

CRB-P™ Engineered for Burgeoning Concentrated Solar Power Industry

| System Efficiently Produces Parts for Parabolic Reflectors |



Once again, Glasstech, Inc., is positioned at the center of an emerging technology that will change the future, as we know it.

There is little doubt that solar energy is developing rapidly on several fronts. One area quickly being commercialized is Concentrated Solar Power. CSP uses four-piece, glass-based parabolic mirrors to create a trough. This trough concentrates the sun's rays on a tube-within-a-tube configuration containing a heat-transfer medium, which eventually provides the heat to create steam that powers an on-site electricity-producing turbine.

"Glasstech's Cylindrical Radius Bender technology is the right technology at the right time to produce the glass substrates that form the parabolic mirrors used in CSP," said Jay Molter, Glasstech's Vice President of Marketing & Sales.

Glasstech has engineered the Constant Radius Bender – Parabolic (CRB-P™) as a cost-effective and efficient means of providing the essential glass parts that are needed by the burgeoning CSP market.

According to Molter, the U.S. Department of Energy estimates by 2020 there will be more than 20 gigawatts of CSP online in the United States. World market demand will be even greater. He said Pacific Gas and Electric Company announced in July it will build a 553-megawatt CSP facility in California's Mojave Desert. Additionally, Nevada Solar One, a 64-megawatt facility just outside of Las Vegas, went online in June.

Glasstech's CRB-P has many distinct advantages which make it the "right technology at the right time." The CRB-P does not use dedicated tooling. It bends glass using patented, computer-

controlled, roll-forming technology. Because of its unique shape control, glass produced on the CRB-P achieves strict tolerances and a high degree of shape repeatability.

"Since CSP uses mile upon mile of glass-based parabolic troughs, the CRB-P's high throughput makes it clearly the cost-effective choice," said Jim Schnabel, Glasstech's Vice President Product Development.

A typical system, configured to produce parabolic parts, will produce up to 111 parts per hour, dependent upon thickness and size requirements.

The CRB-P's flexibility is another advantage. Because the system uses computer-controlled roll forming, shape changes take only minutes. Each section of parabolic reflector requires four distinctly shaped glass parts.

Additionally, glass produced on the CRB-P can be annealed for lamination or tempered or heat strengthened with a minimum of system changes.

"Most CSP panels currently are being laminated for strength, once the reflective coating has been applied," Schnabel said. "Glass produced on the CRB-P can be surface strengthened so additional rigidity is not needed, once the reflective coating has been applied, eliminating the need (and cost) for lamination."

The CRB-P features a forming bed that is 1,700mm by 1,700mm and will be able to process glass of varying thicknesses, depending of the surface-strengthening treatment required. For annealed glass, the system will form glass as thin as 1.6mm. It will heat-strengthen glass as thin as 3.0mm and fully temper glass as thin as 4.0 mm.

CRB-P systems maintain the same characteristics as other CRB systems and are able to quickly form pure cylinders, shapes with two radii that have a point of tangency, J-bends and V-bends. With slight modifications, the CRB-P can form an even wider range of sophisticated bends.

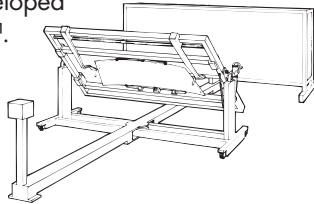
"The CRB-P meets the needs of the Concentrated Solar Power industry by delivering the tolerances and repeatability required to produce the large volume of glass parts the CSP industry will use," Molter said. "The CRB-P is another example of our pledge, 'At Glasstech, the innovation continues.'"

Glasstech Introduces AutoGlassInspector™

It's an ongoing concern. How do you quickly and efficiently determine the quality of automotive glass? Ideally, this evaluation should be automatic and should occur inline.

To meet this challenge, the inventive minds in Glasstech's Product Development Department have developed the affordable AutoGlassInspector™.

The AGI™ quantifies the optical quality of backlites and windshields by numerically evaluating the transmitted optical distortion in a just-formed glass part.



"To determine its quality, the just-formed piece of glass is compared digitally to the industry's recently emerged, de facto world standard, the VW-authored TL957 standard for optical distortion," said Chief Development Scientist Don Shetterly, who supervised the project along with Development Engineer Jason Addington.

"Our focus," Shetterly said, "was to develop an affordable system that meets all the needs of the industry for certifying the quality of its glass products. The AGI meets these challenges."

AGI quantifies transmitted optical quality by means of a user-friendly, intuitive user interface. The system's powerful, state-of-the-art analysis computer can scrutinize a part in less than 10 seconds. Analysis results are displayed on a large, wide-screen LCD monitor.

Once the equipment is installed, it requires no attention from the operator, who simply initiates an analysis with the click of a wireless mouse.

"AGI is only the first in a series of glass quality analysis systems being developed by Glasstech," said Jay Molter, Glasstech's Vice President of Marketing & Sales. "These affordable solutions

for determining the level of quality for tempered or laminated glass will be usable not only on Glasstech's systems, but also on all such systems in glass production plants."

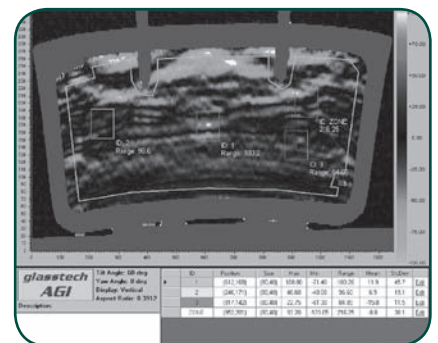
The initial AGI system was developed primarily as an offline instrument. A production-line version now is available. This inline version will reduce manpower currently needed to inspect the glass parts, enabling capital investment costs to be recouped rapidly.

AGI operator training will be accomplished quickly, and the user interface is designed for easy retention of operating commands.

AGI is installed and supported by Glasstech personnel, who are world-class experts in glass technology and the science of industrial glass manufacturing.

Customers are assured of a high level of support not possible from other equipment suppliers.

Contact your Glasstech sales office for detailed specifications and additional information on AutoGlassInspector.



Analysis results are displayed on a large, wide-screen LCD monitor.



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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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