

Genesis Case Study #: J5139-001  
Application: Structural Adhesive Dispensing  
Market Segment: Industrial  
Product: Custom System  
Cycletime: 3.5 Min



### Summary

Customer needed to apply a "Heat Set" structural and sealing adhesive material to large structure that was to be covered with sheet metal panels. The system also needed to be inserted into a new roller conveyor line and work along side hydraulic lifts and other material handling devices. The customer had a 4-5 year old robot with very low hours that could be incorporated to help utilize existing assets and save money on the new capital expenditure. Genesis developed a completely custom adhesive dispensing system to meet all the requirements. The system was integrated into the conveyor line and communicated with the other devices surrounding the cell to make it a complete assembly system. A robot controlled servo turntable was used to position the part such that the robot could reach all of the areas for adhesive material. Approximately 24-meters of bead was dispensed in about 3.5 min of automatic cycle time.

### Project Challenges

- The project was required to have a complete cycle time of less than 8-minutes including load and unload time.
- The Fixture needed to hold the part repeatably, yet the part was rolled into the fixture on an assembly pallet.
- Utilization of an older robot with incomplete software load
- The material to be dispensed had a very steep viscosity curve, related to temperature. As the material became cooler, the viscosity increased greatly
- Some assembly of sheet metal panels takes place before the part is loaded into the cell. Occasionally operators would forget to put the panels on causing a mess of adhesive material.

### Genesis Solution

- Using the Servo controlled dispenser, we were able to dispense at speeds of 500 to 800 Inches Per Min. The interfacing between the robot and dispenser was such that dispensing parameters could be controlled by the robot. Schedules were used to set the dispense rates. The fixture and rollers were designed to integrate into the customer's conveyor line such that an operator could simply push the 1,000 part and rack into and out of the cell without the use of hoists or cranes. Overall cycle time is less than 5 min including load/unload.
- The custom roller turntable / fixture was designed such that the part and rack would be lowered onto rest pads that touched only the part. The rack would continue to fall away so the rack did not influence the position of the part. The part was then clamped to the fixture to ensure locating and holding while the table would rotate during the cycle. Once complete, the part would unclamp, the rack would then be lifted again, capturing the part. Once lifted, the part and rack could be manually pushed out of the cell with ease.
- The older robot was loaded with new software and auxiliary axis control to allow proper interfacing with the positioner and the dispensing equipment.
- A Temperature Conditioning Unit was integrated into the system based on input from the adhesive material supplier. The unit has refrigeration cooling and electric heating to maintain a temperature of 88 degrees F +/- 1 deg. F. This maintains the viscosity of the material through the dispense system and valves, and produces a more consistent bead size. Bead size and positioning is important to have the proper amount of push-out when the sheet metal panels are applied to the structure.
- A non contact sensor was added to the dispense valve mounting bracket that allowed the robot to check for the parts before dispensing material. If the parts were missing, an alarm message was displayed to the operator on the PanelView display asking the operator to load the parts properly.

