



Spectator

the Newsletter of the Ontario Section of SPE

October 2016

Sleeman Brewery Tour – Thursday, 3 November, 2016

Founded in 1834, banned from brewing beer in 1933 for smuggling beer into prohibition America, and resurrected in 1988, Sleeman is one of Canada's most popular and colourful breweries.

The tour will start with a beer tasting, followed by a plant tour and ending with more beer, this will be a great opportunity to meet your fellow SPE members!

Meet and Greet: 3:00 pm – Borealis Grille and Bar

1388 Gordon Street, Guelph, for finger food, tea and coffee.

Plant Tour: 6:30 to 8:30 pm – Sleeman Brewery, 551 Clair Road West Guelph.

Price: \$20.00 per person (Limited to 24 registrants, first come first served basis)

Please register in advance online at <http://www.speontario.com>

SPE Christmas Celebration – 8th December, 2016

Come and join us for our informal Holiday get together at the highly rated (4.6 with 246 Google reviews!) JAC's Bistro in Oakville. JAC's serves fine Italian and French-inspired fare in an elegant, white brick dining room perfect for a quiet night for two or for a larger celebration.

We'll also have a draw for two tickets to the 51st Annual SPE Golf Tournament at Pipers Heath.

JAC's Bistro

379 Kerr Street, Oakville

Time: 6:00 pm

Price: \$65.00 per person

Please register in advance online at <http://www.speontario.com>, space is limited.

Registration deadline is 21 November.

Honda Canada Plant Tour – 26th January, 2017

6900 Industrial Pkwy, Alliston Ontario, Plant 1

Time: 12:45 pm to 2:00 pm

Price: \$20.00 per person

Space is limited, so please sign up ASAP at speontario.com

With 4000 employees the Honda Alliston plant is Canada's first Japanese OEM assembly plant. This state of the art facility manufactures the Honda Civic in Plant 1, and the Civic and CR-V in Plant two.

NOTE: You will be asked to show government issued photo ID when checking in at the Plant 1 Security. Safety glasses and headsets will be provided. All tour guests must wear long pants, closed toe and closed heel shoes. Open toe or open back shoes and shorts are not allowed in the plant.

We Need to Make the Plastics Industry Exciting Again



Hello SPE members and the extended Plastics Industry family!!!

It is with great pleasure that I have accepted the Presidency of the Society of Plastics Engineers, Ontario section. I have big shoes to fill. Dr. Bruce Howie, our president since 2015, has stepped down, but the good news is that Bruce will remain on the board, sharing his experience and dedication. Thank you very much for your commitment and devotion Bruce... people like you make a huge difference in the world.

For those of you that do not know me yet... this is my 27th year as a family member of the plastics industry. I am an Account Manager for Nylene, in the Polyamide/Nylon business. During these 27 years I have seen lots of changes and movement. I have worked in manufacturing, distribution and recycling. One concern of mine is that I find it very sad to see the plastics industry being unfairly blamed for polluting the planet. We all know that thermoplastics are recyclable and can be used in many applications, from both post-industrial and post-consumer sources. There is a huge need on our part to continue to teach the public about plastics use.

If planes and cars are more fuel efficient it is in part because the industry worked hard on making new thermoplastics that are improving energy consumption through, for instance, light-weighting.

Banning plastic bags and other consumer articles is not a solution... the correct course of action is to educate people on how to better use and dispose of plastics properly. Making sure that these products are

disposed of in the correct manner so they can be re-used/recycled is the way to go.

I will share more about this subject, which is close to my heart, in another issue of The Spectator.

SPE Ontario has some exciting events coming this year. Networking is a very important tool that we can use to keep our industry strong both in Ontario and in the Americas. We have shrunk a lot in the past 15-20 years... we need to get the jobs back here!!!! We need to make the Plastics Industry exciting again.

The SPE is a great way to network with our peers. The SPE Ontario division will have numerous activities which will give everybody a chance to get to know each other better, as well as learn, and give us the forum to discuss how we can change our industry for the better.

I had the chance to attend the TOPCON in Quebec City last August, organized by SPE Quebec, and I realized again how important and fun it is to network in person with our peers. We are inundated with emails, text messages and other impersonal forms of communication in today's world, but there is nothing like a face to face meeting... getting to know each other in real life.

I am thrilled to say that we will do exactly that in SPE Ontario... the first activity will be a visit to the Sleeman Beer plant in Guelph in November, then we will close the 2016 year with a December Holiday gathering at JACs Bistro, and start the 2017 New Year with a visit to the Honda Plant in Alliston Ontario. Stay tuned for more from your SPE Ontario team, including our awesome Golf Tournament on June 2nd at Pipers Heath in Oakville.

