

PolyJet Allows Company to Move From Design to Prototype Production Overnight

“In our case, it’s PolyJet or nothing because we couldn’t create a part with this complexity by tomorrow any other way. It’s impossible.”

— Graham Wilson, Director, Design Reality

SITUATION

Design Reality is a product development company located in Northern Wales, United Kingdom, which designs respirators and other equipment used by firefighters and military personnel. These products are typically injection molded using liquid silicone rubber in different grades to provide the required range of properties.

In the later stages of the product development process, functional prototypes must be made from the final production material for testing purposes and to meet critical product requirements. In the past, Design Reality used CNC machining to produce its molds either from modeling board or aluminum. But depending on the complexity of the mold, this could be a very time-consuming and expensive process. For example, developing a mold to produce a silicone protective boot for a digital pressure gauge (DPG) traditionally took three days. If design changes were needed, the existing mold would have to be revised or another mold machined, adding to the overall product development time.

How does PolyJet compare to traditional methods for Design Reality?

Method	Production Time	Cost
CNC	24 hours	\$2,000
PolyJet	6 hours	\$1,000
SAVINGS	18 hours (75%)	\$1,000 (50%)

SOLUTION

Design Reality already owned an Objet[®] 3D Printer that they used to produce multi-material prototypes. However, at the suggestion of a Stratasys[®] support engineer, Design Reality began to 3D print its molds. Soon they were producing liquid silicone rubber functional prototypes in a fraction of the time as compared to that required by CNC machining.

Today, the engineers at Design Reality routinely 3D print a mold overnight and create silicone components for testing and evaluation the following day. Plus they know that if any changes are needed, a design can be easily modified and another mold created in a short time. What used to take them weeks to do before, now takes only a matter of hours.

RESULTS

Thanks to PolyJet[™] technology, Design Reality has been able to greatly shorten their product development process. For example, the time needed to produce a new DPG protective boot prototype has been pared down to four hours for design, plus two hours to 3D print the mold — a 75% savings in production time as compared to traditional CNC machining. Moreover, each mold is durable enough to make 50 production parts for functional testing.

“The Objet 3D Printer gives us a huge advantage as a design company because it makes us better designers,” said Graham Wilson, director of Design Reality. “We used to have to



Figure 1: PolyJet Digital ABS[™] mold for a digital pressure gauge protective rubber boot.



Figure 2: Injecting liquid silicone rubber into the PolyJet mold.



Figure 3: Removal of the boot from the mold.



Figure 4: Functional prototype rubber boot produced with a PolyJet mold.

go through lengthy processes to deliver products to our clients, but now the designer can finish the design, print it overnight and the next morning we're testing it. That's unheard of in our industry."

"In our case, it's PolyJet or nothing because we couldn't create a part with this complexity by tomorrow any other way. It's impossible."



Figure 5: Mock-up installation of a DPG inside a rubber boot produced with a PolyJet mold.

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