

GlassFocus

SIEMENS

ideas for the glass industry

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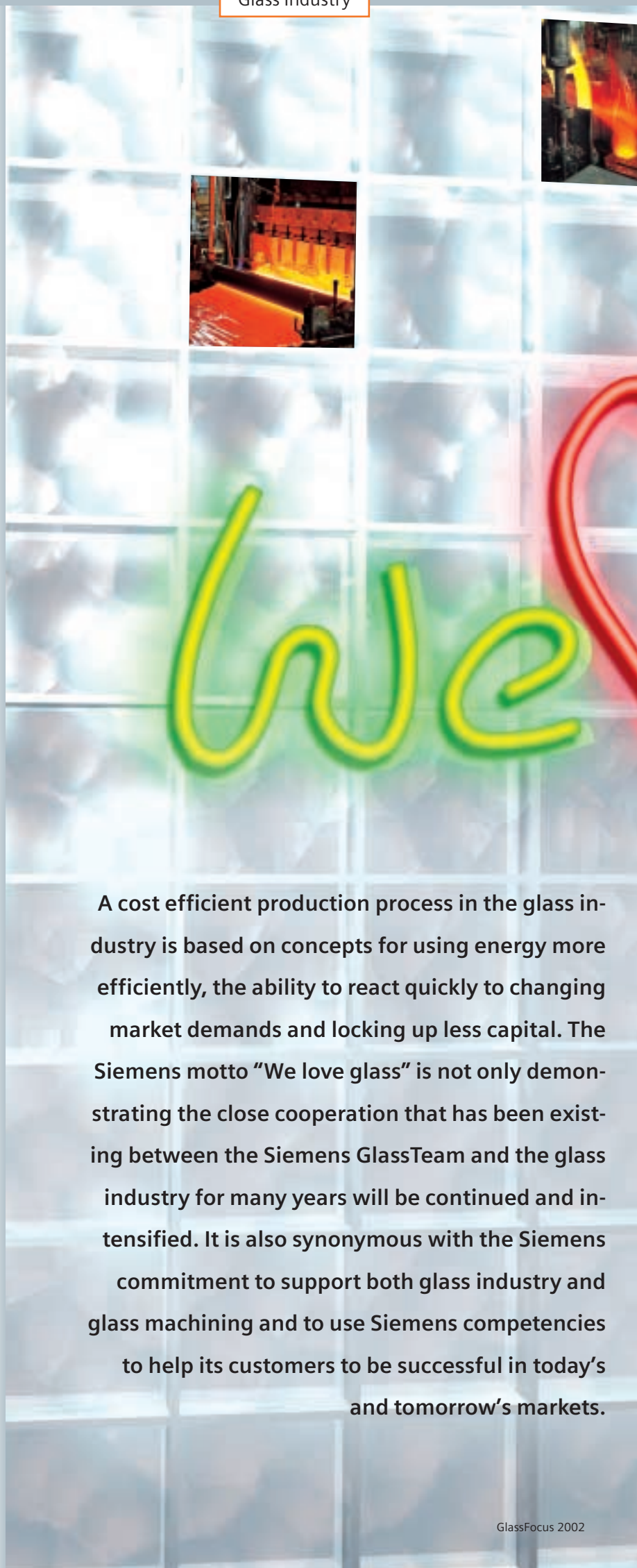
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A cost efficient production process in the glass industry is based on concepts for using energy more efficiently, the ability to react quickly to changing market demands and locking up less capital. The Siemens motto "We love glass" is not only demonstrating the close cooperation that has been existing between the Siemens GlassTeam and the glass industry for many years will be continued and intensified. It is also synonymous with the Siemens commitment to support both glass industry and glass machining and to use Siemens competencies to help its customers to be successful in today's and tomorrow's markets.



Glass

The glass industry performs refinement in its most literal sense. Even the manufacturing process impresses the observer with its physical presence of heat and noise. But for all its passion, the glass industry is also getting smaller and more competitive. Markets are merging, global presence and support presence are more important than ever. Important decisions have to be made in a real time.

Partners for success

The glass manufacturer cannot meet the challenges of increasing productivity while retaining quality and flexibility, and at the same time reducing costs, energy consumption and emissions successfully on his own. He needs partners who share his fascination for glass and who apply globally recognized and open standards, use integrated systems and develop innovative technologies and concepts worldwide, to aid and assist glass producers to achieve their strategic

and operational business goals. Linking all facets in the production chain together, best satisfies growing consumer needs and demands. Responsibilities and interactions have to be well defined, and being open is important not only with respect to technical standards.

Intelligent solutions for greater productivity and transparency

The main job of a glass factory is to produce just what the market needs in one tank cycle as quickly as possible and to tie up less capital in raw materials, equipment and finished glass.

The Siemens glass competencies range from supplying single products to complete electrical solutions, and include the integration of production and management level into one coherent system – from glass production through glass processing to shipment of the finished product.

Together with customers, machine builders and glass specialists as their partners, Siemens develops intelligent

solutions that help to operate glass plants more flexibly and more efficiently. Solutions for integration between the process, production and management allow the glass manufacturers to plan, manufacture and evaluate production more effectively. This allows management teams to communicate and make those competitive decisions on a real time basis using real time information from around the world.

In addition to innovative technology, Siemens offers international project support and realization. The people who coordinate this variety of solutions for the glass industry and regularly share experience have now become the Siemens GlassTeam – a close-knit team with a common vision, to become the world's number one supplier of Automation and Energy systems for the Global glass marketplace by using their expertise to further the glass industry's success.

