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San Antonio, TX

January 24-25, 2012

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Monday, January 23

Exhibitor Set Up

7:00 - 8:30 PM - Navarro, Pre-Function, *Ballroom Level*



Tuesday, January 24

7:30 AM	**REGISTRATION OPENS -** Navarro, Pre-Function, *Ballroom Level*
7:30	**BREAKFAST -** Navarro B**,** *Ballroom Level*
8:00	**INTRODUCTION FROM THE CHAIR ELECT -** Navarro A, *Len Nunnery, SPE Thermoset Division Chair Elect*
8:15 - 8:30	**OPENING COMMENTS -** *Jim Griffing, Boeing, President-Elect of SPE*

8:30 - 9:00 **Use of Composites for Improved Acoustic Performance Through Material Development, Component Design and Appliance Optimization**, *Kevin P. Casey and John Megyimori*, *Mar-Bal, Inc.*

Abstract: Today's consumers demand appliances which provide reliability, convenience, functionality, cost-effectiveness and in recent years, improved acoustic performance to reduce noise levels for comfort. Product Managers and Design Engineers continue to seek new engineering materials which are best suited to fulfill their appliance performance requirements to acoustically manage both the structure-borne and airborne sources. By evaluating various engineering material attributes, component level design and appliance optimization alternatives, reduced noise levels can be obtained at specific operating frequencies and overall appliance sound levels. This paper presents the process of identification of the sources of appliance noise and the use of Bulk Molding Compound (BMC) to optimize acoustic performance resulting in lower noise levels.

BIO - *John Megyimori – Program Manager, Engineering:* John has been in the plastics industry for over 12 years. He has been with Mar-Bal for over 8 years, starting in the Quality Department and then moving to the Engineering department. His knowledge in Quality, Engineering and Manufacturing have helped customers streamline designs and mold structurally sound, designed parts. He recently finished a 2 year assignment as Quality Manager of the Ohio Plant and has returned to Project Engineering. John has been instrumental in Mar-Bal's ISO 9001:2008 Quality Registration.

BIO - *Kevin Casey - Vice-President, Sales and Marketing*: Kevin is responsible for all sales personnel and new business development activities. He drives business growth through the use of innovative and creative marketing programs, so as to meet the changing market and competitive conditions. Kevin has over two decades of sales and marketing experience, leading sales teams at both Sika Automotive and Premix, Inc. Mr. Casey was formerly the Vice-President of Sales and Marketing at both companies. Kevin holds a Bachelor's Degree in Business Administration from The Ohio State University.

9:00 - 9:30 **Continuing the Development of Reduced Density Thermoset Composites (SMC) for Automotive Applications**, *Ian Fellows, Market Manager-Automotive, Core Molding Technologies*

Abstract - In July the government and automakers settled on the new Corporate Average Fuel Economy regulations that will begin to take effect in 2017 and eventually raise the CAFE standard to 54.5 mpg by 2025. The need for lighter weight vehicles that these changes will drive along with the continued development of hybrid and electric vehicles should provide a unique opportunity for composite products.

To meet the unique challenges of this opportunity the composites industry will need to develop materials that will meet or exceed the physical property, dimensional, and appearance standards of the materials that they will be replacing. The material development program provided within will be one example on how this can be accomplished without the use of certain materials that have been traditionally used in the past.

This presentation will include:

- An overview of the current market situation including a brief history of weight reduction initiatives in the industry
- Benefits of lighter weight thermoset materials in automotive applications
- Review of a material development program specifically focused on:
  - Improving stiffness to weight ratio
  - Lower density without using any hollow fillers / spheres which can potentially cause issues in customers finishing lines or increase the risk of water absorption in field applications
  - Employing as much as 25% reduction in molding pressure – resulting in less wear & tear of molding machines, seals and hydraulic systems
- A review of future opportunities of thermoset composites in this specific market place

BIO: Ian Fellows is the Market Manager responsible for CORE's sales initiatives with composite materials in the Automotive Market. He had more than 15 years of

experience working with engineered materials such automotive glass, metals, and ceramics before starting at CORE in 2011. Ian has a Bachelor's Degree from Xavier University and a MBA from Capital University in Columbus, Ohio.

