Society of Plastic Engineers
Upper-Midwest Section

Invite You to a Very Special Event
Getting Physical with Physical Properties

TUESDAY OCTOBER 6, 2009 • 9:00 AM - 3:00 PM
1700 Buerkle Road, White Bear Lake, MN 55110

REGISTRATION ON PAGE 11

Ever wonder how the data on a specification sheet was created and what it means? Is there an easier way to measure a particular physical property? This is your chance to answer those questions and more by attending our MegaTech presentation on physical properties. **Pre-Registration is required.**

**MEGATECH AGENDA**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>9:00 am</td>
<td>Introduction</td>
</tr>
<tr>
<td>9:15 am</td>
<td>First Principles of Thermal Analysis</td>
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<tr>
<td>9:45 am</td>
<td>First Principles of Mechanical Testing</td>
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<tr>
<td>10:15 am</td>
<td>First Principles of Moisture</td>
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<tr>
<td>10:30 am</td>
<td>First Principles of Rheology</td>
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<tr>
<td>11:00 am</td>
<td>Hands-On Workshops in the Lab #1</td>
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<tr>
<td></td>
<td>Mechanical Testing</td>
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<td>Rheology Measurement</td>
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<tr>
<td></td>
<td>Thermal Analysis</td>
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<tr>
<td></td>
<td>Moisture Analysis</td>
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<tr>
<td>12:00 pm</td>
<td>Enjoy a box lunch with your colleagues</td>
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<tr>
<td>1:00 pm</td>
<td>Hands-On Workshops in the Lab #2</td>
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<td>1:30 pm</td>
<td>Hands-On Workshops in the Lab #3</td>
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<td>2:00 pm</td>
<td>Hands-On Workshops in the Lab #4</td>
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<tr>
<td>2:30 pm</td>
<td>Importance of Physical Property Measurements</td>
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<td>- Special Guest Mike Deaner</td>
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<tr>
<td>3:00 pm</td>
<td>Closing Remarks</td>
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</table>

Tours of Aspen, and a review of case studies will be available after the program for those interested.
President’s Remarks
Dick Bopp

Thanks to the graciousness of Dan Mishek and the VistaTek organizers of Manufacturing in Minnesota, a one-day MinniTek Symposium on Low Volume Production, held at the North Oaks Country Club on August 18, I was given the opportunity to present an overview of the SPE along with an invitation to all assembled to join the Upper Midwest Section of the Society. (Please note Dan's MinniTek review later in this issue.) The meeting space was filled to capacity to hear invited speakers and panelists present a shared vision of a fundamental change in prototyping from making one or two mockups to manufacturing fully functional low volume production units. Moreover, they noted that “low volume” can mean up to 60,000 units produced.

Dan captured the moment in his introduction when he used the term, “excitement,” to describe what was happening in his industry. Because indeed you could feel electricity in the room from start to finish. Of course, having the Honorable Gov. Tim Pawlenty on hand to give a keynote address outlining his plans for retaining small business in Minnesota didn’t dampen the mood one bit. But, beyond the governor’s well-received address, the spirit of the MinniTek was marked by a series of revelations on what is now possible with low volume production technology, e.g., Direct Digital Manufacturing (DDM), advances in CNC machining and VistaTek’s progress with rapid tooling.

OK, but how does this all relate to the Society of Plastics Engineers? It relates because the MinniTek is an excellent example of a grass roots effort demonstrating how the SPE—year in and year out—helps keep us current with rapidly developing technology and business advances in our ever changing field. Other examples would include SPE’s GPEC (Global Plastics Environmental Conference), annually held TopCons for Thermoforming, Foams, Vinyl, etc. and, of course, the Annual Technical Conference (ANTEC) and EuroTEC. Added to this list of teaching vehicles are SPE’s technical journals and an impressive catalogue of seminars and webinars.

