Delivering better value to our customers by providing unique glass processing technologies.

glasstech
World Leader in Glass Bending and Tempering Technology
world

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INNOVATION SPURS GROWTH

In 32 years, Glasstech, Inc. has progressed from its first system that tempered flat-glass sheets for patio doors to the company that supplies the world's most diversified selection of tempering and bending and tempering systems for the international architectural and automotive markets.

Innovation established Glasstech and innovation continues to spur the company's growth. Glasstech's innovations are chronicled through 116 active U.S. patents and more than 500 foreign patents or patents pending. Following are some of the highlights of Glasstech's innovation:

1972 – the Roller Hearth Tempering System

1974 – the Batch (Oscillating) Tempering System

1978 – the Quick-Sag Bending and Tempering System

1985 – the Deep Bend 4 (DB4) Process

1991 – the Advanced Cylindrical Bender (CRB)

1992 – the full "Forced" Convection Heater

2001 – DB4 Quick-change and Fast-cycle Bending and Tempering System

2002 – the External Press Bender (EPB)

China and Glasstech, a Partnership for the Future

The Peoples Republic of China is a rapidly evolving automotive glass market, and Glasstech Inc.'s superior, leading-edge technology is well-suited to China's needs.

Three years ago, the Chinese government moved to centralize vehicle production in three locations; and, recently, Japanese and European manufacturers have committed to produce automobiles in China for worldwide distribution. These factors, as well as a growing internal demand for vehicles, have created an increased requirement for bent and tempered glass that meets international standards and is produced just-in-time.

At the heart of the solution to China's automotive glass needs is Glasstech's state-of-the-art DB4 bending and tempering system. This highly dependable and efficient system currently is being used in several Chinese plants to bend and temper sidelites, quarterlites and backlites for a wide variety of models, including products from Ford, Citroen, Fiat, Seat, Brilliance and Geely.

The DB4 has been revised with user-suggested features to improve even further on its optical and shape quality as well as to increase the yield of the glass being processed.

Additionally, a new quick-change tooling system and a fast cycle development have dramatically reduced tooling changeover times to 90 minutes and increased production by 20 percent or more. Both can be ordered on new DB4 systems or retrofitted to existing models.

Glasstech's series of cylindrical benders, CRB1 and CRB2, produce sidelites without part-dedicated tooling. The company's recently introduced CRB3 further refines this family of systems' capability by introducing cross-curvature in the region of 5mm. All three systems are able to change from one part to another in a matter of minutes.

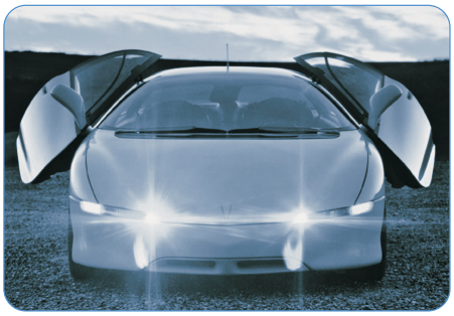
The latest Glasstech system, the External Press Bender (EPB), can produce bent and tempered sidelites of cylindrical, double curvature, symmetrical or nonsymmetrical form with excellent accuracy of shape.

Glasstech technology also leads the field in evaluating glass designs while still in CAD format. The Shape Modeler® from Glasstech is a computer simulation software package that uses mathematical modeling to verify the integrity of a design from the shape and optical viewpoints.

