

# Trinity Products, Inc.

## 3D Systems Rapid Prototyping Solution Turbo-Charges Remote-Controlled Race Car Company



- **Trinity Products** – Leading designer and manufacturer of high-performance remote-controlled cars
- **Challenge** – Obtaining rapid prototypes useful for form, fit and functional testing
- **Solution** – Switching to the ZPrinter 310 System to obtain stronger, higher-resolution parts, even for 1/18th-scale autos
- **Results** – Trinity Products has saved time and money, and generated significant new sales

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– Mike Wood  
Chief Engineer  
Trinity Products, Inc.

The race to create better-looking and higher-performing remote-controlled cars, trucks and parts is every bit as intense as the fury on the track. Trinity Products Inc. of Edison, NJ, is a \$10 million manufacturer and supplier in this robust, nearly \$2 billion market, many of whose customers are adults with full-time jobs and comfortable incomes.

Trinity makes several lines of performance vehicles – including the newest 1/7th-scale Nitro Spyder monster truck and the 1/18th-scale Itsy Bitsy Spyder four-wheel-drive racing truck – as well as engines, fuel, electric motors, batteries, accessories and aftermarket parts. The company employs 35 individuals in Edison and is the exclusive U.S. distributor of rechargeable batteries for remote-control applications from Sanyo and Gold Peak.

### Challenge

#### Obtaining Detailed Rapid Prototypes at any Scale

Trinity’s design engineers are experts at conceiving new products and swiftly creating detailed 3D renderings in their 3D mechanical design software. But, to ensure a component fits a vehicle assembly properly and functions as intended, engineers need to hold a prototype in their hands. A mistake can cost thousands of dollars in wasted time and lost revenue.

This requirement prompted Trinity to invest two years ago in a Dimension® 3D Printer from Stratasys Inc. that can create a physical model, or rapid prototype, of a part or assembly. The device served engineers well enough until they visited a trade show in August 2004 and witnessed the next generation of affordable 3D printing: The ZPrinter® 310 System from 3D Systems. The ZPrinter 310 System was pumping out small, intricate parts at five times the speed of their existing system with details the

Dimension system could not match. The performance of the ZPrinter 310 System astonished Trinity engineers, who had been having difficulty getting useful prototypes of smaller parts with their existing system. The problem was only worsening as consumer tastes shifted around Christmas 2003 toward the “mini” 1/18th scale vehicles. In too many cases, the old printer couldn’t make the part at all, or made the part so flimsy it wasn’t useful for testing.

### Solution

#### ZPrinter 310 System Quickly Creates Functional Physical Models

Trinity Chief Engineer Mike Wood invited 3D Systems representatives to show what their technology could do. Shortly after the handshakes, 3D Systems representatives were making prototypes of suspension parts that were then bolted right to the car and tested on the track. These prototypes proved fit and functionality where the other printing technology had only left questions marks: it was unable to meet the strength and resolution requirements.

“That really convinced our team that we needed the 3D Systems printer,” Wood said. “While priced competitively and focusing on value, it could do so much more than we were able to attempt with our previous printer. We could take virtually any part, bolt it on the car, ensure it fit seamlessly into the assembly, and in many cases take it out for a full battery of functionality testing.”

### Results

#### New Approach Saves Time and Money, Bolsters Marketing

In the year since investing in the 3D Systems system, Trinity has used the technology to save time and money in both the short and



3DSYSTEMS™



#### Hi-Flo Exhaust Pipe and Manifold Set

3D Systems prototypes enabled Trinity to install the manifold and pipe onto the vehicle to ensure that the shape of the configuration was exactly the right fit.

**“Today, we can prototype a complete car kit before going to production and use it for fit and function testing, and a plethora of profitable marketing activities. It’s just been phenomenal.”**

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- 80 percent time savings for printing parts
- Design cycle cut in half
- Elimination of \$800 in prototyping costs per part
- Parts now useful for fit and functional testing
- Parts now suitable for tradeshows, brochures, advertising
- Better communication with manufacturing partners – improving quality, minimizing costs and reducing time to market

long terms. Rapid prototyping with the ZPrinter 310 has even generated new sales revenue and increased brand equity.

According to Wood, the 3D Systems printer shrinks Trinity’s printing time by 80 percent for a typical part, enabling engineers to complete time-sensitive designs faster and with fewer interruptions. A part that took five hours on the old system takes one hour to create on the ZPrinter.

3D printing has cut Trinity’s entire design cycle in half, from eight weeks to four weeks. Moving from concept to manufacturing typically takes eight weeks when the prototype needs to come from a manufacturing partner – or longer if a company skips the prototype only to find out it doesn’t fit as expected. By creating prototypes in house and ensuring fit and function, Trinity compresses the prototyping part of the cycle from four weeks to less than a day.

In addition, asking a manufacturing partner for a production-level prototype engine would cost at least \$800 and involve asking favors. Whatever the cost, the part would take three to four weeks to arrive, suspending Trinity’s design process as competitors continue to pump out products.

Trinity has reaped a significant return on the ZPrinter 310’s unsurpassed resolution, a full three times higher than the company’s previous printer – .0035-inch layer thickness vs. .01 inches. This difference enables Trinity to create prototypes that faithfully resemble production parts. The new capability enabled Trinity to secure thousands of dollars in new revenue this year by using the ZPrinter 310 System to create mockups of new vehicles for an important tradeshow just before Christmas.

“Unveiling prototypes at the show made all the difference in our sales that year, because the show is huge for our market,” said Wood. “It drives our industry and Christmas sales. In addition to the thousand of attendees, many people go online from around the world to see what’s hot during the event. We couldn’t display the prototypes with our old printing technol-

ogy because of their poor quality. The technology’s shortcomings in resolution left curved surfaces jagged and unsuitable for public display. Showing a prototype from the 3D Systems machine made an enormous difference.”

Because of the finished look of a ZPrinter-generated prototype, Trinity for the first time can also use 3D printed models in advertisements, brochures and marketing materials. And because of the low cost and unrivaled speed of the ZPrinter, Trinity has been using the system in entirely new ways. It is making part stands to display new products at trade shows and creating giant bolts to decorate its trade show booths in a Monster Garage theme. Real steel bolts are so heavy they would collapse the walls.

Trinity also uses ZPrinter prototypes to communicate with suppliers, such as the overseas manufacturing partner that makes Trinity’s ready-to-run vehicles. In late 2005, Trinity was developing an entirely new category of 1/18th-scale vehicles and sent a secret mockup to the manufacturer. That gave the partner a chance to understand the product before engineers and executives visited to hammer out details. Giving all parties a jump on the process this way lets Trinity bring better products to market more quickly.

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