



Automotive Plastics NEWS



Faurecia Automotive Exteriors to Sponsor 2015 Student Poster Competition

JUNE 2015
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The SPE ACCE organizing committee is pleased to announce that **Faurecia Automotive Exteriors** (Auburn Hills, MI, US, <http://na.faurecia.com/en/faurecia-north-america>) will be the 2015 student poster competition sponsor. Judges made up of media, industry experts, and SPE board members will review all posters with student authors on the first day of the conference. First-, second-, and third-place awards will be presented to winners in graduate and undergraduate categories by Patrick (Pat) Szaroletta, president, Faurecia Automotive Exteriors North America during a special ceremony after lunch on September 10th on the conference's second day.

"Innovation is part of Faurecia's DNA, so supporting the SPE ACCE student poster competition is a natural way for us to encourage innovative thinking in what essentially is the future of our industry," explained Szaroletta. "We're proud to be a part of SPE and to showcase the expertise, creativity and ingenuity of these future plastics engineers as they bring their fresh perspectives and new ideas to today's challenges."



*Patrick Szaroletta, president,
Faurecia Automotive Exteriors
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AUTOMOTIVE DIVISION MEETING SCHEDULE & SPECIAL EVENTS CALENDAR



SPE Auto. Div. Board Meeting

American Chemistry Council - Auto. Ctr.
Troy, MI USA

5:30 - 7:30 p.m.
June 8, 2015

SPE Automotive Division Annual Golf Outing

Fieldstone Golf Club
Auburn Hills, MI USA

8:30 a.m.- 4:00 p.m.
Sept. 8, 2015

15th-Annual SPE Automotive Composites Conference & Exhibition (ACCE)

The Diamond Banquet & Conference Center
at the Suburban Collection Showplace
Novi, MI USA

ALL DAY
Sept. 9-11, 2015, 2015

First Round - Automotive Innovation Awards Judging

Celanese Corp.
Auburn Hills, MI USA

8:00 a.m.- 5:00 p.m.
Oct. 1-2, 2015

17th-Annual SPE TPO Automotive Engineered Polyolefins Conference (Auto TPO)

Detroit-Troy Marriott
Troy, MI USA

ALL DAY
Oct. 4-7, 2015

Second Round / Blue Ribbon - Automotive Innovation Awards Judging

Celanese Corp.
Auburn Hills, MI USA

8:00 a.m.- 5:00 p.m.
Oct. 12, 2015

45th-Annual SPE Automotive Innovation Awards Gala

Burton Manor
Livonia, MI USA

5:00-11:00 p.m.
Nov. 11, 2015

Automotive Division Board of Directors meetings are open to all SPE members. All events are listed on our website at

<http://speautomotive.com/ec>

EEmail Steven VanLoozen at

auto-div-chair@speautomotive.com for more information.

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TREASURER'S REPORT

by Dawn Stephens

Current finances for the SPE Automotive Division remain healthy. As of May 8, 2015 we have \$210,822.50 in checking, \$27,433.43 in savings, and \$10,426.41 for a total of \$248,682.34 USD





CHAIR'S MESSAGE

by Steven VanLoozen,
SPE Automotive Division Chair



AUTOMOTIVE

Summer is already upon us and I'm sure everyone has been exceptionally busy with all of the activity around lightweighting in the automotive world. It seems there are more projects around plastics and composites than there are experienced engineering resources to support them. I believe the SPE Automotive Division can play a key role in connecting these resources. The automotive supply chain is extremely complicated and the division has members representing nearly every touch point along this chain.

The 15th-annual ACCE being held September 9-11 in Novi, MI, USA is an excellent opportunity to see the most recent automotive applications utilizing polymer-based composites. SPE's Automotive and Composites Divisions co-sponsor this event that is widely considered the *world's leading automotive composites forum*. This year's ACCE will also include technical presentations on Additive Manufacturing & 3D Printing. We're very excited to have this growing technology represented at the conference.

Our 45th-annual Automotive Innovations Awards Gala will be held again on November 11 at Burton Manor in Livonia, MI, USA. As many of you know, this event is an excellent way to showcase plastic/composite innovations that have been brought into production, and allows the industry to congratulate the people who helped bring these ideas to reality. Our theme this year is: *The Future Looks Light*. It's time to start thinking about submitting nominations, which are due September 16 for this year's competition. The first round of judging (where category finalists are selected) takes place October 1 & 2 and the Blue-Ribbon judging (where category and the Grand Award winner are selected) is October 12. Our November 11th Awards Gala is where winners will be announced. We are working hard to make sure this year's show will be our best one yet. We hope to see lots of our members participate.

The Automotive Division's board of directors would again like to extend our sincere gratitude to all of our members for their continued support. We hope all of you have a wonderful and safe summer.

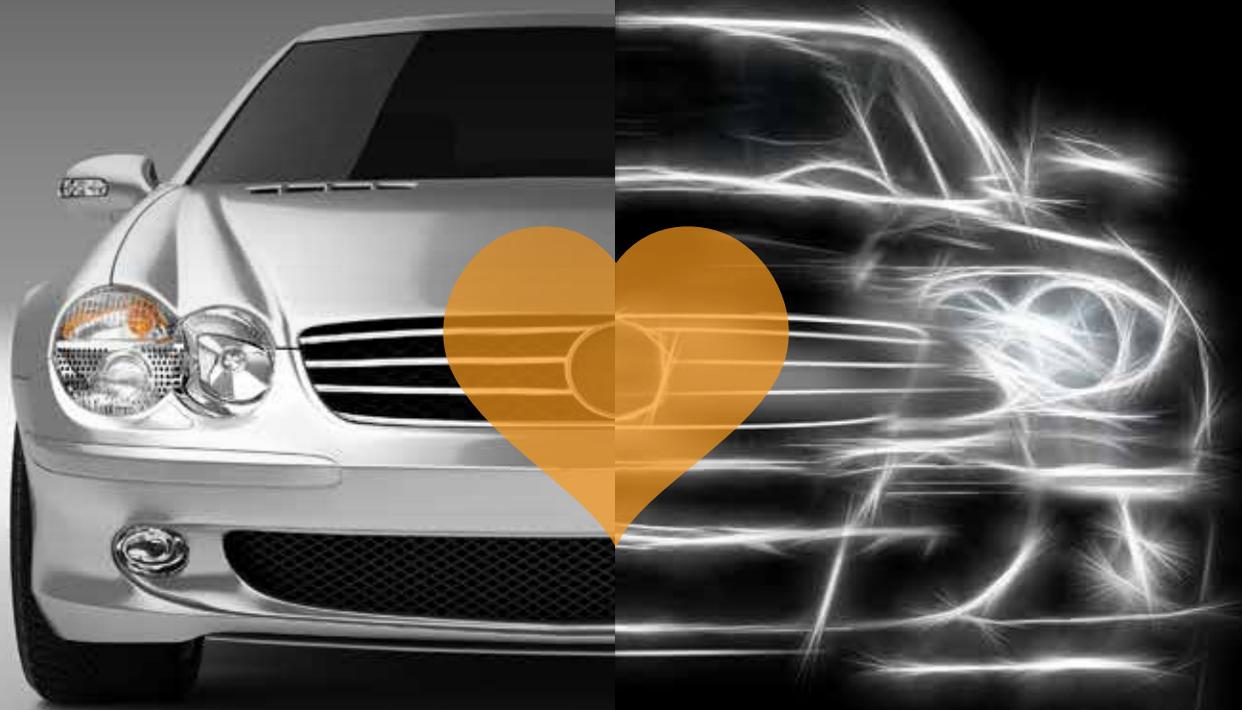
Kind Regards,

Steven VanLoozen

Steven VanLoozen
SPE Automotive Division Chair
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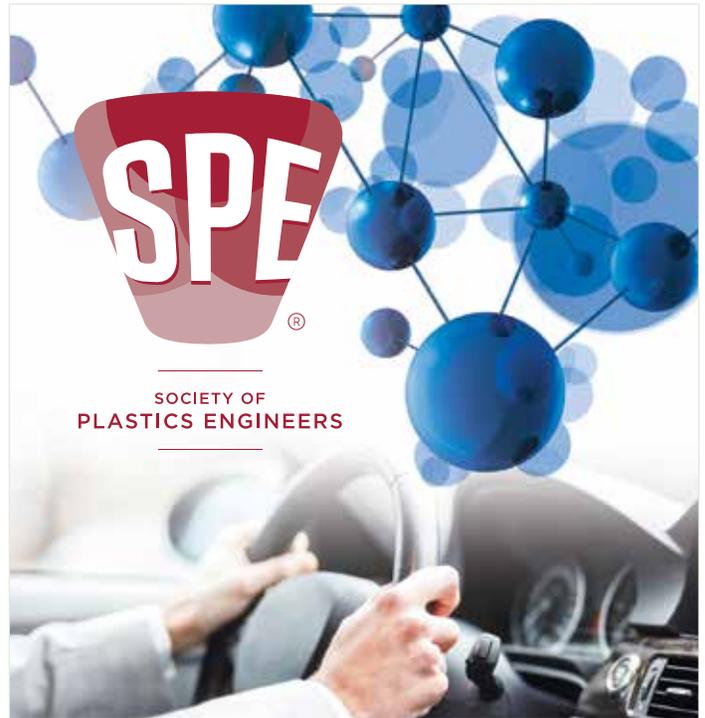
 **BASF**

We create chemistry

This year's SPE ACCE show will be held **September 9-11, 2015** in Novi, MI. in the Detroit suburbs. Students interested in participating in the 2015 competition should contact Dr. Uday Vaidya at ACCEposters@speautomotive.com.

Faurecia is the world's sixth-largest automotive supplier, with four business groups: Automotive Seating, Emissions Control Technologies, Interior Systems, and Automotive Exteriors. In 2014, the group posted sales of \$25-billion USD. As of December 31, 2014, the company employed 99,500 people in 34 countries at 330 sites and 30 R&D centers around the world. Its stock is listed on the New York Stock Exchange (NYSE), Euronext Paris stock exchange, and trades in the US. over-the-counter (OTC) market. In North America, Faurecia had sales of \$6.2-billion USD in 2014 and employed more than 20,000 people at 47 locations in the U.S., Canada, and Mexico. Connect with Faurecia North America at www.facebook.com/faureciaNA and www.twitter.com/faureciaNA.

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A person wearing a yellow racing suit and a black helmet stands on a flat, white surface. In the foreground, a red, highly aerodynamic car is visible. The background shows a clear blue sky and distant mountains.

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Conference will be Second to Try New eTouches Registration System

In an effort to ease online registration challenges in recent years, SPE International is working with a new registration system called eTouches. The Detroit-area AutoEPCON show in May was the first to try out the new system. Now the ACCE is up and running in the software and ready to take early conference registrations. To access the system, go to: <http://AttendACCE.com>.



