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Corrie MacColl represents change for the natural rubber industry. We have the resources to revolutionise the way rubber is grown, processed and distributed.

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Sustainable rubber to ensure long-term viability

Corrie MacColl represents change for the natural rubber industry. We have the resources to revolutionise the way rubber is grown, processed and distributed.

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Talk to us at Booth 111
Chair’s Welcome

On behalf of the City of Cleveland, the Huntington Convention Center and the Rubber Division of the American Chemical Society, welcome to the 2019 International Elastomer Conference. The lineup of events this week is vast, and you are certain to find several things of interest, starting with an outstanding Keynote Address by Dr. Ramani Narayan, globally renowned expert in the “Circular Economy”; the concept of no rubber and plastic leakage into the natural environments through designing and synthesizing new molecules and processes with a responsible end-of-life strategy. He is acknowledged as having pioneered the field of biodegradability and brought to reality how commodity plastics can be recycled as value-added products. Dr. Narayan was prominently featured in a summer 2018 edition of National Geographic magazine and again most recently on National Public Radio.

Whether you are here for one day or the entire week, I hope that you pause a moment to look around at the colorful displays, the people walking the aisles, the conferences taking place in various exhibits, the courses taking place in the Educational Symposium, the special events and the constant chatter in a variety of languages. This environment didn’t happen overnight. It is the result of myriad efforts from a dedicated Rubber Division, ACS staff and volunteers, in an organization that has its roots over 100 years ago.

The Rubber Division is a division of The American Chemical Society. The ACS was founded in 1876 at New York University and currently has more than 158,000 members at all degree levels and in all fields of chemistry, chemical engineering and related fields. It is the world’s largest scientific society by membership and holds a Congressional Charter under Title 36 of the United States Code. The Rubber Division originated as the India Rubber Section of the ACS in 1909, achieving Division status in 1919 and incorporating in 1963. Rubber Division is one of 34 divisions of the American Chemical Society and has been headquartered in Akron, Ohio, since 1909.

In addition to all the exhibits, IEC is a full 3-day Educational Symposium, and this year marks the addition of the Women of Rubber Division (WORD) preconference workshop, as well as the creation of the new Young Professionals (YP) group, whose first forum will be held Wednesday afternoon to prepare for their 2020 kickoff. You will also see a First Timers event for people and companies who are participating at IEC for the first time, a Welcome Reception, a Presentation Skills Workshop and a Get Involved! initiative to help IEC attendees think about becoming the driving forces and leadership of the Rubber Division for generations to come.

Rubber Division staff and volunteers strive to maintain the IEC as the premier North American event in the rubber industry. Trade shows are often not just about business, but about camaraderie and collaboration. It is hard to put on an event like this, but as Tom Hanks said in the movie A League of Their Own, “If it wasn’t hard, everybody would do it. It’s the hard that makes it great.” Thank you to the Rubber Division team, volunteers and participants who make it great. I am proud to be this year’s Rubber Division, ACS Chair, and it is my wish that you will enjoy your time here in your business, that you will have a chance to visit with old friends and customers, as well as create new friendships and potential new customers, and that the afterglow of the event will bring you back to Rubber Division, ACS and IEC for many more years.
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event</th>
<th>Facility</th>
<th>Room</th>
<th>Floor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday 10.7.2019</td>
<td>7:00 a.m. - 6:00 p.m.</td>
<td>Registration</td>
<td>Convention Center</td>
<td>Expo Floor</td>
<td>Exhibit Level</td>
</tr>
<tr>
<td></td>
<td>8:00 a.m. - 9:00 a.m.</td>
<td>Steering Committee Breakfast*</td>
<td>Hilton Cleveland Downtown</td>
<td>Center Street D</td>
<td>Floor 3</td>
</tr>
<tr>
<td></td>
<td>9:00 a.m. - 12:00 p.m.</td>
<td>Steering Committee Meeting*</td>
<td>Hilton Cleveland Downtown</td>
<td>Center Street D</td>
<td>Floor 3</td>
</tr>
<tr>
<td></td>
<td>1:00 p.m. - 2:00 p.m.</td>
<td>Membership Committee Meeting</td>
<td>Hilton Cleveland Downtown</td>
<td>Center Street A</td>
<td>Floor 3</td>
</tr>
<tr>
<td></td>
<td>1:00 p.m. - 3:00 p.m.</td>
<td>Executive Committee/Rubber Group Chairs Training Session</td>
<td>Hilton Cleveland Downtown</td>
<td>Center Street B&amp;C</td>
<td>Floor 3</td>
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<tr>
<td></td>
<td>1:00 p.m. - 6:00 p.m.</td>
<td>Women’s Preconference Workshop</td>
<td>Hilton Cleveland Downtown</td>
<td>Hope Ballroom A</td>
<td>Floor 3</td>
</tr>
<tr>
<td></td>
<td>3:00 p.m. - 4:30 p.m.</td>
<td>Area Directors Meeting*</td>
<td>Hilton Cleveland Downtown</td>
<td>Center Street B&amp;C</td>
<td>Floor 3</td>
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<tr>
<td></td>
<td>3:00 p.m. - 5:00 p.m.</td>
<td>Program Planning Committee Meeting</td>
<td>Hilton Cleveland Downtown</td>
<td>Center Street A</td>
<td>Floor 3</td>
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<tr>
<td></td>
<td>3:00 p.m. - 5:00 p.m.</td>
<td>Strategic Education Committee Meeting</td>
<td>Hilton Cleveland Downtown</td>
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<td></td>
<td>5:00 p.m. - 6:00 p.m.</td>
<td>Best Paper Committee Meeting</td>
<td>Hilton Cleveland Downtown</td>
<td>Center Street A</td>
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<tr>
<td>Tuesday 10.8.2019</td>
<td>7:00 a.m. - 5:30 p.m.</td>
<td>Registration</td>
<td>Convention Center</td>
<td>Expo Floor</td>
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<td></td>
<td>8:00 a.m. - 8:30 a.m.</td>
<td>First Time Attendee Orientation</td>
<td>Convention Center</td>
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<tr>
<td></td>
<td>8:00 a.m. - 12:00 p.m.</td>
<td>Course: Essentials of Rubber Technology</td>
<td>Convention Center</td>
<td>Room 14</td>
<td>Exhibit Level</td>
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<tr>
<td></td>
<td>8:00 a.m. - 12:00 p.m.</td>
<td>Course: Compounding Fluoroelastomers</td>
<td>Convention Center</td>
<td>Room 15</td>
<td>Exhibit Level</td>
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<tr>
<td></td>
<td>9:00 a.m. - 10:00 a.m.</td>
<td>Keynote Speaker Address: Ramani Narayan, MSU University</td>
<td>Convention Center</td>
<td>Ballroom C</td>
<td>Ballroom Level</td>
</tr>
<tr>
<td></td>
<td>9:00 a.m. - 1:00 p.m.</td>
<td>Experience Elastomers High School Program</td>
<td>Convention Center</td>
<td>Ballroom A</td>
<td>Ballroom Level</td>
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<tr>
<td></td>
<td>10:00 a.m. - 10:15 a.m.</td>
<td>Expo Opening Ceremony &amp; Ribbon Cutting</td>
<td>Convention Center</td>
<td>Expo Floor</td>
<td>Exhibit Level</td>
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<td></td>
<td>10:15 a.m. - 5:00 p.m.</td>
<td>Expo</td>
<td>Convention Center</td>
<td>Expo Floor</td>
<td>Exhibit Level</td>
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<tr>
<td></td>
<td>10:30 a.m. - 11:30 a.m.</td>
<td>Presentation Skills Workshop</td>
<td>Convention Center</td>
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<td></td>
<td>11:30 a.m. - 12:00 p.m.</td>
<td>Get Involved!</td>
<td>Convention Center</td>
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<td>1:00 p.m. - 2:00 p.m.</td>
<td>Service Awards Committee Meeting</td>
<td>Convention Center</td>
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<td></td>
<td>1:00 p.m. - 3:00 p.m.</td>
<td>Southern Rubber Group Meeting</td>
<td>Convention Center</td>
<td>Room 22</td>
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<td>1:00 p.m. - 3:00 p.m.</td>
<td>Exhibits &amp; Meeting Sites Committee Meeting</td>
<td>Convention Center</td>
<td>Room 20</td>
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<tr>
<td></td>
<td>1:00 p.m. - 5:00 p.m.</td>
<td>Course: Silicone Rubber Chemistry and Technology</td>
<td>Convention Center</td>
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<tr>
<td></td>
<td>1:00 p.m. - 5:15 p.m.</td>
<td>196th Technical Meeting</td>
<td>Convention Center</td>
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<td>Ballroom Level</td>
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<td></td>
<td>2:00 p.m. - 3:00 p.m.</td>
<td>Student Affairs Committee Meeting</td>
<td>Convention Center</td>
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<td>Exhibit Level</td>
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<tr>
<td></td>
<td>3:00 p.m. - 4:00 p.m.</td>
<td>Marketing Committee Meeting</td>
<td>Convention Center</td>
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<tr>
<td></td>
<td>5:00 p.m. - 7:00 p.m.</td>
<td>Welcome Reception - Open To All Attendees</td>
<td>Convention Center</td>
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<td>Ballroom Level</td>
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<tr>
<td>Wednesday 10.9.2019</td>
<td>6:30 a.m.</td>
<td>Check-in</td>
<td>Hilton Cleveland Downtown</td>
<td>Meet in Lobby</td>
<td>Floor 1</td>
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<tr>
<td></td>
<td>7:00 a.m. - 5:30 p.m.</td>
<td>Registration</td>
<td>Convention Center</td>
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<td>Exhibit Level</td>
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<tr>
<td></td>
<td>8:00 a.m. - 9:30 a.m.</td>
<td>Advisory Committee on Testing Procedures Meeting</td>
<td>Convention Center</td>
<td>Room 22</td>
<td>Exhibit Level</td>
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<td></td>
<td>8:00 a.m. - 12:00 p.m.</td>
<td>Course: Compound Mixing and Consistency</td>
<td>Convention Center</td>
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<tr>
<td></td>
<td>8:00 a.m. - 5:00 p.m.</td>
<td>16th Annual Student Colloquium - Presentations</td>
<td>Convention Center</td>
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<tr>
<td></td>
<td>8:00 a.m. - 5:15 p.m.</td>
<td>196th Technical Meeting</td>
<td>Convention Center</td>
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<tr>
<td></td>
<td>8:30 a.m. - 4:30 p.m.</td>
<td>Course: Basic Rubber Compounding</td>
<td>Convention Center</td>
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<tr>
<td></td>
<td>10:00 a.m. - 11:00 a.m.</td>
<td>Finance &amp; Budget Committee Meeting*</td>
<td>Convention Center</td>
<td>Room 24</td>
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<tr>
<td></td>
<td>10:00 a.m. - 5:00 p.m.</td>
<td>16th Annual Student Colloquium - Posters</td>
<td>Convention Center</td>
<td>Expo Floor</td>
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<tr>
<td></td>
<td>11:00 a.m. - 11:30 a.m.</td>
<td>Get Involved!</td>
<td>Convention Center</td>
<td>Room 21</td>
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<td></td>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>25-Year Club Luncheon</td>
<td>Convention Center</td>
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<td></td>
<td>1:00 p.m. - 2:00 p.m.</td>
<td>Young Professionals Open Forum - for those under 40 years old</td>
<td>Convention Center</td>
<td>Room 21</td>
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<td></td>
<td>1:00 p.m. - 3:00 p.m.</td>
<td>Bourbon Trail Elastomer Group Meeting</td>
<td>Convention Center</td>
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<td></td>
<td>1:00 p.m. - 5:00 p.m.</td>
<td>Course: Establishing a Rubber Molding Process</td>
<td>Convention Center</td>
<td>Room 14</td>
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<tr>
<td></td>
<td>3:00 p.m. - 4:30 p.m.</td>
<td>Area Directors Caucus*</td>
<td>Convention Center</td>
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<tr>
<td>Thursday 10.10.2019</td>
<td>7:00 a.m. - 3:00 p.m.</td>
<td>Registration</td>
<td>Convention Center</td>
<td>Expo Floor</td>
<td>Exhibit Level</td>
</tr>
<tr>
<td></td>
<td>8:00 a.m. - 12:15 p.m.</td>
<td>196th Technical Meeting</td>
<td>Convention Center</td>
<td>Ballroom Rooms</td>
<td>Ballroom Level</td>
</tr>
<tr>
<td></td>
<td>8:30 a.m. - 12:00 p.m.</td>
<td>Course: Processing and Testing of Rubber</td>
<td>Convention Center</td>
<td>Room 14</td>
<td>Exhibit Level</td>
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<tr>
<td></td>
<td>9:00 a.m. - 10:30 a.m.</td>
<td>Executive Committee Meeting</td>
<td>Convention Center</td>
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<tr>
<td></td>
<td>10:00 a.m. - 3:00 p.m.</td>
<td>Career Fair</td>
<td>Convention Center</td>
<td>Concourse Foyer</td>
<td>Concourse Level</td>
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<td></td>
<td>10:00 a.m. - 3:00 p.m.</td>
<td>Expo</td>
<td>Convention Center</td>
<td>Expo Floor</td>
<td>Exhibit Level</td>
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<tr>
<td></td>
<td>2:00 p.m. - 3:00 p.m.</td>
<td>Business &amp; Awards Meeting</td>
<td>Convention Center</td>
<td>Expo Theater</td>
<td>Rubber Division, ACS Booth #648</td>
</tr>
</tbody>
</table>
Stop by their booths to learn more about these great companies.

