



SOCIETY OF PLASTICS ENGINEERS – CLEVELAND SECTION

September 2017 Vol. 61 No. 1

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Editor: [Craig Potter](#)

Upcoming Meeting: Monday, September 11, 2017

PVC Overview and Applications

**Presented by Mr. Richard Krock
Vice President, Regulatory and Technical Affairs
The Vinyl Institute**

The Vinyl Institute will update meeting attendees on opportunities and challenges facing U.S. vinyl resin, compound, and product manufacturers. Resin and compound producers are subject to significant new regulations from EPA and OSHA. Production statistics, key safety and environmental performance metrics, and recycling surveys will provide insights as to the growth of the industry. Highlights from major markets will be augmented with results of VI's most recent AIA architect opinion survey. Programs and responses with respect to vinyl's continued viability will be reported. VI's new sustainability initiatives including outreach with some major brands will be presented that demonstrate how successes can result from collaborative interactions.

Location:

Hilton Akron/Fairlawn
[3180 West Market Street](#)
[Akron, Ohio 44333](#)

Agenda:

4:30 Board Meeting
5:30 Social / Networking
6:00 Dinner - Program immediately follows dinner

Price:

Members/Guest - \$25 / Retired - \$20 / Student - \$5

Reservations:

Please submit your reservation by noon on Friday, Sept. 8 to akronspe1@gmail.com or call Gary Taylor at [330-419-4380](tel:330-419-4380). Please be sure to include the company affiliation of each attendee, including dietary restrictions.

Quick Clicks:

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[Directions to the Meeting](#)
[About the Speaker](#)
[2017-2018 Programs](#)
[SPE Board – Officers](#)
[SPE-Cleveland Website](#)

Directions to September 11th Meeting

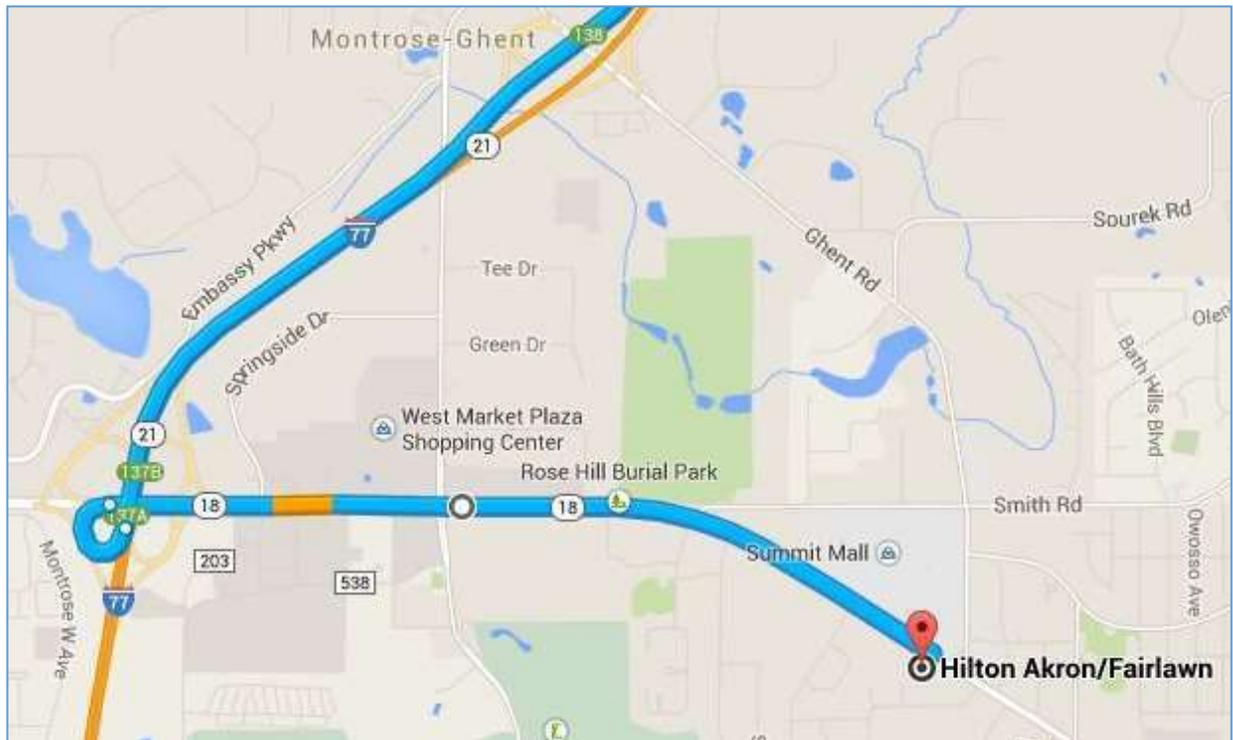
Directions from Cleveland:

Take I-77 south to Exit 137A (Rte 18 East).

In 2 miles, Hilton Akron/Fairlawn will be on the right hand side across from the Mall.

Parking is free in the hotel parking lot.

(Click on the map to view in Google maps)



About the Speaker:



Mr. Krock holds a bachelor of science in Chemical Engineering from The University of Cincinnati and an MBA from Marshall University in Huntington, WV. As a registered professional engineer, Mr. Krock's career has spanned petroleum refining, carbon fibers and pitch, plastic resin polymerization, plastics compounding, plastics processing and recycling. He has worked in the PVC industry for the past 29 years. He joined the Vinyl Institute as its Technical Director in 2009 and is currently responsible for coordinating the organization's regulatory and technical affairs.

President's Message:



Greetings to all plastics and polymers industry professionals and students. We are ready to embark on another great year with the Cleveland section of SPE. I will be serving at the helm of this year's activities, as president for the 2017-2018 year. I have been working with the Cleveland section on the Board and chairing various committees for a few years now. I have been active in the polymers community for over 15 years, functioning in Technical and Commercial roles. I am looking forward to doing my best to help lead the group into another enlightening and enjoyable year for the Cleveland section membership.

We have a strong year of events planned in conjunction with our colleagues at the Akron section. Currently, the Cleveland activities schedule includes 2 plant tours and speakers from local industry leaders. In an effort to reach some of the members that are more constrained by distance, this year's Cleveland sponsored events will be closer to the greater Cleveland area. We hope this year to start the planning process to utilize the electric buzz around Cleveland, generated by the championship Cavs and AL Champ Indians, to bring SPE division events to the area. Additionally, we plan on continuing our support of the next generation of industry members with our scholarship and Plastivan activities.

As always, I would like to welcome any new Cleveland area plastics and polymer industry people to the section. Please stop in at one of the meetings and introduce yourself. We are always looking for active members to serve on our Board of Directors and committees, so any current or prospective members that would like to help in planning and executing this year's and future events and activities, please let us know. I am excited and ready to start this year with the group and I hope to see and meet you all at this year's events.

