FORTIFY

CASE STUDY

MASK ADAPTER FOR PPE SHORTAGES

QUICK TURN PROTOYPING FOR ON-DEMAND COVID RESPONSE

Application / Injection Molding

Material / Polypropylene

Total Project Time / 3 days

THE CHALLENGE

Traditional modes of prototyping injection molded parts through machining aluminum tooling lacks the agility to respond quickly in times of crisis. COVID-19 has led to unprecedented shortages of PPE (personal protective equipment) for healthcare workers. For any new designs to fill the gaps, it is critical to first prototype and validate the design quickly and efficiently. Quick-turn solutions will be imperative to ensure the safety of frontline workers.

BACKGROUND

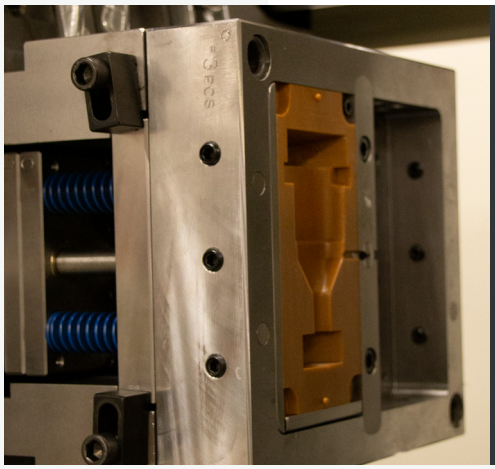
Various groups augmented and repurposed existing products to help fill the PPE gap. One specific group, MasksOn.org, a non-profit organization working to provide face masks to clinicians, designed a snorkel mask adapter that mates with off the shelf filter components. To launch this component into manufacturing production, the design of the adapter needed to be validated and quickly. Transitioning quickly from "look and feel" 3D printed parts to true functional thermoplastic injection molding was critical to long term success of the snorkel mask PPE design.

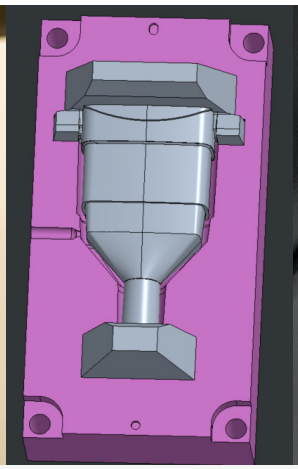
From left to right:

/3D printed tool in mud-frame ready for molding

/ CAD rendering of tool with inserts for molding

/ Snorkel mask, 3D printed tool, and molded adapter part





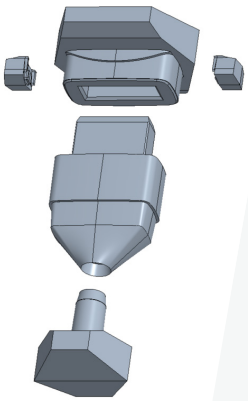
WHAT WILL YOU FORTIFY?

CASE STUDY

MASK ADAPTER FOR PPE SHORTAGES / QUICK TURN PROTOTYPING FOR COVID RESPONSE

THE PROCESS

Fortify designed, printed, and molded the mask adapters in just 3 days - lightning speed compared to traditional aluminum injection molding. The adapter geometry would typically require side action components to be sourced and machined to fit an existing mold in order to mold this part. However, by leveraging the design flexibility of 3D printed injection mold tooling, Fortify engineers designed a complex injection mold tool with multiple inserts to bypass potential bottlenecks and form the inner geometry of the adapter.



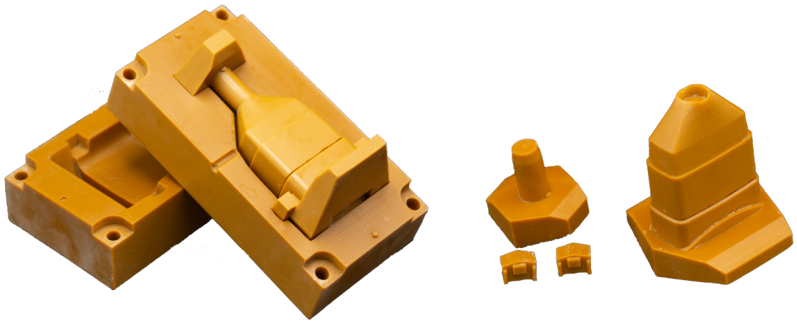
The tool cavities and inserts were printed on Fortify's Flux One system using Digital Tooling resin. The mechanical robustness of the tooling resin combined with the accuracy of the printer enabled the production of sturdy tools with pinpoint accuracy, eliminating unwanted flash.

To complete the process, Fortify injection molded 25 prototype adapters on an in-house 30 ton Nissei injection molding press. The company has opened bandwidth for the molding press, which is typically used for R&D, to tackle quick-turn COVID response projects.

THE RESULTS

	FORTIFY DIGITAL TOOLING	ALUMINUM TOOLING
COST	$300	$2,000 (estimated)
# OF PARTS PRODUCED*	25	25
LEAD TIME	3 days	14 days

*Only 25 parts were needed for design validation of this project, mold tool is available to produce more.



Fortify Digital Tooling Resin Powered by LOCTITE®

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