

Automotive Manufacturers Impose Tougher Requirements on Glass Processors

As automotive designs become more precise and complex, glass processors are meeting the challenge head-on. Not only are automotive designs stretching the capabilities of glass processors, they also are raising the bar on global optical standards. These trends are leading to compound curvature doorlites and larger and more complex roof glasses. Additionally, the number of individual automobile models has increased, forcing glass processors to shorten part runs.

Automotive designers also have adopted the concept of making glass surfaces as continuous as possible by reducing the gaps between windshields, backlites and sidelites.

"Automotive designers are likely to continue extending glass surfaces toward each other until there is no apparent body metal between the adjacent pieces of glass," said John Baxter, Glasstech Senior Vice President.

To meet these requirements, glass processors are producing more complex windshields and more spherically shaped glass. This increase in glass surface area on vehicles is not limited to passenger cars but extends to trucks, buses and trains, requiring glass processors to be able to produce very large and complex parts.

There also is an increased use of laminated glass. Laminated side and rear glazing has become more prevalent over the last several years. Many higher-end vehicles in Europe, Japan and North America are being fitted with laminated side and back windows. There are,



however, economic considerations such as the added expense of laminated glass which will limit this rate of growth, particularly in lower-end vehicles.

Automotive manufacturers are continually pushing for higher quality, more complex, lower-cost glass. Very stringent optical tests have increased the need for accurate, complex bends and freedom from surface distortion, imposing great pressure on glass processors and their equipment suppliers to achieve higher standards.

Glasstech Automotive Systems Making the Future Possible Systems for Today's Needs and Tomorrow's Dreams

Today's glass processing systems must be designed to handle the rigorous requirements of contemporary vehicles and be capable of producing the more demanding designs of the automobiles of tomorrow. Glasstech automotive bending and tempering systems are uniquely designed to meet the needs of automotive processors today and into the future.

Original equipment manufacturers are providing some glimpses into the future by designing vehicles with taller, more precise and complex windows that require even tighter tolerances. Glasstech constantly enhances its capabilities so it can maintain its lead in bending and tempering glass technology for the automotive industry.

The Glasstech SDB family fulfills two very important functions for the automotive industry with the SDB-L™ Super Deep Bend Forming and Annealing System for windshield glass and the SDB-T™ Super Deep Bend Forming and Tempering System for automotive safety glass.

The SDB-L produces very accurate windshield monoliths, with patented stress control, at rates up to 300 monoliths per hour,



equivalent to 150 windshields per hour. The system is capable of producing glass parts having maximum depth of bend of 380mm (15 inches) and minimum radius of 120mm (4.8 inches).

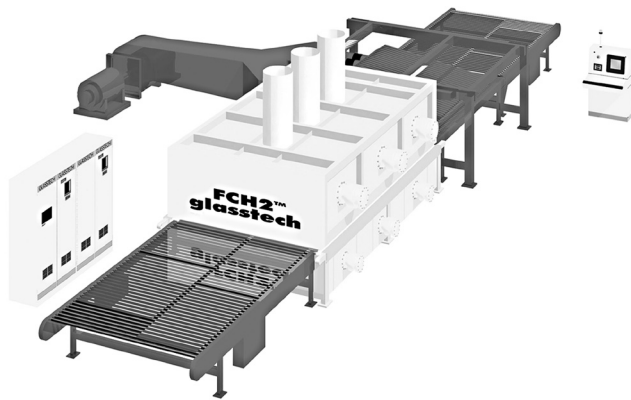
The SDB-T produces complex backlites and sidelites at production rates up to 300 parts per hour. Use of either Glasstech's gas-fired forced convection heating technology or its aspirated convection-assisted electric radiant heating technology enables this system to process energy-efficient, reflective coated glass.

Both the SDB-L and the SDB-T are particularly effective in producing complex spherically shaped parts without distortion. The SDB-T is in use in Japan producing complex parts locally described as "egg-shaped." The SDB-L is currently producing large accurate windshield parts for the most popular pick-up truck in the U.S.A., the Ford F-150.

The self-aligning Quick-Change Option tooling design feature also adds to the overall efficiency of the SDB system by reducing part changeover time to approximately 90 minutes.

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Glasstech Architectural Systems Meeting the Challenges



Gas-Fired Systems Still the Most Efficient

Even with the rising price of natural gas worldwide, Glasstech is seeing increased interest in its FCH2™ Architectural Flat-Glass Tempering System. This gas system continues to demonstrate in daily operation that it is still the most efficient solution for tempering Low-E glass.

"The Glasstech FCH2 is the most efficient system for tempering high-performance Low-E glass because it can temper this coated glass in just 33 seconds per millimeter, the highest continuous throughput in the industry today," said Troy Lewandowski, Glasstech Product Line Manager. "By reducing heating time, Glasstech can produce glass with higher quality, less distortion, improved productivity and superior flatness while reducing processing costs."

The FCH2 is a forced-convection system that processes clear, tinted, patterned or coated glass, including hard-coated and sputter-coated Low-E glass.

