing, and that means the requirements for special properties in glass increase, too.

These increasing demands mean that product quality is becoming more and more important. Defects must be avoided not only in the glass but also in the coating. The high level of quality required can only be achieved with the aid of state-of-the-art automation and drive technology. Siemens works closely with technology partners to provide the industry with appropriate solutions.

In this period of climate change and fuel shortages, the market for solar applications is booming worldwide. The demand for solar glass is increasing accordingly, leading to the building and commissioning of special solar glassworks. These also profit from the benefits of integrated automation technology, as illustrated by two examples featured in this issue: glass production by NSG Group/Pilkington Building Products in Weiherhammer (see pages 12 and 13) and the fully automated module sealing machines from Bystronic-Lenhardt (see page 28 and 29).

Integration and modularity for greater efficiency

Siemens is also working to increase productivity in glass finishing – for example, with special solutions for plant safety. Sinamics drives are therefore equipped with Safety Integrated technology. This helps reduce costs for cabling in the switch cabinet. Safety Integrated also contributes to higher plant productivity – for example, during manual interventions or in setup

and test modes, as safety zones now can continue to operate in a reduced-speed mode and need not be disconnected. The type test was carried out by the Berufsgenossenschaftliche Institut für Arbeitssicherheit (German regulatory body) and by the TÜV. Another innovation that provides increased efficiency is the extensive Simotion Top Loading library, which facilitates the efficient implementation of handling tasks in the glass industry (see page 25).

Siemens is supporting the trend toward modular machine concepts with a corresponding modular system platform as well as appropriate hardware and software solutions designed especially for glass machine manufacturers. This means that it is not necessary to install hardware in advance that may subsequently not be used. Instead, the appropriate options can be configured in the engineering system and then dynamically activated or deactivated as required.

Integrated automation, instrumentation and drive and energy distribution concepts, as well as solutions based on Totally Integrated Automation and Totally Integrated Power, linking all processes within glass production, are at the core of the Siemens Industry Suite Glass. The portfolio for the glass industry is supplemented by innovative services and solutions that Siemens develops for the glass industry in conjunction with technology partners and OEMs.

The Siemens Glass Team within the Siemens industry sector coordinates all activities by Siemens for the glass industry and ensures that customers around the world receive optimal solutions tailored to their requirements. Siemens sees itself as a reliable partner to the glass industry, working with its customers to develop future-proof solutions for glass production. ■

info

www.siemens.com/glass

■ Glass Community

Networked Thinking

The glass community not only provides valuable proposals for the further development of technologies and ideas but also aids the spread of knowledge and experience throughout the industry by networking.

It all started with an anniversary. As Siemens was celebrating 150 years in the glass industry, the idea came up to invite customers and partners to an exchange of experiences. Glass producers, technology companies, plant constructors and members of the Siemens Glass Team met in Venice in September 2006 to discuss current trends in the glass industry. This first Glass Day in Venice was the prelude to a successful series of Glass Days in the United States and China, documenting the partnership and collaboration between the glass industry, technology companies and Siemens, as well as providing a platform for the exchange of ideas and experiences.

Focus on trends and current topics

Taking center stage at the Glass Days is the exchange of experiences between partners from the glass industry and companies in the glass technology and glass mechanical engineering sectors. Innovations are jointly evaluated, developments analyzed and strategies devised for addressing current challenges such as rising energy costs, new products and more stringent quality requirements. There is enormous potential in networking; the expertise gathered from various disciplines and sectors, and the Glass Days, encourage closer cooperation in these areas. However, another important aspect of the Siemens glass community is the networking of knowledge within the various divisions of the Siemens Group. So, on the occasion of Glass Days, employees of the Siemens

glass team also meet to bundle together for the glass industry the expertise of the various divisions within Siemens and to create a mutual experience base.

Achieving more together

Siemens has a long tradition of partnership with the glass industry and with mechanical engineering and technology companies. Utilizing their mutual experience and comprehensive product, system and industry knowledge, technology partners, plant constructors, engineering companies and Siemens develop customized, future-proof solutions for automation and drive technology as well as power distribution.

The global on-site presence of Siemens enables its partner companies to provide their customers in the worldwide glass industry with optimal support by means of its systems development expertise, project implementation skills and spare parts supplies. At the same time, close collaboration during the development phase of the solutions ensures that all components – systems, machinery and drive and automation technology – are perfectly tailored to each other. This partnership also stands for confidence and quality – important pillars for success in the glass industry. ■

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■ Totally Integrated Power

Smoothly Integrated Energy

Siemens supplies a reliable, uninterruptible power supply solution for the production processes in glass plants and enables a rational use of energy and a flexible network structure.

Siemens offers the well-established Totally Integrated Power (TIP) technology platform for integrated distribution of electrical power. It begins with the medium-voltage infeed by the supply network provider and extends to the wall outlet or the electric drive in the process. Tools and support for the planning and configuration of a power distribution system round off the product and system portfolio. Components capable of communication enable an intelligent fieldbus connection of power distribution and motor control center to master HMI/control and management systems.

Managing energy efficiently ...

In order to make efficient use of energy resources and reduce costs, Siemens offers a Power Management System that helps optimize operating costs and increase system availability. Different hardware and software components of power distribution – such as the power management add-ons Simatic WinCC powerrate or Simatic PCS 7 powerrate respectively, Sentron PAC3200 power monitoring devices, communication-capable Sentron circuit-breakers Simocode pro motor management system, E-meters or Siprotec

protective devices – can be integrated into the Power Management System. They contribute to a reduction in running costs by making power consumption and plant status transparent and enabling compliance with contract conditions by means of automatic load management.

Siemens develops and implements technically and economically optimum solutions for its customers' power supplies. These solutions also include an emergency power supply concept with an uninterruptible power supply. It is becoming increasingly relevant for the glass industry to build up its own power supply capacity, especially in view of rapidly rising energy prices. Gas turbine and generator assemblies, as well as concepts for optimum energy recovery, therefore also belong in the Siemens solution range for power supply.

... and saving costs

An improvement in energy efficiency can be achieved, for example, by using energy-efficient IEC low-voltage motors. The new energy-efficient EFF1 motors with aluminum housing achieve their highest efficiency by using copper conductors and are therefore



Type-tested

Switchboards, connection and busbar trunking systems, as well as well-matched products, create system consistency.

Siemens low-voltage power distribution systems cover a wide range – up to 7,000 A with the Sivacon systems. The S8 switchboard and the 8PS busbar trunking systems (CD, BD01, BD2, LD, LX, and LR) are configured according to individual customer requirements. Sivacon offers an optimum solution for centralized or distributed power distribution and enables cost-effective planning and safe operation. As part of Totally Integrated Power, the system components are of course fully compatible with each other and with the Sirius control devices and the Sentron switching and protection devices, including the appropriate software.

The Sivacon power distribution board and motor control center are connected easily and safely by a type-tested busbar connection resulting in a type-tested complete system consisting of a switchboard and busbar trunking system. The standardized busbar connections eliminate special designs and previously common, often expensive, adaptation work. The 8PS busbar trunking system is available up to an IP68 degree of protection.

The Sivacon systems pave the way for integrated and complete system solutions for the IEC market in the field of low-voltage power distribution.

Overview of the advantages

- ▶ **Comprehensive safety**
 - ▶ Type tests
 - ▶ High personnel safety standard
 - ▶ Low fire load in buildings
- ▶ **Greater cost-effectiveness**
 - ▶ Integrated system solutions
 - ▶ Solutions from a single source
 - ▶ High flexibility and availability
 - ▶ Well matched products
 - ▶ Communication-capable modules

Power for Saint-Gobain in India

Over the last 10 years, Siemens has delivered total solutions for power supply to Saint-Gobain in India as a part of several projects in Sriperumbudur, located near Chennai. Siemens was able to survive intense competition for this work thanks to its strong industry expertise and international project experience in the glass sector. Now Saint-Gobain India considers Siemens as a reliable partner for energy solutions

1998: New float plant, Chennai I

Scope of delivery: 132 kV switching system, 5.44 MW generator, 12 MVA diesel generator for emergency power supply, medium voltage switching system, distributor transformers, UPS, grounding, lighting, installation of the entire electrical system

2002: Line for mirror glass

Electrical equipment of the plant as a package

2004: Chennai II brownfield project

Extensions of the site during ongoing operation: 132 kV switching system with 2 infeeds, complex energy distribution of 11 kV medium-voltage level to achieve redundant energy supply system. Installation of entire electrical and lighting system

very economical in terms of energy costs. Frequency converters control the speeds related to requirements and reduce the industrial electricity consumption by up to 70 percent.

Maintenance-free power distribution equipment, such as the modular medium-voltage switchgear systems NXAir and NXPlus, contribute to a reduction in the life-cycle costs. At the same time, flexible solutions can be implemented in the power distribution planning phase by using the Simaris design-dimensioning software, which can also be adapted to new requirements and is an important contribution to investment security. ■

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www.siemens.com/tip

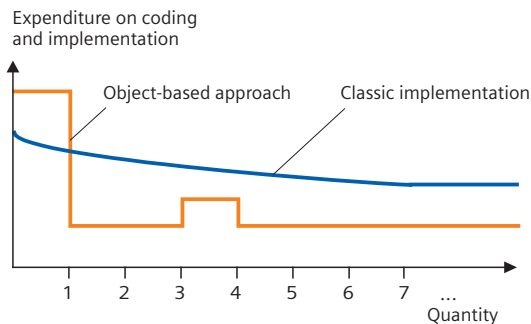
■ PQ Potters Europe GmbH, Germany

Integrated Solution

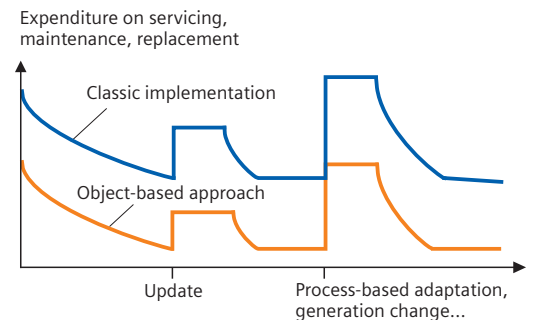
Siemens Solution Partner BN Automation employed forward-looking, object-based engineering in the modernization of a sodium silicate plant. This approach is also a model for similar projects requiring step-by-step modernization.

A forward-looking approach to the step-by-step modernization of glass lines pays off in terms of both investment and operating costs

>> Investment costs



>> Operating costs



PQ Potters Europe GmbH decided in 2006 to implement a comprehensive modernization of its sodium silicate plant in the city of Wurzen, Germany, equipping it with integrated process control technology. The first project step, now completed, was the automation of the tank farm and the setting up of a central control room.

