

Automotive Plastics News

Today, Tomorrow - Together

June 2004 Volume 33, Issue 4

Fast and Furious 2004



By Suzanne Cole,
Innovation Awards Program Chairman

This year's 2004 Innovation Awards Gala is guaranteed to be a spectacular event! We recently confirmed our Executive Leadership and Lifetime Achievement Award Recipients. The two executives are extremely deserving, hard hitting leaders who stand out within the global automotive industry as "All Stars". Due to the expansion of our program and judging portfolio to include aftermarket performance and customization products, space is extremely limited and nominations have begun to flow in, so now is the time to act. To request a nominations form via email, please contact Pat Levine at the SPE office in Troy at 248.244.8993.

Event Date Finalized

The black tie gala event will be held at Burton Manor in Livonia, Michigan on Wednesday November 10, 2004. In today's frantic auto industry, pressure is on the entire supply chain to innovate faster, design faster, launch faster and produce faster with furious attention paid to price and quality in a race to sell more vehicles worldwide. Our theme for the 2004 Innovation Awards Gala is "Fast and Furious". The event will feature performance and customized vehicles

SPE Leadership Awards Announced

Jim Padilla - Ford Motor Company

Tom Moore - DaimlerChrysler (Retired)

See page 8 for more information

displaying the latest technologies and materials as well as cutting edge commercial footage from automakers' latest vehicle introductions. With the overwhelming response we are receiving already, we expect this year to be a record setting event for nominations, product, sponsorship and attendance. Now is the time to think about your nominations and to begin the process - you can always submit your nominations early!

New Judging Category

New this year is the Performance/Customization category, which is intended to enable solicitation of nominations for aftermarket components, which are extremely plastics intensive as well as cutting edge. We are receiving tremendous response to the Performance/Customization category so submit your nomination early this year.

Continued page 8

◆ Automotive Division Calendar	Page 2	◆ Innovation Awards Program	Page 1
◆ Automotive Composites Conference	Page 5	◆ Golf Outing	Page 11
◆ Chairman's Message	Page 3	◆ Inter-Society Report	Page 7
◆ Councilor's Corner	Page 6	◆ Treasurers Report	Page 2

Treasurer's Report

Stuart C. Cohen

The current assets of the Division are \$76,008

We have received \$21,000 in sponsorships for the 2004 Composites Conference (ACCE) and our expenses to date (advertising, PR and MSU deposit) for this event are \$21,093.

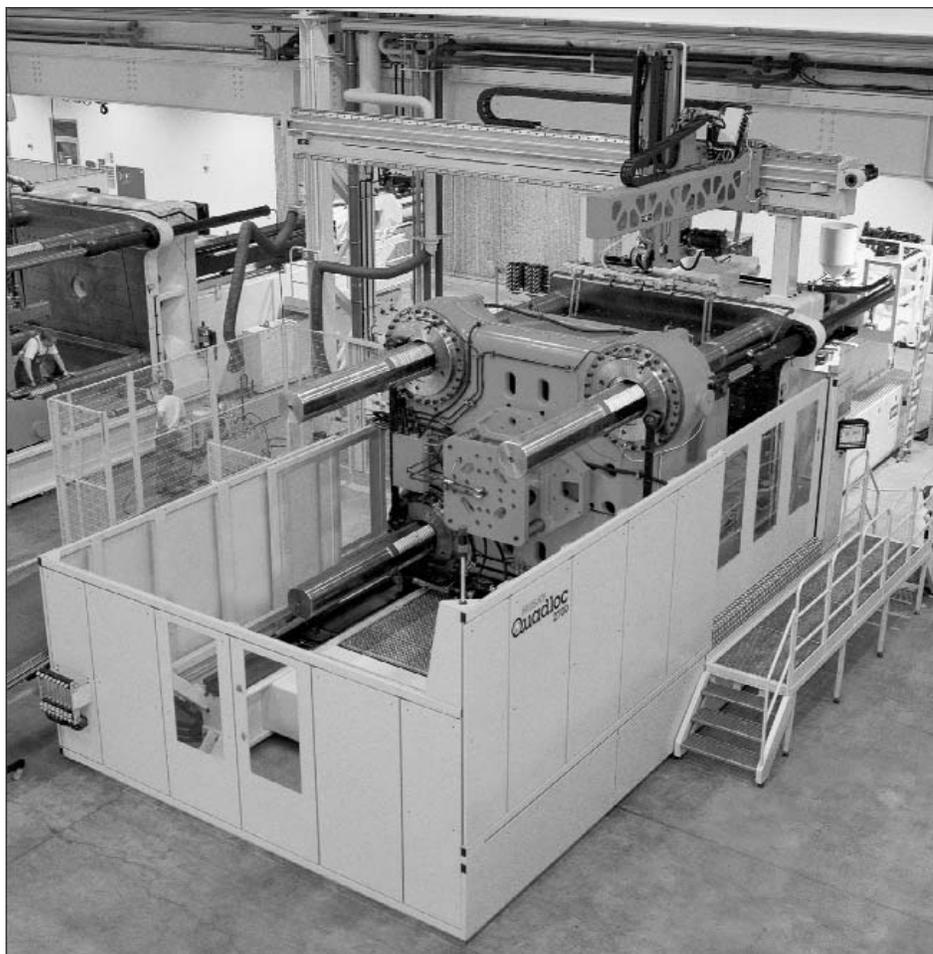
Other major expenses since the last Newsletter have included advanced costs for the 2004 Awards Banquet (\$6,000), 2003 Awards display at APC (\$6,000), SPE International Education Award (\$2,500) and website related costs (\$4,950).

The award winning Newsletter has reduced our assets this fiscal year due to costs of \$20,028 for 4 issues compared to \$15,556 for 3 issues during the previous fiscal year. Income from advertisements has totaled \$13,495 compared to \$23,480, although the latter did include back payments from some companies for advertisements placed in prior Newsletters.