ACCE 2015 Event App Up & Running

For those interested in watching the 2015 program come together, the ACCE 2015 event app has been running since mid-April. Those with Android® or iOS® smart phones or tablets can download the free event app, **SPE Events** in their app store. Once installed, select ACCE 2015. If you are interested in receiving push-notifications (via text message) of news about the conference, please enable that feature. Those on Twitter can also follow the conference using **#SPEAutomotive** and **#SPEACCE** and help us build the buzz. For those using other types of mobile phones, the same content is available on the web at: <http://spe.eventsential.org/Events/Details/456>. At the start of July, we'll begin posting our preliminary technical program schedule, including paper titles, abstracts, and author bios. Those will join evolving content on the show's 2015 sponsors and exhibitors.



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The Automotive and Composites Divisions of the Society of Plastics Engineers (SPE®) invite you to attend the 15th-annual SPE Automotive Composites Conference and Exhibition (ACCE), September 9-11, 2015 in the Detroit suburbs. The show – which has become *the world's leading automotive composites forum* – will feature technical paper sessions, panel discussions, keynote speakers, networking receptions, & exhibits highlighting advances in materials, processes, and applications technologies for both thermoset and thermoplastic composites in a wide variety of ground-transportation applications.

PRESENT BEFORE AN ENGAGED, GLOBAL AUDIENCE
The SPE ACCE draws over 900 attendees from 15 countries on 5 continents who

are interested in learning about the latest composites technologies. Fully a third of attendees work for a transportation OEM, and roughly a fifth work for a tier integrator. Few conferences of any size offer such an engaged, global audience vitally interested in hearing the latest composites advances. Interested in presenting your latest research? Approved papers will be accessible to attendees on a cloud-based server and later will be available to the general public.

SHOWCASE YOUR PRODUCTS & SERVICES

A variety of sponsorship packages – including displays, conference giveaways, advertising and publicity, signage, tickets, and networking receptions – are available. Companies interested in showcasing their products and/or services should contact Teri Chouinard of Intuit Group at teri@intuitgroup.com.



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- **SAE JOURNAL OF MATERIALS AND MANUFACTURING:** This scholarly journal covers authoritative and in-depth research in the areas of materials, design, and manufacturing. **Get more information here: saematman.saejournals.org**
- **COMPOSITE MATERIALS: ADVANCED MATERIALS AND LIGHTWEIGHTING (DVD):** "Spotlight on Design" features video interviews and case study segments, focusing on the latest technology breakthroughs with Composite Materials. **Get the DVD Here: books.sae.org/sod-002**
- **COMPOSITE MATERIALS HANDBOOK (CMH-17):** Polymer Matrix Composites 3-Volume Set: Includes critical properties of composite materials, and guidelines for design, analysis, material selection, manufacturing, quality control, and repair. **For more information, visit: sae.org/cmh-17**

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An Engineer's Life...

By Dr. Suresh Shah

I was born and raised in the western region of India as the oldest of five children. I came from a relatively comfortable business family and my dad was the only person in his family who had graduated from college at that time. I was very good at studying right from the start and I was especially passionate about science and math as early as elementary school. By the time I was in 12th grade, I ranked 10th out of more than 100,000 students in my state.

In India, you didn't have much choice in what you wanted to be. It all depended on how your grades were in high school. In 1972, if you had excellent grades, your options were as follows: medicine, engineering, pharmaceuticals, dentistry, commerce, and art. Since I was among the Top Ten students in my state, I had more of a choice in what I could be. Originally, I wanted to study medicine, but my grandfather overruled my choice due to our Jain religion (one of whose main principles is non-violence). When he heard that I'd be cutting up frogs as part of my study, he nixed that career choice. Since my second-highest interest at the time was engineering, that's what I decided to be. My dad's wish was for me to study textile engineering, since he wanted me to eventually expand his textile business. I joined the University of Gujarat where a Textile Engineering program was supposed to be added to the curriculum within a year. Unfortunately, that didn't happen, so my only choice was to get a B.S. degree in Chemistry and then transfer to the University Department of Chemical Technology (UDCT) at Bombay University, where they were offering a B.Sc. (Technology) degree in Textile Chemistry. After I finished my Chemistry degree, I went to UDCT to apply. As I turned my application form in to a clerk, I listed just Textile Chemistry as my degree choice on the form. The clerk asked me what I would do if I wasn't accepted in to the Textile program; I asked him what the next best field at the school was and he told me "Plastics." I ended up only being accepted into the Plastics program. It's strange that my career-long journey with plastics began with input from a clerk, but I'm still thankful to him.

Because a B.Sc. (Tech) degree in Plastics was equivalent to a Master's program, I had to select a thesis topic after one year of study. I was fascinated with plastics due to their combination of chemistry and engineering, so I decided to work on the thesis topic of bulk-molding compounds (BMC). My thesis topic taught me a lot about chemistry, compounding, additives and fillers, and composite test methods. After completing my second degree in 1979, I decided to explore plastics even further and applied for admission to what was then University of Lowell (now University of Massachusetts at Lowell or UMass-Lowell). It took me a year to convince my dad that higher education would allow me to help his business even more. He was afraid that I wouldn't return to India once I came to the US. While I worked hard to convince him, I spent that year working at an Indian plastic company called Sintex Corp. working on rotational molding, acrylic casting, and profile extrusion projects. Eventually, I won the argument with my dad and moved to the US in 1980 to join the M.S. program in Plastics Engineering at Lowell. I was very pleased with the education system there, particularly since there was a large amount of support provided to foreign students by the Plastics Engineering department. I got a teaching assistantship and my thesis on "Glass Reinforced Structural Foam Injection Molding" was sponsored by then GE Plastics (now SABIC). Since I was teaching in the plastics lab, it exposed me to many different plastic processing and testing methods. It also taught me discipline and responsibility, and I found that dealing with undergraduate students was a great experience.

An Engineer's Life CONTINUED FROM PAGE 9

When I graduated in 1982, there was a bad recession and I had a hard time finding a job since I didn't have a "green card" that would allow me to legally work in the US. My advisor, Dr. Nick Schott told me to join the Ph.D. program in Plastics Engineering/Polymer Chemistry and offered me a scholarship. I had never planned to do a doctorate, but sometimes in life circumstances make a choice for you and eventually it turns out good. In the summer of 1982, I went back India for three months' vacation and got married to Bina. Then, I came back to the US with Bina and I started to work on my doctorate at Lowell. By now my father knew I was never going to return to India to work in his company and he accepted my choice.

My Ph.D. thesis was on "Polymer Devolatilization and Reactive Processing using Twin Screw Extruder." The thesis required me to use my knowledge of chemical engineering, polymer chemistry, and plastics engineering — all at the same time — and later on that really helped me a lot in my career.

While completing my doctorate in 1985, I received offers from General Motors Corp.'s (GM's) research group in addition to several others. Smiling, my advisor recommended that I join "Generous Motors," which I did. However, I chose to work in GM's Fisher-Guide Division instead of GM Research as I was more interested in advanced development to see my ideas go into production.

Initially, I worked in the exterior group, resolving issues with sheet-molding compound (SMC) and developing the co-injection molding process. I also worked on reaction-injection molding (RIM) fascia development. Working in the plant was a real eye-opener. I quickly learned to put my Ph.D. ego aside if I wanted any co-operation. Within two years, I was promoted to senior development engineer in 1987. I was in the same Advanced Development group, but now was working for the Interiors & Lighting group. I came to be known as the problem solver. The one thing I had learned in all those years of schooling was that it was most important to understand the root causes of issues before jumping to any conclusions. Also, my knowledge of chemistry and engineering helped me in understanding the total system and solution. By now, I was working mainly on developing advanced injection molding and extrusion technologies. In 1990, I was issued my first patent on extruding body side molding and shaping it via an inline process, which eliminated a secondary operation. With my team, I also developed a window glass-guidance channel, which won an SPI® (Society of the Plastics Industry, Inc.) award but did not go into production. Unfortunately, I realized that invention has no meaning if it isn't utilized.

In 1991, during my visit to the K Fair in Düsseldorf, Germany, I was impressed by the gas-assist injection molding process. I started working on a door grip handle for the GM/Toyota NUMMI (New United Motor Manufacturing, Inc.) joint venture, which won an SPE Automotive Innovation award in the Process category in 1992. That

project was quite a learning curve, since the part had to be designed for the process. I was the first in the US in any industry to license gas injection molding from Cinpress UK, Ltd. The experience exposed me to the business aspects of a project, since I needed to develop a business model for cost justification.

Then a real opportunity came into my life when one of my managers challenged me to develop a door hardware module that replaced metal with plastics. At that time, door hardware inner panels were constructed of more than 50 metal parts. It was the most challenging project I ever worked on, to design and produce a panel in plastics that met GM's fit, function, and manufacturability requirements. Initial analysis work using injection-molded short-glass reinforced polycarbonate/polyester resin predicted significant warpage in the part. Also, the cost had to be on par with the baseline metal-intensive assembly. Fortunately, calculated risk-taking paid off. Our team designed and developed what then was the world's most complex part made by gas injection molding in a tool without any slides. In 1995, the all-plastic, door hardware inner module — which became known as the *SuperPlug*® — went into production. It was the first of its kind, and the first ever produced using the gas injection molding process. It replaced more than 50 metal pieces with a single robust plastic module with significant multifunctional parts integration. Our peers in industry recognized its innovation by presenting us with several prestigious global awards including the SPE International Plastics Industrial Product Design Award during ANTEC® in 1996. In 2013, this product received the Hall of Fame award during the SPE Automotive Innovation Awards Gala. I learned a lot from this project: how to work with an internal team (design, development and manufacturing groups), how to make sure the customer (OEM/GM) is up to speed through constant communications, and how to leverage the support of material suppliers (we worked closely with GE to develop a special material for the application).

After that, I was on the fast track at GM and was promoted to technical fellow in 1994. That same year General Motors formed the Automotive Components Group, and then in 1999, Delphi Automotive Systems spun off as a fully independent publicly held corporation. As an employee of Delphi, I then was named senior technical fellow in 2001, which was the highest technical level at the company. From 1996 onward, I worked on a number of projects in the areas of exterior, interior, lighting, seating, and underhood. I developed and enhanced process technologies for key automotive applications. I worked on process enhancements for gas injection molding, co-injection molding, microcellular processing, metal/plastics hybrid molding, and direct (inline-compounded) long-fiber thermoplastic (D-LFT) composites. I also worked on material developments for natural fiber composites, nanoclay-based nanocomposites, and on TPOs and TPEs. On several occasions during this period, I learned the painful lesson that when you work on too many projects at the

An Engineer's Life CONTINUED FROM PAGE 10

same time, it's hard to focus on all those necessary details, and some projects don't get delivered as planned. I'm thankful to my mentor who brought this to my attention. In hindsight, maybe the reason I was so driven was that I always felt like I had to keep proving myself, being an immigrant to this country.