Christian Dittrich, Karlsruhe

Optimum use

Energy solutions for the glass industry from Siemens

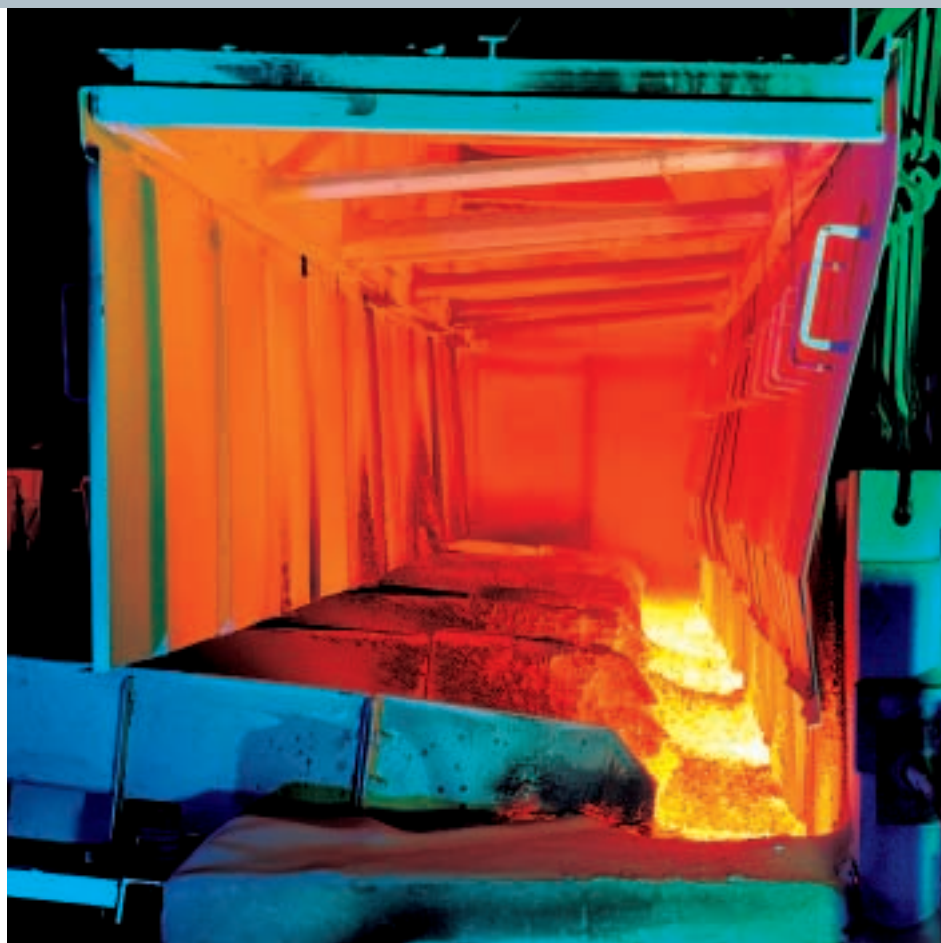
In theory, it takes about 2.2 million BTUs to melt a ton of glass, but in reality it takes twice that much energy because of inefficiencies and losses in today's process designs. This ratio shows that energy efficiency offers an enormous potential for savings.

Measures for saving energy are very important in the glass industry and not just for environmental reasons. Energy is an important cost factor in the long run. To reduce its energy consumption, the glass industry relies on the one hand on the development of more efficient methods of glass production. Parallel to this it aims to reduce energy consumption by developing more efficient heating technologies and improving existing systems.

For an effective energy management, the glass industry relies on having partners who are familiar with the glass process with all its characteristics. These partners should take into account not only isolated systems and individual products but also the entire process and who not only have the necessary energy but also automation and industry know-how.

All from one source

For its customers in the glass industry, Siemens offers an extensive package of



services and solutions to analyze and optimize energy consumption of a plant. Experienced specialists examine the production lines for weak points, develop suitable countermeasures and, where necessary, also supply the appropriate financing concepts. In many cases, simply improving the exploitation of existing equipment will result in considerable savings. Together with its partners, Siemens also offers services that will achieve projected ongoing energy savings of three to

five percent per year over the next five to six years.

Siemens can call on the combined knowledge of being one of the world's most renowned companies in the field of automation, drive and energy supply and distribution technology – knowledge that helps the glass industry to make better use of their resources and to achieve an optimum return on investment.

Bob Newell, Spring House

Totally integrated

Expert in glass production: Simatic PCS 7

The Totally Integrated Automation concept is the foundation for the effective horizontal and vertical integration of information, automation, field and drive technology. The Simatic PCS 7 process control system is an integral part of this concept.



Since it was launched in 1996, Simatic PCS 7 has been and is being used in many production plants in the glass industry because of its functionality and openness. Simatic PCS 7 has since undergone further development to improve its user friendliness and reduce engineering expense.

Glass technology add-ons for enhancing energy efficiency, monitoring quality, improving control accuracy, minimizing emissions in flue gases and reducing consumption of resources have been developed in cooperation with glass specialists and can be integrated easily in Simatic PCS 7.

Bernd Lehmann, Karlsruhe

Eyes and ears in production

Field devices from Siemens monitor all parameters



From analysis of process gases to reliable recording of filling levels even under the most difficult of conditions, there is (almost) no task that Siemens field and analysis devices cannot handle. Plus, these devices come with an extra advantage: they can be integrated quickly and without complications into the master automation system.

In glass production, a great number of parameters has to be monitored reliably. Yet the requirements could not be more different: In the batch house, large quantities of sand, cullet and additives have to be dosed accurately and continuously. Level monitoring in the batch silos has to cope with high dust levels and adhesive materials and in the melting furnace the bottom and crown temperatures must be kept within strict limits.

The Siemens field devices are built to resist even the toughest conditions. Field-proven devices like the highly accurate Siemens-Milltronics belt scales for continuous weighing and dosing of bulk materials, and with Pointek point level switches or Echomax ultrasonic transducers, precise level monitoring is possible even under difficult conditions. The Sitrans LR radar technology devices provide reliable level measurement even in extremely dusty environments.

Siwarex weighing systems are used for steady-state weighing applications like silos or bunkers. The pressure, temperature and flow monitoring devices of the Sitrans P, T and F families of transmitters are available in many different varieties that cover a wide range of applications. The Sipart DR process controllers were developed for both small and medium-sized plants and back-up

control tasks, and the Sirec process recorder series provide continuous documentation of important process parameters.

Important components such as oxygen or nitrogen monoxide in gases or the pH value of sewage water can be measured reliably and accurately with gas analyzers of the Oxymat and Ultramat series and Sipan liquid analyzers from Siemens. Siemens can also provide comprehensive analytic solutions right up to turnkey analysis containers.