Automotive Division Meeting Schedule and Special Events Calendar

July 26th, 2004 Dunham Hills	Automotive Division Golf Outing
September 14-16, 2004 MSU Management Center Troy, MI	Automotive Composites Conference
September 9, 2004 APC, Troy, MI	Automotive Division Board of Directors Meeting
October 3-6, 2004 Hyatt Regency, Dearborn, MI	Automotive Global TPO Convergence
November 10, 2004 Burton Manor, Livonia, MI	Innovation Awards Program
December 6, 2004 APC, Troy, MI	Automotive Division Board of Directors Meeting
February 7, 2005 APC, Troy, MI	Automotive Division Board of Directors Meeting
April 11, 2005 APC, Troy, MI	Automotive Division Board of Directors Meeting

Automotive Division Board of Directors meetings are open to all SPE members. Call Monica Prokopyshen at 248.576.7349 for more information.



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Chairman's Message

Monica Prokopysheh

Thanks to the hard work and support of our members, general and board, the 2003-2004 year was marked with a number of achievements, culminating in a successful ANTEC. The Automotive Division received Pride and Outstanding Division awards and the newsletter, under the extraordinary leadership of Kevin Pageau, also continued its award winning trend.

Dr. Norm Kakarala was inducted as an SPE Fellow and Kevin Pageau, Tom Powers and Dr. Suresh Shah were recognized as Honored Service Members. Dave Arndt was recognized most recently by SPE National President Donna Davis for his outstanding contributions these past six years as Councilor for the Division.

Norm Kakarala, with support from Thomas Pickett, Jay Raisoni, Suresh Shah, Paul Tres and Mike Shoemaker, chaired two Automotive Sessions at ANTEC and is working to bring highlights of technical papers to future newsletters.

Robert Schad, CEO of the Husky Corporation, received the Division's highest honor, the "Executive Leadership Award", November 17, 2003 at the SPE Automotive Division's 33rd annual SPE Innovation Awards banquet, attended by over 500 engineers, executives and media trade journalists. Five category awards, the annual Hall of Fame Award and the Grand Award were presented to the best of 40 unique automotive applications of 2003. More information on these "mold breaking" triumphs can be viewed at www.speautomotive.com. New this year is the Performance/Customization category, geared to aftermarket components and *tuner* enthusiasts.

The 3rd Annual Automotive Composites Conference, held September 9-10, 2003 attracted 300 attendees and was organized jointly by the SPE's Automotive

and Composites Divisions. Four keynote speakers, 53 technical presentations and a program with 22 sponsors/exhibitors was coordinated by over 20 volunteers.

Our programs (ANTEC, Conferences and Innovations Awards Banquet) provide extensive networking opportunities while supporting our primary goal of informing and educating our membership on automotive plastics technology. In addition, your continued support of these programs provides the Division with funds to support student scholarships and education programs at the K -12 and college levels.

During Mike Connolly's tenure as Chairman, not only did the Automotive Division membership grow in a challenging economic environment, but the board of directors welcomed new faces: Maria Ciliberti, Mark Lapain, Peggy Malnati and Brian Grosser. With new members come new ideas, enthusiasm and support for division programs. The 2004-2005 year is continuing the trend by welcoming new board members David Steenkamer from Ford and Venkatakrishnan Umamaheshwaren (UV) from GE to help us enhance existing programs and introduce new services.

As a Division, we are blessed with a strong geographic concentration and the ability to meet in numbers several times a year. I look forward to another strong year for the Automotive Division and the continued pleasure of working with a talented, dedicated and rich talent pool. I welcome the opportunity to grow and learn with my colleagues. Dip your toe in the pool—the water's invigorating. I invite you to join the Division, the Board, a committee, attend an event, or become a sponsor. New ideas and faces, together with your continued support, ensure our future.

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Plastics Technician's TOOLBOX® – Injection Molding

SPE debuted the **Plastics Technician's TOOLBOX® - Injection Molding** at ANTEC 2002. To date, this flagship resource has received rave reviews from industry and academia alike, and is now a popular teaching vehicle for several 2-year technical schools and apprenticeship programs across the U.S.

The TOOLBOX has seven drawers/books packaged in a slipcase – Drawers 1-3 address Fundamental Topics and Drawers 4-7 are Injection Molding Process Specific. This comprehensive resource is a professional growth tool that will serve the technician through an entire career – from novice to master level.

A dedicated team of SPE professionals championed the two-year development of the innovative TOOLBOX. Armed with on-the-job experience, lessons learned, technical expertise, academic degrees, and industry savvy, an array of 47 plastics professionals' authored more than 900 pages, 60 chapters, 570 graphics and 63 tables. Authors were selected based upon their discipline and reputation and represent a cross-section of material suppliers, processors, academicians, manufacturers and mold makers.

Fundamental Skills & Polymer Science (1)

Math 1 & 2, Charts & Graphs, Problem Solving Skills, Design of Experiments, Polymer Basics Plastics Testing, Quality, CIM.

Fundamentals of Machine Operations (2)

Safety, Heat Transfer, Print Reading, Electricity, Fluid Dynamics, Hydraulic Basics, Electro-mechanical Circuits, Hydraulic Circuits

Glossary (3)

Injection Molding Machinery (4)

Clamp End, Injection Unit, Controls, Auxiliary Equipment, Tiebarless Machines, Electric Machines.