Thank you to our valued Platinum, Gold, Silver & Bachelors sponsors and our exclusive IEC sponsors!
## Expo Theater Schedule

**The Expo Theater is located in the Rubber Division, ACS Booth #648.**

These presentations provide an opportunity to learn about what some of the best companies in our industry have to offer and how they can be of value to you.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tuesday</strong>&lt;br&gt;10.8.2019</td>
<td>11:30 a.m. – 12:00 p.m.</td>
<td><strong>TA Instruments Presentation</strong>&lt;br&gt;<strong>Selecting the Right Dynamic Mechanical Testing Solution for Product Performance</strong>&lt;br&gt;Dynamic mechanical testing is essential for guiding compound formulation decisions, optimizing processing conditions, and characterizing product performance. Although preferable to measure the mechanical properties of a rubber compound through all stages of the curing cycle using a single test method, physical limitations affect the accuracy of these measurements when using the wrong measurement technique. TA Instruments’s wide testing portfolio provides a solution for all dynamic mechanical testing needs, ranging from raw rubber, through the cure, to post-cure analysis. Come discover how choosing the right tool for the job will improve product performance and process optimization in the elastomer market.</td>
</tr>
<tr>
<td></td>
<td>1:30 p.m. – 2:00 p.m.</td>
<td><strong>Ergon, Inc. Presentation</strong>&lt;br&gt;<strong>What Drives Your Rubber PO Supply?</strong>&lt;br&gt;The RPO landscape is evolving. Increasing lubricity demands, geography &amp; economic pressures dictate new chemistries for the rubber and tire industry. This presentation looks at the background of the refining industry, insights into how we got here, how these changes could impact RPO, and important considerations as you prepare for potential impacts to your supply. Mary Ann Abney, Global Technical Marketing Manager, will be presenting. She is part of the team who guides Ergon to make long term investments in its raw material security program.</td>
</tr>
<tr>
<td></td>
<td>3:00 p.m. – 3:30 p.m.</td>
<td><strong>HEXPOL Compounding Presentation</strong>&lt;br&gt;<strong>Matching High Performance Elastomers to Your Application Requirements</strong>&lt;br&gt;HEXPOL Compounding is a leading global provider of custom rubber, silicone, thermoplastic and TPE compounds. Through acquisition, HEXPOL has expanded its product line of high-performance elastomers. HEXPOL’s high performance elastomers have been carefully formulated to deliver high performance in specific applications and provide resistance to chemicals and temperature extremes. Flexibility, wear-resistance, durability, mechanical strength and other properties desired by manufacturers. High-performance parts made from these elastomers serve nearly every industrial category. The company’s products are supported by world-class experts who are dedicated to providing proprietary and standard compounding solutions to address the evolving needs of the global manufacturing industry.</td>
</tr>
<tr>
<td><strong>Wednesday</strong>&lt;br&gt;10.9.2019</td>
<td>9:00 a.m.</td>
<td><strong>Exhibitor Meeting</strong></td>
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<tr>
<td></td>
<td>11:30 a.m. – 12:00 p.m.</td>
<td><strong>AirBoss Rubber Solutions Presentation</strong>&lt;br&gt;<strong>Cross – Collaboration, Bridging Innovation into the Rubber Industry</strong>&lt;br&gt;Cross collaboration is not a new concept, but bringing together research and industry to implement application solutions to industrial challenges is nothing new for AirBoss Rubber Solutions. Join us as we present a look into our world class research and development facilities. In addition, AirBoss will present to the audience who we are and how we develop next generation products, working with material suppliers to bridge innovation into end use industry applications.</td>
</tr>
<tr>
<td></td>
<td>1:30 p.m. – 2:00 p.m.</td>
<td><strong>HEXPOL Compounding Presentation</strong>&lt;br&gt;<strong>How to Maintain Molds to Keep Production Lines Running</strong>&lt;br&gt;GloMold Plus™ is a nitrile polymer mold-cleaning compound presented by Hexpol Compounding as a mold conditioner. It works in-production and when integrated into a molding process, it can reduce downtime and material waste while increasing production. GloMold Plus cleans by diffusion and is available in a number of color-coded formulations for standard, high and low temperatures, along with several specialty formulations. GloMold Plus can also be used to protect molds during storage. When integrated as a production maintenance element, annual savings from using GloMold Plus instead of abrasive cleaning media is substantial as shown in cost analysis by Hexpol Compounding.</td>
</tr>
<tr>
<td></td>
<td>3:00 p.m. – 3:30 p.m.</td>
<td><strong>LORD Corporation Presentation</strong>&lt;br&gt;<strong>VOC-Free Rubber Linings</strong>&lt;br&gt;Dr. Daniel Kessler, Market Development Manager for Steuler-KCH, will give an overview on adhesive-free, VOC-free, EBOLOCK® Rubber Linings. EBOLOCK® rubber lining incorporates LORD Chemlok® Film technology. As a result, EBOLOCK® linings are self-adhering—eliminating adhesive application labor and VOCs, whilst improving the safety of rubber lining technicians. Unlike traditional rubber linings, manufactured from multiple layers of laminated rubber, STEUER-KCH’s rubber processing results in a more homogenous rubber interface that offers consistency of performance for rubber linings across various applications. The result is that EBOLOCK® linings, in addition to being self-adhering, are lighter than competitive alternatives; resulting in a significantly less labor intensive process for rubber lining.</td>
</tr>
<tr>
<td><strong>Thursday</strong>&lt;br&gt;10.10.2019</td>
<td>2:00 p.m. – 3:00 p.m.</td>
<td><strong>Business &amp; Awards Meeting</strong>&lt;br&gt;Join us at the semi-annual Business &amp; Awards Meeting of Rubber Division, ACS. It includes general business of the Division, plus the announcement of winners for Student Colloquium, Service Awards and more.</td>
</tr>
</tbody>
</table>
Women’s Preconference Workshop  
**Monday, October 7; 1:00 p.m. – 6:00 p.m.**  
Hilton Cleveland Downtown  
Hope Ballroom A, Floor 3  
**Presenting Sponsor**  
WORDS Matter – How the Women of Rubber Division can Connect, Collaborate & Communicate with Confidence: This interactive session will provide attendees with substance and humor that will help to develop an interactive and engaging networking environment. Attendees will learn about the benefits of the Women of Rubber Division and how they can connect, collaborate, and communicate with confidence.  
**Keynote Address Topic:** There are numerous developments in plastics and rubber as it relates to the “Circular Economy” and the concept of no leakage into the natural environments. The next generation of rubber technologists have to keep circularity front and center in designing and synthesizing new molecules and processes with a responsible end-of-life strategy.

First Time Attendee Orientation  
**Tuesday, October 8; 8:00 a.m. – 8:30 a.m.**  
Room 11, Exhibit Level  
First time attending IEC? Stop by to meet some key individuals and learn how to successfully navigate the conference and make the most of your time here with us. You will also learn what is available during IEC for first-time attendees.

Expo Opening Ceremony & Ribbon Cutting  
**Tuesday, October 8; 10:00 a.m. – 10:15 a.m.**  
Expo Floor, Exhibit Level  
Attend the official opening ceremony ribbon cutting for the expo. We look forward to welcoming you and having you help us kick off our expo!

Presentation Skills Workshop  
**Tuesday, October 8; 10:30 a.m. – 11:30 a.m.**  
Room 13, Exhibit Level  
Learn how to engage with your audience, strengthen communication skills and deliver effective presentations in today’s world. This workshop will benefit anyone looking to communicate with confidence and improve presentation delivery skills, whether at work or at professional conferences such as ours. There is no cost to attend.

Get Involved!  
**Tuesday, October 8; 11:30 a.m. – 12:00 p.m.**  
**Wednesday, October 9; 11:00 a.m. – 11:30 a.m.**  
Room 21, Exhibit Level  
Ever wonder how becoming active within Rubber Division, ACS can benefit you and your company, what opportunities are available or what it takes to get involved? Attend one of these two sessions to learn about the requirements, expectations and commitment to be a volunteer, serve on a committee, be an Area Director, become a part of our Steering Committee and take the journey on the path to Chair of the division.

Welcome Reception  
**Tuesday, October 8; 5:00 p.m. – 7:00 p.m.**  
Ballroom B&C, Ballroom Level  
This event is open to all registered attendees and there is no cost to attend. The reception features hors d’oeuvres and beverages. Get to know other attendees and exhibitors in a social, relaxed setting.

KEYNOTE ADDRESS  
**Tuesday, October 8; 9:00 a.m. – 10:00 a.m.**  
Ballroom C, Ballroom Level  
**Ramani Narayan** - MSU University Distinguished Professor, Fellow – National Academy of Inventors, Fellow – ASTM International  
**Keynote Address Topic:** There are numerous developments in plastics and rubber as it relates to the “Circular Economy” and the concept of no leakage into the natural environments. The next generation of rubber technologists have to keep circularity front and center in designing and synthesizing new molecules and processes with a responsible end-of-life strategy.

Expo Theater Presentations  
**Tuesday, October 8 & Wednesday, October 9**  
**Expo Theater, Rubber Division, ACS Booth #648**  
Learn about what some of the best companies in our industry have to offer as they share their knowledge with you. These half-hour presentations take place in the Expo Theater during expo hours. There is no additional cost to attend these presentations. See Expo Theater Schedule for times.

5K Walk/Run – Presented by H.M. Royal, Inc.  
**Wednesday, October 9; 6:30 a.m. Check-in**  
Meet in the Hilton Lobby  
Runners, walkers and guests are invited to participate. Registration is requested for planning purposes, however, there is no cost to participate.

16th Annual Student Colloquium  
**Wednesday, October 9**  
Presentations: Room 13, Exhibit Level – 8:00 a.m. – 5:00 p.m.  
Posters: Expo Floor – 10:00 a.m. – 5:00 p.m.  
The 16th Annual Student Colloquium will include oral presentations by graduate and undergraduate students, as well as a poster session. All registered attendees can attend the Student Colloquium presentations and view the posters at no additional cost.