9:30 - 10:00 **BREAK - Exhibits Open,** *Navarro Pre-Function, Ballroom Level*

10:00 - 10:30 **(HP-CRTM) FAST CYCLING AUTOMATED PROCESS SOLUTION,** *Christian Fais, General Sales/Project Manager, Dieffenbacher, North America*

Abstract: The presentation gives an overview regarding the latest state in High Pressure Resin Transfer Molding (HP-CRTM) for automotive large scale production in light weight applications. Dieffenbacher has extensively mutually developed the process for a turn-key production line, from the unrolling of the fabrics to the machining of the finished part. This new HP-CRTM line is targeting the market for the mass production of CF parts mainly for the automotive industry.

BIO: *Christian Fais* has worked for Dieffenbacher since 2006 and currently holds the position of the General Sales and Project Manager in Forming. He is responsible for the North American Region in Sales, Marketing and New Business Development. His vast knowledge and working experience, covers all aspects in Sales, Technical Customer Support and Project Management.

10:30 - 11:30 **High Volume Preforming for Structural Composites,** *Dan Buckley*

Abstract: Dan Buckley, Manager of R&D for American GFM will present information on how to preform Engineering Fabrics to near net shape and subsequent 3D trimming of preforms to net shape. It will be shown that various cores and inserts can be included in the preform at high volume capable rates. Preforming of engineering fabrics using the CompForm light cure process for Fiberglass and the CompForm Anaerobic process for Carbon Fiber will be shown along with numerous pictures of equipment, tooling and applications. Emphasis will be on high volume capable preforming processes with

discussion on reinforcing materials, design, volume, and cost considerations. Conformability issues with mats and Engineering fabrics will be discussed with pictures that demonstrate the conformability issues with using structural engineering fabrics and other materials. Selective curing, Energetic Stitching, sub-assembly preforms, true net shape preforms and the inclusion of inserts and core materials will be explained with applications and pictures.

BIO: *Dan Buckley* is the Manager of Corporate Research & Development for American GFM/GFM. Dan has 40+ years experience in Composites, Plastics and related fields. Dan has a BS in Chemistry from the University of Massachusetts and is the author of more than 75 technical papers for Domestic and International publication. Dan has been an educational speaker at numerous Universities, Corporations and technical conferences, worldwide. Dan has numerous patents in composites processing and related fields as well as patents currently in application.

Dan is currently responsible for developing technology in the manufacturing of Single Wall Carbon Nanotubes, developing technology in the high speed manufacturing of PEM fuel cell and DMFC components and developing new process technology for the preforming of fiberglass, carbon fiber and other reinforcement materials. He is a co-founder of the Composites Division of SPE, founder of the Nano/Micro Molding SIG, past Chair of both the Composites Div. and the Thermoset Div. He served 5 terms as a councilor for SPE and is an Honored Service Member of SPE.

11:30 - 12:00 **The Art and Technology of Controlling Alkaline Earth Oxide Thickeners,** *Cheryl Ludwig, Plasticolors*

Abstract: Extensive, almost limitless, lists of raw material choices are available for consideration when formulating a sheet molding compound (SMC). The choices and variations allow for an infinite number of potential formulas designed to meet compound processing parameters and final part requirements. One commonality necessary for successful compounding and molding of SMC is a predictable and reliable rheology profile. Consistent viscosity build is necessary to allow consistent paste delivery / mat weight control, wetting of reinforcements, liquid phase stabilization, proper packaging, acceptable sheet handling for the molding process and appropriate viscoelastic

characteristics for mold fill resulting in consistent, acceptable moldings. As SMC applications become more challenging, as regulations become more restrictive and as customers' expectations for tighter tolerances and more consistent product increase, the Formulator and Processor need to become more creative. To support the changing chemistries and demanding requirements in SMC processing, Plasticolors' understanding of the thickening process and advanced testing capabilities allow for expanded design of appropriate thickeners to meet the industries needs.

BIO: *Cheryl Ludwig* is currently a Thermoset Process Development Specialist at Plasticolors, Inc. For the past 7 years Cheryl has been employed at Plasticolors developing and supporting additives for the reinforced thermoset industry with emphasis on thickening control of SMC. Prior to Plasticolors, Cheryl was employed for 30 years at Premix, Inc. During her tenure at Premix she held numerous positions in Technical including Product Development Chemist for a SMC / BMC. Cheryl has a BS in Chemistry from Lake Erie College.

