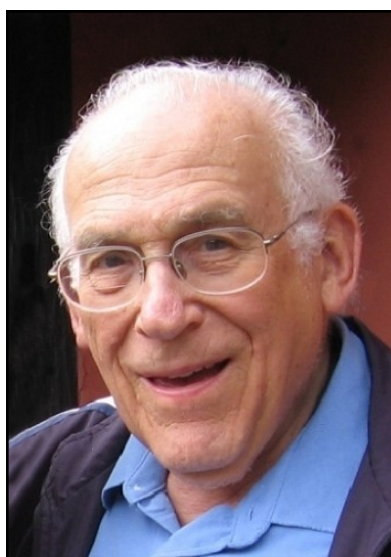


In Memory of Dr. Myer Ezrin June 23, 1926 - May 6, 2016



Special points of interest:

- TRIBUTE TO DR. MYER EZRIN
- ANTEC 2016 WRAP-UP
- FAPSIG SCHOLARSHIP
- FAPSIG BEST PAPER
- ANNOUNCEMENTS
- FAPSIG BOARD

Letter from the Chair — Jennifer Hoffman

Letter from the Chair:

On behalf of the Failure Analysis and Prevention SIG (FAPSIG), I wish you a Happy New Year! We look forward to your continued support and participation in our sessions at ANTEC 2017. This year we plan to offer another engaging and educational expert panel. These types of sessions provide a platform for experts to share their experiential knowledge and attendees to learn approaches to troubleshooting polymer-related issues and designing against failures. You are also welcome to attend the FAPSIG annual board meeting to learn more about our growing group and offer suggestions for improvement! Be on the lookout for more details...

I look forward to seeing familiar faces and meeting new friends in Anaheim!

Warm regards,

Jennifer Hoffman
AirXpanders, Inc.
2016/2017 FAPSIG Chair



Jennifer Hoffman, Ph.D.
FAPSIG Chair

2016 Tribute: Dr. Myer Ezrin

The sad passing of Myer (Mike) Ezrin on May 6 at the age of 89 will be felt deeply in the plastics failure community and well beyond. A regular visitor to ANTEC even long after official retirement and a widely recognized expert, his absence at this year's conference in Indianapolis affected many who attended.

Myer Ezrin was an academic prodigy, graduating from high school at age 15. His studies at Tufts, where he received a B.S. in chemistry (summa cum laude), were interrupted by naval service in World War II. He obtained his Ph.D. in organic chemistry from Yale, researching electron exchange polymers.

Then followed 29 years working in industry at DuPont, Monsanto, and Springborn Laboratories. He moved back into academia in 1980, when he took a position at the Institute of Materials Science at the University of Connecticut, directing its Associates Program and conducting research in areas including plastics failure analysis and electrical insulation. His formal retirement in 2006 marked a total of 55 years working in industry and academia, but he remained active subsequently, speaking and consulting internationally on the topic of plastics failure, acting as an expert witness, and completing the second edition of his book.

Dr. Ezrin had a long-standing involvement with the Society of Plastics Engineers (SPE), in particular with the Failure Analysis and Prevention Special Interest Group, of which he was formerly chairman. He was president of the SPE Western New England Section and elected Fellow of the SPE in 1999. He received the SPE ANTEC, Polymer Analysis Division Best Paper Award in 2002. Recognizing his contribution to the area, the ANTEC Best Paper Award in the area of failure analysis investigations and techniques bears Dr. Ezrin's name on an ongoing basis.

The book "Plastics Analysis Guide" (Hanser Gardner, 1983, 358 pp) was coauthored by Dr. Ezrin. In 1996, this was followed up by his sole-author work "Plastics Failure Guide: Cause and Prevention" (Hanser/SPE, 495 pp), which was quickly recognized as an essential reference guide in the area. A much-expanded second edition (Hanser, 868 pp) arrived in 2013. He published over 70 papers on topics spanning plastics failure, plastics analysis, solar panels, and electrical insulation, and developed innovative interactive video courses at the University of Connecticut.

Myer Ezrin is survived by his three children, five grandchildren, and two great-grandchildren. He was predeceased by his first wife Madeline Becker (née Frager; d. 2001) and Elaine Becker (d. 2014), whom he married in 2005. He will not only be remembered for his significant contributions to improved product safety and reliability, protection of intellectual property, and dissemination of knowledge, but also as a man of humor, kindness, and generous spirit.