25-Year Club Luncheon  
**Wednesday, October 9; 11:30 a.m. – 1:00 p.m.**  
Room 16, Exhibit Level  
Celebrate individuals who have been active in the rubber industry for 25 or more consecutive years. All are invited no matter how long you have worked in our industry. Reservations are required.

Young Professionals Open Forum  
**Wednesday, October 9; 1:00 p.m. – 2:00 p.m.**  
Room 21, Exhibit Level  
Under 40 years old? We want to talk to you! Help us gain insight for our initiative to develop a new Young Professionals Committee and help us learn how we can meet or exceed your expectations as a young professional in our industry.

Career Fair  
**Thursday, October 10; 10:00 a.m. – 3:00 p.m.**  
Concourse Foyer, Concourse Level  
Looking for a new opportunity in our great industry? Meet with representatives from several respected companies about career and professional opportunities. There is no cost to attend and everyone is welcome.

Business & Awards Meeting  
**Thursday, October 10; 2:00 p.m. – 3:00 p.m.**  
**Expo Theater, Rubber Division, ACS Booth #648**  
Join us at the Business & Awards Meeting of Rubber Division, ACS. It includes general business of the Division, plus the announcement of the winners for the Student Colloquium, Service Awards and more. There is no cost to attend and reservations are not required.
The new DMA+ concept includes unique capabilities for automating dynamic testing of rubber and elastomers under various shapes, dimensions and testing modes: compression, shear, tension, fatigue and crack growth.

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AGC Chemicals Americas manufactures, markets and sells fluoroproducts including Fluon® fluoropolymer resins, Fluon® enhanced fluorinated materials and compounds and AFLAS® fluoroelastomers. AGC Chemicals is showcasing high-performance AFLAS fluoroelastomer grades at booth 448 at the International Elastomer Conference, October 8-10 at the Huntington Convention Center of Cleveland. Featured products include AFLAS FEPM grades with enhanced lamination, curing and processing technologies; AFLAS fluoroelastomer grades that are FDA approved for food contact applications; and ultra-clean AFLAS FFKM grades that resist high temperatures and aggressive chemicals and provide excellent electrical insulation properties. For more information about AFLAS fluoroelastomers, visit https://www.agchem.com/products/fluoropolymer-resins/fluoroelastomers.

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Thermal management is growing challenge to technology development across many fields. From tires to transistors, increased demand for power and performance is requiring new thermal management solutions. To overcome thermal throttling and maintain continuous performance, Arieca has created Thubber, a new class of soft, elastic thermal transport materials. Thubber uses liquid metal inclusions to bring advanced capacities to a wide range of polymer and materials, from hard plastic to soft elastomers. Thubber is transforming manufacturing in a wide range of industries by accelerating materials processing, extending product lifetime, and creating enhanced electrical and thermal performance where it was previously impossible.

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doss.it
aleksandra.plackovic@doss.it
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Houston, TX 77573
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gary.gudac@ineos.com
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Linshi Chem(Puyang) Advanced Material Co., LTD is the research and industrialization base of Linshi Group’s polyisoprene products. It is the first manufacturer of polyisoprene products in China. With the investment 300 million yuan, the land area covers 200 thousand square meters, and specializes in polyisoprene production. Our products are widely used in the fields including medical, chemical, national defense, health and so on. Thanks to our products do not cause protein allergic reactions, the market prospects are promising. We have established advanced management systems, and obtained the ISO 9000, ISO14000, ISO13485 and European’s CE certifications.

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Tokai Carbon CB is a proud member of the Tokai Group. We have been producing high-quality, furnace grade carbon blacks in the US for over 50 years. Our product portfolio consists of more than 40 grades of carbon black produced at our three manufacturing locations. Tokai Carbon CB maintains our corporate headquarters, as well as a state of the art research and development facility, in Fort Worth, Texas. Tokai Carbon CB’s products are utilized in tires, manufactured rubber goods, plastics, coatings, inks and toners.

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suremix@polymersolutionsgroup.com
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3600 Gantz Road
Grove City, OH 43123
(614) 277-4348
tosohusa.com
jerry.fetters@tosoh.com
Tosoh USA, Inc. is Tosoh Corporation’s main sales, marketing, and business development center in North America. We are the world leader in chlorosulphonated polyethylene (CSM). We also offer high-quality CR (chloprene rubber) and an array of ethylene, polyethylene, and other functional polymers. The Tosoh name is synonymous with high quality and performance.

Total Cray Valley ............................. 1645
685 Stockton Drive  Suite 100
Exton, PA 19341-252
(677) 871-2729
crayvalley.com
steve.schwartz@total.com
Globally based in Paris, Total Cray Valley (TCV) Business Unit is part of Total Petrochemicals & Refining USA, Inc. TCV manufactures Wingtack® and Cleartack® hydrocarbon resins, Poly bd(R), Ricon(R), and Krasol(R) liquid polybutadiene resins, and Dymalink(R) monomers. These products are used as raw materials and additives for adhesives, rubber, electronics, thermoplastics, coatings, and other applications.

TROESTER Machinery, Ltd. ............ 442
300 Loomis Avenue
Cuyahoga Falls, OH 44221
(330) 928-7790
troester.de
zach.boaz@troester.us.com
TROESTER Machinery, Ltd. is a manufacturing facility in Murray, Kentucky. We manufacture all types of platens, cartridge/strip electric, steam/thermal fluid, and various components in the rubber industry since 1954. We offer technical services for industrial and government clients, especially in rubber and plastics. APTS-Training Division houses classrooms and processing laboratories for workforce training and non-credit courses. The College of Polymer Science and Polymer Engineering offers teaching and research at the graduate level, workforce training, and contract laboratory services. The College grants the M.S. and Ph.D. in either Polymer Science or Polymer Engineering. College faculty members have generated over 160 active patents and licensed technologies worldwide.

TSD Logistics, Inc. ......................... 2031
7970 Hampton Road
Texarkana, TX 75503
(903) 831-8921
tsdlogistics.com
rberry@tdsinc.com
TSD Logistics delivers relationship-driven freight and logistics services to truckload and bulk shippers across North America. Serving the supply chain needs of the industry’s largest companies is a responsibility we have owned for over 35 years. TSD Logistics has earned a reputation as the tire and rubber industry’s most trusted carrier of raw materials. Our success has been driven by a commitment to our core values and long-term partnerships with our customers and suppliers.

TSE Industries, Inc. ....................... 1321
5180 113th Avenue North
Clearwater, FL 33760
(727) 540-1264
tse-industries.com
massimo.cerboni@tse-industries.com
Founded in 1982, TSE Industries is the world’s largest producer of millable polyurethane rubber, sold under the trade name MILLATHANE®. MILLATHANE compounds are processed using conventional rubber equipment and offer exceptional abrasion resistance, strength, oil resistance and ozone resistance.

Unimatec Chemicals America, Inc. ... 535
39555 Orchard Hill Place Suite 164
Novi, KY 48375
(248) 778-3310
unimatec-chemicals.com
d.berardi@unimatec-chemicals.com
Unimetc, is an ISO 9001 certified producer of specialty elastomers and chemicals. We sell our ACM and FKM elastomers under the trade name Noxrite®. We sell our ACM and FKM cure systems under the Cheminox® trade name. Our Noxite® FKM includes bisphenol/ peroxide curable co and ter-polymers, LT FKM’s, TR -30°C. Noxite® ACMs include standard and HT grades, with service from -40°C to 185°C, intermittent to 200°C.

UniSource-Energy, LLC .................... 1848
40 Shuman Blvd. Ste. 290
Naperville, IL 60563
(630) 470-6030
unisource-energy.com
mps smith@unisource-energy.com
UniSource is a world-wide marketer of Specialty Petroleum and Transformer Oils. We serve our clients by sourcing from various domestic and international sources to best meet the needs of our clients.

United Feed Screws ......................... 428
487 Wellington Avenue
Akron, OH 44305
(330) 798-5532
unitedfeedscrews.com
jefflagerlin@unitedfeedscrews.com
United Feed Screws is the one stop shop for your platen and platen related components.

United Soybean Board .................... 1046
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Midland, MI 48640
(989) 631-3377
soynewuses.org
rbrentin@omnitechnl.com
The University of Akron .................. 1603
APTC 116
226 East Mill Street
Akron, OH 44325-5404
(330) 972-7265
uakron.edu/apts
The University of Akron’s Akron Polymer Technology Services—Testing Division (APTS-Testing) is a contract services facility, performing sophisticated and timely contractual technical services for industrial and government clients, especially in rubber and plastics. APTS-Training Division houses classrooms and processing laboratories for workforce training and non-credit courses. The College of Polymer Science and Polymer Engineering offers teaching and research at the graduate level, workforce training, and contract laboratory services. The College grants the M.S. and Ph.D. in either Polymer Science or Polymer Engineering. College faculty members have generated over 160 active patents and licensed technologies worldwide.

Versalis s.p.a ............................... 1415
Piazza Boldrini, 1
San Donato Milanese (MI) 20097 Italy
+39 0252042654
Versalis s.p.a is a global leader in leading edge platen technology that has set the stage for critical advancements in the rubber industry since 1954. We manufacture all types of platens, cartridge/strip electric, steam/thermal fluid, and variations for heating and cooling systems. We offer the MultiZone heating platen system for tight temperature control for those customers in need of a tighter temperature uniformity. Venango Machine is the one stop shop for your platen and platen related components.
Grand Rapids, MI 49512
4540 E. Paris Avenue  Suite F
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VitaFlex LLC .......................................... 1625
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(888) 616-8848
vitaflexUSAstore.com
dtsai@vitaflexusa.com
VitaFlex’s Soft-stretch Hoods is an innovative PPE for primary head protection that provides barrier protection against micron-sized particles, powder, and pigment. They securely cover the entire head, face and neck with a soft, comfortable form-fit which becomes an effective isolation layer next to the skin. The ultrafine intertexture gaps between fibers allow body heat and perspiration to escape which keep heads cool for extended wear. 100% made in the USA, high quality and very affordable.

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(330) 929-6800
vmi-group.com
lllogan@vmi-group.com

Wabash MPI/Carver, Inc. .......................... 624
1569 Morris St.
Wabash, IN 46992
(260) 563-1184
wabashmpi.com
dsinger@acs corporate.com
Wabash MPI is a leading international supplier of standard and custom presses to the medical, aerospace, recreation, automotive, education and energy markets. Also included are elastomer and vacuum molding machines for compression, transfer molding, laminating, and trimming. Wabash also offers custom engineered presses, as well as used and reconditioned presses. Carver, Inc. offers two-column and four column benchtop, manual and automatic hydraulic laboratory presses with clamping capacities from 12 to 48 tons. Carver presses are suited for various materials research such as plastics and elastomers, as well as pharmaceuticals, analytical chemistry, lab testing, laminating and other applications including sample preparation.

Walther Trowal LLC ................................. 1230
4540 E. Paris Avenue  Suite F
Grand Rapids, MI 49512
(616) 455-8940
walthertrowal.com/products/small-part-coating
info@walthertrowal.com
Walther Trowal LLC is the manufacture of the Rotamat Small Parts Coating System that is a PLC based spray coating system that can easily apply metal adhesives to parts prior to rubber bonding. With more than 100 systems installed and working in North America, this coating system has an 85 to 90% transfer efficiency making it a very cost spray coating system. You can even set up the Rotamat system with two nozzles to be able to spray a base coat & a topcoat material in one set up eliminating costly set up time.