Integrated, forward-looking approach

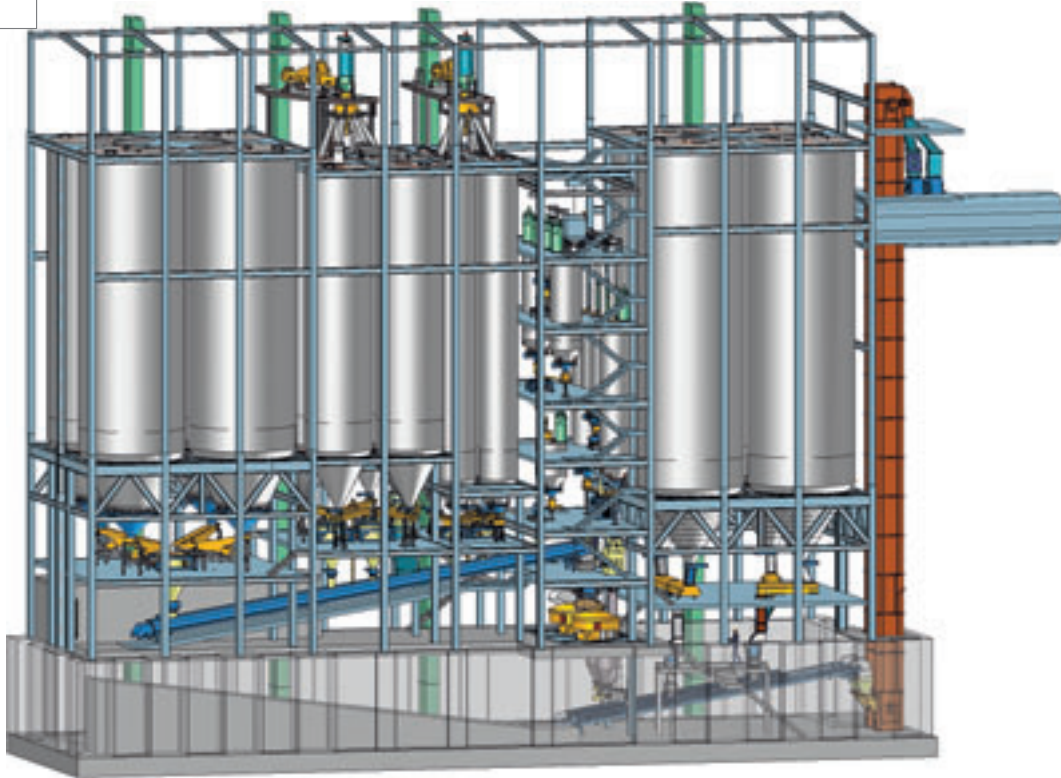
BN Automation AG (BNA) was responsible for the automation and process control technology. The Siemens Solution Partner's approach was based on the idea that with a long-term project of this nature, a great deal depends on employing integrated engineering from the outset. This ensures that the automation in the following modernization steps is also able to seamlessly integrate with the solution already in place. As explained by Frank Bonitz of BNA: "We presented the customer with an alternative to assigning the engineering on a single-package basis. In doing this, we showed how the benefits of seamless automation can be realized with uniform software and hardware in such a project – also with regard to future capability."

The customer was convinced by this groundbreaking concept. BNA therefore developed a comprehensive plan on the basis of Simatic PCS 7 and WinCC. The system structure for the automation system in its final expansion stage was developed in the first step. BNA compiled an extensive library of controller modules (typicals) and control system elements (faceplates). This library formed the basis for the uniform engineering of all subsequent project steps, with around 95 percent of all process objects being represented by eight different typicals.

A project-related approach such as this not only compels a universally structured procedure but also results in far fewer errors. Moreover, the experience gained from testing and commissioning can be implemented more quickly and reliably, as the changing of typicals and faceplates has an immediate effect on the corresponding objects. As a result, BNA required only five days on-site to complete a virtually error-free implementation. ■

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www.siemens.com/glass
www.bn-automation.com



Zippe

■ Gallo Vidrio (Vidrala), Portugal

One-Stop Batch Plant

Zippe recently implemented a complete batch plant for container glass production at Gallo Vidrio (Vidrala) in Portugal with Siemens automation technology.

After acquiring the Gallo glassworks in Marinha Grande, the Spanish company Vidrala commissioned Zippe to construct a batch plant for container glass production at the end of 2005.

New batch plant

Zippe, of Wertheim, Germany, was responsible for the design and implementation of the main plant components as well as the electrical technology for the batch plant, which processes the raw materials for 700 tons of glass every day. The raw materials are stored in steel silos and are batched and weighed in 10 tank scales and then fed to two mixers. Four controlled-speed weighfeeders then add cullets to the finished batches in a sandwich process. The batch mixing plant fills four furnace front silos, which each have a dedicated weighing system, for the two downstream container glass furnaces.

The batch plant is controlled by a Simatic S7-400 with a 414-2 DP CPU that communicates via an Indus-

trial Ethernet link with both the Simatic S7-300 cullet system controller and two PC-based HMI systems for batch control and operation of the entire plant.

Reliable and reproducible

Combined with Zippe's expertise and many years of experience with batch plants, the control system ensures reliable and reproducible operation of the plant. The batch plant has been in operation since the beginning of 2007 and has functioned to the complete satisfaction of the customer.

Zippe has since received another contract from Vidrala to modernize a batch plant in Castellar de Valles, near Barcelona. ■

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www.siemens.com/glass
www.zippe.de

■ NSG Group/Pilkington Building Products, Germany

All Set for the Boom

Thanks to its modernization with Simatic PCS 7, Pilkington's solar glass line in Weiherhammer, Germany, is now even more efficient, cost-effective and flexible.

The demand for solar glass is rising steeply along with the growth of photovoltaics and the rapidly increasing sales of solar collectors. Solar glass must be specially hardened to withstand the thermal and mechanical stresses placed on it by sun, rain, snow and hail. To achieve optimum conversion of solar energy, it is also important that the glass have good permeability to light and a diffusely reflecting surface to prevent direct reflection from the sun, that is, mirror effects. Many of these demands are met by the low-iron Optiwhite float glass, which is one of the types of glass produced by NSG Group/Pilkington Building Products in Weiherhammer, Germany. The company's production line II has now been completely modernized and extended.

Consistently high quality

The melting furnace, the float bath and the annealing lehr of the line, which had been in continuous production for the last 17 years, were equipped with the Teleperm M process control system. A highly available Simatic S7-414H automation system for the cooling circuit was added to the system before the cold repair, and the modern Simatic PCS 7 process control system was integrated into float line II.

In the course of the cold repair, the existing operator systems for the furnace, bath and annealing lehr were replaced by Simatic PCS 7 HMI systems. The distributed process control system ensures consistently high-quality flat glass because it monitors the float

process and ensures that all the parameters are met exactly. Intelligent controls also contribute to energy savings and the minimization of pollutant emissions. At the same time, the open system architecture allows a high degree of flexibility and provides an optimum basis for expansion.

Greater melting performance

The three AS 235 automation systems for the individual line sections were retained in the modernization of the operator systems (OS) level, and the I/O level was extended. The capacity was increased by lengthening the tank and increasing the melting performance. Two further burners were necessary for this. The configuration specialists extended the existing software for new measuring points and control circuits. The fuel and combustion feed to the six burners and the switching processes are controlled by the furnace's automation system.

The extension of the float bath required extra thyristor actuators, thermocouples and pressure gauges. The additional measured values and control circuits – for example, for the bath bottom cooling – necessitated software adaptations. Control circuits and master control functions also needed to be implemented for the annealing lehr's automation system.

In addition to the information about the cooling circuit, a total of approximately 1,700 analog values and 1,800 binary values are now processed by the control system. The OS level includes a redundant

Generating energy with glass

Glass engineers from Bavaria and the Pilkington research center in England have developed a special solar glass coating that is applied to the glass in a pyrolytic process. This type of coating was patented in 2007. The coated glass, which serves as the basis for a solar module with an electrically conductive surface and low electrical resistance, allows the complete elimination of silicon, which was previously considered indispensable. Without this increasingly expensive raw material, solar modules can be produced at a much lower cost.

server and three operating stations from which the plant operators control the float process. The engineering system is used primarily for the central configuration.

Successful collaboration

Pilkington's central engineering department worked closely with the Siemens specialists and the staff at Weiherhammer on modernizing the control system. The extensive preparations made local commissioning easier and ensured that the deadline was met.

After the factory acceptance test in Karlsruhe on a shadow system, a site acceptance test and subsequent commissioning were carried out before tempering. Everything was completed on time and to Pilkington's complete satisfaction.

Bright prospects

Reliable Siemens technology also plays a major role in the cold end at the Weiherhammer site. There, the cutting-line expert Grenzebach has used Siemens automation and drive technology. A hardening system and a new cutting system went into operation in the summer of 2008. The annealing oven is also controlled by Simatic S7 technology, and the fans are driven by Siemens motors with Sinamics G150 converters.

With the extension of float line II, Weiherhammer is now ready for a bright future, thanks to the increase in capacity from 550 to 810 tons of glass per day. Of course, Pilkington is hoping that the modernized equipment will have a long life like its predecessor. The control technology will certainly make a reliable contribution to this. ■



■ San Miguel Yamamura Asia Corporation, the Philippines

Encore Performances

Pleased with Siemens service and know-how,
a glass manufacturer repeatedly hires
Siemens to meet its control system needs.

San Miguel Yamamura Asia Corporation (SMY) is a joint venture company of San Miguel Corporation, the largest food, beverage and packaging company in Southeast Asia, based in the Philippines, and Nihon Yamamura Glass Co. Ltd. of Japan. In January 2005, SMY, which specializes in the manufacture of glass bottles, decided to award Siemens the contract for the installation of a new control system for a glass furnace. Siemens beat out strong competition in securing the contract for the project, which involved completely migrating the old controls on a 180-MTD (metric-ton-per-day) glass furnace in Cavite, the Philippines. Siemens offered a DCS (distributed control system) solution based on Simatic PCS 7. Nihon Yamamura Glass Co. Ltd. acted as consultant, and Asahi Glass Ceramics Co. Ltd. Japan supplied the furnace.

In 2006, SMY hired Siemens again, this time to install a completely new control system for a second furnace adjacent to the existing production line. Each furnace control system included one pair of redundant OS servers, two OS clients and three AS/400 automation systems with approximately 800 I/O devices together with Siemens field instruments and site installation works. The system controls the regenerator, melter, working end, forehearth, annealing lehrs and auxiliaries. The two systems will be linked together for a plantwide automation system based on Industrial Ethernet and Simatic.

Long-standing glass industry experience and expertise were major factors in the decision to hire Siemens. The well-trained local team, the dedicated support provided by the Glass Competence Center and the outstanding after-sales service validated the decision. Pleased with the excellent results after the commissioning, SMY hired Siemens again in 2007 to



The front building of SMY

automate the power plant to handle genset synchronization, load management and load shedding using a PCS 7 system.

