AUTOGLASS INSPECTOR AGI-G™

Non-Contact Gauging System

AGI-G System Overview

AGI-G is a non-contact glass gauging system that is cost effective and eliminates the limitations of traditional contact probe gauging. The AGI-G system provides off form data at probe locations, along with a topographical map of the surface off form. The glass requires only an economical part-specific support fixture to perform the gauging. The system is designed to operate either downstream of bending equipment in the plant or in a lab environment. The system can save all relevant data for each part and provides a real-time logging function to enable continuous trending of individual probe points. Gauging measurements are taken at installation angles ranging from 0° to 70°. Powerful data logging functionality gives the user the ability to detect trending probe data and react quickly to process changes.

Process Description

The AGI-G system can be loaded/unloaded manually or with a robot. The glass is placed on the fixture (A datum) and a positioning system integral to the fixture locates the glass against the B and C datums. The system is already at the proper installation angle. The glass and fixture are conveyed into the enclosure, where the measurements are completed. After measuring the glass, the glass and fixture are conveyed out of the enclosure and the glass is removed from the fixture. The fixture is now ready to accept the next glass. The gauging results of all the probes are reported graphically and in a table. Any probes that are outside specification are indicated.

AGI-G System Components

- High performance Windows computer system with one 24” display and two large-screen video displays
- PLC with servo control including integrated control software with one 24” monitor
- Tilt system to allow gauging at 0° to 70° installation angle
- Fixture shuttle
- Environmental enclosure where measurements are performed
- Operations manuals

System Capability

<table>
<thead>
<tr>
<th>System Capability</th>
<th>Value</th>
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<tbody>
<tr>
<td>Minimum Part Size</td>
<td>1828mm x 1067mm (72” x 42”)</td>
</tr>
<tr>
<td>Maximum Part Depth</td>
<td>200mm (8”)</td>
</tr>
<tr>
<td>Part Evaluation Range</td>
<td>0-70 degrees</td>
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<tr>
<td>Cycle Time</td>
<td>As low as 22 secs (part dependent)</td>
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</tbody>
</table>

Accuracy and Repeatability

<table>
<thead>
<tr>
<th>Accuracy and Repeatability</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Measurement Accuracy</td>
<td>&gt;0.1mm (.004”)</td>
</tr>
<tr>
<td>Measurement Repeatability</td>
<td>Cgk &gt;1.3 using a tolerance of ±0.75mm</td>
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Gauge Capability Index (Cgk) = 0.1 x (Tolerance – ABS (Means-Reference)) / (3 x t)
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AGI-G Probe Output

Topographical map of off form values

Probes:
Green: OK
Red: Out of Tolerance

AGI-G Logging Features

• Graphical format was designed to aid in process control and to detect probes that are trending toward non-compliance
• Trending graphs allow early detection of problems allowing timely process adjustments
• Data can be exported for future evaluation
• Display is customizable to ensure the most important data is shown
• Time to "Out of Tolerance" based on trending data

AGI-G Logging Output

Probes: PRB01...PRB04
Deviation from CAO

Trending Probe Graph

User-Selected Probe Data
Least Controlled Probe Auto-Selected
Least Capable Probe Auto-Selected