



## IMA News

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Below are articles and summaries of **magnesium** related stories. Members are asked to distribute the update to their employees – if their employees wish to receive the IMA Weekly Update, please send their email addresses to the IMA Head Office. We appreciate your company press releases and announcements for inclusion in the Weekly Update.

### INDUSTRY CALENDAR

March 3 – 7, 2013

TMS 2013

San Antonio, Texas, USA

<http://www.tms.org/meetings/annual-13/AM13home.aspx>

May 19 – 22, 2013

70th Annual IMA World Magnesium Conference

Xi'an, China

[www.IMAworldconference.org](http://www.IMAworldconference.org)

June 10 – 13 2013

RAPID 2013

Pittsburgh, Pennsylvania, USA

<http://rapid.sme.org/2013/public/enter.aspx>

September 3 – 5, 2013

Euro LightMAT 2013

Bremen, Germany

<http://www.dgm.de/dgm/lightMAT2013/>

October 6 – 8, 2013

[5th Asian Symposium on Magnesium Alloys](#)

Toki Messe

Niigata, Japan

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## ASSOCIATION NEWS

**IMA Announces the 70<sup>th</sup> Annual World Magnesium Conference 2013 Call For Papers – *Deadline Extended***

**Please Join Us for the 70<sup>th</sup> Annual World Magnesium Conference in Xi'an, China**

**IMA Membership Directory and Buyer's Guide Form Now Available Online - *Now Available Online***

**The IMA Invites You to Join Our LinkedIn Group**

**[Articles follow below](#)**

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## INDUSTRY NEWS

**GM Tests Magnesium Sheet Metal to Make Cars Lighter**

**Magnesium Market Update**

**Cars of the Future Need Radical Change, Not Incremental Tweaks**

**[Articles follow below](#)**

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## ASIA NEWS

**POSCO Completed Construction of a Magnesium Refining Factory**

**[Article follows below](#)**

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*EDITOR'S NOTE: IMA makes every possible effort to substantiate the articles which appear in the Weekly Update. However, as this is not always possible IMA does not warrant the details nor accuracy of any given article. Please keep in mind that materials are attained through press releases, outside articles from numerous sources and publications. Such materials often contain opinions which are not that of the association nor should they be construed as such. We realize that in the case of some materials, the translations might often lead to less than perfect grammar, etc. It is our position however to print as submitted rather than take upon ourselves the editing of such materials which would entail potential changes unwanted by any given author.*

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## ASSOCIATION NEWS

### **IMA Announces the 70<sup>th</sup> Annual World Magnesium Conference 2013 Call For Papers – *Deadline Extended***

The International Magnesium Association (IMA) has issued a Call for Papers in preparation for the 70th Annual World Magnesium Conference to be held May 19 – 22, 2012 in Xi'an, Shaanxi Province, China. Recognizing the global nature of the **magnesium** industry, IMA is seeking industry technical papers with an international perspective. Presentations at the annual event are expected to address topics related to new emerging and process technologies, automotive and non-automotive applications, finishing and joining, environmental considerations and part processing. The official submission document may be downloaded from our website at: [http://www.intlmag.org/call\\_for\\_papers.html](http://www.intlmag.org/call_for_papers.html) or click [here](#).

**\*\*\*Deadline for abstract submission is now January 4, 2013.**

Please submit abstracts to [info@intlmag.org](mailto:info@intlmag.org)\*\*\*

### **IMA Membership Directory and Buyer's Guide Update Form - *Now Available Online***

The 2013 IMA Membership Directory and Buyer's Guide form is now available in the [Members Only](#) section of the IMA website. You are now able to download the form whenever your organization needs to make changes to primary contact information or capabilities and certifications. Please send the completed form at any time to [info@intlmag.org](mailto:info@intlmag.org) or by fax to the IMA Head Office at ++1-847-526-3993. You can also mail the form to the IMA Head Office at International Magnesium Association, 1000 N. Rand Road, Suite 214, Wauconda, IL 60084, USA.