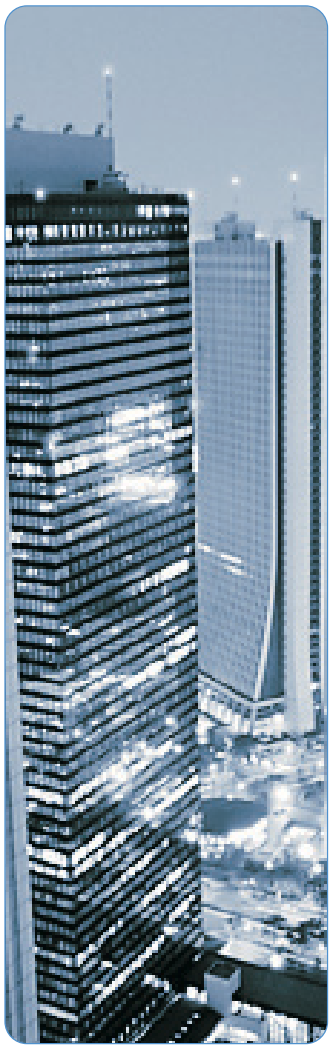
Shape Modeler saves significant time and expense by minimizing development time and proposing changes in the design to overcome optical problems. The program's accuracy has been verified to twenty thousandths of an inch or 0.5mm for parts of average complexity.

As Glasstech develops new technologies, it enhances its Aftermarket Services to support the customer base. Glasstech's Aftermarket Service program offers users of existing systems technology updates, retrofits, parts and equipment, additional training, trouble-shooting and standard maintenance.

As China expands automotive production in the coming years, Glasstech will continue to innovate and keep pace with changing needs. Chinese glass fabricators and Glasstech are a partnership that will achieve mutual success.



Glass Becoming More Prevalent in Chinese Construction



Gleaming, modern buildings are rising throughout China. With each floor constructed, the need for high-performance Low-E coated glass increases.

These high-performance coatings enable the glass in these new buildings to help control the comfort of the occupants. The coatings keep out unwanted heat in summer, retain internal heat in winter and protect against damaging ultraviolet rays. This means smaller, more energy-efficient heating and cooling systems can be used.

Glasstech-developed technology makes it possible to process high-performance Low-E glass efficiently. Through the use of convection technology, Glasstech has significantly reduced the heating time of coated glass.

The ERH-C2, Glasstech's newest electric radiation heater, cuts Low-E glass heating time by 25 percent when compared to a traditional electric radiation heater. As a result, the ERH-C2 not only increases the system's efficiency and yield, it also reduces cost and produces glass with superior optical and surface qualities.

Similar advanced convection technology makes it possible for Glasstech's gas-fired Forced Convection Heater, the FCH2, to process high-performance coated glass in approximately 50 percent of the time required by a traditional electric radiation heater.

Both the ERH-C2 and the FCH2 can be ordered on new systems or retrofitted to existing Glasstech systems.

Glasstech technology also makes it possible for architects and designers to specify bent and tempered glass for a variety of construction-related and interior uses. The ABTS system, Glasstech's architectural bender, makes it possible to shape large sheets of glass into graceful, sweeping and repeatable curves.

The TRCB system produces tight-radius bends without the use of part-dedicated tooling. It has lead the way to dramatic improvements in the shape of such diverse items as shower enclosures and display cases.

Glasstech systems have a well-deserved reputation for durability and low maintenance cost. Since Glasstech systems are built to high specifications, they outlast the competition and incur lower costs over their lifetime.

Aftermarket Service from Glasstech ensures that once a system is installed and commissioned, Glasstech will be there to keep it running at peak efficiency as well as provide technology updates to enable the system to perform beyond its original specifications.

Noe Honored for Outstanding Service

Glasstech's Director of Customer Service and Systems Engineering Tom Noe, left, accepts the Glass Association of North America's first Award for Outstanding Service from Spec-Temp's Dennis Csehi.

The Glass Association of North America honored Glasstech's Tom Noe with its first GANA Award for Outstanding Service. The award was presented during the 17th Annual Glass Week in January in Dana Point, California.

Noe, Glasstech's director of Customer Service and Systems Engineering, was cited for his service to GANA's Tempering Division. He has served as chairman of the division's Annual Educational Seminar since 1991.

GANA's *Glass Reflections* Newsletter for February 2003 stated: "GANA honored Noe's tremendous achievements in the advancement of GANA's Tempering Division Educational Seminars and thanked him for his dedication and perseverance. As a result of Noe's efforts, the Association has gained recognition throughout the industry for high standards of educational quality."

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Where innovation continues.

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