Renee Morin,
President SPE Ontario



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SPE Annual Christmas Celebration

*Join the Society of Plastics Engineers for an evening of dinner,
networking, and draw prizes*

Thursday, December 8, 2016

JAC's Bistro

379 Kerr Street, Oakville Ontario, L6K 3B9

6:00 pm

\$ 65.00 per person

HST INCLUDED #128754025

We Will Draw For Two Tickets To Our Annual Golf Tournament in June!!

Space is limited

Registration deadline November 21, 2016

Register online: www.speontario.com

No walk-ins for this event. Sorry, no refunds.

We are pleased to announce a new partnership with **Excellence in Manufacturing Consortium (EMC)** and its **Canadian Manufacturing Network** to provide resources to local manufacturers and the benefits of real time access to regional Labour Market Intelligence!

ManufacturingGPS is a fully searchable, online Labour Market Intelligence (LMI) system – tracking key workforce trends and occupational intelligence, providing critical information needed to help grow productivity and build competitiveness, including:

- Compensation Rates
- HR Surveys and LMI Data
- Skills Needs/Shortages
- Capabilities Resources
- Productivity Cluster Info
- Benchmarking by Sector, Region etc.



Excellence in Manufacturing Consortium (EMC) through its Canadian Manufacturing Network, funded by the Government of Canada's Sectoral Initiatives Program, is seeking manufacturing employer's input to implement ManufacturingGPS.



Excellence in Manufacturing
Consortium
pour l'Excellence Manufacturière



Canadian
Manufacturing
Network



This project is funded by the Government of Canada's
Sectoral Initiatives Program

The GPS survey should take approximately 20-30 minutes and will help to collect and analyze labour market information and HR benchmarks such as compensation levels, turnover rates, skills levels and much more!

Please register below and a GPS survey agent will contact you directly

Start Accessing ManufacturingGPS

If your company would like to be considered as one of the participating organizations, please contact info@manufacturinggps.ca for more details or [Click here](#) to view **ManufacturingGPS video!**

Thank you for your participation!

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Automotive Composites: Mass Reduction For Mass Production

Reinforced plastics lower weight, improve handling and performance, and boost safety on passenger cars

By Peggy Malnati

“Lightweighting” is the mantra du jour in the automotive industry these days, especially for those designing and producing parts. As the industry passes the midpoint phase-in of the much stricter fuel-efficiency and tailpipe emissions standards of 2025, OEM interest in and support of design, material and process technologies that reduce mass on anything from wiring harnesses to seat structures to chassis components is growing. It’s a good time to be involved in automotive plastics and composites.

As is so often the case, replacing heavier materials with composites to reduce mass isn’t the only benefit that automakers and their tier suppliers gain. Generally, they also benefit from far greater design freedom (including parts consolidation with reduced assembly time and costs, and carryover savings in inventory storage/tracking and warranty claims); elimination of corrosion (and occasionally the paint and primer that protect against

it); increased damage resistance (and often improved crashworthiness); lower noise/vibration/harshness (NVH) for a quieter ride; and lower tooling and part-production costs.

Another indirect benefit is so-called “mass decompounding.” By reducing the weight of a hood or decklid/liftgate, for example, other mass can be removed from the assembly by going to lighter hinges, latches and struts, helping cut mass and costs further. The applications that follow are good examples of the many benefits that come from mass reduction by using composites. Each part was a finalist, category winner, or Grand Award winner in the 2015 SPE Automotive Innovation Awards Competition.

Improved adhesion while saving mass

With all the pressure to cut weight from vehicles, much time and effort are focused on finding ways to trim a few grams to a kilogram of mass from auto parts. However, a reformulated, lower-density grade of sheet-molding compound (SMC), formulated and compression molded by Continental Structural Plastics (CSP) of Auburn Hills, Mich., has reduced mass an average of 9 kg (20 lbs.) on a total of 21 exterior body-panel assemblies for 2016 model year Chevrolet Corvette sports cars from Detroit-based General Motors Co. Reportedly, this was accomplished without lowering mechanical performance or necessitating process or tooling changes.

The new tough Class A grade, which CSP calls TCA Ultra Lite, has a specific gravity (SG) of 1.2, a value the company says is 28% lighter than its TCA Lite 1.6-SG, mid-density grade, and 43% lighter than conventional 1.9-SG SMC. CSP also reports that the formulation is equally appropriate for painted, Class A applications such as the Corvette painted body panels, as well as for non-visible structural applications.

A typical SMC recipe involves use of resin – in this case, unsaturated polyester supplied by AOC LLC of Collierville, Tenn. – as well as additives, chopped fiberglass, and mineral fillers (usually calcium

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New sizing chemistry for tougher hollow glass microspheres and a new form of glass roving combined to lower specific gravity (SG) for sheet-molding compound used to compression mold up to 21 painted exterior body panels on GM’s 2016 model year Chevrolet Corvettes. Molder Continental Structural Plastics developed the unique sizing and special 1.6-SG SMC compound, which is said to make the material competitive with aluminum at any production volume.