Performing to expectations

Both furnace control systems have performed to SMY's full satisfaction. The Siemens solution has proven to be a sound investment in every sense of the word. The performance of the Siemens system and aftersales support have definitely exceeded SMY's expectations. Siemens supplied almost all the process instruments for the two furnaces of the SMY plant. These included more than 30 Sitrans T temperature transmitters, 2 Sitrans P ZD pressure transmitters, 48 Sitrans P DSIII pressure transmitters with Profibus PA signal and 18 Sitrans P pressure transmitters with Hart signal. The Sitrans P DSIII transmitter was introduced by Siemens as the first of a new generation of process devices for fail-safe applications. ■

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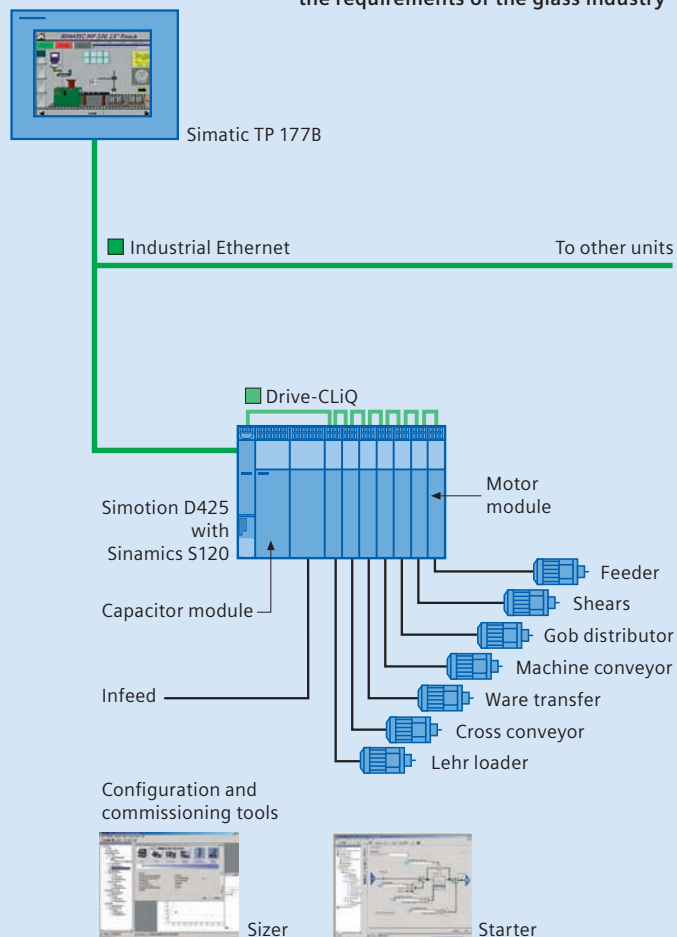
Siemens AG



Process instrumentation highlights: Sipart P DSIII

- ▶ Communication via Profibus with the Profisafe protocol
- ▶ Mixed operation of Profisafe and Profibus PA devices on the same bus
- ▶ Reliable data integrity due to extensive security mechanisms, such as the cyclic redundancy check and watchdog function
- ▶ Fail-safe up to SIL 3
- ▶ A globally proven standard transmitter with a large installed base
- ▶ Parameters available via Profibus, HART, and locally on the device

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



Sinamics S120 for group drives

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 converter. Since the mid-1980s, the Simovert converter system has controlled angular-locked synchronism using several separate inverters, 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 motors, such as servo motors and compact asynchronous motors. However, when systems are being modernized, retrofitting is frequently required to update only the electrical drives and motors by retaining the mechanical designs and flanges.

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 gear synchronism is also possible for synchronous motors via the V/Hz 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.

www.siemens.com/glass
www.siemens.com/sinamics

■ **Kristallglasfabrik Amberg GmbH, Germany**

Top Quality Every Two Seconds

A Simotion-based automation system rapidly increases the quality and cost-efficiency of tableware glass production.

The highest-quality machine-manufactured glasses from Riedel – the global market leader in quality wine glasses and decanters – are produced at the crystal factory in Amberg. Managing director Armin Reichelt says, “The best way to make use of our expertise to beat the competition is to focus our efforts on the industrial production of high-quality tableware glass.”

The factory’s second production line, which was previously configured for standard-quality tableware glass, has therefore been converted to the technologically more demanding blow-molding process. The company has also invested in a new 18-station blow-molding machine and retrofitted the production line’s stem press. Reichelt found ideal partners for the implementation of the new equipment in machine

supplier IPROTec GmbH & Co. KG and Siemens Solution Partner Schlemmer Prozess Systeme GmbH (SPS), which was subcontracted to design the Siemens automation system and program the entire system.

Continuity optimizes maintenance

For Hans Gruber, the head of the electrical department, simple and cost-effective maintenance is all part of process optimization. That is why he is eager for the company to use a single automation system in the medium term: “It’s no longer necessary to have numerous different systems for maintenance, servicing, repairs and procurement of spare parts,” he points out.

This is all the more true now that it is also possible to achieve continuity between the process control system

Schlemmer Prozess Systeme GmbH, Deggendorf

International company active in the field of measuring, control and process control technology for all branches of industry

- ▶ Analysis, consulting and optimization for new and existing plants
- ▶ Custom-made automation solutions
- ▶ Extensive service for plant and operator personnel

Employees: 9

Founding year: 1992

Address: Schlemmer Prozess Systeme GmbH
Greising 40, 94469 Deggendorf,

Germany

Internet: www.sps-gmbh.de



To increase capacity and flexibility in the production of top-quality glasses, the crystal factory in Amberg standardized the technology in its two production lines

and machine control. The PCS 7 process control system, for example, offers all the control functions required by the tableware glass industry. PCS 7 receives the relevant data from the WinCC flexible HMI system used in the machine, which allows motion control applications to be operated using Simotion D.

The continuity this achieves, from the control level to the drive level, considerably simplifies the standard processes, composition handling, quality control and system diagnosis.

Responsibility for the automation of the new blow-molding machine was awarded to SPS, which was previously commissioned with the retrofit of the glass stem press. One of the specifications was to make the familiar user interfaces correspond exactly to customer requirements. The developers at SPS therefore created ActiveX elements for the WinCC flexible RT HMI system that transfer the existing user interfaces to the new automation system.

Inter-project synchronization

The production line is now continuously automated using the Simotion D motion control system. The blow-molding machine and stem press automation projects incorporate a total of five CPUs and 51 servomotor axes with absolute value encode. All components are synchronized with each other in the inter-project synchronization process so that the entire production line now follows a uniform position control cycle. The CPUs are synchronized using Profinet IO with IRT (isochronous real time).

The blow-molding machine is designed in the form of a carousel on which the 36 servomotors and the majority of the I/O signals can be found, particularly the I/O signals with speeds timed to microsecond precision. The drives, the peripheral stations and one of the motion control CPUs are also positioned on the carousel for this purpose. Finally, the switch cabinets sit right on top of the blow-molding machine. Due to the microsecond precision of the fast I/O signals, data are transferred clock-synchronously between the stationary and rotary parts of the blow-molding machine using an equidistant Profibus at a rate of 12 megabits per second via an appropriately certified slip ring.

The modular design of the automation system is a great advantage, as it means that individual stations can be replaced with little interruption to production. The blow-molding machine can also be used without the stem press for the production of tumblers.

Rapid commissioning

Process downtime was limited to 14 days, so SPS carried out the precommissioning of all drives and axes on the SPS test bench in its development department during the software development stage. At the site of machine manufacturer Iprotec in Grafenau, Germany, a further precommissioning process was carried out by the mechanics in the form of a "dry run" without glass or connection to the stem press. "After just four weeks from the start of the conversion process, we have achieved the same throughput and the same product quality as we previously enjoyed after a six-to nine-month lead time," says Reichelt, praising the development team and the machine.

The extremely short response time of the automation system to fast signals, a sensitive temperature control system and a high level of process consistency and reproducibility allow the production of glasses with a uniform wall thickness and a smooth transition to the stem. As a result, not only is the throughput higher – the system produces 30 glasses per minute – but the level of waste is also reduced. ■

■ Ardagh Glass Group, Ireland

Crystal Clear Benefits

In order to ensure that its hollow glass is produced to the highest quality standards, Ardagh Glass relies on modern integrated automation technology with Simatic PCS 7 and Simotion.

Ardagh Glass, headquartered in Dublin, Ireland, manufactures high-quality bottles and glasses for the food and beverage industry. During the cold repair of a melting furnace in late 2007, Ardagh Glass decided to construct an environmentally friendly oxy-fuel melter. The oxy-fuel melter decreases nitrogen oxides (NO_x) and carbon dioxide (CO₂) emissions, and also reduces heat consumption and the use of primary energy. In the new system, fuel is burned with pure oxygen instead of the combustion air used in conventional melting furnaces. The new system exceeds the requirements of the TA Luft (technical instructions on air quality control) regulations.

Trouble-free melting operation

For the automation technology, Ardagh Glass opted for the PCS 7 process control system because of its integrated automation concept. Based on modular hardware and software components from the standard Simatic line, PCS 7 ensures continuous quality and high productivity at Ardagh Glass.

Managers can operate and monitor the melting process from end to end, and at any time, from an engineering station and four operator stations. Two of the operator stations are equipped with multi-VGA graphics cards to allow two process monitors to be operated. The two operator stations communicate with each other via TCP/IP protocol, and they communicate with the Simatic S7 via Industrial Ethernet. The process I/O system is connected to the Simatic S7 via Profibus. In order to achieve the required availability, the system bus and Profibus are designed as fiber-optic cable circuits.

To provide a local operation option and for higher availability, Sipart DR 24 hardware controllers were implemented to control the melting furnace, working end and feeder. In the event of a fault, the hardware controllers switch from automatic operation to automatic stop. After the fault is rectified, an auto-start function is activated to restart the system. An IS machine air-cooling control implemented in PCS 7 also ensures even cooling of the machine and reduces the energy consumption of the air-cooling fan.

The data can be transmitted via an OLE for Process Control (OPC) interface and stored on the plant network server for long-term data recording. This allows the creation of documentation for the entire furnace life that can also be called up from office PCs. The open architecture of the PCS 7 process control system means it can easily be connected to host systems.

Future-safe bottle production

Ardagh Glass acquires a large number of machines and systems, such as IS machines from HEYE International. HEYE International GmbH, a subsidiary of the Ardagh Glass Group, is an international supplier of technologies, machines and systems for the container glass industry. The company, based in Oberkirchen, Germany, uses Simotion D in the IS machines as the feeder and as a belt drive for transporting the glass containers. The Simotion motion control system is the perfect solution for optimizing the synchronization of the numerous axes. Furthermore, it can easily be integrated into existing systems.

The shears form the heart of the IS machine. They play an important role in the challenging production of high-quality container glass. The glass gob created by the plunger is precisely cut off by the shears. The gob distributor then distributes the gobs to the sections where the bottles are formed. The bottles are collected by a belt system and fed into the slider, which transports them into the oven. This requires highly precise motion control with perfect reproducibility.

Simotion offers significant advantages

The systems manufacturer opted for the drive-based Simotion D435 for the motion control and logic functions. In the Simotion D435, the entire motion control functionality is integrated directly into the control module of the Sinamics S120 multiaxis drive. The most important Simotion feature in container glass production is the electronic cam disk used to control the cutter via high-precision motion control, and the subsequent units can be synchronized with the shear cycle in order to collect and distribute the



Integrated glass production

Simatic PCS 7 integrates all the components of a production process, including utilities. With Simatic PCS 7, the complete production process can be automated using a uniform solution. The existing electrical infrastructure can also be integrated into the process control system. The size of the system does not matter: comprehensive scalability allows the control system to be implemented in environments ranging from laboratory systems to large production complexes. Integrated security concepts guarantee trouble-free operation and ensure the safety of personnel, equipment and the environment.

glass gob at the correct time. The precise travel of the cam disks guarantees that each gob is exactly the same size – which is crucial for high-quality and efficient container glass production. Different gob shapes can be produced for different products. With Simotion, the axes of the machines can be controlled with a single system and can be precisely synchronized. Thanks to integrated interfaces such as Industrial Ethernet and Profibus, virtually unlimited operation and monitoring is possible. ■

info

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■ Sklostroj Turnov CZ, s.r.o., Czech Republic

Higher Productivity

The Simotion and Sinamics S120 combination is ideally suited for controlling complex multiple-axis machines in container glass production.



For quite some time, there has been a growing trend in the glass industry to replace mechanical motion couplings and application-specific control technology with standardized mechatronic solutions. Sklostroj Turnov CZ, s.r.o., one of the best-known manufacturers of container glass machines in the world, is the first company to implement the Simotion motion control system in its IS (Individual Section) machines as a standard solution – and is benefitting from higher productivity as a result.

