

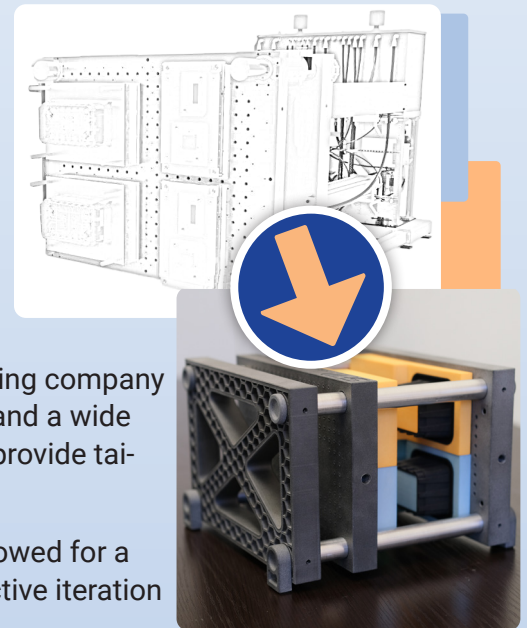
3D Printing an Interactive Industrial Scale Model

The Challenge

The customer, a sales representative in the plastics industry, required a physical scale model of a specific type of injection molding machine for demonstration purposes. These machines are large – up to 50 feet long and 16 feet high – making it challenging to create a handheld model that accurately demonstrates real-world functionality.

Traditional manufacturing methods such as casting and molding were deemed unsuitable due to long lead times, high costs, and quantity constraints – thus increasing the likelihood of 3D printing with injection-grade plastic as a solution. Additionally, the customer lacked in-house design capabilities and needed help creating any required CAD files for the model.

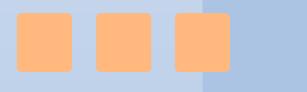
Given the urgency, effective communication and establishing a point of contact were critical to ensuring a quick turnaround.



The Solution

The customer connected with Aerosport Additive, an additive manufacturing company near Columbus, Ohio. With expertise in multiple manufacturing methods and a wide range of in-house capabilities, Aerosport Additive was well-positioned to provide tailored solutions that met the customer's needs.

Early phone calls determined that 3D printing was the ideal solution. It allowed for a one-off production run with precise results and enabled a more cost-effective iteration process if multiple revisions were needed.



The Resolution

The initial discovery call between Aerosport Additive and the customer clarified the end-product requirements, creating project scope (project requirements/expectations, price, & lead time) and establishing a budgetary range. This critical step in the process builds a framework of expectations from both parties and serves as a point-of-reference throughout the project. The discovery call ensures that everyone is aligned on the goals and deliverables, leading to a successful project outcome.

Aerosport Additive's team supported the customer throughout all project phases – design, CAD file creation, printing, and quality control. Initial conversations between the customer and Aerosport's Design and Engineering Lead, Charles McCusker, included photos and sketches that helped lay the groundwork for CAD file development. Since McCusker was unfamiliar with the specific molding machine, the CAD designs were created entirely based on these discussions & online resources.

Jason Anderson, Operations Manager at Aerosport Additive, and Steve Clark, 3D Printing Director, identified the HP Multi-Jet Fusion 3D printer and Selective Laser Sintering (SLS) 3D printers as the best machines for the project due to fast production capabilities, excellent surface detail, and accuracy. While a few components were CNC machined, most of the model was produced on the HP and SLS machines, demonstrating the benefits of Aerosport's diverse manufacturing capabilities.

Quality control played a crucial role in the process, with Anderson relaying photos of the parts to the customer during production for review. Monitoring iterations of the physi-

“Constant communication and a transparent feedback loop are the key to a final product that meets expectations.” —Jason Anderson, Operations Manager

cal product output for potential trouble spots – i.e., printed parts not functioning as intended in the design phase – resulted in revising and reprinting when required.

This communication and feedback loop established a process for continuous improvement and were key in delivering a final product that met expectations for both cost and timing, minimizing surprises at the time of delivery.

There were, in fact, welcome (yet unplanned) additions added to the final product because of the communication between Aerosport Additive and the customer.

During the build process, conversations between Charles McCusker and the customer revealed that the product needed to sit at a slightly elevated height from that of its original design and that the model would be travelling quite frequently. McCusker creatively devised solutions to help with both situations by adding rubber feet to the model to address the height issue, and then printing and mounting replica “mold straps” to keep the model together during transport. These additions were not only welcome and functional, but added additional realism to the model, further increasing its demonstrative value.

The Results

By working with Aerosport Additive, the customer efficiently and successfully obtained an accurate scale model of a large manufacturing machine, which is now an essential tool in the customer education phase of their sales process. The cost-effective nature of additive manufacturing enabled the creation of this model without the need for large quantities or lengthy production times, resulting in a quick turnaround for the customer – about 6 weeks from the initial inquiry to shipped product. With the design files now complete and refined, additional sales models can be ordered and printed on short notice, helping the sales team remain agile and responsive to customer needs.

