

# THERMO SETTINGS

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LETTER FROM THE CHAIR

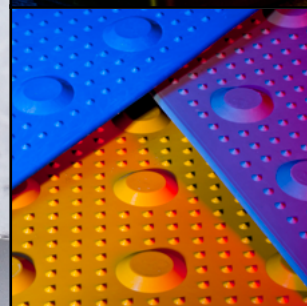
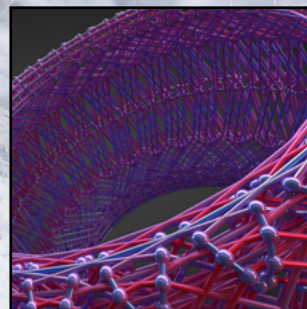
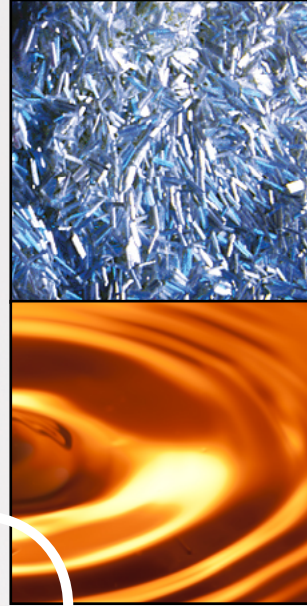
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HIGH STRENGTH COMPOSITES  
FAN BLADE

CSP'S TCA ULTRA LITE

INDUSTRY NEWS

*Editor, Shelane Nunnery*





# LETTER FROM THE CHAIR

Dear Colleagues,

Believe it or not, we are only sixty days away from the SPE Thermoset Division TOPCON, the premier event for the thermoset industry. On behalf of the Board of Directors I invite you to register for TOPCON 2016, to be held 19-20 April, 2016, at the Westin Cleveland-Downtown, in Cleveland, Ohio. The SPE Thermoset Division annual Topical Conference has been, and remains, a key technical forum for the fiber-reinforced thermoset composite industry. Annually attended by hundreds of representatives from a variety of supply chain elements, OEM's, and other technology providers, the TOPCON meeting provides an important forum for the exchange of technical and business intelligence in our market.

We are very excited to be holding this year's event in Cleveland. And with Northeast Ohio being known by many in the industry as the "cradle of composites", TOPCON 2016 is certain to bring together one of the most exciting mixes of university technologists, industry participants, and interested end users the event has ever seen. The agenda is diverse, with topics ranging from fundamental resin technologies, to applied development concepts, focused market analyses, and business management processes.

But the agenda, the collaboration opportunities, and the hip, new venue are only part of the buzz surrounding the April meeting. Because when the meetings wind down, the evening kicks into gear with a maze of dining and entertainment options in close proximity to the Westin. For starters, the Cleveland food scene is renowned, with nationally



**Marc Imbrogno, SPE Thermoset Division Chair**

recognized chefs Michael Symon and Jonathan Sawyer operating several establishments in the downtown area. The East Fourth Street and Warehouse District entertainment zones sport exciting nightlife and live music, including the legendary House of Blues. For sports fans, the Indians will be at Progressive Field hosting the Seattle Mariners for a three game series during the conference, while LeBron James and the Cavaliers will likely be at the Q commencing their run to the 2016 NBA Finals. When the Tribe and the Cavs are both at home, the downtown area surrounding the Westin is alive with action.

In addition, significant infrastructure upgrades in preparation for the 2016 Republican National Convention signal a renaissance on the North Coast and solidify Cleveland as a provocative landing spot for our Conference.

We're very excited about the potential for this year's meeting, and we encourage you to align your calendars and confirm your plans to attend the most dynamic TOPCON in the events history.

See you in April!