Injection Molding Molds (5)

Part Design, Std Mold Definitions, Categories & Classifications, Mold Design, Mold Construction, Runners, Hot Runner Systems, Water Cooling, Venting, Ejection, Mold Plate Sequencing, Side Actions, Unscrewing Mechanism, Collapsible Cores, Mold Related Problems

Injection Molding Processing & Troubleshooting (6)

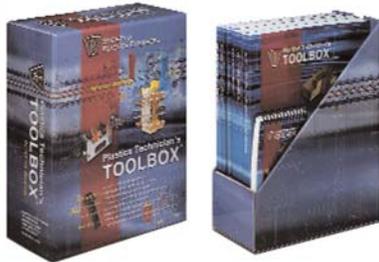
Plastic Flow, Molding: Machine Start Up/Shut Downs, Mold Maintenance, Optimizing the Molding Cycle, Tips for Supervisors and Techs, Polymer Drying, Glass Filled Materials, Heat Sensitive Materials, Acetals, Commodity & Engineering Materials, Computer Flow Simulations, Multi-Injection Molding, The MuCell® Process, Gas Assisted IM, Troubleshooting

Troubleshooting Pocket Guide (7) – in color

"The Toolbox helps engineers and technician's from different disciplines understand molding more in-depth and we purchased several for our employees. It is a great resource." Jeff Dinger, Mfg Engineer and Training Coordinator, Visteon Automotive Systems

http://www.4spe.org/bookstore/pestraining/book_0192.htm

The Plastics Technician's Toolbox®



"And as a technical resource, you'd be hardpressed to find one better than the SPE. One of the best, recent examples of this expertise is the Plastics Technician's Toolbox, which could easily be renamed the Molder's Bible. This seven-book set covers everything from mold design and machine operations to polymer science and process troubleshooting. It was designed for and written by molders for molders and should be a bookshelf standard."

Jeff Sloan
Editor, Injection Molding Magazine
March 9, 2003 issue

The 7 Drawers of the Injection Molding Toolbox

Fundamentals

1. Fundamental Skills and Polymer Science

- Essentials of math and reasoning
- Overview of polymers, testing and DOE
- Monitoring for quality and CIM

2. Fundamentals of Machine Operations

- Safety
- Elements of mechanics and circuits
- What makes equipment work

3. Glossary

Injection Molding

4. Machinery

- Clamp, injection units and control functions
- Auxiliary equipment
- New technologies and fundamental concepts

5. Molds

- All about design, molds and components
- Hot and cold runner systems technology
- Grasp the relationship of mold related problems

6. Processing and Troubleshooting

- Molding procedures and understanding materials
- Optimizing molding cycles and new technologies
- Troubleshooting everyday problems

7. Troubleshooting Pocket Guide

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Society of Plastics Engineers





SPE's Automotive and Composite Divisions are pleased to promote the 4th Annual Automotive Composites Conference and Exposition (ACCE). This year's ACCE will again be held at the MSU Management Education Center in Troy, MI, Sept 14 - 16, 2004. As we have done in previous years, the conference will focus on a variety of timely subjects, such as new materials, processes, tooling, and applications, enabling technologies, decorating and fastening, heavy truck applications, and market trends for automotive composites.

Included in this year's agenda will be panel discussions on industry issues such as outsourcing, Asian challenges and opportunities, and industry trends. Panel and keynote speakers from OEM's and consultants will offer their perspectives on the composites industry. Michael Connolly and Enamul

Haque, this year's Technical Co-Chairs, are preparing a broad - based program that will cover a variety of timely topics and items that will appeal to the composites industry in total.

We expect over 300 participants for this 2 ½ day event. Interested parties can download their attendance confirmation by going to www.speautomotive.com and connecting to the Composites link. SPE contacts for attendance, sponsorship, paper submission, and general information can be found at the web site link.

For general information on the conference, you may also contact Conference Co-Chairs Ms. Peggy Malnati (248-592-0765) or Fred Deans (248-760-7717). We look forward to seeing you at the ACCE.

For More Information

www.SPEAutomotive.com

SPE@plastics.org

SPE Automotive Division
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**COMPOSITES:
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Attendance

The Automotive and Composites Divisions of the Society of Plastics Engineers (SPE) International invite you to attend the 4th-Annual SPE Automotive Composites Conference and Exposition, September 14-16, 2004. The conference will feature technical paper sessions, VIP panel discussions, keynote speakers, & exhibits highlighting advances in materials, processes, and applications for both thermoset and thermoplastic composites. Sessions currently planned include:

- New Composite Materials, Processes, & Applications
- Inter-Industry Technology Transfer
- Enabling Technologies for Composites
- Advancements in Reinforcement Technologies
- Finishing & Decorating Composites
- Bonding & Joining Composites
- Global Sourcing

REGISTRATION FORM (Please Fax to 248-244-8925)

Contact: _____	<input type="radio"/> SPE Member - \$349	<input type="radio"/> SPE Non-Member - \$449
Company: _____	<input type="radio"/> SPE Renewing Member - \$449	<input type="radio"/> Student - \$100
Address: _____	<input type="radio"/> Speaker	<input type="radio"/> Conference Organizer
Phone: _____ Fax: _____	Sponsorship Level:	
E-mail: _____	<input type="radio"/> Premier	<input type="radio"/> Coffee-Break
Other Info: _____	<input type="radio"/> Associate	<input type="radio"/> Exhibit-Only
	<input type="radio"/> Media	

Councilor's Corner

Nippani Rao

The 2003-2004 ANTEC Council meeting was held at Sheraton Towers, Chicago, IL. on Sunday, May 16, 2004. Dave Arndt attended the morning session, which included the outgoing councilors and the afternoon session included the incoming councilors. I attended both.

The morning session was the final meeting of the outgoing President, Donna Davis and the afternoon session is the first meeting of incoming President Karen Winkler.

There were Divisions meeting and several committee meetings (Conference and Seminars, ANTEC, etc) on Saturday. The following summarizes the highlights:

SPE National Update:

Selected Ms. Susan Oderwald, the Deputy Executive Director to the new Executive Director to replace Mike Cappelletti, who retired at the end of 2003. Ms. Susan Oderwald managed day-to day operations for the SPE, the last 3 years. Her appointment was well received by the council.

Staff: Tricia McKnight has joined SPE staff to focus on Sections & Divisions and Debra Ravetto to support Conferences and back-up to Tricia for Sections and Divisions.

