

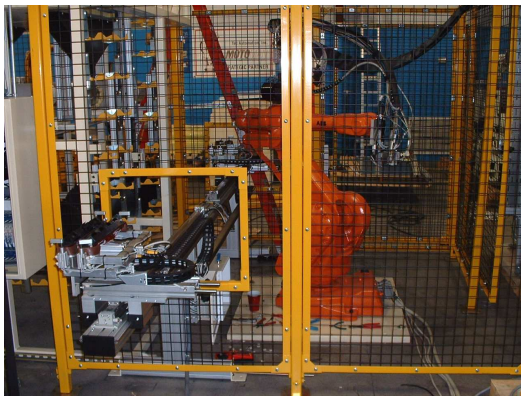
Case Study –Dispensing 2k with Oven for GM



Overview

The cell processes center high mount stop lights (CHMSL) for the line of GM pick up trucks by applying one continuous bead of foam in place gasket material in around the perimeter of the light assembly.

The CHMSLs are welded in an ultrasonic welder and hand loaded into the dispensing cell. There are two shuttles, one on each side of the cell, each with a pair of formed part fixtures. The parts meet in a central location in front of the floor-mounted, 6-axis robot on one side of the shuttle and a cure oven pick up zone on the other side of the shuttles. The robot carries the dispensing nozzle and applies a bead around the lights, signals the oven to index and the oven flights pass through the dispensing fixtures to lift and carry the parts away automatically. Finished parts are automatically placed onto an exit conveyor.



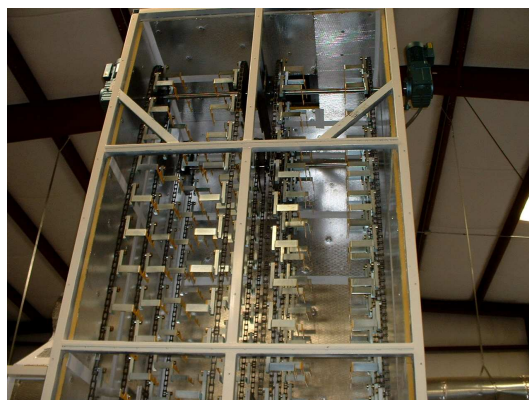
Side view of the robotic cell



The parts as they exit the cell after the oven



The 2 component dispensing system



The inside of the cure oven



Description of the Solution

There are several tricks to this application of material – the starting point must be clean and tapered, there are locations in the bead where the bead must narrow or be necked down and then built up, and at the end location, the bead must overlap with the starting point without excess material build up.

The TEC scope of supply is the complete system; starting with custom-formed TEC fixtures for the parts, the TEC shuttles into and out of the cell, the robot - an ABB IRB2400 with the S4C+ controller – the EDF Sonderhoff mixing and dosing plant and purge station, the TEC 3-zone cure oven and the TEC exit conveyor. The per part takt time is 10 seconds.

The dispensing equipment includes bulk tanks and day tanks for the two components, the mixing chamber and application nozzle. The cell controller is an Allen-Bradley PLC that provides traffic control, part sequencing logic and safety device interlocking. This is supplied complete with the system in a top mount cabinet extension to the robot controller. An HMI unit allows the operator to set up and run the cell.

The volume of the oven has been established based on the allowable and required cure time for the dispensed material and the part rate. The first two zones of the oven are rise and cure. Rise allows the material to expand slightly and settle on its final shape. The cure zone heats the material and substrate to the proper temperature for permanently curing the material and completing the adhesion to the substrate. The third portion of the oven is a cool down area where the parts cool to near room temperature before they are powered out to the operators for the manual assembly process. The oven stress relieves the parts as well as cures the material.

The oven has swing fixtures with part-specific details and is a single carousel unit. In all, the oven is 17 feet tall, insulated and has multiple controlled heated zones.

Completed parts exit the oven by being placed from the swing unit onto the belt conveyor – the fixtures and belt design are coordinated to work together.



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