Throughout my career, I was fortunate to be able to be involved in bringing a number of technology firsts to the industry, including:

- in-house development of TPO interior skin formulations (the first for a tier supplier),
- microcellular foaming of driver-side airbag covers,
- inline compounded D-LFT structural parts (we were the first to bring that technology to the US from Germany),
- paintless/molded-in-color TPO for instrument panels,
- a hollow all-plastic steering wheel,
- new materials for radiator end tanks, and
- instrument panel retainer and heating/ventilation/air-conditioning (HVAC) ducts.

As a result, I hold more than 40 intellectual properties as well as 27 US and worldwide patents, 40% of which have made it into production. I've also had the privilege to be invited to more than 15 national and international conferences as a keynote speaker or panel-discussion member, and have been interviewed extensively by plastics and automotive press on my unconventional use of plastics in the auto industry.

My career has given me a lot and I've tried to give a lot back. When we moved to Detroit in 1985, I joined the SPE Automotive Division and was elected as a member of its board of directors. I worked as a technical program chair for more than 12 years, served as division chair from 1999-2000, and have chaired or supported numerous conferences and other division activities over the years including the Automotive Innovation Awards program, AutoEPCON, and the Automotive Composites Conference & Exhibition.

I also believe in giving back in the form of education. I was a member of the Plastics Advisory Group (PAG) at UMass-Lowell for four years, and I taught a summer seminar on "Advances in Plastics Processes" for three years at University of Michigan-Ann Arbor. I also worked as an industrial thesis advisor for several students at Kettering University, and was a member of the external review committee for Ph.D. student theses at University of Detroit.

For me, going forward, I strongly believe that I should give back to society, help others, and stay active as long as time and health permit. That is exactly what I plan to do, as well as spending more time with family. I also want to spend more time practicing meditation and yoga.

I'd like to offer some advice to young engineers who are just starting out in their careers.

- Take a deep dive (in-depth look) at each project; Every detail, no matter how small it is, is the most important. To be more useful and well-rounded, understand or learn as much as you can about all aspects of a project — from product to materials to process to tooling to testing.
- When you start a job, building relationships and networking will be the most important and helpful aspects of becoming a successful engineer. Join societies like SPE, SME, SAE etc. I found SPE to be a great communications platform and technical/networking resource to help me develop new applications, processes, and materials.
- Think of each challenge as an opportunity, because often that's where the greatest innovation flourishes.
- Don't work in silos where you are isolated from your counterparts in other areas of a project. Work closely with all who will be involved in a project now or in the future, and that will help move the project forward.
- Upfront engineering is the most important thing. Spend more time here and life will be much easier later on; you'll avoid having to do a lot of firefighting.
- Speak up to your superiors if you believe you are right, but be diplomatic and make sure to do your research. Don't burn bridges if you can help it.
- Change is constant. We live in an environment where one has to compete globally, so "Recalibrate your Goals as needed." Adaptability, acceptance, and a positive attitude will make you more successful.
- Don't accept things as the way they are and be willing to be different. Following the herd is a sure way to mediocrity. Always ask – why, who, when, where and how? This will help you in problem solving as well as bringing new ideas/innovations forward.
- Prioritize your projects and list of tasks you want to work on, and then take action.
- Be an entrepreneur. I got into a comfort zone working in the automotive industry. I don't regret this, as I've had a great career, but I strongly believe that people earlier in their careers can and should take risks. My daughter just left her job after working in industry for four years to start her own company.
- Have a life and enjoy it. If you treat work as hobby, then you will be never unhappy.

Auto Division Board Member, Suresh Shah Receives Prestigious 2015 SPE Research/Engineering Technology Award



Dr. Suresh Shah, who has served on the SPE Automotive Division board of directors in many roles since 1992, was named the 2015 recipient of SPE International's prestigious **Research/Engineering Technology Award**. The prize, which included an engraved plaque and a \$2,500 USD honorarium, recognizes outstanding achievements in the fields of plastic research and/or engineering technology and is one of the highest honors SPE bestows upon an individual.

Shah received the award and was recognized at both the Council Leadership Luncheon and the Plastics Hall of Fame Reception and Induction ceremony on March 22, 2015 during the Society's 73rd Annual Technical Conference (ANTEC®) in Orlando, FL, US. Given since year 2000, previous recipients of the award include:

- Dr. Gregory B. McKenna (2000),
- Dr. Yash P. Khanna (2001),
- Dr. Costas G. Gogos (2002),
- Dr. Robert A. Weiss (2003),
- Dr. Chan I. Chung (2004),
- Dr. Shriram Bagrodia (2005),
- Dr. Anthony J. Bur (2006),
- Dr. Kun Sup Hyun (2007),
- Dr. L. James Lee (2008),
- Dr. Murali Rajagopalan (2010),
- Dr. Rejendra Krishnaswamy (2011),
- Dr. Krishna Venkatasway (2012),
- Dr. Robert Gallucci (2013), and
- Prof. Sinee Simon (2014).

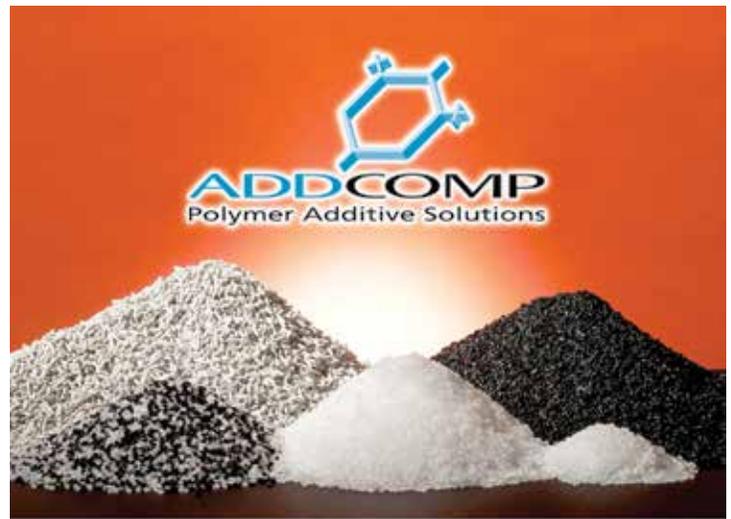
Shah was selected as this year's winner for his longstanding contributions to automotive plastics and composites developments. He has authored approximately 71 publications and given 16

keynote speeches. Two papers he authored in 1991 and 1993 won SPE Best Paper Awards at the society's Annual Technical Conference (ANTEC®). He has been interviewed more than 30 times by various magazines as an expert in automotive plastic materials and processes. He also holds 44 intellectual properties — 27 U.S. patents, 10 defensive publications, and seven trade secrets.

Additionally, Shah was inducted as a Gold Level Hall of Fame Innovation Award winner at Delphi Automotive LLP for his technical contributions and 40+ intellectual properties in December 2014. The *SuperPlug*® door hardware module he led development of in 1993, and that has now been translated to more than 30-million vehicles worldwide, was given the SPE Automotive Division's Hall of Fame award in 2011. Shah was named Scientist of the Year in 2009 by the Engineering Society of Detroit and its 77 affiliate councils. That same year he also received tributes from the governor of Michigan and the mayor of the city of Troy, MI. In 2003, Shah received the SPE Honored Service Member award for his contributions to the SPE Automotive Div. Two years earlier, he was inducted as a technical fellow in SPE and a year before that he was inducted into Delphi Automotive Systems' Innovation Hall of Fame — again for his technical contributions to the company. In 2000, his work on TPO skin formulations for the *Pontiac Bonneville* sedan produced by General Motors Corp. won the Interior Product Innovation award by the SPE

Shah CONTINUED FROM PAGE 12

Automotive Div. In both 1996 and 1998 Shah was nominated for the Boss Kettering award at General Motors for his efforts bringing innovation into production that had significant impact on corporate profits, and in 1997, he was given GM's Presidential Council Honors award. Between 1995 and 1997, Shah's *SuperPlug* application won a host of international awards including *Modern Plastic International* magazine's Process Award (Zurich, Switzerland, 1997); the *PRW Europe* Award of Excellence in the transportation category (London, U.K., 1996); SPE International's Plastic Industrial Product Design Award during the society's ANTEC® show (Minneapolis, MN, 1996); the IBEC Design Award from the International Body Engineering Council (Novi (Detroit), Mich., 1996); the SPE Automotive Product Design award (1995, Detroit); and *DesignFax* magazine's Five-Star Product of the Month Award (1995). Other technologies he worked on that won awards include the SPE Automotive Division's Body Interior category for the NUMMI assist grip handle in 1991, and the Society of the Plastics Industry (SPI®) Award of Excellence for a composite window guidance channel in 1990.



Addcomp is a global developer and provider of one-pack additive solutions and production services for manufacturers, compounders, and converters of thermoplastic resins.

The company's products can improve production processes, lower life-cycle costs, and enhance material or end-product performance.

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The advertisement features the Trexel Inc. logo at the top, which includes a large red 'T' with a white dot pattern and the text "MuCell Processes" and "Trexel INC." Below the logo is a microscopic image of a cellular structure. The main text reads "MuCell® Microcellular Foaming Technology for Light Weighting Automotive Plastic Parts" next to a photograph of an engine. At the bottom, there are four bullet points: "Reduced Vehicle Weight", "Improved Fuel Economy", "Uniform Part Shrinkage", and "Dimensional Consistency". The website "www.Trexel.com" is listed at the very bottom.

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SPE® Auto TPO Conference Organizers Announce 2015 Event Dates & Location, Extend Abstract Deadline

The seventeenth-annual **SPE® TPO Automotive Engineered Polyolefins Conference**, the world's leading automotive engineered-polyolefins forum, returns to the Troy Marriott in the Detroit suburbs from **October 4-7, 2015**. The committee also has extended its deadline for abstracts as part of its annual call for papers and presentations. Abstracts were previously due April 18, but now will be accepted through the end of June with non-commercial papers or presentations due **July 31, 2015**.

"The auto industry faces a dynamic period with profound changes coming from government mandates for higher fuel economy and/or lower tailpipe emissions," notes Dr. Sassan Tarahomi, manager-Advanced Engineering, International Automotive Components (IAC) and 2015 Auto TPO conference co-chair. "That means we can expect to see a great deal of new and 'disruptive' technologies introduced during the next decade. We selected a theme for this year's conference — *TPOs Delivering Performance* — that seeks to remind our colleagues in the auto industry just what a disruptive and productive category of polymers TPOs, TPEs, and TPVs have been over the past few decades."

Conference co-chair, David Okonski, subject-matter expert (SME)-Injection Molding / CAE / Moldflow at General Motors Co. adds, "For seventeen years, the Auto TPO conference has been known for the quality of its technical program, its exceptional networking opportunities, and the open dialogue it fosters between all members of the automotive-plastics supply chain. We hope once again to attract a large global crowd of attendees, speakers, and sponsors/exhibitors who are passionate about making passenger cars better, safer, greener, and more responsive to consumer demands."