Ron Raleigh
President
Society of Plastics Engineers - Cleveland Section

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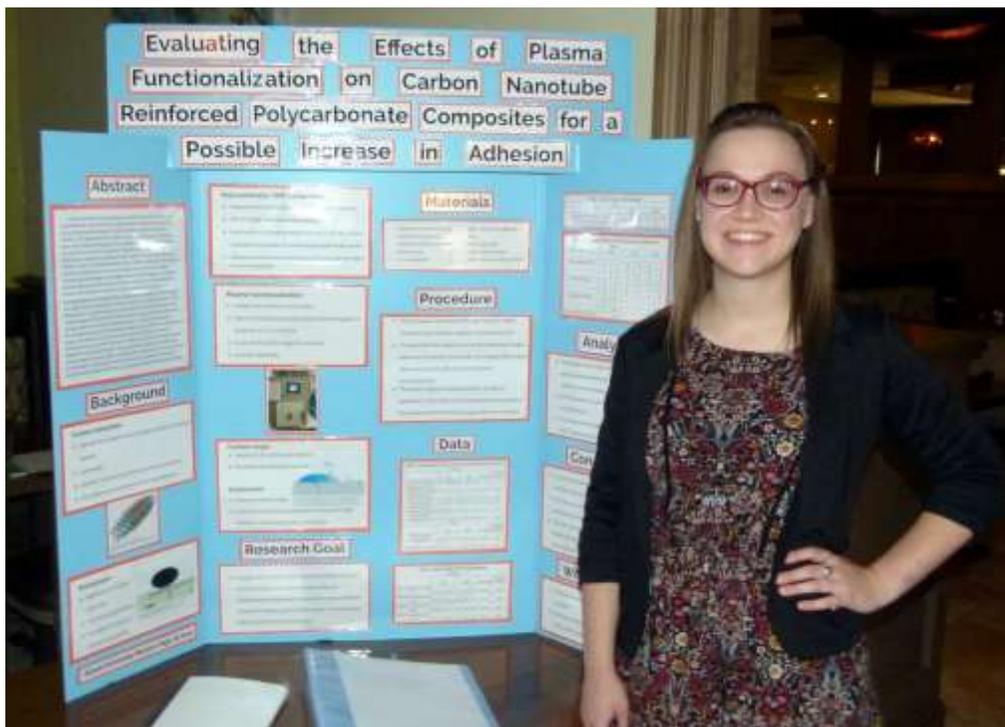
SPE Akron and Cleveland Sections Technical Meeting – Awards Night

1st Place: Alison Kennedy

Evaluating the Effects of Plasma Functionalization on Carbon Nanotube Reinforced Polycarbonate Composites for a Possible Increase in Adhesion.

Carbon nanotubes are emerging as a viable material for reinforcing polycarbonate composites due to their excellent mechanical properties such as high specific strength, tensile strength, hardness and Young's modulus. The applications for carbon nanotube reinforced composites span many industries though the focus of this research is for fabricating composites for wind turbine blades. The most significant challenge of fabricating composites is sufficient load transfer. The lack of ample load transfer is due to the hydrophobicity of the carbon nanotubes. One way to combat hydrophobicity is a process called plasma functionalization. Plasma functionalization uses oxygen plasma to add oxygen containing functional groups to the surface of carbon nanotubes by disrupting the bonds at the surface.

One way to measure the effect of plasma functionalization is through contact angle measurements. Contact angles, the angles that form between a drop of testing liquid and the surface that is being tested, are used to quantify the properties of the solid surface. The contact angles of the plasma treated polycarbonate and buckypaper were smaller than those of the untreated samples. This shows that plasma functionalization reduces the contact angle of water, dimethyl sulfoxide, and epoxy. This reduction in contact angle correlates with an increase in wettability and a possible increase in adhesion. An increase in adhesion will make the composites stronger. Future research would include gathering contact angle data with other testing liquids so that the surface energy could be estimated. It would also include fabricating composites with plasma functionalized carbon nanotubes and experimentally testing their mechanical properties.



