

GlassFocus

SIEMENS

ideas for glass production and glass machinery

November 2004
English edition



Trends in the Glass industry
Case Studies
Cooperation with Technology Partners
Products and Solutions

We love Glass



12

Using integrated control and automation technology from Siemens, Benteler can process glass for automotive applications even more productively than before



14

SCHOTT has developed a laser scribing process that surpasses mechanical glass cutting



22

Optimized production: Simatic PCS 7 at Saint-Gobain

Glass Market

4 New Challenges - New Opportunities

Innovative solutions for the glass industry

Flat Glass

6 From the Cold-end to the Warehouse

Successful cooperation of the cold-end experts Grenzebach and Siemens

Hollow Glass

8 Productive, Flexible and Integrated

Simotion increases productivity in the hollow glass industry

Glass cutting

10 Investing in the Future on the Bosphorus

Professional glass cutting with Sinumerik 810D

Glass Grinding

11 Everything Under Control

Glass grinding with Simatic S7-300 and Simatic MP270

Pre-Processing

12 Uniform from Cutting to Washing

New pre-processing line for automobile glass panes

Laser Scribing

14 Diamond and Metal are Passé

Laser scribing breaks glass with micrometer precision

16 Products

Simatic WinCC flexible, Simatic IT, Profinet, Torque motors, Sinamics, Simatic PCS 7, process instrumentation, energy supply systems

Flat Glass

22 Transparency and Reliability

Account Management Saint-Gobain
Automation of a float glass line with Simatic PCS 7

Flat Glass

24 Prepared for the Future

Cold repair of two lines at Saint-Gobain Germany

Glass Containers

25 A Series of Successes

Simatic PCS 7 implemented in the glass container division of Saint-Gobain

Glass Wool

26 Multinational Teamwork

Experience and industry expertise convince Isover

Flat Glass

28 Local Expertise

Glaverbel automates glass production with Simatic PCS 7

Flat Glass

29 A Hot Project during Cold Repair

Modernization of a float line at Cardinal in the USA



32

Success in China: Simatic technology at LG Philips Displays ensures reliable operation in a crucial production step

30 **Glazing Systems**
Stepping into the Future
Simatic PCS 7 automates glazing system production

31 **Flat Glass**
Several in a Row
Excellent cooperation with Guardian Industries Corp.

32 **New Markets**
Success in China

34 **Siemens Technology Partners**

38 **Support**
Good Advice is a Safe Bet
The right support for every phase

39 **Dialogue**

Dear Readers!

The market has changed a great deal in recent years. New markets – especially in Asia and Eastern Europe – with a rapidly increasing demand for glass for automobiles, the building trade, and the food and beverage industry are dictating the direction. International glass manufacturers and machine builders are following this demand and are increasing their investments in these markets.

At the same time, the pressure of costs on glass producers is increasing. Energy, one of the most important driving forces behind costs in this industry, is becoming increasingly expensive.

The business is becoming more and more global, and anyone who wishes to succeed will have to enter the market quickly and track down and consistently exploit potential for rationalization in production.

We, the Siemens Glass Team, support our customers – the glass manufacturers, processors, and plant planners (EPCs), machine manufacturers (OEMs), and consultant engineers – with an extensive and innovative product portfolio, tailor-made solutions, and experience and know-how in the glass industry. We back our customers from America to Asia, from Europe to Australia and Africa. The Glass Competence Center brings together our activities and expertise so that our customers can benefit from the accumulated experience of more than 50 years of international cooperation with the glass industry. International account management supports machine manufacturers as well as glass-producing companies in the implementation of international standards in automation technology, and a dense network of partner companies uses our products and solutions for tailor-made glass plants and machines that optimize production and processing.

In this issue, we provide some select examples of how our customers benefit from collaboration with Siemens and our partners – starting on page 6 for glass machine manufacturing and page 20 for glass production. We hope we can give you a few valuable ideas.

Yours,

Bernhard Saftig

Siemens Glass Team

Head of the Glass Competence Center

Ralph Burgstahler

Sales/Marketing

Automation Glass Processing Machines



Innovative solutions for the glass industry

New Challenges – New Opportunities

Today more than ever, low cost production in the glass industry means saving energy, using resources more effectively, responding more flexibly to market requirements and binding less capital. But this is getting harder because markets are growing closer together and competition is getting more fierce. But there are still opportunities, for example new markets in Eastern Europe and Asia or also new products such as ultra-thin glass for flat screens, PDAs or mobile phones. In order to successfully exploit these opportunities, all those involved must pull together – from the glass manufacturer through the machine manufacturer to the system supplier.

Some of the best opportunities are in the new markets. The heavy building activity there but also the constantly growing demand for mobility in these countries are increasing the demand for flat glass enormously – this also applies for hollow glass in the food and beverages industry.

But the building industry also is an important driving force for the glass industry in all other regions: not just float glass as an important raw material for windows and facade elements but also glass blocks as

rediscovered design materials as well as glass wool as an insulating material are just some of the market segments that are showing considerable growth.

International competition and substitute products such as PET and Tetrapak intensify the price pressure in the traditional glass industry markets which is having a great effect especially for hollow glass. Here companies are being forced to become even better by optimum utilization of their resources and plants.

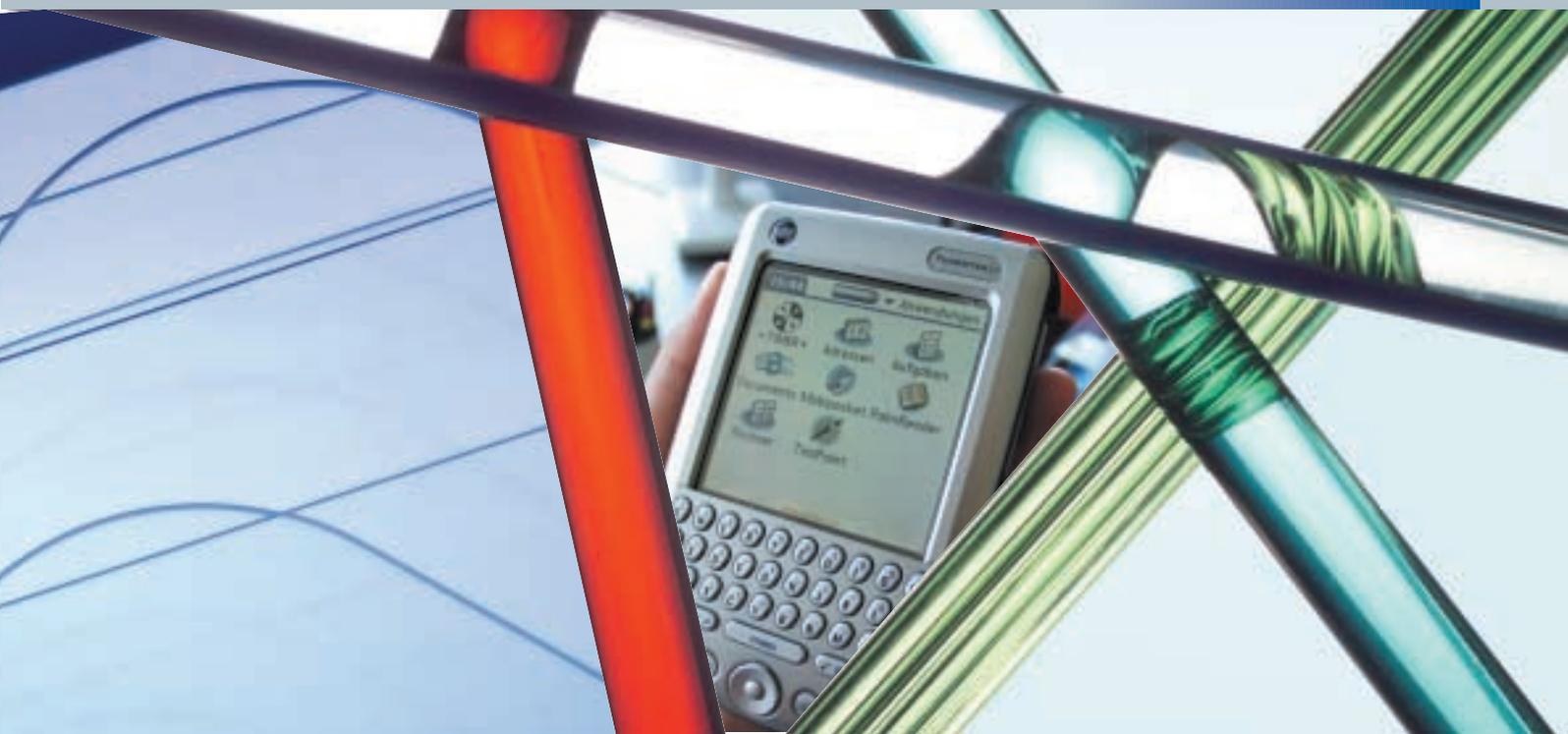
With partners to success

The challenge to increase the productivity but retain the same quality and flexibility and at the same time reduce the costs cannot be met by the glass manufacturer alone. There is a great need for partners who are internationally available, globally accepted and who use open standards, implement integrated systems and develop innovative techniques and concepts. The growing demands of consumers can best be satisfied by all those involved in the productivity chain.

Siemens' competencies range from the product delivery to the electrotechnical complete solution including the integration of production and management or solutions for better exploitation of energy. Competencies which are equally important for glass production and glass processing. In partnership with customers, machine manufacturers and glass specialists, Siemens develops intelligent solutions based on proven standard products with which glass plants can be operated more efficiently and at state-of-the-art levels.

Productivity, flexibility and transparency

The main job of a glass plant is to produce what the market needs as effectively as possible and to bind less capital in raw materials, operating materials and finished glass.



For years, Simatic PCS 7 has proven itself as an efficient process control system in the glass industry. One of the most important new features of Version 6 is the plant Asset Management. This alerts the glass producer's attention to potential failures in production in good time and therefore considerably reduces production downtimes or avoids them altogether.

Not only the quality of the raw material but also and quite particularly the precise proportioning and exact observance of all the process parameters is responsible for the quality of the finished glass. Siemens have consistently developed their product range in this field or have expanded it by their acquisitions.

From the order to the finished glass plate

Of course the pressure of costs is also increasing in the area of the cold end, and time-to-market is playing an increasingly important role. Siemens respond to the new requirements with their new float end concept which serves as an example of a low-cost, homogeneous plant concept. The new drive concept with Simotion and Sinamics is an integral part of Totally Integrated Automation and therefore fully compatible with the Simatic world.

Both in the cutting technique and the removal and transport of glass plates, modularly structured plants and production lines best satisfy today's market requirements. Modular plants with distributed

intelligence and simplified machine-machine communication can be set up perfectly with Component based Automation (CbA). The basis for this are mechatronic modules which integrate mechanics, automation technology and user program. The vision of "plug&work" of future production lines consisting of fully tested individual machines which configure themselves automatically in the network and communicate independently with each other via standardized CbA interfaces are becoming a more and more realistic prospect.

Due to the continually increasing economic demands, neither plant manufacturers nor float glass producers can avoid integrating the production level in an existing order process any longer, because this is the only way to optimize the whole business process. To keep waste as low as possible, cutting should be done exactly at the flawed position, e.g. occlusions in the glass. The dimensions of the plate then do not usually correspond to the dimensions of the order currently being processed. In this case it is obviously useful to find a suitable order immediately and assign the plate to it. Simatic IT closes the gap between the automation level and the order process.

Standardized, homogeneous and global

With the standardized and homogeneous solutions for the glass industry based on Totally Integrated Automation (TIA) and Totally Integrated Power (TIP), glass pro-

ducers and glass machine manufacturers can effectively meet these challenges. The high degree of standardization reduces the amount of time up to commissioning of a production or plant, simplifies maintenance and service and cuts implementation costs.

The smooth integration between company management, order management and glass processing with Simatic IT releases a great potential for rationalization especially in the cold end.

In addition to innovative technology and intelligent solutions for the whole glass process, Siemens offers global support and project handling as a partner to the glass industry. The staff at the Glass Competence Center coordinates activities from all over the world for the glass industry with a variety of solutions and they regularly swap experience. ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Successful cooperation of the cold-end experts Grenzebach and Siemens

From the Cold-end to the Warehouse

One of the specialists for the cold-end section of a flat glass plant is the Grenzebach Maschinenbau GmbH. The recipe for success of the globally active company is innovative mechanical engineering paired with intelligent control and optimization technology. Grenzebach has relied for years on a homogeneous automation solution based on Totally Integrated Automation.

The products of the Grenzebach Maschinenbau GmbH range from float glass and cutting lines through control technology right up to stacking machines. With progressive development and new designs, the medium sized company based in Southern Germany has become a world leader in the glass industry. The company is number one on the market for the construction of float plants. About 80

percent of the plants they produce are for export.

Grenzebach also takes over the responsibility for the whole control and automation technology in addition to the mechanical engineering for the cold-end section in flat glass production. A uniform plant concept is a decisive factor especially here. Grenzebach has therefore chosen automation based on Totally Integrated Automation with Simatic and Simotion.

The cutting technology – accurate, fast and ...

The nucleus of the plant is the cutting line. Here a very high plant availability and extreme accuracy are demanded. Efficient production also depends on an opti-



Flat glass production with Grenzebach plants

mized and job-related cutting of the glass web. Precision, speed and maximum flexibility are essential aspects.