*Marc Imbrogno*

Chair, SPE Thermoset Division Board of Directors

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Join us in Cleveland April 19-20,  
2016 for the annual Thermoset  
TOPCON

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# TOPCON TOPICS RANGE FROM LIGHTWEIGHTING TO LEADERSHIP

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**A**nchored by Keynote Speaker Lieutenant General John Sattler, the Division has assembled speaker/authorities in the precursor, resin, additive and compound spaces. In addition, experts from industry leading firms will deliver updates regarding advancements in both 'virtual' and 'actual' thermoset processing techniques. As always, technical topics will be complimented by contemporary application case studies and market development tutorials focused on the pursuit of profitable, organic growth. Sponsor supported exhibit sessions and our annual cocktail reception will provide educational and networking opportunities.

**A**s the proliferation of information regarding thermoset plastics technology is the charter of the SPE Thermoset division, the Division Board has decided to advance this initiative by offering free entry (to the conference, exhibits, meals and cocktail reception) to representatives of original equipment manufacturers (limit two per company). Core to the applied use and growth of this valuable technology is the specification of thermosets by those responsible for design, engineering and procurement. The Division welcomes qualified OEMs to attend these informative proceedings at no cost to their firm.

**I**n his 37-year military career, Lieutenant General Sattler has had a unique and invaluable mix of frontline tactical experience coupled with policymaking at the highest levels of the U.S. government. Before retiring, Lt. Gen Sattler's final assignment was as Director for Strategic Plans and Policy (J-5) for the Joint Chiefs of Staff where he regularly represented the Joint Staff at the National Security Council's Deputies' Meetings on the nation's toughest issues. As senior advisor to the country's highest level officials, Lt. Gen Sattler regularly provided advice on national security problems spanning the globe to the Chairman of the Joint Chiefs and the Secretary of Defense. He has broad experience with Congress and with the Chairman's foreign counterparts.

One of the nation's most respected Marines, Lt. Gen Sattler also served as Central Command's J-3 Operations Officer in 2003 and 2004 where he was responsible for the execution of the wars in Iraq and Afghanistan as the invasion of Iraq culminated and the Afghans held their first presidential elections. As the former Deputy Director of Operations Combating Terrorism at the Joint Staff, General Sattler was a key contributor to the development of U.S. counterterrorism policy and authorities before and after the attacks of September 11, 2001.

As one of the Armed Services' most experienced officers, Lt. Gen Sattler brings significant expertise in public affairs and in shaping information operations as the Marine Corps' former Director of Public Affairs. As the Marine Corps Congressional Liaison to the U.S. House of Representatives and former weapons acquisitions officer, he also brings a depth of knowledge regarding the acquisition and defense legislative processes. He currently is a sought-after public speaker on the subject of Leadership and security issues.

Operationally, Lt. Gen Sattler served in a host of junior leadership and staff positions ranging from platoon leader to tactics instructor to executive officer. His operational career culminated with commanding the U.S. Marine Corps Forces Central Command, the 1st Marine Expeditionary Force, and the 2nd Marine Division at Camp Lejeune, NC. Lt. Gen Sattler also commanded the Combined Joint Task Force, Horn of Africa where he began building his reputation as a Commander who "gets" the need for "soft power" and interagency cooperation. There he worked across the interagency and with numerous Embassy Country teams,



*Lieutenant General Sattler, TOPCON Keynote Speaker, will discuss Leadership*

as well as with a multitude of host governments in order to deliver effective humanitarian aid and security forces capacity in order to maintain stability in key African countries.

Lt. Gen Sattler received his commission in June 1971, following graduation from the United States Naval Academy, where he earned a Bachelor of Science degree in Economics. He was an honor graduate of the Marine Corps Command and Staff College and graduated from the Industrial College of the Armed Forces as well as the National Defense University.





IDI's materials were a perfect choice for Horton when they wanted to develop a superior blade to cool the engines of large vehicles.