This year's technical program is co-chaired by Dr. Norm Kakarala, Inteva Products LLC and Dr. Debbie Mielewski, Ford Motor Co. Sessions currently planned for the event include:

- **Adhesives & Coatings of TPO** organized by Hoa Pham, Freudenberg Performance Materials and Dr. Pravin Sitaram, Haartz Corp.;
- **Advances in Automotive Polyolefins** organized by Neil Fuenmayor, LyondellBasell and Laura Soreide, Ford Motor Co.;
- **Bio-Based Polyolefin Materials** organized by Susan Kozora, International Automotive Components (IAC) Group and Dr. Ellen Lee, Ford Motor Co.;

- **Interior Soft Trim: Skins & Foams** organized by Dave Helmer, General Motors Co. and Robert Eller, Robert Eller Associates;
- **Lightweighting Polyolefin Parts** organized by John Haubert, FCA US LLC and Normand Miron, Milliken Corp.;
- **Polyolefin Underhood Applications** organized by Jim Hemphill, Dow Elastomers, and Joel Myers, Hyundai Kia America Technical Center, Inc.;
- **Process/Enabling Technologies** organized by Dr. Suresh Shah, SPE and Kurt Anthony, Washington Penn Plastic Co., Inc.;
- **Rigid Polyolefin Compounds** organized by Mike Balow, Asahi Kasei North America and Ermanno Ruccolo, Mitsui Plastics, Inc.;
- **Surface Enhancements** organized by Dr. Rose Ryntz, IAC and Jim Keller, United Paint Co.

Anyone interested in presenting a paper at this year's conference should submit an abstract as soon as possible to TPOpapers@auto-tpo.com. A non-commercial paper or presentation should be sent to the same address by July 31.

ABOUT THE AUTO TPO CONFERENCE

Since 1998, the **SPE TPO Automotive Engineered Polyolefins Conference** has highlighted the importance of rigid and flexible polyolefins throughout the automobile – in applications ranging from semi-structural composite underbody shields and front-end modules to soft-touch interior skins and bumper fascia. Engineered polyolefins have been the fastest-growing segment of the global plastics industry for more than a decade owing to their excellent cost/performance ratio. The show typically draws more than 700 attendees from 20 countries on four continents who are interested in learning about the latest in rigid and elastomeric TPO as well as TPE and TPV technologies. Fully a third of conference attendees say they work for a transportation OEM, and roughly 20% work for a tier integrator/molder, with the balance from materials or reinforcement suppliers, equipment OEMs, industry consultants, and members of academia. A variety of sponsorship packages are available for companies interested in showcasing their products and/or services. The show is organized by volunteers from the **Detroit Section** of the **Society of Plastics Engineers (SPE)**.

For more information about the **SPE TPO Automotive Engineered Polyolefins Conference**, see <http://auto-tpo.com/> or <http://speautomotive.com/tpo.htm>.

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Meet Your SPE Staff:

Russell Broome, Managing Director

Russell

(Russ) Broome is no stranger to SPE. His father, Clark Broome — who has spent 50 years in the plastics industry himself and has been an SPE member since 1982 — originally introduced his son to the society in 1992. Young Broome was a student member in college at North Carolina State University and actually attended board meetings with his local section, Piedmont-Coastal during school. After graduation, with a freshly minted Bachelor's degree in Mechanical Engineering in hand, Broome got his first job — in the plastics industry, of course — thanks to a Piedmont-Coastal board member.

It wasn't long before he joined that section's board of directors and began giving back as he worked his way through a number of positions, including newsletter editor, section president, and two terms as councilor from 1998 to 2004. So began a long career not only in plastics but also of service to SPE.

Prior to being hired as SPE's new managing director in October 2014, Broome had served as president of the society between 2011 and 2012 and past-president from 2012 to 2013. He'd also spent the previous 7 years holding a variety of positions on SPE's Executive Committee. By his own admission, after his terms as president and then past-president were over, Broome took an 18-month break from SPE governance and joined TE Connectivity where he worked in the same office as his father. However, he'll also admit that he missed SPE and that he'd always felt like he never had enough time to devote to the society while volunteering and working full time at companies like PolyOne Corp., LNP Engineering Plastics Inc., GE Plastics, as well as his own company where he sold injection-molding machines and auxiliaries. When Gail Bristol retired last fall, Broome received a phone call inviting him to "throw his name into the hat." After a bit of reflection he did so.

As SPE CEO, Wim de Vos works hard to help expand the society into other geographies and make it a truly international organization, Broome's focus is on improving services and support to the society's core membership base in North America. His initial focus has been three-pronged: students, SPE Foundation, and industry at large. Broome says he's always had a huge passion for students and during his years as councilor worked hard to get students more involved in ANTEC than just being ushers. One of the programs he feels proudest of a half-a-year into his new role is how much The Plastics Race® at ANTEC has grown. "The event has grown year over year and we're continuing to improve it and bring more value to our corporate sponsors as well as to students and young professionals," he notes. "We've added more technology and more features, and this will benefit both groups." Broome, who has recently become director of SPE Foundation as well, is visiting universities and even high schools as often as time permits to talk with students about careers in the plastics industry. He considers this outreach vital to the society's

mission. "We have some huge goals to take what has been pretty flat performance with the Foundation and really kick it up a notch. We want to give out more scholarships and we want to give them to younger students. Ninety percent of Foundation's scholarships right now go to upper classmen in college. We'd like to get STEM (science/technology/engineering/math) high school students into plastics. I have professors at several college plastics programs who say 'If you can get the students into my seat, I can keep them there,' because they have so few students dropping out of the program. We need to build on this and help students realize the value of niche education so we don't lose them to other curricula."

Another area Broome is pursuing is helping SPE branch into a consultative role to industry. "Whether it's running surveys, putting on more focused technical seminars, or adding new products and services to SPE's portfolio," he adds, "on the business side, we're not doing the same old thing every year. Rather, we're pushing ourselves beyond the *status quo* to bring more value to members." One of the ways he's helping drive this is through strategic alliances with outside partners. "On the one hand, we're constantly looking for new alliances where we can offer niche benefits to our members, such as training and certification, that we don't have internal staff to provide ourselves," he explains. "On the other hand, we're also leveraging SPE's excellent reputation to provide technical content whether through webinars, ongoing forums in The Chain™, or providing technical content for industry events." For example, Broome's team is exploring ways to translate SPE's many-year partnership with SPI® (the Society of the Plastics Industry, Inc.), bringing technical sessions to the NPE® (National Plastics Exposition), to other industry events. "We talk a lot about competition in the area of technical programming," he adds. "We can either stand on the sideline thinking we're the only game in town, or we can partner with some of these groups. If both organizations are helping the industry grow, then both will benefit."



Russell Broome learning about plastics from his father, Clark Broome

There's a lot of opportunity out there, a lot of market space and we're actively looking for new alliances and new projects to fully capitalize on our strengths. It's arrogant of us to think one organization can do it all alone."

Still other ways Broome is reaching out to industry includes trying to garner corporate support for everything from sponsorship to dues. To that end, his team is putting a lot of effort into showing the benefits of belonging to SPE. He acknowledges that one of the greatest issues the society faces is all the "free content" available on the internet. "There're still so many companies out there that feel that the information they can get on the web is 'good enough'. They're still stuck in survival mode and are missing out on access to a higher level of content that can help them go to the next level of problem-solving at their company. Our opportunity is to educate industry that moderated content from a trusted source is a whole lot more valuable than any old thing they find on the internet," he notes. "To do that, we've got to offer some free content, and that's just starting with our limited-access eMemberships. After that, we've got to deliver on our value proposition."

What was his greatest surprise now that he's working directly for SPE instead of volunteering for the society? "Even as a very involved volunteer on the Executive Committee," he explains, "I just had no idea what it takes to pull off all the events and provide all the services our hardworking staff do for members every day." One of his strong goals in the next year is to make sure that the staff that has hung in there and helped the society grow and prosper will be taken care of as the society's financial pressures ease. "We've been overworked and understaffed to the point that it's been killing us," he adds, "but if we can just hang in there a little longer, we'll be able to add more staff and ease the pressure on the whole team."

What does he feel is the greatest misunderstanding members have about the society as a whole? "When I hear that our current members feel we're going through too much change right now, it really surprises me because I don't feel you can grow if you get too comfortable with the *status quo*. It was a major theme of my SPE presidency that if we don't find a way to get comfortable with change, we get stagnant and backslide. To a great extent, that's what happened to SPE. The reality is that we probably made too few changes for too long and that's why we've got to make more significant changes now." He cites the huge retirement wave that's already started as the leading edge of the 'Baby Boomers' begins to retire. "We've really got

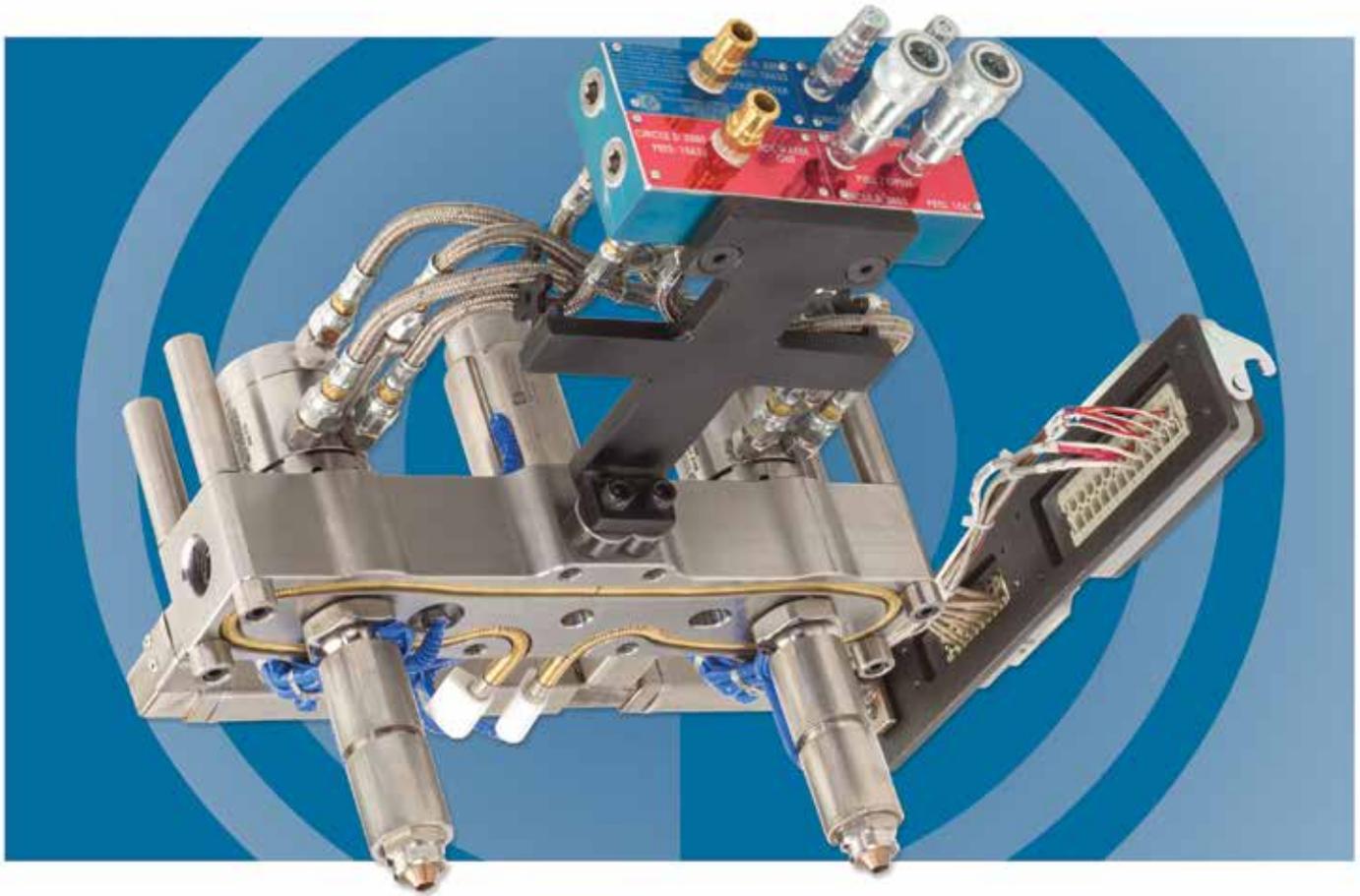


to tailor our content to the next generation, and that means changing how we deliver value and what that value actually is."

