Tools for Low-Volume Injection Molding

Collaboration overcomes traditional limitations providing one-day turnarounds on accurate tools for quality parts.

OVERVIEW

Becton-Dickinson uses Forward AM's Ultracur3D® RG 3280 ceramic-filled resin with Axtra3D's Lumia X1 3D printer to rapidly produce low-volume injection molds for accurate, easy-to-eject parts made of different plastics. Through this collaboration, BD used additive manufacturing to quickly produce injection molds with production-level quality. In addition to supplying Ultracur3D® RG 3280, a ceramic-filled polymer, as the mold material, Forward AM shared its 3D printing expertise.

You can read the full use case here: 3D Printed Tools for Low-Volume Injection Molding

QUICK FACTS

Materials:

Ultracur3D® RG 3280

Industry:

Medical, Healthcare

Partner:

AXTRA3D

Technology:

DLP

Becton Dickinson of Franklin Lakes, New Jersey (USA) is the world's largest manufacturer and distributor of medical surgical products. To support its partners, the medical technology company provides low volumes of parts for tradeshows, materials testing, and product assembly. Often, the partner requests are urgent. With a goal of *advancing the world of health*™ by improving medical discovery, diagnostics and the delivery of care, BD supports the heroes on the frontlines of healthcare by developing innovative technology, services and solutions that help advance both clinical therapy for patients and clinical process for healthcare providers.

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Reduced production timeline from days to hours

Increased part quality at low-volumes

Challenge: Develop and implement a process to reduce costs and accelerate accurate and timely mold production.

Traditionally, low-volume injection molds have lacked the precision that's needed to create production-quality components and can be expensive and take a long time to make. To reduce costs and accelerate mold-making, master unit die (MUD) inserts with a standard frame and removable inserts can be used. MUD molds, as they are called, can support the complexity that medical parts need; however, inserts made of metal can take a long time to machine.

These 3D printed inserts take less time to produce, but the plastics they use may lack sufficient rigidity for accurate, functional parts. Unless a 3D printed insert has the proper surface finish, the MUD mold won't produce low volumes of parts with high enough quality.

The solution to Becton Dickinson's challenges came in two stages. The first began with the 45-minute design of a MUD mold insert. This core and cavity block was made of Ultracur3D® RG 3280 and produced with a Lumia X1 3D Printer which combines high resolution with fast print speeds.

Printing took just 54 minutes to complete and was followed by post-processing, including cleaning and post-curing, that took about 60 minutes. Next, the 3D-printed insert was machined to fit the mold frame. This took about 120 minutes, and the entire mold was ready for the press in less than 5 hours. Some 30+ polypropylene parts were ejected by hand. They had a production-quality finish and exceeded expectations.

The second stage of the solution involved the automatic ejection of 100+ polypropylene parts and 100+ polycarbonate parts. Setting up the ejection pins lengthened the lead time, but over 300 functional parts were molded.

Learn more about Ultracur3D® RG 3280:

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