The Grenzebach float cutting technique consists of two to three longitudinal and a maximum of six transverse cutting bridges. On the longitudinal cutting bridge the glass web gets one or two trimming cuts on the left and right or two longitudinal dividing cuts before being divided on the transverse cutting bridges.

The mechanical and electrical structure of the longitudinal cutting bridges is modular and they can be equipped with up to 16 cutting tools. A Simotion D435 takes care of the positioning of all the tools in every longitudinal cutting bridge. In the up to six transverse cutting bridges per plant, the cutting head is pulled directly by a compact servo motor 1FK7 (by the flying saw principle). Here, one Simotion C230-2 per bridge controls the cut dependent on the glass feed. In this way an extremely accurate, straight and right-angled cut is made. The cutting section is rounded off by the marking system in which up to four marking bridges also equipped with Simotion D mark flaws reliably and accurately.

Hans Jennings, Deputy Design Manager at Grenzebach, is convinced by the new concept with Simotion, "By using Simotion, the modularity of the system can also be fully exploited on the control side. This keeps availability very high because failures on one of the bridges (longitudinal or transverse bridge) have no influence on the other bridges and may even be compensated by them. In addition the commissioning is much easier and quicker because the individual modules can be started up separately. An important advantage for us is that the delivery time is reduced considerably by using standard devices.

Another advantage is the improved

troubleshooting; in such a plant concept we can find errors and eliminate them much faster and more accurately. Moreover, innovations in the individual modules can be made without feedback and therefore faster. This means that the machine manufacturer and the plant operator can react faster to changing market requirements and decisively reduce their time to market."

The required homogeneity is naturally guaranteed; Simotion is an integral part of Totally Integrated Automation and thus fully compatible with the Simatic world. Configuration, programming or parameterization – these can all be combined in one system in Simotion and the flexibility in terms of hardware is still retained.

... perfectly adapted to customers' wishes

The longitudinal cutting, transverse cutting and marking bridges are coordinated by a redundantly designed Simatic industrial PC. A master control and optimization computer knows the current status of the line and takes care of the quality and capacity-dependent optimization of the cut. First all the flaws detected in the glass web are reported to the optimization computer with position and classification. The computer then calculates the cutting coordinates based on the reported data and the existing job data and sends them to the Simotion units of the individual bridges via Industrial Ethernet.

Distributed intelligence in the transport

Transport of the glass plates from the cutting section to the predetermined destinations (routing) is a perfect application for component based automation (see also page 4 and 5). The slave transport systems are restricted to just a few basic types (technology modules) each equipped with their own intelligence. Grenzebach's solution at the moment is to use pre-fabricated software modules – one module per basic type – which are available on the line computer and can be switched accordingly. To ensure as high a fail safety of the cutting line as possible, the line control is designed redundantly with a high performance Simatic S7-400H. The Profibus

DP field bus by which the periphery consisting of drives, actuators and sensors is connected to the line control also has a redundant design. The visualization of the entire line is based on the Grenzebach visualization system PC-Panel or the SCADA system Simatic WinCC and runs on Siemens industrial PCs (for example on the Panel PC 670).

Globally active partners

An export-oriented company like Grenzebach appreciates, not only the innovative automation solutions of a partner such as Siemens, but also the optimum diagnostic possibilities – such as the remote system which enables telemaintenance of the plants. Equally important is the local support from the automation provider. A flat glass plant needs to be in operation around the clock for about 12 years. Problems have to be eliminated quickly to avoid interrupting the process. The demands of the end customers on their plant suppliers are accordingly high. Siemens can offer the necessary automation know-how locally worldwide. Grenzebach's expansion into the US market is helped greatly by the support possibilities that Siemens is able to provide there. ■

Find out more:

www.siemens.com/glass

e-mail: glass.team@siemens.com

Simotion increases productivity in the hollow glass industry

Productive, Flexible and Integrated

The Heye International GmbH is using the drive-based variant Simotion D for the first time as a belt drive for transporting glass containers. Simotion provides a motion control system which is practically made for optimum synchronization of the axes and which can be easily integrated in existing plants.

Automation has to deal with demanding tasks in the transportation of glass containers: for example the exact synchronization of the belts to the machine speed, the angled synchronization of belts and reversers and the movement of the feeder. The integration in an existing environment also plays a major role in these factors. The Simotion motion control system represents the ideal solution for the complex tasks of glass manufacture.

An essential factor in the qualitatively demanding production of hollow glass is the exact forming and cutting of the glass drop and the loading of this drop into the production machine. A high-precision motion control with absolute reproducibility is necessary, which is provided by an electronic cam disk. The slightest deviations show up by changes in the weight of the glass mass which in turn has a negative effect on the productivity of the whole production line.



Simotion brings enormous advantages

Together with the Heye International GmbH in Oberkirchen, Germany, Siemens has developed an innovative automation solution initially for belt drives. The globally situated provider of technologies, machines and plants for the container glass industry had the drive-based variant Simotion D435 installed for motion control and logic functions in which all motion control functions are integrated directly in the control mod-

Motion Control system for complex movements

Simotion has a wide range of application possibilities. Stretching from simple speed control right up to complex multi-axis machines in which numerous single axes need to be commissioned. Motion control, logic and technology functions are integrated here homogeneously in one system. This dispenses with time-critical interfaces between the individual components and enables efficient engineering. As an integral part of Totally Integrated Automation, Simotion is fully compatible with the Simatic world. Configuration, programming or parameterization – all these engineering jobs can be combined in one system with Simotion and the flexibility in terms of hardware is retained.

Simotion is made up of three different components: engineering system, runtime software and various hardware platforms

as a target system. The engineering system Scout enables engineering of motion control, logic and technology tasks in a homogeneous system and provides all the tools from programming through parameterization right up to commissioning. An application created with Scout runs on any hardware so that the user can choose the hardware which best suits his machine. Scout also gives users graphic support in creating the hardware and network configuration as well as a graphic programming language (Motion Control Chart MCC). Apart from MCC he also has the high-level Structured Texts (ST) language for programming Simotion and Contact Plans (KOP), and function plans (FUP) for logic programming. The runtime software is flexible and scalable due to reloadable technology functions and enables motion control, logic and technology functions to

be run on one controller. Its modular structure allows the requirement profile to be adapted exactly to the machine's needs.

Simotion runs on three hardware variants: the controller-based Simotion C in S7-300 design is modular and flexible. Simotion P on PC-basis unites motion control and HMI on a single platform and is therefore open for other tasks. Already integrated in the drive, the compact drive-based variant Simotion D is ideal for distributed automation structures. ■



Hege International GmbH

ule of the new multi-axis drive Sinamics S120. The compact 1FK7 servo motors with their robust resolver transmitters ideally supplement the drive range.

The decision in favor of Simotion was not a difficult one. A large number of axes can be controlled and synchronized accu-

rately. The system is also equally suitable for all other plant sections for hollow glass production such as plunger, shears or drop distributor. Previously, every plant section needed its own control system – because of the scalability of Simotion with the hardware and software the machine manufacturer only needs one system. And this is where the enormous advantages of Simotion's homogeneity come in: one engineering system – which reduces training expenses and commissioning – and the homogeneous communication via Profibus – this means not only less wiring work but also fewer interfaces and therefore fewer sources of error.

One engineering system for everything

Simotion Scout is an engineering program for the configuration of typical logic functions as they arise in a belt drive solution – for example control panel evaluation, locks, coolant controllers and auxiliary drive controllers. The control provides the necessary dynamic as well as can be synchronized in high resolution to an external pulse.

The simple handling in case of service makes the system even more attractive. All the configuration data is stored on the memory card of the Simotion D435 head module so that you only have to change the

hardware module if a component of the plant operator fails. Then reconfiguration is not necessary because the new component gets its data sent automatically from a central station. In combination with the worldwide availability of Simotion D and the possibility of teleservice, this helps keep downtimes to a minimum.

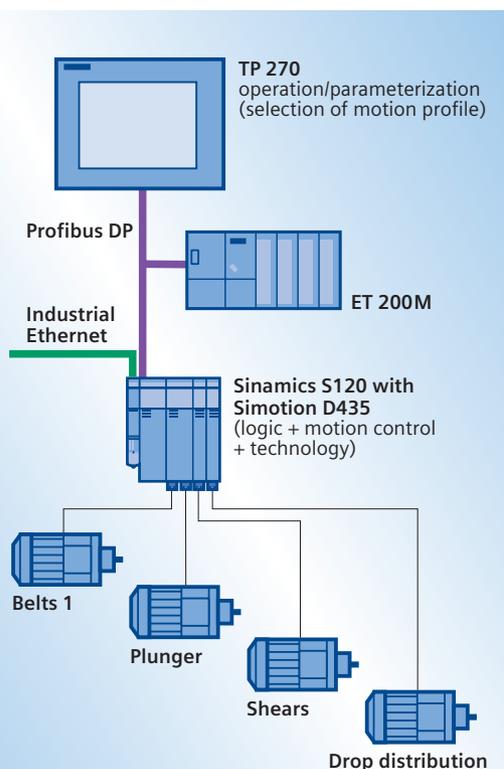
Integration in existing automation

Easy operability is guaranteed by the locally installed touch panel TP 270 based on Windows CE or a master visualization system. Almost unrestricted operation and monitoring is possible thanks to installed interfaces such as Ethernet and Profibus. Simotion D is connected to the main controller and the distributed Simatic ET 200M devices through the standard bus system Profibus DP. Open interfaces and extension possibilities – such as the communication modules for ET 200M – allow simple integration in the existing automation landscape. The openness of the system has a positive effect on the operation because process data, messages or alarms are sent to a master control or the Simatic PCS 7 process control system and where they can be analyzed and archived.

Find out more:

www.siemens.com/glass

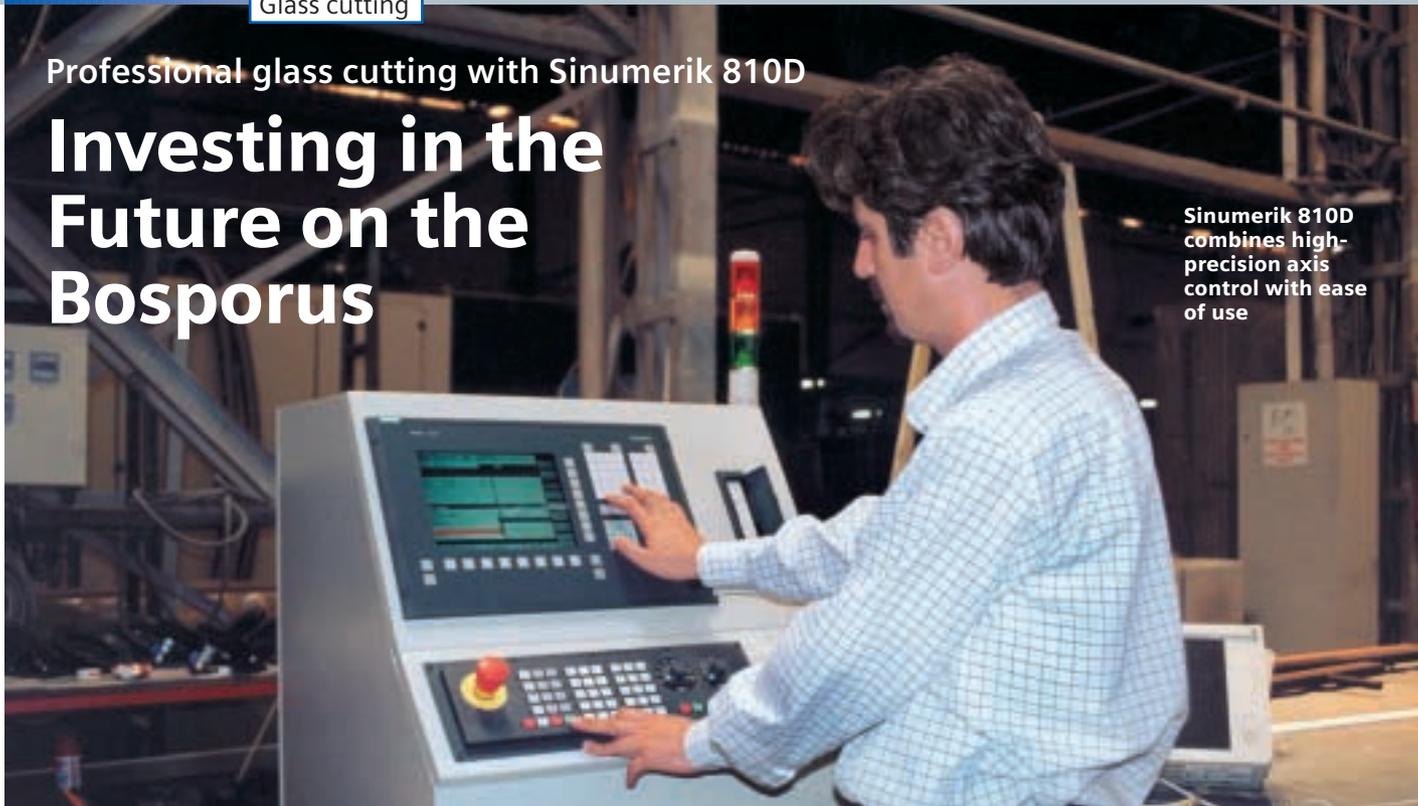
E-mail: glass.team@siemens.com



Professional glass cutting with Sinumerik 810D

Investing in the Future on the Bosphorus

Sinumerik 810D combines high-precision axis control with ease of use



Glass plates in jumbo format can be cut exactly to the millimeter in straight or curved parts on the standalone glass cutting tables made by the Turkish company CMS. Since being upgraded with the modern, compact CNC control Sinumerik, the machines now cut even more accurately and the cutting speed is three times as fast.

