

Detroit Three's Partnership Researches Potential Use of Magnesium

by Jim Stickford

The United States Automotive Materials Partnership (USAMP) recently announced that they have completed phase two of their magnesium front-end research and development (MFERD) project.

Alan Luo, GM technical fellow at the automaker's research and development division in the chemical and materials systems laboratory, said USAMP is a joint effort between Ford, GM and Chrysler in researching ways to improve auto technology.

Phase one of the project indicated that it was possible to achieve great weight reductions in vehicle structures by using magnesium, Luo said, adding that phase two was building demonstration models based on what was learned in phase one.

"We built 200 demonstration structures," Luo said. "And then we performed corrosion tests and durability tests to determine the strengths and weaknesses of magnesium."

He said one of the strengths is

that magnesium does greatly reduce weight in a vehicle, adding that current vehicles only have about .3 percent magnesium (a current weight of 12 pounds) as part of their makeup.

"The demonstration structures were not test vehicles," Luo said. "They looked like an automobile substructure, but they were not designed using any particular vehicle platform."

"Some of the things tested were construction processes such as casting, extrusion and sheet forming. The structures were 100 percent magnesium."

Phase three of the project just got underway, Luo said, and will go until May of 2015. It is called "the development and demonstration of magnesium-intensive vehicle front-end substructure."

One of the things they learned, Luo said, was that while magnesium reduces weight by as much as 45 percent in a front-end unibody structure and 24 percent in a body-on-frame architecture, there are difficulties in manufacturing when compared with

steel, which is easier to process.

Magnesium is processed using methods that are similar to aluminum, so basically there isn't the infrastructure in place to produce the magnesium parts like there is for steel.

The test engineers also looked at corrosion issues and learned a lot about the crash worthiness of vehicles with magnesium substructures, specifically that magnesium has limited energy ab-

sorption properties and magnesium also has higher costs when compared with aluminum.

While magnesium and aluminum production processes are similar, Luo said, there are still costs unique to magnesium that would have to be factored in when OEMs decide what to do with what they've learned from MFERD.

"The message is that we're not ready right now for magnesium, but using more aluminum in the fu-

ture could make magnesium more practical in the future," Luo said.

"I certainly expect the use of magnesium to increase over the next few years, but at what rate depends on how fast the technical issues of production and cost are overcome."

"Also, there is currently only one producer of magnesium in the U.S. right now. About 80 percent of magnesium produced worldwide comes from China."

GM Pursues Global Automotive Innovations With Launch Of Phase Two of the China Advanced Technical Center

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"EN-V 2.0 is being developed and will be tested first right here in China," Socia noted. "This is a further testament to the important role that China is playing in GM's product development strategy."

Along with existing products such as the Buick LaCrosse with eAssist, Cadillac Escalade Hybrid and Chevrolet Volt, the EN-V 2.0 project is part of GM's overall vehicle electrification strategy.

Sustainability is another key factor, and the ATC's R&D team is working to create battery cells, come up with newer, stronger lightweight materials, more efficient and greener manufacturing processes, advanced engines and transmissions, and leading-edge mobile apps to keep the urban customer connected while driving, said Jon Lauckner, GM chief technology officer, vice president of Global Research & Development, and president of GM Ventures.

One such sustainability breakthrough through GM China can cite with pride is the lightweight magnesium alloy that will help improve its vehicles' fuel economy. GM has also had successes in developing batteries in China to power the next generation of electric vehicles.

Just like GM customers here in North America, buyers in China and around the world are interested in the latest connectivity and infotainment features.

The Advanced Technology Center is also forging new paths in these areas. For example, China customers will be able to use a Shanghai OnStar mobile app for the Sail SPRINGO EV, which will

let owners monitor the car's battery charge and the vehicle's remaining EV range by using their smart phones.

Also, Cadillac plans to add one new model each year to its China lineup, starting with the XTS in early 2013.

The ATC's new Advanced Design Center gives designers the state-of-the-art tools and equipment to enable them to explore future mobility solutions and technology integration.

"Our new Advanced Design Center in Shanghai is part of the GM Global Design Center network, which webs from California to Germany to India and Korea and points beyond," said Wulin Gaowa, design director of the GM China Advanced Design Center.

"We are building a team of talented local designers and modelers that will enable us to deliver world-class work for China and other markets."

GM completed the ATC's first phase, which included a battery cell testing lab, battery material lab, metallography and electrochemical lab, cell fabrication lab, and micro-foundry and formability lab in September 2011.

The automaker broke ground on the facility, which is adjacent to the GM International Operations and GM China Headquarters, in July 2010 as a joint venture with SAIC (Shanghai Automotive Industry Corporation) to carry out important research and development for GM on a worldwide basis.

17th Annual Urban Wheel Awards Will Honor Auto Industry's Women

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"We also have new categories this year. We have designers and engineers at the automotive companies. We will also be selecting women from these categories as well. We will be acknowledging various automotive companies as it relates to their dealer development, supplier development and other initiatives related to women within their own respective companies."

"Our mission is to ensure efforts in all aspects of diversity are honored and rewarded with the Urban Wheel Awards," said Randi Payton, UWA founder.

"For 17 years, this has been the only event held during the NAIAS promoting and celebrating diversity and inclusion in the auto industry. We are extremely honored to dedicate this year's event to women in recognition of their significant accomplishments and success in the automotive industry."

The star-studded evening starts at 4 p.m. with a vehicle exhibit, followed by the celebrity Red Carpet at 5 p.m., then the VIP and general reception at 5:30.

The awards show runs from 7 to 9 p.m., and an afterglow networking reception will round out the evening.

Awards will be given for: Dealer of the Year, Supplier of the Year, Executive of the Year, Companies of the Year, and the Urban Car, Truck and Green Vehicle of

the Year. Two new awards to be presented are Designer of the Year and Engineer of the Year.

Proceeds from the UWA support the Emerging Diversity Education Fund, which provides scholarships, mentoring support and internships for ethnic minority college students who are pursuing careers in communications and the auto industry.

Staten praised the role of the Metro Detroit-based domestic automakers for their role in supporting and promoting diversity within their organizations, and this year is no exception.

"GM, Ford and Chrysler have always been recognized, and with the information I have to date will continue to be recognized with this year's awards for their various initiatives, and they've also submitted nominations for various women executives in their respective companies, so I do intend that those companies will be heavily acknowledged at this year's show."

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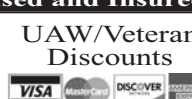


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