Membership:

As of April 30, 2004-20,639. Incoming President Karen Winkler and her team, Alan Arduini and Tobi Gebauer reviewed a new membership campaign called AIM (Action Increases Membership).

12/31/2004 goal is 20,625. To achieve this we need at least 88.5% of current membership plus recruit 2,400. This is the task AIM will help. Briefly, if every councilor recruits 1, we will have 100 new members. If SPE's 1000 leaders recruit at least 1, we will have 1000 new members. The objective of AIM is to target at-least 5 potential members. National will send the letters and follow-up letters. A \$10, discount is offered with this plan. For more information, contact me at 248 576 7483 or NR2@dcx.com or visit the AIM web page or SPE web page. Year to date SPE has had solid success with membership, attracting 1782 new members. Renewals are also ahead of prior years with more than 50% of membership that expire June 30 already renewed.

Financial:

As of April 30, 2004, Net operating income is \$238,133 and with holding rebates back, it is \$368,082. This does not include the final numbers from ANTEC. This year may prove to be the least profitable ANTEC's on record, due to the high costs associated with the Chicago venue and some what



soft attendance as of April 30. As of April 22, the Society has a positive cash flow of \$700K and the Society also paid off its line of credit loan in full (300K?).

Rebate Program:

Vice President/Treasurer

Nancy Hermanson reviewed and proposed a new rebate structure which is based on incentives. The distribution is planned to take effect in 2006, with Sections and Divisions submitting data beginning in 2005. The basics of the new rebate proposal are: Basic sum of \$500 for Sections and Divisions, Demonstrating some level of activity. Tier 1 level would include some additional requirements and at this level, the section or division will get additional \$2/member. Tier 11 level would require even more requirements than Tier 1 and the section or division will get \$3/member. This is not well received by the Council and especially the sections, where they were getting about \$10/member. The divisions were getting about \$4/member. There will be a lot of discussion on this topic at the next 2 or 3 Council meetings before a final plan is approved. This will also be tied with a new Star/Pride award called Pinnacle award for both Section and Division given at two levels Silver and Gold. Dave Arndt is working with Karen Winkler on this proposal.

Divisions Committee meeting:

Jim Griffing from the Composites Division is the chairman. Briefly the discussions were in regards to the formation of two special interest groups known as Radiation Processing of Polymers and Rapid design, engineering and mold making, Pride revision proposal, sub-committee reports and liaison reports. Mr. Ranga Shastri from the PD3 division was elected the new Vice Chair. Dave Arndt explained the new Pinnacle award.

President Donna Davis Presented Dave Arndt an appreciation plaque for the outstanding contributions to SPE for the last 6 years as the Automotive Division Councilor as well as chairman for the conferences and seminars committee, last 2 years. Dave is working with the current President Karen Winkler on the new Pinnacle award, which replaces Pride and Star awards.

On behalf of the Automotive Division, I would like to thank Dave for his dedication and outstanding contributions to SPE, as a Councilor for the last 6 years. I do have a tough act to follow.

Inter-Society Outreach

Mark Lapain

SPE Detroit

2004 Global TPO Conference

October 4-6, 2004, Hyatt Regency, Dearborn, MI

SPE - International

14th Annual Thermoforming Conference

Sept. 19-21, 2004, Indianapolis Convention Center & RCA Dome, Indianapolis, IN

Plastics USA 2004 – North America's Plastics Marketplace

September 28-30, 2004, McCormick Place East, Chicago, IL

FOAMS 2004

October 5-6, 2004, Holiday Inn Select, Wilmington, DE

SAMPE

Japan International SAMPE Technical Seminar 2004 (JISTES 2004)

July 14-15, 2004, Kyoto, Japan

China-Japan International SAMPE Symposium

September 6-7, 2004, Galaxy Hotel, Shanghai, China

36th International SAMPE Technical Conference

November 15-18, 2004, Sheraton San Diego Hotel & Marina, San Diego, CA

SAE

2004 International Body Engineering Symposium

September 21-22, 2004, MSU Management Education Center, Troy, MI

Convergence 2004

October 18-20, 2004, Cobo Center, Detroit, MI

2005 SAE World Congress

April 11-14, 2005, Cobo Center, Detroit, MI

SME

1st Annual Manufacturing Technology Summit – 2004

August 10-11, University of Michigan-Dearborn, Dearborn, MI

IMTS 2004 Manufacturing Conference

September 8-15, McCormick Place, Chicago, IL

FABTECH International 2004 Exposition & Conference

October 26-28, I-X Center, Cleveland, OH

Miscellaneous

Fourth World Congress Nanocomposites 2004

September 1-3, 2004, Crowne Plaza Hotel, San Francisco, CA

K 2004 Show

October 20-27, 2004, Düsseldorf, Germany



U.S. Patent No. 5269677

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Fast and Furious

Continued from page 1

This new category is in addition to the current categories, which include: Body Interior, Body Exterior, Chassis/Hardware, Powertrain, Environmental, Process/Assembly/Enabling Technologies, Materials, and Hall of Fame. The deadline for nomination submissions is September 10, 2004. The part you are nominating must be in mass production and on a vehicle that is available for consumer purchase by November 1, 2004.

Executive Award Recipients Announced!

Executive Leadership Award Recipient

The SPE Automotive Division is pleased to announce that the first recipient of the SPE Automotive Division Executive Leadership Award for 2004 is **Jim Padilla**, Chief Operating Officer, Ford Motor Company, and Chairman, Automotive Operations. He is responsible for the global automotive business.

Padilla was most recently president, North America and South America Operations. In that role, he was responsible for all operations in the development, manufacturing, marketing and sales of Ford, Mercury and Lincoln vehicles in the United States, Canada, Mexico and South America. He had been appointed president of North America Nov. 14, 2002, and added oversight of South America on Sept. 10, 2003.