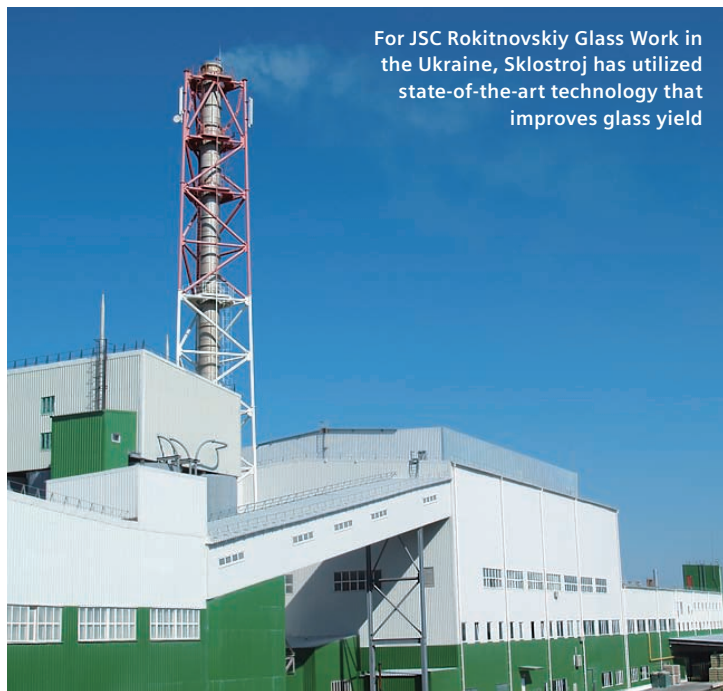
Higher productivity with Simotion

Simotion's particular strengths lie in meeting real-time requirements such as e-timing, motion control and logic at the same time. And that's not all. At the hot end of container glass production – the shaping process – factors such as throughput, availability and robustness are extremely important. There is also a tendency to use mechatronic drives for functions that were previously powered by pneumatic drives, and consequently higher performance is required of the control system. This means that ever greater numbers of I/O devices must be coordinated in real-time operation with increasing numbers of electrical drives. High-precision motion control with absolute reproducibility is essential.

Thanks to the scalability of Simotion, one system is sufficient for all assemblies at the hot end. Simotion ensures that the plunger generates even gobs; that the shears work extremely dynamically and accurately, cutting at the right moment; and that the gobs are reliably distributed to all sections. The sections highlight a further strength of Simotion: The pneumatic and servoelectric assemblies are integrated into a single control system. This combines the advantages of electrical movement guidance, which enables high reproducibility and low levels of wear on molds and assemblies, with simple and cost-effective pneumatics. Last but not least, the conveyors and servo feeders are all perfectly synchronized.

Sinamics S120 – modular drive system for single and multiple applications

The Sinamics S120 offers high-performance AC/AC single drives available as Blocksize and Chassis versions, and coordinated DC/AC drives for multiple-axis applications, available as Booksize Compact, Booksize, Chassis and Cabinet Module versions. These options enable any combination of power and control performance. The drive and control intelligence are combined in control units (CUs), which handle vector and servo control as well as V/f open-loop control. In addition, they manage the speed and torque settings for all drive axes and also provide other intelligent drive functions. The high dynamics and accuracy levels enable higher clock rates for maximum productivity. Easy configuration using the Sizer and Starter engineering tools reduces project duration.



For JSC Rokitnovskiy Glass Work in the Ukraine, Sklostroj has utilized state-of-the-art technology that improves glass yield

Fail-safe drive technology

In regions with a weak power supply, the Sinamics S120 series offers the ideal solution. The active infeed systems have a stabilized intermediate circuit boosted to 600 volts. This compensates for even short voltage drops of up to 50 percent without affecting machine productivity, thereby ensuring optimum system availability in the event of network fluctuations. An uninterruptible Sitop power supply unit powers the control systems in the event of a grid failure until the machine has safely shut down. This controls the system in the event of network failure until it can be safely shut down.

Even the system design of the Sinamics S120 reduces downtime since all data of one unit of networked drives are saved on a CompactFlash (CF) mem- ►►



Sklostroj Turnov CZ, s.r.o., Czech Republic

Sklostroj, a company based in the Czech Republic with a workforce of 480, has made a name for itself as the leading manufacturer of machines, complete systems and services for the container glass industry. The key to the company's success is a readiness to listen to customers, the development of customized solutions for the hot and cold ends, the implementation of a quality management system for turnkey projects that is certified according to ISO Standard 9001-2000 and the provision of a comprehensive service package.

The EP97-04 E-Pusher promises higher glass yields in triple-gob lines

►► ory card, there is no need for a programming device when replacing a Sinamics component. The firmware, program and parameters are automatically read by the CF card as soon as the drive network unit is powered up again.

Maximum glass yields

After just a brief introductory period in 2006 and 2007, all IS machines with servo components, such as the DSP4-1 servo feeder, servo shears, servo gob distributor, Servo Invert and Servo Take-Out, can be easily equipped with the SST-06 Time & Drive System. The SST-06 system is currently being expanded to include additional software options and process functions. This allows functions such as the Plunger Pressure Control System (PPCS), Counter Blow Control System (CBCS) and Final Blow Control System (FBCS) to be fully integrated into the software and display for the SST-06 Time & Drive System, thus avoiding interference with third-party software and hardware, and making the entire system more cost-effective and more reliable. What's particularly impressive about the timing and drive system with Simotion D445 is the fully integrated pusher system – the patented EP97-04 E-Pusher. This system is behind the high glass yields (“pack-to-melt”) of lines where the solution has already been installed, for example, at JSC Rokitnovskiy Glass Work in the Ukraine, where the yield is 93 to 96 percent – a value that Sklostroj is continuously improving through constant collaboration with the customer.

Success with stand-alone solution

Other customers have now discovered the benefits of this solution. Sklostroj Turnov is using an SST-06 Time & Drive System for a 4¼-inch two-fold gobbing

IS machine with six sections at another glassworks. The customer achieves a higher yield with the Simotion solution – not least because of the excellent functionality of the EP97-04 E-Pusher – and has consequently installed the Sklostroj E-Pusher in three lines over the last 12 months. Some of these lines are operated as triple-gob lines.

The E-Pushers are implemented as a stand-alone solution with WinCC flexible and can be connected to any machine. With the latest Simatic Mobile Panel 277 IWLAN (Industrial Wireless LAN), the pusher can be installed directly in the IS machine's conveyor. The freely programmable CAMs adapt perfectly to the customer's requirements, making operation much simpler. Another reason for the successful development of the EP97-04 E-Pusher is the use of 1FK7022 servomotors instead of stepper motors. This facilitates the integration of hardware and software and allows the electronic control boxes to be further reduced in size.

Standard motors save space and reduce costs

Specific motors were used in various applications in the past. In addition to a new line of parallel servo shears, Sklostroj has also introduced the second-generation Servo Invert and Servo Take-Out mechanisms, all of which are constructed with and driven by standard Siemens components. The motors are the same for all mechanisms, which reduces replacement parts and storage requirements and enables cost and space savings. ■

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■ I-Scan Robotics Ltd., Israel

Float Glass around the Clock

I-Scan Robotics has teamed up with Althaus AG to equip the cold end of a Romanian float-glass line with high-availability Siemens control technology.

The Israeli machine manufacturing firm I-Scan Robotics is a leading industry player that provides innovative solutions for the cold end of float-glass lines. The solutions offered by this multinational company allow simultaneous production of varying sheet sizes and address the entire cold-end process, from the visual quality inspection of cooled glass and the cutting process to the variable stacking of sheets using robots. I-Scan Robotics wants to offer its customers measurable benefits by increasing the flexibility and productivity of lines and improving safety levels.

The new float-glass line in Calarasi, Romania, automated from the Swiss solution provider W. Althaus AG, has a nominal daily production capacity of 660 tons and a maximum of 750 tons. It produces clear

and colored glass as well as solar-control glass, which can be used in buildings, mirrors or vehicles. The system is capable of producing glass widths of 2,500 to 3,660 millimeters and glass lengths of 800 to 6,100 millimeters. The thickness of the glass can be between 2 and 12 millimeters.

Redundancy at all levels

The entire cold end is controlled by a redundant Simatic S7-400H as the master controller. When the float process is operating in a continuous cycle, the reliability of the technology is key. The high-performing Simatic S7-400H achieves this reliability with two H-CPU's of the same type; if the master system fails, operation is switched to the slave system. The switch- ►►

**W. Althaus AG, Aarwangen,
Switzerland**

With over 40 years of experience, W. Althaus AG offers industrial automation solutions and a comprehensive set of services for engineering, construction, manufacturing, and installation of machine and plant control systems for float glass plants and conveying systems, glass processing units, material storage units, handling automats, and many other applications.

Address:

W. Althaus AG, Industrielle Automation,
Jurastraße 12, CH-4912 Aarwangen
Switzerland

Internet: www.althaus-ag.ch



**Perfect cutting with high technology:
The cross-cut bridges on the I-Scan float glass line**

- ing time in this process is less than 100 milliseconds (hot standby).

High-availability communication is enabled in the S7-400H by means of two communication processors; these are connected to the PC with the S7-Red-connect software package. The WinCC visualization system, which is linked to the controller via Industrial Ethernet, is operated as a redundant client/server system. The vertical integration of the controller allows all process data to be tracked at all stages, even in the booking system.

The distributed I/O system is linked to the S7-400H via Y-Link. In the event of a failure, the Y-Link switches the entire I/O line seamlessly to the active bus channel of the redundant H system. In order to further optimize availability, the ET 200M distributed I/O system is also configured and operated on a redundant basis, meaning that the system can tolerate the failure of a CPU and a Profibus line or signal component. Safety is further increased by redundant communication of the H-system with the superordinate cutting optimization by Mipec AG that is also designed as a redundant system. In Calarasi, the system designed that is to a large extent redundant enables a system availability of 24 hours a day, 7 days a week, 365 days a year, for a period of around 13 years (uninterruptible power supply [UPS] supported).

Perfectly synchronous

Following the visual quality inspection of the glass (laser scanning), the Simatic S7-400H forwards the cut orders to the subordinate controllers in the cutting equipment. Here, I-Scan has opted for the drive-based Simotion D motion control system with Sinamics S120 drives. In addition to the particularly compact design and low reaction times, the combina-

tion of motion control, PLC and technology functions in the context of Totally Integrated Automation provide optimum simplicity in programming, which substantially reduces start-up times. The synchronization function allows the movement of the cutting tools to be precisely synchronized with the different glass sheet speeds required for the various products.

In earlier solutions, the transport system was driven by an upright shaft in the cutting area, which was, mechanically speaking, extremely complex. Today, the single-axle drive programmed by Althaus, with Sinamics servodrives, enables nonslip glass sheet transportation, thereby optimizing the quality of the end product. The “on-the-fly” picking of the glass by the robots requires single-sheet tracking of the glass, replacing the block-by-block glass transportation, that used to be the norm.

Advantages of continuity

Consistent use of Siemens drive and control technology from the engine to the display has reduced the number of mechanical elements, simplified engineering, speeded up the start-up of the cold end and lowered maintenance costs. The system has now been in operation for a year and a half without any noteworthy faults. As a result of this positive experience, which includes competent support from designated contact partners, I-Scan Robotics and Althaus are already planning and realizing further cold-end projects using Siemens technology. ■

info

www.siemens.com/glass
www.iscanrobotics.com
www.mipec.ch

■ Handling with Simotion

On the Right Track

Track interpolation and Simotion Top Loading increase both performance and productivity in handling tasks and are also suitable for simple machining steps.



Siemens AG

To save space, time and money, handling modules are increasingly being integrated into machines used for glass production. This increases the demands placed on the motion control system, as handling signifies free movements in an area with variable start and end points.

