



Cleanroom Conveyor System Allows for Efficient Coating and Curing of Headlight Lenses

EXECUTIVE SUMMARY

In 1961, W&M Manufacturing began as a custom metallizing and painting facility for primarily the casket industry. Their sister company, Pier-Mac Plastics was established in 1975 and specialized in injection molding. It wasn't until 2008 when both companies merged under one, which is known today as Carrera Manufacturing. Since then, Carrera has strategically grown to provide their customers a single-source for molding, finishing and coating needs for plastic products from individual to finished components.



Customer Challenge

While Carrera's main business is still in the casket industry, they continue to flourish in the automotive and lighting industries, specializing in both lenses and reflectors. To help strategically grow this side of the business, they sought Shuttleworth's expertise to assist in a solution designed to provide gentle transportation of freshly molded headlight lenses throughout both a cleanroom 100 and cleanroom 1000 coating and curing process.

The Solution

Shuttleworth's system begins in a Cleanroom 1000 environment as an operator loads uncoated lenses onto a flat metal carrier. While the carriers accumulate behind a blade stop escapement, the operator cleans each lens with a special anti-static cloth before signaling its release downstream. If the downstream conveyor is clear, a lift and transfer device will then raise the carrier holding the clean unfinished lens and move it through a Cleanroom wall opening to initiate the coating process.

Once two carriers accumulate behind a blade stop located on the other side of the Cleanroom wall, they are released to one of two operator stations. When the carriers reach their designated station, the operator transfers the uncoated lens from the tray into a 6' x 6' coating fixture shuttle where the operator will signal its release with pneumatic valves for the automated robotic spray coating application. There is a high emphasis on this process as it is applying the protective coating on the lenses and requires a highly sensitive environment free of dust and other possible debris from adhering onto the freshly coated lenses. Once the coating process is complete, the operator again uses the pneumatic valves to move the shuttle out of the coating room and then moves the coated lens back onto the metal carrier. The operator then presses a button to signal a lift and transfer device to carry the tray back to its original location as it conveys down the line. It isn't until then that another two trays will convey to the coating area, preventing any possible collision between trays.

The trays holding the freshly coated parts then accumulate behind another blade stop before traveling through the customer-supplied 230°F convection oven. In order to meet the high temperature requirements, Shuttleworth utilized its Slip-Torque® roller technology made with high-temperature polymer compound. Once two trays have accumulated, a lift and transfer device moves them into the oven at a 16.5" speed for 10 minutes. The lift and transfer belts will not lower again until one minute has passed, giving enough space in between the trays as they move through the oven. Once the allotted curing time has passed, the trays will reach another slightly faster moving conveyor to create a bigger gap between the first row of carriers. Another lift and transfer device then moves each carrier onto a conveyor that is surrounded by a UV light chamber. Each carrier travels through the tunnel for 30 seconds and is rotated 90-degrees to ensure complete UV coverage. As each carrier comes out of the tunnel, it is rotated another 90-degrees narrow-edge leading before returning back to the operator station for either unloading or moving through an identical system for a secondary coating operation.



SLIP-TRAK® CONVEYOR SYSTEM

RESULTS

Shuttleworth integrated its Slip-Trak® chain drive throughout this process, providing an ultra-clean system that is certified and designed to be compatible with federal Cleanroom 100 and 1000 standards. The system also utilizes Slip-Torque® roller technology, creating low back pressure which allows for the highest level of safety for human interaction as well as providing gentle handling for the fragile headlight lenses. The open center design of Slip-Trak maximizes process adaptability with the low-line pressure accumulation as well as providing optimal airflow in Cleanroom designs.

Shuttleworth also provided W&M/Carrera with metal enclosures between the coating area and oven, as well as the oven and UV light chamber. These enclosures enhance the Cleanroom process by minimizing dust particles which could contaminate the finished lenses.

Overall, Shuttleworth provided an operator safe and Cleanroom compliant system which has allowed W&M/Carrera to maximize their line efficiencies for automotive headlight lenses and more.



CLEANROOM 100 AND 1000 PASS-THROUGH



High-Temperature Conveyor



Lift and Transfer

From automotive and electronics, to paper conversion and pharmaceuticals, to food and consumer good markets and beyond, manufacturers across the globe rely on Shuttleworth's proven product handling solutions to increase line efficiency, maximize profitability, and minimize risk. As part of the ProMach Product Handling business line, Shuttleworth helps packaging customers protect and grow the reputation and trust of their consumers. ProMach is performance, and the proof is in every package.

SHUTTLEWORTH

10 Commercial Road
Huntington, IN 6750

P: 260-356-8500

Toll Free: 800-444-7412

E: Shuttleworth.Sales@PromachBuilt.com

www.shuttleworth.com