Woodworkers Guild

of

Southwestern Michigan – http://www.woodguild.org **March 2016**

Next Meeting

March 8, 2016 7:00pm

Al Collison's Shop at
10292 Douglas Ave.

Take Douglas North to Cooper, it is 2 ½ miles North of Cooper, on the right (East) side. Or you can take 131 to D ave East to Douglas and turn left, (North). Al will have an orange cone and flashing light out to get your attention.

Agenda: Woodcraft of Grand Rapids will present a program on Mortise and Tenon.

Notice

We are looking for a volunteer to be the club Photographer. The job would consist of taking photos for the newsletter and keeping the membership album current.

Gary Doyle has been doing a fantastic job for us and we would all like to thank him for a job well done.

Thanks Gary!

The February meeting was held at WMU'S Engineering and Applied Sciences Campus. It was a cold blustery winter's night, but over 25 member's guests ventured out for the meeting.

Al Collison presided over the meeting as Bill Crown could not attend. Bruce DeDee was given credit for arranging the evenings meeting, so it was fitting for Bruce to introduced the evenings feature presenter and tour guide: Dr. Steven E. Butt PhD; Chair of the Department of Industrial and Entrepreneurial Engineering and Engineering Management and Chair of the Engineering Design, Manufacturing and Management Systems

Steve gave us an introduction to the WMU school of Engineering and the agenda for the evening. We were going to take a guided tour of the WMU Sunseeker Solar powered car shop, the 3-D printer lab, metal casting lab and plastics lab. The tour began in earnest and the size of the engineering building became quite apparent on the walk to the labs.

The main corridor is 300' long, followed by a large central commons area and then a second 300' long corridor of labs, class rooms and offices. At the Sunseeker shop were a number of student volunteers eager to explain their work and inner workings of the solar powered car. The group slowly split into two groups. One group gravitated to the mold work in progress for a new 2016 car. Others gravitated toward the retired 2010 car for discussion on its past accomplishments. The student volunteers explained their work and answered many questions.

The solar car will race each year at track events across the US. The car also competes every other year in open road completion that crosses the entirety of the US. The current car #20 was built in 2010, the 20th anniversary of WMU's solar car program. The car weighs in at roughly 700lbs with a driver. On battery power it can run over 200 miles at 45 mph. It tops out at over 80 mph, but can become airborne at the higher speeds. The temperature inside the car and run up to 30 degrees warmer than the outside from heat absorbed through the black solar cells, battery charging equipment and twin electric motors to drive the car. A driver is allowed six hours daily behind the wheel of the car and can carry 2 liters of water via a camelback type water reservoir.

The new 2016 car will return to the traditional number 786, the number to type "sun" on a phone keypad. Even though the 2016 car is a four wheel design as opposed to the three wheel predecessor, it is expected to weigh 100 lbs. less. The weight loss comes from a carbon fiber body vs fiberglass and instead of a primer and paint coating; the new car will receive a custom vinyl wrap that weighs less than traditional coatings.

To learn about the WMU Sunseeker check out their web page at https://wmich.edu/sunseeker/

At this point we split off into groups of three. The metal castings lab was next on our tour. There were various castings prototypes with intricate details to showcase their skills. One such example was a coffee mug with a spoon and a marble on the spoon. The mold for that being built in several layers. Lost investment or lost foam castings are used where a prototype is made out of Styrofoam. The foam is

captured in a sand mold and molten metal is poured into the mold. The foam mold is destroyed and replaced by the molten metal. Once cooled the metal becomes the new prototype. They have a 3D printer that sprays down sand in layers about 0.030" thick. Multiple heads spray sand that hardens and sand used as filler that can be removed. The process is slow and does not provide crisp edges. A newer method produces layers 3/8" thick quickly that can be milled with traditional cutting tools, producing a mold prototype quickly with near machined edges. Also in use is a 3D welder. It is still slow thin layers that lack machined crispness, but the technology is improving daily.

From here we moved over to the 3D plastics printer lab. This is a multiple head printer that prints different material; some harden under UV light, while others act as filler that can be washed out. WMU was fortunate to get this printer early, just behind MIT. With this printer working, articulating prototypes with great detail can be made in minutes. Some examples included a working adjustable Crescent style wrench, a bicycle chain with every link movable. Also passed around was a small printed replica of the Millennium Falcon the size of a silver dollar with every surface detail intact. It would be interesting if there are members unfamiliar with the Millennium Falcon; it is the ship that made the Kessel run in 12 parsecs; everyone knows that. The printer can print objects about 15" square by about 9" high. The material cost to print was around $0.15/gram. The material cost to print the small 6" crescent wrench was about $15. In the prototype business, that is cheap. A question brought up in our group was how far are we from being able to print human organs. Answer was that while that is a ways away, it is being researched.

From here we moved down to the plastics lab. Here again students were ready to explain the process of taking a mold and creating plastic components for production or plastic film. The school had various molding techniques and machinery to transform BB-sized plastic pellets into useful items or film. All involve transporting the pellets from hoppers to heating elements to injection into a mold. One of the larger injection molds is used to produce Frisbees for the school's College of Engineering and Applied Science. Members were allowed a take home Frisbee or two and were given the opportunity to run a thermal print machine to impart a bronco on the Frisbee's top.

I'm sure each group saw and picked up on different things. The groups reconvened at the starting point classroom. I had to depart early and missed the regrouping. While there was not much in the way of woodworking going on here, the engineering, technology, craftsmanship along with teacher and student dedication were astounding. Thanks again to Bruce DeDee for arranging the meeting, Dr. Steven Butt and his students for their generous time and attention.

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