Padilla, 57, previously was group vice president, North America. Prior to that, he was group vice president, Global Manufacturing and Quality. From January 1999 until July 31, 2001, he was group vice president, Global Manufacturing.

Padilla joined Ford in 1966, beginning his career as a quality control engineer. In 1976, he began a series of management positions in product engineering and manufacturing. These included manufacturing operations manager for the Ford Escort and Mercury Tracer, Ford Contour and



The SPE Automotive Division "Most Innovative Use of Plastics" Grand Award Trophy

Mercury Mystique, and Ford Taurus and Mercury Sable car lines. He also worked as director, Small Car Segment, Car Product Development.

From 1992 until 1994, Padilla served as director of Engineering and Manufacturing, Jaguar Cars, Ltd. during Jaguar's critical turnaround period. From 1994 to November 1996, Padilla was director of performance luxury vehicle lines, overseeing the successful launches of Jaguar XJ



*Robert Schad, President and CEO of the Husky Corporation, received the SPE Automotive Division "Lifetime Leadership Achievement Award" from Awards Program Chairman Stuart Cohen at the 33rd Annual Innovation Awards Program. Previous recipients of this award include **Bernard Roberston**, Senior VP - DaimlerChrysler and **J.T. Battenberg III**, chairman, CEO and president of Delphi Corporation.*



Plastics: Setting The Pace For Innovation

series, the Jaguar XK-8 and the world-class AJ26 engine, Aston-Martin DB-7, Jaguar S-Type and Lincoln LS.

From November 1996 through December 1998, he served as president of Ford South American Operations, where he was responsible for restructuring the company's operations after the breakup of Autolatina.

Padilla holds a bachelor's and master's degree in chemical engineering and a master's degree in economics from the University of Detroit.

Lifetime Leadership Award Recipient

We are pleased to announce **Tom Moore**, Vice President, Liberty and Technical Affairs, DaimlerChrysler (retired) has been confirmed as our Lifetime Leadership Award Recipient. Tom has been a major force in promoting the use of plastics in automotive applications for many years. Tom has held leadership positions at DaimlerChrysler and Ford Motor Company.

From February of 1989 to July of 2003, Tom was Vice President - Liberty and Technical Affairs at DaimlerChrysler in Auburn Hills. Tom was the leader of a well-known "skunkworks" conducting all of the Chrysler Group's advanced technology development (5 to 10 years before production). Liberty focused on finding, inventing, or developing technical solutions to meet the customer needs, regulatory requirements, and profit levels that are vital to producing competitive future cars and trucks.

There was a major cultural tendency toward urgency with a strong bias for concentrating on moving new ideas into concept prototype vehicles to quickly proveout customer appeal, function, packageability, and economic viability. Liberty was a group of 100 people who formed the core DaimlerChrysler activity, but were greatly expanded through the use of the automotive supplier community. The term "iceberg organization" had been coined to show that most of the team's resources were hidden below the organization chart, at the supplier, but were managed by the core team to produce concept prototypes that met functional, cost, and timing targets.

Major accomplishments that have been shown publicly include: the PNGV "super car" called Dodge ESX3 (72 mpg hybrid electric diesel w/ plastic body), Jeep Commander 2 (methanol fuel cell powered hybrid concept vehicle), Dodge Power Box ("thru-the-road" hybrid (T. Moore patent) using compressed natural gas fuel w/350 mile range), "cone-of-sound" speaker system to allow each seat to have unique sound w/o headphones, Jeep Grand Cherokee Concierge (ten novel new customer features), and the well publicized "Natrium" minivan powered by a fuel cell using NaBH₄ fuel - a world first.

Tom joined Ford Motor Company in 1975 as a Light Truck College Graduate Trainee and progressed through the ranks to become a Chief Engineer from April 1985 to February 1989. Tom was recognized at Ford as leading the

Fast and Furious

Continued from page 9

revitalization of its manufacturing operations by promoting new methods for product development and manufacturing/assembly process engineering through simultaneous engineering using new technology tools to implement flexible automation.

A few months prior to his departure in 1989, Ford recognized Tom Moore as "the main ingredient in the first phase of a revolution in NAAO culture to totally rewrite the rule book for the way Ford was organized...designed products.... manufactured/assembled vehicles, and the content of our products..." Tom is a true leader with an innovative and entrepreneurial spirit who knows how to lead people and get things done.



The 2003 SPE Automotive Division Most Innovative Use of Plastics Grand Award presented to DaimlerChrysler for the innovative roof module on its 03MY smart™ Roadster. Below, accepting the Grand Award from Norm Karala are (L to R) Peter Doerries, UV, Tom Edson, J. Scheffer, and Greg Adams.



In concert with Tom's impressive career accomplishments, his academic accomplishments include the following degrees: MBA from Michigan State University, M.S. and B.S. Mechanical Engineering from Texas Tech University, and a B.S. in Electrical Engineering from Lawrence Technological University He has received numerous awards including the Henry Ford Technology Award in 1986. He was awarded several patents including 7 at Ford, 18 at DaimlerChrysler, 2 personal and 5 pending.

Anyone who knows Tom Moore has witnessed the very positive impact he had on the automotive industry, the promotion of plastics and his love of cars. He always had an open door to speak with the plastics community, never hesitating to accept our many invitations to make presentations at SPE Automotive events and is well respected by the automotive community at large. Tom has an uncanny knack of being able to explain technology to non-engineers including politicians and was very successful in communicating with Washington politicians during ride and drives and PNGV demonstration events. Whether he was hosting Generals, Congressmen or Heads of State, Tom was always a straight-forward congenial car guy who loved the auto industry. Tom's humor, tremendous knowledge and laid-back Texan style have made him an icon in the auto industry.

We are very honored to have the opportunity to present the 2004 Executive Leadership Award to Jim Padilla and the Lifetime Achievement Award to Tom Moore and hope you will attend to join us in honoring these tremendous executives for their dedication to and achievements in the automotive industry on Wednesday November 10 at Burton Manor.

