Staking/Epoxy Adhesive Dispensing for Aerospace

Case Study

One of our aerospace customers was looking to automate a few manual operations and asked for suggestions. This customer specializes in assemblies for inflight connectivity for commercial airlines and low orbit satellites. The dispensing process includeds the application of bonding to the sides of large and small components (4-axis) and the ability to cope with the changing viscosity during processing. The material used was EC-2216 B/A Two Part Epoxy and the largest board size was 12”x10”.

Recommended Dispensing Process:

A benchtop dispense system robot, Catalina with Tilt and Rotate capability, non-contact surface sensor, automatic nozzle alignment was recommended. This dispensing system was equipped with a Time Pressure dispensing 2-inch Luer needle, 14G (0.060-inch ID). The concerns over short working times and replacement costs, if cleaning is not done properly and frequently, makes time pressure dispensing a good option. The extended length allowed the needle to reach tight spaces on the printed circuit boards (PCB) with larger components.

GPD Global's application specialist dispensed the glue on eight large capacitors on the low voltage side of the board, with a syringe pressure of 90 psi. The needle was set to a 20-degree angle to dispense on the component, component base, and the PCB. Our specialist rotated the needle as needed to dispense from an optimal direction.

Dispense Parameters:

Pump	:	Time-Pressure
Needle	:	14G 2-inch Luer
Material	:	EC-2216 B/A Two-Part Epoxy
Mix ratio (by weight)	:	5 Parts B: 7 Parts A (weighed and mixed offline)
Syringe Pressure	:	90 psi

Conclusions: Staking/Epoxy Adhesive Dispensing for Aerospace

The Catalina dispense system can dispense the epoxy in required locations on the PCB (4-axis). Due to the very high viscosity and short pot life of the epoxy, the dispense characteristics change throughout the dispensing process. With dispense times had to be adjusted at each location to compensate for the rapidly changing epoxy viscosity. To control the tails of epoxy as the needle moved away from each dot, the system was programmed with delays before the retract motion as well as after to optimize how the epoxy sticks as well as how the tail stretches and collapses back onto the dot.

Final Dispensing Equipment Recommendation:

Dispense System	:	Tabletop Catalina TR
Dispense Pump	:	Time Pressure
Material	:	EC-2216 Epoxy
Needle Size and Type	:	14G 2-inch Luer

GPD Global offers dispensing system customization and in-house application evaluations with our customers. Call 1.970.245.0408 or email request@gpd-global.com.

Read more about fluid dispensing applications.