Integrated software solution

Track interpolation software now offers an ideal solution for handling tasks. The software is integrated into Simotion and provides system support for the most important standard kinematics. The options cover applications from Cartesian portals, SCARA robots and roller pickers to articulated-arm robots and Delta-2 and Delta-3 pickers. On the system side, the software supports linear, circular and polynomial interpolation in a primary plane (2-D) and in space (3-D).

As the track movement is executed and monitored directly by the system, the conventional cyclical calculation of cam disks for each handling movement, which has high computational costs, is no longer required. This significantly reduces the system load and increases machine efficiency. Moreover, typical machining steps in the field of structural and furniture glass – such as edge processing and the sealing of insulating glass – can also be mapped with track interpolation (see pages 28 to 29).

The object-oriented approach means that several instances of the path interpolation technology object can be used simultaneously, that for example, multiple handling devices can be controlled simultaneously. One possible application is in float glass stackers that can be operated both as individual units and coupled for stacking jumbo formats.

Simple programming with standard library

Together with the Simotion Top Loading standard library, integrated interpolation significantly reduces engineering and programming effort. The software library enables the programming and configuration of handling cells with different kinematics in connection with other software modules on one or more controllers. This eliminates the need for synchronization with proprietary control architectures, and the user no longer needs to learn special programming languages for robot controllers.

Track interpolation can be programmed in Structured Text according to IEC 61131-3 or in Motion Control Chart (MCC). Real-time synchronization and consistent data storage are possible without restrictions. With Simotion Top Loading and integrated interpolation, both machine manufacturers and users can benefit from a software library that significantly reduces engineering effort and increases machine performance. ■

info

www.siemens.com/motioncontrol
www.siemens.com/glass



Pictures: Forvet

The Francesca 32M 3300 glass machining center is particularly versatile

■ Forvet SRL, Italy

Dynamic Drilling, Milling and Grinding

The Italian glassworking specialist Forvet has opted for Simotion D automation systems to boost the productivity and flexibility of its machine series.

Forvet produces numerical control (NC) drilling, grinding and milling machines for building and furniture glass, and these products place the Italian company among the market leaders in the glassworking industry. Forvet's extensive product portfolio addresses an extremely diverse range of customer requirements and glass dimensions.

Forvet has converted its machine series to Siemens control technology in a bid to gain a variety of benefits: to further boost the dynamism and productivity of the company's often multi-axis machines; to produce a standardized, easy-maintenance automation environment; and to reap the rewards of a global ser-

vice facility. Using the Simotion D motion control system and Sinamics S120 drives for all work steps has enabled the company to develop a standardized, modular platform that delivers the ultimate in scalability and flexibility as well as being extremely compact and responsive.

Four tools for one pane

First on the agenda are the Francesca glass machining centers, most importantly the particularly versatile Francesca FC 32M 3300. This machine can clamp, process and remove glass panes in a single, completely

automated work cycle with no intermediate steps; it can process either one large pane of glass measuring up to 3,300 millimeters by 8,000 millimeters, or two smaller panes of glass (each measuring up to 1,800 millimeters by 8,000 millimeters) simultaneously.

Throughout this process, there is no contact with the upper surface of the glass, which means that even insulation glass with a magnetron coating can be processed without any damage to the glass surface in question. The machine features fully automated processes for loading/positioning, zero positioning and unloading so that the milling and drilling processes can be incorporated into automated production lines. It also boasts 32 tools spread across four processing heads, meaning that four tools can be used simultaneously on the same pane of glass, which considerably reduces processing time.

Compact and speedy

The NC machine comes equipped with 24 fully controlled axes in servo and standard motors technology. The double-axis modules based on the Sinamics drive platform make for a particularly compact design, and the Drive-CLiQ drive interface enables a distributed design setup, simplified wiring and efficient service. Use of the high-level Structured Text programming language makes it easier to execute synchronous actions or implement portal operation or a specific cam profile, and Simatic WinCC flexible on a Simatic Panel PC 677B enables simpler operation.

The new Francesca FC 16M 1600 features the principles and patents found in the larger sister model but on a smaller scale, and can process panes of glass weighing up to 300 kilograms and measuring up to 3,500 millimeters by 2,000 millimeters. The tried-and-tested Francesca FC 16M 1250 with its robust nature, low cost, and powerful performance, confirms its status as the best-selling machine for the automation of challenging milling and drilling activities using automated loading and unloading cycles. The machine is designed for three-shift operation and requires an average of four minutes to complete cutting and drilling activities for the production of a door.

Flexible grinding like never before

Francesca glass processing machines can be combined with a Chiara series grinding and polishing machine in order to further enhance productivity. The Chiara MT, available in two sizes, is an automated NC grinding machine that can process all four edges of a pane of glass at the same time. It can process glass panes of varying thicknesses and dimensions, one after the other, without interruption and without having to adjust parameters. As soon as the glass is transported to the grinding area using an automated process, the Simotion D motion control system automatically configures the machine for that specific pane of glass and its dimensions.

The Chiara MT is able to process each side of a glass pane in a different way (e.g., one side can be buffed, and another rough machined, etc.) and to process the edge surfaces and corners, or just the edges. Simotion D even makes it possible to grind edges that have a 45-degree angle. The machine determines the shape and edge of the unprocessed piece and compares the shape with the programmed dimensions. This leads to an optimum speed of the grinding heads.

Contact-free processing

During the production process, an automated vacuum system holds the glass in place; the air flow is controlled by the Siemens digital controller, based on the dimensions of the glass pane. This approach is unique to the Chiara; it is the only grinding machine to process low-emissivity (low-e) glass without touching the surface in question, regardless of the coating.

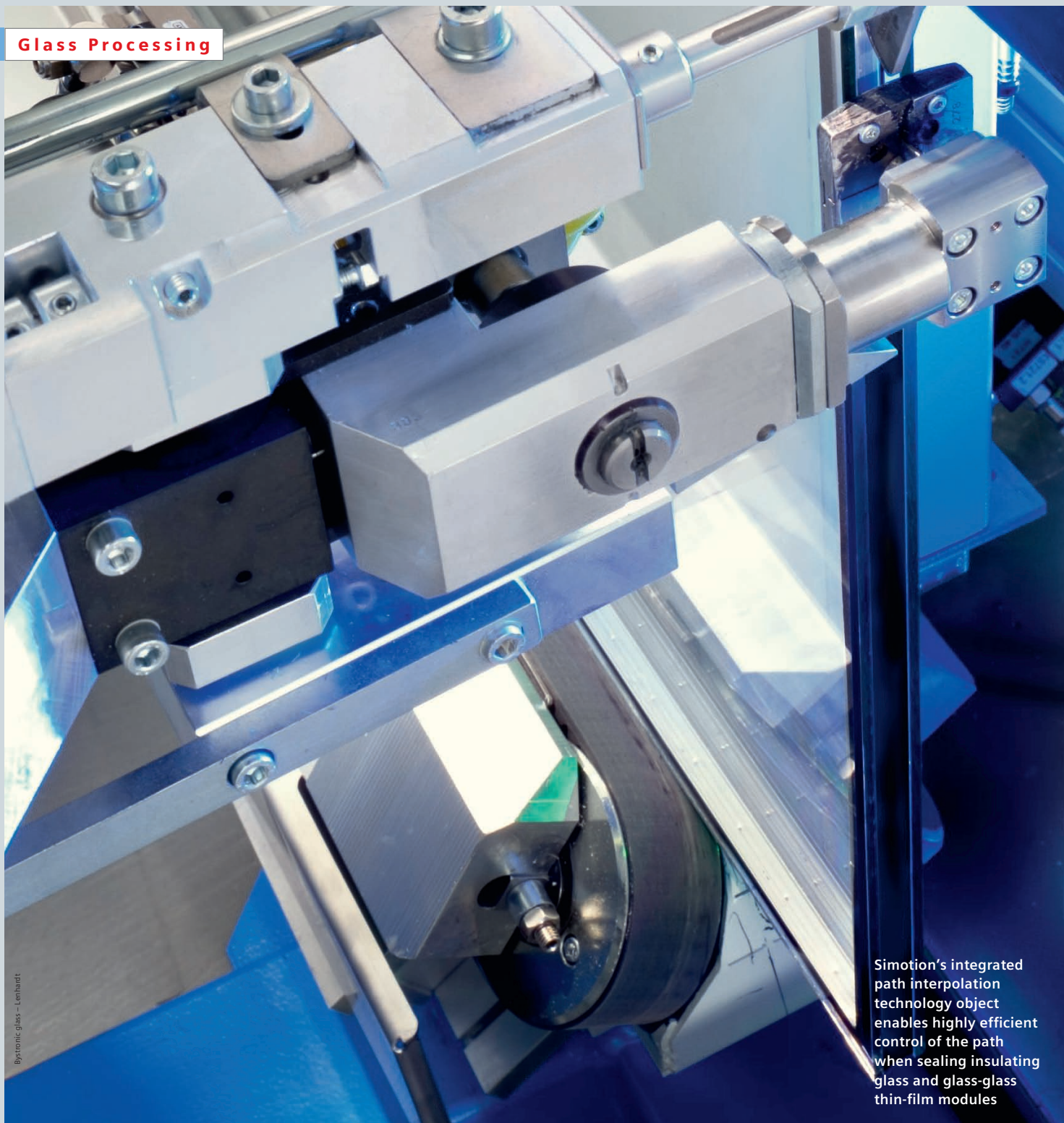


The control technology from Siemens boosts the dynamism and productivity of all Francesca machines

The drive platform is formed by 1FK7 servomotors and Sinamics S120 drives. Here, too, the Drive-CLiQ drive interface reduces the volume of different electrical parts in the switch cabinet. A modem connection enables remote service and remote maintenance. By virtue of its compact automation and drive technology, the Chiara MT also takes up only half the space of comparable double-sided grinding lines. ■

info

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Bystronic glass - Lenhardt

Simotion's integrated path interpolation technology object enables highly efficient control of the path when sealing insulating glass and glass-glass thin-film modules

■ Bystronic glass – Lenhardt Maschinenbau GmbH, Germany

Perfectly Sealed

The Simotion motion control system increases efficiency in the production of insulating glass and photovoltaic modules.

The excellent quality, efficiency and innovative technologies of the insulating-glass manufacturing systems from Lenhardt Maschinenbau GmbH have been winning over customers for decades. The company, which is part of the Bystronic glass group, boasts an extensive product line and provides customized solutions to support the complete process of manufacturing insulating glass.

But there is more: The TPS® (Thermo Plastic Spacer) technology has now proved suitable for producing the glass-glass thin-film modules used in photovoltaic systems. These thin-film modules are similar in structure to insulating glass. This means that there is high potential for rationalization in sealing the modules, as this is often still done by hand in the photovoltaic industry, by using costly robot cells. What's more, the use of TPS® technology dispenses with the need for expensive laminating films and an aluminum frame. And unlike conventional laminating methods, the entire process can be carried out inline, which also reduces costs.

Modular hardware and software configuration

Using the Simotion D drive-based motion control system, Lenhardt Maschinenbau has now implemented further control technology innovations in its new products. "A key aim of the project was to improve product quality and the reproducibility of processes through the increased use of motion control functions such as cam disks, electronic cams and synchronization. This simplifies machine operation while at the same time increasing productivity," explains Jürgen Schnorr, head of engineering at Lenhardt Maschinenbau.

The idea was to shorten commissioning and project implementation times and cover the various requirements of the glass and photovoltaic industry using a modular hardware and software configuration. "Using new drive-based security functions, we also want to provide end customers with options for increasing productivity even further, as this makes it possible to optimize processes through manual interventions in the security sectors," adds Schnorr.