12:00 - 1:00 **LUNCH -** Navarro B**,** *Ballroom Level*

1:00 - 1:30 **Multifunctional Composites - Electrical, Thermal and Mechanical Behavior**
David Hartman and Scott Schweiger, Owens Corning Composites Solutions Business

Abstract: Recent advances in carbon enhanced reinforcements have focused on delivering multifunctional composites with enhanced thermal and electrical conductivity combined with the utility of injection molded composites. This presentation reviews the multifunctional characteristics of these hybrid composites and application of these materials to automotive and consumer electronics for commercialization.

BIO: *David Hartman* is a senior research associate for the Composite Solutions Business of Owens Corning. He received his M.S. Degree from Materials Science and Engineering at the Georgia Institute of Technology. Dave has served with material and design expertise in the development, qualification and specification of glass and carbon fiber products for manufacturers and end users of composite materials in the wind energy, construction, transportation, electronic, armor, aerospace and defense market segments. Recent work has focused on integration of multiple functions within

composite engineering solutions using conventional materials and new hybrid carbon nano-structures. He has over 50 publications in the composite material technical literature and holds 21 patents. Dave has served several industrial and university advisory boards including the CERF, UOM-R, SAMPE, BRITE EURAM, Massachusetts Institute of Technology House-n, Georgia Institute of Technology MSE, and the National Composites Center.

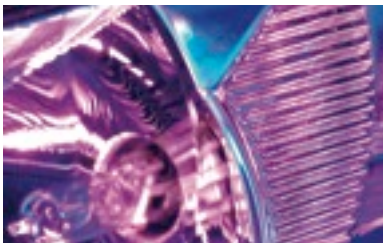
BIO: *Scott Schweiger* is a senior scientist and program manager for the Composite Solutions Business of Owens Corning. He received his Ph.D. in Organometallic Chemistry from Purdue University. Scott has worked on a range of fiberglass reinforcement applications using high performance fibers, fabrics, and non-wovens. This work has included surface finish chemistry and material process interactions in composites. Recent work has focused on integration of multiple functions within composite engineering solutions using new hybrid carbon nano-structures.

1:30 - 2:00 **Low Fire, Smoke and Toxicity SMC and BMC Using Novel Latent Catalyst Activated Phenolic Resins** - Dr. Graham Murray, CTO, Bac2 Conductive Composites, Romsey, United Kingdom

Abstract*:* Bulk and sheet molding compounds today are predominantly polyester based due to the cost and processability of the resins. Despite their superior fire properties, phenolic resole based BMC and SMC products are not so commonplace due to poor storage and processing. Bac2 Ltd has developed novel latent acid catalysts for use in the production of resole based bulk molding and sheet molding compounds with low fire smoke and toxicity values. The latent catalyst allows storage stable moulding compounds to be produced containing highly reactive phenolic resole based polymer binders. The catalysts, pre-fixed CSR, enable molding compounds containing resin, latent catalyst and filler to be mixed, packaged, shipped and stored ready for use for up to 6 months. Mechanical and fire properties are excellent for the newly developed phenolic moulded parts. The main challenge is to demonstrate to the com-posite industry that a phenolic option for storage stable BMC, SMC and other composite forms are available and can produce mechanically strong, fire safe products for many applications.

BIO: *Dr. Graham Murray* is the Founder and CTO of Bac2 Ltd. Graham was born in Edinburgh, Scotland and has over 20 years experience working in manufacturing industry in technical and management roles, supporting the European business of a large polymer company. His PhD was obtained researching the mechanism of a novel phenolic resin polymerization reaction. Much of his time in industry was spent developing products based on the novel polymer technology. In 2002, Graham formed Bac2 with the aim of developing phenolic based products in cleantech applications, including fuel cells, batteries and renewables.