Siemens also offers a brand new solution for in situ analysis of exhaust gases: the Laser Diode Spectrometer LDS 3000 was especially designed for high temperature processes such as DeNOx plants.

Helmut Schneider, Karlsruhe

Everything under control

Advanced Process Control optimizes glass production

Advanced Process Control (APC) software from Siemens makes sure that the system is always "on track". For the glass industry that means: more stable processes and a better product quality. Investment in APC pays off quickly – usually within 9 to 15 months.



The bottom and crown temperatures in glass melting furnaces can be controlled optimally with the MeltingExpert software. As a result, the channel temperature in the transition between the furnace and the conditioner can be stabilized and then reduced by 6 °C for instance.

ProfileExpert makes sure that the temperature distribution of the glass at the feeder output is stabilized and set specifically to predetermined values. This allows direct influencing of the viscosity of the glass before further processing.

TubingExpert is a software package for automatic control of the wall thickness and diameter in glass tube manufacture. With TubingExpert the wall thickness and diameter are controlled not only during straight running but also during changeovers. This minimizes waste and considerably shortens conversion times.

Siemens has also developed suitable solutions for additional glass applications such as temperature control in the float bath and for glass bulb manufacture.

Stefan Bergold, Karlsruhe

Glass from Northern Ireland

Simatic PCS 7 controls UK's newest glass factory

Operating a modern glass factory requires a high degree of automation, distributed intelligence and an efficient process control system. Quinn Glass of Northern Ireland made the right choice when it selected the Simatic PCS 7 and Totally Integrated Automation.

Quinn Glass operates the most modern center for glass manufacture in Great Britain and Ireland. After a construction period of just 18 months, the plant came on line in County Fermanagh, Northern Ireland. 300 employees are now responsible for the daily production of up to 600 tons of bottle glass on eight production lines.

First-class reliability

The manufacture and processing of glass poses a major challenge for automation and process control technology. If only one melting end is in operation, any disruption can result in huge costs or lead to irreparable damage. That's why Diarmuid O'Donovan, responsible for electrical equipment and instrumentation at Quinn, didn't entertain any thoughts of compromise when it came to control technology: "The melting ends are in continual operation for around eight years until they are exchanged. We expect a lifetime of at least 20 years for a process control system and a high degree of reliability during this time."

Siemens and the Simatic PCS 7 process control system were selected from nine potential suppliers. "In addition to its broad knowledge of the sector, the support offered by Siemens played a major part in our decision," explained O'Donovan. The system now installed with around 3,500 I/O points is operated by five operator stations. An OP25 Operator Panel is also available for the on-site operation of the cooling furnace. Profibus DP is used for communication in the plant and Industrial Ethernet at the operator stations. Integration into Quinn Glass Management Information System (MIS) is also planned.

Turnkey solution

The tasks of the process control system are in the so-called hot area and also in the upstream and downstream processes. This involves glass batch preparation, insertion of the glass batch, melting ends, feeders and cooling furnaces.



The control of the melting end is particularly critical as temperature between 1580 °C and 1590 °C must always be maintained. Quinn uses regenerative ends and the heating is switched over every 20 minutes. With Simatic PCS 7, the end parameters, the influence on the glass consistency and the energy consumption can be constantly optimized.

Normally, each end has its own chimney, but at Quinn it was decided to have a common outlet, as the problems which may arise as the result of pressure fluctuations in a shared system can be easily overcome with Simatic PCS 7.

Flexibility leads to progress

As with many plants of this size, the project engineering for the control technology did not go completely according to plan. In the original planning, an independent control system was planned for the exhaust gas purification plant. However, it soon became clear that the integration of this part of the plant into the control system would provide better control over the entire process. In the course of the project, it was also decided to integrate the controls for the auxiliary systems into the control system. The same applies to the batch control, which was only incorporated at a relatively late stage. This demonstrated the strength of the Simatic PCS 7. While other products can only talk about flexibility, with PCS 7 demands could be met which would be difficult to implement with conventional systems.

The number of I/O points was also a point in its favor. Conventional systems will have already reached their limits at 3,500 points; while for PCS 7 this application is an example of a medium-sized installation. Simatic PCS 7 is primarily a symbol of modularity and scalability – properties that give the plant designer the highest degree of flexibility.

Mark Chung, Manchester

Five Operator Stations monitor the new system.

Central Control Room Solution

Simatic PCS 7 automates glass tube production at Osram

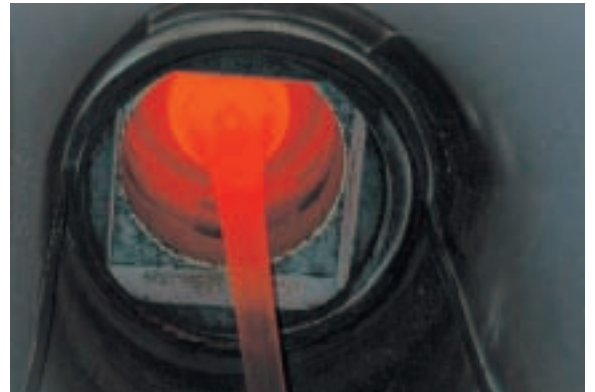
Glass tube production at Osram in Augsburg was automated fairly early with control technology. The due repair of melting end C gave Osram the opportunity to rethink its current operating philosophy and to modernize its control technology.

The operation in Augsburg employs around 2000 staff and comprises the glass factory, the lamp factory and the machinery delivery center. The glass factory produces the glass tubes used in the lamp factory to manufacture fluorescent lights.

Innovative from the very beginning

As part of a melting end repair in 1980, the central control technology was equipped with the Teleperm M AS220 automation system – something new for the glass industry at the time. When the new melting end B opened in 1987, it was equipped with the same technology. Last year as part of the repair work on melting end C, the existing control technology islands were replaced by a central solution, which also integrated the glass batch preparation and the tube pulling (Vello process).