## IDI INTERNATIONAL AND HORTON, INC. HIGH STRENGTH COMPOSITE FAN BLADE

IDI Composites International ([www.idicomposites.com](http://www.idicomposites.com)) partnered with Horton, Inc. ([www.hortonww.com](http://www.hortonww.com)) to produce a high-strength composite fan blade that excels at engine cooling in harsh environments. IDI Composites International is the premier global custom formulator and manufacturer of thermoset molding compounds for molders and OEMs providing customized polyester/vinylester-based bulk molding compounds (BMC) and sheet molding compounds (SMC) and a new line of Structural Thermoset Compounds™ (STC™) that are

manufactured in both sheet and bulk formats for the most demanding applications. Each IDI SMC and BMC is custom formulated to offer a wide array of performance characteristics including high performance and high-strength, heat and corrosion resistance, low to no shrink, UV stability, low smoke and flame spread and flame resistance.

IDI's materials were a perfect choice for Horton when they wanted to develop a superior fan blade to cool the engines of large vehicles and stationary

equipment for mining, construction and the oil and gas industries. The high-strength composite fan blade was designed to overcome limitations that metal fans run into with equipment operating in difficult environments.

Horton's computer-optimized blade designs allow for improved airflow performance and reduced noise, previously not achievable by stamped metal blade designs, are now possible to mold with a composite material. The material strength-to-weight ratio and durability allow high fan speeds in operating environments with vibration, dust, grime, corrosive elements and temperatures that range from frigid to scorching, and the material allows unmatched durability to reduce maintenance costs. The resulting fan performs more efficiently than current metal fans in the market, improving airflow performance, reducing noise and fuel consumption. The new blade designs are not limited to engine cooling, allowing for expansion into many aspects of airflow management in harsh environments, such as cooling towers or agricultural ventilation.

IDI Composites International and Horton Inc.'s HTEC (Horton Thermoset Engineered Composite) fan blades were nominees for the 2015 CAMX Awards for Composites Excellence (ACE) competition in the "Market Growth: Infinite Possibility for Market Growth" category. The ACE awards are a prestigious composites industry competition, recognizing outstanding achievement and innovation in technology, manufacturing and product development.

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# CONTINENTAL STRUCTURAL PLASTICS' TCA ULTRA LITE™ RECOGNIZED WITH UNSURPASSED INNOVATION AWARD

The 2015 CAMX Steering Committee has awarded Continental Structural Plastics (CSP) its Unsurpassed Innovation Award at the CAMX Expo in Dallas, Texas, for the company's innovative TCA Ultra Lite advanced composite material. This revolutionary, 1.2 specific gravity material offers as much as a 40 percent weight savings over standard density advanced composite materials. It is currently in production on the 2016 Chevrolet C7 Corvette.

"TCA Ultra Lite has been called 'a space age material' by our customers, because of the significant weight savings it offers while maintaining all of the surface and mechanical properties of our proven TCA material," said Frank Macher, chairman and CEO of Continental Structural Plastics. "This material provides car makers with a competitive alternative to aluminum as they seek ways to reduce vehicle weight and achieve CAFE standards."

The CAMX Unsurpassed Innovation Award recognizes the cutting-edge innovations that will significantly impact composites and advanced materials in the marketplace. The CAMX Steering Committee looks for visionary concepts and products that show strength through collaboration, while bridging low-cost materials/high-volume applications with

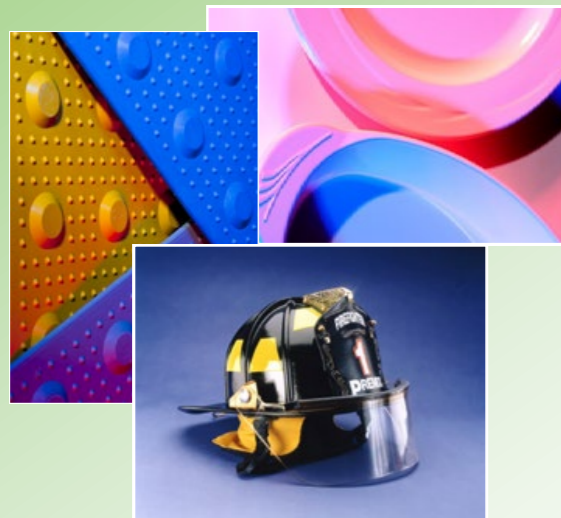
high performance applications/low-volume materials. The award was presented at the Opening General Session of the annual CAMX Expo.

