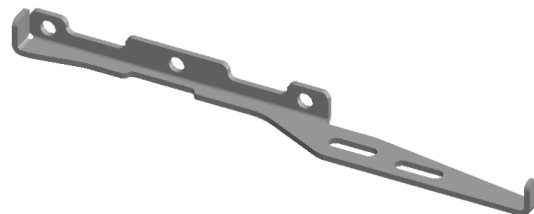




Frame B – Flexible Feeding System





Project Goals

Tessy Automation, in collaboration with ARS Automation and Epson Robots designed the Frame B Feeder to operate press-side and load bent sheet metal parts into a press to be over molded. Project goals included fewer damaged parts than the legacy vibratory feeder bowl as well as smaller footprint and decreased cycle time.

Design Process and Collaboration

Tessy Automation engineers worked in close collaboration with ARS and Epson to simulate timing, develop a de-tangling system, and integrate the robot with the feeding and vision system. Representatives from both parties played crucial roles in the success of the project.

From ARS Automation, Francesco Neri expedited testing and proof of concept showing the FlexiBowl® system could handle the parts. ARS also developed a pre-feeding system that detangled the parts and fed the FlexiBowl® with manageable groups of parts. FlexiVision® was also used in this system to guide the robot and locate parts on the FlexiBowl® pick zone. Said Francesco, *"Thanks to the native FlexiBowl®-EPSON plug-in, integration with the EPSON SCARA robot was smooth and robust, while FlexiVision® provided reliable part detection and full application-level control."*



From FAComponents, Grant Schiefferle coordinated testing from Epson and communication with ARS. Grant played a critical role in the success of this collaboration, making sure all parties were in communication and made aware of Epson's and ARS's capabilities. All robot simulations were routed through Grant and were critical to ensuring the cycle time of the machine.



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Frame B Feeder System

The press-side automation presents parts to an IMM robot where they are picked, 4 at a time, and loaded into the press to be over molded. Operators load parts into the bulk hopper where they are fed to the FlexiBowl®. From here a FlexiVision® guided Epson T-series robot picks each part and loads them into a dead nest specifically designed to fit the IMM robot tooling. Each part is vision inspected for defects before placing in the nest. The automation discards any defective parts into a reject bin while logging reject quantity and calculating OEE.

The system runs at 10ppm loading 4 parts into the nest every 24 seconds. It is also designed to connect directly to the press allowing it to communicate parts-ready and nest-empty signals. This communication enables the press and automation to work autonomously. The 5-liter bulk feeder ensures autonomous time is not compromised.



Feeding Challenges and the Transition to FlexiBowl® Technology

During early development of the Frame B Feeder, the team began with a conventional backlit-table flex-feeding approach. However, testing quickly revealed that the bent sheet-metal parts had complex geometries that caused them to interlock, stack, and tangle. Their irregular shapes prevented consistent singulation, making it difficult for the robot and vision system to reliably identify and pick individual parts. This issue led the team to Flexi-Bowl's® custom part feeding solutions.

FlexiBowl® technology offered the dynamic motion and part-conditioning needed to separate and present challenging components. Working with ARS Automation, the team developed a custom pre-feeder that detangled the parts before they entered the FlexiBowl®. The pre-feeder handled large bulk quantities, breaking up major tangles, while the FlexiBowl®—with its wide range of motion parameters—managed any remaining small clusters and effectively separated the parts for reliable vision identification. This combination successfully addressed the singulation issues and enabled reliable part presentation required to meet the system's throughput and quality goals.



About Tessy Automation

By designing and building custom automated systems, Tessy automation helps manufacturers increase production potential while lowering costs and improving quality. We manufacture state-of-the-art assembly automation equipment — ranging from sub-assemblies to fully-automated, turnkey assembly lines — that allow you to increase assembly process efficiency and profitability and improve product quality and safety.

Combining engineering expertise with advanced in-house manufacturing capabilities, Tessy Automation delivers fully customized automation solutions tailored to the unique needs of each customer. Our team specializes in complex mechanical design, precision machining, controls engineering, and system integration — all supported by a vertically integrated facility that ensures tight quality control from concept through commissioning. Whether developing one-of-a-kind equipment or scaling high-volume automated production lines, Tessy Automation provides the technical capacity, manufacturing flexibility, and collaborative partnership needed to bring innovative automation systems to life with speed, precision, and reliability.

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