

4131 Pheasant Ridge Drive
Minneapolis MN 55449

Office (763) 784-0466
Fax (763) 784-1362



“The Pulse Dryer”

Features & Benefits

Drying Coatings on Flat Glass

Infrared/Convection Drying

The dryer incorporates high intensity infrared technology incorporated inside of a convection oven. Infrared heater modules are staged through the dryer between high velocity hot air nozzles to create a “pulse” drying affect. The infrared stages drive heat energy into the glass while the high velocity hot air nozzles wipe the rising vapors off the surface of the glass. The rapid drying provides for compact designs and energy efficient dryers.



Zone Control

The dryer includes infrared emitters are grouped into zones across the width of the oven. Generally the zoning is as follows: a center zone, off center zones and outer edge zones. The zoning provides the following distinct benefits to the customer.

First, the lamp output can be profiled across the width of the glass to provide even temperature from the center of the glass to the outer edges of the glass. If two lanes of glass are being painted the zones can be controlled to match the loading. Second, if smaller glass parts are being dried the outer edge zones output can be turned off. As a result there is significant energy savings with the efficient use of applied infrared energy.

Closed-Loop Control

The dryer features closed-loop part temperature control. The system includes a non-contact optical pyrometer on the exit end of the dryer. The optical reads the exiting temperature of the glass and close-loops on the applied voltage to infrared emitters. The oven start-up set-points will provide for a good first part to exit the dryer and then automatically modulate to provide consistent part exit temperature part after part.

Convection Air Nozzles

The dryer includes recirculating convection air system. Air temperature is maintained at a consistent dryer internal temperature. Air exits through the nozzles between the infrared modules and sweeps over the top surface of the glass. The air then is drawn to the bottom of the dryer and recirculated back to the nozzle plenums above the glass.

The system also includes an exhaust blower to draw exhaust air out of the dryer cavity. The blower keeps the LEL at an acceptable level.

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Powered Roller Conveyor

The dryer includes powered stainless steel rollers on the appropriate centers to handle the smallest piece of glass. The rollers have swaged ends to the desired diameter to accommodate the roller bearings. Inherent to the swaged rollers is open ends to allow heat to escape from the center of the roller. A chain drive or timing belt positively drives the rollers from one side. Wire mesh belt conveyors also available in certain applications.

Idle Mode

The dryer includes an Idle Mode to put the dryer in a constant temperature state in the case that there are extended periods between parts.

A part sensor in front of the dryer detects parts about to enter the dryer. If there are no parts in or about to enter the dryer, the infrared emitters will modulate to a lower voltage enough to simply maintain a preset dryer temperature. Also, the exhaust blower speed slows to help keep heat energy in the dryer with no solvents to exhaust. This is called a “ready” condition. The ready condition is also used at the beginning of the production run to complete drying the first part through.

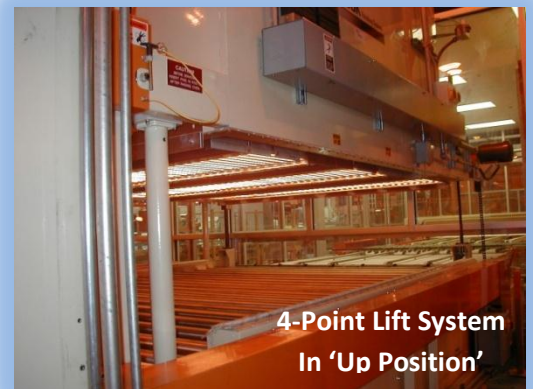
When the part sensor detects a part about to enter the dryer, the infrared emitters respond to full production output instantaneously. Drying will be consistent from the first part to the last.

Part Recipe Control

The dryer PLC control package includes a “Part Recipe” function. Once an initial setup is done on a certain part running at a certain speed, a recipe is developed and stored in the PLC. Whenever that part is produced, the recipe is entered, and production can begin. The recipe will control, conveyor speed, infrared emitter output across the zones, dryer cavity temperature and exhaust speed.

Automatic 4-Point Lift System

The dryer includes a 4-Point Lift System to lift the upper half of the oven off the lower half at the conveyor level. The system lifts from the four corners of the dryer to smoothly and evenly raise the upper half of the dryer off the lower frame. This allows total instant access to the inside of the dryer for maintenance from either side of the dryer.



4-Point Lift System
In 'Up Position'

Typical Applications (for Automotive, Architectural, Appliance and Mirror Glass)

- Lead Free Pine Oil
- Water Based Frit
- Ink Jet Printing
- Electrochromic Coatings
- Silvering
- Low E Glass
- Screen Print
- Spandrel
- Mirror Backing