

CHAIRMAN'S MESSAGE

As the newly elected chairman of the Extrusion Division Board for 2020, it is my pleasure to introduce myself. I am a chemical engineer who works for a large manufacturer of twin-screw extruders, and I have been involved in the polymer industry for over 20 years in executive management and sales. I enjoy golf, lake activities, and sipping Kentucky's favorite spirit. I been involved with SPE since I started working in the polymer industry and this Society has opened up a great many doors and given me a wonderful road map for my career. Today, I enjoy meeting everyone in this industry and I enjoy giving back to the Society that helped me so much during my career.

We just finished up with Virtual ANTEC which ran from March 29 - May 6 with all the presentations done remotely. It was thought to be a big success. ANTEC was supposed to be held March 29-April 2 in San Antonio, Texas at the Marriott RiverCenter Hotel, but due to COVID-19 virus it was cancelled.

The Extrusion Division put together another phenomenal technical program and I would like to thank Dr. John Perdikoulis (JP) for his hard work in making it run so smooth, and his presenters of the sessions who had to quickly adapt to the new virtual format. I would like to also thank the SPE members...because the presentations were so well attended via Zoom videoconferencing.

After ANTEC, we will continue to update our members on when we can get back to business as "normal." We are still planning some conferences, but for the moment everything is on hold.

Finally, I am pleased to serve our membership and will try to make 2020 a memorable year for everyone. I wish all of you good health during these trying times and please take care of your friends, spouses, and families during the remainder of 2020.

Paul Martin

SPE Extrusion Division Chair 2020-2021

pumpmantx@yahoo.com



SPE EXTRUSION DIVISION HONORS 2020 AWARD WINNERS

Each year the Extrusion Division Board of Directors honors members of the extrusion community with awards that honor their achievements. This year, the awards honored the achievements of seven outstanding members of the community.

Bruce Maddock Award: Bruce Maddock was a pioneer in the fundamental analysis of the single-screw extrusion process. This award honors his achievements. Award recipients have contributed significantly to the advancement of single-screw extrusion technology or associated processing technology by providing experimental achievements and understanding to the fundamentals of the process. The award recipient is selected by The Extrusion Division Board of Directors. Sponsored by The Dow Chemical Company.



The 2020 Bruce Maddock award honors the achievements of William A. Kramer. Bill started his career working in the shop at the extruder manufacturer Davis-Standard in Pawcatuck, Connecticut in 1970, and took evening classes in drafting at Thames Valley State Technical College. He soon moved into the engineering department as a junior draftsman, and in over just a few years advanced to

Engineering Manager while continuing night school. Bill graduated from Mitchell College in 1986 earning an Associate's degree in Mechanical Engineering with various academic awards. He continued night classes in engineering with the University of New Haven towards a BS degree but never completed due to increasing work responsibilities and travel.

Bill co-founded Hi-Tech Extrusion Systems in 1979, a rubber extrusion systems supplier, serving as engineering director until rejoining Davis-Standard in 1982 as chief engineer, later becoming technical director on the president's staff. In 1997 Bill co-founded (with Ed Steward) and was president of the extruder manufacturing company American Kuhne Corp., which was acquired by Graham Engineering Corp. in 2015. Bill subsequently became involved again in a new start-up as president of US Extruders, a manufacturer of plastic extrusion equipment, in Westerly, R.I.

Distinguished Achievement Award: This award is sponsored by The Extrusion Division to honor individuals who have made significant contributions to the development and advancement in the extrusion industry. The Distinguished Achievement Award is sponsored by The Extrusion Division.