In the spring of 1999, Siemens was awarded the contract to automate the new control room with the Simatic PCS 7 process control system. In addition to proven expertise in the sector, local presence and good long-term co-operation, also crucial to awarding of the contract was the migration solution offered which allows the existing Teleperm M system to be integrated into the new automation concept. As the I/O periphery could also be taken over without changes, no new periphery test was required. This resulted in reduced costs and shortened repair times. In order to guarantee continuity, the inventory was networked via Profibus to the Simatic S5 115U controllers and the existing Sipart DR22 controller. Two redundant servers linked the system bus with the terminal bus. The system is operated via five



operating stations, one of which is being also used as an engineering station.

Scheduled implementation

In a period of around five months, a considerable amount of engineering work had to be completed. According to Heinz Müller, Osram Chief Project Engineer, the fact that it was possible to keep to the September 1999 start time for the melting end could be attributed to the excellent cooperation within the project team and the short decision-making paths. Dr Karl Zirkelbach, factory manager, was able to present the new plant to an interested audience at the DGG meeting in Ulm in May 2000.

Johann Fendt, Augsburg

Do-it-yourself modernization

Migration from Teleperm M to Simatic PCS 7 at BSN glass pack

When BSN glass pack in Leerdam in Holland decided to replace the Teleperm M system with the Simatic PCS 7 process control system, the company chose an innovative solution: BSN did the migration themselves – with the technical support of the Siemens system experts. In this project PCS 7 proves once again that it makes no compromises when it comes to simple handling and user friendliness.

The BSN glass pack Company with subsidiaries in four countries is one of the leading manufacturers of glass bottles, glasses and food jars. With about 45 glass furnaces at a total of 21 sites, BSN produces about 3.8 millions tons of glass annually in 144 production lines – or 13 billion single glass items. One of the subsidiaries is BSN Netherlands with three sites in Schiedam, Maastricht and Leerdam.

The migration from Teleperm M to Simatic PCS 7 is the third project which BSN glass pack has implemented in Europe with Simatic PCS 7 and Siemens. At the beginning of 2000 BSN glass pack had already decided to automate the transport systems for the glass raw materials and the process control of a furnace in two projects with PCS 7 at the Schiedam site. The positive experience gathered with the new process control system was also the decisive argument in favor of choosing PCS 7 for the modernization of the control system for the glass furnace in the Leerdam factory.

Migration made easy

“What was much more important to us, however, was the fact that Siemens was able to offer us a highly sophisticated migration strategy from Teleperm M to the new system. This put us in a position to

continue using about 60 percent of the existing hardware – an enormous cost advantage”, states René Meuleman, Project Manager at BSN glass pack Netherlands. “In addition, PCS 7 has a look-and-feel that is similar to Teleperm M, so that our production staff could continue working in a familiar environment.”

Since Simatic PCS 7 had already proved in Schiedam how easy it is to handle, BSN decided to do the necessary migration themselves after appropriate training at Siemens and only consult Siemens specialists for the fine-tuning of the system. A courageous and not altogether everyday step as René Meuleman confesses. “This decision was aimed primarily at reducing both the running costs and the costs for maintenance and service of the system. Although we signed a service contract with Siemens, our on-site technician still has to make the right decision within minutes should a serious fault occur – and that is why we have to know the system inside out.” In addition, BSN glass pack is planning to install PCS 7 in other plants as well, therefore a build-up of know-how is also important in this respect.

Exact process control is crucial

The temperature of the molten glass must be kept within narrow and exactly

A sophisticated migration strategy reduces refitting costs



defined limits to avoid a loss in quality of the finished product. With the Teleperm M system BSN had already developed strategies that were able to achieve this high accuracy. PCS 7 continues using these strategies and is expanding them. Advanced Process Control systems, which Siemens has developed in cooperation with the IPCOS Technology specialists in Bostel in Holland, will not only enable a more accurate process control in future but will also ensure that the plants work more energy-efficient.

Easy commissioning

Since the three glass lines in Leerdam operate continuously, the furnace conversion had to be completed during the routine cold repair. The project team benefited from the experience with the Schiedam project. For example, templates for system installation and parts of the system software were simply copied.

The good cooperation between BSN glass pack and Siemens will continue. At the moment a furnace control with PCS 7 is being implemented at the Maastricht site.

René Meuleman, BSN glass pack, Maastricht

A crystal-clear decision

Modernization with PCS 7 in ongoing operation

The Schuller GmbH – a subsidiary of the internationally active Johns Manville Company since 1971 – is one of the top companies in textile glass production. After years of good experience with the Teleperm M process control system, the company management decided to modernize the Wertheim production with Simatic PCS 7, the Siemens control system succeeding Teleperm M.



The new PCS 7 control room

In 1936, Werner Schuller reached an important milestone in the history of the Schuller GmbH with the development of glass fibers that were fit for spinning. Today, almost 70 years later, the company is the world's leading manufacturer of glass fiber products and the largest glass fiber mat producer in Europe. The recipe for the company's success is based on a skilful combination of technical creativity, decade-long expertise in innovative customer-oriented solutions and clearly defined production criteria. What counts is a production at the highest technical level – fast, flexible, just in time – and the finest quality products.

In the factory's own glassworks at the Wertheim site, C-glass pellets are manufactured as a base material for the subsequent fiber production. The batch house feeds the raw materials for production into two electrically heated melting furnaces. The resulting liquid raw glass gets the proper shape on the pellet machines. After cooling, the pellets are transferred to the roving or hank fiber production.

From Teleperm M to Simatic PCS 7

Both melting furnaces were automated with Teleperm M AS 230 during a cold repair in the 1980s. Since then the system has been operating reliably and without a single failure – operation of the control system was only interrupted during the scheduled routine annual maintenance. The discontinuation notice for the Teleperm M AS 230 systems triggered the decision to modernize the furnaces with the Simatic PCS 7 process control system.

Two-stage implementation

Each of the two melting furnaces was equipped with its own AS 416 automation system that communicates with a redundant PCS 7 Operator Station via Industrial Ethernet. The I/O level and important control circuits with Sipart DR-24 positioners, thyristor actuators, variable speed drives and the pellet-weighing unit with Siwarex M are networked directly via the Profibus DP.