### **Please Join Us for the 70<sup>th</sup> Annual World Magnesium Conference in Xi'an, China**

The World Magnesium Conference is scheduled for May 19-22, 2013. This event is the premier international **magnesium** industry conference that highlights the latest technological advances, innovative applications, and emerging developments in the global marketplace. The conference combines informative technical sessions, exhibits, networking and social opportunities for a well-rounded industry experience.

- Industry Updates
- Technical Program, provide a wealth of information for **magnesium** industry professionals and address topics ranging from an overview of the current state of the **magnesium** industry to **magnesium** process breakthroughs, applications, and business management issues.
- Social Program
- Sponsorship Opportunities
- Awards of Excellence, IMA's competition recognizing outstanding **magnesium** products and innovative manufacturing technologies
- International Environmental Responsibility Awards
- IMA Annual Membership Meeting
- Exhibit Showcase
- Spouse Program
- Tours

Xi'an today sits in the fertile Wei River valley, one of the epicenters of early Chinese civilization. The area was home to the capitals of several major dynasties (historians count 11), stretching all the way back to the Zhou in the 11th century BC. The remnants of this ancient world are everywhere – from the First Emperor's Terracotta Army to the Muslim influence that still characterizes the city. Many of the city's attractions are unique not only to the city itself, but to all of China.

Click [here](#) for the 2013 IMA Annual World Magnesium Conference flyer.

## The IMA Invites You to Join Our LinkedIn Group

LinkedIn is an excellent virtual networking tool and knowledge sharing resource, allowing people to make connections without actually going out and meeting people face-to-face and exchanging business cards. The venue offers the opportunity to exchange strategic ideas with a much larger base of **magnesium** professionals from around the world. With the steady popularity of social networking usage, LinkedIn fits in perfectly within the **magnesium** business professional networking environment.

Our IMA Group community is growing very quickly. We have 294 members worldwide who use LinkedIn for connecting with current business contacts to build and develop relationships to further levels as well as meet new professional contacts. It offers group discussions that create awareness and information sharing within the thriving **magnesium** community.

We encourage all IMA members to take advantage of the opportunities for **magnesium** discussion contributions and networking expansion. Utilize the IMA Group to meet amazing professionals within the **magnesium** industry across the globe. LinkedIn provides key resources that **magnesium** professionals need to be informed and even continue to grow.

Please visit our IMA Group website on LinkedIn and join today! You can find us here:

[http://www.linkedin.com/groups/International-Magnesium-Association-IMA-107283?goback=%2Eanp\\_107283\\_1346872555081\\_1](http://www.linkedin.com/groups/International-Magnesium-Association-IMA-107283?goback=%2Eanp_107283_1346872555081_1)

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## INDUSTRY NEWS

### GM Tests Magnesium Sheet Metal to Make Cars Lighter

Making auto parts from **magnesium** sheets by heating the lightweight metal so it can be formed into precise, rigid shapes will help GM and other automakers meet demanding U.S. fuel economy requirements, said GM metals researcher Jon Carter.

**Magnesium** auto parts formed by high pressure die casting are already common in cars and trucks, for steering wheels and other parts.

Using **magnesium** sheets to make auto parts could be a significant breakthrough for GM and eventually lead to much more **magnesium** in vehicles, said Dick Schultz, managing director of Ducker Worldwide and an expert on metals used in manufacturing.

GM is starting slow, using **magnesium** from sheet metal to make inner panels of doors and trunk lids.

**Magnesium** is 75 percent lighter than steel and 33 percent lighter than aluminum, said GM engineer Paul Krajewski. He said it also costs three to four times as much as aluminum, but wider use will encourage **magnesium** sheet metal producers to make more, which will bring down the costs.

"**Magnesium** will allow us to reduce the weight of certain sheet metal panels and thereby improve fuel efficiency and handling and overall performance," Carter said in a telephone interview.

GM will make about 50 vehicles, which will be sold to consumers, using the **magnesium** sheet process in the fourth quarter, but Carter would not indicate which model or models will be involved.

By 2020, **magnesium** will be able to take out 15 percent of the weight of a vehicle, leading to fuel savings of 9 percent to 12 percent, according to the U.S. Automotive Partnership.

The auto industry has been stamping steel sheets into trunk lids, hoods and door panels for more than 100 years.