Motion control and process control in one

The first machines to feature this innovative technology were a sealing machine for photovoltaic modules, which is already on the market, and a sealing machine for insulating glass units. A particular challenge in developing these machines was that the path control must work in a control circuit with the two-component metering system. "Thanks to the fact that the control functions and motion control run in one system, the Simotion motion control system has opened up completely new ways of directly linking together the metering process control and

motion control," says Schnorr. "This simplifies things considerably in comparison with conventional solutions that work with separate PLC and CNC systems." Previously, the path position was constantly being cyclically scanned by the PLC (programmable logic controller) and then applied to the metering in pro-

» Thanks to the fact that the control functions and motion control run in one system, the Simotion motion control system has opened up completely new possibilities for us. «

Jürgen Schnorr, head of engineering at Lenhardt

cess controls. This led to coordination work in the software and downtime in the system, and made it much more complex to optimize the system by setting the parameters of the two-component metering system. The option to map process characteristics in the form of cam disks and to manipulate these in real time opens up new development opportunities for managing the complex process even more effectively.

Standard Top Loading library

The solution is based on the Simotion D445 multiaxis system in which the Simotion functions are directly integrated into the control module of the Sinamics S120 drive system. Finally, the sealing machines have up to nine axes that synchronize with one another, depending on the process step. Simotion's integrated path interpolation technology object makes it possible to control the path in a highly efficient manner. It is extremely easy to parameterize motion programs using the standard Simotion Top Loading software package.

The Simotion system is connected to Bystronic's in-house visualization system using the Simotion onboard Industrial Ethernet interface. This means that new cam disks, characteristic curves and machining programs implemented by a CAD or PPS system can be continually transferred to the control system during production operation. ■

info

www.siemens.com/simotion
www.siemens.com/glass

■ UAS Messtechnik GmbH, Germany

Degrees of Revolution

A new automation concept with Simotion for fiberglass systems combines temperature control for bushings with winder control.

UAS, a specialist in the field of measurement and control technology, is a well-known name within the glass sector. The Siemens Automation Partner, who is also currently qualifying for Siemens Industry Partner, has now developed a revolutionary automation concept for fiberglass production with Simotion. This concept allows bushings and winders to be controlled together as a single system, using standard automation components from Siemens. The new concept allows the draw rate of the winders to be controlled by the temperature in the bushings, and vice versa. In addition, all bushing-winder systems are linked to the Simatic PCS 7 process control system. This was previously the case only for the melting furnace. The many benefits of the new concept include greater process accuracy, enhanced quality and increased user-friendliness.

Temperature control and draw rate as key quality drivers

Fiberglass production is a sensitive process that requires a fine touch. Accuracy is key in temperature control, not only during the glass melting process but afterward as well: The temperature of the molten glass must be maintained within a narrow and very specific range to avoid compromising the quality of the finished product.

Once the glass has been melted in a melting furnace in a multistage process, it is transferred via feeders (channel system) to the bushings, where the liquid glass is drawn into individual fibers (filaments) using winders. The individual filaments are spun in the winder spinning unit to form a fiber strand, treated with size to make the glass flexible and tear resistant and finally wound onto coils. The temperature, the quality of the glass and the coil speed must be perfectly coordinated to ensure the consistently high quality of the strands and to avoid any strand breakages. If, for instance, the temperature increases but the draw rate remains constant, the width of the filaments will decrease and fail to achieve the required tex value. Or, if both the draw rate and the temperature decrease, the width of the filaments will increase, along with the tex value.

Uniform automation solution

UAS opted for components from Siemens because their integration capabilities could enable seamless coordination of all the automation components – from the controller and HMI devices to the drives and the process control system. The Siemens products have the added advantage of reducing the complexity of the system. From this starting point, UAS worked together with its partners to develop two solutions for implementing the automation concept. The two solutions are similar in that they both link the bushing-winder systems to Simatic PCS 7 and ensure perfect coordination of the winders and the bushing temperature control. This results in precise synchronization of the draw rate and temperature control systems, which ultimately determines the width and the tear



resistance of the filaments. Linking up the bushings and winders to the Simatic PCS 7 process control system via Industrial Ethernet saves time and reduces costs right from the construction phase, as there is no need for a complex bus structure to facilitate communication between the PC and the controller. The new concept also simplifies the process for linking the bushing temperature control system and the winder control system to the central control system, and makes individual components easier to operate.

The first version of the concept offers a highly integrated, universal solution in which the systems integrator UAS combines the automation of the winders and the temperature control of the bushings to form a single control system. Each of the 100 stations is equipped with a Simotion D 435 motion control system. The benefits of this system lie in the fact that it eliminates the interfaces between temperature control and winder control, and both processes can be perfectly coordinated with each other. In addition, fewer components are needed, thereby allowing reductions in stocks of spare parts. The solution can be housed in a compact switch cabinet.

The second version of the concept consists of a highly standardized OEM solution with defined interfaces that the systems integrator uses to control the temperature of the bushings. Each station is equipped with a Simatic S7-300 programmable logic controller (PLC) together with a Sinamics S120 drive to control the winders. Simotion D 425 systems are used to control the temperature of the bushings. The benefit of

Solution Partner

Automation

SIEMENS

UAS Messtechnik GmbH

Founded in 1983, UAS (Unternehmensbereich Automatisierungssysteme) provides measurement and control solutions for companies in all sectors and is active on an international scale.

The company specializes in the following:

- ▶ Planning, design, production, installation and commissioning of systems
- ▶ Customer-specific solutions
- ▶ Modernization and optimization of existing systems

Employees: 20

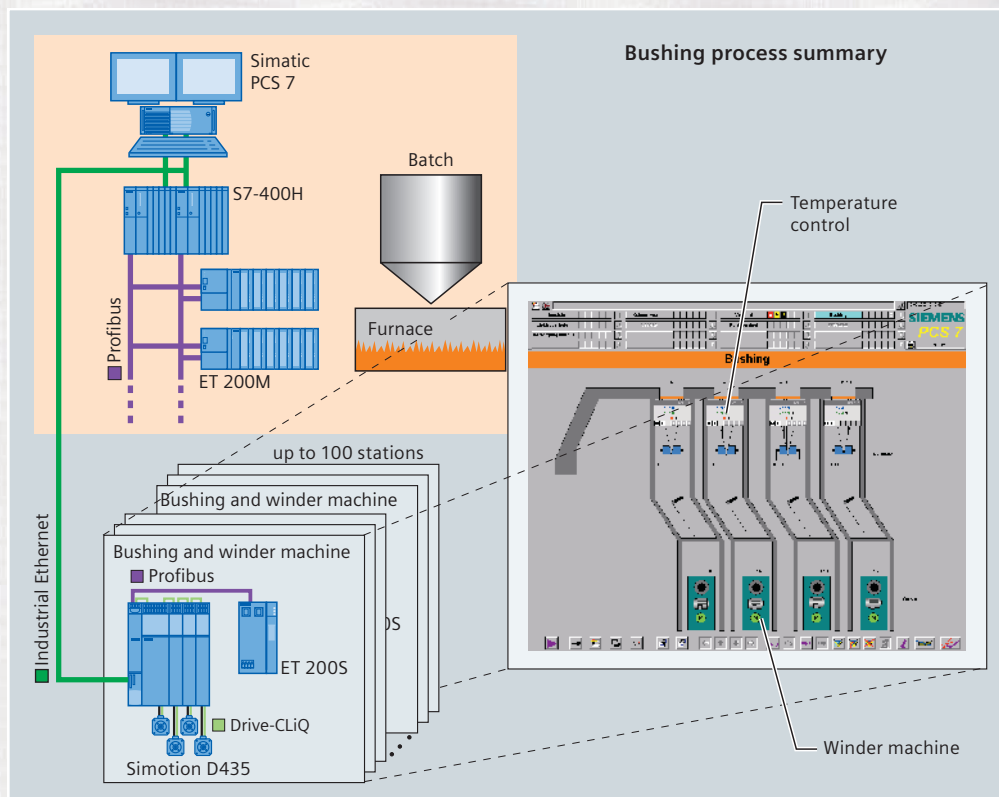
Address: Prof.-Hermann-Staudinger-Straße 4
94234 Viechtach, Germany

Internet: www.uas.de

this version lies in the high degree of OEM standardization; this reduces winder costs while retaining the advantages of a fully integrated solution. ■

info

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The new float line produces one of the widest ribbons in the world

■ AGC Flat Glass Europe, Czech Republic

Uniform Solution for a Complex Plant

The new float line of AGC Flat Glass Europe in the Czech Republic benefits from a uniform automation architecture based on Siemens automation and drive technology.

Glass production in Teplice in the north of the Czech Republic began in 1820, with the production of rolled glass sheets made from cylinders. In 1921, production was modernized with a Fourcault furnace for vertical pulling. The last fundamental change in production technology occurred in 1966, when the plant bought a float process license, making it the first float plant in the former Eastern Bloc. Today the Teplice plant is one of the 18 float plants of AGC Flat Glass Europe, a leading flat

glass producer and marketer with activities all over Europe, from Spain to Russia. The company mainly serves the building and automotive sector besides some special niche markets.

A new float line, a new technology

In response to the continued growth in the demand for flat glass in central Europe, AGC Flat Glass Europe decided to build a third float line at its Teplice plant

in the Czech Republic. This line, with a capacity of 700 tons, produces one of the widest glass ribbons in the world. Due to the width of the ribbon and its various thicknesses, there is a selected number of top rollers in the float bath. Since the float also serves the automotive industry, which requires smaller sizes than the building sector, the line was also optimized for this type of product. By employing a very complex cold end with a cutting line supplied by the Italian company Bottero, the glass ribbon is cut both lengthwise and crosswise into the required sizes. The cold end is built following a fully new design and is equipped with control and drive technology from Siemens. "This type of cutting line was implemented for the first time within AGC, so it wasn't easy," says Jiří Bílek, chief of electrical maintenance and control system maintenance at AGC in Teplice. "However, the new approach made the line more efficient, as it minimizes the manipulation and handling of the glass."

Uniform control architecture

Final decisions regarding this project, including the process control system and the power supply technology, were taken by the Engineering Team of AGC Flat Glass Europe and by the global project manager of this third float line in Teplice, Guy André. The Siemens hardware in all sub packages of the new line, such as batch house, cullet handling and cutting line, offered the best solution.

The batch house by Lahti Precision is equipped with a redundant Simatic S7-400 controller, Simatic ET 200S distributed I/O devices, Siemens drives and motors and Siemens low-voltage switchgear and electrical systems, as well as Simatic WinCC as the Supervisory Control and Data Acquisition (SCADA) system. The cullet return system was supplied by Zippe and is also equipped with Simatic technology. Siemens Solution Partner AEG supplied the roof heating in the annealing lehr. Siemens Belgium supplied the power supply system for medium and low voltage. For the process control technology, AGC opted for Simatic PCS S7. AGC Flat Glass Europe already had a positive experience with other projects such as the float line in Klin, Russia. In contrast to previous automation projects with PCS S7 at AGC, the system for Line 3 employs a redundant concept for the first time. "Before, AGC typically used Sipart backup controllers to ensure continuous control. However, we had already had good experience with a redundant control system here at the Teplice site, so we proposed using this approach for Line 3 as well," says Jiří Bílek.