- Myer Ezrin, born June 23, 1926; died May 6, 2016.

Mark Smith, Senior Editor, Hanser Publishers, Munich

It is with great sadness that I write this article on the passing of a dear friend and mentor.

Dr. Myer Ezrin, known as Mike to the many friends he had, passed away on May 6, 2016 at the age of 89. Mike was an icon in the plastic failure and prevention community. He was an icon not only because of his in-depth knowledge, but because of his great passion for the subject and his willingness to educate any person that asked.

I recall, as a young engineer, timidly calling Mike to educate me on thermal desorption gas chromatography/mass spectroscopy. Nearly two hours later with my head full and spinning, I had a clear direction on how to proceed with the project I was working on. More importantly, I made a new friend that would last for almost two decades. He made it clear that I could call him at anytime to discuss plastic failure, prevention, testing and life in general—I took him up on this generous offer many times.

These discussions will be truly missed. Thanks Mike.

Paul Gramann, Ph.D., The Madison Group

ANTEC® 2016

ANTEC 2016 Wrap-up

FAPSIG offered two well-attended sessions at ANTEC 2016 in Indianapolis. We partnered with the Pipes and Fittings SIG to present papers related to Failure Prevention and Slow Crack Growth. We thank Prof. Alexander Chudnovsky (Univ. Illinois-Chicago), who kicked off the session with a very informative keynote addressing “Limitations of existing standards in assessment of PE pressure pipe lifetime in brittle fracture.” In a second joint session, we partnered with the Composites Division to present papers on Failure Analysis in Composites. Special thanks to our keynote speakers Matt Jaworski (Autodesk, “Advances in the prediction of weld line strength failures for fiber filled plastics”) and Dr. Antoine Rios (The Madison Group, “Why it is not always better to use fiber reinforced plastics”).

Congratulations to Suk Joon Na (lead author/presenter, Ph.D. candidate), Long Nguyen, Sabrina Spatari and Grace Y. Hsuan of Drexel University for winning the Dr. Myer Ezrin Best Paper Award for their paper “Evaluating the Effect of Nanoclay and Recycled HDPE on Stress Cracking in HDPE Using J-Integral Approach.” (The abstract of this paper is shown on page 5 of this newsletter)

FAPSIG would also like to thank the following sponsors for supporting and funding our ANTEC activities: Element, Engineering Systems, Inc., Exponent, The Madison Group, and Plastic Failure Labs. Because of our sponsors we were able to sponsor student travel, and continue our annual tradition of handing out \$5 Starbucks gift cards to thank attendees for their interest and participation in FAPSIG sessions. Additionally, starting in 2016-2017 FAPSIG will be sponsoring a student paper award to encourage graduate and undergraduate students to become involved in SPE. If your company is interested in becoming a sponsor for ANTEC 2017, please contact Jeff Jansen (jeff@madisongroup.com). Overall, the FAPSIG sessions at ANTEC 2016 were a success and we look forward to building on that success for ANTEC 2017.

Brian Ralston, ANTEC 2016-17 FAPSIG Technical Program Chair



www.esi-website.com

FAPSIG Announces \$2000 Scholarship

The Failure Analysis and Prevention SIG of the Society of Plastics Engineers is pleased to announce a new scholarship award for students involved in research related to failure analysis and prevention, including topics such as material selection/characterization, CAE/FEA modeling, and lifetime prediction.

The scholarship is a two-part award. For the first part, the recipient will be presented with \$500 (USD) and a plaque at ANTEC 2017. To be eligible for the second \$1,500 part of the award, the research described in the winning application must be submitted as a paper, accepted and presented at ANTEC 2018 (procedures for submitting papers to ANTEC can be found on SPE's website, www.4SPE.org).

The scholarship winner will be selected based on a 1-page summary of their research. The summary must be written by the student and submitted by completing the attached form. The summary is due on March 13, 2017, and the winner will be announced by March 31, 2017. The winner will be announced by email via a valid university email account. The applicant is expected to complete the proposed research as a university student and to be enrolled at the time the paper is submitted to ANTEC 2018.

