

February 2014



UNIVERSITY OF MICHIGAN
SUPERMILEAGE

Editor: Agney Deshpande

The Layup Process

Shell Eco-
Marathon Send-
Off Event
Thursday, April
4th, 9:00 AM
Cobo Center,
Detroit

University Vehicle
Unveiling Event
Friday, April 5th,

Congratulations
to our new
leads! Learn
more about
them below and
in the following
newsletters!

Once our male mold has been sanded down to a smooth, shiny finish (we start with 80 grit sandpaper and end with 3000 grit) it's time to begin the layup process. First, we determine how we want to separate the female mold: too many pieces and our error and time increases, too few and it's difficult to separate the fiberglass from the mold. Next we use sealed cardboard to create flanges, or walls, extending out from the male mold. These must be strong and level, because they need to hold several layers of saturated fiberglass. After the flanges have set and any gaps between the cardboard and male mold have been filled, we cover the mold with two different sprays. First, we spray Polyvinyl Alcohol, or PVA. PVA is a water soluble polymer that is often used to package Liqui-tabs for laundry detergent. The benefit is that epoxies do not stick to PVA, so it helps our female mold to release. The other spray is a gelcoat, the same durable material used on the surface of boats. The gelcoat creates a tacky, gummy surface which makes it easier for the fiberglass to stay on the mold before we add resin.

Once the surface of the male mold is properly prepared, the actual fiberglass process can begin. Using a 100:1 mix of polyester resin to MEK hardener catalyst, we cover each segment of the mold first with chopped fiberglass followed by a biaxial weave, which provides better lateral support.



The chopped fiberglass is made up of fiberglass strands held together by an adhesive. It provides stiffness to the female mold, but we use the biaxial weave fiberglass mat for greater strength. It's imperative that we do not put too much resin on at once; the exothermic reaction between the resin and hardener has occasionally made the mixing cups that we use start smoking! We can actually feel the warmth coming off the mold if we lay our hands on it.

After the fiberglass composite has cured, we carefully separate the female mold pieces from the male mold. These pieces are taken to Michigan Fiberglass Sales, one of our sponsors, where they perform a vacuum infusion using carbon fiber. Carbon fiber is both lighter and stiffer than fiberglass, and using the vacuum infusion technique minimizes the resin needed. This in turn ensures that our vehicle's weight is minimized.

Sponsor Highlight: Eaton Corporation



Powering Business Worldwide™

Eaton is a global technology leader in electrical systems for power quality, distribution and control. Founded in 1911, Eaton has grown from an innovator for vehicle technologies, to a leading power management company. Eaton works in fields as

diverse as aerospace, filtration, and hydraulics to provide energy-efficient solutions to their customers' problems. In addition, Eaton also works in markets such as agriculture, construction, and healthcare to develop expert, customized support for their clients. For over 30 years, Eaton has hosted over 40 college teams to utilize their test

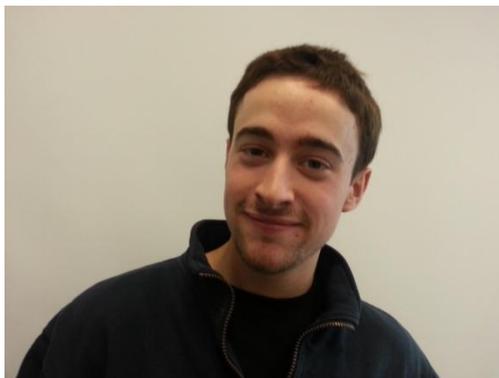
track in Marshall, Michigan in an attempt to set new fuel records. The SAE Supermileage competition is organized and run by Eaton employees who have been incredibly helpful throughout all of our previous experiences at the competition.

Eaton is helping our engine team develop a custom reverse camshaft

this year. Earlier in the year UMSM members had the opportunity to show Eaton employees around the Wilson Center when they visited campus. We appreciate the enthusiasm and expertise Eaton employees provide for us!

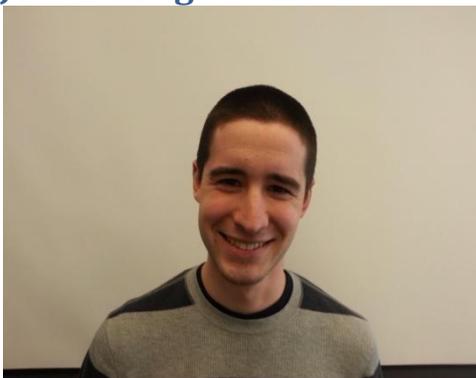
Meet Some New Leads

Sean Stalhandske



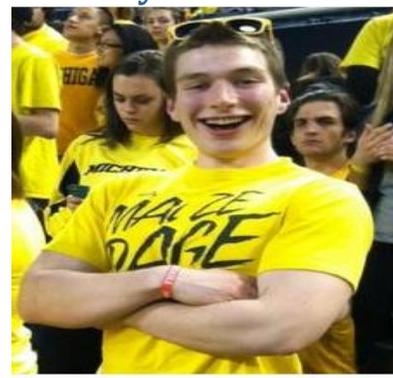
Position: Project Manager
Major: Junior, Mechanical Engineering
What he's excited about:
 I'm really excited to bring my passion for Supermileage and share it with those around me. I want to develop the project support sub team so that all the technical value our team holds can be maximized and fully appreciated by the University and beyond. Setting unprecedented high expectations for the team and the individuals around me will push UMSM to the next level on our journey to the North American MPG Record.
Why he joined:
 Because Andy Dun is a cutie pie.
Favorite Pudding:
 Danish style rice pudding with slivered almonds and cranberry juice

John Young



Position: Chief Engineer
Major: Junior, Mechanical Engineering
What he's excited about:
 I'm excited to be involved in the big picture of the team, making the decisions that will help all the subteams come together to create a really great car.
Why he joined:
 I joined Supermileage because I've always been interested in automobile efficiency, always trying to get the most MPG's out of my car when I drove. So Supermileage was a natural fit for me.
Favorite Pudding:
 Chocolate of course!

Zack Snyder



Position: Rules and Safety Officer
Major: Sophomore, Mechanical Engineering
What he's excited about:
 I'm excited to talk to the competition organizers to make sure I have a crystal-clear understand of any rules and regulations. I think this will help our team set achievable goals for a successful competition.
Why he joined:
 I wanted to join a project team and Supermileage seemed like the right size for me. There's an opportunity for growth within the team and I knew I'd immediately be able to help out with the car.
Favorite Pudding:
 Tapioca. Get at me.



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