The CMS (Cam Makinalari Sanayi Ltd.) company founded in 1995 has specialized in a wide range of machines for the glass industry. CMS took an important step in establishing an even better position in the market with the introduction of CNC technology in a plate-cutting machine over two years ago. Whether windows, furniture glass or flat glass products for buildings, sanitary and automotive industry; The standalone glass cutting table FCL 6032 cuts oversize plates into the most accurate parts with CNC control.

CNC controlled for a better cut

The desired cutting shape is transferred to the Sinumerik 810D controller, which cuts the glass with a cutting wheel along the rail-controlled main axes X and Y. To obtain a perfect result, the cutting wheel, the C axis, has to be guided tangentially. This is

achieved with the integrated tangential control of the Sinumerik 810D. At CMS, the “gantry function”, parallel drive in X direction, compensates for the spindle pitch error or reverse lots, which occur particularly on larger cutting tables. The cutting pressure, cutting oil and cutting speed can be set optimally using speed-dependent analog outputs as well as the Simatic S7 PLC integrated in the Sinumerik. The “look ahead” speed pre-control also guarantees a high cutting speed in short travel sets. The Standard-PC PCU50 has many advantages; it not only enables operation and monitoring (HMI) but it can also run third-party industry specific software, for example, for cutting optimization.

With Opty-Way, the optimization software from Optima, the glass industry has an appropriate tool for efficient glass cutting management – starting from receiving an order right through to delivery. The user

can therefore largely avoid glass waste and use the cutting surface on the glass plate rationally.

Cutting plates more accurately and quickly

Since CMS has been using Sinumerik controls, they claim the quality of the cut glass plates has noticeably improved. Unlike previously used solutions, the dimensions can now be corrected and entered as a correction in the machine. The cutting speed has also increased decisively to 150 meters per second.

The company is very pleased with the growing number of orders as a result.

“We have set the goal for ourselves of becoming a leading producer of plate cutting machines in this industry and are convinced that the cooperation with Siemens will bring us further in this direction faster.” The Istanbul glass machine manufacturer has already set its sights on the next development: a 5-axis edge-grinding machine with the Sinumerik 840D CNC with even more automation and accordingly less personnel involvement. ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Glass grinding with Simatic S7-300 and Simatic MP270

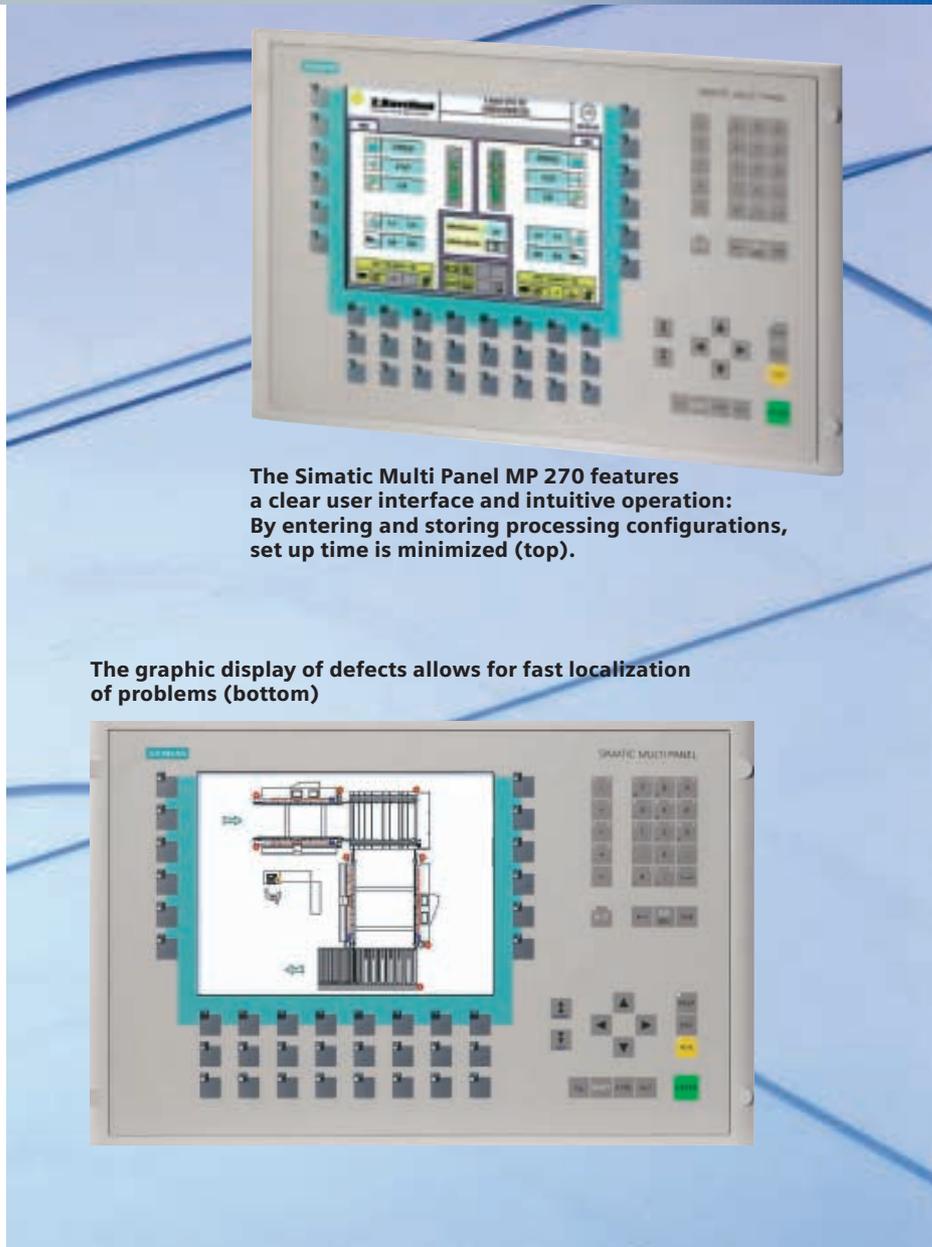
Everything Under Control

The customers of the Italian company Z.Bavelloni are benefiting from a new automation concept which the company has developed specially for its grinding machines in cooperation with Siemens. In addition to the improved human-machine interface the machines are characterized by high dimensional accuracy in glass processing.

Flat glass processing ranks highly in the wide range of machines of the Z.Bavelloni SpA., a subsidiary of the Finnish Group Kyro. The strength of the double-sided grinding machine with cup grinding discs of the VX series is in the processing of building glass. On a base frame made up of two beams with one fixed and one moving cross beam the glass is transported by four individually driven high quality belts which are operated by two maintenance-free compact synchronous motors 1FK7. The Simodrive 611U converters are used here as a drive system. The motors are electronically synchronized and guarantee higher quality running and reliability with lower maintenance costs in comparison with conventional solutions with a drive shaft. Flexible format adjustment of the grinding discs is provided by the distributed drive system Posmo A which is ideally suited for adjustment jobs and communicates easily with the controller via Profibus DP.

High performance paired with easy operation

With the CPU Simatic S7-315 2DP, Z.Bavelloni has considerably increased the performance capacity of its machines. The set-up times have been reduced above all: The operator not only has the possibility of creating and configuring 48 programs in



The Simatic Multi Panel MP 270 features a clear user interface and intuitive operation: By entering and storing processing configurations, set up time is minimized (top).

The graphic display of defects allows for fast localization of problems (bottom)

advance but also of defining and saving 40 processing configurations. For example glass abrasion, feeding speed or grinding quality. An external PC can be linked serially or via an Ethernet network. In this way the solution also enables simple import and export of programs, data and alarms and therefore improves the data storage for monitoring the machine. What Z.Bavelloni admires most about the Simatic S7 is the variety of possibilities for easy integration of sensor systems. Glass measuring sensors which make it easy for the operator to determine the exact dimension of the glasses and therefore ensure that the glasses are ground with high precision can now be connected easily.

With the Simatic Multi Panel MP270 the operator has full control over the whole

grinding line at all times. The Simatic ProTool/Pro visualization software also allows simple, fast, intuitive operation. The operation is also simplified by the ergonomic and multi-lingual user interface. In the event of a faulty plant condition the operator is immediately informed by an alarm in his own language on the screen. ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Pre-Processing



For all sections of the modern plant for automotive glass panes Benteler now only needs a single Sinumerik 840D CNC

New pre-processing line for automobile glass panes

Uniform from Cutting to Washing

Since the Benteler company revised their plant concept the automotive glass suppliers have become more productive than ever. The secret to their success lies in an integrated control and drive technology from Siemens.

grinding machine that can be arranged adjacently in any number and connected to other plant sections. In Iran there are three cutting/breaking tables and three grinding machines including automatic robot feeding, the proven rotary table drilling machine from Benteler and a washing machine. After only ten seconds the discs leave the machine cut to size, ground, drilled and washed.

The side windows of modern private automobiles are becoming lighter and lighter and are therefore taking on increasingly complex shapes – this makes cutting a lot more complicated and time-intensive. At the same time the grinding time is shortened by the increased grinding speed. To synchronize the process Benteler has come up with a very clever solution: the installation of bridges in the plant shortens the cutting and breaking time because the panes can be cut and broken simultaneously. The response to model changes in the automotive industry is also unproblematic: retooling on the cutting table is unnecessary because every pane shape can be broken automatically on the soft base.

The maximum speed in the grinding machine could be doubled because it has been equipped with new vacuums that can be arranged quickly to suit any pane shape by vacuum fixing. Another advantage of the machine is its good accessibility and maintenance friendliness. The new hood – made completely of diecast aluminum – requires only one touch to open for changing the grinding tool or cleaning the nozzle ring.

Cost-effective, industrial production of automobile side windows requires complex systems which only a few manufacturers can offer. One of these is the Benteler Maschinenbau GmbH & Co. KG in Bielefeld. According to the motto “traditionally progressive”, the mechanical engineering division of the company produces plants, machines and tools for the flat glass processing industry. Standard machines and plants are just as much a part of the production range as customized special solutions. A typical example of these

is a plant for cutting/breaking, grinding, drilling and washing automobile glass panes, which was recently developed and built for an Iranian customer.

Modern machines for new requirements

The work processes, from cutting to washing, are known as pre-processing because they are followed by further processes such as bending or hardening. The heart of every pre-processing line is the combination of a cutting/breaking table with a



With the vacuum fixing suckers the grinding machine can be adapted quickly to any pane shape

Any model shape can be cut and broken on the soft base without retooling

All pictures: Benteler



To ensure that all elements of the different machines interact perfectly, an efficient control and drive technology is required.

One controller for all jobs

The heart of the automation is the Sinumerik 840D machine tool controller with high-performance 32-bit microprocessor, up to 10 channels and up to 31 axes as well as an integrated Simatic S7 PLC. It can be assembled from a few components and the specific know-how of the machine manufacturer added for different performance requirements. This is an important aspect for Andreas Lüdtkke, Head of Electrical Design at Benteler: "The scalability of the Sinumerik 840D is very good because we can respond to many different automation tasks with just one uniform controller."

The controller in the Benteler plant is equipped with 4 channels that run an NC program simultaneously and independently. Where, in the past, cutting/breaking and grinding centers had to be equipped with separate controllers there is now just one controller for both. "This brings a technical simplification and a more favorable cost structure", Andreas Lüdtkke explains. With regard to dynamic and precision the Simodrive 611D in conjunction with the 1FK7 compact servo motors meet all the requirements of a modern NC processing. Converters of the Micromaster type are used for transporting the panes that are connected to the Sinumerik 840D or Simatic S7 controllers via Profibus DP. All

the components integrate smoothly into the automation landscape thanks to Totally Integrated Automation (TIA), the uniform configuration and data storage.

Benteler is well known for its drilling station with patented drilling spindle. The compact, fully enclosed unit, which is protected by blocking air even against splash water, is driven by a sliding rotor motor. A torque-free power transmission guarantees a precise feed. A Simovert Masterdrives MC converter controls the digital drive whilst the distributed Posmo A drives take over the x and y movements of the drilling table. Since the frequency converters and controller are directly on the motor in this case, distributed drives considerably reduce costs: they reduce the size of the switch cabinet, require less maintenance effort and are also more compact and maintenance friendly.

Solution à la carte

Benteler relies on Siemens' branch competence for such complex and tailor-made concepts. The joint development of a solution gives the company the insurance that all the components will fit together optimally and guarantees a cost-optimized result. The support from Siemens in commissioning the plant also receives a positive echo: "We accept gladly because we need less time," Andreas Lüdtkke explains.

Benteler write the NC program for the plant themselves. The part currently required for the job is transferred from a

The patented Benteler drilling spindle with Simovert Masterdrives MC and the distributed drives Posmo A



server to the machine control via Ethernet. The program is selected on a Sinumerik panel so that the operator can supply the new program to all other machines from one plant section. ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Laser scribing breaks glass with micrometer precision

Diamond and Metal are Passé

SCHOTT Advanced Processing (AP) has developed a laser cutting technique for display manufacturing which is superior to mechanical glass cutting. Prerequisite for the splinter-free scribing which can be used directly in a clean-room environment, is a highly flexible control and drive technology.