The process control system was designed and implemented by the Siemens Automation Partner STG Cottbus. STG is also currently qualifying for Siemens Industry Partner. Jiří Bílek says, "STG has excellent expertise, and they have already engineered several float lines. They know both aspects – the control technology and the float bath process – and when you

Solution Partner

Automation

SIEMENS

Software & Technologie Glas GmbH, Cottbus (Germany)

Founded by three chemical engineers in early 1990, STG GmbH evolved into an innovative technology-oriented engineering company that develops solutions for energy savings and NO_x reduction, progressive burner and sensor technology and innovative automation and process control systems.

STG is active in more than 20 countries. STG's customers are primarily in the glass industry, but are also serving in the ceramic and metallurgical production.

Employees: 40+
Bahnhofstr. 76
03058 Kiekebusch
Germany
www.stg-cottbus.de
stg@stg-cottbus.de

work with people who know what to do and how to do it, the results are good." All the important systems are redundantly designed with "hot standby" backup systems ready for immediate takeover in case of a component failure. Because it is important that the operators be able to control the furnace and the float bath under absolutely all circumstances, all output parts from the screen in the control room to the actuator are designed as redundant systems.

Start-up on time

Shortly before Christmas 2007, Line 3 started up on time without any delay. Jiří Bílek is very satisfied with the results of the project: "There are always some problems; that's normal. What is important is that everything that occurred was in the manageable range. I would like to point out the performance of STG, however. They were simply perfect."

"It was a great opportunity for me to be part of this project, to share experience and gain knowledge. I was working on the engineering team for the new line, and now I have shifted to maintenance. It was very exciting to help start it up!" ■

info

www.siemens.com/glass

■ Cardinal Glass, USA

Both Ends Covered

Siemens technology and equipment by Grenzebach help a glass manufacturer automate both the hot end and cold end of production.

Cardinal Glass Industries is a market leader in residential glass for windows and doors. The company has more than 5,500 employees at 27 locations in the United States. When Cardinal Glass Industries prepared for a 90-day planned shutdown at its Menomonie, Wisconsin, float glass plant, it wanted to make sure the new control system would work dependably for the next 15 years.

The hot end solution

After considering several automation vendors, Cardinal Glass Industries chose Siemens. Mark Gehrke, Cardinal Glass electrical engineer, played a key role in the decision. "The redundancy of the Siemens system was much better than the other systems," Gehrke says. "The Siemens system was also very easy to implement."

The upgrade solution was a fully redundant Simatic PCS 7 process control system that includes Simatic 417 and 417H controllers, the PCS 7 OS, Masterdrives

variable-frequency drives, a Simatic ET 200 I/O system and more than 30 Sitrans pressure and temperature transmitters. To take advantage of the fieldbus benefits and to tie everything together seamlessly, Cardinal Glass replaced the electronics in its existing analog 4-20-type instruments with Profibus PA communications-capable modules.

"Profibus helped us eliminate a lot of manual tweaking at the control engineering station," Gehrke says. "We keep a controller in each production area because of redundancy and the ability to isolate problems. Those diagnostics allow us to make adjustments before an instrument goes down."

Gehrke says the plant met its 90-day upgrade schedule because the team retrofitted the existing control cabinets with new PCS 7 hardware. "We basically gutted the cabinets and started over," Gehrke says. "We saved the wire connections and put terminal blocks in the bottom."

It was the only way we could have done it on time and on budget." Today, the control system reliably



automates the entire hot end of the production process and provides the trending, diagnostics and communications needed to keep the plant running reliably and efficiently.

The cold end solution

In the United States, the cold end process has not usually been automated, making it very labor intensive. Interested in the economic and labor-safety benefits of automation, Cardinal brought in Grenzebach, a key developer of equipment used in all aspects of cold-end glass processing, to engineer the solution. Central to Grenzebach's equipment is its integrated control systems from Siemens.

"The Side-Leg Stacker line from Grenzebach uses a combination of swing-arm stackers and robots to remove the glass from the line and pack it on our racking system," says Robert Bacon, engineering manager with Cardinal Glass Industries/Cardinal FG Company. "It is highly automated; the workers are really just there to ensure that the machines are functioning properly. We are very pleased with the system's performance."

Siemens S7-300 PLCs control the material-handling conveyors, the stacking devices and the robotics. Masterdrives drive systems are used where high dynamic performance and intelligent motion control functions are required. Like the S7-300 PLCs, these motors fit seamlessly into the Grenzebach automation system.

The Siemens S7 controllers feature Safety Integrated technology, providing the highest level of safety. They monitor themselves, detect faults auto-

Key points

The Siemens equipment was retrofittable into existing cabinets, so installation could take place on time and within budget.

The superior redundancy and ease of use of the Siemens technology ensure that production will continue uninterrupted for many years.

The Grenzebach-Siemens automation partnership helps glass manufacturers to be more competitive by reducing the manual labor associated with stacking glass.



matically and immediately change into or remain in a safe mode when a fault occurs.

Nonstop reliability

Chris Granley, engineering manager at Cardinal, comments on the improvements in maintenance work and troubleshooting: "I need to troubleshoot the equipment, and I've been very impressed with what I can bring up on a screen. Also, I used to frequently come in after hours to handle alarms. Now, I just log in to the engineering station remote desktop from home." Granley says the system was very easy to learn. "After 10 minutes of training, I can look at any trending information I want. You just click on the red flashing part of the screen and all the information is there."

Mark Kehne, production manager at the plant, says, "The PCS 7 system removed much of the potential for error. If it sees something, it automatically compensates for the problem. The new control system is far superior to what we had before." ■

Grenzebach Maschinenbau GmbH, Hamlar, Germany

"Success is fun" has always been the motto of Rudolf Grenzebach, the founder of Grenzebach Maschinenbau GmbH. Grenzebach and his employees have achieved this success through competent and committed work. The name Grenzebach Maschinenbau has long been recognized worldwide as a high-quality brand in processing line construction and in the automation of production processes for the flat glass and building material industries. Grenzebach has evolved into a world leader not least due to its continuity and the shared desire of several generations of employees to make the company a success.

info

www.siemens.com/glass

■ Guardian, United Arab Emirates

Glass Roots

In a new glass production facility in Ras Al Khaimah in the United Arab Emirates, Guardian Glass benefits from an integrated solution based on automation, drives and power distribution technology from Siemens.

Mention “Middle Eastern company” and many people think of the oil industry companies. But there’s another industry for which the Middle East is extremely well known – the glass industry. In the Middle East 9,000 years ago, that industry was born, and it is likely the industry will be with us quite a bit longer. Now, glass is returning to its roots. The Middle East is becoming a boom region for glass production, supporting the major building projects currently under construction there.

Guardian recently completed a float glass plant in Ras Al Khaimah (RAK), United Arab Emirates. The plant is one of the largest non-oil projects in the region and will produce 700 tons of float glass per day, including high-performance coated glass for use in automobiles and construction. The plant employs about 300 people and is expected to generate as many as 1,000 regional jobs relating to distribution.

The new plant exploits the benefits of Totally Integrated Automation by using Siemens systems and technology throughout the plant. The new plant was built in just over a year, one of the fastest completions in the industry. The Siemens Solution Partner program was a significant factor in the successful and timely completion of the project, which was truly an international effort, with manpower coming from Dubai, Belgium and Germany. A local company was responsible for the mounting and cabling of the systems.

Siemens solutions every step of the way

For the batch house subsystem, designer Zippe Industrieanlagen GmbH of Germany used Simatic S7-300 and S7-400 programmable logic controllers (PLCs), with Simatic ET 200 distributed systems. Zippe also used Simatic technology for the cullet recycling system, in which leftover glass is returned to the batch house. These PLCs can be set up easily without the need to observe slot rules, and the S7-400 can be reconfigured on the fly.

The medium-voltage switchgear was engineered, delivered and commissioned by Siemens Dubai. The roof heating system in the tin bath was provided by the Siemens Solution Partner AEG SVS Power Supply Systems and is also equipped with Simatic technology networked with Profibus. The drive cabinets and motors that controls the batch chargers, lehr drives, top rollers and other drivers were designed, delivered and commissioned by Siemens Belgium. Simosyn 1FU8 motors were used in coordination with Sinamics S120, G120, and G150 drives. These drives were designed to offer integrated functions through the platform concept, total integration in engineering and a high degree of flexibility and many combination possibilities. Siemens also supplied analytical equipment for the RAK plant.

The cold end, in which the glass is inspected, packaged and labeled for shipping, was designed by Grenzebach. Simatic S7-400 PLCs and Masterdrives are well suited for the complicated and sometimes awkward task of moving and packaging the delicate finished product.

Proven partner for the control solution

For the distributed control system (DCS), Guardian contracted Siemens Solution Partner STG Cottbus of Germany, as Guardian has a long-standing and positive experience with Simatic technology and STG. The RAK plant is the tenth float glass automation project that STG has executed for Guardian. Since 1996, Guardian Glass relied on the expertise of STG and Siemens automation technology in a total of 12 projects.

The DCS project had to be implemented in a very short time, with just twelve weeks from the initial order to the factory acceptance test. All systems were delivered just fourteen weeks after the order. This short-track project execution was possible only due to STG's library of customer- and application-specific control modules. The pretests of all systems were

Modular control for glass: Simatic

The modular Simatic Controllers have been optimized for control tasks and specially designed for ruggedness and long-term availability. They can be flexibly expanded at any time using plug-in I/O modules, function modules and communications modules.

- ▶ Simatic S7-200: The low-cost micro system for simple automation tasks, easy to install and configure
- ▶ Simatic S7-300: The modular PLC for system solutions in the manufacturing industry with a wide range of modules
- ▶ Simatic S7-400: The Power PLC for system solutions in the manufacturing and process industries, with high-speed processing and enhanced communication performance
- ▶ Simatic C7: The complete machine control in the smallest possible space, comprising Controller and Operator Panel in one device

Process control solution

STG Cottbus implemented a process control system for the furnace/reversal unit, the tin bath, the lehr and the utilities, with a total of 11 Simatic PCS 7 automation systems. These systems are connected to the subsystems via Profibus, MPI and Modbus. Subsystems include:

- ▶ 20 Simatic ET 200M I/O systems
- ▶ 15 Simatic S7-300 controllers
- ▶ 44 Sinamics drives
- ▶ 57 AEG thyristor controllers
- ▶ 2 encoders (Tempsonics)
- ▶ 3 Simatic TP 277 panels for backup visualization
- ▶ 11 Simatic OP 77 panels
- ▶ 1 MicroSAM process gas chromatograph

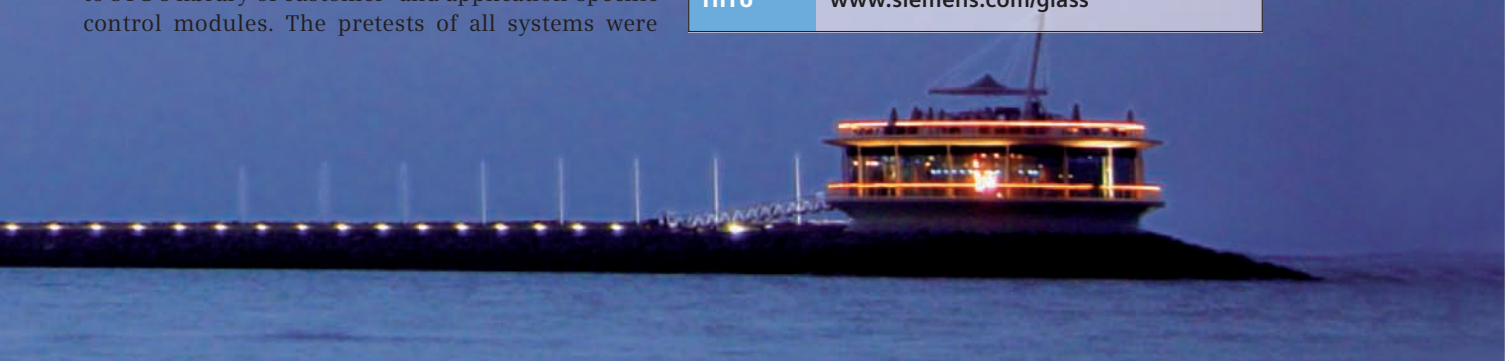
performed at STG in Germany, and the commissioning of the systems was performed as plug and play: The entire control system was installed, connected and almost immediately operational.

