

Ultra-Precision Excise and Attach System



Challenge

A semiconductor manufacturer needed an automated system that would excise individual nozzle plates from a reel of input material and accurately attach the nozzles to a silicon wafer.

Solution

The machine accommodates two product reels on the excise side of the machine at any given time. When the onboard sensors detect an end-of-reel condition, the machine automatically splices the leader from the next reel onto the end of the current reel, reducing downtime.

Wafers enter via operator-loaded cassettes at the attach side of the machine. The machine automatically scans for wafer presence and orientation before a three-axis robot with dual grippers transfers the first wafer directly to the processing table. The table rotates the wafer into proper alignment, which is confirmed by a machine vision system.

Prior to each nozzle placement, syringes on the glue assembly deposit 150-micron adhesive dot at opposite corners of the current nozzle place location. A nozzle plate from the excise station enters the attach station on the prealigner, where a quill assembly picks up and holds the plate in position while the wafer aligns to the nozzle plate. The quill then moves the plate downward against the wafer and narrow UV light beams tack the plate to the wafer. The robot transfers the completed wafer to the UV-flood station, where intense UV light cures the adhesive to complete the nozzle-to-wafer bond.



Result

The system isolates and punches a part with **10-micron accuracy**, applies two 150-micron adhesive dots with 20-micron accuracy, then assembles and bonds the part to a wafer. The entire **process takes 1.5 seconds**, and boasts **1.5-micron placement accuracy**.

About DWFritz Automation

Established in 1973, DWFritz Automation provides world-class build-to-print manufacturing capabilities to clients, in addition to designing, building, and supporting engineered-to-order automation systems and high-speed, non-contact metrology products.

