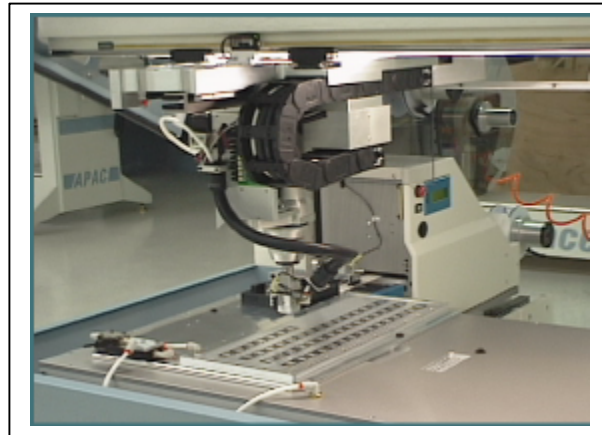


Pick-and-Place Machine Puts Adhesive on Bezels for HDTV

When Fralock Corp. (Canoga Park, CA) needed to supply adhesive-backed assemblies for a customer's high-definition television projectors, it had the experience and the relationships, but not the equipment, to successfully pull the job off.

Fralock, a die-cutter and converter of all types of functional adhesive parts, found this particular job challenging. While the adhesive could be die-cut, the small metal bezel that was to be attached to the adhesive could not. This required the bezel to be assembled to the adhesive and then placed onto a silicone-coated liner one after another in an array to facilitate further assembly at the customer's plant.

Fralock called **AccuPlace** (Plantation, FL). "The original idea was to provide the customer with a machine to perform the assembly," says Maggie Souva, a sales engineer at Fralock. "But the volumes were too low to keep the machine busy. The customer then asked us to provide bezel assemblies instead of just bezel adhesives." This requirement is not unusual to Fralock, as the company will provide assembly services when it is not practical for the customer to do it in-house. "We have an ongoing need for performing this kind of assembly for our customers, so the flexibility of the APAC machine to run different jobs with little changeover is a home run for expanding our capabilities," says Marcelo Norona, COO at Fralock. So Fralock purchased an APAC pick-and-place machine.



The APAC has a tooling plate in the main robot work area and one RM3065 tape feeder for feeding the adhesive. The thin double-sided strips are about 1 millimeter wide and 12 millimeters long. The tooling plate holds a removable subplate with a nest for stacks of the thin metal bezels and a vacuum-assisted nest for the liner sheet that will receive the bezels once they have the adhesive strips attached to their undersides.

The operation begins with an operator loading bezels in stacks and one sheet of silicone-coated release liner onto the nest. When the program is started, the machine drives its actuator over one of the stacks of bezels where a vacuum chuck end-effector drives down and picks up a single bezel. It then moves the bezel over to the tape feeder. A fiber-optic sensor searches for the exact location of the adhesive strips. Once located, the vacuum chuck moves the bezel down to contact the adhesive. The tape feeder then peels the adhesive strips from their carrier tape, and the actuator transfers the new assembly over to set it down onto the release liner held in the vacuum-assisted nest. This process continues until the sheet of release liner has a 4 by 14 array of bezel assemblies. It is then ready to be removed from the machine. Once a new piece of liner is in place, the machine will continue the process.

Assembling these parts only keeps the APAC machine running part of the time. Therefore, the machine must be easily modified to run other jobs. Ordering parts, along with programming the new task into the machine, can be done in 2 weeks. The changeover time between jobs is typically 1 hour or less. The APAC machine consists of a large cast iron frame with an overhanging gantry X-Y stage and a 1,000- by 500-millimeter work envelope. The feeder bay is behind the envelope. Up to four RM3065 feeders can be mounted there on telescoping drawers. These tape feeders can feed any die-cut adhesive components. The drawers provide easy access to the feeders for maintenance and reloading. Additionally, standard 3065 placement machines can be mounted upside-down to facilitate assembly to both sides of a target part. The APAC uses linear motors and optical linear feedback.

Typical move velocity is 240 ips, and the machine's positioning accuracy is ± 0.0005 inch. The machine can be equipped with vision.