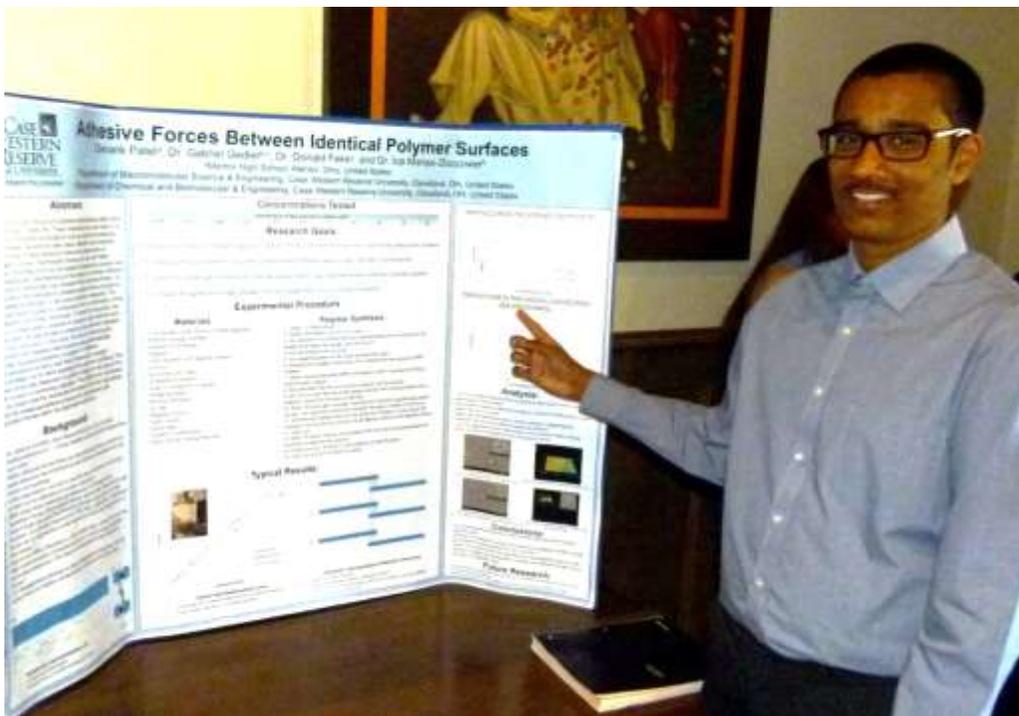
SPE Akron and Cleveland Sections Technical Meeting – Awards Night

2nd Place: Devank Patel

Adhesion Forces between Polymers

The physical interactions between solid surfaces affect many occurrences in daily life. These interactions are also seen in a variety of industrial applications such as material processing. When these interactions take place, attractive and repulsive forces arise. These adhesive forces are categorized as Hydration forces, Electrostatic forces, and van der Waals forces. Industries such as the polymer engineering industry lack a fundamental understanding of the origins of polymer adhesion and how to manipulate the strength of the adhesive forces. To understand the interactions between similar blocks of polymer, the adhesive strength of lap-joints had been measured.

The polymer being studied is synthesized from a combination of two surfactants and three monomers. To create the lap-joints, the solid polymers were contacted by aqueous salt solutions and once dried, the salt tended to enhance the adhesion between the solid polymers. In this work, the role of contacting the polymers with aqueous salt solutions was systematically studied. Aqueous solutions contained 11 different concentrations of CaCl₂ and NaCl measured in weight percentages (wt.%) were applied to the polymer surfaces. The shear force was measured to provide insight on the role of the salt solution in promoting adhesion. This allows the conclusion to be drawn that the results are consistent with the hypothesis that the measured adhesive forces are associated with hydration forces within the deposited salt layer.



SPE Akron and Cleveland Sections Technical Meeting – Awards Night

3rd Place: Julia Roth

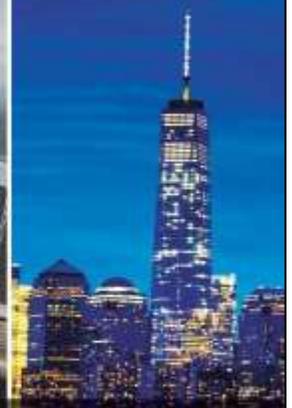
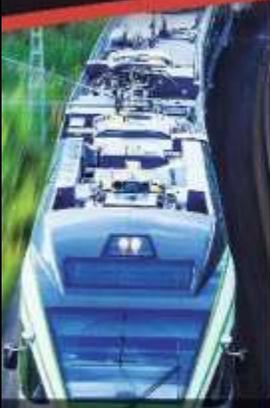
Super Absorbent Polymer Crystals