Wealth Ocean Inc. .............................. 234
4340 Von Karman Ave.  Suite 260
Newport Beach, CA 92660
(949) 679-1062
worubber.com
marketing@wealthoceanc.com
Wealth Ocean Inc. – Chloroprene Rubber Division was established in 2009. Our business includes: chemical research, product development, material production, and marketing & promotion of the Chloroprene Rubber. We offer the most reliable & superior products and services to our customer. Committed to continuously deliver results and distribution options to market, we are constantly adding new industrial products and materials for our customers to choose from. It is our significant worldwide reach that allows us to bring the finest products at a fraction of their original cost.

Western Reserve Chemical Corporation... 424
4837 Darrow Road
Stow, OH 44224
(330) 650-2244
wrchem.com
betsy@wrchem.com
Western Reserve Chemical is an ISO certified distributor serving formulators and compounders in the rubber, plastics, adhesives, sealants, and coatings industries. Our quality products are easily accessible from 9 locations throughout the NAFTA region. We offer a wide range of cost effective chemicals and additives including, antioxidants, accelerators, co-agents, stabilizers, resins, waxes, process aids, carbon black and silica reinforcing fillers.

Whitford Corporation .............................. 1041
47 Park Avenue
Box 80
Elverson, PA 19520
(610) 286-2509
whitfordww.com
cbuchanan@whitfordww.com
Whitford is a leading company in the automotive sealing systems tackling problems of “itch and squeak,” weathering, abrasion, freeze-release, consistent appearance, chemical resistance, reduced friction, etc. Substrates for the Resilon coating include EPDM rubber (sponge and dense), TPV, TPE and PVC (polyvinyl chloride) plastics. In addition to coatings, Alpha performs secondary operations: flock, mastic, pin insertion.

Wickert Hydraulic Presses USA … 1224
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Wolff Industries, Inc......................... 2034
107 Interstate Park
Spartanburg, SC 29303
(803) 888-3832
wollfindustries.com
caleb@wollfind.com

Yancheng Biqi Sealing Systems Co., LTD........................................... 1741
Development Zone, Caoyan Town
Dafeng District
Yancheng 224114 China
(86) 0086-1381-690-0729
andrey.com.cn
andreysealing@vip.163.com

Yancheng Biqi Sealing Systems Co., Ltd. was established in 2009 with its brand “ANDREY”. We are located in Yancheng City, Jiangsu Province. We are a professional manufacturer specializing in producing rubber and plastic seals. All of the goods can pass tests of REACH, ROHS and CA65. Our company has professional technical personnel and scientific management system, excellent service mechanism. Company has passed ISO 9001:2008 quality system certification, BSCI certification. Main products: EPDM foam seals, EPDM solid rubber seals, PVC+NBR seals, TPE seals, etc. As high quality products and well customer service, we are now cooperating with many famous foreign enterprises all over the world.

Wealth Ocean Inc. .............................. 234
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Newport Beach, CA 92660
(949) 679-1062
worubber.com
marketing@wealthoceanc.com
Wealth Ocean Inc. – Chloroprene Rubber Division was established in 2009. Our business includes: chemical research, product development, material production, and marketing & promotion of the Chloroprene Rubber. We offer the most reliable & superior products and services to our customer. Committed to continuously deliver results and distribution options to market, we are constantly adding new industrial products and materials for our customers to choose from. It is our significant worldwide reach that allows us to bring the finest products at a fraction of their original cost.

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Xishui Industry Zone, Guangrao
DongYing City 257336 China
+86-1895-4003-350
yongyigroup.net
cindy.zhou@yongyigroup.net
Yongyi Rubber Co., Ltd is well-known tire curing bladder manufacturer, founded in 2002. As the biggest bladder manufacturer in China, our major products are more than 1000 specification, covering sorts of curing bladders for bias tires, radial tires and OTR tires, motorcycle tires, air spring, turn-up bladders. The annual output of tire bladder is more than 1000,000 pcs.

Zeon Chemicals L.P ....................... 638
4111 Bells Lane
Louisville, KY 40211
(502) 775-2000
zeonchemicals.com
jlangford@zeonchemicals.com
ZEON Makes The Future Today Through The Power of Chemistry. Since 1950, ZEON has been a world leader in specialty elastomers, polymers, and chemicals. ZEON operates a global network of plants in Asia and North America, and R&D laboratories in the US, Japan, China, and Singapore. ZEON specialty elastomers have established themselves as premier solutions for applications demanding superior temperature/oil resistance as well as toughness and durability such as brake pads, timing belts, seals, and hoses. We offer a broader range of nitrile (NBR) specialty grade elastomers, including powder, liquid, ground, carboxylated, and NBR-PVC blends than any other global producer.

Zeppelin Systems USA, Inc ............. 107
13330 Byrd Drive
Odessa, FL 33556
(610) 282-5848
zeppelin-systems.us
christian.tittensor@zeppelin-usa.com
Zeppelin Systems USA is recognized worldwide as the leading manufacturer of bulk material handling equipment for the Tire and Rubber Industry. The Tire and Rubber Industry: Systems and Solutions - To be successful in the rubber and tire industries, you need to have sound operating procedures that guarantee consistent, high quality, accurate feeding, and precise weighing. In short, you need to make sure that you’re producing a quality product every single batch. That’s where Zeppelin can help. Products and Services: Pneumatic Conveying Systems, Silo Systems, Weighing and Batching Systems for Solids and Liquids, Mixer Feed Systems, Small Chemical Preparation Systems

Zhejiang Amino-Chem Co., Ltd .......... 1644
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Pudong, Shanghai 201206 China
0086-2150-306-558
amino-chem.com
eric@amino-chem.cn
Amino-Chem is the world’s largest manufacturer of Resorcinol, Meta Phenylene diamine and Para Phenylene diamine used for Rubber and Tire industries. Amino-Chem continuously focuses on R&D and sustainable development to expand its product portfolio and to stay competitive in the value chain. We has become the suppliers and strategic partners of many well-known multinational companies, through our globalized mindset and good reputation.

Zhengzhou Double Vigour Chemical Product Co, Ltd. ............. 1622
No. 107, North Huayuan Road
Pilot Free Trade Zone (Jinshui)
Zhengzhou 450000 China
0086-1873-6295-999
zz-chem.com
sale2@doublevigour.com
Zhengzhou Double Vigour Chemical Product Co., Ltd. is a professional and international modern enterprise integrating R&D, production, marketing, with 400 employees including the engineering and technicians, located in Zhengzhou, Henan, China.

Zinc Nacional ............................ 644
Serafin Pena 938 Sur
Centro, Monterrey NL 64000 Mexico
72-4630-1324
zincnacional.com
slewis@gpromax.com
Zinc Nacional is a privately owned company dedicated to the production of Zinc Oxides and Zinc Sulfates. In existence for 68 years, Zinc Nacional is one of the largest producers of zinc compounds in the world, with products currently being sold in over 22 countries. Zinc Nacional manufactures zinc oxide by both the American and French Processes. Having both processes within the same facility allows Zinc Nacional the flexibility to produce zinc oxides covering the full spectrum of customer needs, resulting in one of the most extensive product lines available in the industry.

Zochem Inc ............................. 538
600 Printwood Drive
Dickson, TN 37055
(615) 375-5058
zochem.com
esmith@zochem.com
Zochem is the largest producer of high purity zinc oxide in the world. Established in 1933 and operating without interruption from its current facility in Brampton Ontario since 1974, we produce zinc oxide in a wide range of grades and packaging for a diverse mix of markets around the world. Zochem safely and efficiently manufactures only French Process zinc oxide from SHG zinc resulting in the most consistent quality and highest purity. Finally, our superior support and service ensures we are: Delivering the expected, Effortlessly!
Rubber Division, ACS (American Chemical Society) is an international association of chemists, engineers, technicians, scientists, plant managers, sales and marketing professionals and others in the rubber, polymer or related fields within industry, academia and government. Our organization enhances science, technology and business across the evolving elastomeric community by working to expand the elastomeric profession and individual development through educational, technical and interactive activities. For over 100 years, we have delivered exceptional value, service and support, and have become an indispensable resource to our industry.

Conferences & Expos
Our highly respected conferences, expos, technical meetings and educational symposiums attract professionals across all areas of the rubber and elastomeric industries. We host a technical meeting in the spring and our International Elastomer Conference in October.

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When it comes to elastomers education, we’re your best resource. We offer instructor led and e-Learning training covering materials supply to end-use production in rubber, plastics, polymers and other advanced materials. From basic to advanced rubber technology to hot industry topics, we cover it all.

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We are proactive in attracting, educating, training and recruiting talented and qualified students into the rubber and affiliated industry to be part of the future workforce. Scholarship, networking, leadership and education opportunities are some of the student support we provide. Continuing to develop and improve upon student-oriented programs and resources is a primary focus of ours.

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Stay informed about the latest rubber industry issues, trends and events through a subscription to Rubber Chemistry and Technology, the leading industry journal on rubber science and technology research. Articles date back to 1928 - print and online available.

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Get your questions regarding the science and business of rubber answered. We can conduct searches and provide access to the latest scientific information and scholarly research, as well as industry statistics and market information.

VISIT RUBBER.ORG FOR MORE INFORMATION.
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<td>Ergon, Inc.</td>
<td>1638</td>
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<tr>
<td>Evercompounds, LLC</td>
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</tr>
<tr>
<td>Evonik Corp.</td>
<td>1144</td>
</tr>
<tr>
<td>Excalibur Minerals Co., Ltd.</td>
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</tr>
<tr>
<td>ExxonMobil Chemical</td>
<td>415</td>
</tr>
<tr>
<td>EZ Kote Inc.</td>
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</tr>
<tr>
<td>FACTS, Inc.</td>
<td>548</td>
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<tr>
<td>Finite Fiber</td>
<td>1595</td>
</tr>
<tr>
<td>Fisio North America</td>
<td>1628</td>
</tr>
<tr>
<td>Fort Mill &amp; Moline Engineering, Inc.</td>
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<tr>
<td>Fortuna Spezialmaschinen GmbH</td>
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<tr>
<td>French oil Mill Machinery Co./TMP</td>
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<tr>
<td>FTIM LLC</td>
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<tr>
<td>Fujian YongHao New Materials Co., Ltd.</td>
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</tr>
<tr>
<td>Future Foundation (India)</td>
<td>1621</td>
</tr>
</tbody>
</table>

**Exhibitor List - Quick Reference**
For over twenty four years, Lianda has been a reliable source of high quality products for both the Rubber and Plastics industries. We focus on high performance elastomers such as CPE, CR, CSM, HNBR and FKM and specialty additives such as peroxide, coagent, and composite zinc oxide. Our highly experienced TS&D team, along with a fully equipped lab, enables us to provide a high level of technical support and expertise to our customers. We focus on collaboration with our customers as we continuously strive to satisfy their technical, logistical, and commercial needs. Lianda works hard to consistently earn the status of being More Than a Distributor.

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There are numerous developments in plastics and rubber as it relates to the “Circular Economy” and the concept of no leakage into the natural environments. The next generation of rubber technologists have to keep circularity front and center in designing and synthesizing new molecules and processes with a responsible end-of-life strategy.

Ramani Narayan is University Distinguished Professor at Michigan State University -- the highest honor that MSU bestows on a faculty member. He is an elected Fellow of the U.S. National Academy of Inventors; Fellow, ASTM International Chemical Engineering & Materials Science. Ramani Narayan is University Distinguished Professor at Michigan State University -- the highest honor that MSU bestows on a faculty member. He is an elected Fellow of the U.S. National Academy of Inventors; Fellow, ASTM International Chemical Engineering & Materials Science. There are numerous developments in plastics and rubber as it relates to the “Circular Economy” and the concept of no leakage into the natural environments. The next generation of rubber technologists have to keep circularity front and center in designing and synthesizing new molecules and processes with a responsible end-of-life strategy.

