



## The Project:

### Consumer Product

Design, build, and run a 64 cavity tool with robot automation for overall program savings and to accommodate an increase in consumer demand. This vent bushing serves as a safety device in the end product that had been previously produced in a lesser cavitation tool. Due to the critical nature of the bushing, the tool and process needed to produce a part capable of holding critical-to-function dimensions within 25% of the total tolerance (re: +/- .002").

## The Overview:

The customer's provided forecast for the upcoming quarter would exceed the throughput of the existing 32 cavity tool. Instead of building a duplicate 32 cavity tool and purchasing a new robot automation cell, Matrix Tool suggested building a new 64 cavity tool and use the existing robot automation cell in order to save the upfront investment costs of a new servo-robot. The new 64 cavity tool would be able to satisfy the increased demand and offer significant program savings through higher cavitation.

## The Challenge:

The challenges faced with this project resided in the automation cell with the high cavitation given each part weighs approximately 0.0075 g. An appropriate servo robot end of arm tool (EOAT) would need to be implemented to ensure all cavities are removed from movable half during the ejection sequence via

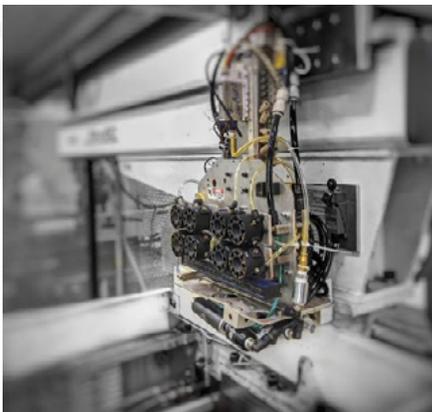


Fig 1: Full Servo Robot / 64 Cavity End of Arm Tool (EOAT)

a vacuum system. The new 64 cavity tool would be a challenging project since we elected to utilize the existing servo-robot and 55 ton all electric injection molding machine.

An appropriate EOAT would need to be designed to stay within the small footprint and existing envelope of the machine. Given the small nature and weight of the part, we found that static would be one of our largest hurdles in completing this project. The end product is also subjected to an annealing process which meant Matrix Tool would not only need to provide pre and post SPC dimensional data per shipment, but also take this into account during the manufacturing of the tool.



Fig 2: Vent Bushings

## The Solution:

Through iterative design changes and critical thinking, Matrix Tool was able to produce an EOAT that fit within the limitations of the servo-robot and constraints of the injection molding machine. We were able to design and 3D print "nests" that were installed on the EOAT. The "nests" served as the housing for the parts when they are vacuumed out of the back half of the tool and are transported to the collection bin where they are released. Anti-static equipment was integrated into the EOAT as well as into the manufacturing cell. A world leading anti-static provider stated this was the most difficult application they have been a part of, and was glad to see Matrix Tool take a creative solution providing approach that utilized multiple anti-static equipment from their portfolio. The newly designed EOAT was robust in nature. This allowed us to accommodate the use of an existing servo-robot while still being able to condone the demand of a 64 cavity tool.

## The Benefits:

The end customer was able to validate a new 64 cavity tool without affecting current demand. The customer also received significant savings by using the existing automation cell and a new higher cavitation tool. This 64 cavity high-production project was a good fit for Matrix Tool as it utilized our highly skilled personnel with advanced technical knowledge of high precision tooling, molding, and inspection services.

***Let's 'push the envelope' together!***

**For a quotation or additional information, contact Matrix Tool Inc:**