2:00 - 2:30 **Thermoset Materials in Automotive Forward Lighting: Threats and Opportunities,**
James E. Johnson, Principal Engineer in R&D, Materials and Process Development, Valeo (Automotive Lighting)

Abstract: The paper will present the technical background of material choices for headlight reflectors and various components in current systems. Mechanical and thermal simulations will be covered as they relate to material choices. The shift from Halogen to HID and now LED, and potential of laser use in the future, will be covered in a Strengths, Weaknesses, Opportunities and Threats (SWOT) format as related to material choices compared to BMC. Background of wavelengths outputs, dimensional stability and other technologies that must be understood and addressed as changes occur in this large automotive market segment. A summary will look at these near future technologies and the hurdles that might open up different material choices and components than those used today if they become common place.

BIO: *Jim Johnson* is a Principal Engineer in Advanced Engineering/R&D with Valeo-Sylvania, an automotive lighting supplier. He received his BS in Mechanical Engineering

Technology from Purdue University. He has 25 years of thermoset experience in formulations, processing, tooling, technical field support and sales/marketing. He has 12 years experience in automotive lighting in both thermoplastic and thermoset fields in market development and Tier 1 Materials R&D. Jim is the Vice-Chairman of the Materials Standards Committee for SAE's International Lighting Committee where he also sits on the steering committee. He is the SAE Task Force Chairman and new document sponsor to determine testing protocol for life testing for materials exposed to LED light sources and for the rewrite of a current document, J1647 for HID light sources. These documents make up the backbone of FMVSS108, Federal Motor Vehicle Regulations for automotive lighting.

2:30 - 3:00 **BREAK - Exhibits Open,** *Navarro Pre-Function, Ballroom Level*

3:00 - 3:30 **Thermosetting Plastics with Moldflow Simulation,** *Matthew Jaworski, Solutions Engineer, Autodesk for Moldflow Simulation*

Abstract: Autodesk Moldflow Insight software allows customers to simulate thermoset injection molding, RIM/SRIM, resin transfer molding, microchip and underfill encapsulation, reactive injection-compression molding, multiple-barrel reactive molding, and rubber compound injection molding processes. This presentation will review the latest capabilities of the software and reveal how companies are using digital prototyping to design and optimize their plastic parts earlier in the design to manufacturing cycle when the cost of change is least.

BIO: *Matt Jaworski* is a Technical Specialist for Autodesk's Manufacturing Simulation Team. He has over 16 years experience in the injection molding CAE simulation field working for such companies as Hewlett Packard, Rubbermaid and Moldflow/Autodesk. He has dual BS degrees in Mechanical and Plastics Engineering Technology from Penn State, a MS in Plastics Engineering from UMass Lowell and is currently finishing his Ph. D. at UMass Lowell in Plastics Engineering. Matt is also active in education and has taught at the University of Massachusetts Lowell and Penn State Erie, The Behrend College as an adjunct professor.

3:30 - 4:00 **Long Fiber Thermoset Composites for Medium and Large Scale Manufacturing,** *Dr. Frank Henning, Tobias Potyra, Jan Kuppinger, Fraunhofer Institut, Germany*

Abstract: The presentation will give an overview about the latest state of the art in long fiber PUR spraying – giving an example of the manufacturing of a train component sandwich structure. The presentation will highlight the process technology and the concept of the part design. Second part of the presentation will be an update on the direct SMC Technology offering tailor-made formulation opportunities. The process technology will be introduced and the crucial steps for improvement of the process as well as future opportunities will be highlighted.

BIO: *Dr. Frank Henning* **-** Dr. Henning is Managing Director of Fraunhofer Project Center at the University of Western Ontario, London, Canada. He holds a Doctoral degree (Dr. -Ing) from Composites, Universitat Stutgart, Germany, as well as a Diploma in Mechanical Engineering from the same. In 2010 he was appointed as Adjunct Research Professor in the Department of Mechanical Materials Engineering, Faculty of Engineering of the University of Western Ontario, London, Canada. He has held position of Professor for Light-Weight Technologies at Karlsruhe Institute of Technology in Germany as well as CEO of Franhofer Innovaton Cluster KITe hyLITE - for Karlsruhe Innovation Cluster for Hybrid Light-Weight Solutions. In 2005 he was the Director of Competence Centre for Automotive Light-Weight Solutions.