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### 196th Technical Meeting

**Symposium topics and room listed below**

#### Room 25 AB, Ballroom Level

<table>
<thead>
<tr>
<th>Symposium</th>
<th>Date and Time</th>
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<tbody>
<tr>
<td>New Commercial Developments I</td>
<td>Tuesday 1:00 – 5:15 p.m. Wednesday 8:00 a.m. – 5:15 p.m.</td>
</tr>
<tr>
<td>Rubber for Shock, Damping, Noise &amp; Vibration Applications</td>
<td>Thursday 8:00 – 10:00 a.m.</td>
</tr>
<tr>
<td>Contributed Papers</td>
<td>Thursday 10:15 a.m. – 12:15 p.m.</td>
</tr>
</tbody>
</table>

**Chair:** Peter Cameron, Tokai Carbon

**Co-Chairs:** Chris Robertson, Endurica LLC; Josh Goossens, DrIV

#### Room 25 C, Ballroom Level

<table>
<thead>
<tr>
<th>Symposium</th>
<th>Date and Time</th>
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</thead>
<tbody>
<tr>
<td>New Commercial Developments II</td>
<td>Tuesday 1:00 – 5:15 p.m. Wednesday 8:00 – 11:45 a.m.</td>
</tr>
<tr>
<td>Thermoplastic Elastomers</td>
<td>Wednesday 1:00 – 5:15 p.m. Thursday 8:00 – 11:15 a.m.</td>
</tr>
<tr>
<td>Silicone Materials for Rubber</td>
<td>Thursday 11:15 a.m. – 12:15 p.m.</td>
</tr>
</tbody>
</table>

**Chair:** Lena Nguyen, Dow Chemical Co.

**Co-Chairs:** Chris Napier, ExxonMobil

#### Room 26 A, Ballroom Level

<table>
<thead>
<tr>
<th>Symposium</th>
<th>Date and Time</th>
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</thead>
<tbody>
<tr>
<td>Advanced Materials in Healthcare</td>
<td>Tuesday 1:00 – 3:00 p.m.</td>
</tr>
<tr>
<td>Mechanics and Modelling of Rubber</td>
<td>Tuesday 3:15 – 5:15 p.m.</td>
</tr>
<tr>
<td>Advances in Materials &amp; Processes for Car &amp; Truck Tires</td>
<td>Wednesday 8:00 a.m. – 5:15 p.m. Thursday 8:00 – 9:30 a.m.</td>
</tr>
<tr>
<td>Tire Processing, Manufacturing and Testing Equipment</td>
<td>Thursday 9:45 a.m. – 12:15 p.m.</td>
</tr>
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</table>

**Chair:** Cal Moreland, Michelin

**Co-Chairs:** Ed Terrill, Akron Rubber Development Laboratory, Inc.; Crittenden Ohlemacher, The University of Akron

#### Room 26 B, Ballroom Level

<table>
<thead>
<tr>
<th>Symposium</th>
<th>Date and Time</th>
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</thead>
<tbody>
<tr>
<td>Rubber Bonding and Adhesion</td>
<td>Tuesday 1:00 – 5:15 p.m.</td>
</tr>
<tr>
<td>Testing and Predicting Behavior of Rubber &amp; Tires</td>
<td>Wednesday 8:00 a.m. – 5:15 p.m. Thursday 8:00 a.m. – 12:15 p.m.</td>
</tr>
</tbody>
</table>

**Chair:** Ursula Oyer, Freudenberg-NOK

**Co-Chairs:** Ed Terrill, Akron Rubber Development Laboratory, Inc.; Crittenden Ohlemacher, The University of Akron

#### Room 26 C, Ballroom Level

<table>
<thead>
<tr>
<th>Symposium</th>
<th>Date and Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elastomers in Electronic Applications</td>
<td>Tuesday 1:00 – 5:15 p.m.</td>
</tr>
<tr>
<td>Recycling, Sustainability &amp; Retreading</td>
<td>Wednesday 8:00 a.m. – 2:30 p.m.</td>
</tr>
<tr>
<td>Contributed Papers</td>
<td>Wednesday 2:45 – 5:15 p.m.</td>
</tr>
</tbody>
</table>