While initially he wasn't sure what he could contribute when first invited to apply for the job, Broome now realizes all his SPE volunteer work as well as his years in the plastics industry actually were ideal training for his new role. "At first I was unsure because I'm an industry guy, not an association guy. I didn't know what I didn't know. But the more I thought about it the more I realized that I had worked closely with SPE staff and volunteers for the last 20 years, plus I also had spent my career working in design and manufacturing engineering, sales, marketing, and business development. In short, I'd interacted with every level of the plastics supply chain. I'd walked in their shoes just enough to be dangerous."

Six months on he knows he made the right decision and says he loves what he's doing. "I'm putting more hours into this job than anything else I've ever done in my career, but I love every minute of it. SPE has done so much for me in my career: from networking and technical information, to giving me a platform to learn public speaking and professional writing — all those disciplines you don't pick up as an engineer — plus many of my job moves over the years all came as a result of an SPE contact. This is my chance to give back."

To reach Russell Broome, SPE managing director: email: rbroome@4spe.org



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Designer's Den

The End of Defensive Design: Simulation for Aggressive Composites Use

by Roger Assaker, Ph.D.



Composites, or fiber-reinforced plastics (FRPs) offer engineers a broad palette of options for replacing conventional low-carbon steel with lighter, more efficient materials that eliminate corrosion, improve damage tolerance, reduce tooling costs, offer parts-consolidation opportunities, and provide high design freedom, and quite often improve service life of automotive parts.

At the same time, this combination of thermoplastic or thermoset resin matrix and high aspect-ratio reinforcements (e.g. fiberglass, carbon fiber, aramid fiber, basalt fiber, or even natural fibers) is so complex to simulate that the lack of good material models often undermines the usefulness of composites as engineering materials.

Few engineers take full advantage of FRPs. They regularly over-design composite parts to ensure against failure, adding weight and cost that defeat the purpose for designing with these materials in the first place – which is generally to reduce weight and cost. **This isn't designing to succeed, it's designing not to fail and as such it will not lead to superior products.**



A major cause of over-designing FRP parts is a lack of knowledge about material properties. There is a persistent tendency among engineers to treat FRPs like metals (with homogeneous, isotropic properties) instead of taking the time to understand their local/heterogeneous, anisotropic nature. In many cases, an FRP part's real anisotropic behavior would enable it to perform better than analyses assuming metallic/isotropic properties predict.

FRPs are unlikely to realize their full potential until engineers embrace their unique properties and have the finite-element analysis (FEA) and simulation tools that support aggressive design for minimum mass and maximum performance.

The FRP Difference

Unlike the stiffness of metal parts, which is consistent throughout a given geometry, the stiffness of parts designed in FRPs can vary widely in different areas of the part. That variation comes from several factors:

- Initial form factor (e.g. prepreg, performs, pellets, tapes, logs/billets, etc.),
- Forming process used, and
- Final alignment of reinforcing fibers within the molded part.

These factors are all interrelated because the starting material and the molding process used both have tremendous impact on final fiber alignment, length, and even local content. In other words, they greatly affect whether fibers end up where engineers want and expect them to be.

For example, a composite part that deflects 10 mm on its long end and 5 mm on its short side under a 454 kg load might deflect only 3 mm on its long side and 0.25 mm on its short end if continuous-strand carbon fibers are aligned parallel to that upper surface. And more importantly, the FRP part will perform much better in a crash situation if it has the enhanced stiffness properties that aligned, continuous-fiber reinforcement provides.

However, if an engineer is going to fully utilize that stiffness, he/she needs assurances that the fibers will be aligned properly when the part is actually produced – and not just on the first time, but also on the 1,051st time.

That's where production processes introduce another variable into FRP design. Consider the normal process of designing an injection mold for a thermoplastic composite part. If the part is made of a homogenous (neat/unreinforced) plastic, the mold's gate location has less impact on final part properties than it does if the part is reinforced with short or long fibers. For an injection-molded FRP part, gate location is a very important feature that can affect the part's performance. Gate type and location and accompanying hot or cold runner can cause significant fiber breakage, jetting, and over-shearing of the material. This in turn can lead to resin degradation and chaotic fiber distribution, plus the formation of knitlines. Of course, a host of other tool and part design features also can lead to problems, but they are outside of the scope of this article.

Now assume that the injection mold has two gates. They are placed directly opposite one another. The flow fronts from the two resin melts will meet in the mold and create turbulence that not only will displace fibers from their intended location, but also will create knitlines, which have poor aesthetics and are weaker than the surrounding material.

Production engineering has several options for correcting this problem. One is to adjust the rate of injection or the temperature of the melt. If that doesn't solve the problem, it will be necessary to move gate locations, a more costly and time-consuming fix, so flow fronts intersect in a less mechanically critical and aesthetically sensitive area of the part.

To do any of this without a wasteful trial-&-error (make-&-break) approach, production engineers should be able to simulate the FRP injection molding process in the same way that design engineers simulate the FRP part's mechanical performance.

The "should" is the crux of the challenge in working with FRPs. Most of the finite-element analysis (FEA) and simulation tools in use today do not treat FRPs as the anisotropic materials that they are. Instead, they treat them like metals, which are isotropic materials. The result is unnecessary over-engineering and the higher costs and mass that go with that.

Working with the Right Curve

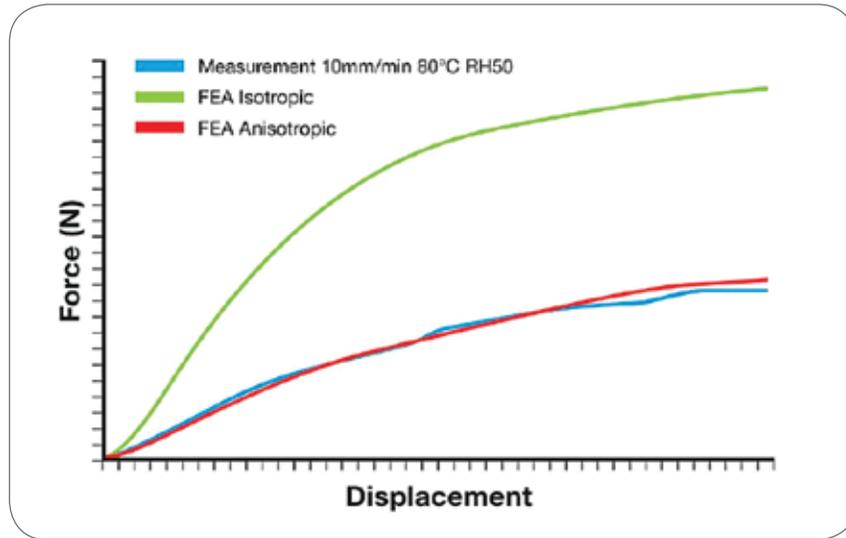
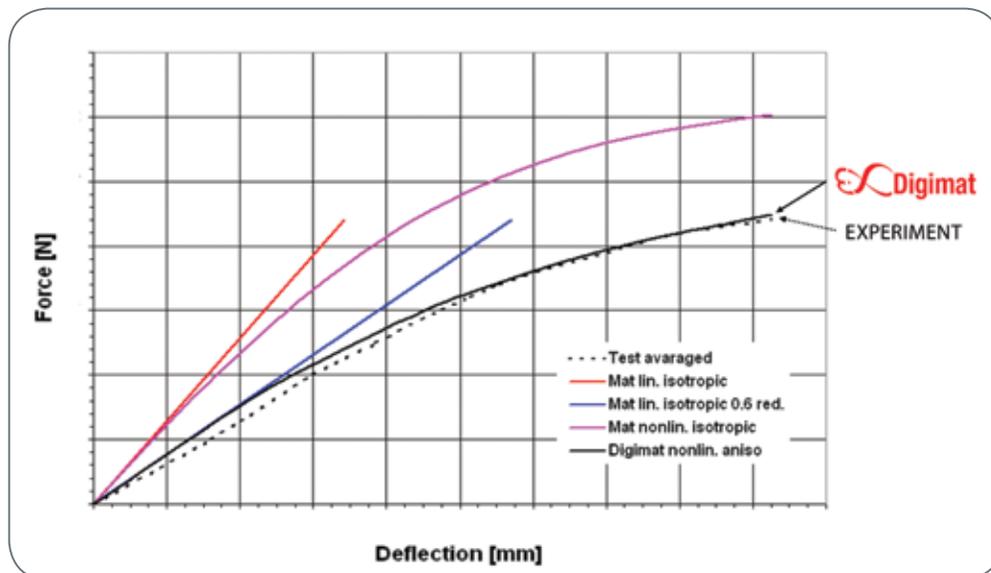
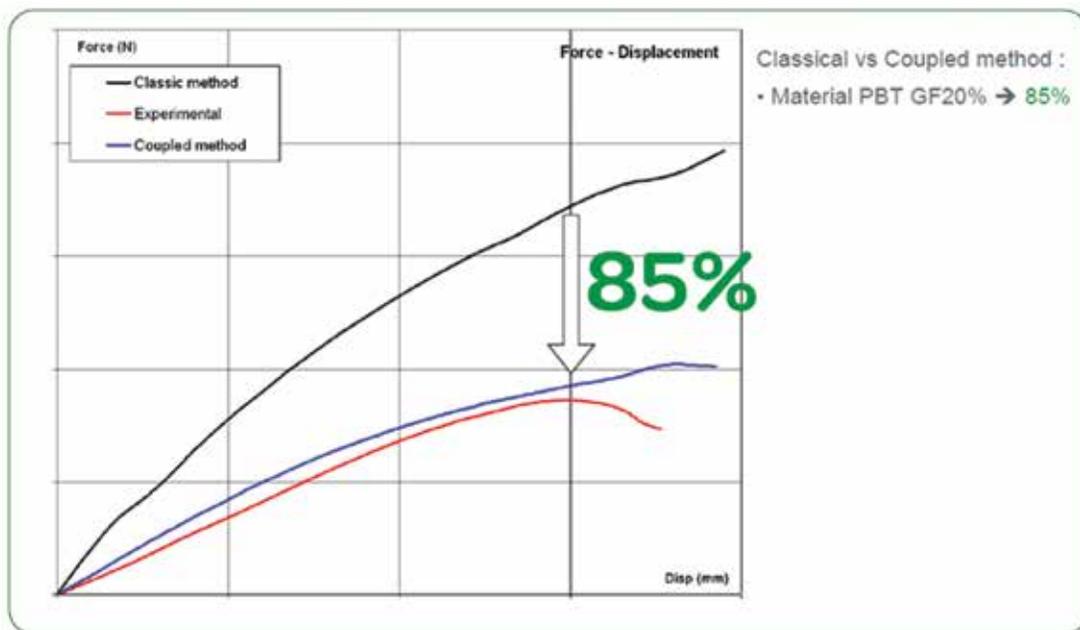