The whole conversion was executed in two stages. The most important requirement that Schuller made: The glass pro-

duction was not to be interrupted or stopped during the entire modernization. When the contract had been awarded to Siemens, the project of converting the furnace number 2 was set on course in the spring of 2001. Existing low voltage switchgear and parts of the existing control room were integrated in the hardware planning. Based on the requirements specification previously negotiated with the Schuller GmbH, a team of glass experts at Siemens in Cologne took over the PCS 7 engineering. The customer conducted the software acceptance test in Cologne, and the actual migration began immediately after the hardware plans were submitted.

Thanks to the excellent cooperation between the project teams of Siemens and Schuller, the peripheral signals were converted quickly to the new system without affecting the continuous glass production. "Furnace 2" has been in operation using PCS 7 since April 2002. PCS 7 offers greatly extended operating and monitoring features compared to Teleperm M while controlling the same quantity structure that have been optimally implemented in the software and have led to a high acceptance with the personnel in production.

The changeover of "Furnace 3" to PCS 7 began in May 2002 and will be completed by the fall of this year.

Jürgen Herbach, Thilo Behringer-Stephan,
Schuller GmbH, Wertheim



Take-off in China

Totally Integrated Automation and Simatic PCS 7 at Arc International

Arc International in Arques in France have become the world leader in glasses and table glassware with such trade names as Cristal d'Arques, Luminarc or Arcopal. The company is now preparing to conquer one of the world's most important markets: China. Arc is building a new production plant in Nanjing, 200 kilometers from Shanghai.

Siemens is supplying the automation and drives for this project.

The Central Engineering department at Arc International was responsible for the development and design of the oven and the machines. For local support to the team, Arc was looking for a partner for the automation and drives part of the project

who not only had the necessary industry know-how but could also offer a strong global presence. With its Totally Integrated Automation concept, its international GlassTeam and the excellent local support in both France and China, Siemens were able to meet Arc's requirements.

The feeders and the glass furnace were automated with the Simatic PCS 7 process control system. Masterdrives, 1FT6 motors and other components belonging to the Totally Integrated Automation family make sure the production runs without a hitch. Siemens also supplied the Siwarex weighing systems for the Nanjing site.

Locally, Siemens Industrial Automation Shanghai (SIAS) also helped the customer in recruiting and training automation and drives technicians and were also responsible for the erection of the control cabinets.

Olivier Vincent, Caluire-et-Cuire



Designing with light and glass

Glass blocks have established themselves as an indispensable building element in modern day architecture owing to their interesting light conducting effects and the effective symbiosis of functionality and design.

The Building Glass Division of the Saint-Gobain Oberland AG with its headquarters in Wirges near Koblenz is the leading European glass block manufacturer. The wide range of products is exported to more than 70 countries worldwide.

Together with Siemens, Saint-Gobain Oberland AG has already completed several successful products. For example, a new furnace for bottle production was automated with PCS 7 in Spring 1999 in Wirges and the furnace for glass blocks in December of the same year.

At glasstec 2002, visitors were able to admire the "offspring" of this cooperation. A wall of glass blocks from Saint-Gobain Oberland carrying the fair motto "We love Glass" caught everybody's attention.

Cornelia Dürrfeld, Karlsruhe



Brilliantly clear pictures

Totally Integrated Automation at LG.Philips Displays

Cathode ray tubes will continue to dictate the market for TV and computer monitor tubes in future owing to their low costs and excellent picture quality. But the demands on picture tubes are increasing: Flatter screens with a higher resolution at a low price are what the customer wants. The market leader LG.Philips Displays is reacting to these demands by building a new CRT glass factory in Zhengzhou in China that is automated with components from Totally Integrated Automation (T.I.A.).

One in four color screens for the world's TV sets and computers are made in one of the 32 LG.Philips Displays factories. This makes the joint venture between the Korean LG Electronics and Philips Electronics of the Netherlands the world's largest provider of cathode ray tubes for TV and computer screens.

LG.Philips Displays was looking for a process control system which allows extremely complex and flexible solutions and at the same time guarantees maximum precision and consistent quality – requirements that are essential in manufacturing these glass tubes. For instance, the required quantities of glass must be

exactly proportioned and the aperture mask has to be applied to the screen with an accuracy of a thousandth of a millimeter. In a new glass factory in Zhengzhou in China, LG.Philips Displays chose an automation solution based on the Siemens T.I.A. concept for the first time.

This project is called ANFEI and is being installed on new premises. In the first phase of the project, two furnaces with two production lines each are being implemented. The ANFEI project is based on a partnership with a Chinese company and is a real international cooperation: Siemens Netherlands produced the switching cabinets for the glass press which were installed and successfully

tested together with the whole press in the USA by the press manufacturers Lynch. Then they were transported to China and installed on site.

Siemens also provided the entire automation technology, including the Simatic Controller, distributed Simatic ET 200S I/O devices, Masterdrives, servo motors and the switching technology and process analysis systems. Profibus and Ethernet networks handle the communication between the individual components.

Martin Stofregen, The Hague



Excellent view

Simatic PCS 7 in glass production for LC displays

Cell phones, computer monitors, field devices or handheld organizers – Liquid Crystal Displays (LCD) can be found almost everywhere. The possibilities of this technology have by no means been exhausted as the rapid progress of the TFT-LCD proves. The microscopically small structures of the displays are manufactured in a process that is similar to semiconductor production – except that the carrier is not silicon but a very thin, flat panes of glass. This motherglass is produced by COTC in Taiwan using the Simatic PCS 7 process control system.

An ever-increasing number of devices are now equipped with an LCD – and the end to the boom is not in sight. The basis of LCD production is the so-called motherglass that must meet exact quality specifications.

The new production line of the COTC China Optoelectronics Technology Corporation produces motherglass for Super Twisted Nematic LCDs (STN-LCD) and Thin Film Transistor LCDs (TFT-LCD) in two melting furnaces. The motherglass is

between 0.3 and 1.1 millimeters thick; the size of the finished glass panes for the displays is 355 x 406 millimeters for the STN-LCDs and 680 x 880 millimeters for the TFT-LCDs.