Gas-fired, forced-convection heating systems offer the lowest energy costs per square foot of glass processed and have been proven to be as much as 50 percent less expensive to operate than standard electric heaters. Gas heating also facilitates cycle times 25 percent shorter than traditional electric radiant heating.

Under normal production conditions, the FCH2 can consistently heat clear glass at a typical cycle time of 30 seconds per millimeter of thickness.

Auto Systems Continued

EPB Gains Highly Sought Certification

Audi AG has awarded its coveted certification to glass parts produced on the highly innovative Glasstech EPB External Press Bending System for automotive glass.

"We are gratified that Audi has recognized the excellent optical quality and strict tolerances that can be achieved on the EPB," said Terry Bennett, Glasstech Product Line Manager. "The EPB is proof positive that Glasstech systems not only set the level for quality, they also continue to raise the standard."

Glasstech offers two EPB models. The EPB-SS™ External Press Bending System is for single-stream sidelites, and the recently introduced EPB-DS™ External Press Bending System, with a 72-inch (1829mm)-wide bed, can accommodate either a single backlite or windshield part or a dual-stream of sidelites.

Both systems are designed to meet the demands of automotive glass processors for parts having very accurate peripheral and body shape and the highest optical quality.

Architectural Bending Systems Getting Larger to Meet Demand

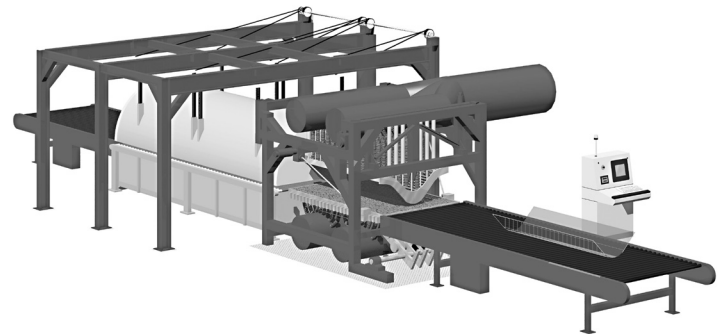
With each passing year, architects create more complex and stunning building and product designs that require more durability and flexibility from glass.

The Glasstech Advanced Bending and Tempering System™ (ABTS) allows architects and designers the freedom to create dramatic curved glass parts for buildings, display cases, shower enclosures and furniture in clear, tinted or coated glass.

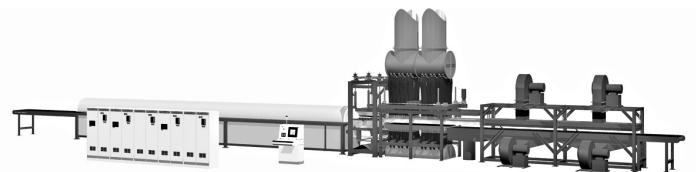
"Glasstech encounters more designs each year that call for curved safety glass for interior and exterior use and the designers are now calling for larger parts," said Tom Zalesak, Glasstech Product Line Manager. "The Glasstech ABTS is equal to the challenge."

ABTS bends can range from graceful "S" curves and "V" bends to constant radius and asymmetrical shapes. The system avoids the need for expensive tooling by using a combined bending and quenching section, controlled by an advanced PC interface. This approach also permits quick shape changeovers, since the computer records shape parameters and stores the data for future reference.

Glass from 5mm to 19mm in thickness and as large as 2440mm (96 inches) by 3800mm (150 inches) can be processed on the ABTS.



Glasstech's Advanced Bending and Tempering System™ (ABTS)



Glasstech's External Press Bending System™ (EPB)

The EPB-SS and the EPB-DS systems are versatile, efficient, high-throughput systems that bend and temper or heat-strengthen cylindrical, compound and symmetrical or asymmetrical complex-shaped parts.

Either system can be configured as a high-capacity system with cycle times of approximately seven seconds per load (of one or two parts) or as moderate-capacity systems with cycle times of approximately 15 seconds per load.

Glasstech Service, Support ▶▶▶

Ensure Continuing Success for Customers

From its inception, Glasstech has earned a reputation for developing highly dependable automotive and architectural systems. Almost as critical as the systems themselves are the measures Glasstech takes to ensure its systems are highly reliable and remain working at peak production levels.



“While Glasstech systems run for decades, frequently the environment at customer sites changes over the same period,” said David M. Luttrell, Glasstech Sales Manager, Aftermarket Sales. “The Glasstech Aftermarket Support Group exists to provide the technology and training needed to help our customers maintain the highest output levels at all times.”

To ensure Glasstech systems continue to operate efficiently and effectively, the company has charged the Aftermarket Support Group with the following responsibilities:

- Provide fast and effective response to customer requests for assistance
- Help to improve day-to-day system operations at customer locations
- Demonstrate how to reduce downtime and increase output
- Provide new solutions to replace obsolescent technology
- Introduce new methods and processes to improve efficiency and increase productivity

“Glasstech systems are designed for high productivity and reliability, and we constantly search for the best and most economical ways to further increase output, increase quality and reduce operating costs. We offer retrofits to take advantage of new technologies, as well as benefits from new Glasstech system developments,” Luttrell said.