BIO: *Tobias Potyra* **-** From year 2000 on Tobias Potyra studied Material Science at the University of Bayreuth, Germany, where he focused on polymers and polymeric composites. After graduating in 2005 he joined the Fraunhofer Institute for Chemical Technology as researcher and PhD candidate. His research field are thermoset polymers, where focuses on Sheet Moulding Compound. His main work is material and process development especially in the field of Direct SMC as well as conventional SMC.

Since 2007 Tobias is responsible for all SMC activities within Fraunhofer ICT and has been a member of the steering committee of the European Alliance for SMC/BMC. Tobias was the recipient of the 2008 ACCE's ***SPE Automotive Composites Conference & Exhibition*** scholarship for his work "**New direct processing technology for the manufacturing of SMC parts: Direct- SMC"**. Since 2011 he has been group leader of the Canada group at Fraunhofer ICT. He relocated to London, ON, in November 2012. Tobias is Manager of Operations at the Fraunhofer Project Centre for Composite Research at The University of Western Ontario (FPC@Western).

4:00 - 4:45 **Development of a Structural Composite Automotive Underbody,** *Libby Berger, General Motors R&D Center*

Abstract: A structural composite underbody capable of carrying crash loads has been designed, fabricated, assembled into a structure, and tested by the Automotive Composites Consortium. The underbody is compression molded of sheet molding compound (SMC), with a vinyl ester matrix and predominately glass fabric reinforcement, with some chopped glass. CAE-based design methodologies were utilized to assess the structural stiffness and impact performance of the initial composite under body design. Weld bonding was selected as the means to join the composite under body to the steel passenger compartment. A method for weld bonding the structural composite has been developed and tested in static and dynamic modes. The molded underbody was tested in modal, bending and torsion. The underbody was assembled into a structure mimicking an automotive body-in-white, and tested to simulate an offset deformable barrier crash. The Automotive Composites Consortium is a joint program between GM, Ford, Chrysler, and the United States Department of Energy.

BIO: *Libby Berger* has a BA in chemistry from the University of Kansas, and a PhD in physical chemistry from the Pennsylvania State University, where she studied quasi-elastic laser light scattering. She began her career with Owens Corning Fiberglas, working on sizing emulsions and fiber/matrix interface properties, then moved to General Motors in 1985. At GM, she has worked at Research and Development on adhesives and structural composites, including fiber/matrix interactions, preforming, molding, and characterization of both carbon fiber and glass fiber composites. The projects she has been able to contribute to include the Silverado composite truck box and the carbon fiber Corvette hood. Since 2000, she has been very involved in the Automotive Composites Consortium, working with the Focal Project 3 all-carbon body-in-white, and currently the Focal Project 4 Structural Composite Underbody.

4:45 - 5:15 **New Bulk Molding Compound Developments for Automotive Powertrain and Electrical Applications,** *Jim Cederstrom, BMCI*

Abstract: Bulk-molding compound has been used in underhood and automotive electrical applications ranging from engine sealing, to electric motor components, to

forward lighting for many years. New CAFÉ and EURO emissions rules are driving fundamental vehicle architecture changes which translate into new needs and opportunities in both areas in terms of composite materials. BMCI will present recent material developments and enhancements with unsatured polyester bulk molding compound composites for current and future powertrain and electrical applications.

BIO: *Jim Cederstrom* is the Automotive Business Development Manager for Bulk Molding Compounds, Inc (BMCI) headquartered in West Chicago, IL, and is responsible for automotive marketing and new application development initiatives for BMC thermoset composites. His background includes over 18 years of new product development and commercialization in the automotive industry primarily in the area of polymer composites in powertrain systems such as air intake systems, engine sealing modules, engine cooling and fuel management systems. Prior to joining BMCI he has held positions with Denso Corporation, Mann+Hummel Automotive, and Dow Chemical. He holds a BS in Mechanical Engineering from Western Michigan University.

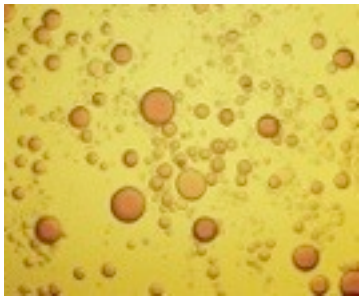
5:30 - 7:30 **EXHIBITOR RECEPTION -** Navarro Pre-Function**,** *Ballroom Level.*
Cocktails and hors d'oeuvres will be served.

