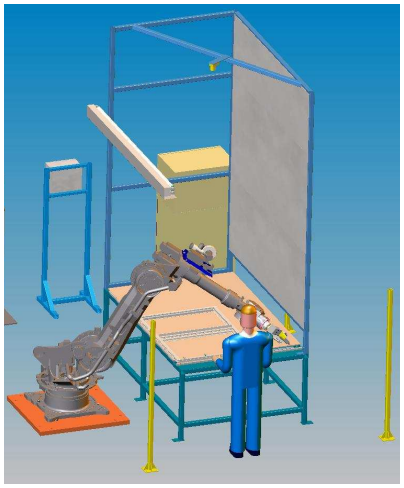
Case Study – Dispensing Silicone

This is a window seal with silicone application. The robot and supporting vision system dispense material onto the window frame or doorframe for proper weather sealing of the glass to the frame.

The challenges with automating this dispensing process included

- The part range and variety is huge – there can be literally any size part presented to the plant for quick turnaround and all of the parts need to be processed through the sealant dispense area
- The customer was interested in choosing and using a new material – this required substantial testing of materials and application methods by both TEC and the dispensing equipment supplier – Graco
- The dispense path tolerances are tight and all paths are straight lines
- The operator and floor supervisory personnel needed education as to the proper use of this more sophisticated equipment and process
- The end user had no experience with robotic dispensing or robots – the partnership between the customer and TEC is very close to assure that the technical and commercial goals are all met



System Requirements

- Measure and dispense a silicone bead, within a +/- 0.15 inch tolerance, onto the frames regardless of size
- Run around the clock and with a variety of operators
- Direct labor savings
- Material waste must be reduced
- Part to part changeovers must be done seamlessly, i.e. soft fixturing is the only possible solution
- Supply a rugged and industrial system
- Meet the financial requirements set forth by the customer

Description of the Solution

The system uses a Motoman HP165 robot with NX100 controller, a Cognex two-camera system and a Graco dispensing system.

The operator loads the table with one part. The part is positioned into a datum corner.

The overhead and fixed mounted camera has a larger view of the system and part as it sits in this datum corner. This camera supplies the first and macro measurement of the part for the development of the robot path. The second camera is mounted to the robot. Once the macro measurements are taken and delivered to the robot, the robot reaches to each of the four corners of the part and takes a closer look. These pictures supply the more accurate actual measurement of the part.

The robot then initiates the dispense routine and applies the four strips of silicone to the flanges of the frame at an adjustable rate (from 400 to 800mm/second).

The results of this automation are much improved overall quality of the bead and seal and a substantial reduction of the use of material.

Customer Benefits

- Consistent throughput
- Predictable cycle time for a given length of dispense
- Part to part changeovers and the ramifications of wide part size variations and mixes are irrelevant to the process output
- No human involvement with the application of silicone
- The flexible and programmable industrial (automotive spec.) robot will have a long and useful life
- Removal of the human element from a very repetitive and boring task

TEC Automation, Inc.

30 Hickory Springs Industrial Drive
Canton, GA 30115

Phone 770-720-3333
www.tec-automation.com