Continued on Page 9
WELCOME TO OUR NEW MEMBERS
Dan Mishek, Membership Chairman
Email: Dan@vistatek.com • Phone: (651) 653-0400

Meet the newest members of SPE below. I am excited about the diversity of the newest batch of members. Again, we are looking for active members to help grow the local chapter. Use your membership to network, gain education, gain employment or just to hang out with people that have similar interests as you do. There are so many things that you can get involved with. I look forward to personally meeting you at an event.

Maybe at the Golf Event on September 15th – see you there!

NEW MEMBER AFFILIATION LOCATION New Member AFFILIATION LOCATION
Michael Wilder ————- Minneapolis E Ziegler Andersen Corp. Bayport
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Ken Kang Boston Scientific Minneapolis Zachery Johnson ————- Golden Valley
Carlos Lopez U OF M Minneapolis Jason Lubs General Mills St. Paul
Tim Wylic ————- Hopkins Terry Collier ————- Minneapolis
Mark Wollschlager Greatbatch Medical Minneapolis Jie Song U of M Minneapolis
Leo Twaha ————- Minneapolis Kelly Edgington Boston Scientific Edina
Steve Garden ————- Saint Paul Colin Maus Donatelle New Brighton
James Orrock Stratasys Eden Prairie
Jason McNulty ————- Stillwater

SPOTLIGHT ON THE BOARD
Dick Bopp, President

For this issue of The SPEcialist it is my pleasure to present to you, Dr. Domasius Nwubunma, our past section president for 2005 – 2007 and now serving on our board as Past President.

Domasius is a native of Nigeria and received an B.S. with honors in chemical engineering from the University of Lagos. He emigrated to the U.S. in 1993 to pursue a Master’s degree in polymer engineering at the University of Akron. He obtained his MS degree in 1996. Following his MS degree, he obtained his Ph.D. in polymer engineering from that institution in 1999.

After serving as a post-doctoral fellow, Domasius left Akron for the Twin Cities in 2000 to accept a position as Senior Research Engineer in the Science Research and Organic Materials Research Technology Centers at 3M in St. Paul. In 2004 he was named Research Specialist in the Safety, Security and Protection Services Business Laboratory. He is currently developing a consulting business.

Domasius first joined SPE as a student member while at the University of Akron and became a regular member following his Ph.D. How did he become involved with the Upper Midwest Section? In his own words:

“I credit Dave Erickson with [getting] me involved in SPE Upper Midwest

Continued on Page 9
Local Section’s Steinwall, Inc. wins INTERNATIONAL INNOVATIVE DESIGN

During the National Plastics Expo (NPE) in Chicago, Steinwall was among 41 other companies worldwide to compete for the honor of being judged one of the best in the plastics' industry. Steinwall won for their contribution to the John Deere Seed Tube project.

The part looks surprisingly simple; yet a simple part design sometimes involves creativity and a complex mold design. The project objective was to design a one-piece molded tube given existing exterior part geometry; the current design was a clam-shell tube. The tube is used for dispensing seed into the ground and the clam-shell parting lines caused seeds to bounce resulting in variability in ground placement.

The design was achieved in three steps; first, design the curved core, than design the cooling, and finally determine the sequencing of the mold. And, this design needed to accommodate high annual volumes requiring the process to be extremely robust and repeatable.

**Step One:** The core needed to be both straight and curved; therefore, a double-acting slide was necessary to allow for the straight portion of the core to eject first and then a swing arm was required to allow the core to clear the cavity steel when ejecting.

Shutting off the swing-arm core also presented unique design challenges. Since the core moves on an arc, the shut off point involved dynamic analysis to guarantee proper alignment. Without proper alignment, core damage could result increasing flash at the end of the tube. This flash was undesirable as it would also cause the seed to bounce.

**Step Two:** Cooling the curved-core that was moving on a double-acting hydraulic slide with a swing-arm was extremely challenging! The challenge was machining ¼ inch water lines into an 18 inch curved core while maintaining steel strength. After several false attempts, the solution was to machine the water lines first in flat stock and then machine the curve.