The SCHOTT laser cutting system cuts display glasses under clean-room conditions



The market for flat screens is growing constantly. At the same time the competition in this segment of the market is increasing and the innovation cycles are getting shorter and shorter. The "laser scribe & break" technique of SCHOTT AP, a division of the SCHOTT AG glass company in Mainz, offers several solutions for more rational and flexible display production. In display manufacturing, the glass surfaces to be cut are known as substrates and are usually coated with the electrically active components. Any waste therefore means not only the loss of a glass panel but also of the finished display, which, in the case of high quality and large screens, would mean considerable financial damage.

Since even the slightest contamination of the coating could destroy the display, flat panel production takes place under clean-room conditions. Cutting the glass surfaces to size by the conventional cutting method inevitably produces glass dust.

Laser scribing on the other hand operates without contact. A focussed CO2 laser

beam heats up the glass along the cutting line, which is then cooled down almost instantly. No micro-tears occur on the surface in embrittling and pre-tensioning and practically no micro-particles in the subsequent breaking of the substrate. The laser scribing method is therefore considered dust-free, and the edge produced is extremely precise and stable.

Accurate adjustment to the micrometer

For optimum dynamic, maximum positioning accuracy and minimum load on the clean room, SCHOTT AP uses a Sinumerik 840D controller and the wear and maintenance-free linear motors 1FE3 and torque motors 1FN3. The direct drives therefore meet the requirements of clean room class 1000 and interact optimally with the Simodrive 611D converter system. SCHOTT uses the high positioning accuracy and holding force achievable with this drive technology in its machines for micrometer-precise alignment of the substrate. A camera picks up the coordinates of three printed marks on the glass whereupon the Sinumerik controller can then convert the coordinates of the cutting contour to the individual position of the glass plate.

The intensity of the laser beam is controlled dependent on the track speed for an even cutting depth. A camera monitors whether the intended scribing depth is reached – in case of errors the cutting line can be retraced immediately with adapted parameters. This reduces waste and improves the throughput.

The trend of display manufacturers to shift away from rectangular panels towards more complex shapes, places increasingly high demands on the controller. When cutting narrow curve radii for example, the thermal conductivity of the material also needs to be taken into account in addition to the track speed of the scribing head because the inside of the curve is exposed to a greater heat than the outside. Because of its flexibility and scalability the Sinumerik 840D controller is also ideal for future tasks as far as the scope of functions and performance are concerned.



The difference speaks for itself: Micro-tears are normal in the conventional cutting method (top) whilst the glass plate cut by laser (bottom) has not one single micro-tear

The clean room capability of the laser scribing method and the drive technology used saves the display manufacturer several steps in the process chain such as intermediate inspection, edge grinding and polishing and subsequent washing. The investment and operating costs and the space required by a laser scribing system are therefore less than a comparable mechanical system. The laser scribing is also far superior to conventional methods as far as cutting accuracy is concerned. Edge contours with an accuracy of 50 micrometers are normal with laser scribing in comparison with 100 to 200 micrometers in mechanical scribing.

Flexible conception

SCHOTT AP places great emphasis on finding solutions that exactly meet the requirements of their respective customers. The flexibly designed machines DLC 600, 800, 1200 and 2000 have a modular structure and can therefore be put together in individual line solutions or free-standing processing stations with little engineering

effort. Georg Geissler, Sales & Marketing Director at SCHOTT AP stresses: “We benefit greatly from the openness and flexibility of the Siemens systems which enable us to individually adapt our basic machines and standard solutions quickly and easily to very special customer requirements.” The homogeneous Profibus architecture with its extensive diagnostic functions is just as important to SCHOTT as the compatibility with various HMI systems, for example Windows-based user interfaces. The company especially exploits the possibility of creating user interfaces with Asian languages.

The integration of the SCHOTT laser scribing machine in a Japanese production line with about 100 machines was a challenge. With installation and commissioning deadlines of one to three weeks for the whole production line – as is usual in this market segment – everything has to fit the first time. “One stop automation is therefore very important for us. The openness of the Siemens systems considerably simplifies integration in the whole system. And the fast commissioning of Sinumerik as well as the self-optimizing Simodrives were a big help in meeting the tight deadlines,” Geissler praises.

A homogeneous telemaintenance capability of the control and drive technology is indispensable to the display manufacturers who are producing at full steam and is also offered by Siemens as a standard. Next to their own bases in Japan, China, Korea and Taiwan, the dense service network of their automation partner in Asia particularly is very important to SCHOTT AP. Dr. Christoph Hermanns, General Manager of SCHOTT AP, gives the reason that about 99 percent of all TFT cells are produced in Asia, that is in Japan, Korea and Taiwan. ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Close-to-machine HMI and process visualization with one software

Numerous glass manufacturers and processors are now also using panels for close-to-machine HMI for plant-wide process monitoring with SCADA systems (SCADA – Supervisory Control and Data Acquisition). Siemens previously offered two different systems: Simatic ProTool or ProTool/Pro for the configuration of close-to-machine HMI applications and Simatic WinCC for the process visualization.

With Simatic WinCC flexible, uniform HMI software for all applications is available for the first time. The compatible replacement of ProTool and WinCC takes place in two stages; since 2004, applications for operating units under Windows CE and PC systems under Windows 2000 or XP Professional can be implemented with WinCC flexible, while WinCC remains the Siemens process visualization system. With the second stage projects for the plant monitoring can also be implemented based on WinCC flexible. The existing software products ProTool and WinCC are still available.

WinCC flexible allows universal configuration of all Windows CE-based Simatic HMI operating units – from the smallest Micro Panel right up to the PC solution – with one engineering software. Existing ProTool projects can be taken over compatibly or converted.

The personnel only needs to learn one engineering environment and can configure all visualization tasks with it. Project parts created, for example, for a small panel can be used in other panels or in the master process visualization. High configuration efficiency is ensured by the image modules and intelligent wizards provided as well as by full integration in Totally Integrated Automation by integration in Simatic Step 7, Simatic iMap and Simotion Scout. A simple, intuitively operable interface has been developed with the aid of numerous usability tests in Europe and the USA.



WinCC flexible is the uniform visualization platform for every task whether in close-to-machine applications (left) or control room solutions (right)

The support for foreign language configurations is of interest especially to export-oriented machine manufacturers. The most important terminology in the HMI field is already available in 20 languages and can easily be added to. Comfortable text import and export functions allow ef-

ficient translation. The graphics of WinCC images can be easily transferred to a WinCC flexible project. ■

Find out more:

www.siemens.com/wincc-flexible

Simatic IT optimizes production processes

The success story of Totally Integrated Automation continues with Simatic IT. Full integration, extensive support of all industrial standards and a component-based solution; that is Simatic IT.

With Framework and Simatic IT Components, Simatic IT provides a wide portfolio for successful E-manufacturing.

This integrates all production-relevant applications and activities which enables company-wide communication and coordination. By the exchange and cooperation of various factory plants in a Collaborative Manufacturing Execution Exchange the supply chain requirements can be met efficiently and an increase in performance and production quality achieved.

Simatic IT Framework implements E-Manufacturing and takes care of system integration in a factory, the standardization of the production throughout the company and the adaptation of the production processes to the activities of the supply chain. With its various modules, the framework takes both production-oriented and IT-oriented perspectives into account and thus offers a complete production management solution.

The production modeler is responsible for the entire management of an operation.

It synchronizes and coordinates people, machines and applications. An S95 plant model serves as a basis. The IT server takes care of component integration with each other and in an existing IT environment.

Profinet sets new standards

The increasing importance of vertical integration and the trend towards distributed automation structures both demand a new solution for industrial communication. Profinet, the innovative automation standard of the Profibus User Organization for the implementation of a complete and homogeneous automation solution based on Industrial Ethernet, offers the most promising solution.

Profinet relies on established IT standards and unrestrictedly supports TCP/IP simultaneously for realtime communication. Profinet consists of the solution for the field area (Profinet IO) and the solution for distributed automation (Profinet CBA). Distributed field devices can be integrated directly on the Ethernet with Profinet IO. The master-slave method familiar from Profibus becomes the provider-consumer model. The usual IO view is retained, that means the useful data of the field devices are transferred cyclically to the process simulation of the controller. This protects the investments of machine and plant manufacturers and device manufacturers in changing over to Profinet. The heart of

Profinet CBA is a component model. It is used in distributed automation systems and is ideally suitable for intelligent field and automation devices with programmable functions.

Solutions for realtime, Motion Control and safety

The realtime communication in Profinet is scalable according to requirements: Real Time for standard applications transfers realtime data in response times which correspond to the performance of today's field buses. The Isochronous Real Time (IRT) with its extremely short response times is suitable for fast clock synchronous Motion Control applications. With IRT it is possible to handle multi-axis machines such as they occur for example in IS forming machines with just one bus system. In this way 150 drives can be operated at a cycle time of one millisecond whereby a data rate of six Megabyte per second is even available for IT applications with TCP/IP protocol. The Profisafe profile already proven in Profibus will also provide for uninterrupted safety of man and machine in the Profinet. ■



Find out more:

www.siemens.com/profinet

www.profibus.com

With the Production Modeler, for example, it is possible to create a line configuration of a cutting line graphically from a pre-fabricated library, parameterize the respective units automatically and generate a configuration file. Changes in the configuration can be converted easily later in the Production Modeler.

The standard products Simatic IT-Components provide a number of functions for executing production such as material tracking and history, preventive maintenance, batch management and many other components. ■



Find out more:

www.siemens.com/simatic-it

Torque motors – new direct drives for the glass industry

More and more accuracy at high torque and low speed – those are the demands on high-tech machines in all industries. So-called torque motors are ideally suited as direct drives for all rotational axes with high torque and low speed.

For example, torque motors are used in the glass industry for driving rotary tables.

The drives work without mechanical transmission elements such as clutches or gears. They can be integrated directly in the machine structure. The advantage is an extremely compact structure, in addition unnecessary elasticities and transmission problems are avoided. The minimizing of total mass and friction forces also increases the overall efficiency of the motors as well as the machine dynamic. At the same time the repetitive accuracy and positioning accuracy are improved.

Torque motors are available in two versions: as built-in or complete torque motors. They have the water-cooled stator with three-phase current coil and the rotor with permanent magnet and hollow shaft in common. In the case of the built-in torque motor, the stator and rotor are delivered separately for installation in the machine.



Torque motors get by totally without mechanical transmission elements

The complete torque motor consists, as the name implies, of a ready-to-assemble unit with its own mounting and integrated sensor system.

To suit various requirements, stators with external diameters of 230 mm to 730 mm are available. These cover a torque range of 100 Nm to approx. 7,000 Nm. The reference speeds are in a range from approx. 250 to 500 rpm at low torques, up to

approx. 50 to 150 rpm at higher torques and large external diameters.

Together with the proven converter series Simovert Masterdrives Motion Control and Simodrive 611 the torque motors represent another milestone in the Siemens drive technology range. ■

Find out more:

www.siemens.com/drives

Cabinets from A to Z

The Chemnitzer Werk für Kombinationstechnik (WCK) offers tailor-made solutions dealing with automation technology. The switch cabinet builder provides one-stop services – from consulting on hardware and software configuration right up to commissioning. Today about 420 people produce more than 9,000 switch cabinets a year in the factory, which was founded in 1992. The recipe for success of the Chemnitz company is their wide range of products and services with which they can meet various customer requirements.

But the customer benefits from having a single partner for the switch cabinet design cycle even more than from the wide

product range. Configuration with the necessary products begins after customer-specific consulting. If necessary, customer-specific auxiliary modules can also be developed and produced on the same site. The sophisticated material logistics and procurements concepts specially adapted to his requirements and the appropriate supply chain management help the customer to save costs.

In production, every order is accompanied and executed completely by special customer teams. Favorite suppliers ensure considerable price and logistics advantages. The machine manufacturer can choose different service packages for the electrical testing with which he can optimize his process costs. That means he gets pre-tested total equipment on request. The delivery logistics are also adapted to the customer requirements. One example of



A look at the switch cabinet production in Chemnitz

this are the ship-to-line concepts for different customers. WCK fitters also provide local support for assembly and commissioning on request. ■

Sinamics: the new drive generation

With the Sinamics drive system integrated in Totally Integrated Automation all Siemens drives will have a common software and hardware platform in the future. Several Sinamics drives can be combined easily in individual drive solutions without any great engineering effort with the common configuration and commissioning tools.

Based on typical reference data the user can select the type and size of suitable drive with the Sizer configuration tool. The Starter tool provides optimum support in the commissioning and testing of the drive solution.

The Sinamics S120 is a modular drive which is particularly suitable for multi-axis applications. Several axes are managed by one common control and supply module. The central control module of the Sinamics S120 performs the drive control for all connected axes throughout and is responsible for the technological links between the axes. Sinamics S120 contains both servo and vector control. All components including the motors and the encoders are connected with each other via a common interface, the Drive-Cliq. Transformer modules for the conversion of conventional encoder signals to Drive-Cliq are provided for OEM motors or retrofit applications.

Sinamics G110, the smallest frequency converter for variable speed drives in the Sinamics family, has been developed for single-phase mains at 200 to 240 V with a power range of 0.12 to 3 kW. It is available in several versions with analog input or RS485 interface. Three digital inputs ensure great flexibility. An integrated DIP switch sets the drive to 50 or 60 Hz so that Sinamics G110 is ideally prepared for global application.