The problem was super absorbent polymer crystals are a high topic of controversy on if they are really able to absorb. This led to the question, “How will various liquids other than water affect the absorbency of super absorbent polymer crystals?” The hypothesis was if super absorbent polymer crystals are added to various liquids: orange juice, vegetable oil, milk, 91% rubbing alcohol, white vinegar, club soda, and distilled water, then the super absorbent polymer crystals will be able to absorb each of the various liquids. The procedure was to add four ounces of each liquid into seven ounce plastic cups and then add half a teaspoon of the absorbing crystal to each cup. The crystals were left in the cups for eight hours and a series of observations were to be made. The crystals were then extracted and the amount of liquid left in the cup was subtracted from the original four ounces.

The data showed that each liquid was fairly consistent with its own type in the amount of liquid left in the cup. It also showed the crystals did better in the liquids that had water in them while the crystals did worse in the liquids that had little to no water in them. The crystals did the best in water and did the worst in the 91% rubbing alcohol. The results did support the hypothesis because in the majority of the liquids there was some absorption.



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SPE Cleveland Section Board Meeting Minutes May 15, 2017

In Attendance:

Dan Crist (President, House), Moris Amon (Treasurer), Ron Raleigh (Awards), Craig Potter (Advertising, Interim Newsletter Editor), Jerry Blayne (Councilor), Dennis Meade (Education), Bob Opalko (Secretary)

Minutes

New Business: There is a need for a Treasurer, to replace M. Amon who has announced his resignation. Despite several forms of solicitation, nobody has come forward.

Old Business: The May 19, 2017 Networking Event at the University of Akron will be from 1-7PM, with a tour at 3PM. The Akron Section of the SPE has details on their website. Members from the Toledo and Cincinnati Sections will attend, and so far, 15 people have signed up.

On May 22, 2017 the American Chemical Society and the Society for Applied Spectroscopy will have a conference at John Carroll University, and we are down to two speakers.

Treasurer: The Board reviewed the Treasurer's report from M. Amon, and there was some discussion about current income and continuing commitment to the Scholarship Fund. M. Amon noted that he will continue as Treasurer, albeit remotely, until a new Treasurer assumes the role.

Advertising: C. Potter said that no new ads were placed. He is coming up to speed on the Newsletter.

Councilor: J. Blayne distributed a report that covered the National SPE Executive Board contact information and the ANTEC Council Meetings. Of note is that the National SPE signed a contract with Wiley Publishing that guarantees the SPE \$875K/yr. for 10 yrs. Also, the professional membership is 11,000 and the student membership (free) is at an all-time high. A 3-yr. operating plan was presented, and the future strategy is to reap more income from advertisement and less from membership dues.

Education: D. Meade reported that the PlastiVan at Lake Ridge Academy went very well. At tonight's meeting, the student winners will present their work:

Alison Kennedy: "Evaluating the Effects of Plasma Functionalization on Carbon Nanotube Reinforced PC Composites for a Possible Increase in Adhesion"

Devank Patel : "Adhesive Forces Between Identical Polymer Surfaces"

Julia Roth: "Super Absorbent Polymer Crystals"

2017-2018 Program: J. Sovis presented the list of future events through May 2018. For February and April of 2018, the Board chose to pursue a tour of the Cleveland Clinic Innovation Center and one other candidate from a list of 8. For October 2017, we will have a tour and Speaker from Lubrizol. In November 2017, we will have a tour and speaker from Avery. J. Blayne suggested that we ask Berry Plastics (Streetsboro) for a tour / speaker for 2018.

Students/Awards: R. Raleigh attended the teleconference concerning VinylTec, and reported that the Akron Section of the SPE is bidding to host VinylTec in 2019. R. Raleigh suggested that the Cleveland Section of the SPE bid on hosting a smaller TOPCON in 2020. J. Blayne noted that in 2014, the Cleveland Section hosted an Extrusion Div. TOPCON, and it required 5 hardworking volunteers to pull it together. He has spoken with the Extrusion and Injection Molding Divs., and the Injection Molding Div. is looking at CLE for a future event. D. Meade will explore the possibility of hosting a future RETEC.