To receive the application form or if you have any questions, please contact:

Dr. Antoine Rios
Activities Chair, Failure Analysis and Prevention SIG (FAPSIG)
Antoine.SPE@madisongroup.com

2016 Dr. Myer Ezrin FAPSIG Best Paper

Suk Joon Na, Long Nguyen, Sabrina Spatari and Grace Y. Hsuan of Drexel University were the winners of the Dr. Myer Ezrin Best Paper Award for their paper "Evaluating the Effect of Nanoclay and Recycled HDPE on Stress Cracking in HDPE Using J-Integral Approach." This paper can be found in the proceedings of the ANTEC 2016 conference. Below is the abstract from this paper:

EVALUATING THE EFFECT OF NANOCCLAY AND RECYCLED HDPE ON STRESS CRACKING IN HDPE USING *J*-INTEGRAL APPROACH

*Suk Joon Na, Long Nguyen, Sabrina Spatari and Grace Y. Hsuan,
Drexel University, Philadelphia, PA, USA*

This study employed the *J*-integral approach to investigate the effect of recycled HDPE and nanoclay contents on the long-term stress cracking behavior of pristine HDPE. This behavior was conventionally approached by using stress intensity factor *K*, which defined the stress cracking behavior as two failure mechanisms: creep and slow crack growth (SCG). Unlike the conventional approach, the *J*-integral method identified the short-term failure prior to the creep failure. By integrating the short-term and SCG failure behavior, this study derived a correlation between J_c and SCG. The SCG behavior of recycle-blended materials without nanoclay was governed by J_c which decreased as the recycled contents increased. The decrease of J_c led to a reduction in SCG failure time. In contrast, the addition of nanoclay (up to 6-wt%) reduced J_c and stress relaxation of the material, subsequently extending the SCG failure times.



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Announcements



John Nebbia Joins The Madison Group Engineer Team

John joined The Madison Group in June of 2016 after graduating from Winona State University with a B.S. in Composite Materials Engineering and a minor in Mathematics. John has worked at the Composite Materials Technology Center (COMTEC) performing thermal and mechanical testing of polymeric materials. Additionally, John has worked in different manufacturing engineering positions with Coda Composites and Abrasive Technology. While working at these companies, he implemented continual process improvement, worked in new product development, and conducted research. At The Madison Group, his work primarily involves material evaluation, failure analysis and prevention. John is also an active member of the Society of Plastics Engineers (SPE).



Dr. Sarah Parker Joins Exponent

Exponent welcomes Dr. Sarah Parker to its Polymer Science and Materials Chemistry practice. Dr. Parker's expertise is in the areas of homogeneous organometallic catalysis as well as machinery lubrication. Prior to joining Exponent, Dr. Parker was employed by ExxonMobil where she worked on lubricant products for commercial engines and investigated product performance issues associated with low temperature operating conditions, oxidation and wear. Dr. Parker received her Ph.D. in Chemistry from Harvard University where she studied selective hydrosilylation of dienes by platinum catalysts. Dr. Parker joined Exponent on January 9, 2017 in its Natick, MA office.



Dr. Michael Imburgia Joins Exponent

Exponent welcomes Dr. Michael Imburgia to its Polymer Science and Materials Chemistry practice. Dr. Imburgia's expertise is in the areas of physical and chemical characterization of polymeric materials as well as mechanical and adhesion testing, materials selection, and component design. Dr. Imburgia received his Ph.D. in Polymer Science and Engineering from the University of Massachusetts Amherst where he studied the deformation and adhesion of compliant composite systems. During that time his work focused on applications ranging from bio-inspired adhesives to micro-wrinkled surface fabrication. Dr. Imburgia joined Exponent on January 16, 2017 in its Natick, MA office.

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Announcements

SPE Webinars Related to Plastic Failure/Prevention

Understanding Failure Rate in Plastic Components

Instructor: Jeffrey Jansen, The Madison Group

January 26, 2017, 10 AM central

Contact: smarko@4SPE.ORG

When a plastic part fails, a tough question is often asked, “Why are a limited number of parts failing?” This is particularly true with seemingly random failures at significant, but low, failure rates. Two aspects are generally linked to such low failure rates, multiple factor concurrency and the statistical nature of plastic failures. Failure often only takes place when two or more factors take effect concurrently. Absent one of these factors, failure will not occur. Plastic resins and the associated forming processes produce parts with a statistical distribution of performance properties, such as strength and ductility. Likewise, environmental conditions, including stress and temperature, to which the resin is exposed through its life cycle is also a statistical distribution. Failure occurs when a portion of the distribution of stress on the parts exceeds a portion of the distribution of strength of the parts. This webinar will illustrate how the combination of multiple factor concurrency and the inherent statistical nature of plastic materials can result in seemingly random failures.