Finally, Sinamics G150 was developed for pumps, fan and compressor drives. It controls the speed of low voltage asynchronous motors with outputs between 75 and 800 kW and is the world's quietest and most compact converter in the standard switch cabinet at the moment. ■

Find out more:

www.siemens.com/sinamics



The first members of the new Sinamics family: Sinamics S120 (left), Sinamics G110 (right) and Sinamics G150 (in the background)

To simplify clear identification of all the modules used in a machine, every component of the Sinamics S120 is equipped with a digital rating plate containing all the relevant technical and logistic data. These values can be called electronically locally and by tediagnosis to greatly simplify drive servicing. The large mains voltage range of 380 to 480 Volts allows worldwide utilization.

Repair service

To ensure that costs are always within the planned scope and therefore remain calculable for the machine manufacturer, Siemens offers a Repair Service Agreement (RSV). This agreement offers the machine manufacturer worldwide troubleshooting at a reasonable price – even at the plant operator's.

The RSV contains the following services: provision of service personnel, error diagnosis and troubleshooting on site as well as certification of fault elimination.

The agreement runs for 12 or 24 months.

Interested? Just get in touch with your contact partner. You can find more about Siemens support solutions also on page 38. ■

Find out more:

www.siemens.com/automation/support

The story continues: New features in Simatic PCS 7

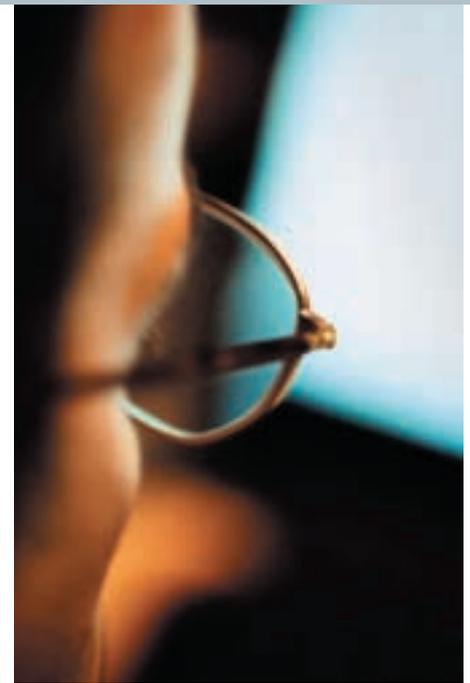
Simatic PCS 7 has been used successfully as an efficient process control system within the scope of Totally Integrated Automation for many years – in more than 3,000 projects worldwide. The new version 6.1, with numerous new functions and features, is now continuing this success story.

Thanks to the smooth integration of plant asset management in Simatic PCS 7, plant operators are able to recognize potential problems in good time so that production failures can be effectively reduced or avoided altogether.

Easy access to Simatic PCS 7 via standard PCs is supported by the new OS-Web function. For this a web server is installed on a PCS 7 client through which standard web clients can then monitor and supervise the process via intranet or Internet – from anywhere in the world, using standard PC technologies. Access can be protected by a password, firewall technology, and also individual application concepts designed to meet a plant's specific safety requirements.

So-called floating licenses support a parallel user model – any number of installations are allowed, but with restrictions on the number of users who can work with the software simultaneously. Enterprise licenses are offered for large-scale users. With rental licenses, the software access expires after a certain number of operating hours – an attractive alternative for projects with a time limit, which is typical for engineering tasks. Finally, with a trial license the user is given access to the software for demo, testing, and evaluation purposes for a limited period.

The PCS 7 system bus can now also be operated with transmission speeds in the gigabit range – an important aspect for very large plants and when several plants are networked on one site. Gigabit technology is available both for optical and twisted pair networks and can be designed in redundant and double redundant ring technology in order to considerably increase the network's performance and



availability. Usability and handling of all system components have been improved, and transmission and loading times have been reduced – in some cases by half.

Simatic PCS 7 version 6.1 still runs under Microsoft Windows 2000 but also under Windows XP. ■

Find out more:

www.siemens.com/pcs7

E-mail: glass.team@siemens.com

Full power: Integrated solutions for energy supply

The choice of new sites for glass production depends not only on closeness to the market but also on the availability of appropriate high-voltage electrical networks of sufficient quality.

Siemens is now offering products, systems, and solutions for energy supply for glass production, including the associated engineering services.

Utilities such as energy supply systems should be designed compactly to minimize factory space requirements. SF₆ switching systems on the high- and medium-voltage

level need only one-third the space of conventional switching systems. In addition, the 8DJ, 8DH, and NXPLUS C SF₆ switching systems are climate independent and maintenance free. Air-insulated switching systems in the NXAIR series are distinguished by their modularity and performance – a short-circuit rating of up to 50 kiloamperes and a rated current of up to 4,000 amperes.

The switching systems also meet a second basic requirement of the glass industry: availability and reliability of the energy



For all situations: A wide range of process instrumentation equipment

High availability, high reliability, and precise results are the three basic requirements of the glass industry for process instrumentation. Another important aspect is a high degree of standardization to keep spare parts stocks and maintenance expenses to a minimum. The aim is to be able to cover the entire glass production process with just a few process instrument types.

Due to the consistent development of its products and the acquisition of well-known specialist companies, Siemens today offers a wide range of sensors and measuring instruments for almost all applications.

With Siwarex in its portfolio, Siemens has products for dynamic weighing as well as static weighing, including belt scales, proportioning belt scales, and deflector plates. The latest addition to the weighing systems is the new Siwarex FTA weighing processor, with an integrated high-precision proportioning control and batch system.

For level measurements in silos and bunkers, Siemens offers, in addition to ultrasonic sensors, radar instruments such as the Sitrans LR 400, with which the level can be measured accurately to the millimeter in silos with a height of up to 45 meters.

With its acquisition of the Danfoss Flow Division, Siemens has added to its portfolio of instruments for pressure, flow, and temperature measurements, as well as position controllers, process controllers, and recorders. New, for example, is the mass flowmeter, using the Coriolis principle, for flows of 65 to 510,000 kilograms per hour. The 0.1 percent tolerance of the Sitrans FC MASSFLO and the repetitive accuracy guarantee maximum quality and low waste.

The MicroSAM compact gas chromatograph has a diameter of only 26 centimeters and can be used directly in the process – for example, for determining the exact calorific value in gas-fired ends. The LDS 6 laser diode spectrometer that, for example, measures oxygen directly in the ex-



haust gas is a further step toward closeness to the process. ■

Find out more:

www.siemens.com/processinstrumentation

E-mail: glass.team@siemens.com



supply. The choice of transformer size for consumers should therefore also be designed in accordance with the n-1 rule in order to avoid network problems in the event of failures.

The standardized Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) system platforms enable the energy supply and the process to be monitored continually. The continual recording of consumption forms the basis for a substantiated load forecast and optimization of energy consumption. All operating data

relating to the energy supply can also be transferred to the glass production process control system so that the production manager can identify trends at an early stage and take appropriate action.

Siemens has created an open platform that is also compatible with other systems and therefore enables extensions and integration of OEM systems. ■

Mehr zum Thema:

www.siemens.com/ptd

E-mail: glass.team@siemens.com

Automation of a float glass line with Simatic PCS 7 at Saint-Gobain in France

Transparency and Reliability

The Chantereine plant of Saint-Gobain Glass France primarily produces float glass for the automotive industry. The melting furnace of the plant in the French city of Thourotte was replaced during the cold repair in 2001. By adopting the Simatic PCS 7 process control system, the company was able to secure its investment in the infrastructure.

The leading European glass manufacturer Saint-Gobain was founded in 1665 and has produced such famous glass constructions as the Galerie des Glaces in the Palace of Versailles and the pyramid of the Louvre.

Transparent or colored glass is made in a float glass line in France and then, depending on the application, processed further in the building or automotive industry. The manufacture of colored glass requires a higher heat supply than normal

flat glass. Changeovers during production also cause heat shocks, which are often the cause of material fatigue and reduce the life of the furnace. Statistically speaking, Saint-Gobain must renovate one and a half float units every year in its 26 float glass plants worldwide.

Uniform solution

In Chantereine the float lines were modernized and the power distribution for medium and low voltage and the digital control system upgraded. The Teleperm M control technology was also migrated to Simatic PCS 7. The new control system now controls the entire plant, from the composition of the raw material mixture to the end of the cooling Lehr. In the production control room the personnel can control and monitor the processes in the batch section, on and in the melting furnace, in the float bath, and in the cooling Lehr, including the utilities from the operator stations.

The operator stations communicate with each other via an optical Ethernet network. Two PCs serve as a server and manage the database containing all the information collected from the automation systems. Via a Fast Ethernet network, the servers communicate with the automation systems for the furnace, the burners, the top rollers, and the power distribution for the factory.

Two Profibus DP bus systems connect the process control system to the systems in the process, where distributed Simatic ET 200M and ET 200S devices are used as I/O. Profibus PA is used for connecting the process instrumentation.

Another unit of the float plant is also connected to the process control system via Profibus DP. The switchgear cabinets for the power transmission and distribution systems are equipped with Sentron WL

Global Partners: Saint-Gobain and Siemens

Saint-Gobain has been producing glass for 300 years – and can therefore rightfully claim to be one of the oldest industrial enterprises in the world. What began in a small glass foundry in France is today an international group that is present in almost every country in the world, producing – in addition to glass – ceramic materials and materials for the building industry. The company's sales totaled 29 billion euros in 2003.

Think global, act local – this strategy, which Saint-Gobain pursues consistently with its own production in 46 countries, is one of the company's key strengths. "It is an important part of my job to help implement this motto, both in Saint-Gobain and Siemens," says Olivier Vincent, international account manager for Saint-Gobain at Siemens.

"That means I work closely with the local teams on the projects and at the same time keep an eye on the global aims of the Saint-Gobain Group. I am the one person responsible for all questions regarding our collaboration with Saint-Gobain – regardless of whether it is a project in Asia or a

strategic decision for a specific technology. Saint-Gobain is more than just a customer to us. We see our cooperation as a long-term partnership, and this is also how I am working with the teams at Siemens and at Saint-Gobain – as a partner."

This joint approach has proven itself in more than 100 projects that Saint-Gobain and its subsidiaries have completed with Siemens since 1956. In the last few years, more than 15 projects used Simatic PCS 7 as an automation solution, including plants for hollow glass, float glass, cast glass and glass wool.

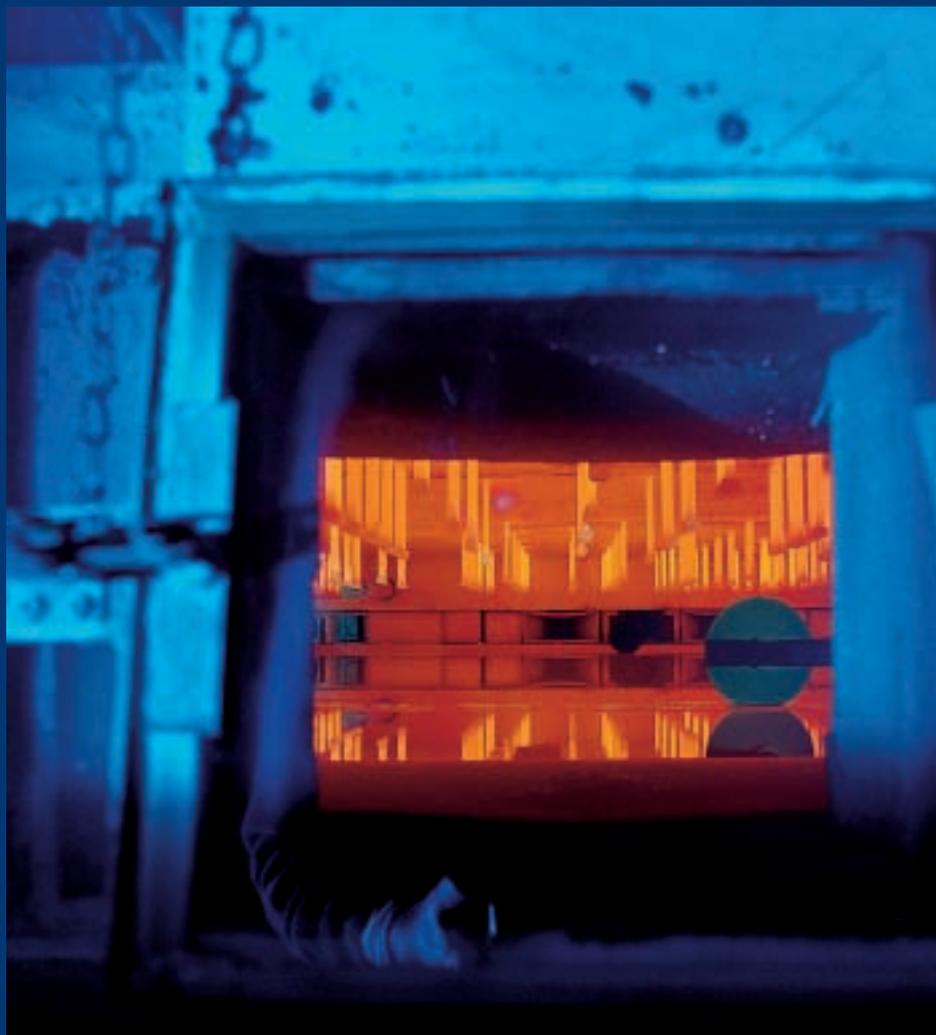
Several of the plants are located in the world's emerging glass markets such as Russia and China, where technology and glass expertise has to be combined with local support. Siemens – a global player just like Saint-Gobain – can offer just that, plus the possibility of standardizing on proven and integrated solutions on a global scale, based on Totally Integrated Automation with the process control system Simatic PCS 7. Together with Siemens, Saint-Gobain has all the means to face another 300 years of successful business.

