



Transfer Line Control for Automotive Glass Production

In any production system, control of movement handling of materials and assemblies is a key component in maintaining product quality. This is especially true in automotive glass production facilities, which create tempered glass shapes for car windows. Cimtec has developed a precision control solution for a transfer line that handles the edging and tempering processes for sheet glass manufacturing. However, this application can be applied to other industries that use transfer lines, including other automotive parts, discrete manufacturing, and glass manufacturing.

In a high volume transfer line, parts are moved from workstation to workstation automatically through continuous indexing or via a conveyor at a rate fast enough to keep up with demand. Accurate control systems are required to keep the line functioning at a high rate while maintaining quality of production. Parts have to be moved at the right time, and gaps between parts in the line have to be maintained to avoid part collisions, and in this particular application, potential shattered glass.

Cimtec's Transfer Line Control Solution

This automotive glass production line consists of a furnace that heats the glass, blowers that rapidly cool the glass, resulting in its tempered state, and grinding machines to finish the edges of the glass. The tempering process introduces internal stresses into the glass that significantly increase its strength. The grinding eliminates the weaker glass that remains at the edges of the part. The strengthened glass is now able to withstand the forces experienced in normal automobile operation without breaking. If the glass does break, the internal stresses cause the glass to shatter into small dull pieces rather than sharp shards, reducing potential injuries in the case of an accident.

For this particular solution, Cimtec created a combination of, mid-range PLCs, PLC-based APM modules, AC drives, and a man-machine interface software running on an industrial PC. AC inverters are combined with PLC modules in follower mode. These modules receive their master encoder speed reference from the furnace, and speed is precisely controlled on all axes to achieve proper gapping for the glass on the line. To support changing types of products on the line, recipes are downloaded to the control system, allowing for quick product type changeover and complete system diagnostics from one source. AC drivers communicate with the PLC, providing complete diagnostics and reducing system downtime.

Benefits of Precision Transfer Line Control

By providing precise control of transfer line operation, facilities can tap into a variety of



benefits, including:

Increased production throughput tonnage by optimizing gapping of the glass. By optimizing the gapping, the gap distance is minimized, but also controlled throughout all stages of movement.

Reduced scrap through precision control, resulting in fewer crashes, which in this application generally result in cracked or broken glass

AC drives help to increase uptime, reduce maintenance costs (when compared to long lead-time DC motors and drives) and improve system diagnostics

Rapid PLC throughput

Precision control of a transfer line through Cimtec's control solution allowed this particular manufacturer to reduce waste and increase throughput.