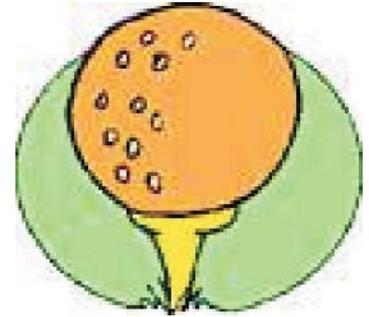
Overall the "Fast and Furious" Innovation Awards Gala is an event you will want to invite your company executives and clients to attend. Our executive award recipients are icons in the auto industry and we fully anticipate a sold-out event. Stay tuned for more spectacular news in September.

Automotive Division Golf Outing

Dunham Hills Golf Club

Hartland, MI (248) 887-9170
Monday, July 26, 2004

Registration/Lunch 11:30
Shot-gun Start 1:00
Cocktails/Prizes 6:00



Join us for a fun afternoon of lunch, golf, refreshments and networking. This outing is a great opportunity to meet people, entertain customers, or just get out. We are limited to 36 foursomes, so register early!

TO REGISTER FOR THIS EVENT:

Complete and fax this form to:

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Division/Department: _____

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Foursome(s) _____ @ \$380 each

Total amount due: \$ _____

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ANTEC 2004

Dr. Jay Raisoni

SPE Automotive Division organized a day-long session on Tuesday, May 18th during the ANTEC 2004 held at Navy Pier in Chicago May 16-19. Dr. Norm Kakarala of Delphi Corporation organized the sessions with help from Dr. Suresh Shah, Dr. Jay Raisoni both also of Delphi Corporation, Mr. Tom Pickett of General Motors, Mr.. Mike Shoemaker of Dow Chemical Co.



Total of twelve technical papers were presented in two sessions and were quite well received. The morning session on Materials and Applications, moderated by Dr. Jay Raisoni of Delphi had six technical papers from academia, industries covering current developments in elastomers to plastics to structural composites. Mr. Mike Shoemaker moderated the afternoon session on Process Developments.

The talks included a review of last year's Automotive Innovation award winners by Dr. Suresh Shah, Trends in Exterior Application by Mr. Tom Pickett and recent advances in processing and application of structural composites, etc. From the AD session papers "Composite Material Transmission Cross Member Feasibility" presented by Adam Myers of General Motors was selected for Best Paper Award.

Three of our active members of board of directors were honored at a gala dinner event during this 62nd ANTEC. Dr. Norm Kakarala, senior staff research scientist at Delphi Corporation, and vice chairman of the Automotive Division was named a "Fellow of the Society" for his development and implementation of thermoplastic polyolefin (TPO) materials for vehicle interior skin applications and a closed-loop recycling process to produce TPO instrument panel skins.

Dr. Suresh Shah, senior technical fellow, Delphi Corp. and Mr. Kevin Pageau of SCA North America were named "Honored Service Members" at the same event. Suresh, named a "Technical Fellow" by SPE in 2001, and Kevin were honored for demonstrating long term, outstanding service to the Society and its objectives.

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SPE Automotive Division Planning Meeting

Minutes from June 7, 2004 Meeting
Meeting held at Big Fish 2 in Troy, MI

Attendees:

Nippani Rao; Suresh Shah; David Steenkamer; Rahul Mukerjee; Brian Grosser; Bonnie Bennyhoff; Norm Kakarala; Mark Lapain; Michael Connelly; Monica Prokopyshen; Jay Raison; Kevin Pageau; Tom Morse; Ed Garnham; Al Murray; Suzanne Cole; Greg Korchnak

BOD Positions

CONFIRM OFFICERS & COMMITTEE CHAIRS

Chair - Monica Prokopyshen

Chair Elect - Norm Kakarala

Vice Chair - Mark Lapain

Councilor for the three year term 2004-2006 - Nippani Rao

Membership Committee - Bonnie Bennyhoff

Secretary - Brian Grosser/Monica Prokopyshen

Inter-Society - Mark Lapain

Innovation Awards Chair - Suzanne Cole

Treasurer - Brian Grosser

Education Chair - Open

Composites Conference Chair - Fred Deans

Antec Technical Program Chair - Norm Kakarala

Newsletter - Kevin Pageau

Past Chair - Michael Connelly

House - Ed Garnham

Communications - Peggy Malnati

Newsletter Sponsorship - Teri Chouinard

NEW BOARD MEMBERS/NOMINEES

THRU 2006 RAHUL MUKERJIE

THRU 2007 DAVID STEENKAMER FROM FORD

THRU 2007 Venkatakrishnan Umamaheshwaren (UV) FROM GE

THRU 2007 SUZANNE COLE

THRU 2007 GREG KORCHNAK

ROSTER VERIFICATION (ADDRESSES & CONTACT INFO.)

SPE Automotive Division Tentative Schedule

July 26 - Golf Outing

September 14 - 16 - Composite Conference

Oct. 3 - 5 - TPO Conference (Detroit Section)

October - Councilor's Meeting Cleveland

November 10 - Innovations Award Ceremony

January 2005 - Councilor's Meeting

May 1, 2005 ANTEC (Boston)

Future SPE AD Board meetings:

Thursday September 9

Monday December 6th

Monday February 7th

Monday April 11th

Monday June 6th SPE AD BOD Planning Meeting

Goals for the Year

Membership Committee Goals for 2003/2004

Added: Bonnie to assemble small team to address membership issues

Added: Include 1 free membership with top Awards Night Sponsors

Keep remainder of Membership Team Goals for 2004-5.

Long Range Plan Additions/Deletions

Broaden SPE AD communications

Develop BOD Position Descriptions

Remove "Hire golf outing organizer"

Include European perspective? Under communications?