The 2020 winner of the Distinguished Achievement Award is Dr. Gregory A. Campbell. Dr. Campbell is being honored for his many contributions to the plastics industry and to the Extrusion Division. He is Professor Emeritus at Clarkson University and has a consulting company Castle Associates. His research and innovations include PU foams, electro-deposition of paint primers, development of the neck design for crash dummies, injection molding controls and instrumentation, blown film fundamentals, and screw rotation fundamentals for single-screw extrusion. He was a member of the Extrusion Division Board of Directors from 2002 to 2017. He is an SPE Fellow and Honored Service Member, was honored with the Bruce Maddock Award (2011), won the SPE Research and Technology Award, and has won the Best Paper Award 4 times in Extrusion.



Heinz Herrmann Twin-Screw Extrusion Award: Award recipients are to have contributed significantly to the advancement of twin-screw extrusion technology. This can be accomplished through experimental or theoretical achievements that provide an understanding to the fundamentals of processing material in the extruder. These experiments could include (but not limited to) work relating to solids conveying, melting, mixing, devolatilization, and pumping functions of twin-screw extrusion. The Heinz Herrmann Award is sponsored by The Coperion Corp.

The 2020 Heinz Herrmann award winner is Dr. Paul Andersen. Dr. Andersen is retired from Coperion Corporation. He was responsible for Process Engineering and New Technology Development for Twin-Screw Extrusion/Compounding. He has over



40 years of industrial experience. He has worked extensively on compounding of multi-phase engineering polymers. Paul holds process patents as well as patents on screw element design for improved mixing. Dr. Andersen is a SPE Past-President (2009-2010), Honored Service Member (2015), and frequent presenter at ANTECs.

Heinz List Award: Heinz List was a pioneer of modern industrial processing technology. He was the inventor of the Ko-Kneader, the founder of LIST, and a member of the Polymer Processing Hall of Fame. Recipients are to have contributed significantly to the advancement of polymer devolatilization, drying, evaporation, or reactive polymerization technologies pertaining to extrusion processing. The Heinz List Award is sponsored by List USA Inc.



Dr. Chun Sing Wong (retired from DuPont) is the 2020 winner of the Heinz List Award. Dr. Wong was born in Hong Kong. He received his BSc degree from The University of Hong Kong and his PhD degree from The University of Chicago. Under the guidance of Professor Jack Halpern in Chicago, he studied kinetics and mechanisms of reactions involving organometallic complexes.

After graduation he immigrated to Canada and worked with Professor Howard Clark as a postdoctoral fellow. Later he joined DuPont Canada Inc. in their Research Division in Kingston Ontario.

With the goal of increasing the value-in-use of PE, he developed a process to functionalize PE in a twin-screw extruder. It involved extruding PE and maleic anhydride together in the presence of a peroxide free radical initiator. The final process had high monomer conversion efficiency and had a rate comparable to that of simple compounding. The resultant grafted product had low residual monomer, low gel, and low color. Similar processes were also developed for other thermoplastics and elastomers, leading to the commercialization of several FUSABOND® product lines. Commercial production of these products is still occurring in North America, Asia, and Europe.

Jack Barney Award: The Jack Barney Award was initiated by Walex Corporation to honor Jack Barney, the founder of Extrusion Dies Industries. The award is to be presented to persons who have made a significant contribution to the development of the flat sheet industry. Their contributions can be technical

or commercial. The Jack Barney Award is sponsored by Nordson EDI.

The 2020 Jack Barney Award winner is Greg Dixon. Greg has served the extrusion industry for thirty-five years. He has spent the last twenty-three years working at Spartech Plastics where he has held various positions supporting manufacturing and new product application development. Greg's primary focus throughout much of his career has been multilayer barrier coextrusion. Greg began his career in multilayer coextrusion in the 1980's with DRG Plastics in Union, Missouri which is now owned by Silgan. DRG Plastics was known for their proprietary in-line extrusion rotary thermoforming process. Greg holds a BS in Mechanical Engineering from Ohio University (1985).