The entire plant, from the mixing section right through to packing of the finished products, has been automated with Totally Integrated Automation (TIA) components. A total of 20 Simatic controllers control the processes and the 12 Operator Stations of the Simatic

PCS 7 process control system ensure that the personnel always has an eye on all the important information. AEG SVS supplied the systems for the furnace heating which are also integrated into the TIA concept.

Siemens Limited Taiwan was responsible for implementing the entire network technology for COTC and integrated the production utilities into the PCS 7 system.

Ludo Goethals, Karlsruhe



No system breaches

Integrated automation from the batch house to the working end

Siemens components and the experience of the project team of the Nikolaus Sorg GmbH & Co KG were a guarantee that the expansion and renovation of an existing glass melting furnace would be a total success. With this project, the melting furnace specialist from Lohr am Main was once more able to prove its great expertise.



The order also included the control equipment for the melting furnace and the forehearth as well as the partial renovation and expansion of the batch house and the corresponding electrical equipment from the EME Maschinenfabrik Clasen GmbH, a subsidiary of the Sorg group.

For automation of the system, Sorg relied on the Totally Integrated Automation (TIA) concept which, thanks to the high degree of integration of hardware and software, minimizes spare parts stocks, reduces wiring due to consistent use of field bus technology and reduces the space demand in the wiring ducts.

The ten scales of the glass batch plant are automated with Simatic S7 400 con-

trollers and Siwarex U weighing systems. The automatic sand moisture correction from EME guarantees an exactly defined SiO_2 percentage in the batch. The cullet handling is coupled to the automation via Profibus and, like the batch plant, can be operated from all four WinCC operator panels.

An S7-400 controller is responsible for the furnace, the working ends and the forehearth including the Sorg cascade heating system and the Sorg step control for the cooling systems. The subordinate Simatic S7 300 controller takes over regenerative reversal of the heating and transfers the relevant process data via Profibus DP to the S7 400 controller.

All functions of the plant can be monitored and controlled continuously by the Simatic WinCC visualization system. WinCC also allows access to other plant parts such as filter plant and cooling lehrs, which are linked to the system via Profibus.

SORG **EME**

contact: Richard Sims

e-mail: sims@sorg.de

web: www.sorg.de

Process engineering know-how

The AAC GmbH – a global partner to the glass industry



The AAC Ade Automation Consulting GmbH has an excellent reputation where complete process engineering solutions for hollow and flat glass production are concerned. The company develops and implements process-specific add-ons that extend the scope of functions of Simatic PCS 7 in close cooperation with Siemens.

Know-how from AAC is much asked for all over the world: COTC Taiwan, for instance, chose a PCS 7-based control system to optimize automation in the batch house. Well-known customers such as Saint-Gobain Glass France also rely on the German company both for equipping new plants and migration projects from Teleperm M systems to PCS 7.

The solutions from AAC optimize effectiveness, flexibility and quality in glass production. The recipe management with connected SQL database for example takes care of time-controlled parameter changes to the feeder controllers, thus simplifying and accelerating product changeovers.

An IS machine cooling solution was developed in cooperation with Siemens and Silitec to measure the baffle temperature without contact and to control it constantly. This guarantees the consistent quality of glass packs.

At Saint-Gobain Desjonqueres in France, setup times for product changes could be reduced considerably by using an AAC fuzzy controller for the feeder control and a greater temperature constancy was achieved.

AAC **ADE AUTOMATION CONSULTING**
Consulting for Process Technology and Process Automation

contact: Andreas Ade

e-mail: andreas.ade@aac-st.de

web: www.aac-s7.de

High-precision mixing

Zippe builds a new plant for Saint-Gobain

Under contract to the Saint-Gobain Glass Deutschland GmbH, the Zippe Industrieanlagen GmbH built a new turnkey batch house in Cologne-Porz. The innovative plant has been running successfully since June 2001 – controlled by two Simatic S7-400 and S7-300 controllers.



Since its foundation in 1920, the Zippe Company has been focused on supporting the international glass industry. Zippe develops and implements solutions for handling raw materials in glass production – from the planning and basic engineering through plant design, to building and commissioning.

With two mixers and fourteen container scales the batch house in Cologne-Porz handles the equivalent of 800 tons of molten glass in 16 hours. The rated load of the scales ranges from 200 grams to 3,500 kilograms, and each is equipped with its own weighing and proportioning computer. The compressor system and the cullet process are each controlled by a dedicated Simatic S7-300 controller. The raw materials registration is monitored by a barcode reader system with a large display. This system sends the delivery data to the central S7-400 controller that also controls the entire batch house. All components are networked via Profibus DP. The recorded

data can be used for raw material accounting and distribution.

An optical glass fiber network connects the automation system with the operator stations in the furnace control room and in the batch house. A comfort-

able SPC module with an XRS chart and various trend displays for plant monitoring and optimization is an integral part of the system. A display panel with manual control features and four control cameras are also integrated in the control system.

The maintenance and service module checks all the important functions, provides maintenance at the right time and provides the necessary manuals. The plant is in contact with the Zippe Service Center via modem. This center provides support and can access the controls and control system directly.



contact: Franz Rhein

e-mail: info@zippe.de

web: www.zippe.de

Glass Experts

Siemens Industrial Solutions and Services

No matter whether it comes to blow glass, float lines or glass fiber production: More than fifteen experienced technicians and engineers plan electrical equipment for all types and stages of glass production at Siemens Industrial Solutions and Services. The team from Bayreuth, Germany not only implements energy supply and distribution solutions using type-tested switchgear but also provides efficient drives and controls engineering. The portfolio covers every stage of produc-

tion from the batch house through furnace, float bath and annealing lehr up to the cross cutters and packaging units.

The performance catalog includes extensive know-how in hardware and software configuration, visualization, control technology, switch cabinet construction, on-site installation and commissioning. This guarantees reliable equipment for the whole life cycle of the machinery.

