Issue 13

glasstech® World

Conserving Energy Through More Efficient Quenching

Automotive Tempering

There are two initiatives affecting automotive glass fabricators: the unrelenting need to reduce the cost to produce a product, and the near term movement to thinner safety glass to meet future fuel economy standards. Fortunately, Glasstech has developed a new automotive quench technology for tempering thinner glass that addresses both initiatives.

Recently, automotive companies have publically stated that they are targeting a 15 percent weight reduction for their vehicles by 2016* to meet the more stringent fuel economy standards. If the 15 percent weight reduction is applied across all aspects of an automobile, future glazings will be specified in the 2.6mm to 3.2mm thickness range instead of the 3.1mm to 3.8mm thickness range primarily used today.

In addressing the need to temper thinner glass, a new approach for quenching was developed that increases the effective heat transfer capabilities of the quench when compared to the traditional technology.

The more effective heat transfer allows thinner glass to be tempered to the same safety standards as the traditional glass thicknesses with existing quench air blowers. This more effective heat transfer quench can also be used on the current range of glass thicknesses to consume less energy. As an example, the new high efficiency quench will require roughly half the power as the traditional quench for 3.1mm glass.

Continued on Page 2.

**Akerson, Dan. Speech to CERAWeek Energy Conference.*

Conserving Energy Through More Efficient Quenching

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As the industry knows, the amount of energy required to temper glass increases as the glass thickness decreases. In the case of 3.1mm glass, roughly 40 percent of all the energy consumed in processing glass is used for the tempering and after cooling function. When the glass thickness decreases to 2.8mm thickness, roughly 60 percent of all of the energy consumed in processing the glass is used for the tempering function. The new high efficiency quench, by reducing the required quench power on 3.1mm glass by 50 percent, lowers the total energy consumption for producing a part by roughly 15 percent.

Contact Glasstech with your specific automotive part requirements to see how this new quench technology can help your organization lower energy consumption on current glass thicknesses and position you for thinner glass tempering.

Flat Glass Tempering

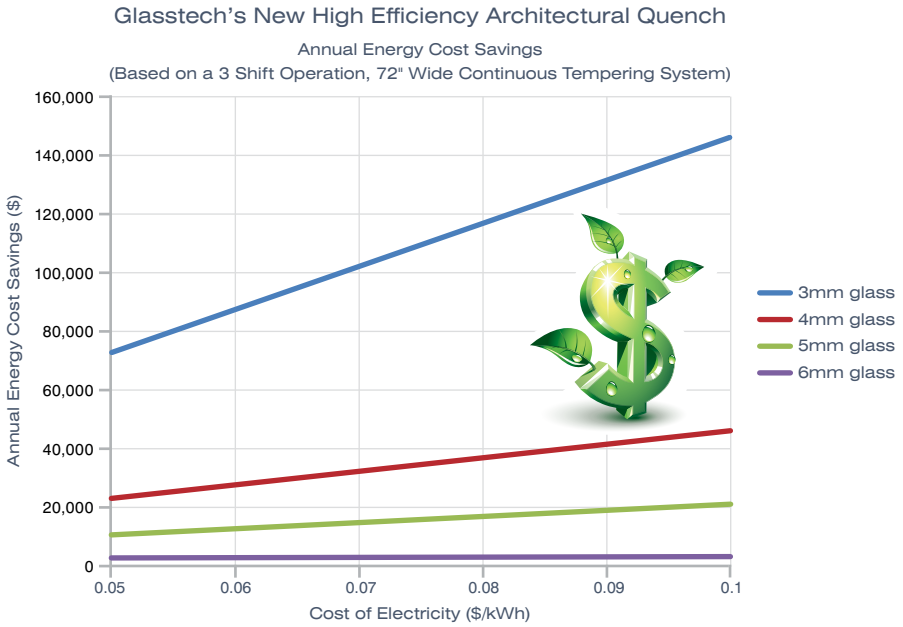
Glasstech systems are renowned for producing everything from thin, high performance coated glass for residential and photovoltaic markets to large, thick tempered panels for commercial applications and creative interior designs.

