

Forj Medical Boosts Production by 120% With Automated Molded Needle Manufacturing

The Challenge

A global medical device company approached Forj Medical to develop an automated system to manufacture insert-molded sensor needles for a closed-loop insulin pump. The sophisticated system would replace a labor-intensive manual process that was plagued with inefficiencies: four employees were required for each cycle, two per machine, each placing four needles at two stations to fill 8-cavity tooling. This manual process created bottlenecks, increased the risk of human error, escalated costs, and limited scalability. Automating production posed its own significant challenges, as the miniature part required precise orientation with extremely tight tolerances.

The Solution

Our engineers developed a fully automated production process that replaced manual labor with robotics, a transport system, and a 16-cavity tool – immediately doubling capacity. The solution included an Allen-Bradley servo flip station with a Bosch Rexroth PSK-60 actuator, which was used to invert the needles eight at a time during production. Precision SCARA (Selective Compliance Articulated Robot Arms) robots ensured the needles were correctly oriented right-side up, minimizing errors and maintaining consistency.

The Results

The automated solution requires minimal employee intervention and reduces errors, cutting costs and shortening each molding cycle by up to 20%. The new system achieves outputs of approximately 44 needles per minute – representing a 120% increase over manual processes.

120%
Production
Increase

20%
Cycle
Reduction

44
Needles
Per Minute

Automated Insert Molded Sensor Manufacturing

