



# Road-Worthy Roar

3D PRINTING BREATHES LIFE INTO OCC'S DRAGON MOTORCYCLE

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*– Jason Pohl, Orange County Choppers*

## CASE STUDY



OCC built the detailed dragon head on a Stratasys 3D Production System.

Orange County Choppers (OCC) builds custom and production motorcycles in Orange County, New York. Founded by Paul Teutul Sr., OCC was the topic of the Discovery Channel's American Chopper, a reality TV show that most recently pitted father against son to see who could build the best custom bike. OCC is famous for building bikes around a theme, such as the Fire Bike, which commemorated the New York firefighters who died on Sept. 11, 2001, and includes a steel rivet from the World Trade Center.

### Production Runs of One

Custom motorcycles, by their very nature, demand many intricate parts to carry the design theme forward. Most of these parts are produced in lots of just one for a unique bike. In the past, OCC primarily machined these parts from aluminum billets or high-density foam. This approach required considerable time for creating a computer numerical control (CNC) program, producing fixtures to hold the part, and machining the part, often on multiple machines. The labor involved added to both lead time and cost, and the parts could be heavy.

Over the last few years, OCC has begun producing more and more parts for its custom bikes on a Fortus 400mc 3D Production System. “What’s great about additive manufacturing is that you can work with the solid model created during the design process without any additional preparation,” said Jason Pohl, graphic artist and designer for OCC. “You export an STL file and send it over to the printer and go on to your next job. The Fortus produces a perfect replica of the solid model without any operator supervision or tooling. We often use the sparse fill build to substantially reduce the weight of parts.”

### Design Freedom

In response to a customer’s ambitious request, OCC recently designed a bike in the shape of a Chinese dragon. Outfitted with an S&S 100 cubic inch engine and a Rolling Thunder frame, the bike is street legal in China, the customer’s home. Pohl designed the dragon’s head in 3D Studio Max graphic design software with an incredible amount of detail, including finely stylized horns, teeth, eyelids, gums and nostrils. “In the past, we would have cut the head out of high-density foam using at least a dozen setups to get all of the undercuts and angles,” he said. “We would have had to scale back the design in order to keep a lid on the time and cost required to manufacture the part.”

With the Fortus, Pohl designed the dragon’s head without worrying about how to produce it.

“The Fortus machine captured every detail down to the ribs on the roof of the dragon’s mouth,” Pohl said. “When I put the head on my desk, it felt like it was going to come to life any second.”

To reduce the weight after that first iteration, Pohl created internal voids and printed another copy. The client loved the design, which Pohl created faster and at less expense than was possible with traditional methods.

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Rendering of dragon chopper as presented to client



OCC's Paul Teutul Sr. with the Stratasys 3D Production System



More renderings of dragon chopper

| METHOD   | COST          | LEAD TIME     |
|--|---------------|---------------|
| CNC machining of aluminum or high density foam | \$2,400       | 15 days       |
| 3D Printing                                    | \$800         | 3 days        |
| Savings  | \$1,600 (67%) | 12 days (80%) |



E info@stratasys.com / STRATASYS.COM

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#### HEADQUARTERS

7665 Commerce Way, Eden Prairie, MN 55344  
 +1 888 480 3548 (US Toll Free)  
 +1 952 937 3000 (Intl)  
 +1 952 937 0070 (Fax)

2 Holtzman St., Science Park, PO Box 2496  
 Rehovot 76124, Israel  
 +972 74 745-4000  
 +972 74 745-5000 (Fax)