Wednesday, January 25

7:30 AM **REGISTRATION OPENS -** Navarro, Pre-Function, *Ballroom Level*

7:30 **BREAKFAST -** Navarro B**,** *Ballroom Level*

8:00 **KEYNOTE INTRODUCTION -** *Rick Faulk, New Market Development Manager, BMCI*



8:10 - 9:00 **KEYNOTE SPEAKER:** ***Opportunities for Thermoset Materials in Electric Vehicle and Smart Meter Applications*** **-** *Karen Dubiel, Underwriters Laboratories, Inc.*

Abstract: Underwriters Laboratories Inc. has been a leader in Standards development for 118 years. As technology changes, UL works with manufacturers, government agencies, trade organizations, and other interested parties to develop programs that evaluate the safety of a product, and, in many cases, the performance of that product. When the government encouraged the use of bio-fuels in automobiles, UL worked with gasoline dispenser manufacturers to investigate and resolve the challenges of using these new fuels with existing polymeric components. Other new industries that UL is working with include: alternative power sources, such as photovoltaics and wind turbines; electric vehicles; and Smart Grid / Perfect Power.

UL has been actively involved in the development of Safety Standards for Electric Vehicle components since the 1990s. Recently there has been much growth in this area, especially related to charging system infrastructure. There have been fires related to the use of these systems by consumers, and the materials used in their construction are now being more closely evaluated. Smart meters are now being included in the charging mechanisms for electric vehicles, and also have greater application in whole-house energy management. This presentation will provide an overview of current and proposed requirements related to electric vehicle charging systems and wiring, and smart meters. It will also focus on the role that polymeric materials play in these applications, and how manufacturers can develop and evaluate materials that will meet the requirements outlined for these products.

BIO: *Karen Dubiel* is a Lead Engineering Instructor with Underwriters Laboratories Inc. She received an MS degree in Mechanical Engineering with an emphasis in polymers from Milwaukee School of Engineering. In her 21 years with UL, she has worked as an engineer evaluating polymeric materials to various UL Standards; conducted polymer-related research projects in Corporate Research; and currently creates and delivers technical training in these areas.

9:00 - 9:30 **High Temperature Performance and High Mechanical Strength Composite Material Development,** *Li Bradshaw, George Lin, Alfredo Guzman and Steven Balogh Mar-Bal Inc., Bill Carroll, Reichhold Industries, Inc.*

Abstract: As potential applications for new materials continue to push the performance envelope, off-the-shelf solutions often are unable to meet new and stringent requirements. To step up to a new level of performance often demands intensive experimentation by scientific methods and inter-disciplinary cooperation. This paper illustrates the development process of high temperature and high mechanical strength composite materials through effective use of design of experiments to optimize BMC formulations and close collaboration with the resin supplier to give robust resin manufacturing process. The resulting material successfully replaced the current material in demanding locomotive braking applications of up to 300ºC with much better thermal longevity and structural integrity. The BMC product was found to be superior in performance and lower cost than phenolic and high temperature SMC materials.

BIO - *Dr. Li G. Bradshaw* is a Senior Materials Chemist with Mar-Bal Inc. She received her Ph.D. degree in Chemistry from the University of Akron in 1996. Dr. Bradshaw has 15 years of thermoset composite experience in materials development, analyses and product quality improvement. She is a certified Six Sigma Master Black Belt by Whirl pool and instructs Black Belt Operational Excellence Classes at Mar-Bal Inc.

BIO - *George S. Lin* is a Senior Materials Engineer with Mar-Bal Inc. He received a B.S. degree in Polymer Technology from Nanjing Institute of Chemical Technology, China in 1982 and an M.S. degree in Chemical Engineering from West Virginia Institute of Technology in

1991. He has been with Mar-Bal Incorporated since 1991. He is a Six Sigma black belt.

Alfredo Guzman Jr. has been with Mar-Bal Inc. since 2000. He is a Materials Technician for the last 5 years. He has the experiences making BMC mixes, molding and testing of material properties. Prior to this Alfredo was working in the manufacturer mixing, extruding, supervising and training new operators.