**Chair:** Thein Kyu, The University of Akron

**Co-Chairs:** Jacques Noordermeer; Wilma Dierkes, University of Twente

**Chair:** Lewis Tunnicliffe, Birla Carbon
<table>
<thead>
<tr>
<th>Time</th>
<th>Paper</th>
<th>Title</th>
<th>Room</th>
<th>Session Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 p.m.</td>
<td>A01</td>
<td>Visco-Elastic Modifiers from a Renewable Resource: The Performance of the Newly Developed Terpene-Based Tread Enhancement Additives in PCR Tread Compounds - Wolfgang Pille-Wolf, Kraton Chemical BV</td>
<td>25AB</td>
<td>New Commercial Developments</td>
</tr>
<tr>
<td></td>
<td>B01</td>
<td>Fuel Aging Studies of AEM Compounds - Edward McBride, DuPont</td>
<td>25C</td>
<td>New Commercial Developments</td>
</tr>
<tr>
<td></td>
<td>C01</td>
<td>Comprehensive Self-Sterilizing Elastomers to Combat Drug-Resistant Microbes - Richard Spontak, North Carolina State University</td>
<td>26A</td>
<td>Advanced Materials in Healthcare</td>
</tr>
<tr>
<td></td>
<td>D01</td>
<td>Rubber Bonding: Novel Measurements for Cure Rate of Adhesives and Measurements of Reactivity of Applied Dried Adhesives Christopher Stevens, NGF Europe Limited</td>
<td>26B</td>
<td>Rubber Bonding and Adhesion</td>
</tr>
<tr>
<td></td>
<td>E01</td>
<td>Low Voltage Driven Large Bending of Ionic Liquid Crystal Elastomers Antal Jakli, Kent State University</td>
<td>26C</td>
<td>Elastomers in Electronic Applications</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>A02</td>
<td>Rosin Additives to Improve Compound Performance of Truck Bus Radial Tires (TBR) - Yating Mao, Eastman Chemical Company</td>
<td>25AB</td>
<td>New Commercial Developments</td>
</tr>
<tr>
<td></td>
<td>B02</td>
<td>General Introduction and Potential Applications of New Oil-Resistant Elastomer: Evolmer® - Mousumi DeSarker, Denka Corporation</td>
<td>25C</td>
<td>New Commercial Developments</td>
</tr>
<tr>
<td></td>
<td>C02</td>
<td>Selection of Elastomer and Corresponding Elastomeric Products and their Properties are Critical for the Healthcare Industries Amalendu Sarkar, Qure Medical</td>
<td>26A</td>
<td>Advanced Materials in Healthcare</td>
</tr>
<tr>
<td></td>
<td>D02</td>
<td>Two-Coat Rubber to Substrate Bonding Systems vs One-Coat Bonding Systems and the Impact on Corrosion Resistance Roger Cassell, DuPont</td>
<td>26B</td>
<td>Rubber Bonding and Adhesion</td>
</tr>
<tr>
<td></td>
<td>E02</td>
<td>High Performance Solution-Processed Perovskite Solar Cells via Novel Materials and Device Engineering - Xiong Gong, University of Akron</td>
<td>26C</td>
<td>Elastomers in Electronic Applications</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>A03</td>
<td>Evaluation of ExxproTM 3563 in Tire Innerliner Applications Sujith Nair, ExxonMobil Chemical</td>
<td>25AB</td>
<td>New Commercial Developments</td>
</tr>
<tr>
<td></td>
<td>B03</td>
<td>New 1K Castable Urethane Adhesives Brian Carney, Lord Corporation</td>
<td>25C</td>
<td>New Commercial Developments</td>
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<tr>
<td></td>
<td>C03</td>
<td>Developments in SEBS for medical and other valuable applications Sergio Corona-Galvan, Grupo Dynasol</td>
<td>26A</td>
<td>Advanced Materials in Healthcare</td>
</tr>
<tr>
<td></td>
<td>D03</td>
<td>Replacing Materials of Concern in Steel Skim Formulation with Inorganic Bunte Salts C. Jeffrey Lin, Eastman Chemical Company</td>
<td>26B</td>
<td>Rubber Bonding and Adhesion</td>
</tr>
<tr>
<td></td>
<td>E03</td>
<td>Stretchable Elastic Shape Memory Fibers with Electrical Conductivity Sungjune Park, Chonbuk National University</td>
<td>26C</td>
<td>Elastomers in Electronic Applications</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>A04</td>
<td>Development of High-Strength SBR for High Durability Tires Hirofumi Senga, Research Lab JSR Co Ltd</td>
<td>25AB</td>
<td>New Commercial Developments</td>
</tr>
<tr>
<td></td>
<td>B04</td>
<td>Liquid EPDM for Waterborne Coatings Greg Brust, Lion Elastomers</td>
<td>25C</td>
<td>New Commercial Developments</td>
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<tr>
<td></td>
<td>C04</td>
<td>Advanced Capabilities in LSR Over-Molding Brian Thornburg, Jamak Fabrication, Inc.</td>
<td>26A</td>
<td>Advanced Materials in Healthcare</td>
</tr>
<tr>
<td></td>
<td>D04</td>
<td>Advances in Coatings for Rubber-to-Metal Bonded Parts Tiffany Betzhold, Kalcor Coatings</td>
<td>26B</td>
<td>Rubber Bonding and Adhesion</td>
</tr>
<tr>
<td>Time</td>
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<tr>
<td>3:15 p.m.</td>
<td>A05</td>
<td>Sustainable Tire and Rubber Compound Development: Low Aromatic Plasticizers Based on Renewable Feedstock in Rubber Performance Enhancement - Kamyar Alavi, Nynas AB</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<tr>
<td></td>
<td>B05</td>
<td>Novel Developmental Specialty Elastomer for EPDM with High Tack Scott Loyd, ExxonMobil Chemical</td>
<td>25C</td>
<td>New Commercial Developments</td>
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<tr>
<td></td>
<td>C05</td>
<td>Cavitation Damage in Tire Rubber Materials Eric Euchler, Leibniz Institute of Polymer Research Dresden e.V.</td>
<td>26A</td>
<td>Mechanics and Modeling of Rubber</td>
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<tr>
<td></td>
<td>D05</td>
<td>The Effect of Bonding Aid on Aramid Pulp in EPDM Compound Mike Gmerek, Finite Fiber</td>
<td>26B</td>
<td>Rubber Bonding and Adhesion</td>
</tr>
<tr>
<td></td>
<td>E05</td>
<td>Elastomer Sealing Performance in Hydrogen Fuel Cells Kevin Kulbaba, ARLANXEO</td>
<td>26C</td>
<td>Elastomers in Electronic Applications</td>
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<tr>
<td>3:45 p.m.</td>
<td>A06</td>
<td>Developing New Carbon Blacks for Rubber Industry Irene Yurovskaya, Himadri Specialty Chemical</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<tr>
<td></td>
<td>B06</td>
<td>New NORDEL™ EPDM Products with High Mooney Viscosity, Oil extended EPDM pellets for extruded profiles and TPV applications Lena Nguyen, Dow Chemical</td>
<td>25C</td>
<td>New Commercial Developments</td>
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<tr>
<td></td>
<td>C06</td>
<td>Computing Stiffness Loss Due to Fatigue Under Incrementally Updated Load and Displacement Histories - Will Mars, Endurica, LLC</td>
<td>26A</td>
<td>Mechanics and Modeling of Rubber</td>
</tr>
<tr>
<td></td>
<td>D06</td>
<td>Improved Adhesion in Elastomeric Laminates for Chemical Protection Through the Use of Compatibilizing Rubber Blends Jianan Yi, Univ. Massachusetts Lowell</td>
<td>26B</td>
<td>Rubber Bonding and Adhesion</td>
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<tr>
<td></td>
<td>E06</td>
<td>Actuating and Energy Harvesting Based on Dielectric Elastomers Changwoon Nah, Chonbuk National University</td>
<td>26C</td>
<td>Elastomers in Electronic Applications</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>A07</td>
<td>High Performance Silanes for Tires Judy Douglas, Momentive Performance Materials Inc.</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<tr>
<td></td>
<td>B07</td>
<td>Challenges in Extrusions, Including Hose and Profiles, are Met with Branched, High Molecular Weight Keltan® 13561C EPDM Pete Spanos, ARLANXEO</td>
<td>25C</td>
<td>New Commercial Developments</td>
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<tr>
<td></td>
<td>C07</td>
<td>Understanding Role of Filler Particles in Stress Softening of Filler-Reinforced Elastomers - Vahid Morovati, Michigan State University</td>
<td>26A</td>
<td>Mechanics and Modeling of Rubber</td>
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<tr>
<td></td>
<td>D07</td>
<td>Chemistry of Underwater Adhesion: From Understanding the Contact Mechanics of Bioinspired Adhesives to Sealing Pericardial Defects Amal Narayanan, University of Akron</td>
<td>26B</td>
<td>Rubber Bonding and Adhesion</td>
</tr>
<tr>
<td></td>
<td>E07</td>
<td>Development of Elastomeric Polymer Electrolyte Networks for Energy Harvesting from Rolling Tires and Wearable Therapeutic Devices Hamad Albehaijan, University of Akron</td>
<td>26C</td>
<td>Elastomers in Electronic Applications</td>
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<th>Title</th>
<th>Room</th>
<th>Session Topic</th>
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<tbody>
<tr>
<td>4:45 p.m.</td>
<td>A08</td>
<td>A Paradigm Shift: SureMix® CO₂, a Performance Optimizing Process Aid which Enables Next-Level Hysteresis Reduction with Functional, Solution SBR, and Provides a Route to More Efficient, Complete Silanization</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td><strong>Vince Cremona</strong>, Flow Polymers, LLC</td>
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<td></td>
<td>B08</td>
<td>New Developments in Fluorosilicone Rubber</td>
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<td>New Commercial Developments</td>
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<td><strong>Craig Gross</strong>, Dow Corning Corporation</td>
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<td></td>
<td>C08</td>
<td>Breaking the Computational Barrier to Simulating Full Road Load Signals in Fatigue - <strong>Will Mars</strong>, Endurica, LLC</td>
<td>26A</td>
<td>Mechanics and Modeling of Rubber</td>
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<tr>
<td></td>
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<td><strong>Will Mars</strong>, Endurica, LLC</td>
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<td>Time</td>
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<tr>
<td>8:00 a.m.</td>
<td>A09</td>
<td>The Use of Modified Cocoa Shell in Low Molecular weight Natural Rubber Compounding - A.K. Akinlabi, University of Agriculture</td>
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<td>New Commercial Developments</td>
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<tr>
<td>B09</td>
<td></td>
<td>Vulcanization of Brominated Poly(Isobutylene-Co-4-Methylstyrene) with Zinc Oxide, Stearic Acid, 2,2'-Dibenzothiazole and Sulfur Sunny Jacob, ExxonMobil Chemical</td>
<td>25C</td>
<td>New Commercial Developments</td>
</tr>
<tr>
<td>D09</td>
<td></td>
<td>Inner Liner: How Construction, Composition and Air Retention Dana Adkinson, ARLANXEO</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<tr>
<td>E09</td>
<td></td>
<td>Circular Loops for Tire Rubber: Chances and Challenges Wilma Dierkes, University of Twente, The Netherlands</td>
<td>26C</td>
<td>Recycling, Sustainability &amp; Retreading</td>
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<tr>
<td>8:30 a.m.</td>
<td>A10</td>
<td>Manufacturing Green Silica from Rice Husk Ash Paulo Garbelotto, ORYZASIL SILICAS</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<tr>
<td>B10</td>
<td></td>
<td>Engineered Surfaces Treatments for Elastomers for Various Applications Prakash Iyer, Inhance Technologies</td>
<td>25C</td>
<td>New Commercial Developments</td>
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<tr>
<td>C10</td>
<td></td>
<td>Designing Bromobutyl Elastomer System for Tire Innerliner Compounds Eric Wamsley, ExxonMobil Chemical</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
</tr>
<tr>
<td>D10</td>
<td></td>
<td>Branching Characteristics of Model Polybutadienes Using Multi-Detector Gel Permeation Chromatography and Rubber Process Analyzer Luis Rodriguez-Guadarrama, Dynasol Group</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<tr>
<td>E10</td>
<td></td>
<td>Cradle-to-cradle Devulcanization Options for Various Elastomer Types Jacques Noordermeer, University of Twente, The Netherlands</td>
<td>26C</td>
<td>Recycling, Sustainability &amp; Retreading</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>A11</td>
<td>Diversity Study for Recovered Carbon Black Use Carlee Manges, Alttran</td>
<td>25AB</td>
<td>New Commercial Developments</td>
</tr>
<tr>
<td>C11</td>
<td></td>
<td>Emergence of Carbon Nanotubes into Rubber for Tire Formulations: HSE Aspects of Use of NC7000 into Formulated Products Alicia Rul, NANOCYL SA</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
</tr>
<tr>
<td>D11</td>
<td></td>
<td>Fatigue Crack Initiation in Filled Rubber Composites Hiron Raja Padmanathan, Luxembourg Institute of Science and Technology</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
</tr>
<tr>
<td>E11</td>
<td></td>
<td>Pushing boundaries! - VESTENAMER® in Recycling Rubber Applications Alexander Paasche, Evonik Resource Efficiency GmbH</td>
<td>26C</td>
<td>Recycling, Sustainability &amp; Retreading</td>
</tr>
<tr>
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<tr>
<td>9:45 a.m.</td>
<td>A12</td>
<td>Compounding and Processing Rubber Compounds containing Insoluble Sulfur Yesterday, Today, and Tomorrow</td>
<td>25AB</td>
<td>New Commercial Developments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frederick Ignatz-Hoover, Eastman Chemical Company</td>
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<td></td>
<td>B12</td>
<td>MLPC = A Reliable Partner for Sustainable Solutions</td>
<td>25C</td>
<td>New Commercial Developments</td>
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<td>Isabelle Yarzabal, MLPC intl</td>
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<td>C12</td>
<td>Silica Development for Sidewall Compounds</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>Lucas Dos Santos Freire, PPG Silica Products</td>
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<td>D12</td>
<td>Multiscale Approach for Characterizing Damage in Rubber Composites</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>Carlos Eloy Federico, Luxembourg Institute of Science and Technology</td>
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<td>E12</td>
<td>The Importance of Validated Test Methods for Recovered Carbon Black (rCB)</td>
<td>26C</td>
<td>Recycling, Sustainability &amp; Retreading</td>
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<td>Pieter ter Haar, Terhaar Consulting</td>
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<td>10:15 a.m.</td>
<td>A13</td>
<td>Development of the New-typed Additive for Silica Dispersion in Rubber Composition</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td>Masaaki Kojima, Otsuka Chemical Co. Ltd.</td>
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<td>Structure Property Relationships of Partially Unsaturated Polyester</td>
<td>25C</td>
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<td>Modifiers in Peroxide Cured HNBR Compounds</td>
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<td>Erica Anderson, Hallstar</td>
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<td>C13</td>
<td>Solvay Specialty Silica for All-Season &amp; Non Tread Application</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>Marcus Copperwheat, Solvay Silica Division</td>
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<td>D13</td>
<td>Prediction and Validation of Optimal Curing Conditions in Non-Post Cured Rubber Compounds</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>Albrecht Becker, SKF Sealing Solutions</td>
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<td>E13</td>
<td>Compounding for Sustainability: A Comparison Between Recovered Carbon Black (rCB) and standard N650</td>
<td>26C</td>
<td>Recycling, Sustainability &amp; Retreading</td>
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<td>in EPDM Rubber Compounds</td>
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<td>Andres Gil, Alpha Technologies</td>
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<td>10:45 a.m.</td>
<td>A14</td>
<td>Material Design and Consideration into Bonding Mechanism between Thermoplastic Vulcanizate (TPV)</td>
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<td>New Commercial Developments</td>
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<td>and Cured Ethylene Propylene Rubber Interface for Automotive Applications</td>
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<td>Osamu Kose, JSR Corporation</td>
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<td>B14</td>
<td>New Polymeric Esters for Modification of Low Polarity Elastomers</td>
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<td>New Commercial Developments</td>
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<td>Erica Anderson, Hallstar</td>
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<td>C14</td>
<td>Biomimetic Synthetic Rubber vs. Natural Rubber: Strain Induced Crystallization and Abrasion Resistance</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>Mario Beiner, Fraunhofer IWM Halle</td>
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<td>D14</td>
<td>Using nSpec 3D for Analyzing Dispersion of Rubber Compounds</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>Kylie Knipp, Akron Rubber Development Laboratory, Inc.</td>
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<td>E14</td>
<td>Application of Recovered CB in Support of a Circular Economy</td>
<td>26C</td>
<td>Recycling, Sustainability &amp; Retreading</td>
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<td>Jamie McNutt, Bridgestone Americas Tire Operations</td>
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<td>11:15 a.m.</td>
<td>A15</td>
<td>Evaluation of Pretreated Silica in Industrial Rubber Compounds</td>
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<td>Jared Rueby, PPG Silica Products</td>
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<td>Roger Cassell, DuPont</td>
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<td>C15</td>
<td>Effect of cis-1,4 Content on Properties of Polyisoprene Rubber</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>Feng Liu, EVE Rubber Institute</td>
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<td>D15</td>
<td>Using the Laboratory Cutting Method for Predicting Long-Term Durability of Elastomers</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>Chris Robertson, Endurica, LLC</td>
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<td>1:00 p.m.</td>
<td>A16</td>
<td>Optimizing Elastomer Molding Process and Design through Virtual Molding - <strong>Harshal Bhogesra</strong>, Sigma Plastic Services, Inc.</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td>B16</td>
<td>3D Printing Elastomeric and Rubber Materials: Polyurethanes, TPU, Silicones and Others - <strong>Rigoberto Advincula</strong>, Case Western Reserve University</td>
<td>25C</td>
<td>Thermoplastic Elastomers</td>
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<td>C16</td>
<td>New Developments in OTR Tires: Performance And Sustainability <strong>Fabio Bacchelli</strong>, versalis (ENI)</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>D16</td>
<td>Rheological Characterization of Mixing Effects on Natural Rubber Using an RPA - <strong>David Bohnsack</strong>, TA Instruments - Waters Corporation, LLC</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>E16</td>
<td>Analysis of Novel Devulcanization Processes For End-Of-Life Tires <strong>Dogu Kaya</strong>, Derby Conveyor Belts</td>
<td>26C</td>
<td>Recycling, Sustainability &amp; Retreading</td>
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<td>1:30 p.m.</td>
<td>A17</td>
<td>5 Reasons to Celebrate Tool Cleaning in Elastomer Molding <strong>Steve Wilson</strong>, Cold Jet LLC</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td>B17</td>
<td>Effects of Molecular Architecture and Charge Complexation on Thermoplastic Elastomer Gels <strong>Richard Spontak</strong>, North Carolina State University</td>
<td>25C</td>
<td>Thermoplastic Elastomers</td>
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<td>C17</td>
<td>Brominated Isobutylene-co-para-methylstyrene (BIMSM) with Superior Impermeability for Tire Innerliner Applications <strong>Sunny Jacob</strong>, ExxonMobil Chemical</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>D17</td>
<td>Dynamic Mechanical Characterization of BR/NR Cured Rubber <strong>Troy Nickel</strong>, TA Instruments - Waters Corporation, LLC</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>E17</td>
<td>Soybean Oil as a Plasticizer for Micronized Recycled Crumb Rubber <strong>Olena Shafranska</strong>, North Dakota State University</td>
<td>26C</td>
<td>Recycling, Sustainability &amp; Retreading</td>
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<td>2:00 p.m.</td>
<td>A18</td>
<td>Ground Crumb Rubber Production: The Advantages of a High Pressure Water Process - <strong>Frank Pappas</strong>, ACE Products &amp; Consulting</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td>B18</td>
<td>High Resiliency Santoprene Thermoplastic Vulcanizates (TPVs) <strong>Krishnan Iyer</strong>, ExxonMobil Chemical</td>
<td>25C</td>
<td>Thermoplastic Elastomers</td>
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<td>C18</td>
<td>Silane-Terminated Liquid Poly(butadienes) in Tread Formulations: A Mechanistic Study - <strong>Steven Henning</strong>, Total Petrochemicals &amp; Refining USA, Inc.</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>D18</td>
<td>Characterizing Tensile Strength Distribution to Evaluate Filler Dispersion Effects and Reliability of Rubber - <strong>Chris Robertson</strong>, Endurica, LLC</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>E18</td>
<td>Modification of Soybean Oil to Enhance Performance as a Processing Oil in SBR-Based Rubber Compounds - <strong>Bret Chisholm</strong>, Bridgestone Americas</td>
<td>26C</td>
<td>Recycling, Sustainability &amp; Retreading</td>
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<td>2:30 p.m.</td>
<td>A19</td>
<td>New Insights into the Role Played by ZnO in Sulfur Crosslinking by Ways of a Sulfur Donor - <strong>Gina Butuc</strong>, University of Twente, The Netherlands</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td>B19</td>
<td>Programmable Shape Change in Bio-Inspired Thermoplastic Elastomer Bilayers - <strong>Justin Barone</strong>, Virginia Polytechnic Institute &amp; State University</td>
<td>25C</td>
<td>Thermoplastic Elastomers</td>
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<td>C19</td>
<td>Universal Coupling Agent for Carbon Black and Silica <strong>Maurizio Galimberti</strong>, Politecnico di Milano</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>D19</td>
<td>Automation and AI for Material Development and Testing <strong>Khaled Boqaileh</strong>, LabsCubed</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>2:45 p.m.</td>
<td>E19</td>
<td>The Characterization and Correlation of the Network Chain Density to the Properties of Fluoroelastomer Rubber</td>
<td>26C</td>
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<td>Richard Pazur, Department of National Defence</td>
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<td>3:15 p.m.</td>
<td>A20</td>
<td>Building it Better - CASE Formulas with Harmonite Powders</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td>Ken Thomas, The Dupps Company</td>
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<td>B20                      Improving the Sustainable Content in Thermoplastic Elastomers – Use of Natural Rubber and Alternative Fillers</td>
<td>25C</td>
<td>Thermoplastic Elastomers</td>
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<td>Cindy Barrera, Ford Motor Company</td>
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<td>C20                      Liquid Rubbers for Enhanced Tire Performance</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>Kai Kranig, Evonik Resource Efficiency GmbH</td>
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<td>E20                      Advantage of 1,2-Polybutadiene on Halogenated Rubber Applications</td>
<td>26C</td>
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<td>Bruce Bartlett, Nisso America</td>
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<td>3:45 p.m.</td>
<td>A21</td>
<td>Bio-based Sealant for Puncture Resistance of Tires – Preparation and Applications - Suchismita Sahoo, John Deere India Pvt. Ltd.</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td>B21                      Effects of Textile Spin Finishes on Thermoplastic Polyurethanes Elastomers - Lalith Suragani Venu, Lubrizol Advanced Materials</td>
<td>25C</td>
<td>Thermoplastic Elastomers</td>
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<td>C21                      Improved Winter Tire Performances with Liquid Rubber</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>Yosuke Uehara, Kuraray Co. Ltd.</td>
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<td>D21                      A Novel Insight into Ozone Cracking of Rubber</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>Hiroshi Mouri, Bridgestone Firestone</td>
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<td>E21                      Tailoring Natural Rubber Compounds Containing a Hybrid Carbon Black-Silica Filler for Aircraft Tire Treads</td>
<td>26C</td>
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<td>Indriasari Indriasari, University of Twente</td>
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<td>4:15 p.m.</td>
<td>A22</td>
<td>Next-generation Insoluble Sulfur: Setting a New Standard for Productivity</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td>Gwee Liang, Eastman Chemical Company</td>
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<td>C22                      Utilization of Organoclay as Secondary Filler in Silica-Reinforced Natural Rubber Tire Tread Compounds</td>
<td>26A</td>
<td>Advances in Material and Processes of Car and Truck Tires</td>
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<td>Suppachai Sattayanurak, University of Twente, The Netherlands</td>
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<td>D22                      Fundamental Aspect for Evaluation of Activation Energy of Thermal degradation of Tetrfluoroethylene-propylene elastomer by Weight Change</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>Masayuki Ito, Waseda University</td>
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<td>Paul Engel, Howard &amp; Howard, PLLC</td>
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<td>4:45 p.m.</td>
<td>A23</td>
<td>Unique Non-staining Polybutadiene Rubber containing SPB with High Melting Point for Excellent Energy Loss Performance and High Processability - <strong>Koji Mizokami</strong>, UBE America Inc.</td>
<td>25AB</td>
<td>New Commercial Developments</td>
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<td>D23</td>
<td>Understanding Traction Enhancers with Ueshima RTM Friction Tester <strong>Edward Terrill</strong>, Akron Rubber Development Laboratory Inc.</td>
<td>26B</td>
<td>Testing and Predicting Behavior of Rubber and Tires</td>
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<td>E23</td>
<td>Patently Good Ideas: Trademark Basics for Business <strong>Jacob Ward</strong>, Ward Law Office LLC</td>
<td>26C</td>
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| 8:00 a.m. | A24  | A Finite Element Methods Engineered Solution for Implementing Component Material Properties for Predicting Tire Vibration Performance  
*Robert Wheeler*, Hankook Tire & Technology Co Ltd | 25AB | Rubber for Shock, Damping, Noise & Vibration Applications                      |
|         | B24  | 3D Printing Thermoplastic Polyurethanes and Elastomeric Nanocomposites  
*Rigoberto Advincula*, Case Western Reserve University | 25C  | Thermoplastic Elastomers                                                       |
|         | C24  | CarbonX: A Revolutionary New Carbon, Opening up a New World of Design Opportunities -  
*Yifang Lin*, CarbonX B.V. | 26A  | Advances in Material and Processes of Car and Truck Tires                    |
|         | D24  | A Novel Method for Vulcanization Research in Elastomeric Tire Formulations Using High Resolution X-ray Computed Tomography  
*Dayakar Penumadu*, University of Tennessee | 26B  | Testing and Predicting Behavior of Rubber and Tires                           |
| 8:30 a.m. | A25  | Deformation Index Applied to Projectile Impact  
*C. Michael Roland*, Naval Research Laboratory | 25AB | Rubber for Shock, Damping, Noise & Vibration Applications                      |
|         | B25  | Improving CPE Cables for Robotic Welding Formulations, Enhancing Actual UL94 V-1to UL 94 V-0 Crosslinking by Electron Beaming  
*Dan Marginean*, Electron Beam Technologies, Inc. | 25C  | Thermoplastic Elastomers                                                       |
|         | C25  | Silica-Filled Masterbatches Produced with Liquid Phase Mixing  
*Meng-Jiao Wang*, EVE Rubber Institute | 26A  | Advances in Material and Processes of Car and Truck Tires                    |
|         | D25  | Tearing Energy in Relation to Distribution of Oil Concentration Measured by Infrared Spectroscopy at Fracture Surface  
*Sanjoy Datta*, Tomas Bata University in Zlin, The Czech Republic | 26B  | Testing and Predicting Behavior of Rubber and Tires                           |
| 9:00 a.m. | A26  | Carbon Black Reinforcement of Rubber for Vibration Isolation Applications: Dynamic Performance vs Durability -  
*Lewis Tunnicliffe*, Birla Carbon | 25AB | Rubber for Shock, Damping, Noise & Vibration Applications                      |
|         | B26  | Oil Extended, Free Flow Pellet NORDEL™ EPDM for TPV and Extrusion Applications -  
*Xiaosong Wu*, Dow | 25C  | Thermoplastic Elastomers                                                       |
|         | C26  | Silica-Filled Masterbatches Produced with Liquid Phase Mixing Part II. Dynamic Stress-Softening Effect -  
*Mingxiu Xie*, EVE Rubber Institute | 26A  | Advances in Material and Processes of Car and Truck Tires                    |
|         | D26  | NORDEL EPDM solution to enable high heat resistant applications  
*Yuming Lai*, The Dow Chemical Company | 26B  | Testing and Predicting Behavior of Rubber and Tires                           |
| 9:30 a.m. | A27  | NVH Implications of Using Guayule in Automotive Part Applications  
*Cindy Barrera*, Ford Motor Company | 25AB | Rubber for Shock, Damping, Noise & Vibration Applications                      |
|         | B27  | Natural Rubber-Toughened PHBV/PLA Bioplastic Films for Quieter Packaging Applications -  
*Xiaoying Zhao*, The Ohio State University | 25C  | Thermoplastic Elastomers                                                       |
|         | C27  | Combining a Single Screw Extruder with a Capillary Rheometer to Facilitate Faster Measurements -  
*Tim Haake*, GOETTFERT USA | 26A  | Tire Processing, Manufacturing and Testing Equipment                           |
|         | D27  | Hydrogen Compatibility of EPDM in High Pressure Environments  
*Kevin Simmons*, Pacific Northwest National Laboratory | 26B  | Testing and Predicting Behavior of Rubber and Tires                           |
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<tr>
<td>10:15 a.m.</td>
<td>A28</td>
<td>A Low Hysteresis Additive for use with Phenol-Formaldehyde Resins</td>
<td>25AB</td>
<td>Contributed Session</td>
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<td>Darren Seel, SI Group</td>
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<td>The Influence of Carbon Black Types on the Processability of Rubber</td>
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<td>Compounds in Green Tires - Scott Martin, Thermo Fisher Scientific</td>
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16th Annual Student Colloquium