Add in Composites Conference to track attendance at.

Marketing approach? Are we as good as we need to be? To discuss further.

The rest of the goals are OK for now.

Web Site - BOD reviewed quotation & agreed to use Media Genesis as the web service provider.

Pride Report

Review at each BOD meeting.

Coordinated by Chair-elect

Target January for completion

Long Term Strategy Meeting - Past Chairman to coordinate

Budget

Monica reviewed the budget.

APC charges are up from last year.

Education items will appear as line items for planning/tracking.

Newsletter

Send out e-mail summary of newsletter to broad distribution.

New Feature - Technical article(s)

Suresh to condense a technical paper to place in the newsletter.

Education

CCS - BOD agreed to make the CCS a line item of the yearly budget. Licensing part of APC negotiations.

Plastivan - BOD agreed to make the Plastivan a line item of the yearly budget.

Explorathon - (Part of Plastivan schedule)

Student Aid - BOD agreed to make the Student Aid a line item of the yearly budget.

Antec Student Travel - BOD agreed to make the ANTEC Student Travel a line item of the yearly budget.

Councilor's Report

Councilor's report issued and reviewed by Nippani.

Awards Update (Cole)

Jim Padilla and Tom Moore to receive awards.

Videos being prepared for both.

Logo for the awards night is complete and looks great.

Wednesday November 10 will be the date.

Lots of other notes- see minutes previously issued.

September 10 is the cutoff date for nominations.

New or Other Business - none

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COMPOSITE TRANSMISSION CROSS MEMBERS FOR FULL-SIZE TRUCKS

Adam D. Myers

Full-Size Truck Frames - General Motors - Warren, MI

Department of Mechanical Engineering - Kettering University - Flint, MI

Problem Topic

Distributing lighter products to customers is a concern for many automobile manufacturers. Lighter vehicles reflect increased performance, fuel economy, and overall customer awareness. By replacing the current steel transmission cross member on General Motors' full-size trucks through the application of a composite material transmission cross member, a substantial weight reduction will be achieved. Reducing the weight of General Motors' full-size trucks will consequently increase the fleet-wide fuel economy for the company's truck line, allowing the government's Corporate Average Fuel Economy (CAFE) requirements to be met more easily. A composite material has never been chosen for the fabrication of a full frame structural component on General Motors' full-size trucks.

Benefits

By establishing a mass reduction on full-size trucks, General Motors can advertise attractive aspects such as increased performance and fuel economy. Other benefits may include savings in piece cost and tooling investments.

The most beneficial result, by reducing vehicle weight, is the increase in that program's fuel economy, accomplishing a higher fleet-wide average fuel economy for light-duty trucks. With this in mind, Corporate Average Fuel Economy (CAFE) standards will be easier to meet, and penalizations will be easier to avoid.

Criteria and Parameter Restrictions

Transmission cross members are evaluated and restricted from many different aspects, for many different reasons. This list includes, but is not limited to, the following areas of evaluation: stiffness, fatigue, mobility, vibration, interior noise, heat deflection, and durability. The scope of this project is limited to the evaluations of stiffness, vibration, noise, and heat deflection. Standards and requirements for newly designed composite material transmission cross members will not change from the current specifications.

Selecting a Composite Material

Composite materials are attractive to the automotive industry because they are lightweight and provide strength. Decreasing a vehicle's weight could reduce emissions and require less fuel. Composites can be made with increased material stiffness and decreased mechanical deformation. Vehicle components, made of structural composites, reduce weight and still provide strength to that component. Compared to steel structures, composites provide high stiffness-to-weight and strength-to-weight ratios. Composites can be configured into complex shapes at lower costs, and maintain functionality during the duration of component life due to high corrosion resistance.

Recently composites have been growing in many different industries replacing various materials. Reinforced with stiff fibers and particles, composites are a polymer matrix. Although composites are stiff and strong, they are capable of becoming weak in increasing temperatures because they are bound by polymers. Understanding that fibres and particles are used to reinforce the polymer matrices to make composites, it is important to understand both, the different possible polymer matrices and the different possible reinforcements that can be used to assemble a composite. These polymer matrices are formed as either

thermoplastics or thermosets.

Due to the structural advantage provided by thermosets, a glass reinforced polyester application has been chosen for evaluation. This application is in the form of sheet moulding compound (SMC). Glass fibre reinforcement has been chosen because it provides adequate strength and stiffness and mechanical properties are retained at higher temperatures. Competitive pricing of glass fibre has allowed the use of this application to be more feasible than using carbon fibre reinforcement.

SMC

Sheet Moulding Compound (SMC) is a composition of glass fibres, resin, and filler. It is an integrated, ready-to-mold composition. This particular SMC was fabricated using a metering polyester resin on a thin plastic film. This film acts as the carrier for the polyester. The polyester resin system includes a catalyst to enhance curing, a filler, and thickening and mold release agents. Adjustable blades control the thickness and width of the resin on the film. Continuous glass fibres are fed into a chopper assembly and deposited onto the resin paste. Then the resin paste is conveyed on the plastic carrier film. A second layer of resin on another carrier film is then placed on top creating a sandwich of polyester resin. This sandwich is fed through compaction rollers to uniformly distribute the resin and to ensure wetting of the glass. SMC allows the consolidation of several parts, reducing the need for subassemblies. SMC can provide one single, molded unit. The engineer's design of the composite material transmission cross member requires the production of two separately molded units. This is still an advantage from the current design, which requires the welding of three separate steel units.

Sheet Moulding Compound is lightweight, stiff, and strong all at the same time. It offers high strength-to-weight and stiffness-to-weight ratios.

Less expensive SMC tooling can also be made faster than tooling for sheet steel. Automotive companies have found this to be most attractive when looking for ways to differentiate the appearances of car and truck models.

