

Case Study

Automated COC-Syringe Production

#MedTech #COC #Syringes #PFS #DrugDelivery





HAHN Automation Group develops solution for pre-filled syringes



The customer required a fully automated solution for pre-filled syringe (PFS) production using COC (Cyclic Olefin Copolymer), a high-performance but fragile plastic.

- ✓ **From Mold to Tub - Turnkey Solution**
- ✓ **Maximum Precision**
- ✓ **100 % Vision Inspection**

Challenge

While offering excellent transparency and chemical resistance, COC is prone to stress cracking, demanding extremely precise and gentle handling. The system needed to integrate part removal from the injection molding machine (IMM), accurate cavity sorting, inline plasma activation, siliconization, and luer cap assembly—all while maintaining a fast and reliable 60 parts per minute (ppm) production speed with full traceability and strict quality control.

Developing a Solution

To meet these demands, an advanced automation system was developed. A six-axis robot ensured careful part removal and sorting, minimizing mechanical stress on the delicate COC components. Inline plasma activation optimized surface properties, followed by controlled siliconization and precise luer cap assembly.

With 100% vision inspection, defects were detected in real time, ensuring continuous quality control. The finished products were placed cavity-pure into a Tub-Nest combination, then sealed with Tyvek film and labeled with product and production data. The sealed tub was then double-packed in a tubular bag machine, ensuring compliance with stringent medical packaging standards. Complete traceability and data storage provided full process transparency.

Core Technologies

- 1 IMM Automation
- 2 Surface Treatment: Plasma & Siliconization
- 3 360° Vision Inspection
- 4 HAHN Analytics: OEE Transparency & Analytics

Cycle time: 60 parts per minute.



Results

This solution combined speed, precision, and material-sensitive handling, enabling efficient, high-quality production at 60 ppm while protecting the integrity of COC components. The HAHN Automation Group, with its strong network of partners, successfully delivered this as a turnkey solution, providing the customer with a comprehensive, one-stop service.



Rheinböllen, DE

HAHN Automation Group
Liebshausener Str. 3
55494 Rheinböllen | Germany
sales@hahnautomation.group

www.hahnautomation.group