Student Presentations
Wednesday, October 9
Room 13, Exhibit Level

8:00 a.m.  S01 Evaluation of the Crosslink Density Obtained Through Different Methodologies in Rubber Formulations Containing Eco-Friendly Materials - Suelen Moresco, Universidade de Caxias do Sul

8:30 a.m.  S02 Chemistry of Underwater Adhesion: From Understanding the Contact Mechanics of Bioinspired Adhesives to Sealing Pericardial Defects - Amal Narayanan, University of Akron

9:00 a.m.  S03 From New Molecular-Level Understanding of Brittle-to-Ductile Transition in Polymers Toward Design of “Super-Rubber-Toughened” Polymers - Masoud Razavi Aghjeh, University of Akron

9:45 a.m.  S04 Preparation, Characterization, and 3D Printability of Cell Laden Biodegradable Polymers blended Spider Silk - Selvakumar Murugesan, University of Bayreuth, Germany

10:15 a.m. S05 Liquid Guayule Natural Rubber Simultaneously Reinforces and Plasticizes Natural and Synthetic Rubber Composites When Used as a Processing Aid - Xianjie Ren, Ohio State University

10:45 a.m. S06 Micro-mechanical Model for Thermal Induced Aging of Rubbers - Hamid Mohammadi, Michigan State University

11:15 a.m. S07 Soft Elastomer Without Cross-Linking Shows Excellent Elasticity Dominated by Knotted Rings and Entanglements - Pengpeng Hu, Technical University of Denmark

1:00 p.m.  S08 Influence of Functionalized SSBR and Highly Dispersible Silica Filler and its Hybrid with Nanoclay and Graphene Nano-Platelet on Dynamic Mechanical, Wet Traction and Tear-Fatigue Properties of a Model Passenger Car Radial Tread Compound - Amrita Mazumder, student of IRI

1:30 p.m.  S09 A Micro-mechanical Model to Predict Damages in Adhesive: Hydrolytic Aging - Seyedamir Bahrololoumi Tabatabaei, Michigan State University

2:00 p.m.  S10 Crosslinking Combinations Involving Benzocyclobutene Chemistry - Akshata Kulkarni, University of Akron

2:30 p.m.  S11 Effect of End-Functionalization on the Silica-Filled Solution Styrene-Butadiene Rubber Vulcanizates with Different Silica-Silane Systems - Byungkyu Ahn, Pusan National University

3:15 p.m.  S12 Effects of Process Temperature on Pyrolytic Products Recovered from Waste Tires - Balan Ramani, University of Twente, The Netherlands  

3:45 p.m.  S13 Modelling of Glass Transition Temperature of Polymer Using Quantitative Structure-Property Relationship and Molecular Dynamics Simulations - Anas Karuth, North Dakota State University

4:15 p.m.  S14 How to Predict Tire Grip in a Laboratory Environment - Marzieh Salehi, University of Twente, The Netherlands

4:45 p.m.  S15 Effect of Reversible Addition-Fragmentation Transfer Emulsion Styrene Butadiene Rubber (RAFT ESBR) on the Properties of Silica Compound - Hyunsung Mun, Pusan National University

Support the future of our industry!
The Student Colloquium is open to all conference attendees and exhibitors at no additional cost.