## TCA Ultra Lite = Lighter, Stronger Parts

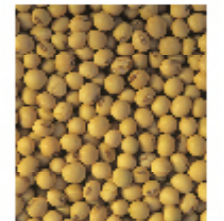
Because there is no degradation of mechanical properties, lighter parts molded with TCA Ultra Lite do not have to



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## “Depending on part design, it can be as light as aluminum.”

be made thicker, or incorporate structural reinforcements, to maintain the desired performance qualities. Specifically, Ultra Lite technology uses treated glass bubbles to replace Calcium Carbonate (CaCO<sub>3</sub>), allowing the resin to adhere to the matrix and increase the interfacial strength between the bubble and the resin. This is a patented treatment technology that results in a more robust resin mix that makes molded parts more resistant to handling damage, and prevents the micro-cracks that cause paint pops, pits and blistering.

The product also uses Owens Corning Advantex® glass technology which can be manufactured with lower environmental impact compared to other glass types. Glass reinforced polymers can have a lower global warming potential (GWP) than steel in the production and use phase for automotive applications such as body parts.

“By replacing the CaCO<sub>3</sub> filler with glass microspheres, and incorporating Owens Corning’s ME1975 roving glass fiber, we have achieved a lightweight composite material that is e-coat oven capable and offers a superior surface finish for Class A applications,” said Probir Guha, vice president, Research and Development for CSP. “Depending on part design, it can be as light as aluminum, and more cost effective. Replacing conventional materials like steel with lighter alternatives like TCA Ultra Lite decreases energy consumption and greenhouse gas emissions during vehicle use.”

TCA Ultra Lite offers automakers an opportunity to achieve a Class A finish with a material that is resistant to corrosion, dents and dings, ultimately providing the consumer with a vehicle that doesn’t rust, and won’t be subject to the scratches and dings that mar the surface of any vehicle panel made of metal. In addition, TCA Ultra Lite provides the benefits that come with using a composite over a metal, including significantly reduced tooling costs (50 percent or more, depending on production volumes) and the ability to achieve unique design cues such as deep draws that can’t be achieved with a stamped metal.

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*TCA Ultra Lite technology offers stronger, lighter parts. It was the material of choice for Corvette’s 2016 Stingray.*



# MAR-BAL PARTNERS WITH UNIVERSITY ECOCAR3 TEAMS

Virginia Tech (VT) students “invent the future” every day through research and creativity. The Hybrid Electric Vehicle Team of Virginia Tech (HEVT) is doing just that as they take on a four-year hybrid vehicle competition.

HEVT has been working on advancing vehicle technology since 1994. The team is currently comprised of around 50 undergraduate students who are competing in EcoCAR 3, a collegiate competition sponsored by General Motors and the U.S. Department of Energy.

Sixteen colleges are participating in the competition, with the goal to reengineer a 2016 Chevrolet Camaro to be more fuel-efficient,

all while maintaining aspects such as safety and performance.

EcoCAR 3 is split into four one-year phases, with a competition at the end of each phase. Currently, HEVT is in year two of the competition, the design phase. HEVT placed second at year one competition.

“The Year Two Competition is focused on the continuation of the engineering design process and the beginning of the vehicle build,” said William Dvorkin, HEVT EcoCar 3 project manager. “For us to score well this year, all components must be installed in our vehicle, and it needs to be able to safely operate with basic functionality.”

The competition gives VT students the opportunity to apply what they have learned in the classroom to a meaningful experience. Technical challenges and barriers due to limited experience are two of the obstacles HEVT has encountered.

