



The Project:

As demand for our customer's vent bushing product grew year over year, it was becoming obvious that additional capacity needed to become available. The part was being produced in a 32-cavity tool running in a 55-ton all-electric injection molding machine which included a Yushin full servo robot utilizing a specialized end of arm tool (EOAT). Since this product line has been on the market for many years, the customer had a limited budget for capital spending for new tooling on a legacy program.

The easy solution would have been to merely duplicate the existing 32-cavity tool and automation system. Instead, Matrix Tool suggested building a new 64-cavity tool using the existing 32-cavity core and cavities, along with the robotic automation cell as a way to reduce our customer's project cost. The new 64-cavity tool would satisfy the increased demand and offer significant program savings.



Vent Bushing Parts

The Challenge:

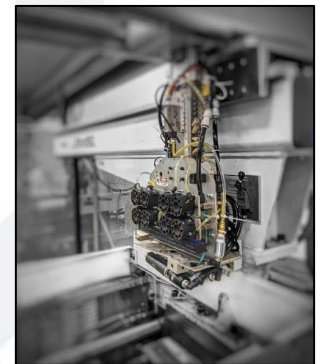
Due to the vital nature of the safety bushing, the tool and process would need to be capable of holding critical-to-function dimensions within 25% of the total tolerance of $\pm .002$ ". There was an added challenge that each part weighs 0.0075 g. and is subject to static attachment to the cavity. The specialized EOAT would have to ensure all cavities are removed from the movable half during the ejection sequence via a vacuum system.

The custom EOAT would also need to stay within the small footprint of the 55-ton machine. Since the end product also has a post molding annealing process, Matrix Tool would have to take this into account during the manufacturing of the tool. Pre and post annealing SPC inspection would be an on-going need in production.

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 the constraints of the injection molding machine. We designed and 3D-printed "nests" that were installed on the EOAT. The "nests" captured the parts and then they were vacuumed out of the back half of the tool and 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 equipment provider stated this was the most difficult application they had been a part of. The newly designed EOAT was robust and flexible in nature. This allowed us to use the existing servo-robot while still being able to accommodate the size and volume demand of a 64-cavity tool.



Custom EOAT w/Anti-stat and Vacuum

The Benefits:

Our customer was able to validate a new 64-cavity tool without affecting their 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 showcased our creative engineering capabilities combined with our advanced technical knowledge of high precision tooling, molding, and inspection services.

We're the Easy Button for the Hard Stuff!™



For a quotation or additional information, contact Matrix Tool Inc.