**Step Three:** Final sequencing of the tool operation is very involved and took this form:

```
Mold Open  Mold Close
Lock Pin open  Ejection retract
Hydraulic slide out  Mold close
Hydraulic swing-arm open  Hydraulic swing-arm close
Mold open  Hydraulic slide in
Ejection Forward  Lock Pin closed
```

The timing of the sequencing above is crucial to producing acceptable parts. Several proximity switches were installed to increase the robustness of the operation.

*The article was provided by Steinwall, Inc and for more information, you can go to www.steinwall.com/awards.html*
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August, 2009

Total ......................................................... 413

OPEN Invitation to all Upper Midwest Section Schools/Colleges to JOIN the Society of Plastics Engineers (SPE)

Here are Top 10 reasons to join the SPE

Student Members of SPE have all the privileges of SPE membership afforded to other member grades, including:

- Reduced SPE membership dues – ONLY $31.00 per year
- Plastics Engineering magazine every month
- Reduced registration for all educational seminars; Reduced registration at ANTEC and other technical conferences
- Discounts on over 100 important publications
- Insurance programs
- 3 free “position wanted” ads in Plastics Engineering; Access to Career Solutions, SPE’s Online Plastics Employment Network
- Scholarships offered through the SPE Foundation, SPE Sections and Divisions; Cash Awards for Best Paper/Poster at many SPE-sponsored Conferences.
- FREE membership to your local SPE Section; FREE Division affiliation
- Section dinner meetings; technical programs and even Special Events… check out the Annual Golf Outing flyer to be held on September 15 this year.
- Professional contacts

... and much more!!!

Please contact
Shilpa Manjure, Education Chair – Upper Midwest Section SPE to learn more about the benefits of being a member of SPE and a few easy-steps to form a student chapter:
email smanjure@ntic.com or call (763) 225 6646
The Upper Midwest section of SPE is proud to announce our next SPE Networking Happy Hour

Thursday September 10, 2009 • 5 p.m. to 7 p.m.

Where: Alaska Eatery and Glacier Bar
6501 Wayzata Boulevard, St. Louis Park, MN 55426

Who: Everyone in the plastics industry

Why: It is FUN! Plus, there has never been a better time to get to know your fellow professionals in the plastics industry. You never know when you will need it.

Cost: FREE ADMISSION AND COMPLIMENTARY APPETIZERS!! Food and Drinks off the Happy Hour menu are extra.

If you have any questions please feel free to e-mail me at: EricS@Harbor-Plastics.com
If you plan to come please e-mail me so I can make sure we have enough space reserved.

upper midwest section
GOLF OUTING
RESCHEDULED FOR
September 15, 2009
Oak Marsh Golf Course • Oakdale MN

For Registration and Questions, please contact;
ERIC at 62-810-9764 or erics@harbor-plastics.com
SHILPA MANJURE at 763-225-6646 or shilpa.manjure@gmail.com
or go to the section website at www.uppermidwestspe.org

SPE Past President
Jerome L. Formo

The Society of Plastics Engineers notes with sorrow the passing of Jerome L. Formo of Roseville, Minnesota. Jerry died on April 9, 2009, at the age of 93. He was President of SPE in 1956, and he was the first President of the Upper Midwest Section, which was founded in 1947.
SPOTLIGHT ON THE BOARD – Continued from Page 8

Domasius is a prolific author, having published 11 technical papers and two book chapters. He has also edited two books, Polyolefin Blends and Polyolefin Composites. Moreover, his publications have already been cited by other authors over 150 times...an excellent example of building an Absolute Career! (See the President’s Remarks column in this issue.) In addition to his membership in SPE, Domasius is a member of the American Chemical Society (ACS) and Polymer Processing Society (PPS).