The Float Process

Just like every other type of glass, float glass is made of sand, soda, and lime, which are mixed, wet, and melted. What makes float glass special is the specific shaping process. The Float process was introduced to the public for the first time on January 20, 1959, and has since, in a few variations, become by far the most important glass producing process.

In the float process, the melted glass flows from the end of the melting furnace at a temperature of about 1100 degrees Celsius into the float bath. There, the glass spreads evenly on a surface of liquid tin. The top rollers and the speed at which the glass is drawn off determine the thickness of the continuous glass ribbon, that usually varies between 1.6 and 19 millimeters.

The glass ribbon is cooled slowly and evenly to room temperature in the annealing lehr and then cut into plates that match the requirements of the current orders. Large lift-off devices then store the plates on vertical racks.



circuit breakers and the Simeas P low-voltage monitoring systems. Other thyristor power switches with a rating of 150 to 250 kilowatts guarantee the additional electrical heating of the float bath.

The switches can be integrated easily with the Totally Integrated Automation concept and also communicate with the automation system via Profibus DP. Around 20 Siprotech 8DH10 protection devices are responsible for the 20-kilovolt power supply to the plant. These components are also connected to the Simatic PCS 7 process control system via Profibus DP.

Higher performance, lower costs

In the glass production process, 60 smart digital Sitrans sensors were installed for the

first time to measure pressure, flow, and temperature. These are connected directly to the control system via Profibus DP. Jean-Paul Rischmann, head project engineer at Saint-Gobain, particularly admires the speed at which the sensors can be commissioned: They can be calibrated and programmed through PCS 7, which “saves a considerable amount of commissioning time.”

With the selection of Simatic PCS 7, Saint-Gobain Glass has chosen a future-safe process control system that can be linked to the IT level of the company – and all with comparable or even better performance than the previous system. Rischmann particularly stresses the economic advantages of the migration from

Teleperm M to PCS 7: “Up till now the plant was controlled by a Teleperm M system from Siemens. The installation of the PCS 7 system meant that the majority of the older peripheral devices could still be used, and thus the costs for the conversion were kept low.” ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Cold repair of two float lines at Saint-Gobain Germany

Prepared for the Future

In the past two years, two float lines at Saint-Gobain Germany have been modernized with the Simatic PCS 7 process control system as an integral part of Totally Integrated Automation during scheduled cold repairs. Both sites benefit from the high level of integration the new solution offers.

The cold repair in the float plant at the Stolberg factory was carried out in the first half of 2002. With the conversion of a standard float line into an extra-wide float line, the plant in Stolberg – which has been producing float glass for 30 years – has become one of the most modern in the world. It is the fourth line at the Saint-Gobain site in Stolberg and produces float glass destined mainly for the automotive industry.

The cold repair of the float glass plant at the Cologne-Porz factory was performed in the second half of 2003. Increasing the volume of the melting end has made the line in Cologne-Porz one of the largest float glass plants in the world.

The melting furnace in Stolberg was officially refired on May 21, 2002, and in Cologne-Porz the melting furnace officially began operation on October 21, 2003. Saint-Gobain Germany also took the opportunity of the cold repair to bring the electrical equipment up to date at both sites. In modernizing the control system, the company pursued clear goals. Great emphasis was placed on a modern control concept with high availability, which also provides a platform for future expansion.

Uniform long-term solution

Saint-Gobain awarded both automation projects to Siemens – not least due to the fact that Siemens had the necessary industry know-how to perform a general overhaul of the automation technology during the cold repair of the float line. The good price/performance ratio of the Siemens solution with Simatic PCS 7 and the good support from account management were also decisive factors.

Siemens delivered not only the components for the control system and devices for the process instrumentation for both projects but also managed the technical as-



essment and compilation of the specification as well as the hardware and software engineering.

PCS 7 was able to demonstrate all its strengths, both in Stolberg and Cologne-Porz. In both cases, existing plant units such as utilities were easily integrated into the new control system. The field devices were also easily connected to PCS 7 via Profibus DP and PA.

Within the scope of the standardization and optimization of spare parts stocks, Saint-Gobain made sure that the drive solutions were also standardized. After extensive comparisons, Saint-Gobain chose Simovert Masterdrives for both Porz and Stolberg. All the drive components were connected to the control system via

Profibus DP. Siemens was also contracted to design the respective control centers from which the individual plant sections are operated and monitored.

Double score

The two new lines have been in operation for quite some time now, and Saint-Gobain Germany has not regretted choosing Siemens. Both the implemented technology and the Siemens support lived up to all expectations. ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Simatic PCS 7 implemented in the glass container division of Saint-Gobain

A Series of Successes

The production of glass containers for packaging is without a doubt one of the most fiercely contested markets at present. A company wishing to be successful in this market must consistently optimize its plants, exploit synergies, and use technical progress to its advantage – both in terms of development of new products and optimization of the plants. For this reason, at Saint-Gobain Oberland AG the automation technology has been consistently modernized with Simatic PCS 7 for several years.

Saint Gobain Oberland AG has been synonymous with expertise in the glass industry for decades. As an independent subsidiary of the french Saint-Gobain Group, Saint-Gobain Oberland is a leader in glass container production. In Germany, Saint-Gobain Oberland runs four factories: in Bad Wurzach, Neuburg, Essen, and Wirges.

At the Wirges site, Saint-Gobain Oberland replaced the existing automation of a furnace in 1999 with the Simatic PCS 7 process control system. This made the Wirges factory a pioneer in the Saint-Gobain Oberland company at that time.

The openness and high degree of integration of Simatic PCS 7 was a particularly decisive factor in the selection of the Siemens technology as well as the price/performance ratio and the long-term investment security. PCS 7 relies on the proven components from the Simatic product line and therefore has a very sound technological basis.



The first in a series of successful projects

The pilot project in Wirges was so successful that Saint-Gobain Oberland soon began other projects with Siemens – also at other sites. At the Neuburg site, where glass containers are produced for the food and beverages industry, the company decided in 1999 to modernize the control system by implementing Simatic PCS 7 during the next scheduled cold repair of a furnace. The contract included the delivery of the hardware, the engineering, and the commissioning, which was completed successfully and on time in February 2000.

After the successful conversion to Simatic PCS 7, it was only logical to implement PCS 7 for the other melting furnaces in the following years.

Trend toward standardization

Additional projects have been completed successfully in Wirges. In 2003, the decision was taken to modernize another furnace with its corresponding feeders as well. Siemens received the order to convert the automation in 2003 and will complete the work this year.

These projects for the glass container division of Saint-Gobain continue the trend of using PCS 7 as a standard solution in the glass industry. ■



Easy monitoring and control through the PCS 7 operator stations



Glass containers for the food and beverages industry are the main market of Saint-Gobain Oberland

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Experience and industry expertise convince Isover

Multinational Teamwork

Doing a big project in Russia with five companies in four different countries – still almost a routine job for Siemens, which took on the project management for a new glass wool plant for Isover under these conditions. A successful project for a similar plant in Poland, extensive experience in the Russian market, good relations with technology partners, and, last but not least, a cooperative customer all contributed to the successful completion of the project – which in turn prompted Isover to continue its partnership with Siemens.



All pictures: Isover

The TEL process

The raw material for glass wool is ordinary sand, which is mixed with melting agents and recycled glass and melted at 1450 degrees Celsius. The glass melt is fiberized on a spinner in the TEL machines. The fibers are treated with binding agents (to give cohesion and mechanical properties to the glass wool) and formed into a fiber mat. The special TELSTAR process used exclusively by Isover produces particularly long and soft fibers that have very good insulating properties.

The continuous fiber mat strand then passes through a curing oven, where it gets its final shape, strength, and stability. The finished fabric is then coated, cut, and packed either as batts, slabs, or rolls.

Isover: Experts in insulating materials

Isover is the primary global brand of the insulation division of the French glass manufacturer Saint-Gobain. With a market share of 30 percent in Europe and 20 percent in the United States, Isover is the world's leading name in insulating material for building.

Isover is represented in 35 countries worldwide and produces glass and mineral wool and thermal and acoustical ceilings at 37 sites. Isover also produces insulating foams that are developed in partnership with major chemical companies.

Last year, the company, which currently employs about 9,000 people, achieved sales of approximately 1.9 billion Euro.

Starting in 1996, Isover has been active in the Russian market for eight years and is the second largest supplier of insulating materials in Russia. Isover has benefited from the rapidly growing demand for insulating materials in Russia and neighboring states, and about two years ago the company decided to build its own production site in Russia. The new plant was to be built on an old industrial site in Yegorievsk, near Moscow. From the very start, the project was geared toward future growth. Initially only one line with a capacity of 20,000 tons of glass wool was to be built. However, the plant's premises are large enough to house further glass lines.

International project team under experienced management

The new plant was built by Isover Oy of Finland, in cooperation with Isover Russia. The plant uses state-of-the-art technology to ensure efficient and reliable production. An energy-saving melting process, sophisticated TEL machines, and efficient and reliable automation technology were planned and implemented by an international project team.

Siemens was responsible for project management in the areas of automation, process instrumentation, and valve technology, including the corresponding engineering and services. The fact that Siemens had already proven its industry and project expertise in other Isover plants, for example in Poland and Germany, was a decisive factor for Isover in placing this order.

The Siemens project management team worked in close cooperation with Russian engineering consultants Sinetic, who took over the responsibility for local installation of the systems. Siemens contracted its technology partner STG Cottbus GmbH to create the application software and supervise the commissioning and installation of the systems on site. An Austrian company supplied the valves, Siemens Germany provided the Simatic PCS 7 system and the entire field instrumentation, and Siemens Finland delivered the cabinets and operator panels for the process control technology.

"Coordinating such a multinational project is always an immense challenge," says Dirk Richter, Siemens project manager for the plant in Yegorievsk. "We had to coordi-

nate all units that were in our responsibility along with the activities of the local Russian companies and our own subcontractors. In addition, the Russian market has a number of peculiarities that demand special expertise." Siemens has been extremely active in the Russian market for several years and therefore possesses the necessary licenses and permits – another advantage of working with Siemens, as Isover confirms.

Uniform automation technology

The Simatic PCS 7 process control system is used throughout the plant. The systems in the process are connected to the control system via Profibus DP – including Sitrans PS 2 positioners, which control the valves in the plant, among other things.

The uniform system architecture offers Isover several advantages. The work involved in the commissioning and fine adjustment of the individual units is reduced considerably, and maintenance and servicing of the plant are also simplified. At the same time, Isover can be certain that both the process control system and the process instrumentation can be extended or modified at any time – an important aspect, especially in a plant that was geared toward growth from the very outset.

Project completed successfully

The whole project went off perfectly. The plant went into operation in October 2003 and was producing at full capacity within a very short time. This was due not least to Siemens' international project expertise. Together with Isover, Siemens always managed to make the right decision when difficulties arose or when modifications were necessary.

In June of this year, Isover decided to expand its activities in Russia even further. A second production line is presently under construction and has been designed from the start so that its capacity can easily be doubled. With this new line operating at maximum capacity, production in Yegorievsk will be more than tripled. For the new project, Isover again put its trust in Siemens' competence and appointed the proven team as project managers. ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com



Glaverbel automates glass production with Simatic PCS 7

Local Expertise

For the automation of a new glass line in Russia, Siemens was able to win the client's trust with its extensive local experience and clear technology expertise.

Glaverbel, as the European branch of the Asahi Glass Company, is a member of a leading global association of glass-producing companies. By the mid-1990s, Glaverbel had identified the huge development opportunities offered by the Russian market and acquired a holding in the country's largest glass manufacturer, Bor Glassworks. Since then, the company has concentrated on massively expanding glass production in Russia in order to meet the expected rapid increase in demand in coming years.

The company's most recent project are production lines for float glass, coated glass, and mirrors in Klin near Moscow, involving a total investment of 150 million euros. Siemens also has a significant role in the project.

Know-how in Russia

Siemens was commissioned to handle the project management because of its long-standing experience of co-operation with the glass industry, and because of its extensive knowledge of the applied processes in Russia. The size of the order comprised the complete engineering, installation and commissioning of the plant. Siemens supplied all of the automation and drive engineering, the field instrumentation and the entire power supply infrastructure. In addition, the responsibility for the integration for the components of all of the sub-suppliers was handled by Siemens. The core component for the solution as part of the Totally Integrated Automation (TIA): Simatic PCS 7

Glaverbel and Siemens have already worked together successfully on previous projects, including the establishment of glass plants in Iran and in Mol, Belgium. Philippe Mary of Siemens in Brussels says: "Siemens is an international partner of Glaverbel. We were able to convince the Glaverbel experts of our qualifications by taking them to a few reference projects.

Siemens' long presence in Russia also proved to be of considerable benefit."

Another contributing factor in the decision was the fact that Siemens works with partners who have a very good reputation in their respective fields of expertise. These partners include AEG as the supplier of the heating system for the float bath and STG as the provider of the process control for the melting furnace.

"Glaverbel clearly valued our expertise in the glass industry. Another crucial point in our favor was the Russian project management approach we use," explains Philippe Mary. Guy André, manager of the Glaverbel project, concurs. He also cites the efficient method of cabling and the outstanding relationship between quality and costs. The excellent on-site logistical support in Russia, facilitating the speedy implementation of the project, was also a deciding factor for Glaverbel.

