
# Wolfpack Motorsports

## Use Case – Sacrificial Tooling

### Customer Profile

Wolfpack Motorsports is North Carolina State University's Formula SAE racing team. The team participates in a collegiate racing series where students get to design, build, test, and race their own quarter-scale formula style race car. The goal is to design the best overall race car – being given points based on static and dynamic events – and get a top-10 finish in competitions.

### Challenge

One of the team's biggest projects was the development of a modular intake system for the car's engine to test its performance on a dynamometer. Testing multiple designs allows the team to optimize engine performance but this requires multiple intakes to be manufactured. Using traditional methods, the team would have to go through the process of making molds and laying up the intake in carbon fiber. However, there were several drawbacks to this process:

- Long lead time (1.5-2 months)
- Less time for design iterations resulting in fewer design tests

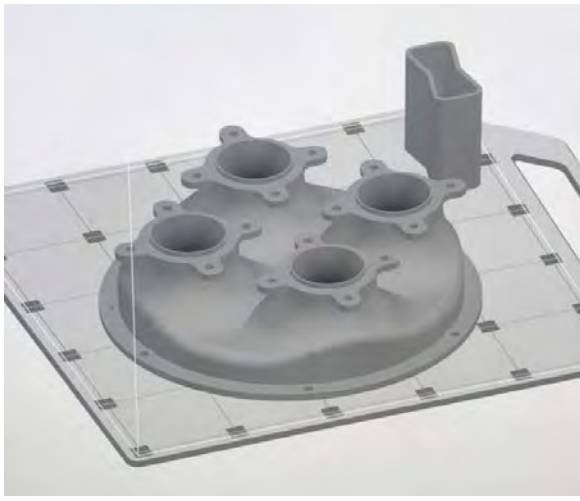
### Solution

Instead of making traditional lay-up molds, Wolfpack Motorsports used additive manufacturing and their Stratasys F370™ printers to build the molds. They were printed using soluble QSR Support™ material and then wrapped in carbon fiber. The support material was then dissolved out, leaving a hollow intake system formed by the carbon fiber material. Multiple iterations were created and once enough data was gathered, the intake design was finalized. This solution provided a variety of benefits:

- Drastically reduced lead time
- Allowed for more design iterations
- Greater design freedom

### Impact

FDM® additive manufacturing gave Wolfpack Motorsports the ability to produce 16 design iterations in a short amount of time to optimize the design. Traditional manufacturing would have allowed for one. Additionally, lead time for a single printed modular intake system amounted to 75 hours, instead of 1.5 to 2 months, an 80+% time savings. Additive manufacturing also gave students the opportunity to keep the process in-house for added student learning and hands-on experience.



**Time Savings**

**80%**

**Design Iterations**

**16X more**