When asked about how he became interested in polymer science and engineering, Domasius replied, “I credit my interest in plastics to my two mentors: my high school chemistry teacher Mr. Arora (an Indian) and my chemical engineering teacher Dr. Olakoke Olabisi (a Nigerian)... I love plastics field so much that I can’t imagine being in any other field.”
Local SPE and the Governor Help Support Manufacturing in Minnesota

The SPE - Upper Midwest Section helped sponsor Minni Tek on August 18, 2009. SPE realizes small businesses and the local manufacturing sector are vital elements to keeping local economies strong, and last week, Minnesota Governor Tim Pawlenty reinforced that message during his keynote address to a crowd of nearly 170 people attending Minni Tek, a half-day, invitation-only event organized by Vista Technologies. The educational event introduced attendees to the new methods and technologies used to manufacture low volume production parts including additive fabrication, milling and aluminum tooling.

During his speech, Gov. Pawlenty noted that the public perception of manufacturing is 20 to 30 years out of date, and praised Minnesota manufacturers for adopting niche and value-added systems to counteract decline in the sector. He also commented on the prevalence of Minnesota growth due largely in part to in-state entrepreneurs who build their businesses locally.

The Governor had a tough act to follow, because Chapter President Richard Bopp had the podium before Governor Pawlenty to discuss the local SPE chapter and all the positives there are to joining. He highlighted the Online Technical Library, technical conferences, opportunities to network and for career development and the Golf Event on September 15, 2009. There were no member applications leftover on the Sponsor Table so we are looking for a great upswing in membership!

The event was held at North Oaks Golf Club in North Oaks, Minn. Attendees included engineers and purchasers from companies including Medtronic, Lockheed Martin, St. Jude, Toro, 3M and Boston Scientific.

About Minni Tek

Minni Tek strives to increase the awareness of the growing niche of low volume production and its struggles. The intention of this platform is to educate companies of new technologies and the successes that follow. For more information on MinniTek or to download the presentations, please visit www.lowvolumeproduction.com.

The session concluded with an expert panel discussion on the trends of low volume production and the implications these trends have on the Minnesota economy.

Other participating experts at the event included:

Dr. Art Erdman, University of Minnesota, event moderator
Gloria McDonnell, HLB Tautges Redpath, LTD., presenting on manufacturing and regulations
Jeff Hanson, RedEye, presenting on Direct Digital Manufacturing
Dave Reasor, Product Development Solutions, Inc., presenting on CNC Machining
Dan Mishek, VistaTek, presenting on Rapid Tooling and Injection Molding
Expert panelists David Sparks - Andersen Corporation
Michael Thorsfeldt - Clearfield
Paul Hennen - Donaldson
Bill Buenz, Graco
Kimberly Stenerson, Medtronic

Dan Mishek, co-owner of VistaTek and on the SPE Board (Membership Committee), and his grandfather, Ken Wilson, founder of Wilson Tool, introduced the Governor together.
Society of Plastic Engineers Upper-Midwest Section
Getting Physical with Physical Properties

Pre-Registration Form
Please fill out this registration form and immediately FAX it to:
(952) 492-5156

Or scan this form and email to sdmertes@ashland.com
The number of seats are limited and will be assigned to the first 100 registrations received based on the FAX time stamp. Sorry, no exceptions.

NAME(s): ____________________________________________
COMPANY: __________________________________________
PHONE: ____________________________________________
ADDRESS: __________________________________________
EMAIL: _____________________________________________

☐ I/we will attend. Enclosed is my payment for:

Before September 22nd:
$99.00 per SPE member ________________
$129.00 per Non-member ________________
$60.00 per Student (ID Required) ________

After September 22nd:
$129.00 per SPE member ________________
$149.00 per Non-member ________________

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NAME ON CARD: ________________________ CODE on BACK ______

For payments with a check, the postmark date on the envelope will be used to determine eligibility for the first 100 seats (not the FAXed registration form). Make checks payable to “SPE - Upper Midwest Section” and mail to:

Sean Mertes
19095 Wells Lane
Jordan, MN 55352

For questions and further information please contact:

Sean Mertes
Phone: (612) 801-2417
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