Glass Fibres

The primary purpose of adding glass fibre to thermoset plastics is to increase the polymer matrix's tensile strength, flexural strength, modulus, and impact strength. For the purpose of this project, E-glass has been chosen to fabricate the transmission cross member.

Reinforcement is achieved by transferring the stress, under an applied load, from the weak polymer matrix to the much stronger glass fibres. Under stress, the elongation of the glass fibres must be less than that of the polymer matrix to acquire an efficient reinforcement. While also under stress, the modulus must be higher than that of the polymer matrix.

Sizing efficiency, fibre content, length, orientation, and diameter of the glass fibres are responsible for the mechanical properties of reinforced composite materials. As glass fibre content increases, material strength increases. Generally the isotropic oriented glass fibres are 25 to 30 percent of the SMC by weight. For increased

strength, the transmission cross member is 50 percent glass by weight. This has increased the material's stiffness and strength. Longer lengths in any given direction will generally allow greater continuity of stress transfer in that particular direction. The engineer has chosen to use long glass fibres for the reinforcement of the composite material. The lengths of the glass fibres were increased to two inches, which has also increased the material's stiffness and strength.

The glass fibres chosen for the fabrication of the transmission cross member are chopped and randomly oriented. For developmental research, this decision was made to discover which directions could use more fibrous reinforcement if necessary. Ideally the direction and orientation of the fibres should be arranged in the same direction of induced stress. This will optimize load-carrying capabilities.

Thermoset Polyester

Unsaturated polyesters are versatile in properties and are widely used in many different applications. It was the polymer matrix chosen to manufacture the composite material transmission cross member. The actual material name given by Quantum Composite is QPC-1977.

QPC-1977 is a modified polyester engineered structural composite (ESC) molding compound that is designed for applications requiring high strength, fire retardance, and resistance to elevated temperatures. QPC-1977 offers fast molding cycles and adequate surface appearance.

Unsaturated polyester resin is dissolved in a crosslinking monomer, which contains an inhibitor to prevent crosslinking until the resin is ready to be used for fabrication. Using different ingredients will determine the properties of the resin.

Unsaturated polyester is the condensation product from an unsaturated dibasic acid and a glycol. This unsaturated dibasic acid is usually maleic anhydride. By adding a saturated dibasic acid such as isophthalic acid, adipic acid, or phthalic anhydride, the degree of unsaturation will vary. Commonly the type of glycol used is either propylene glycol, ethylene glycol, diethylene glycol, dipropylene glycol, or neopentyl glycol (G. R. Bell o Kettering University, personal communication, February 2003).

As for the crosslinking monomer, styrene is most commonly used. However, vinyl toluene, methyl methacrylate, alpha methyl styrene, and diallyl phthalate could also be used as the crosslinking monomer (G. R. Bell o Kettering University, personal communication, February 2003).

To achieve flame-retardance chlorendic anhydride, tetrabromophthalic anhydride, and dibromoneopentyl glycol is used. To obtain chemical resistance isophthalic acid, neopentyl glycol, trimethylpentanediol, and hydrogenated bisphenol A is used. To achieve weathering resistance neopentyl glycol, methyl methacrylate, and ultraviolet absorbers are used. Common ultraviolet absorbers are benzophenone and benzotriazole (G. R. Bell o Kettering University, personal communication, February 2003).

Newly Designed Transmission Cross Member

To optimize the composite transmission cross member's structural performance, the engineer redesigned the geometrical shape of the current process. The new design of the cross member allows simple manufacturing techniques to fabricate the entire application. The new cross member is fabricated using two separate pieces: an upper section and a lower section, which

replaces the current three-piece application. These two sections are designed to be adhered using an epoxy adhesive system called 5300 Black/5330.

Additional strength and stiffness were made possible by increasing the wall thickness of the upper and lower sections of the composite transmission cross member. Due to clearance issues, most of the exterior geometrical shape could not be changed. Except for increasing the height of the cross member, most of the increased wall thickness was added to the interior cross section of the transmission cross member.

Aluminum spacers and pads were added to replace the steel binocular bushings on the current design. The entire newly designed composite material transmission cross member can be viewed in Figure 1.

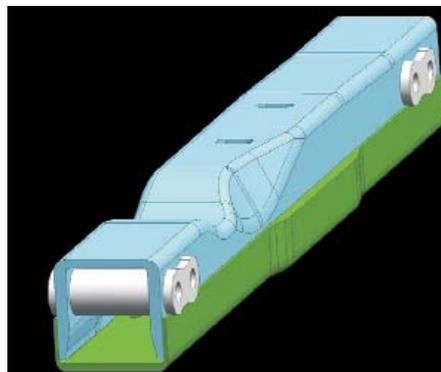


Figure 1. Newly designed composite transmission cross member.

Weight Evaluations

The total weight of the steel transmission cross member is 19.5 pounds. The total weight of the composite transmission cross member is 8.5 pounds. The engineer has accomplished an eleven-pound savings in one single component through the application of this particular composite material.

Conclusions

When determining the feasibility of using a composite material as a full frame structural component, many tests must be conducted. Many aspects must be evaluated to ensure durability and structural performance of the transmission cross member and the vehicle. Through physical testing, the engineer has subjectively and objectively evaluated the feasibility of using this particular composite material on a full-size light-duty four-wheel drive sport utility by testing its stiffness, vibration, noise, and heat deflection. After reviewing the vibration results, the engineer observed minor fore/aft, lateral, and vertical vibration differences between the current transmission cross member and the composite material cross member. Although only minor vibration differences were discovered between the steel and composite cross members, the component will be refined to continuously improve and enhance the quality of GM's products.

When the composite material transmission cross member is refined to improve vertical characteristics, the cross member will be more resistant to vertical deflection. This will reflect compatible vibration behavior, and General Motors will proceed to execute durability performance.

Introducing composite materials to automotive frame applications is very exciting to General Motors. This composite transmission cross member is very appealing to GM, and the company desires to advance in the development of more weight efficient frame applications.

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