“Being a leader on this team puts you at the heart of a fast-paced environment with tons of smart and hard-working students who are constantly trying to better themselves and this team, and you can’t stop it from rubbing off onto you,” Dvorkin said. “I can’t give enough credit to our undergraduate engineering students who balance their HEVT responsibilities with the rest of their schoolwork and lives outside of the classroom and lab.”

West Virginia University (WVU) is also participating in EcoCAR 3. HEVT is serving as a mentor to WVU, assisting with the technical standpoint of the project. However, each team has mutually assisted each other along the way.

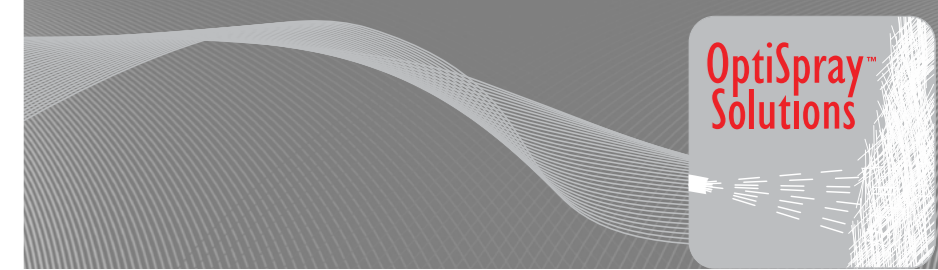
“Virginia Tech is a veteran of the EcoCAR competitions and their team has a lot of valuable experience,” said Chelsea Betts, WVU EcoCAR 3 communication manager. “As our mentor, they are always offering to help in any way that they can and they have a lot of great advice to give. It has been a wonderful experience working with them and learning from a team that wants us to succeed as well.”

Dr. Andrew Nix, a Virginia Tech alumnus, is WVU’s EcoCAR 3 academic advisor. Nix won the advisor of the year award in April 2015 for all EcoCAR 3 teams.

“Sometimes team members joke around with Dr. Nix and tell him that he has to choose a side and that it better be WVU,” said Garet Carden, WVU EcoCAR 3 development officer. “But all joking aside, that connection is what makes our teams so close. We don’t think of Virginia Tech as a rival in this competition because we are all in this together.”

Mar-Bal has sponsored both VT and WVU EcoCAR 3 teams, and has spoken to the WVU team to raise awareness about composites.

“The EcoCar 3 project represents one of our university outreach programs and we are very excited to be working with Virginia Tech



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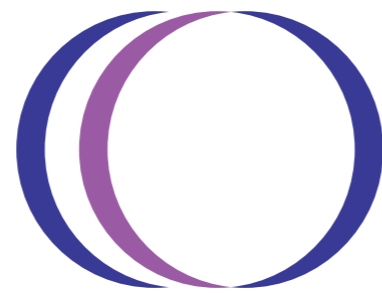
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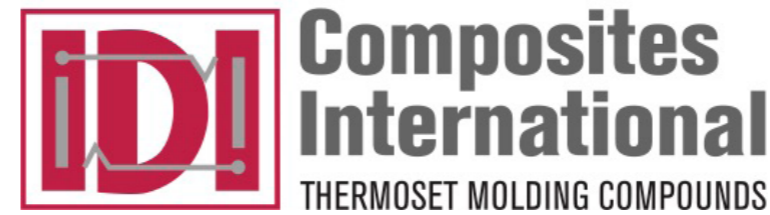
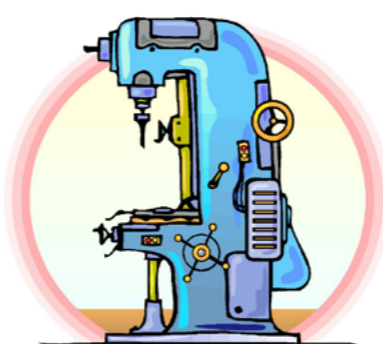


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