APPLICATION CUSTOMER STORY:

ScanMed

FDM Allows ScanMed to Meet Customer Needs Faster and Less Expensively than Ever Before

"We have substantially reduced the time and cost required to make mold masters while also providing our engineers with virtually unlimited freedom to produce designs that meet our customers' requirements."

– Martin Troudt, Mechanical Design Manager, ScanMed

SITUATION

ScanMed of Resonance Innovations LLC, based in Omaha, Nebraska, is a leading manufacturer and engineer of magnetic resonance imaging (MRI) coils. ScanMed produces its MRI coil covers utilizing silicone molding or room temperature vulcanization (RTV) molding using mold masters fabricated in-house.

High quality construction of the mold masters is important because they dictate the precise form, fit and function of the coil cover. Additionally, because each cover will ultimately come in contact with a patient, they must have a professional look and feel.

Prior to creating their mold masters in-house, ScanMed used an outside machine shop to CNC

HOW DOES FDM COMPARE TO TRADITIONAL METHODS FOR SCANMED?

METHOD	PRODUCTION TIME	COST
CNC Patterns	Up to 7 days	$1,000
FDM Patterns	Up to 2 days	$400
SAVINGS	5 days (71%)	$600 (60%)

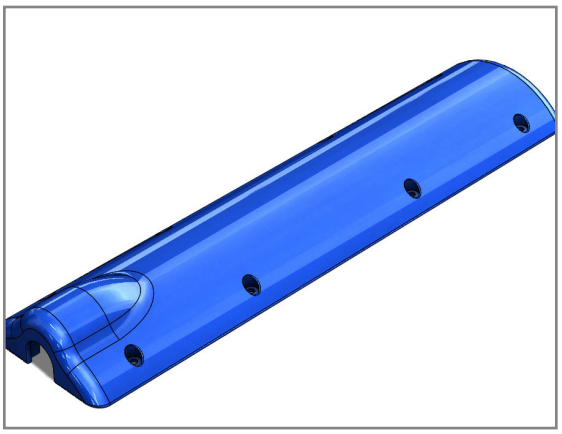
ScanMed

machine the mold masters at a cost of nearly $1,000 each. Production lead time was also substantial; each master took approximately 7 days to make, with an additional three to four days to pour and finish the mold. ScanMed design engineers also had to make allowances for the limitations of CNC machining when creating patterns with thin walls because they had a tendency to warp and deflect during machining. These issues were causing the company a great deal of extra expense in addition to long delays in getting products to market.

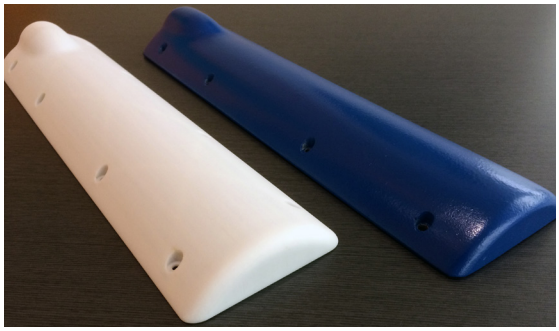
SOLUTION

The designers and engineers at ScanMed needed a better, faster way to create high quality production parts. After researching additive manufacturing for mold master creation, they purchased an FDM® 3D printer from Stratasys® because FDM materials have the strength and heat resistance to withstand the mold making process. What's more, patterns can be extracted from the mold without damage, even if they include thin walls or small features. Finally, mold masters made from polycarbonate and ULTEM™ 9085 thermoplastic resin are MRI transparent and robust enough to be used as both functional prototypes and mold masters.

A production MRI coil assembly with a finished and painted urethane distal cover. The distal cover was cast using silicone molding.



CAD rendering of a custom ScanMed coil cover to be used as an FDM mold master for creating a silicone mold.



FDM distal cover to be used as a mold master: before finishing and painting (left) and after (right).

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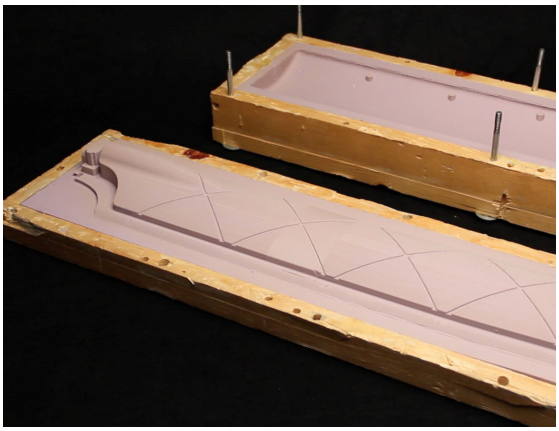
RESULTS

Today, ScanMed prints its smaller part mold masters in-house on their Stratasys 3D printers in one to two days for about $400 each — a time savings of 71% and cost savings of 60% as compared to CNC machining.

An added benefit is the design freedom the company's engineers now have because they can create complex parts without incurring additional time or cost penalties. For example, side holes can be incorporated into 3D printed mold masters thereby allowing them to bypass secondary operations. Thin-wall mold masters can also be produced without warping or deflection.

"This was a fairly easy choice for us. Now, we can say with confidence to our customers that we can get a project completed in a certain amount of time and live up to that expectation," comments Randy Jones, President and CEO of ScanMed.



Silicone mold created using the FDM master pattern and used to produce cast urethane coil covers.

Cast urethane distal cover ready to be finished, painted and mounted on the MRI coil assembly.

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