At the moment, the successful team is fitting out a new Guardian float system with drive technology. Contracts in the Saint-Gobain and Pilkington factories have been completed within the narrow time schedules of cold repairs.

contact: Reinhold Selz, Bayreuth

e-mail: reinhold.selz@siemens.com

Intelligent and efficient

Technological solutions for the glass industry from STG

The STG GmbH Cottbus offers innovative technological solutions for industrial furnaces, especially glass melting furnaces. STG works in close cooperation with Siemens in the field of process automation in the glass industry. Comprehensive solutions using PCS 7 systems have been implemented for Saint-Gobain Glass Mannheim and Stolberg. Siemens technology was also used for the Guardian float plant in Poland.

Glaverbel, the Schott group, Isover, Samsung Corning, Philips, BSN glass pack and Saint-Gobain Oberland also rely on technological solutions developed by the company from Cottbus, Germany.

One of the developments of STG are long-life zircon dioxide oxygen sensors for high temperature applications that are used as a basis for lambda-controlled

combustion air supply. Energy saving and low-emission solutions for gas- and oil-fired burners, dynamic air baffles for optimum control of combustion air distribution or video image evaluation of the furnace room for online analysis of the melting behavior, are also part of the product portfolio. The combination of intelligent automation and innovative technology leads to energy savings of up to 10% – and this at NO_x emissions of 400 to 800 mg/Nm³ depending on the furnace type. The return on investment can be within the year.



contact: Dr. Peter Hemmann

e-mail: stg_cottbus@t-online.de

web: www.stg-cottbus.de

Controlled cooling

SiliTec exploits optimization potential in glass production

When it comes to stabilizing and optimizing glass production processes, the SiliTec employees know best.

The company from Freiberg, Saxony, implements accurate process diagnosis systems and develops products for the process stabilization by automatic control engineering for glass manufacturers. Based on automation systems from Siemens and supported by the process-technical know-how of a whole network of specialized companies, SiliTec offers a wide range of innovative solutions.

One example for these solutions is the modular control system CMCS for stabilizing the mould temperatures on IS machines and cycles. This system was implemented for the Hermann Heye Glas company in Germersheim using the following configuration: Cooling air and mould temperatures are monitored by measuring instruments and controlled by a Simatic C7 controller and a throttle valve or alternatively by a frequency inverter. The system is linked to a separate PC for process control and to Simatic WinCC for continuous documentation. SiliTec also implemented a teleservice concept for remote servicing of the system.

Another component for process stabilization is the VisControl; a solution for viscosity-dependent glass conditioning in the feeder which ensures that every change in viscosity is measured precisely. Here too, the dedicated control concept DeltaControl can be connected to every process control system from Siemens without any problems.



SiliTec

contact: Harald Zimmermann

e-mail: info@silitec.de

web: www.silitec.de

Setting standards

New automation standard with Simatic PCS 7 faceplates



The Schlemmer Prozess Systeme GmbH in Deggendorf develops faceplates for the Simatic PCS 7 process control system that are adapted exactly to customer requirements and based on internationally recognized standards. Schlemmer provides customer support throughout the production life cycle from planning through commissioning right down to day to day

production. For the Heinz Glas GmbH in Oberfranken SPS has equipped three melting furnaces complete with numerous sub-plants with the PCS 7 control system within the last three years. For Heinz and other SPS customers, factory-wide process automation has long since become one of the prerequisites for a future-safe quality assurance and increase in production.

The economical advantages of these uniform hardware and software components are obvious. The modular structure ensures that extensions to parts of the plant can be implemented quickly and at low cost. It simplifies spare parts stocking and reduces personnel training to a minimum. The common user interface not only makes it easier for production staff to handle the different parts of the plant on site but also considerably reduces outage times and production failures. The cabling and installation costs are also reduced by the distributed structure of the control system including the operator stations.

SPS

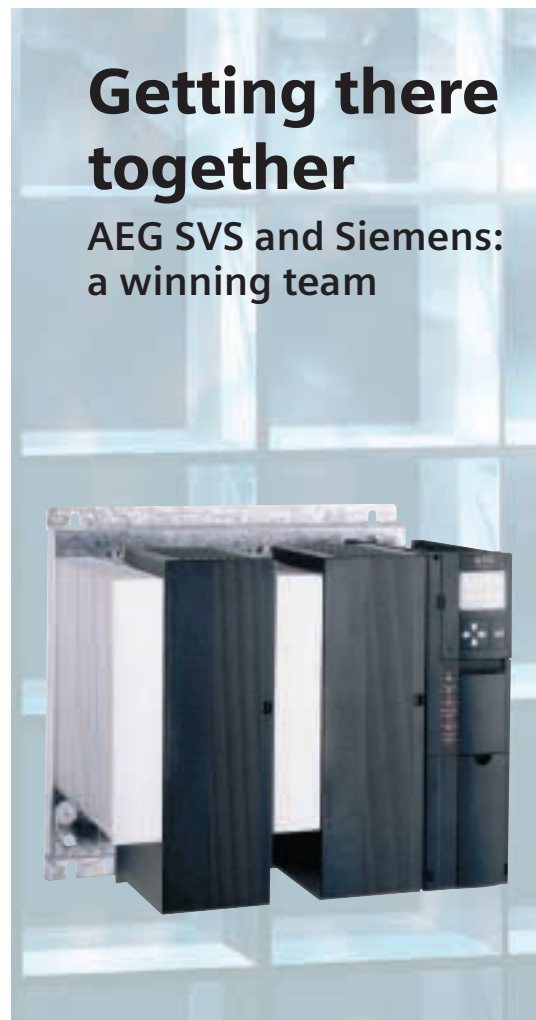
contact: Heribert Schlemmer

e-mail: SpS@SpS-gmbh.de

web: www.sps-gmbh.de

Getting there together

AEG SVS and Siemens: a winning team



Video surveillance saves costs

Digital image data recording opens
up new possibilities

Intranet and Internet and modern digital video technology open up new dimensions in the monitoring and control of processes and procedures. The ASE-INDUSTRY Services AG in Bruchsal was able to prove this claim successfully in several projects. ASE works in close cooperation with Siemens, developing future-proof digital video solutions for diverse applications in the manufacturing and process industries.

Event-triggered image data are recorded by on-site cameras and – adapted to the respective customer – stored centrally on the Visor video server developed by ASE. Here they can be accessed any time so that a detailed, up-to-date process database can be easily created and maintained. Faults and failure times

are therefore minimized, production costs are reduced and the whole operating process is optimized.