Out-Going Extrusion Division Chairman:

Kevin Slusarz led the Extrusion Division as Chairman for 2019-2020. Kevin provided direction for the economics of the division, policy changes, setting committees, and many other activities. He now provides the skills learned as a Past Chairman. Thank you for your leadership. ■



EXTRUSION PRESENTATION OF THE MONTH

How Robust is Your Feeding Technology? Key Considerations to Ensure Reliable and Even Smarter Performance

John Winski, Director of Sales -Americas, Coperion K-Tron

Today's modern manufacturing processes utilize loss-in-weight (LIW) feeders as the automated dispensing technology for dry bulk solids. The most current feeding technologies have evolved in many aspects through improved control and design features with an emphasis on process robustness and intelligence. It is expected that feeder controls can easily connect to industrial networks and key process data, which has become a critical criterion in evaluating not only feeder performance but also real-time indication of the complete process.

This presentation addresses what a processor should consider when evaluating his current feeding equipment and the feeder's ability to monitor, trend and react to process variations. The availability of this data and its management in accordance with Industry 4.0 automation can allow the user to adapt to future manufacturing requirements, which can include greater traceability, flexibility, adaptability and overall effectiveness.

To download this presentation [CLICK HERE](#) ■

SPE WEBSITE LINK OF THE MONTH

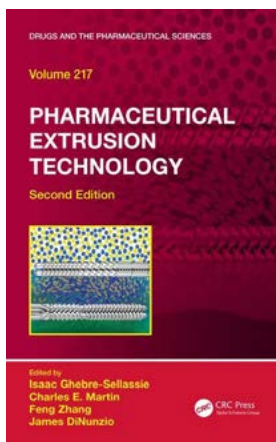
Plastics Research Online allows you to view and download technical articles for free. Browse the latest articles by category including: Applied Rheology, Bioplastics, Composites, Conductive Polymers, Engineering Properties, Extrusion, Failure Analysis, Injection Molding, Plastics Nanotechnology, Polymer Modifiers, and Thermoplastics.

To access these articles [CLICK HERE](#). ■

BOOK RECOMMENDATION:

PHARMACEUTICAL EXTRUSION TECHNOLOGY, SECOND EDITION

Edited by Isaac Ghebre-Sellassie, Charles E. Martin, Feng Zhang, and James DiNunzio



The first edition of *Pharmaceutical Extrusion Technology* (published in 2003) was deemed the seminal book on pharmaceutical extrusion. Now it is expanded and improved, just like the usage of extrusion has expanded and evolved into an accepted manufacturing technology to continuously mix active pharmaceutical ingredients for a myriad of traditional and novel dosage forms. *Pharmaceutical Extrusion Technology, Second*

Edition adds new authors, expanded chapters and contains all the extrusion related technical information necessary for the development,

manufacturing, and marketing of pharmaceutical products.

Features:

- » Reviews how extrusion has become an accepted technology to continuously mix active pharmaceutical ingredients with excipients
- » Focuses on equipment and process technology
- » Explains various extrusion system configurations as a manufacturing methodology for a variety of dosage forms
- » Presents new opportunities available only via extrusion and future trends
- » Includes contributions of experts from the process and equipment fields.

To order this book [CLICK HERE](#) ■

EXTRUSION FORMULA OF THE MONTH: UNDERSTANDING TORQUE IN A TWIN-SCREW EXTRUDER

By Charlie Martin, Leistritz Extrusion

The gearbox of a twin-screw extruder transmits energy from the motor to the screws, and reduces the motor speed to the desired screw rpm while multiplying torque. To avoid gearbox damage, most twin-screw extruders have a mechanical overtorque coupling that connects the motor shaft to the gearbox input shaft, and automatically disengages the motor in an overtorque situation.