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com



Modernization of a float line at Cardinal in the USA

A Hot Project during Cold Repair

The cold repair of a glass plant provides an opportunity to update automation technology. Cardinal Glass in the USA decided to install a consistent and redundant process automation solution based on Simatic PCS 7 at one of its float glass plants.

With more than 4,000 employees, 18 production sites, and 2 in-house research centers, Cardinal Glass is one of the leading glass producers in the USA. The company is considered to be exceptionally innovative and has made a name for itself in the field of double-glazing for the construction industry.

As part of a cold repair carried out at its float glass plant in Menomonie, Wisconsin, Cardinal also wanted to update all the plant's automation technology. Specifically, Cardinal needed to implement an integrated solution for the batch house, melting furnace and the cutting line of this plant, which has an output of over 550 tons of glass per day.

Cardinal selected the Simatic PCS 7 process control system, a homogeneous and integrated solution that is ideal for the requirements of glass production. Specifically, the PCS 7 solution provides the redundancy and reliability necessary to sustain continuous glass production.

Redundancy from A to Z

The process control system is redundantly configured in order to provide maximum

availability – including the server and controller processors. Siemens is also providing all the programming and installation of the system, as well as supplying the fully integrated controllers for the heating systems and more than 30 transmitters for the pressure and temperature values.

The project began in the summer of 2003 with a comprehensive on-site analysis of the plant and will conclude at the beginning of 2005 with in-depth training of plant employees.

Upon completion of the project, Cardinal will have at its disposal an integrated, uniform technology that brings together the entire production process in the hot end under a single operator interface, which will not interfere with production if individual components break down. Cardinal is already very satisfied with the project implementation and is convinced that by choosing Simatic PCS 7 as a solution, it has assured the cost-effective operation of the plant for many years to come. ■



The Menomonie plant has an output of 550 tons of glass per day

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Simatic PCS 7 automates glazing system production

Stepping into the Future

The Profilit™ glazing system from Pilkington is rapidly moving beyond its original purely industrial function and becoming a design-oriented element in modern architecture. This development has spurred a fundamental modernization of the company's process control system.

Architects have long known Pilkington Profilit™ as a product to be used for glass facades. Now, however, demand for the glass is increasing as its role expands to include more decorative functions. The Profilit™ system consists of self-supporting glass channels that are manufactured at Pilkington's building glass plant in Schmelz, Germany, using a specially developed mechanical rolling process.

As part of a recent cold repair, Pilkington subjected the entire production site to a comprehensive refit before refiring the

and utilities such as the compressor station and hydrostation were a key part of the upgrade. Pilkington decided to work with Siemens on the implementation of the project and chose the Simatic PCS 7 process control system.

The fully redundant system permits the uniform control and monitoring of the entire production process from one control room. It is accommodated in four standard cabinets and is expanded by process instruments such as Sipart controllers, Siwaxex weighing system, Sitrans P pressure transmitters, Sitrans FR flow meters, and Simovert Masterdrives.

Siemens was responsible for the implementation of the entire project, including the development of the circuit diagrams, the cabling, the software configuration and parameterization, and the commissioning of the entire system. Simovert Masterdrives VC control the transport of the raw glass within the shaping machine and in the annealing lehr. Their functions are also integrated into the PCS 7 interfaces.

Experienced project management

Pilkington was very satisfied with the experienced project management provided by the Siemens team and was able to start operations on time with no problems. From a technological viewpoint, the company has now set a course for the successful manufacture of its unique product, which began life as purely industrial but which is now well on its way to becoming a creative design element in modern architecture. ■

new melting furnace in April 2004 and continuing with the production of glass elements.

Entering the 21st century

According to production manager Christoph Claesges, the technical upgrade of the plant has enabled profiled glass production to take a step into the 21st century, adapting Pilkington Profilit™ to future market requirements. A new control system for the melting furnace, shaping unit,



Pilkington

Pilkington

Find out More:

www.siemens.com/glass

www.profilite.com

E-mail: glass.team@siemens.com

Excellent cooperation with Guardian Industries Corp.

Several in a Row

The glass industry depends on extremely reliable production processes. This means that the industry tends to use only proven innovative technology built and commissioned by reliable partners – such as Siemens, who has implemented a sustainable, innovative automation solution for Guardian at several sites in Europe and Saudi Arabia.

As a rule, the glass industry relies on solutions that have proven themselves over decades. However, in cooperation with the melting furnace specialist STG from Cottbus, Siemens has been able to introduce a range of innovations offering clear benefits in process control, which have since become accepted as the new industry standard. The trigger for this change was a range of projects undertaken for Guardian in the UK, Poland, Spain, Luxembourg, Saudi Arabia, Germany and Hungary. Siemens implemented a new control concept in these applications.

One of these projects was the Guardian float glass plant at Goole in the UK. With a capacity of more than 600 tons per day, the plant produces all strengths of glass for the British construction industry. The project included the automation of the entire process from the hot to the cold end. Not only did Siemens supply and install the entire process control system for this project, but also all the sensor technology, as well as the exhaust gas analysis system. The expertise of Siemens' long-term partner STG was very beneficial, particularly with regards to the melting end and cooling channel. The results were impressive: The plant delivered perfect quality product – from the very first day of production.

First steps in the Americas

Siemens was able to secure another project at the Guardian glass plant in El Marques, Mexico. This completely new plant is the site of Guardian's first flat glass production facility in Mexico. It came online in August of 2004 and is designed to produce a daily capacity of 700 tons.

Siemens supplied all the motor control centers (MCCs), the gas analysis system for the bath, medium voltage switchgear, distribution panels and lighting panels, and essential parts of the electrical system. Siemens and its partners played a crucial role in the project, with a team of Siemens experts from Mexico and the USA providing comprehensive on-site support.

Cooperation continues

The most recent project is the Guardian production line for float glass in Oroshaza, Hungary. This project involved the realization of the control technology for the melting furnace and cooling channel. Work began in July 2004. This project was also carried out with STG and utilizes Simatic S7-400 technology with comprehensive networking via Profibus DP in an approach very similar to the innovative strategy already implemented at Goole in the UK. All participants are confident that this project will continue the series of successful projects for Guardian and Siemens. ■



Guardian

For Guardian in Mexico, Siemens supplied the medium voltage switchgear

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Elam Engineering and Siemens: Automated Glass Production at LG Philips Displays Perfect Premiere



The mold press is the crucial unit of TV pressed glass production

Elam Engineering and Siemens began a new partnership with a very large and ambitious project: the automation of an important process step in a new production facility for LG Philips Displays in Zhengzhou. Depending on the size of the produced parts, the factory has a capacity of two to three million glass screens and cones per year.

TV pressed glass is produced continuously – 24 hours a day, seven days a week. One of the most critical machines in the production process is the hydraulic press, which molds the melted and cut glass into its final shape. The press can exert a force of 700 kilonewtons (70 tons) and has a maximum speed of 1,000 millimeters per second.

The young Dutch company Elam Engineering was responsible for all the electrical engineering and automation of the press and the machines that feed it, from portioning to placing the glass parts on the conveyor belt. Elam Engineering was founded in mid-2001 by Huub Emonts and George Lam, who both came from the glass division of Philips and decided

to go independent with their own automation company.

Philips and LG Philips Displays equip their plants with Siemens automation technology as a standard. Simatic technology has therefore already been used successfully for several years in another production facility for LG Philips Displays in Aachen, and the positive results gained from this project also benefited the work in Zhengzhou. Huub Emonts states, “Of course we worked closely with Martin Stofregen, the Siemens account manager for Philips. He coordinated all the Siemens activities for us and introduced our team and the LG Philips Displays staff to the Siemens solutions.”

The hardware for the press consists of about 30 control cabinets and 40 field cabinets, most of which are built and configured by Siemens. George Lam describes the dimensions of the project: “The press is controlled by about 20 Simatic S7-300 and S7-400 controllers with the appropriate Simatic ET 200 distributed systems, drives, and Siwarex weighing systems, which are linked via Profibus and Ethernet.” The new plant began operation in March 2003 and has since been running to the customer’s complete satisfaction. ■

Find out more:

www.elam-engineering.nl

www.siemens.com/glass

E-mail: glass.team@siemens.com

LuoYang Float Glass and Siemens Cooperation Agreement

From April 11 to April 14, Beijing International Exhibition Center was home to the fifteenth International Glass Exhibition. More than 2,100 companies attended the exhibition and 40 percent were from foreign companies, illustrating the growing global significance of the Chinese glass industry. China is becoming one of the most important glass-producing centers with one of the most rapid growth rates worldwide. Siemens Ltd. China showed the latest Simatic PCS7 technology including the newly launched Simatic PCS7 Box as well as motion control products, and Siemens Shanghai Industrial Automation Ltd. showed its solutions for the glass industry.

During the exhibition, Siemens and the China LuoYang Float Glass Group held an Advanced System Integrator cooperating signature ceremony. China LuoYang Float Glass Group was founded in 1956, and after more than forty years development, it has become a huge enterprise group containing technology development, producing and marketing, import and export



LuoYang Float Glass and Siemens signing the cooperation agreement in Beijing

trade, finance and stock business. The company has developed the LuoYang Float process, one of the three main float glass techniques, and is China's top float glass manufacturing company.

The president Mr. Liu Baoying and general manager Dr. Zhu Leibo of China LuoYang Float Glass Group expect that with the

signature, Siemens and China LuoYang Float Glass Group will both venture into a fruitful cooperation that will provide a good platform for future projects. ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

Stein Heurtey and Guangzhou CSG Float Glass rely on Siemens New Project in China

Shanghai Stein Heurtey MECC Industry Furnace Co., Ltd. (SHMECC in brief) is a Chinese joint venture of the renowned technology company Stein Heurtey, one of the World's leading manufacturers of thermal systems for the glass industry. Worldwide, more than 200 melting furnaces, including 15 for float glass lines, over 40 Float Bath, over 60 flat glass annealing lehrs and now 7 hot ends for float glass lines have been supplied by the Stein Heurtey Glass Group, including its subsidiary Belgium Glass Equipment (BGE).

Two lines are under construction for Guangzhou CSG Float Glass Co., Ltd. Stein Heurtey, BGE and SHMECC are installing two new float glass lines with a production capacity of 550t/d and 700t/d respectively; both lines are equipped with the latest technology and will produce high quality glass for automobile and architecture industry.

In this project, Guangzhou CSG Float Glass and Stein Heurtey /SHMECC are using Siemens automation technology for the first time in China. The decisive factors in the selection of the Siemens's solution were

the smoothly integrated Totally Integrated Automation systems, the efficient Siglas technology modules, Siemens long-term presence in China, and the competent support by industry experts on the Siemens glass team ■

Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

You will find more information about these and other companies in the glass portal at:
www.siemens.com/glass/partner

Better Together

Siemens has been working successfully for many years with numerous machine manufacturers and plant planners specializing in the glass industry. This experience and collaboration guarantee glass manufacturers a uniform and standardized automation solution based on Totally Integrated Automation (TIA) for all sections of the plant. Siemens also supports its partners in the development of technological solutions that can, for example, save energy, ensure quality, or minimize nitric oxides. In this issue of GlassFocus we present some examples of companies that have been relying on innovative solutions from Siemens for years.



Horn Glass Industries AG produces plants that are distinguished by maximum reliability and transparency. The company relies on Totally Integrated Automation with the Simatic PCS 7 process control system.

► www.horn-glas.de

In the Glass Academy in Zwiesel, **UAS Messtechnik GmbH** installed a new glass melting end – a highly available solution with a universal backup function – without interrupting ongoing operation. A Simatic PCS 7 process control system monitors and stores all plant data.

► www.uas.de

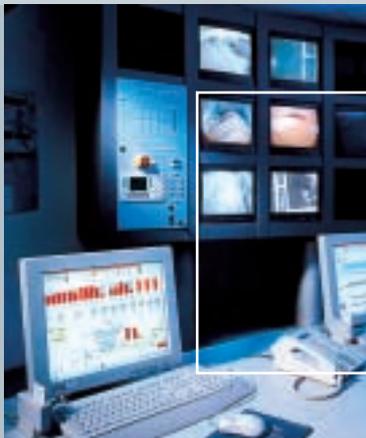
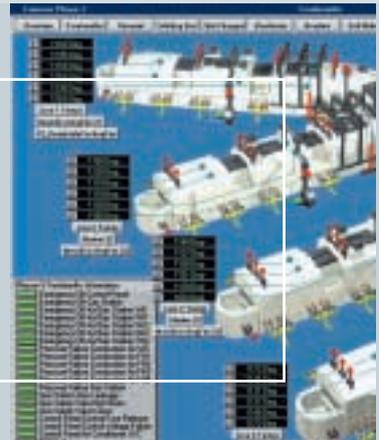


The non-contacting, wear-free thyristor power actuators from **AEG SVS Power Supply Systems**, in connection with Profibus and Simatic PCS 7, guarantee 100 percent quality in glass manufacturing – reliably, reproducibly and perfectly documented.

► www.aegsvs.de

In just six months, **AST Automation** completed a total turnkey project including Batching, Furnace, Forming and Packaging of a glass bottle production line for Nampak Roodekop South Africa. This included all HT, LT and Automation systems. One of the factors that contributed to the problem-free implementation of the new plant that also features a MES system were Simatic S7 and Simatic WinCC.