The modular structure simplifies making individual adaptations and later add-ons. That way the system can be modified to fit to all company and plant sizes. The ASE video surveillance systems can also be equipped with components for networking as well as control and interface software.



Kontakt: Eric Steck
e-mail: eric.steck@ase-industry.com
web: www.ase-industry.com

The exact control of the electrical power supply is a tricky business not just for the glass industry. But here the particularly high demands on precision and efficiency make power supply one of the “hot spots” of application engineering.

Siemens therefore placed great emphasis on consistent optimization of the power control from the start and found the ideal solution in the partnership with AEG SVS Power Supply Systems, the leading provider of thyristor power actuators. With these devices, the electrical energy supply can be controlled not only loss-free and precise regardless of the method used – phase gate principle or clock principle – but also monitored down to the finest detail. AEG SVS has consistently integrated interfaces to Profibus and the Siemens world of automation in all digital devices. And the cooperation pays off: Short plant commissioning times, high operational reliability, lower costs and increased efficiency – plus points which the customers require.

For example at Saint-Gobain: In the float plant in Thourotte, the French company had 33 heating zones equipped with the communication capable power actuators Thyro-P from AEG SVS. These were linked to the master PCS 7 process control system from Siemens via Profibus DP. This first installation of Thyro-P, Profibus and PCS 7 in a combination worldwide has drastically reduced the conversion time and eliminated many problems that Saint-Gobain had with other solutions in the past.

A large number of customers all over the world put their faith in the integrated solution – for example in float glass lines, directly heated melting or motherglass plants for TFT display production.



contact: Harro Liese
michael-harro.liese@aegsaft.alcatel.de
web: www.aegsvs.de

Successful in Russia – as well

Intelligent process
automation with TIA

Together with their partners, the specialists of the IWG Glasofenbau company in Zwiesel have successfully equipped a continuously operating glass melting furnace with a capacity of six tons in the city of Gus Khrustalny, 250 km east of Moscow, with Totally Integrated Automation (TIA) components from Siemens. This project is another success story in the cooperation between the renowned furnace manufacturer and Siemens.

The heart of the automation is a Simatic S7-Controller from Siemens. Moreover, the Siemens control system handles the plant HMI (Human Machine Interface). Forty-eight customized process images and menu-guided operation make operation of the system easy. The training expenses have been reduced considerably as a result.

For example, all the process data can be called from the Controlling and Preparation units at any time via the Ethernet and processed as desired. Remote maintenance by IWG is no problem either because all texts are convertible from Russian to German at a click of a mouse.



contact: Markus Schreder
e-mail: info@iwg-online.com

The Siemens GlassTeam: Think global – act local

Siemens has built a network of specialists with the necessary industry know-how who offer services including testing, training and after-sales service and made-to-measure solutions ranging from planning and concept development right through to implementation on the basis of Totally Integrated Automation. Throughout the entire project, the experts will cooperate closely with all parties involved, thus guaranteeing that the important deadline for furnace firing up is met and ensuring cost-saving and fast implementation of the project.

The regional project support for the USA comes from Spring House (Philadelphia), for Europe from Germany, for



Southeast Asia from Singapore and for China from Shanghai.

A regular exchange of information between the experts guarantees that the Siemens industry know-how is available all over the world.

"Think global – act local" also means that the responsible Siemens project

team is always right where the project is, whether in the planning phase, the implementation or commissioning. In this way the customer can be sure of always having a competent partner from the Siemens GlassTeam at his side.

Bernhard Saftig, Karlsruhe

Successful Sequel at Kaveh Float Glass

Kaveh Float Glass had already been working with Siemens when they equipped the line 1 of their float glass production. In that project, Siemens had made such a good impression that Kaveh opted for a sequel to this cooperation when they decided to build a second line with a capacity of 600 tons per day in Saveh southwest of Teheran, Iran.

For the new project, which is scheduled to start at the second quarter of 2003, Siemens are also supplying not only the Simatic PCS 7 process control system, but also heating transformers and thyristor cabinets. Additionally, Siemens are also responsible for the engineering and commissioning. The factory acceptance test was conducted successfully at the end of July and right now the system is on its way to Iran.

Thorsten Reichenecker, Karlsruhe

Expertise convinces Sisecam

When Sisecam was looking for a new process automation system for their second float glass furnace in Luleburgaz, Turkey, Siemens was able to secure the contract against a strong competition owing once more to industry know-how, a comprehensive product portfolio and the impressive advantages of Totally Integrated Automation (TIA).

The Siemens scope of supply consists of process automation with Simatic PCS 7, low and middle voltage switchgear, drives, controllers and the WinCC process visualization system from the TIA systems family. Engineering, implementation and commissioning of the automation systems and switchgear is presently underway and by December 2002, the entire project will be completed.

Hakan Ersin, Istanbul

Saint-Gobain Iover is ready for new opportunities

The new Saint-Gobain Iover production for glass wool in Yegorievsk, Russia will help to strengthen Iover's position in this important market. Since Siemens had already made an excellent impression in the automation project for another Iover production in Poland, Siemens will also supply the process control system Simatic PCS 7 plus instrumentation and be responsible for the installation, engineering and commissioning of the systems.

Tuomas Tuomela, Ulvila

For more info visit our website: www.siemens.com/glass-industry

GlassFocus

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Division Board

H. Gierse, A. S. Huber, A. Ötsch

Responsible for Legal Matters involving the Press
P. Miodek

Responsible for Technical Content
B. Lehmann

Phone +49 (0) 7 21 5 95-60 82

Fax +49 (0) 7 21 5 95-44 77

E-Mail: bernd.lehmann@siemens.com

Publishing House

Publicis KommunikationsAgentur GmbH, Corporate Publishing

Postfach 3240, 91050 Erlangen, Germany

Phone +49 (0) 91 31 7-4 67 75

Fax +49 (0) 91 31 7-2 45 40

Editorial Staff: Dr. B. Bellinghausen, Kerstin Purucker

Layout, Artwork: Jürgen Streitenberger

Coordination: Sabine Zingelmann

Photos

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