Forming **magnesium** sheets into auto parts by heating them to 842 degrees Fahrenheit (450 degrees Celsius) is a slow process.

## ROOM TEMPERATURE A GOAL

Manufacturers can stamp out steel auto parts at room temperature.

"The ultimate goal is to be able to one day stamp **magnesium** panels just like today we stamp steel panels at room temperature. We're not there yet," said Carter, but he added that **magnesium** sheet makers are working with new alloys that will allow the sheets to be formed at lower temperature.

So the use of **magnesium** sheets for auto parts in GM vehicles will be small in the near-term, but may expand as researchers and engineers speed the process.

GM's Detroit rivals Ford Motor Co and Chrysler Group are among automakers that currently use **magnesium** auto parts made by suppliers in their vehicles.

But those parts using **magnesium**, Schultz said, are not formed from **magnesium** sheets.

Schultz said the average passenger vehicle on the U.S. market has a weight of about 3,800 pounds, including 10 pounds from **magnesium**. Steel makes up 2,100 pounds of the weight of that average vehicle, and aluminum makes up 343 pounds.

GM began getting patents for the concept of using **magnesium** sheets back in 2002. It was Carter who had a "slowly developing 'aha' moment" when he was working with a GM metal forming plant several years after that.

"We found that if we control the way we heat the sheet metal blank before it goes into the hot forming tool, it makes a world of difference in how the panel looks, how fast it can be formed and how to avoid making panels that have defects in them," said Carter.

Then it was back to the lab to see if this serendipitous discovery could be duplicated, he said.

The **magnesium** sheets are comprised of 96 percent **magnesium**, 3 percent aluminum and 1 percent zinc.

In the past few years, automakers have relied on more aluminum to make vehicles lighter.

"Aluminum has gotten much better through innovations. **Magnesium** is probably where aluminum was 25 years ago," said Schultz.

"Some of the existing infrastructure for making **magnesium** sheet dates back to World War Two when it was made for airplanes," said Krajewski. "We are now seeing an evolution of both the alloys and the material processing technology that can truly drive the costs down."

Carter and Krajewski estimate that developing **magnesium** alloys strong enough to make auto parts at room temperature, is still five to 10 years off.

GM has patents on the process for heating **magnesium** and for making it more resistant to corrosion. The company plans to license the technology to allow auto-parts suppliers to produce the **magnesium** inner panels, according to GM spokesman Kristopher Spencer.

Source: <http://www.reuters.com> (23-Nov-2012)

## Magnesium Market Update

**Magnesium** has stabilized after a downturn last month, but business activity remains lackluster.

In China, 99.9 percent min **magnesium** ingot traded between RMB 17,500 (US\$2,810) and RMB 18,100 (\$2,907) a tonne this week, unchanged from last week. The price for low-**magnesium**, battery-grade mischmetal was also flat at RMB 150,000 (\$24,088) to RMB 160,000 (\$25,694) per tonne on thin business last week.

A producer from Shaanxi told Metal-Pages that he thinks "this is the last acceptable price for **magnesium** ingot producers, and **magnesium** alloy prices will pare losses in line with the stabilizing metal market."

After a meeting last week of the Shaanxi Magnesium Group, which is comprised of 53 **magnesium** smelters in Shaanxi plus its newest member, the Shaanxi Circular Economy Institute, prices stabilized, but shipments are still low, a producer source told Metal-Pages. In May, the group resorted to establishing a unified price when prices decreased. "Downstream aluminum, **magnesium** powder and

**magnesium** alloy industries have been weak, which cannot support demand for **magnesium** metal,” a Liaoning-based trader said.

The spot price rose in Europe to between \$3,300 and \$3,350 a tonne, up \$100, while delivery settlements for the first quarter and first half of next year were done between \$3,350 and \$3,400 per tonne, as per Metal-Prices data. Prices got a boost from the signing of longer-term contracts, but the market is now expected to be quiet until the start of next year.