Figure 1 illustrates how the isotropic/anisotropic difference plays out in practice. The blue line represents the actual physical measurement achieved through prototyping, which treats FRP as an anisotropic material. The green line represents an FEA analysis of the part assuming isotropic properties. The variance in results is more than 80%, with the isotropic analysis showing a much stiffer response than what is observed during physical testing. The results represented by the red line, however, closely approximate physical testing. The red line represents FEA that employs anisotropic material properties.



The same pattern emerges on **Figure 2** (bearing illustration), which applies the principle described in Figure 1 to an actual design scenario. Figure 2 depicts testing of a bearing under load. The top curve (pink) represents an isotropic, non-linear analysis. The black line represents anisotropic, non-linear FEA, and the dotted line represents the averaged results from physical testing. Again, the anisotropic, non-linear analysis is almost identical to results from physical testing.

Any engineer who saw the Figure 2 results would instantly realize that following the “pink curve” results would cause him/her to needlessly add more mass. The more accurate approach would be to base assumptions on the black curve results. That’s the kind of predictive analysis that the engineer needs from his/her FEA and simulation tools so that designs can go right from computer to production without extensive physical prototyping.



In another example (**Figure 3**), a redesigned bracket in FRP illustrates the value of using anisotropic material properties. Two companies used predictive analysis to modify and optimize the FRP bracket design. They analyzed the design in two material configurations (20% short-glass-reinforced polymer and a 50% short-glass-reinforced polymer) to determine stiffness at the breaking point based on fiber orientation in the material. They imported production process models into a non-linear, multi-scale material and modeling platform and analyzed the design using isotropic and anisotropic material properties.

The anisotropic curve differed from the physical measurements by 5% for the 20% reinforced material and 2.5% for the 50% reinforced material. In contrast, the isotropic analysis varied 85% for the 20% reinforced material and 120% for the 50% reinforced material. Engineers relying on the isotropic analysis would probably assume that the deflection rates were higher than the actual. Without the more precise anisotropic results, however, it is impossible to create an optimal design. The variation between the simulated and actual results is far too large and unpredictable for engineers to design with the maximum possible precision. Instead, they will over-design to avoid failure.

Predictive vs. Comparative Simulation

Predictive analysis is a fundamental element of successful engineering with FRPs. Heterogeneous (local) anisotropic analysis is a major component of predictive analysis. However, most FEA and simulation software is not geared toward local anisotropic analysis. Instead, the codes represent FRP parts as “black aluminum” – a kind of placeholder that accurately depicts an FRP part’s geometry but not its actual anisotropic properties.

FRP suppliers and FEA-simulation software vendors have made small moves in the past to accommodate anisotropic properties. Most material suppliers provide their customers with basic material property data. Analysis software vendors incorporate some

level of anisotropic material behavior into their solutions to approximate FRP behavior. However, aggressive, creative product design requires a much more comprehensive approach. To offer the predictive intelligence that engineers need, FRP models require an accurate handle on:

- individual properties of the fiber and the matrix;
- the composition of the overall materials;
- influence of geometry of the final part; and
- influence of the manufacturing processes.

The current generation of FEA-simulation software has traditionally been part of benchmarking, which is a comparative rather than predictive process. In benchmarking, engineers run an FEA analysis of a design, then machinists develop molds to produce actual parts, which are molded and tested. The engineers go back and compare the finished part properties to the initial FEA predictions, correlating the FEA model until it represents the final product's behavior. That benchmark informs work on the remainder of the project and very likely on future projects as well.

Benchmarking is not as effective with FRPs as it is with metals. As we've discussed, the resin/fiber composition, part geometry, and forming process used to produce a composite part all affect final fiber alignment and hence properties like stiffness. If any changes are made to fiber/resin composition or part geometry or tooling geometry at any point during the benchmarking process, quite different results could be produced. This variation makes benchmarking an unreliable basis for determining mass and geometry.

Engineers need the capacity to make predictions for each new project without relying on the costly and time-consuming process of benchmarks. FRP models with the characteristics described above would provide the predictive element that engineers need so their designs can go directly from their computers to pre-production without extended delays in prototyping.

Predictive analysis is particularly relevant to design engineers today because shorter product lifecycles make fast design, tooling, and production critical. **At the same time, a fast production process that yields erratic quality or over-engineered parts is obviously self-defeating.**

FEA and simulation tools must include fiber orientation maps

and "smart" material data models to support predictive analysis. Smart in this context means employing material datasets that, given any fiber alignment, can tell the analyst the exact stress-frame response. The fiber orientation information comes from process simulation software that depicts the "cloud" of fibers in the resin matrix that emerges from the production process.

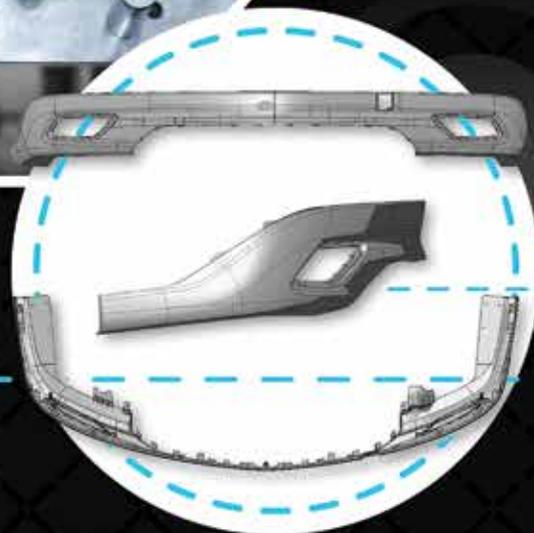
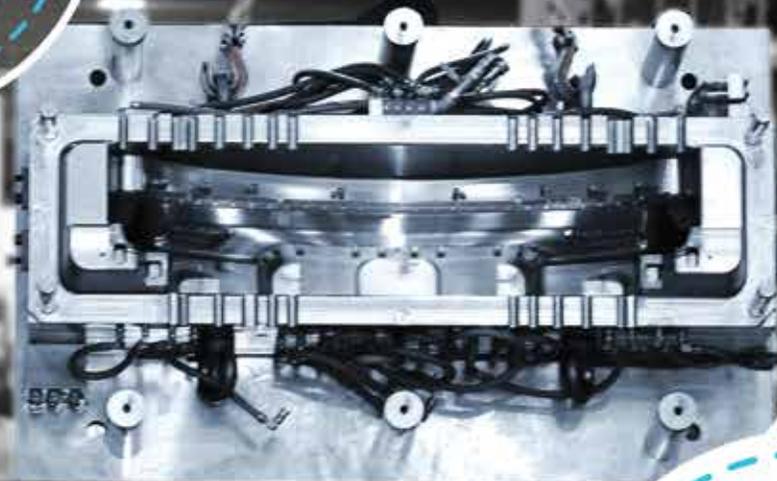
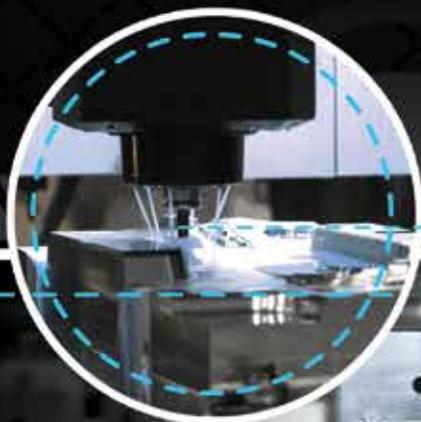
Bringing smart material data models and fiber alignment information into FEA and simulation enables an engineer to see the stress-frame response for each section of a design. The engineer can then use that knowledge to reduce mass where possible and increase it where needed.

These new types of FEA and simulation tools enable engineers to use FRPs to their best advantage – reducing weight and improving performance. **They give engineers the confidence to stop designing simply to avoid failure and instead to design creatively and aggressively to produce superior products.**

ABOUT ROGER ASSAKER

Tech entrepreneur, Dr. Roger Assaker is CEO and co-founder of e-Xstream engineering, a software and engineering-services company that is 100% focused on advanced materials modeling. Since September 2012, he has also been the chief material strategist of MSC Software. He holds both Ph.D. and M.S. degrees in Aerospace Engineering with a strong focus on nonlinear computational mechanics – an area of expertise where he now has over 20 years' experience. Assaker has complemented his engineering education with an M.B.A. degree in International Business, plus has taken additional advanced business and technology entrepreneurship courses from prestigious schools such as Massachusetts Institute of Technology and Harvard University. In addition to growing e-Xstream engineering into global leadership in advanced composite modeling, Assaker is also vice-chair of NAFEMS Ltd's (National Agency for Finite Element Method & Standards) Composite Working Group and an active member of other technical material associations such as SPE and SAMPE. Learn more at <http://www.mscsoftware.com/product/digmat>.

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SOCIAL REPORT

Teri Chouinard,
SPE Automotive Div. Social Chair



2015 Cellar Door Mixer

The last SPE Automotive Div. Social Event — Wine Tasting 101 held April 30th at the Cellar Door in Auburn Hills, MI, USA — attracted over 30 automotive and plastics industry professionals.

In attendance were sponsors and guests from Allied Composites Technologies, Abaris Training Resources, Inc., Advanced Innovative Solutions, Asahi Kasei Plastics North America, Delphi Automotive LLP, Dow Automotive Systems, Global Tech, Inteva Products LLC, Huntsman, JR Plastics, Miller-Cole LLC, Plasan Carbon Composites, Plasmatrete, and SABIC. OEMs represented at the event included members from Ford Motor Co., General Motors Co., and Nissan North America Inc.