The range of Glasstech Aftermarket services includes technical service, training, on-site assistance, tooling services, design review, retrofits and spare parts.

Service ▶▶▶

Glasstech offers customized service agreements to meet specific customer needs. The services that can be included are preventive maintenance, operator and maintenance training and spare parts review. Additionally, system audits can be included to identify relevant retrofits and other improvements that keep the system running at peak performance.

Training ▶▶▶

Inevitably, some companies lose trained employees or add new equipment requiring additional training. To ensure systems continue to run at their peak performance, Glasstech is available to train operators and maintenance personnel on a regular basis. This training can be conducted in a customer's plant or at Glasstech to comply with the customer's schedule.

On-Site Visits ▶▶▶

Glasstech personnel will visit customer locations on a regular basis to supervise preventive maintenance and review efficiency of operations. Additionally, visits can be scheduled for equipment audits, tooling prove-out and personnel training.

Tooling Services ▶▶▶

Glasstech assists customers with the entire tooling process, from design through prove-out, either at Glasstech or at the processor's location. To ensure glass produced on its systems meets manufacturers' demanding specifications, Glasstech recommends the purchase of genuine Glasstech tooling for proven reliability, quality, economy and longevity. Replacement, refurbishing, providing spare parts and conducting training are part of Glasstech's comprehensive tooling services.

Design Review ▶▶▶

By using its proprietary Shape Modeler® Software, Glasstech can review OEM glass designs without processing glass and prior to tooling production and sampling. This computer simulation identifies problems in the design and suggests possible modifications to optimize the quality and characteristics of glass to be run on Glasstech systems. Use of Shape Modeler Software speeds the development of tooling and saves processors money and time.

Retrofits ▶▶▶

Glasstech constantly searches for new ways to improve the efficiency and capabilities of its systems. Glasstech develops new products and processes, such as the Quick-Change and Fast-Cycle options for the DB™ 4, to be retrofitted easily to existing systems. These new methods save customers time and money and extend the life of existing Glasstech systems.

Spare Parts ▶▶▶

When replacing parts on a Glasstech system, primary consideration should be given to how well the replacement part will operate within the system. Instead of purchasing generic parts produced to work within multiple systems on the open market, knowledgeable processors use genuine Glasstech spare parts. They know these components are designed to meet Glasstech's exacting standards and tolerances and will match the performance of the original components.

To ensure maximum “uptime” for your Glasstech system and benefit from expert knowledge, Glasstech can be contacted through its Web site (www.glasstech.com) or by E-mailing specific departments as follows:

- sales@glasstech.com
- service@glasstech.com
- software@glasstech.com
- tooling@glasstech.com
- spareparts@glasstech.com
- aftermarket@glasstech.com

Glasstech Strengthens Its Worldwide Presence

Glasstech was founded in 1971 by a trio of glassmaking veterans in a dusty second floor office in Woodville, Ohio. Today, the company is a global enterprise that reaches around the world and has operating units in 54 countries.

"To handle the global demand for Glasstech systems and support, we've established geographically diverse sales and service locations to support our efforts," said Jay Molter, Glasstech Vice President, Marketing & Sales. "These sales and service locations are the backbone of Glasstech's customer relations effort."

The locations include the Glasstech corporate headquarters in Perrysburg, Ohio, U.S.A.; Glasstech Limited in Worcester, UK; a representative office in Shanghai, China; and the recently opened liaison office in Mumbai, India.

"Providing fast and efficient response to inquiries is a Glasstech hallmark, which is why Glasstech has staff on hand at its sales and service locations to respond efficiently and effectively," Molter said. "This ensures valued customers and prospects receive the highest level of service and fast response to requests for new systems, parts, tooling and service."

Following is a listing of Glasstech's personnel assigned to its geographic territories and offices.



Americas

Jay Molter, Vice President, Marketing & Sales
Dave Luttrell, Sales Manager
Sam Wygant, Sales Representative
Michael Walbolt, Spare Parts Coordinator

Europe and Africa

John Baxter, Senior Vice President, Glasstech, Inc.
& Managing Director, Glasstech Limited
David Reeve, Sales Manager
Roger Rasch, Spare Parts Coordinator

Asia Pacific

Randy Croson, Director of Sales
Mark Krupp, Sales Manager
Mark Rosenberger, Spare Parts Coordinator

Shanghai, China, Representative Office

Yang Ping, Country Manager
Hui Duan, Sales Representative

Mumbai, India, Liaison Office

Ramesh Srinivasan, Country Manager

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Glasstech, Inc., based in Perrysburg, Ohio, U.S.A., is the leading innovator and producer of highly productive bending and tempering systems used by glass fabricators supplying the worldwide automotive and architectural safety-glass market. Glasstech automotive and architectural glass bending and tempering systems have become world standards for the production of high-quality safety-glass products.

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WHERE INNOVATION CONTINUES

www.glasstech.com