CANCELLED
Student Posters

Wednesday, October 9
Posters displayed on Expo Floor

P01 Stretchable Electrodes on Elastomeric Substrates with Buckled Topography - Yuwen Wei, Chonbuk National University

P02 Agricultural Proteins as Multifunctional Additives in ZnO-free Synthetic Isoprene Rubber Vulcanizates - Natasha Chauhan, Virginia Polytechnic Institute & State University

P03 Programmable Shape Change in Bio-inspired Thermoplastic Elastomer Bilayers - Catherin Wisinger, Virginia Polytechnic Institute & State University

P04 Influence of the Functional Groups of the Organosilane Agents on Surface Modification of Silica and Properties of Solution Styrene-butadiene Rubber/Silica Compounds - DongHyuk Kim, Pusan National University

P05 Effect of Zinc Oxide Contents on the Properties of ESBR Compounds Filled with TESPT Modified Silica - Gyeongchan Ryu, Pusan National University

P06 Energy Dissipation Characteristics of Crosslinks in Natural Rubber: An Assessment Using Low and High-Frequency Analyzer - Anas Karuth, North Dakota State University

P07 Manufacturing of Elastomeric Dielectric Substrates for Stretchable Printed Electronics - Shruti Deshmukh, University of Massachusetts Lowell

P08 Material Extrusion 3D Printing of Rubber - Leeda Phaen, University of Massachusetts Lowell

P09 Development of Continuous Electron Induced Reactive Processing (EIReP) Pilot Plant for Production of Rubber-Toughened Polypropylene - Masoud Razavi Aghjeh, University of Akron

P10 Investigation of the Adhesion in a Laminate Consisting of Fluoroelastomer, Nitrile Rubber, and Bromobutyl Rubber - Jianan Yi, University of Massachusetts Lowell

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## 197th Technical Meeting

**Embassy Suites by Hilton, Cleveland Rockside; Independence, OH**

**Featured topics:**
- 3D Printing with Elastomers
- New Reinforcing Materials for Rubber
- Fracture Mechanics of Elastomers, Networks and Gels
- Sustainability Developments in the Tire Industry
- Advances in Polymer Blends
- Computational Chemistry

*Visit rubber.org for the official call for abstracts. Abstract deadline is November 3rd.*

## International Elastomer Conference

**Knoxville Convention Center • Knoxville, TN**

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Essentials of Rubber Technology

October 8 • 8:00 a.m. – 12:00 p.m.
Room 14, Exhibit Level

This course is structured to benefit all those who design, make, buy or sell rubber products. The course will enhance those who have some level of experience and will lay a firm foundation for those new to working, buying or selling this complicated material.

Course Content:
- What is rubber and its history
- Basic polymer chemistry and how to use it
- Why do engineers use it
- Differences between rubber and plastic
- Types of rubber
- How to select the type of rubber for the application
- How rubber compounds are formulated
- How rubber compounds are mixed
- Rubber curing and its relationship to properties
- How to test rubber
- Rubber bonding
- Rubber molding
- Improving rubber part quality
- How to write and interpret a rubber specification

Learning Objectives:
- Demonstrate the difference between natural rubber and synthetic rubber
- Contrast the difference between thermoset rubber and thermoplastics
- Choose the correct rubber system for specific applications
- Discuss the most common testing methods used to classify rubber characteristics
- Describe and contrast the characteristics between different fabrication methods
- Recognize the importance of cross-link density relative to rubber characteristics
- Apply the principles presented to create specifications and improve the quality of rubber articles

Instructor: Joe Walker, Elastomer Technologies

Compounding Fluoroelastomers

October 8 • 8:00 a.m. – 12:00 p.m.
Room 15, Exhibit Level

Fluoroelastomers are a class of synthetic elastomers that exhibit exceptional heat and fluids resistance when compared to other ‘hydrocarbon’ elastomers. Fluoroelastomers are used where other elastomers will not work. This course will give the participant a good understanding of fluoroelastomers, properties and usage.

Course Content:
- What are fluoroelastomers
- How do fluoroelastomers differ from the other elastomers
- The different types of fluoroelastomers
- Compounding ingredients used in fluoroelastomers
- Properties of fluoroelastomers, both processing and physical properties
- Molding of fluoroelastomers
- Troubleshooting
- Applications

Instructor: William Stahl, Rainbow Master Mixing LLC

Silicone Rubber Chemistry and Technology

October 8, 2019 • 1:00 p.m. – 5:00 p.m.
Room 14, Exhibit Level

The focus of this training session is to provide the attendee an increased level of insight into the silicone rubber family of polymers. The course will take the participant through the process of making silicone polymer, selecting the polymer architecture, cure systems, formulating and fabrication.

Course Content:
- How silicones are made
- What makes silicone a specialty polymer; when to use it over other polymers
- The influence of polymerization on suitability of manufacturing process
- Essential differences between high consistency (millable), RTV and liquid silicone rubber
- Influence of filler types
- Cure systems
- Mixing/manufacturing compounds
- Fabrication technologies; how to set up the process
- Adhesion
- Troubleshooting guide

Instructor: Joe Walker, Elastomer Technologies

Interested in attending a course, but haven’t registered?
Stop by registration to see if there is still seating available.
Compound Mixing and Consistency
October 9, 2019 • 8:00 a.m. – 12:00 p.m.
Room 14, Exhibit Level

This course is designed to provide the attendee an in depth understanding of the influence of the mixing process and the characteristics of the mixed compound. The focus of the training will be on reducing the batch to batch variation commonly associated with batch mixed rubber compounds. The use the Association of Rubber Products Manufacturers Compound Consistency Guideline will be used to walk each aspect of rubber compound manufacture.

Course Content:
• Raw material specifications
• Storage of raw materials
• Error proofing
• Weigh-up controls
• Batch sizing
• Integrated power mixing
• In process mixer data and analysis
• Two roll mill controls
• Compound properties vs. the mix fingerprint
• Testing the compound

Instructor: Joe Walker, Elastomer Technologies

Basic Rubber Compounding
October 9, 2019 • 8:30 a.m. – 4:30 p.m.
Room 15, Exhibit Level

This course is an overview of rubber compounding and testing. Compounding subjects include elastomers, fillers/reinforcement, plasticizers/process aids, antioxidants and cure systems. Testing laboratory subjects will include process testing, physical properties testing, dynamic properties testing and aging. Processing subjects will be in mixing, milling, molding, extrusion and calendering.

Instructors: Bonnie Stuck, Nicki Hershberger of Akron Rubber Development Laboratory

Interested in attending a course, but haven’t registered? Stop by registration to see if there is still seating available.

Establishing a Rubber Molding Process
October 9, 2019 • 1:00 p.m. – 5:00 p.m.
Room 14, Exhibit Level

This program is designed to show how to establish a rubber molding process based on cross link density, as well as the influence of cross link density on mechanical properties and its influence on de-molding. The overall focus is the design of a rubber molding process that yields the most consistent properties.

Course Content:
• Selection of the correct polymer characteristics to match the molding process
• Understanding curing of rubber
• How to measure cure state
• Relationship between cure state and physio-mechanical properties
• Role of mold temperature and its variation reduction
• Heat transfer models in predicting cure time
• Insert molding
• Selecting mold release
• Post mold curing
• Verification of the molding process

Instructor: Joe Walker, Elastomer Technologies

Processing and Testing of Rubber
October 10, 2019 • 8:30 a.m. - 12:00 p.m.
Room 14, Exhibit Level

Mixing, extrusion, molding and testing is the focus of this course. It is taught by three instructors who have extensive rubber plant experience. Different mixer types and rotors types are reviewed. Extrusion, salt batch and other processing is discussed along with how to troubleshoot processing problems. Compression, injection, transfer molding and other molding is discussed. The testing section includes quality control and more details on most rubber tests. Analytical chemical testing of rubber compounds is included. Compound development is covered with a detailed explanation of ASTM D 2000 line call out compounding. Warehouse storage of elastomers and rubber chemicals is included along with useful reference sheets. This course is best suited to rubber plant technical personnel.

Instructors: Nicki Hershberger, Kylie Knipp and Paul Pavka of Akron Rubber Development Laboratory
Business & Awards Meeting

Thursday, October 10 • 2:00 p.m. – 3:00 p.m.
Expo Theater/Rubber Division ACS Booth #648
Huntington Convention Center, Cleveland, OH

Agenda

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EDITORIAL-DRIVEN LIVESTREAMING

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PUBLICATIONS & LIVESTREAMS LEFT FOR 2019!

» OCTOBER 21
  Laboratory & Testing Focus Issue
  IEC Livestream on 10/24

» NOVEMBER 4
  Hose Focus Issue

» NOVEMBER 18
  Rubber in Automotive Special Report #2
  Hose Manufacturing Livestream on 11/21

» DECEMBER 16
  2019 Year in Review/Executive of the Year

» DECEMBER 2
  Belting Focus Issue

» DECEMBER 30
  2020 Rubber Directory and Buyers Guide

TUNE INTO OUR LIVESTREAMS FEATURING RUBBER & PLASTICS NEWS EDITORS INCLUDING:

Bruce Meyer
Editor
Rubber & Plastics News

Chris Sweeney
News Editor
Rubber & Plastics News

ADVERTISING:
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Pete McNeil | Sales Representative | pmcneil@crain.com
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Lena Nguyen
Dow Chemical
Crittenden J. Ohlemacher
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Department of National Defence
William Stahl
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Edward R. Terrill
Akron Rubber Development Laboratory, Inc.
Andrew L. Tisler
Omnova Solutions
Lewis Tunnicliffe
Birla Carbon
Dominica Wong
Eastman Chemical Company
Ping Zhang
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INTERNATIONAL ELASTOMER CONFERENCE 73
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- Don’t leave valuables in your hotel room. Use a hotel safe deposit box.
- Walk in open well-lit areas at night.
- Travel in groups. Don’t be a loner, particularly in the evening.
- Use common sense. If someone or someplace looks suspicious, report it and/or avoid it.
- If an emergency occurs during a meeting event, report emergencies to the nearest security guard or to any Rubber Division, ACS staff member.
- If an emergency occurs outside a Rubber Division, ACS event, contact police or emergency assistance by dialing 911 or seeking assistance from the facility where the emergency occurs.
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