Source: <http://www.magnesiuminvestingnews.com> (14-Nov-2012)

## **Cars of the Future Need Radical Change, Not Incremental Tweaks**

Race cars should be exciting to watch. But they aren't. Instead, they blur together in an endless stream of lookalikes: if it weren't for the sponsor logos, most people couldn't tell a Red Bull RB-7 Formula One car from a Ferrari F2012.

But then there's the Nissan DeltaWing, the strangest, coolest race car to come along in decades. At first glance, it resembles a missile that has fallen to earth. The nose tapers to an impossibly long point, covering what looks like a single front wheel (there are actually two, mounted side by side.) The rear end is a deltoid, topped with a vertical tail that rises behind the driver like the fin of a giant shark.

The DeltaWing's unforgettable form has given rise to a number of nicknames, which include "Batmobile," and "SR-71." But there's much more to the DeltaWing than its oddball shape – this unique race car is a harbinger of a radically different automotive future where efficiency will be the new performance standard.

That future is now looming: the U.S. and Canadian governments have passed tough new standards that will force car makers to increase fuel economy by 50 per cent and cut emissions in half by 2025.

Those gains won't come from powerplant improvements. The internal combustion engine is a mature technology – today's motors are many times more efficient than their forebears, but any further gains will be incremental. Hybrid powertrains work well, but again, dramatic gains are not on the immediate horizon. The pure electric vehicle is extremely efficient, but remains crippled by energy storage and transfer issues – limited range, overweight batteries and long charging times.

And so we come to the DeltaWing, a template for the automotive future – light, aerodynamically slippery and designed with outside-the-box thinking. The DeltaWing doesn't depend on power for its speed (its motor is a four-cylinder pulled out of a Nissan Juke street vehicle). Instead, it focuses on strategic design that lets it run with cars with twice the power – and do it on half as much fuel.

The secret is mass and drag reduction. The DeltaWing weighs just more than 500 kilograms (about 50 per cent less than a typical Indy car) and has extremely low drag due to its slim nose and lack of downforce-generating wings.

"There's never been anything like the DeltaWing before," says Nevada-based Peter Brock, designer of the legendary Shelby Daytona coupe. "This is a totally different way of doing things."

The DeltaWing was first conceived by British engineer Bruce Bowlby as a part of a design contest for the IndyCar race series. Bowlby's radical car was rejected by the IndyCar sanctioning body in favour of a more traditional design (the Dallara DW-12) but attracted the attention of several key players, including Dan Gurney, a champion race driver turned team owner and car builder.

Last summer, the DeltaWing ran at the 24 Hours of Le Mans in an experimental category known as Garage 56. Although it was knocked out of the race when another car slammed into it, the DeltaWing amazed a lot of people by lapping at competitive speeds on a fraction of the power and fuel required by its competitors.

But the significance of the DeltaWing extends beyond the racetrack and into the world of everyday driving, where transformational change will be required to meet the tough new efficiency standards.

"Watching this car is like seeing the Wright brothers at Kitty Hawk," says Brock. "This is revolutionary. The stuff we've done before isn't really the way to go. The increments of gain are too small. You need to break things wide open. You need to make changes of 100 per cent, and that's what the DeltaWing does."

Car design is generally incremental, with small, evolutionary changes added to existing platforms. Even in the world of racing, dramatic change occurs only occasionally – like in the 1950s, when designers started

putting engines in the back instead of the front. The next watershed moment came in the 1960s, when engineers learned that they could increase traction by mounting wings that pushed cars down onto the track.

Although aerodynamic downforce made cars faster in a race, that came at the cost of efficiency, because wings and wedge-shaped bodies created exponential drag increases that had to be overcome with more power – which also meant far greater fuel consumption.

Street vehicles, meanwhile, suffered from steady weight gain, which is an efficiency no-no. (Engineers estimate that every 50 kg added to a vehicle increases fuel consumption by up to 2 per cent.) The 1972 BMW 2002 Tii sports coupe weighed about 1,000 kg. Today, its modern counterpart (the BMW M3 coupe) weighs 1,680 kg. A 1970s Porsche 911 weighed as little as 1,000 kg. Today's model weighs about 50 per cent more, depending on options – one of the most popular versions, the 911 Carrera 4S, weighs 1,540 kg.