An Introduction to Plastics

Instructor: Jeffrey Jansen, The Madison Group

February 16, 2017, 10 AM central

Contact: smarko@4SPE.ORG

Plastics are the most versatile materials ever invented, and have become a universal material, used for everything from water bottles to wings on combat aircraft. Plastic materials display properties that are unique when compared to other materials and have contributed greatly to quality of our everyday life. At this moment, you are almost certain to be touching plastic. Yet, while plastics play such an important role, we do not always understand the fundamental concepts of their production, compounding, end properties, and use.

FAPSIG Meeting Minutes, May 23, 2016

Attendees:

Jennifer Hoffman – Chair
Anand Shah – Past Chair
Brian Ralston – (TPC)
Antoine Rios - Activities Chair
Jeffrey Jansen – Sponsorship Chair
Steve Maclean - Treasurer
Todd Menna - TPC in Training
Sue Mantell - Website Coordinator
Don Duvall - Membership Chair
Jose Perez - Secretary
Antoine Rios – Activities Chair

Sue Mantell – Webmaster
Kathy Schact – SPE Liaison

Others

Dale Edwards – Director (Past Chair)
Maureen Reitman (Exponent)
Alexander Chudnovsky (University of Ill – Chicago)
Byoung-H Choi (Korea University)
Robert Pieper (Element)

Absent

Mike Hayes – Social Networking
Paul Gramann – Newsletter Editor
Javier Cruz - Education Committee Chair

Board (Hoffman):

Minutes approved from 2015 meeting, no changes requested.
No changes to current board positions for 2016-2017.

Treasurer's Report (Maclean):

As of 12/31/2015, balance was \$12,004
Sponsorship contributions, ANTEC gift card and best paper expenses led to balance of \$14,839 as of 5/23/2016
\$750 Student Travel sponsorship to continue moving forward.

ANTEC 2016 Review (Hoffman):

Soliciting Papers:

Significant drop in papers for 2016. Only 4 submitted. Per Don: We have 1,600 active members (for comparison 2,785 in injection molding). A lot of interest, but only limited participation. Active members are persons who are active members of SPE vs. an E-member who is a person with a free membership.

Call for papers are going out very late in the process. Possibly too late. We can do e-Blasts (1 /month?) to either our SIG or other SIGs.

Per Sue Mantell - Offer old paper topics as an example for potential new topics. Mention significant cost drop for being a presenter.

Per Antoine Rios - No solicitation of topics specific to the "Prevention" component of FAPSIG. Wait and see if the Composites partnership pays dividends moving forward.

Per Jennifer Hoffman - Hit up the Plastic Design folks for the prevention aspect. Will solicit additional feedback from board.

Per Jeff Jansen - Solicit presentations without the need to do a paper.

Per Maureen - Solicit former authors for papers

Best Paper Criteria:

Added focus/weight to the presentation last year. Plan to keep that focus moving forward. Per Brian R.: Limited submissions limits the process. Possible need to invoke a minimal submission threshold. No decision made.

Per Don Duvall - Multiple awards for different categories

ANTEC 2017 (Hoffman):

Session Format:

Per Don Duvall - Tremendous need/demand for FA education, thus "expert" and "tutorial" sessions offer great value due to lack of education in schools.

Per Maureen - Presentations/tutorials focusing on common failure modes?

Per Sue - Selecting materials tutorial?

Per Todd - Beware excess overlap. Possibly keep these types of overarching topics to a limited number of authors.

Per Andy - Year in review of topics covered in Plastics Engineering Magazine

Soliciting Papers:

Already covered.

Money Allocation for ANTEC 2017

Student Paper Proposal (Rios) - Proposed plan is to create an award to undergraduate and graduate students (sent out via email). 250 word abstract, anonymized review and judging, \$500 award (student need not be present). If a follow up paper is submitted, accepted, and presented, additional award of \$1500. Running cost of \$2,000/annual to our SIG.

Concerns raised regarding the strength of the abstracts to include data and/or references. Add examples on the page.

Maureen made motion to approve Antoine's plan, Brian Ralston seconded. All YEAHs (unanimous).

Student Activities Fund - Was \$750 in last two years. No metric for effectiveness, but certainly viable as a good will gesture.

Other Topics:

Website: Per Sue - Our page is currently simple/limited. Basic links with links to newsletters. Could add sponsors.

Current photo stream is mostly headshots. Wants feedback from team on how to target traffic to the FAPSIG community page.

SPE can build a website for a fee.

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