(Part photo courtesy of SPE Automotive Division; vehicle photo courtesy of General Motors Co.)

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carbonate, or CaCO_3). Lower-density grades of SMC often have some portion of CaCO_3 replaced by hollow glass microspheres, which are more costly and require more care during compounding and molding because they are sensitive to process conditions and can crush. CSP researchers believed that if they could reach a density of 1.2 SG with their SMC, they could directly compete cost wise against aluminum, while offering the benefits of much lower mass, elimination of rust/corrosion, better energy absorption in low- and high-speed crashes, and far greater design freedom — a boon to designers on cars sporting the kinds of compound-curve styling that epitomizes Corvettes.



Injection molded long-glass PA 6/6 and barium sulfate have replaced stamped and painted steel for an engine-compartment partition wall on 2015 Hyundai Genesis luxury sedans. The composite partition wall reduced mass by 20%, and improved sound damping by 8 dB while also reducing part count and assembly time, and eliminating paint. (Part photo courtesy of SPE Automotive Division; vehicle photo courtesy of Hyundai Motor Group.)

Given the sensitivity of the microspheres, CSP researchers sought a tougher, higher performance product (which they eventually sourced from 3M Co. of St. Paul, Minn.), and they also set out to improve interfacial adhesion with the matrix. After much trial and error with a scanning electron microscope and different sizing chemistries, CSP developed a formulation in-house that not only greatly improved part performance, but also offered visibly better matrix adhesion under the microscope.

As an added bonus, that work helped researchers better understand long-standing issues with paint adhesion on certain SMC parts. The problem, it turned out, wasn't the strength of the bond between paint and part surface,

but rather between the matrix and microsphere surface. By strengthening the latter, the former was improved as well, leading to better part bonding with paint and adhesive. Still another formulation change that helped reduce mass without loss of mechanicals was switching to ME1975 fiberglass, a new multi-end glass roving from Toledo, Ohio-based Owens Corning that is specifically formulated for use in unsaturated polyester SMC where high strength and corrosion resistance are required. Better still, CSP claims its numbers show that TCA Ultra Lite saves money vs. aluminum even at production volumes as high as 350,000-400,000 vehicles per year.

Damping sound at lower weight

Engine-compartment partition walls help keep engine noise out of the passenger compartment for a more comfortable ride. In addition to good NVH values, such parts also need stiffness and strength, the durability to last 161,000 km (100,000 miles), and thermal stability to 160°C (320°F), since they are mounted near the exhaust system. A composite engine-compartment partition wall has replaced stamped steel on 2015 model year Hyundai Genesis luxury sedans from South Korea's Hyundai Motor Group. The steel part offered good stiffness, strength, dimensional stability and sound insulation, but was heavy and needed paint to prevent corrosion. Injection molded neat plastic was cost effective, but had poor NVH values, dimensional stability, stiffness, and strength.

Researchers experimented with combinations of polymer (Kopla KDX 1065 PA 6/6 resin from South Korea's Kopla Co. Ltd.), reinforcements and fillers to improve performance of the plastic option. They compounded combinations of short and long glass fiber with several mineral fillers (barium sulfate (BaSO_4), iron oxide (FeO), and wollastonite (calcium inosilicate/ CaSiO_3)). The formulation with the best

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balance of mechanicals, NVH, and weight featured 15% long-glass fiber and 50% BaSO₄. The patent-pending application is supplied by NVH Korea using tools supplied by Hyundai. Not only does the new part reduce mass by 20% without increasing costs, but it also improves sound damping by 8 dB while reducing part count and assembly time, and eliminating the cost and environmental issues of paint.



Ford Motor Co. last year introduced a hollow-spoked, all carbon-fiber-reinforced composite wheel as standard equipment on its 2016 model year Ford Shelby GT350R Mustangs. Australia's Carbon Revolution Pty. Ltd. makes the single-piece wheel using a proprietary resin system via resin transfer molding. Replacing aluminum with composite not only reduced mass but also lowered rotational inertia, and improved steering, acceleration and braking. (Part photo courtesy of SPE Automotive Division; vehicle photo courtesy of Ford Motor Co.)

Reduced mass, improved handling

If you've been around the automotive industry for a while, you've seen many attempts to make composite wheels on passenger cars work — with lots of development effort and marketing promise, but few commercial successes. However, that's changing with a new wheel introduced last year by Dearborn, Mich.-based Ford Motor Co. as standard equipment on its 2016 model year Ford Shelby GT350R Mustang. The product is said to be the first high-volume, original-equipment, carbon fiber-reinforced composite wheel designed to meet all OEM requirements and quality standards, and produced and sold with full warranty coverage. The single-piece, painted wheel is made by infusing a dry carbon fiber preform with a proprietary resin system via the resin transfer molding (RTM) process.