Glasstech has taken its world-leading flat glass tempering technologies and further improved their quenching efficiency to provide more process capability while also reducing the amount of energy required. That translates into significant energy cost savings and opens the doors to new market opportunities for our customers. This impressive development can be retrofitted to existing Glasstech tempering systems or supplied with new Glasstech tempering systems.

Existing quench technologies can boost heat transfer by increasing the air pressure supplied to the quench nozzles either with compressed air boosters or by increasing fan speed. However, neither of these techniques improves efficiency or reduces energy costs. In fact, these techniques require more power and create additional energy costs.

Glasstech's improved quench performance is achieved by replacing all or part of a quench system with a new design having a dramatically higher convective heat transfer coefficient for a given amount of air pressure. This means that the same glass product can now be tempered using less air pressure and power. It also means that thinner glass can be tempered using the same quench fans. For example, a system currently configured to temper 3mm glass would have the capability to temper 2.7mm glass or thinner.

Depending upon the amount and thickness of glass being tempered, the number of operating hours per year, and the cost of electricity, the annual energy cost savings provided by this new quench technology could be $100,000 or more!



System Modifications Enhance Forming

To be an industry leader, a company must anticipate future developments and must position itself to create new products or modify existing products to meet these future developments.

"To increase our ability to maintain tight tolerances, especially in the D-pillar area, our researchers developed a patent-pending method of positioning glass on the tooling."

True to its position as the foremost innovator in the glass-processing industry, Glasstech has enhanced its industry-leading DB 4™ Deep Bend Advanced Bending and Tempering System for automotive glass, to improve the system's forming capabilities and enhance its operational efficiencies.

In the area of forming capabilities, the increasing popularity of crossover vehicles, which combine aspects of a sedan with an SUV, has caused tolerance problems with shape compliance for glass processors. In many crossover vehicles, the glass covers the D-pillar in the rear of the vehicle, making it difficult to maintain tight tolerances.

"We asked our engineers to meet the challenge posed by some crossover vehicle designs," said Jim Schanbel, Glasstech Sr. Vice President of Development. "To increase our ability to maintain tight tolerances, especially in the D-pillar area, our researchers developed a patent-pending method of positioning glass on the tooling. This new system has demonstrated a significant reduction in the off-form losses caused by upstream/downstream position variations for our DB 4™ system users."

This technology can be retrofitted to existing DB 4™ systems or ordered as a part of a new system.

In addition to improved positioning for DB 4™ tooling, Glasstech has also recently launched an improved quench open/close mechanism. The quench improvement utilizes precision controlled mechanics driven by an AC servo motor. This precision control allows a faster cycle without shaking that can occur on air cylinder quenches. The precision control and nozzle-to-glass gap adjustment can also improve quench yield on difficult parts.

Another DB 4™ enhancement that can improve quality and yield is the addition of impulse vacuum. This patented technology available on Glasstech tooling allows the vacuum to be applied to a particular zone on the glass surface allowing that area to be pulled into conformance with the mold.

"We asked our engineers to meet the challenge posed by some crossover vehicle designs."

Finally, Glasstech can assist its customers in successfully launching complex, tight tolerance parts through our tooling services. Glasstech recommends the purchase of genuine Glasstech tooling for proven reliability, quality, economy and longevity. Glasstech tooling can be run, proven and prototype parts produced on Glasstech's DB 4™ tooling prove-out machine or Glasstech engineers can prove-out the tools on the processor's production system.

ARCHITECTURAL – IMPROVED ABTS INCREASES CREATIVITY

Improved ABTS Increased Creativity Reduces Costs

A seemingly endless list of requirements – curved, flat, big, small, clear or coated, short run or long – are the daily customer requests faced by architectural glass processors.

Tempering flat glass is not a problem, but the same system usually does not bend glass, especially large glass parts into a variety of shapes.