► www.ast.co.za

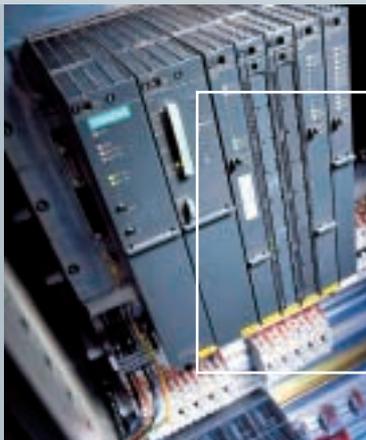


As the market leader in zirconium oxide probes for online control of effective combustion in industrial furnaces, **STG GmbH Cottbus** combines automation expertise with technological know-how and measurable cost advantages from NOx reduction and energy saving, providing the basis for more than 20 successful projects with Simatic S7 and Simatic PCS 7 systems in the fields of insulating, container, and float glass.

► www.stg-cottbus.de

Raute Precision is one of the leading suppliers for weighing and dosing systems and implements cost-effective and innovative solutions for the glass industry. One example are standardized WinCC operator interfaces that can be used in both Simatic WinCC and Simatic PCS 7 environments.

► www.rauteprecision.fi



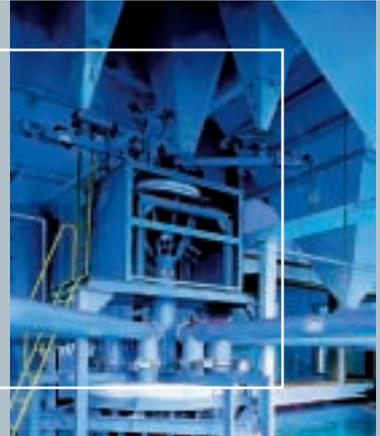
In close cooperation with Siemens, **AAC** produces complete process solutions for hollow and flat glass plants – for both new plants and migration from Teleperm M. The company relies on Totally Integrated Automation with Simatic PCS 7 and Totally Integrated Power for greater effectiveness, flexibility, and quality in glass production.

► www.aac-st.de

You will find these and other interesting applications described in detail at:
www.siemens.com/glass/partner

The Sorg Group combines plant and machine manufacturing and services for the glass industry in three companies. **Nikolaus Sorg GmbH & Co. KG** supplied a fully electrically heated glass-melting end of the VSM type for the Beijing Glass Instrument Factory in China. The melting end can melt up to 35 tons of borosilicate glass. **EME Maschinenfabrik Clasen GmbH**, which also belongs to the Sorg Group, has developed a system with which proportioning and weighing units can be controlled in a decentralized manner. Both solutions use Simatic technology.

- ▶ www.sorg.de
- ▶ www.eme.de

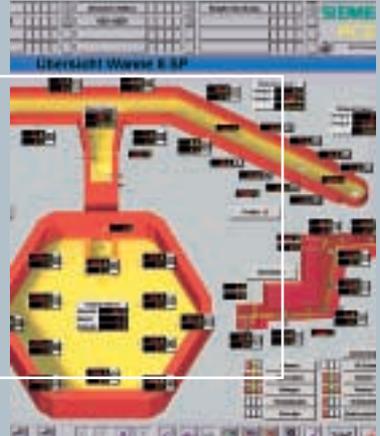


G-E-N, a cooperatively organized network of small and medium-sized suppliers to the glass industry, combines expertise from various technical fields. Whether the project is an efficient individual solution or the automation of an entire process section, G-E-N produces first-class solutions based on Totally Integrated Automation.

- ▶ www.glasnetzwerk.de

Schlemmer Prozess Systeme GmbH (SPS) relies on Totally Integrated Automation for the implementation of individually tailored automation solutions. This pays off all along the line, with drastically reduced production costs per unit as well as the minimization of expenses relating to spare parts storage, maintenance, and training.

- ▶ www.sps-gmbh.de



Glashüttentechnik Grob GmbH planned and produced a low-cost, fully automatic booster control for a discontinuous glass melting and conditioning process with a Simatic S7-300 controller for one of its customers. Grob also developed a system with which the process can be monitored and controlled both manually at the local level and from the central control room and at the management level.

- ▶ www.grob-glass.de

In order to be able to meet the constantly growing demand for low-emission (Low-E) glass from its own production, BAMO-FLOAT GLASS Solnetschogorsk chose a completely new inline sputter plant made by Von Ardenne Anlagentechnik GmbH. The plant, controlled by a Simatic S7 controller, went into operation after just 10 months. **Glasinvest Engineering und Anlagenbau** was heavily involved in the project.

► www.glasinvest.com



Zippe-Technologie is an expert partner to the glass industry, for new plants and plant modernizations alike. For the modernized float-glass mixing plant for Hunguard in Hungary, the company relied on Siemens components that are all networked via Profibus or Ethernet.

► www.zippe.de

Pyro-Contrôle, part of the Chauvin Arnoux Group, offers a comprehensive temperature sensor portfolio – tailor-made to suit the extreme requirements of the glass and ceramics industries. The high-performance, high-quality devices are being used as an integral part of Simatic PCS 7 in many of Siemens' turn-key projects.

► www.pyro-controle.com



Where quality control and company-wide information management are concerned, the **ilis GmbH** in Erlangen offers first-class solutions for the glass industry. One of the highlights from the company's wide range of services: Glasdata, a Web-based information system for company-wide data management (for the fields of used glass, laboratory, mixing, and melting), which can easily be linked to Simatic PCS 7.

► www.ilis.de

The right support for every phase

Good Advice is a Safe Bet

Siemens supports its customers at every stage – from online and technical support to extensive consulting and engineering services to rapid field service and maintenance and optimization of machines and plants – around the clock and (almost) everywhere in the world.

Machine and plant manufacturers, for example, can ask for early support for large projects abroad. The regional Siemens branch on location will then make the right preparations for the machine or plant and offer the right service and support locally. That way, machine manufacturers or OEMs often even do not have to have a spare parts stock on their own.

Always prepared: The Automation Value Card

More than 140,000 cases per year are registered alone at the Siemens Dispatch Center in Germany. The Technical Support

center for Siemens automation technology, which handles specific product and system related technical inquiries, takes about 800 calls a day. The appropriate expert calls back in an average time of two hours. Basic cases which take up to approx. one hour is one of Siemens' free services.

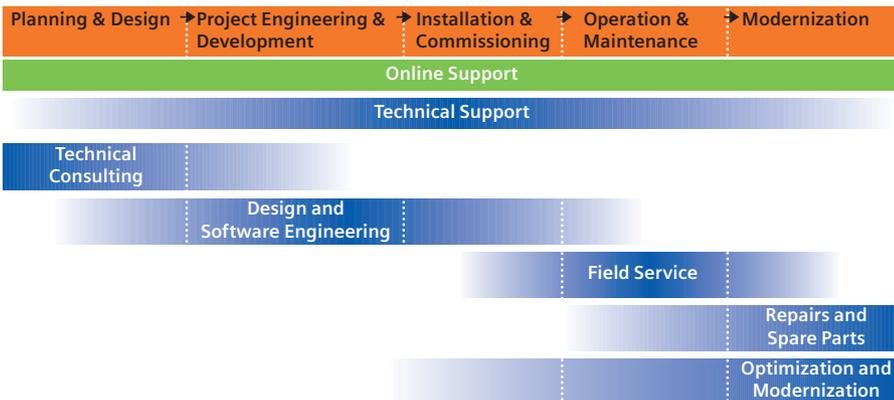
However, if a company requires emergency assistance – for example, within the commissioning phase of a plant or in a case of system or product failure- Siemens offers to its customers and partners additional services with the Automation Value card (AVC). This AVC is charged with a number of credits which can then be used up – similar to a telephone card – easily with the

card and PIN number. With the Automation Value Card (AVC, the customer can request in urgent cases a priority or a 24-hours support as well as support for products which are no longer available and called Mature products. Additional software tools can also be downloaded with the card. The credits are then simply deducted online from the Automation Value Card.

More time for core activities

Franz Nolte, head of customer support at Zippe Industrieanlagen GmbH, is impressed by the advantages and benefits of the networked services offering. "Our project engineers' concentration on current projects was always being disturbed by inquiries about our plants," he says. "Today Siemens Support & Services takes care of these inquiries for more than 350 Zippe plants worldwide, and that, of course, saves us a great deal of time." Contact with technical support has long become part of the daily routine at Zippe, and experience has shown that the globally active Siemens specialists who are familiar with the entire product range can always be relied on. For Nolte, at any rate, the relationship with Siemens ensures a smooth daily routine in the industrial plants: "The Siemens experts are always there when you need them." ■

The right support in every phase



Find out more:

www.siemens.com/glass

E-mail: glass.team@siemens.com

online

Custom-made suit off the rack: The Glass Industry Suite

With the Industry Suites, Siemens has grouped its wide range of products for automation, drive technology, process instrumentation, and energy supply systems into industry-specific suites. There is a special Industry Suite for the glass industry, which covers the entire glass-production process, from mixture preparation through special solutions for the hot end to further processing and conditioning of the finished glass in the cold end.

The basis of the Industry Suites is the open, standardized, and uniform Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) platforms, as well as a thorough understanding of the production and business processes in the glass industry – including the products, the industry-specific process expertise, and specific MES solutions and services for the industry.

Of course, solutions from third-party technology partners are also an integral part of the Glass Industry Suite. A lambda-controlled melting end, which makes an effective contribution toward minimizing NOx and optimizing energy consumption, is just as much a part of the Industry Suite as are special add-ons for process control.

With the Industry Suite, all those involved – the end customer, systems integrator, and OEM – can save time and reduce costs. The industry-specific layout of products, systems, and solutions accelerates bidding procedures, simplifies the integrated planning of all units, and minimizes the number of interfaces. A visitor to the Internet portal of the Glass Industry Suite will find the right solution for every process step, along with quick, clear information about the range of products and services available for the glass industry.

www.siemens.com/glass
glass.team@siemens.com

team

The Siemens Glass Team: Global knowledge

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

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

www.siemens.com/glass/team
glass.team@siemens.com

GlassFocus 2004

Herausgeber
Siemens Aktiengesellschaft,
Bereich Automation and Drives (A&D),
Gleiwitzer Str. 555, 90475 Nürnberg
www.siemens.com/glass

Bereichsvorstand
Helmut Gierse, Anton S. Huber, Alfred Ötsch

Presserechtliche Verantwortung
Peter Miodek

Verantwortlich für den fachlichen Inhalt
Ralph Burgstahler, Cornelia Dürrfeld,
Bernd Lehmann

Verlag
Publicis KommunikationsAgentur GmbH, GWA
Corporate Publishing Zeitschriften
Postfach 3240, 91050 Erlangen
Tel.: (091 31) 91 92-501
Fax: (091 31) 91 92-594
publishing-magazines@publicis-erlangen.de
Redaktion: Dr. Beate Bellinghausen (ChR),
Kerstin Purucker, Gaby Stadlbauer

Layout: Jürgen Streitenberger, Alexandra Graf

Projektmanagement:
Regina Severing, Daisy Kraus

DTP: Doess, Nürnberg

Druck: Wunsch Offsetdruck GmbH

Auflage: 20.000

© 2004 by Siemens Aktiengesellschaft
München und Berlin. Alle Rechte vorbehalten.
Diese Ausgabe wurde auf Papier aus umwelt-
freundlich chlorfrei gebleichtem Zellstoff
gedruckt.

**Die folgenden Produkte sind eingetragene Marken
der Siemens AG:**

ET 200, MP270, PCS 7, POSMO, ProTool,
ProTool/Pro, S7-300, S7-400, SENTRON, SIMATIC,
SIMEAS, SIMODRIVE, SIMOTION, SIMOVERT,
SINAMICS, SINUMERIK, SIPART, SIPROTECH,
SITRANS, SIWAREX, STEP, TELEPERM, TOTALLY
INTEGRATED AUTOMATION (TIA), TOTALLY
INTEGRATED POWER (TIP), WinCC.

Wenn Markenzeichen, Handelsnamen, technische
Lösungen oder dergleichen nicht besonders
erwähnt sind, bedeutet dies nicht, dass sie keinen
Schutz genießen.

Die Informationen in diesem Magazin enthalten
lediglich allgemeine Beschreibungen bzw. Leistungs-
merkmale, welche im konkreten Anwendungsfall
nicht immer in der beschriebenen Form zutreffen
bzw. welche sich durch Weiterentwicklung der
Produkte ändern können. Die gewünschten
Leistungsmerkmale sind nur dann verbindlich,
wenn sie bei Vertragsschluss ausdrücklich
vereinbart werden.

Bestellnummer E20001-A370-P620-X-7600

Greater productivity –
with more flexibility at lower cost

... your Profit

Maximize ...

totally integrated automation



Our top priority? Keeping productivity curves on the upswing for the glass industry. The Siemens Glass team, backed by innovative technologies and years of experience in the glass industry, is expert in creating profitable solutions that remain viable into the future. Our approach integrates all levels of your enterprise from the field to management, and all processes from raw materials to finished glass products. Whether you're installing a new facility or upgrading an existing one, we'll integrate your field instrumentation, IT and automation and energy technologies to create a complete, comprehensive solution. For you, **Totally Integrated Automation** means increasing flexibility, higher quality, minimized costs – and a clear competitive advantage for your company. You can contact us directly at glass.team@siemens.com

SIEMENS