Steven Balogh, Vice-President, Mar-Bal, Inc. Steven has responsibility for materials re search and development, procurement, and supplier chain management. He oversees Mar-Bal's state of the art Research and Development Center and has led the pioneering efforts to introduce innovative Thermoset plastic materials which have resulted in higher quality and lower costs for Mar-Bal's customers. Since he started with Mar-Bal, Inc. in 1993, his focus on the development of new materials and production techniques for Mar-Bal's Bulk Molded Compounds (BMC) has enabled the company to support a compound sales growth rate of over 10 percent. He is a Six Sigma black belt.

Bill Carroll is a Chemist Associate with Reichhold, Inc. He received an MS degree in Polymer Science from Case Western Reserve University. He has 35 years of experience in the development and application of composite materials. He has been with Reichhold for eleven years.



9:30 - 10:00 **Collaborative Working Within the Thermoset Market,** *Andrew Sanders, Sumitomo Bakelite North America, Inc.*

Abstract: Composites are entering a new age. Some markets are now opening up that where typically closed to composites due to cost or scale up issues- volume Automotive/Aerospace applications are examples. The whole composite arena is in the process of being redefined. The thermoset industry has to maintain and redefine our

core competencies in the face of this threat from thermoplastic and advanced processes. This paper aims to discuss ideas on how collaborative working can help counter this threat. It is in all of our interests to jointly 'ring fence' a portion of the market(s) that only thermoset can service. There is a very defined fit for thermoset materials (especially price vs. performance when compared to high end TP) and we need to reestablish this position as an industry rather than as individual companies. This will require the thermoset industry to work in collaboration to meet the needs of these markets and we need to be prepared to operate beyond the normal boundaries as individual companies. This paper hopes to provoke this discussion and working practices.

BIO: *Andrew Sanders* has worked in the Automotive Industry for the last 33 years in most areas of the vehicle design, development and manufacture. This has been supplemented by diversifying into the Aerospace and Oil and Gas industries for the last 5 years. Andrew spent the first 16 years of his career at Ford Motor Co. followed by 17 years in the plastics and composites industry. Companies included GE Plastics (Sabic) Owens Corning and currently Sumitomo Bakelite North America Inc. Andrew's current role is Corporate Marketing covering Automotive, Oil and Gas and Aerospace industries, for both resins and compounds. He holds a BEng (Hons) in Mechanical Engineering from the University or Hertfordshire UK.

10:00 - 10:30 **'FRP in the International Building Code',** *Dr. Nicholas A Dembsey PhD, PE, FSFPE,* Professor, Fire Protection Engineering, WPI

Abstract: As the building construction industry in the USA continues to evolve to ad dress modern needs and requirements, this vast industry offers great potential for FRP based applications. However, historically FRP has not been considered one of the typical building materials such steel, concrete and wood. Given this it is not surprising that the prescriptive building code has not included FRP as a typical material. This situation creates a barrier to FRP use for a range of architectural and structural applications in buildings as FRP can only be considered in an ad hoc fashion. To rectify this situation, a team from ACMA proposed changes to the International Building Code (IBC) to explicitly include FRP as a material and identify requirements for various architectural applications. The proposed changes were first accepted in the current 2009 Edition of the IBC. Additional changes have been accepted for the next edition of

the IBC in 2012. This presentation will detail the FRP sections of the IBC and the related requirements as well as provide general guidance for meeting the test requirements of the IBC.

BIO: Nicholas Dembsey is a Full Professor of Fire Protection Engineering at Worcester Polytechnic Institute as well as a Professional Engineer and a Fellow of the Society of Fire Protection Engineers. He has been involved in fire dynamics, and fire and materials teaching, scholarship and research over the last 25 years. His primary scholarship and research interests involve studying the pyrolysis of solid phase materials such as FRPs under fire conditions and how this behavior relates to flame spread and fire growth. His work focuses on fundamental understanding as well as development of analytical tools for use by practitioners. His service involves working with organizations such as the Society of Fire Protection Engineers, the International Association for Fire Safety Science, and the American Composites Manufacturers Association as well being an editorial board member of Fire Technology and Fire and Materials journals.