That was the case until Glasstech developed the Architectural Advanced Bending and Tempering System™ (ABTS). This highly productive yet versatile system can be ordered in two widths, 2140mm (84 inches) and 2440mm (96 inches). Both systems can be equipped with a flat tempering option to temper large glass lites as well as bending and tempering glass in a range of bends including …

- Cylindrical bends
- Asymmetrical bends
- J bends
- V bends
- S bends

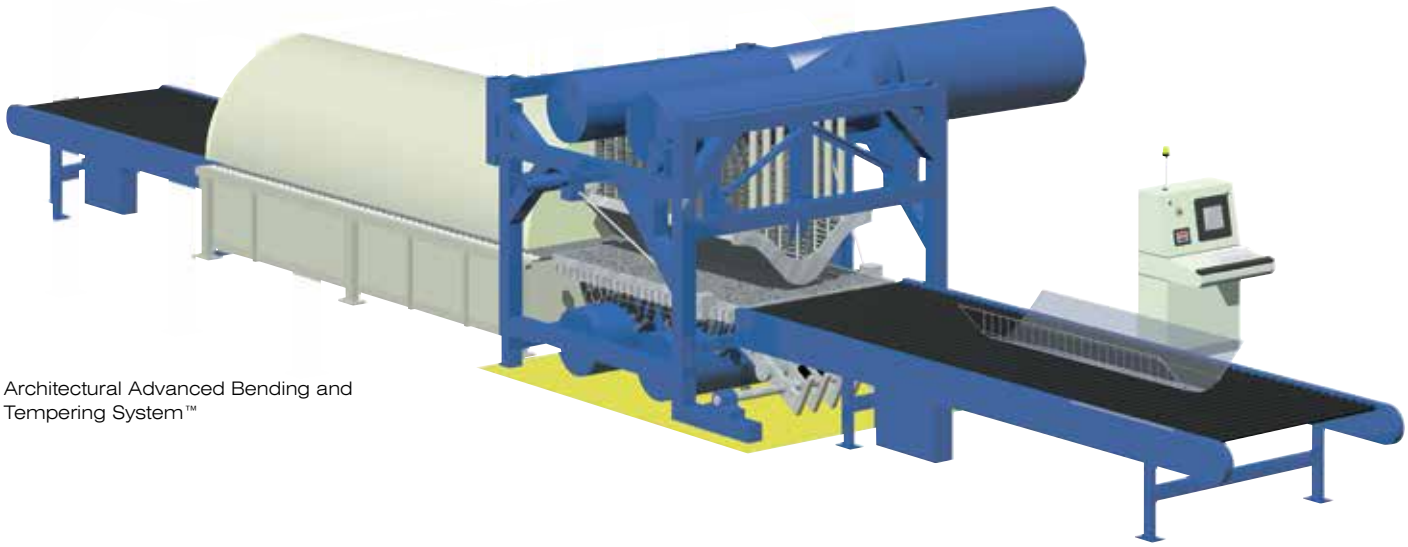
The ABTS reduces tooling costs by using a combined bending and quenching section, in which computer-controlled, articulated platens form the glass without the need for part-dedicated tooling. This approach also permits quick shape changeovers, since the computer records shape parameters and stores the data for future reference.

Glasstech's ABTS allows architects and designers the freedom to create curved glass elements for buildings, display cases, shower stalls and furniture from clear, tinted or coated glass.

Glass from 4mm (5/32 inch) to 12mm (.50 inch) in thickness and as large as 2440mm (96 inches) by 3660mm (144 inches) can be flat tempered or bent on the ABTS into graceful, custom-specified curves.

The ABTS is available with Glasstech's Electric Radiant Heater, which features outstanding uniformity for heating, or Glasstech's Forced Convection Heater, one of the most effective heating systems available for all glass types, which can also provide tremendous energy cost savings based on local energy rates.

For more information on the ABTS, please see the Glasstech website at www.glasstech.com or call us at 419-661-9500.



Architectural Advanced Bending and Tempering System™

AFTERMARKET

Glasstech Service & Support

Performance Audits Optimize Glasstech Systems, Save Money – At No Net Cost to Glasstech Customers

Glasstech's aftermarket offerings include ongoing service agreements, on-site or remote training, tooling services, genuine replacement parts and system upgrades.