The TSE motor inputs energy into the process via rotating screws that impart shear and energy into the materials being processed to facilitate melting, mixing devolatilization and pumping. Alternating current (AC) motors/drives are the industry standard. The percentage motor torque is a particularly critical parameter to be monitored, and is measured as follows:

% Torque: This formula indicates % of available rotational force being used in a process, and is a

typical readout in the control panel as a %. This is calculated as follows:

$$\% \text{ Torque} = \text{applied motor power (kW)} / \text{maximum available motor power (kW)}$$

For example, if a TSE has a maximum rating of 500 kW and a process draw 400 kW, then the torque is 80% (400 kW/500 kW).

$$\% \text{ Torque} = 400 / 500 = 80\%$$

Torque % is one of the most important process parameters to monitor and track in any extrusion process. If it changes lot to lot, then something else has changed too and the final product may also be different. It's at least worth checking.

This parameter can also be used to help calculate the energy used and the related costs. ■

ANTEC® 2020 BEST PAPER EFFECT OF ULTRASONIC EXTRUSION ON PROPERTIES OF COLLOIDS CONTAINING EPOXIDIZED SOYBEAN OIL AND CLAY

Tian Liang, Department of Polymer Engineering, The University of Akron, Akron, OH

Avraam I. Isayev, Department of Polymer Engineering, The University of Akron, Akron, OH

Shuailin Zhang, Department of Polymer Science, The University of Akron, Akron, OH

Stephen Z. D. Cheng, Department of Polymer Science, The University of Akron, Akron, OH

It is well established that the addition of solid particles that absorb light across ultra-violet (UV) wavelengths can improve the environmental durability of plastics [1,2]. Thermoplastic polyester elastomers are sensitive to UV degradation in both exterior and interior applications. This paper describes an experimental evaluation of the improvement in UV performance of a polyester elastomer, Hytrel®, with the incorporation of a conventional chemical UV stabilizer along with different UV absorbing or scattering solid fillers. A rapid screening method is described that measures mechanical elongational properties as a function of UV exposure time. The results show that the particle type and size, the dispersion quality and melt compounding conditions affect UV durability.

To download entire paper [CLICK HERE](#) ■

PRECISION EXTRUSION TOPCON RESCHEDULED FOR JUNE 22-24, 2021

LEARN THE LATEST THEORIES, TIPS AND TECHNOLOGIES TO EXTRUDE PRECISION PARTS!

We've rescheduled our Topcon to June 22-24, 2021 in Nashville, TN! Look around us, the world is filled with products that are the result of precision extrusion! To make these items a thorough knowledge of extrusion is required, beginning with fundamentals and material selection, learning advanced extrusion techniques, as well as implementing process monitoring and analysis. The SPE Precision Extrusion Topcon will include:

- » ½ Day fundamentals of extrusion session
- » 20+ technical presentations by world leading industry experts
- » A great venue to mix and meet with colleagues and experts, and have some fun too!

For program details: <https://www.4spe.org/i4a/pages/index.cfm?pageid=5086>

A limited # of corporate sponsorships are available for only \$1200.

We look forward to seeing you at this high-tech event! ■

Thanks to the SPE Topcon corporate sponsors:



SHAPE EXTRUSION TOPCON 2021

Nashville, Tennessee • June 22-24, 2021
Presented by SPE Extrusion Division

SPE EXTRUSION DIVISION SPONSORS

PLATINUM

Davis Standard - www.davis-standard.com

Nordson - www.nordson.com

Coperion - www.coperion.com

Leistritz Extrusion - www.leistritz-extrusion.com

Barr Inc. - www.robertbarr.com

Cloeren - www.cloeren.com

Gneuss - www.gneuss.com

Kuraray - www.kuraray.com

US Extruders - www.usextruders.com

Chan I. Chung - www.hanserpublications.com

GOLD

Teel Plastics - www.teel.com

Polymer Center of Excellence - www.polymers-center.org



EXTRUSION

SPE Upcoming Calendar of Events:
[CLICK HERE](#) for all upcoming SPE events.

For the latest on the SPE Extrusion Division
and for contact information [CLICK HERE](#).

Newsletter Editor:

Jim Callari, *Plastics Technology Magazine*