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Jesse Hahne / Center for Advanced Design

From left to right, the helmet camera mount, final helmet, mouthpieces in red and white, and the helmet prototype at CAD.

#### CASE STUDY

# Complex Designs Fast

**DESIGN FIRM 3D PRINTS TO REFINE IDEAS WITH SPEED**

At the Center for Advanced Design (CAD), a product development firm in Minnesota, USA, a team of design engineers specialize in creating complex surface geometry for the plastics industry. The agile team of six handles everything from industrial design concepts and digital sketching to assisting clients with implementation by building production tooling. Their ability to advance projects quickly keeps their specialized team very busy.

“We’ve carved a niche out for ourselves designing plastic components for customers in the power sports industry,” Jesse Hahne, partner at CAD, said. “Many of the larger companies we work for are very talented, but they move slower. When deadlines are looming, they look to us to get their complex projects back on track.”

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## Smarter Prototyping

Developing a customer need into a product requires an ability to verify concepts, validate designs and test function fast; a process made more efficient with CAD's in-house Stratasys F370™ 3D Printer.

"Time is our only product, so it's all about saving time to get to the next project," said Hahne. "3D printing prototypes gives us the ability to fail fast. We can produce multiple design iterations quickly or change a product design overnight to meet a customer's deadline. The parts are accurate and the process is dependable."

The Stratasys F370 with GrabCAD Print™ software streamlines the team's shared workflow and makes CAD even more responsive to fast-moving projects.

"The Stratasys F370 prints quite a bit faster and we're able to process projects quickly," said Hahne. "We save time with GrabCAD Print and that's a real cost savings to us."

The team not only benefits from the speed and ease of use, but the ability to use materials that create high-quality parts. "Now we can run ASA and we absolutely love it," Hahne said. "With ASA we can run 5-slice and print higher-resolution parts, which gives that 'wow' factor with our customers. 3D printing intricate housings in 5-slice was almost like an injection molded part when we were done."

## Continuous Design Improvement

The all-in-one capabilities of the Stratasys F370 help CAD continuously improve product designs, like their popular motocross helmet. Feedback on a previous version prompted CAD to make design changes more in line with what riders want – a helmet that can accommodate a neck brace and a camera.

"We came up with an interchange system for the helmet to fit a neck brace better," said Hahne. "We were able to print and test two different concepts before committing to tooling."

CAD also designed a new mount to hold a GoPro camera on the visor of the helmet. "Typically riders use a suction cup or tape to attach a camera to their helmet, but they don't want to stick adhesive to a really expensive paint job. So we built a mount right onto the visor of our helmet," Hahne said. "We 3D printed and tested it three times to determine the optimal position for filming."

## Custom Tooling for Custom Designs

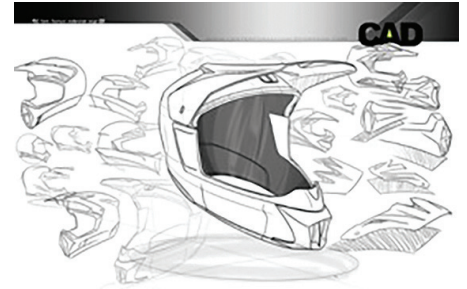
Not only does 3D printing enable quick product development, the team at CAD 3D prints assembly fixtures for clients that are specific to the new products they design.

"Building fixtures out of wood or aluminum using CNC machining was a time-consuming process," Hahne said. "With the new Stratasys F370, we can 3D print huge fixtures that we weren't able to print before, or we'd have to glue together. Now we can print 70-90% of what we do without dovetailing."

Features of the Stratasys F370 like its minimal setup, fast-draft mode and auto-calibration ensures less time troubleshooting and more time for the team to tackle the next complex design.



CAD specializes in creating complex surface geometry for the plastics industry.



Digital sketch of CAD's helmet redesign



Render of CAD's helmet redesign highlighting a new camera mount, back piece and mouthpiece in blue.



The helmet prototype was 3D printed in one build on the Stratasys F370.

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