



Automated Embolic Coil Processing System

Challenge

A medical device manufacturer needed a semi-automated system to trim platinum wires from incoming coils before applying and curing a UV adhesive between the coil and proximal bead.

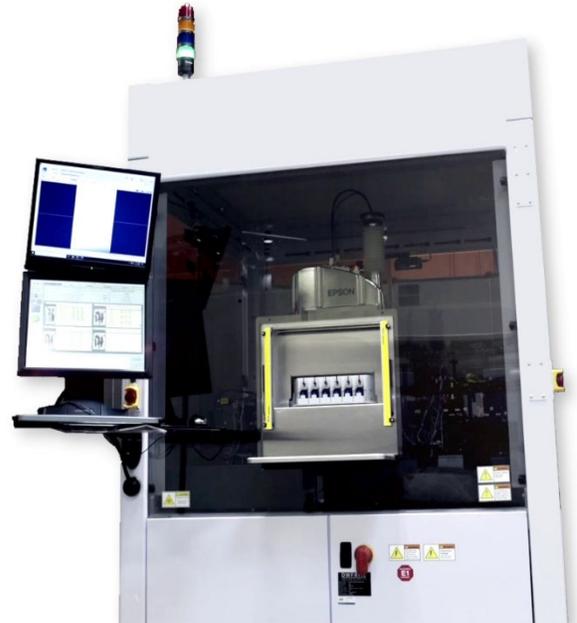
Solution

An operator loads and unloads coils into a collet fixture on a rotary carousel, which carries the coil through the automated trim and dispense system. The collet's universal design can support 10 different customer part types and over 500 variants of these parts.

The rotary carousel indexes and presents a set of collets wire to a robot with a custom end-of-arm-too. The robot picks a collet and moves the part to the system input camera station where the barcode is read, and incoming fibers are inspected from multiple angles. The robot then moves the collet to one of two processing stations.

Products that pass the first inspection are positioned in a precision dispense and cutting station, where a microdot dispenser mounted on a linear actuator dispenses precise amounts of adhesive. The rotary nest rotates during this process, allowing an even 100 μ m-diameter dispense around the 300 μ m wide fiber below the proximal bead. The dispense station retracts for UV curing before the nest rotates 180° to dispense one or more micro dots of adhesive onto the fiber opposite first dispense and repeats the UV cure process. The dispenser continues dispensing in a series of 50nL increments to prevent wicking, as the rotary nest rotates continuously to build up material between the bead and fiber.

A color camera measures the height of the adhesive on the fiber and the distance to the constraint before the nest is positioned by the stage stack in the bead lift station. The bead lift station threads the fibers of the embolic coil into the slot where the bead is pulled against a flexure so the top of constraint is tangent with a trim tool. The trim station consists of a pneumatically actuated set of clipping blades along with an extendable deflector mounted on a linear actuator. The pneumatic clipper moves into position and cuts the 50 μ m platinum wire above the bead before the deflector extends, bending the cut wire ends. After



the trim station, a final adhesive dot is dispensed over the clipped wire stubs and UV cured. Inspection cameras then verify the adhesive on top of bead and the fibers below the bead.

Result

The system completes one part every 120 seconds, including camera inspections to verify the correct profile of material build up.



About DWfritz Automation

Established in 1973, DWfritz Automation designs, builds, and supports engineer-to-order automation systems and high-speed, non-contact metrology products, in addition to providing world-class build-to-print manufacturing capabilities to clients.