10:30 - 11:00 **BREAK - Exhibits Open,** *Navarro Pre-Function, Ballroom Level*

11:00 - 11:30 **Novel Low Flame, Low Smoke, Thermoset Composite Sheet Molding Compounds and Their Integration into Residential HVAC Applications**, *Marc Imbrogno, The Composites Group*

Abstract: Thermoset composites are routinely specified in applications where flame retardant material performance is required. However some applications have been out of reach due to stringent flame spread and smoke developed criteria. Specific to the HVAC industry, a critical performance standard – "STANDARD FOR SAFETY OF HEATING & COOLING PRODUCTS: UL 1995" – has presented limitations relative to the expanded use of contemporary thermoset SMC technology.

Within this standard a certain requirement has been particularly problematic; this being the requirement for a combustible material to demonstrate a Flame Spread Index (FSI) < 25 and a Smoke Developed Index (SDI) < 50 (subject to UL 723) if more than 10 ft2 is present in the airstream while in proximity to an ignition source. Until recently, formulation pathways to achieve these criteria have been limited due to rheological barriers which rendered reliable compounding and effective molding infeasible.

The development of Premi-Glas® 2550B-CR-SX embodies a combination of unique raw materials and a novel formulation approach which delivers a compoundable, moldable, low flame, low smoke thermoset composite material compliant with requirements of UL 1995. Its development has enabled more widespread use in HVAC products, has allowed for more creativity in the development process, and has contributed to a paradigm shift in residential HVAC product design.

BIO - Marc Imbrogno is a Business Development Manager at Premix, Inc., a unit of The Composites Group. Premix is an industry leader in the development and manufacture of fiber-reinforced thermoset composite molding compounds and custom molded parts. He currently participates in market research, business development, and technology planning activities.

Marc has been a member of the Premix team for over twelve (12) years, during which he has managed customers across all platform and secondary markets which Premix serves. In addition he's managed Aero-defense Tier 1 and Tier 2 customers for Premix's wholly-owned subsidiary, Quantum Composites.

Prior to joining Premix, Marc served in technical and business development capacities at BASF, a global leader in chemical and polymer technology for the construction industry. His primary focus was in the development and commercialization of fiber-reinforced strengthening systems for infrastructure.

Marc holds a BS in Chemistry from the University of Akron and has over twenty (20) years experience in the thermoset industry. Throughout his career he has contributed to various composite industry trade journals and has presented at over twenty domestic and international technical conferences.

11:30 - 12:00 **3D Printed Prototype Molds in Two Days'**, *Gary Bailey, Xlaform*

Abstract: Molders, molding compound manufacturers and OEMs have been limited in ways to present the advantages of their plastic products because of the cost and time constraints necessary to produce a prototype part made from their material. The industry has been limited to data sheets and molded plaques as the only way to present a competitive product. Xlaform has developed a process for infusing 3D printed parts so that they exhibit enough strength to be used as prototype molding cavities. The process

allows a cavity and core to be printed and infused with a THERMOSET resin for hundreds of dollars, taking days, as opposed to thousands of dollars and weeks or months with the conventional method. This allows the molder, molding compound supplier or OEM to produce a small number of parts molded from their material; then to present the actual part to the customer suggesting, “Take the line and see how it works”.

12:00 - 12:30 **Styrene and Advocacy Efforts on Behalf of the Composites Industry,**
John Schweitzer, ACMA Director of Government Affairs

Abstract: Potential styrene health effects have received a lot of attention recently - both by regulatory agencies and industry health scientists. This paper will review the science on styrene toxicity, regulatory status, and industry efforts to encourage sound science and responsible stewardship.

BIO: Since 1989, John Schweitzer has managed regulatory and legislative affairs for the composites industry. Major programs managed during this period include the EPA MACT standard for composite manufacturing, adoption of the voluntary styrene worker exposure limit, promulgation of the UEF emission factor program, and development of styrene hazard assessment and risk communications. From 1979 to 1989, John managed R&D and manufacturing operations for plastic manufacturing companies.

12:30 - 12:45 **CLOSING COMMENTS**, *Jeff Schumm, SPE Thermoset Division Chair*