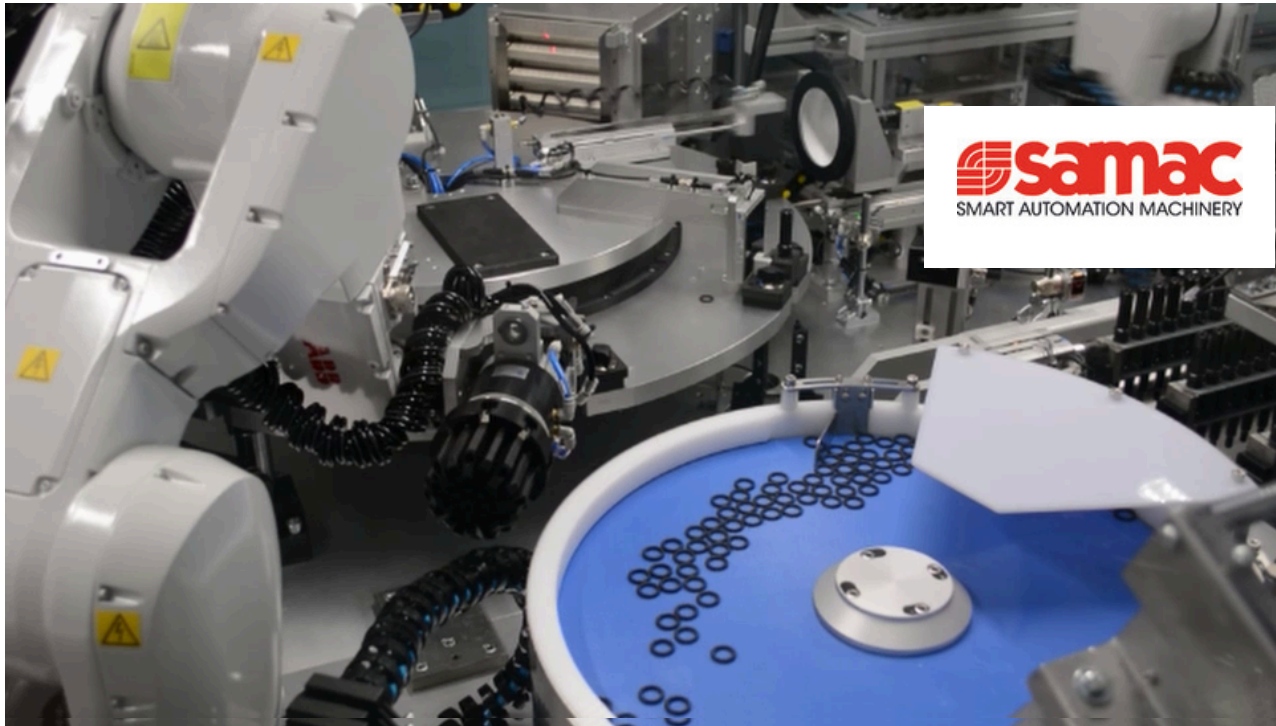


Case Study: Feeding Solution for a High-Pressure Connector Assembly Line



Introduction

In the automotive sector, assembling components like high-pressure connectors is a significant challenge. Production requires automated solutions that deliver precision, efficiency, and flexibility, all while meeting the industry's stringent quality standards.

One of the main requirements was to develop a system capable of assembling different connector models within a single process, optimizing cycle times and ensuring seamless component management.

SAMAC, a leader in designing and manufacturing assembly and testing systems, addressed this challenge with an advanced and highly customized solution.

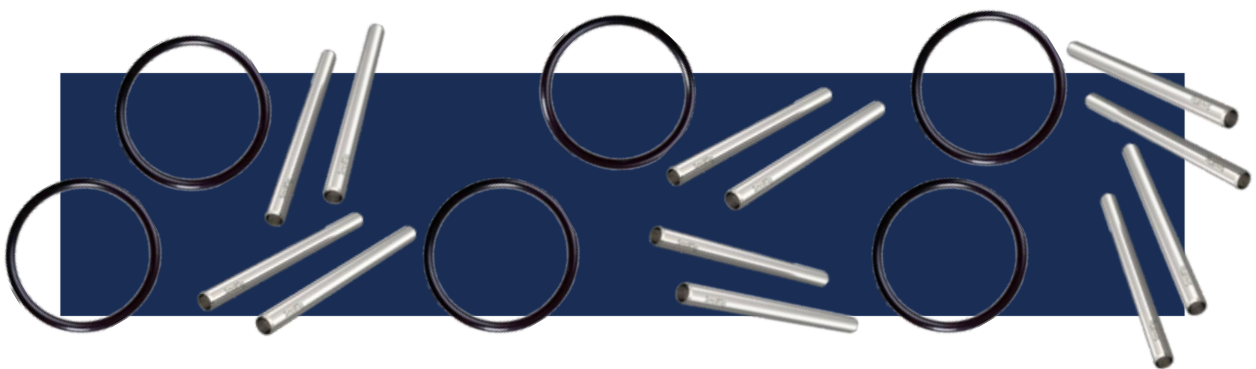
Ars Automation

Application notes

Handled parts

The system was designed to process six models of high-pressure connectors, divided into two main categories. The first group consists of connectors that require the insertion of an o-ring and a filter; the second group includes more complex connectors that also involve the insertion of either a key or a ball, depending on the model.

The challenge lay in handling delicate parts with varying geometries, such as o-rings and filters, within a single, flexible system while maintaining the precision needed for high-quality assembly.



System configuration

To meet these requirements, SAMAC implemented an innovative solution featuring:

- FlexiBowl® 500, a flexible feeder capable of accurately separating, orienting, and positioning components of different shapes and sizes, ensuring smooth handling of o-rings and filters.
- An advanced vision system, which identifies components and pinpoints their exact position to ensure proper orientation for the assembly process.
- An ABB robot, equipped with a custom-designed end-of-arm tool (EOAT), that precisely picks up the components and places them at the designated stations to complete the assembly process.



FlexiBowl® 500

Traditional Operating Mode

Ars Automation

Application notes

The entire cycle runs efficiently and seamlessly, with a cycle time of just 12 seconds per piece. The system's compact and modular design not only optimizes space on the production line but also allows for future expansions. This modular approach ensures maximum flexibility, enabling quick adaptation to new connector models or changes in production processes.

Results

SAMAC's solution successfully achieved all the set goals, delivering a reliable, efficient, and highly flexible assembly system. It can process six connector models without requiring manual intervention or retooling, ensuring a continuous production flow while reducing operational costs.

The integration of the ABB robot with the vision system and FlexiBowl® feeder guarantees high-precision assembly, fully compliant with the strict quality standards of the automotive industry. With its optimized cycle time and scalable design, the client not only saw a significant boost in productivity but also gained a robust solution ready to tackle future challenges. This project demonstrates how integrating advanced technologies can deliver concrete results, enhancing efficiency and competitiveness in an ever-evolving market.



Automotive



Assembly Process



FlexiBowl® 500



ABB



Precise Insertion