With a number of innovations and retrofits available to existing Glasstech customers that can improve efficiency, reduce expenses and enhance throughput, there has never been a better time to contact Glasstech for a System Performance Audit.

Optimizing the operation of a Glasstech system ensures it will last longer, maximizes system output and enhances the production of excellent glass parts at the lowest possible price per part.

The purpose of a Glasstech System Performance Audit is to identify areas for performance improvements or enhance capabilities.

Many customers have increased their uptime and yield on their Glasstech equipment by simply upgrading their control system to current technology. The more efficient control system utilizing Control Logix™ provides increased diagnostics to ensure any downtime associated with the Glasstech system is minimized. This leads to a more efficient operation and a better bottom line.

No Net Cost Performance Audit

The "No Net Cost" System Performance Audit is simple. Glasstech charges a small fee to visit a customer site, perform an audit and provide performance enhancement recommendations. If the customer agrees to implement the recommendations from the audit, the price of the original audit will be deducted from the price of the order, giving the customer enhanced system capabilities with no out-of-pocket expense for the System Performance Audit.

Glasstech has designed audits to probe performance characteristics such as costs, downtime, throughput and yield. Performance audits will also include investigations of energy usage and preventive maintenance practices.

The company will make written recommendations outlining steps to be taken to reduce costs.

Throughput Audit

The more product processed on your Glasstech system, the more efficient the system will be. This audit will look at your system's current production capacity and what can be done through retrofits, updated software and operator training to increase throughput.

Customized Audit Path

If a customer experiences a continuing problem that is not traceable, Glasstech will design an audit path specifically for the problem and customer.

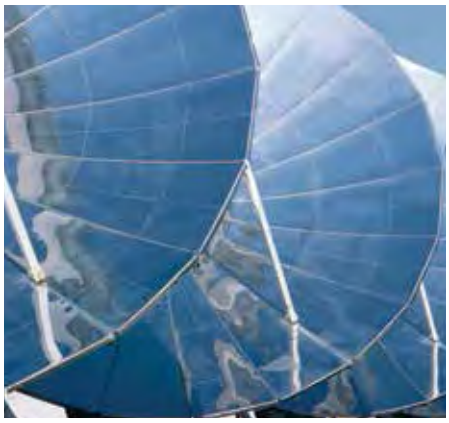
Service Agreements

Glasstech can design a package of contract services to meet each customer's needs and budget. Contract service customers receive priority from Glasstech's technicians and can specify the number of days of on-site service at the customer's facility.

Please contact the Glasstech Aftermarket Sales Department (aftermarket@glasstech.com) to learn greater details concerning the value and savings possible through a Glasstech System Performance Audit.

SOLAR

Glasstech Advances Point-Focus Glass Reflector Shaping for Solar



Glasstech has recently developed breakthrough technology for the fabrication of very precise point-focus glass reflectors. Point-focus concentration solar power technologies continue to grow, from varieties of micro-dish to dish and tower technologies.

Glasstech has now developed an advanced process for shaping and tempering these point-focus reflector shapes. Glasstech can work with solar glass processors to develop a high volume, manufacturing capability utilizing Glasstech technology. Glasstech's specialized process can accommodate near or longer distance focal lengths, all with high quality strengthened bent glass reflector shapes that exhibit higher impact and wind-load resistance. Depending on the low-iron glass thickness, self-supporting reflector shapes can be processed which minimize external support and lower the overall cost of the structure as well.

Self-supporting 4mm shapes can be processed up to 1500mm x 1500mm and down to 250mm x 300mm depending on the shape. Thinner glass thickness capabilities are also available based on the reflector shape and dimensions. With regard to the tolerances desired by those in this market segment, Glasstech has been able to achieve shapes with slope errors of less than 2mrad RMS with efforts continuing to lower this limit.

Contact your Glasstech Representative today to discuss your solar glass bending and tempering equipment needs.

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