Looking ahead

An integrated solution using automation, drive and power distribution technology from Siemens will enable Guardian to operate its plant reliably and economically, and to maintain its leading position in the important growth region of glass in the Middle East. ■

info

www.siemens.com/glass





Automation technology for CSG Hebei Float Glass

Double Score

Siemens Industry Automation Ltd., Shanghai, was contracted by China Triumph International Engineering Co., Ltd (CTIEC) to supply a Simatic PCS 7-based process control solution for two float lines of CSG Hebei Special Float Glass. The lines have a capacity of 900 and 600 tons per day. The project continues the successful cooperation between CTIEC and Siemens.

Siemens was able to score with its excellent expertise in the glass industry. Moreover, CSG had already had good experiences with Simatic PCS 7. The two lines are scheduled to go into operation in October 2008.

www.siemens.com/glass

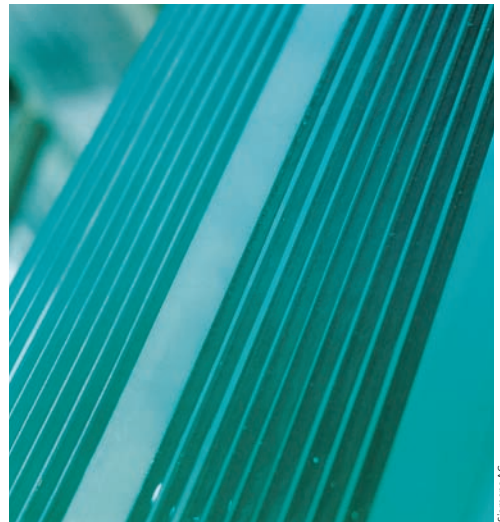
Salavatsteklo opts for Siemens technology

Hot and Cold

Salavatsteklo AG is a leading manufacturer of float and container glass, tempered glass, triplex, sodium water glass and other goods. The company is situated in Russia, in the foothills of the Ural mountains in the city of Salavat, Republic of Bashkortostan. Production started in 1962, and the glass is sold successfully in Russia as well as abroad. The production facilities have recently undergone an extensive modernization.

For the second floatline of Salavatsteklo, STG Cottbus is responsible for the process control system, based on Simatic PCS 7, in close cooperation with Horn Glass Industries. Additionally, the cold end solution supplied by Grenzebach employs Siemens drive technology. The plant has a capacity of 500 tons per day and is one of the most modern of its kind.

www.siemens.com/glass



Wine bottle plant in Australia

Quality Glass for Quality Wines

For the Amcor Glass wine bottle plant at Gawler in Australia, Heye International supplied the entire plant equipment, including IS machines and cold end. The plant serves customers in the renowned Barossa Valley wine region. The two furnaces have a melting capacity of 450 tons per day each and are automated with Simatic PCS 7. Amcor recently ordered a third unit that will also use Simatic PCS 7. In this third plant, systems that were previously equipped with Simovert PM, such as servo feeder, gob distributor or belt drives, will use Simotion and Sinamics drives. In a newly designed system at Heye International, all distributed systems (high-dynamics servo drives and perfectly aligned synchronous drives) are integrated from the feeder to the cooling lehr.

www.siemens.com/glass www.hey-international.de



Fotolia

Owens-Illinois (O-I) modernizes with Simotion D Savings through Retrofit

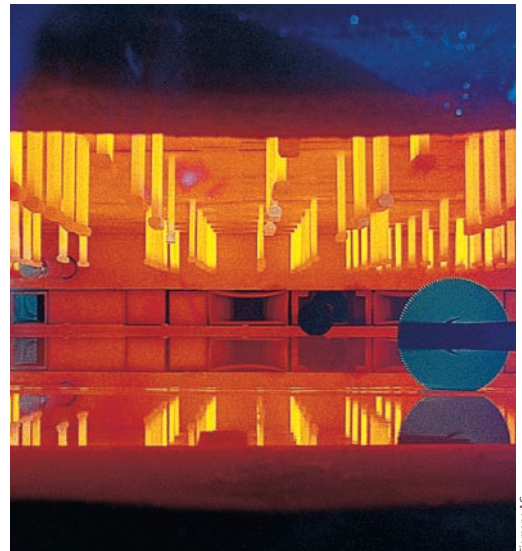
The Automation Summit 2007 had retrofitting as one of its focus topics. Tom Green from Owens-Illinois (O-I) presented one landmark example: O-I has recently modernized its glass forming machines with the drive-based motion control system Simotion D. Simotion now is a standard solution for the hot end at O-I. "The award went to Siemens mostly because the same drive-based control technology can be applied to both the servo and inverter systems – which results in additional savings," says Green.

<http://www.designnews.com/index.asp?layout=articlePrint&articleID=CA6453060>

Siemosyn synchronous motors in float glass lines Precise and Rugged

Permanent-magnet synchronous motors Siemosyn (1FU8) with Sinamics S120 drives for top rollers and annealing lehrs increase both float glass quality and plant availability in float glass lines. The drives for the top rollers and the rollers in the annealing lehr have to operate with a high degree of rotation precision and rotation consistency so that the glass sheet is formed true to size and with a high surface quality and runs through the annealing lehr without being scratched. Siemosyn motors are perfectly suited for this task, as they exactly follow the electric rotating field thanks to the permanent magnet excited rotor. This technology also eliminates conventional motor encoders, which reduces the frequency of occurrence for failures compared to conventional solutions.

www.siemens.com/glass



Siemens AG



Olivetto

New Olivetto machine series with Simotion Smart Solution

Higher performance and improved ease-of-maintenance are two benefits of the drive-based motion control system Simotion D with Sinamics S120. The Italian hollow-glass forming machine manufacturer Olivetto Glass Industries uses this combination in a new machine series. Benefits for the glass industry: functions and control algorithms that are called in the application program are time-synchronous with the axes. Machine behavior is reproducible, which yields significant improvements in end-product quality.

www.siemens.com/simotion



Expanding a production line for shaped jars

Quality Automation

For Ardagh Glass in Nienburg, Germany, Bertram Elektrotechnik has installed a system that performs quality checks, sorts the glass and aligns asymmetric products so that they can be palletized in an optimum way. The safety concept of the plant is based on conventional switching technology that was combined with the integrated safety features of Sinamics S. The systems have to be converted for a new product approximately once per week, a process that involves several manual interventions by the operating personnel at different locations. During these interventions, Sirius 3TK28 safety relays protect equipment and staff. No separate failsafe controller is required.

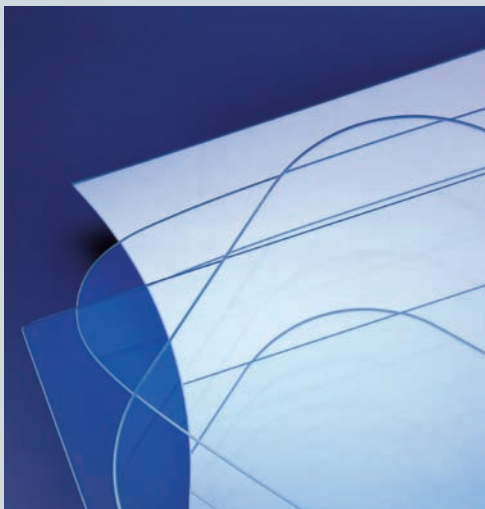
www.siemens.com/simotion

Simple automation solution for filament cleaning

Shining Example

The filament in incandescent lamps has to be cleaned and calibrated meticulously so that the lamps have a long lifetime. The manufacturing of high-quality filaments at Osram was successfully automated using the motion control system Simotion. The automation system is very simple to operate so that operating and maintenance personnel at Osram are able to service the machine, which is a bottleneck in the manufacturing process, themselves. Simotion opens up new perspectives in process automation at Osram: Apart from motion control and PLC functionality, various technology functions are available as standard software modules that are ready to use or can be adapted. Together with the integrated safety technology of the Sinamics S120 drives, the easy-to-use system covers a broad range of process engineering and production tasks.

www.siemens.com/simotion



Cutting and processing center for glass with Sinumerik 840D sl

Perfect Cut

For high-performance cutting and processing of automotive and building glass, the new Sinumerik solution line with the drive system Sinamics S120 presents an ideal solution. Functions specific for the glass industry are already integrated into the control system, such as the tangential control that ensures the cutting wheel is perfectly aligned at all times, and an exact speed-controlled adaptation of the cutting pressure enables higher speeds. A standard function for jerk limitation reduces mechanical stress in the machine under full load. Thanks to open interfaces for connecting to user HMI systems, machine builders and system integrators can offer an integrated solution for both cutting optimization and operation.

www.siemens.com/sinumerik

■ OEMs and Plant Operators

Optimized Service

| Siemens RSA offers optimum machine service – anywhere.

The Siemens repair service agreement (RSA) for original equipment manufacturers (OEMs) ensures that costs remain predictable and within budget. The agreement offers OEMs a global repair service on-site at the plant operator, if required, for an attractive flat-rate fee. The RSA can be signed with a contract duration of 12 or 24 months and includes

the following services: provision of service personnel, on-site fault diagnosis and rectification, and proof of remedy of failure.

The RSA is activated following end-user registration of the machine, based on the product parts list that is used during the second commissioning at the end-user site. Should the machine require servicing, the contract enables rapid, machine-specific servicing without the need for preliminary clarification between the end customer or the OEM and Siemens. In other words, only the certificate number is required for optimized machine service.

The agreement is maintained in EUNAweb (End User Notification Administration via Web). EUNAweb is a database that allows equipment information and the RSA data to be accessed by authorized contracting parties at any time. That way, the machine manufacturer can also track modules right down to the level of the series number. ■



Publicis

info

www.siemens.com/automation/support

Mechatronic Support: accelerating machine development

With Mechatronic Support, Siemens has developed a graded range of services for machine development and optimization. If an existing machine does not fulfill requirements, or a tried-and-tested machine is to be developed further, a thorough machine analysis is needed. Such an analysis provides information on the development potential of a machine concept. Together with simulation and virtual prototyping, this process accurately quantifies a machine's properties. For example, the customer can see what investments will pay off and can immediately begin looking for the most cost-effective solution. The analysis results provide engineers with the basic raw material for a simulated machine model. The

optimum time to perform this analysis is in the concept phase, as changes to the design can still be carried out where necessary. The virtual prototype that then emerges on the computer shows all the major performance characteristics of the real machine. In addition to shorter development time and quicker time to market, this also brings a significant cost advantage.

info

www.siemens.com/mechatronic



From lots of energy ...



... to less energy and more and more output.

Energy Efficiency

Increased energy and raw material costs, reduction of carbon dioxide levels, efficient resource usage, and environmentally friendly production – all of these demands are current trends in the glass industry. We understand these developments and are working on solutions for glass production and processing that result in increased productivity and energy-efficient production processes at the same time. Together with you we can optimize your plant, so that you can set new trends and standards. More information: www.siemens.com/glass
Setting standards with Totally Integrated Automation.

Answers for industry.

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