System supplier, material processor, and tooling supplier Carbon Revolution Pty. Ltd. of Waurin Ponds, Australia,

does say it uses a high-Tg resin to meet extreme track performance where brake-rotor temps can reach 900°C (1,652°F). This necessitated use of a novel ceramic thermal barrier applied via plasma arc to the inner barrel surface and back of the spokes. The polymer also provides high yield stress and elongation, and abrasion and weathering resistance. Carbon Revolution designed the closed-cell, foam-filled spokes for maximum stiffness at low weight, while aluminum lug seats and backer plates are slip-fit (via C-clips) around the composite for a robust joint after machining bores into the wheel. The manufacturer even embeds a radio-frequency identification chip in each wheel to record and track manufacturing and quality history. Replacing aluminum with a composite reduced wheel weight by 27 kg (59.5 lbs) per car and lowered rotational inertia by 40%, thereby providing faster, more responsive steering, and improved acceleration and braking.



A plastic/metal hybrid floor rocker reinforcement from FCA US LLC on 2015 model year Jeep Renegade SUVs removed 1 kg of mass from the body-in-white and lowered direct costs by about 10%. It also proved to be a very efficient, energy-absorbing crash-box structure during U.S. Federal Motor Vehicle Safety Standard 214 testing for dynamic side-impact protection. (Part photo courtesy of SPE Automotive Division; vehicle photo courtesy of FCA US LLC.)

Hybrid rocker improves crashworthiness at lower weight

A plastic/metal hybrid floor rocker reinforcement on 2015 model year Jeep Renegade sport-utility vehicles from FCA US LLC of Auburn Hills, Mich., removed 1 kg (2.2 lbs) of mass from the body-in-white, lowered direct costs by about 10%, and also contributed tooling savings vs. the earlier all-steel solution. Less than half the weight of the incumbent design, the part's optimized honeycomb geometry uses SABIC's Noryl GTX 910

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modified polyphenylene ether/polyamide 6 (MPPE/PA6) alloy and is integrally attached to two steel flanges. System supplier Proma Group of Caserta, Italy, subsequently welded these flanges to the rocker during injection molding, thereby eliminating the need for structural adhesives. The part reportedly proved to be a very efficient, energy-absorbing crash-box structure, reducing intrusion levels during U.S. Federal Motor Vehicle Safety Standard 214 testing for dynamic side-impact protection. Furthermore, not only is the plastic/metal hybrid rocker reinforcement capable of being e-coated (electrophoretic/anti-corrosion coating), but it is easy to assemble to the vehicle's body-in-white and is said to offer comparable performance to high-strength steel. Given that there are 10-12 similar reinforcement junctions on a typical vehicle, there is an even greater opportunity to trim 5.4-8.2 kg (12-18 lbs) of mass from the body-in-white by using the same technology.

Learn about the latest in automotive composites at SPE's 16th annual Automotive Composites Conference and Exhibition (ACCE) from September 7-9, and the 46th annual Automotive Innovation Awards Gala on November 9, both in the Detroit suburbs (see <http://speautomotive.com>).

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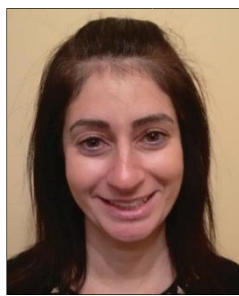
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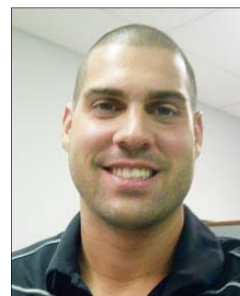
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8th December 2016

SPE Christmas Celebration

Jac's Bistro
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Time: 6:00 pm
Price: \$65.00 per person.

Please register in advance online, space is limited.
Registration deadline is 21 November.

26th January 2017

Honda Canada Plant Tour

6900 Industrial Pkwy, Alliston Ontario, Plant 1
Alliston Ontario
Plant Tour: 12:45 pm to 2:00 pm

16th February 2017

Scientific Injection Molding

Presentation by Umberto Catignani,
President, Orbital Plastics Consulting, Inc.
Details to be announced.

8-10th May 2017

Antec

Anaheim California

16-18th May 2017

Plast-Ex

Toronto Congress Centre

2nd June 2017

51st Annual Golf Tournament

Pipers Heath Golf Club,
5501 Trafalgar Rd, Hornby (Milton), ON
Details to be announced.



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The Spectator is sent to over 400 plastics industry professionals, and viewed by over 10,000 people on the SPE Website.

Through these mediums we are able to inform our membership of monthly meetings, industry news, our annual Christmas dance, our annual Minitec, University Night, and our golf tournament, as well as other activities within the plastics industry.

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