Even so, these cars can equal or beat the fuel economy of their much-lighter ancestors thanks to incredible improvements in the efficiency of their powerplants (current internal combustion engines minimize fuel burn thanks to technologies like direct fuel injection, digital ignition, variable valve timing and turbocharging).

Ruben Archilla, a senior design engineer with Mazda, says the efficiency improvements have been used to offset an endless series of automotive weight gains: "We've made the engines more efficient, but we've spent those gains on heavier cars," he says. "So we end up in the same place."

Weight increases can be partly blamed on improved safety standards – adding airbags, side impact beams and crumple zones comes at the price of mass. But the single biggest contributor is consumer taste, which invariably pushes vehicle design toward bloat and inefficiency.

The Hummer H1 (which became popular after action film star Arnold Schwarzenegger began driving one back in the 1990s) weighed more than 3,175 kg. In 1957, Ford introduced the Galaxie Skyliner, which weighed more than 1,815 kg, partly due to a folding metal top designed to appeal to gimmick-obsessed consumers. (The top required 18 metres of wiring and a massive collection of electrical components that included 10 power relays, three motors, 10 limit switches, eight circuit breakers and a safety interlock.)

When Henry Ford introduced the Model T, it didn't even have an electric starter (the driver had to insert a crank handle in the front and turn the engine over by hand). Today, features like stereos, air conditioning and electric seats are virtually de rigueur.

Car companies are already working on ways to cut weight. They're exploring lighter materials like carbon fibre, aluminum and **magnesium**, as well as design improvements like optimized wiring and lightweight entertainment systems.

But incremental change won't be enough, according to experts: "The efficiency gains have to be major," says Brock. "It's not going to be business as usual this time."

The cars we'll be driving 20 years from now are going to be different. They'll be lighter, sleeker and smaller. And I think we're going to look back at the DeltaWing and realize that it wasn't just a race car, but a symbol of the automotive future.

Source: <http://www.theglobeandmail.com> (06-Dec-2012)

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## ASIA NEWS

### POSCO Gangneung Magnesium Refining Factory Construction Completed

POSCO completed construction of a **magnesium** refining factory in Okgye Gangneung of Gangwon-do on November 20th.

The meeting was attended by 150 people, including CEO Chung Joonyang, Gangwon-do Governor Choi Munsun, National Assemblyman Kwon Seongdong, Ministry of Knowledge Economy Growth Engine Division Leader Kim Jaehong, Gangneung Mayor Choi Myeonghee and others.

CEO Chung Joonyang in his commemorative speech said, ``Without forgetting the founding spirit of serving the country through steel, we will successfully operate Korea`s first domestic **magnesium** refining factory to increase national competitiveness and contribute to revitalizing the local economy, taking on all duties in becoming a loved company.``

POSCO`s **magnesium** refining business was initiated with an MOU for investment in November 2009, the first stage of construction was started in June 2011, followed by the start of test operations and stabilization this past March, and the first set of products were shipped in September.

The total production capacity of the **magnesium** refining factory is 10,000 tons annually, but based on technology and know-how accumulated in the first stage of the business, POSCO will develop its own vertical thermal reduction technology by 2018 and increase annual production capacity to 100,000 tons, becoming a leader in the material business and a **magnesium** refinery with the best global competitiveness.

POSCO plans to lead global material technology particularly by establishing a highly efficient, environmentally friendly process by applying the world`s first vertical thermal reduction method. **Magnesium** ingot use has relied entirely on imports from China, but with the Gangneung **magnesium** refining factory starting operation, the company expects to stably supply environmentally friendly, high quality magnesium ingots made of domestic dolomite, increasing competitiveness of related parts industries. The factory is particularly expected to contribute to applying environmentally friendly materials for automobile production, making electronic products lighter, and solidifying upper and lower processes by procuring **magnesium** ingots as an intermediate material to the Suncheon **magnesium** plate factory. Also, by producing **magnesium** ingots, POSCO expects to strengthen supply networks between family companies and promote sales in Japan and North America to expand synergy in the non-ferrous material industry moving forth, and expand into the world market to secure global competitiveness.

Source: <http://www.posco.com> (23-Nov-2012)

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