In addition to a presentation on the benefits of supporting the SPE Automotive Div., the event included a one hour introduction to the wonders of fine wine, including varieties available and proper glassware for serving and pairing wine with food for maximum flavor. Guests received sample pours of six different wines plus cheese and bread to enhance their tasting experience. Afterward, guests enjoyed hors d'oeuvres and networking.

"Thanks again for setting up the wine tasting networking event," commented Dave Reed, General Motors, retired. "It was great. I discovered that my personal tastes in wine lean toward Welches, but now I know it's because Welches has an audacious bouquet, rich color, fruity pallet, and because of how it swirls in the glass. Good to see so many friends in such a nice setting."

The purpose of SPE Automotive Div. Social events is to nurture networking, have fun, and build membership. If you have an idea for a social event, which may include a tour of your facility or other educational and fun ideas that will interest our existing membership and draw new members, please email teri@intuitgroup.com or call 1.810.797.7242.



2015 SPE Automotive Division Golf Outing & ACCE Welcome Reception



Another opportunity to get out and meet fellow SPE members will be at the 21st-annual SPE Automotive Div. Golf Outing on Tuesday, September 8th, at Fieldstone Golf Club in Auburn Hills, MI (<http://www.fieldstonegolfclub.com/>). The day-long outing will take place one day before the 15th-annual SPE Automotive Composites Conference & Exhibition (ACCE) at a beautiful and award-winning course. September usually has some of our best weather in Michigan. Sponsorship opportunities are available. Please see the ad in this newsletter or go to our SPE Automotive Division Golf Outing webpage at <http://speautomotive.com/golf.htm> for more info.

That very same evening, those attending either the golf outing or SPE ACCE are invited to continue with more SPE networking at our welcoming reception in The Fireside Lounge at the Hyatt Place Detroit/Novi hotel (attached to the Diamond Conference Center at The Suburban Collection Showplace where the ACCE show will be held). The gathering runs from 8:00-10:00 p.m. and will feature light appetizers and a cash bar. Of course, the SPE ACCE runs from Wednesday through Friday, September 9-11 at the Diamond Center.

We hope to see you soon at an upcoming SPE social event or educational conference.

SPE Golf Outing



2015

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There are a number of promotional opportunities available for this year's SPE Golf Outing.

Type of Sponsorship:	Cost:	Benefits Include:
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Hole	\$750. USD	1 foursome & signage
Lunch	\$2000. USD	2 foursomes, signage & 100 fliers printed & distributed at the event promoting sponsoring company or its products
Dinner	\$3000. USD	3 foursomes, signage, company message / logo on dinner table centerpieces, 100 fliers printed & distributed at the event promoting sponsoring company or its products

<http://speautomotive.com/golf>

Contact Teri Chouinard for more details.

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Tuesday September 8 2015

Fieldstone Golf Club
1984 Taylor Road
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USA

Cost:
\$500. USD / Foursome
\$125. USD / Player

Program:
8:30 am – Sign-in &
Continental Breakfast
10:00 am – Shotgun Start
Box Lunch at Turn
3:30 pm – Buffet Dinner
4:00 pm – Awards
& Prizes





SPE and JEC announce the first world conference on the use of new plastics and polymer technologies for bicycle manufacturing.

We will have presentations on:

- Carbon composites process innovations
- New materials
- More plastics to replace metal and save weight
- Safety aspects of the frame and complete bicycle
- Failure analysis and failure prevention
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- And more!

Additionally, there will be a panel discussion featuring Top professional cyclists, the UCI and technical experts on the aspect of performance versus safety

We are accepting presentations and technology papers, please contact:

Carine Roos
SPE European Office
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croos@4spe.org

There will be a small table top exhibition alongside with the conference.

For more info about presenting your products, please contact Carine Roos.

December 8-9, 2015





COUNCILOR'S REPORT

March 21-22, 2015

Council I & II Meeting Minutes
Orlando, Florida, US

by Tom Pickett, SPE Automotive Div. Councilor



Councilor I Meeting Saturday, March 21, 2015

1. Welcome, Anti-Trust & Conflict of Interest

President Vijay Boolani called the meeting to order at 8:00 AM EDT, and reminded everyone that the meeting was operating under SPE's Antitrust and Conflict of Interest policies. The agenda was approved.

2. Roll Call

Since this was an election meeting, a complete roll call was completed by Secretary Gomez. Proxies were identified and approved.

Boolani recognized the 2014-2015 Executive Committee members, SPE CEO, past presidents, staff members, and special guest Mary Byers, coauthor of the book [Race for Relevance](#).

3. Approval of Outstanding Minutes

Past Executive Committee minutes from September 21-12, 2014, October 9, 2014, November 20, 2014, December 15-16, 2014, January 29, 2015, and February 26, 2015 were approved. The September 13-14, 2014 Council meeting minutes were approved.

4. President Boolani's Opening Remarks

In memoriam, President Boolani announced the names of the following members who recently passed away: Bret Baumgarten, Patsy Bell, Pierre Hamel, Alva Whitney, and Andrew Yacykewych. A moment silence was taken. Boolani provided his remarks regarding his term as president. He recognized the different conferences that he attended during his term. He appreciated the great work done by the different divisions and sections to have successful conferences.

5. Election

Jon Ratzlaff conducted elections for President Elect, Senior Vice-President, Vice-President, and Chair of the Council Committee of the Whole (CCOW). Ratzlaff thanked the nomination committee of Paul Browitt, Brian Grady, Dick Cameron, and Marc MacLean-Blevins. Jeff Helms, Greg Campbell, and Scott Owens completed their three-year terms as vice-presidents of the Society and moved off the Executive Committee. Owens was elected President Elect. Oliver Crave was elected Senior Vice-President. Monika Verheij was elected Vice-President. Sandra McClelland was elected CCOW Chair.

6. Financial Update

Dr. Raed Al Zubi provided an update on financial performance. A copy of the presentation is on The Chain. SPE did well with a

positive result of \$103,000 USD for the financial year. Revenues from membership were in line with budget. Advertisement and ANTEC revenue were up by 20%. Publications revenues were better than expected. There was less spending on membership acquisition (less renewal mail). The management expense was up 30%. This year is an NPE year so it will impact revenue from ANTEC. SPE started the financial year with a \$1.2-million USD surplus and ended with a \$1.3-million USD surplus.

SPE CEO, Wim De Vos addressed a return on investment (ROI) question that was brought up during the last council meeting in New Orleans, LA, US. The presentation is on The Chain. De Vos explained that ROI is not easy for certain investments. He explained that we cannot calculate WACC (weighted average cost of capital) since we are not a "for profit" organization. However we can estimate "paybacks" for the different projects. The new membership system cost \$110,000 USD and it is easier to renew membership and allow new members to join. The new website cost \$130,000 USD. The new website centralizes databases. It has a fully searchable database. The website has sold \$90,000 USD in advertising that we did not have on the old website. The projected payback for investment on the new website is 1.5 years. The conference mobile app cost \$20,000 USD and has already paid for itself. The Chain cost \$30,000 USD.

The Executive Committee is evaluating potential new products and services as a source of revenue, including advertisements on the website and The Chain, additional headquarters' organized TopCons, and the industry newsletter. De Vos presented a financial projection to the year 2020 based on the continuous loss of membership while gaining revenues from other sources. He remarked that future financial streams can only be realized if we consider other options to reach people. He explained that this is another reason why we need eMembership.

A question on how TopCons have performed with the new policy was raised. De Vos responded that money is received many months after the conference takes place so it is difficult to answer the question right now. He added that by the next Council Meeting, the staff will be able to provide the numbers from 2014. He cautioned that we have nothing to compare with because we just changed the rules. He also emphasized that groups are benefiting from all the new services, so in essence they are paying less than before.

7. Council Committee of the Whole (CCOW)

Sandra McClelland provided an update on the CCOW meeting. There also was a review of The Chain. Further, there was a lot of discussion on eMembership, SPE Foundation, and the PlastiVan™ program.

COUNCILOR'S REPORT

Continued from Page 30



8. Sections & Division Committee Update

Monika Verheij announced eight petitions for new student chapters. The student chapters were approved. University of Michigan-Ann Arbor is one of the new student chapters. Brian Landes put forth a motion to have Additive Manufacturing & 3D Printing approved as a Special Interest Group (SIG) and that motion was approved.

9. Bylaws

Paul Anderson reviewed several bylaw changes. Student members are allowed to vote in all affairs of the society. Honoree Members may participate in all affairs of the society except voting or holding elective office. An extensive list of all the bylaw changes can be viewed on The Chain.

10. Special Guest

Mary Byers, coauthor of [Race for Relevance](#), discussed how organizations need to change. She discussed the six challenges faced by organizations today: Time, Return on Investment, Specialization & Consolidation, Generational Value, For Profit Competition, and New Technology.

Meeting adjourned at 1:00 PM.

Luncheon Awards:

Congratulations to Steven Van Loozen and the SPE Automotive Division Board and members for winning the 2015 SPE Gold Pinnacle Award. This was a team effort! It is the highest award given to a Division or Section in the Society.

Congratulations to Peggy Malnati and her team for its great work throughout the year that allowed the Automotive Division to win the 2015 SPE Communications Excellence Award. It is the highest award for communications excellence in the Society. Congratulations to Suresh Shah for being honored by SPE for his technical achievements as well.

Councilor II Meeting Sunday, March 22, 2015

1. Welcome, Anti-Trust, & Conflict of Interest

President Dick Cameron called the meeting to order on March 22, 2015 at 3:20 PM EDT, and reminded everyone that the meeting was operating under SPE's Antitrust and Conflict of Interest policies.

2. Roll Call

Past-President, Vijay Boolani, acting as secretary, conducted a roll call. Proxies were identified and a motion passed to seat proxies. The Executive Committee was recognized.

3. Agenda

The agenda was approved.

4. President's Remarks

Cameron remarked that he wants to work on relevance. He remarked that Russell Broome, managing director, is doing great work. The membership of the Young Professionals is important. Cameron feels that adding value is critical. The organizational plan was approved.

5. Support / Services at HQ

Broome stated that there are dedicated resources at SPE headquarters for governance, scholarship/grants, and communications. SPE is looking at new technology projects. Broome discussed alignment with corporate sponsors and partnerships, including partnerships with Plastics Association Leaders (PALs) such as SPI, ACC, SAMPE, ACMA, GPCA, Plastics Europe, and EUPC. The Foundation is focused on growth. With a \$250,000 USD investment, the PlastiVan program will expand. SPE will take over the ACC Hands on Kit.

6. SPE Strategic Plan

De Vos plans to post the strategic plan on The Chain. He discussed that the source of income will be changing. SPE traditionally received revenue from membership and ANTEC. SPE is looking to add other streams of income. In order to contribute more time to the workshop, De Vos decided not to go through the presentation, but to post it on The Chain. He wanted to spend time discussing changing the governance. The Councilors formed into eight separate groups to address the questions: *What is the role of governance? How many people do you need for that? What should be the structure?* The groups were given 30 minutes, then they presented responses to the questions. Many complained that the time was too short. De Vos announced that the questions will be posted on The Chain for further discussion. He also collected the reports from each group for review by the Executive Committee.