Membership: L. Nie reported that no new members joined the Cleveland Section of the SPE in May, and that our total stands at 156.

Other: Our next Board Meeting will be 7-24-17 @ 5PM, location TBD.

SPE Cleveland Section Board Meeting Minutes July 24, 2017

In Attendance:

Dan Crist (President, House), Ron Raleigh (Awards), Craig Potter (Advertising, Interim Newsletter Editor), Jerry Blayne (Councilor), Dennis Meade (Education), Bob Opalko (Secretary), Rik Keeley (Past President), Li Nie (Membership)

Minutes

New Business:

The new board of directors was established:

- Ron Raleigh – President
- John Sovis – Treasurer
- Rik Keeley – Program
- Craig Potter – Newsletter and Advertising
- Bob Opalko – Secretary
- Dan Crist – House
- Jerry Blayne – Councilor
- Li Nie – Membership
- Dennis Meade – Education, Awards

New members Dr. Guojuin Zhang (A. Schulman) and Todd Waddle (M. Holland) offered to help in the areas of Technical Programs and Membership respectively.

Members agreed that we should look into purchasing a new projector.

There was some discussion about approaching large local companies to recruit new members, demonstrate our relevance, etc. Members agreed to this, and R. Raleigh will create a list.

Treasurer: No report, although members discussed the current fiscal status and the possibility of dialing back future scholarship commitments as the need dictates. Members noted that the budget should be submitted by September.

Advertising: C. Potter noted that he would give the consultant from Wisconsin ad pricing in lieu of his offer to present at an SPE meeting—members sensed that this presentation would be a commercial.

Councilor:

Education: D. Meade reported that the PlastiVan at Lake Ridge Academy went very well, and that Eve Vitale has hired another instructor for future dates. Plastics Pioneer Program and the SPE Cleveland Section have donated \$1500 each to this effort. Future sites include Beachwood, Solon, Twinsburg, Aurora, and Hudson.

2017-2018 Program:

October = Lubrizol (Brecksville) tour & Speaker
November = Avery Dennison tour & Speaker
February = Dr. Gao of the Cleveland Clinic,
Medical Device Solutions



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Students/Awards:

D. Meade met with the CAD Site Selection Committee, and they have selected CLE for the CAD TOPCON in the fall of 2019. The Chairman is open to the CLE Section of SPE helping out at this event. The next meeting of this committee is 8-7-17, and we may need to commit to finding papers, speakers, etc.

J. Blayne and R. Raleigh will develop an outline for J. Blayne to present at the CAD in Orlando, FLA.

Membership: L. Nie reported that no new members joined the Cleveland Section of the SPE in May, 5 dropped out and that our total stands at 153.

Other: Our next Board Meeting will be 9-11-17 @ 5PM, location TBD.



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2017 – 2018 Cleveland SPE Programs (in conjunction with Akron section)

Meeting	Topic	Speaker	Company	Location
11-Sep-17	PVC Overview and Applications	Richard Krock	The Vinyl Institute	Akron Hilton
9-Oct-17	Plastic Resin Development		Lubrizol	Brecksville OH
13-Nov-17	High Speed Coating of Wide Film Webs	Mike Rossi	Avery Dennison	Mentor OH
4-Dec-18	Holiday Party	Madrigal Singers		Tavern at Richfield
8-Jan-18	ACCESS	Joe Gingo CEO	A. Schulman / PolyOne	Akron Hilton
12-Mar-18	Plastics in Medical Field	Dr. Gao	Cleveland Clinic	Cleveland
12-Mar-18	Parker Hannifin Tour	Sahil Gupta		Plant Tour
9-Apr-18	Plastics in Education			Akron Hilton
21-May-18	Cleveland Section Awards			tbd

2017 – 2018 SPE Cleveland Section Officers and Board of Directors

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