

A 3D Systems Success Story

Élan Motorsports Technologies

Selective Laser Sintering (SLS®) • DuraForm® EX Plastic • Direct Manufacturing



Advanced Processes and Materials Help Indy Racing League Racecar

- Customer:** Élan Motorsports Technologies (EMT), part of the Panoz group of companies, is one of the world's leading motor sports technology companies.
- Situation:** EMT needed help developing a fuel manifold, a two-part assembly that would be used in the methanol fuel tank in several racecar bodies. Part complexity, a tight deadline and the harsh tank environment were among the challenges facing EMT and American Precision Prototyping (APP), a industry-leading service bureau providing fast, high-quality Rapid Prototyping and Manufacturing solutions.
- Solution:** Behind the expertise of APP, the fuel manifold was created using the 3D Systems' Selective Laser Sintering (SLS®) process with DuraForm® EX Material.
- Benefits:** The newly engineered fuel vent manifold, impervious to fuel and strong during performance testing, was directly manufactured by the SLS® System and ultimately used during several races, including the Indianapolis 500.

Part Complexity, Tank Environment Challenging

ÉLAN MOTORSPORTS TECHNOLOGIES (EMT) (BRASELTON, GA.), part of the Panoz group of companies, manufactures racecars and uses carbon composite technologies in various applications.

Facing a tight deadline, in April 2007, EMT and Panoz Group teamed with service bureau American Precision Prototyping LLC (APP) (Tulsa, Okla.) to create a fuel vent manifold, a two-part assembly to be used in a methanol fuel tank in several of their race car bodies.

This proved to be no small feat with various challenges to overcome, such as part complexity and the tank environment itself. The parts were complex and since this was a first-time test, the quantity being produced was too low to justify the cost and time for traditional production tooling.

Strong Parts Keep Form Under High Temperatures

THE NEXT CHALLENGE WAS THE STRESSFUL TANK environment in which the parts would have to perform. The parts would be completely submerged in the methanol fuel tank and would have to resist and not absorb the methanol fuel. If the parts absorbed the fuel, they would swell up within the tank, leading to serious problems with ventilation.

Form retention and strength were other challenges for the EMT and APP teams to overcome. Stresses such as high temperature



Exhibiting great strength and thermal resistance, the two-part fuel vent manifold (in white) was built in 3D Systems' DuraForm® EX Plastic.

and extreme vibration meant the fuel vent manifold would have to be strong enough to keep its original form under the high temperatures and would have to stay attached to the tank where its original design dictated and not vibrate loose. This required a unique approach to standard prototyping methods and APP was there to accept this direct manufacturing challenge.

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Better Performance During Testing

APP, AN INDUSTRY-LEADING SERVICE bureau providing instant online quotes and innovative manufacturing solutions, realized the directly manufactured parts would need superior strength to withstand the harsh thermal conditions and quickly chose the 3D Systems'

Selective Laser Sintering (SLS®) process and the new, tough, impact-resistant DuraForm® EX Plastic.

"We couldn't have done it with anything else but DuraForm® EX Plastic," said Jason Dickman, president of APP. "We have so many successful companies who are benefiting from this technology."

APP collaborated with one of its partners using the DuraForm® EX Plastic and a newly engineered multi-layering technique to create an enhanced functional assembly with longevity in mind. The fuel vent manifold tested better by combining a tempering plasma spray and a infiltrate coating.

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- Jason Dickman, president of APP

The total thickness applied was measured to be 25 to 38 microns (1 to 1.5 mils). The tempering process only took 20 minutes and dried within minutes of shipping.

DuraForm® EX Goes to the Races

CONTINUALLY PRODUCING THE BEST

in motor racing, EMT found the 3D Systems direct manufacturing solution for its fuel vent manifold superior in design and outstanding in functionality.

EMT and the Panoz Group successfully used the new DuraForm® EX parts in multiple races, including the Indianapolis 500, Michigan 300, Las Vegas Race and the Florida INDY car race.

To read more about Élan Motorsports Technologies, visit www.elanmotorsports.com.

For information on APP, a 3D Systems' Preferred Service Provider, call (918) 266-1004 or visit www.approto.com.



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