7. Old Business / New Business

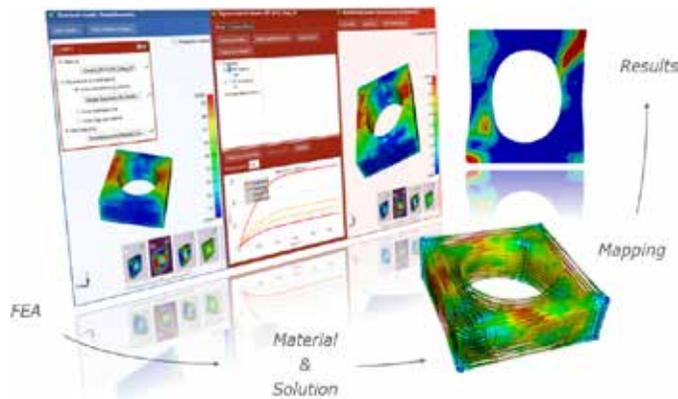
Cameron talked about eliminating remote participation. It costs \$9,000 USD each meeting and only had one participant. ANTEC 2015 student events scheduled for this week include: the Plastic Race, student papers and posters, and the student awards lunch. Jon Ratzlaff also announced that the second Plastics for Life™ global parts competition would also take place at ANTEC.

Councilor meeting adjourned at 5:09 PM. October 10-11, 2015 is the next councilor meeting, which will be held in Pittsburgh, PA, US.

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EDUCATION REPORT

by Monica Prokopyshen,
SPE Automotive Division
Education Chair



2015 Explorathon™

The Explorathon is an annual event of the American Association of University

Women (AAUW), Birmingham Branch, whose purpose is to provide students with interactive and hands-on workshop sessions featuring dynamic women scientists, engineers, mathematicians, and healthcare specialists; and to showcase career opportunities. The event is open to Southeast Michigan students from grades 8 – 12.

The SPE Automotive Div. (SPE AD) has hosted Explorathon workshops for 16 consecutive years. Our participation is made possible by member support of division events as well as donations of display/teaching materials and handouts from member companies. Over 400 students, parents, and teachers attended the event this year. After a keynote presentation, students split up and attended three out of 21 workshops that were available during this one-day event.

On March 25, 2015 we hosted three hands-on workshops covering: *Chemistry and Designing with Plastics*. Cranbrook Kingswood Middle School was the host this year and we appreciated the well-appointed chemistry lab made available for our use. The following individuals participated in this year's event: Barbara Cochran (AAUW); Elizabeth Egan (PlastiVan™ Education Program), and myself.

Close to 60 students attended our three sessions. Fifty-five percent of students were from grades 10 and 11. The fast-paced session covered the history of plastics, major industries, chemistry, polymer properties, forms and uses, recycling experiments, post-secondary programs, and career-path information. Several students came back with further questions about the experiments and careers.

Attendees by Grade %	Session Ratings	%
8th 22%	Your interest in this session	91
9th 12%	Presenter's content and materials	98
10th 31%	Presenter's presentation style	98
11th 24%	Your overall evaluation of this session	98
12th 10%		

Thanks to Celanese for the surplus conference bags, which were used for distributing handouts that included: SPE AD Education Outreach Summary, SPE lanyards, SPE AD pencils and newsletters, and ACCE CDs, notepads, and program guides. The students found "An Engineer's Life" and "Service through Science" articles interesting and valuable.

Write-in Comments

The most popular answers to the two write-in questions are listed below, in most to least common order.

- 1) What was most useful this session?
 - a) The hands-on experiments
 - b) Everything!
 - c) How to make things with plastics.
 - d) The variety of careers in the industry. The variety of things plastics engineers do.

One student responded, "learning about how cool it would be to major in this."

- 2) What might have made it better?
 - a) Nothing. It was wonderful. Experiments are great. It was awesome.
 - b) More experiments & more time/longer session.
- One student told us it was her favorite session of the day.

PlastiVan™ Update

St. Clair Middle School students from grade 7 sent their thanks for the PlastiVan program. Ms. Joan Rosol, the 7th- & 8th-grade science teacher commented: "The students all loved it and not one negative comment was heard. They all raved about it and word spread quickly. Margie Weiner brings in real-life applications to demonstrate to the students chemistry has real uses....I truly appreciate your help in allowing our students to learn more about plastics in a fun, engaging way."

Some other student comments include:

"...appreciated you coming and please keep coming for new 7th graders for years on..."

"Your program is astonishing and I love it."

"My parents though[t] it was cool when I told them everything I did in science!"

"It was such an experience to see what science really is and can do. I hope I get to see you guys again because it was amazing."

"The presentation was better than amazing. What I learned about plastics is nothing like I thought. I never knew you could make clothes out of plastic."

"Thank you for coming to our school to present multiple different examples in many different ways we use plastic—also why plastic is an extremely important material...Also I did not know that nylon was made of plastic, which is amazing."

"Ever since I watched you guys do the experiments [I] decide[d] that when I grow up I want to be part of the Society of Plastic engineers."

"I'm really interested in plastics because we use plastic so much and we don't even realize it!"

"My favorite was the one where you mixed Acetone and put it on a Styrofoam cup. I am going to show my mom and do it at my house."

"I now understand how cool the world really is."

"The lab with the sodium polyacrylate was really awesome! It opened my eyes that plastic isn't just desks and tables, it[']s much more."

"I think I want to become a plastic engineer. It is so cool what you guys do."

"I never new Plastic could be so cool."

"I learned so many things from you coming here and teaching us about plastics. For example, one of my favorite things we were shown was the flash paper. I was almost certain it would have set off the fire alarms! Also, thanks to you, I am considering working in the plastics industry, once again, thanks for coming."

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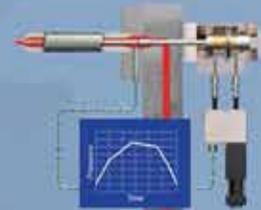
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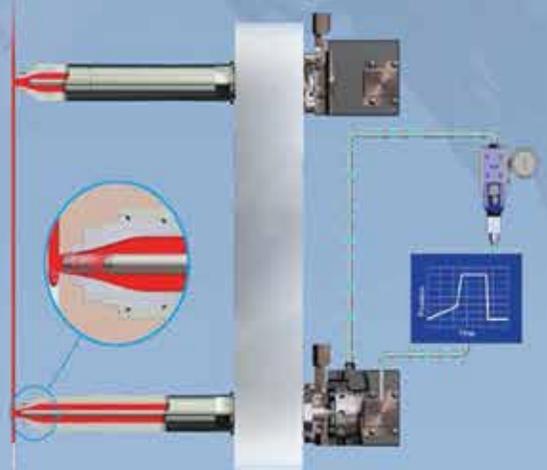
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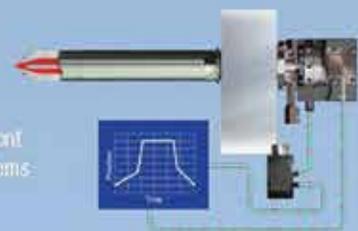
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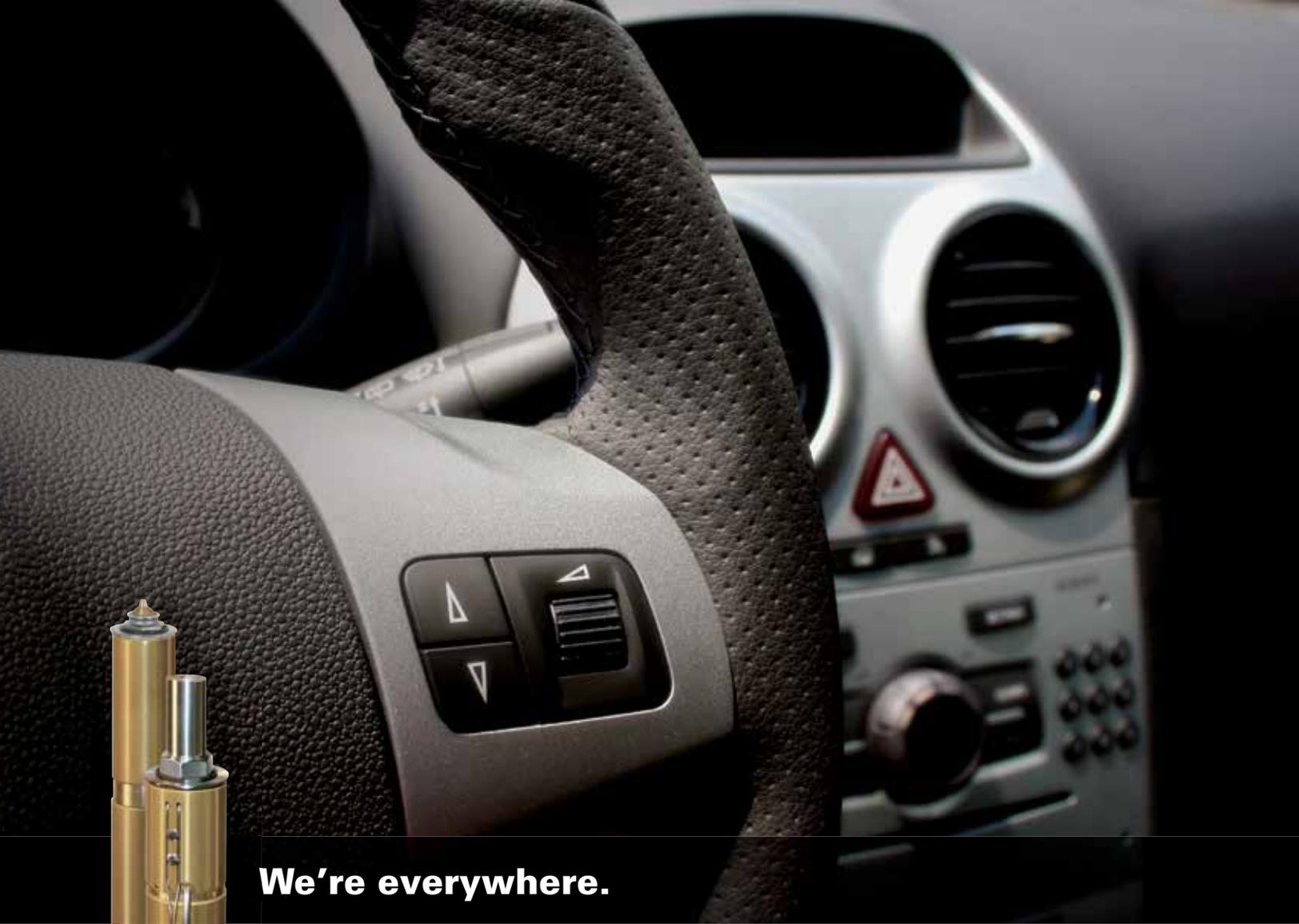
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