



**Date: Thursday,
April 21, 2016**

Engel Technology Center

2012 Cecilia Drive,
Corona, CA 92881

Registration: 8:30 a.m.

9:00 Workshop
1:00 Live demonstrations
3:30 Adjourn

Register Now!

Download Event PDF

Improving Productivity, Scientific Molding Workshop

Molding Amorphous vs. Crystalline Polymers | Tuan Dao

Do you know the difference between molding Amorphous and Crystalline polymers? Is there a difference? If so, what is the difference?

In reality, there are fundamental differences between amorphous and crystalline polymers. Learn all about the differences in this informative and practical presentation. The PVT diagram (Pressure, Volume, and Temperature) will be used to show the interrelations of these three variables that affect the processing of amorphous and crystalline resins. Things to do or to avoid when molding amorphous and crystalline polymers will also be discussed.

Hands-on Approach to Cycle Time Reduction and Productivity Improvement | Vishu Shah

Increasing competition in molding business has created a renewed sense of urgency among entrepreneurs to focus on improving productivity, reducing cycle time and train the employees to troubleshoot the problems in the most efficient and expedient manner. Learn all about tried and tested common sense approach and techniques to maximize productivity. Take advantage of the practical and hands-on experience of the veteran presenter and take with you some key pointers that you can put to use immediately.

Energy Efficiency in Molding operation | Joachim Kragl

In the majority of the cases energy efficiency in injection molding centers around a machine's drive system. It is very rare to compare the same drive concepts for energy efficiency. The presentation will tap in this topic as not all machines are built the same. The presentation will also highlight how auxiliary systems stack up in terms of energy efficiency. Energy savings in auxiliary systems represents one of the biggest opportunities for molders to cut down production cost. Lastly, the presentation will also provide a detailed look on how correct processing settings can influence the overall energy efficiency of a molding cell.

..... Continued on Page 2



..... *Continued from Page 1*

The Misunderstood 'Scientific Molding' Getting Started in 11 Simple Steps | Suhas Kulkarni

Every molder wants to get on to the 'Scientific Molding' bandwagon. They invest a lot of money in training, equipment and personnel. However after all the time and money investment, nothing changes! The first thing they do after taking the class is to try and develop the Viscosity Curve. If they do not get good results and/or they cannot run at the faster injection speeds and/or they are now conflicting with another person to get things done, Scientific molding becomes a burden. Everyone is back to turning knobs because they say 'Scientific Molding does not work'!

The talk will highlight the main reasons why companies fail in adopting this concept that has proven to improve the efficiency of a molder. A simple 11 Step Process will be presented to start picking the low hanging fruits of efficiency. No experience necessary!

Who should attend?

The intensive course is designed for plastics engineers, managers, processors, Technicians, floor personnel, OEM's and anyone who wishes to acquire knowledge concerning injection molding productivity improvement.

Date: Thursday, April 21st 2016

Time: 8:30 registration 9:00 Workshop 1:00 Live demonstrations 3:30 Adjourn

Location: Engel Technology Center, 2012 Cecilia Drive, Corona, CA 92881

Cost: Cost: SPE Member: \$100 Non-Member: \$ 130 (Join SPE today and save \$30)
(Includes Breakfast and Buffet lunch)

SPEAKERS:

Tuan Dao | President, Polymer Engineering Group

Tuan Dao, B.Ch.E., MSME, is a Senior Consultant at the Polymer Engineering Group, Inc. He was previously a Senior Technical Specialist at the DuPont Company, Engineering Polymers Division. He has over 25 years' experience in Plastic Engineering with applications in various industries such as automotive, medical, electrical/electronics, irrigation and consumer. His expertise includes product design, mold design, runnerless technology, and optimum molding. He is an instructor in plastics engineering design at the University of California San Diego Extension.

Vishu H. Shah | President of Consultek Consulting Group, a technical and management consulting firm.

Vishu's 35 years of extensive practical experience in plastics Industry includes positions as president and cofounder of Performance Engineered products, Senior Plastics Engineer of Rain Bird Corporation and Nibco Inc. His areas of expertise include product design, processing, automation, materials, rapid prototyping, tooling, failure analysis and testing. He is the author of Handbook of Plastics Testing & Failure Analysis and has taught various plastics related subjects throughout his career. Currently, he is teaching classes covering, Plastics Theory and Practice, Scientific Molding, Product Design and Tooling at CAL POLY, Pomona. An active, involved professional, he is a SPE Honored Service Member, past president of So. Cal. SPE section, and also a board member of SPI Western Moldmakers Division. Vishu is a graduate of UMass Lowell where he received his B.S. and M.S. degree in Plastics Engineering.

..... *Continued on Page 3*

..... Continued from Page2

Suhas Kulkarni | President, FIMMTECH, Frontier Injection Molding & Material Technologies

Suhas Kulkarni is the President of FIMMTECH, a consulting firm that specializes in services related to injection molding. He earned his Master's in Plastics Engineering from the University of Massachusetts, Lowell and a Bachelors in Polymer Engineering from the University of Poona, India. He has 22 years of experience as a process engineer. His main area of expertise is Scientific Processing for Injection Molding. Based on his experience, he has developed a custom software called Nautilus, that aids the complete process development routine to production release. He has given numerous presentations on Injection Molding related topics and written several articles. He is also an author of the book 'Robust Process Development and Scientific Molding' published by Hanser Publications.

Joachim Kragl | Director of Advanced Molding Systems and Processing | ENGEL North America

Joachim Kragl graduated from the T GM College for Polymer Engineering and Processing in Vienna, Austria in 1992. Upon graduation, he began working as an applications engineer for ENGEL Austria GmbH . In 1999, he transferred to ENGEL's research and development department and was named technology manager for MuCell, in-mold labelling, and in-mold film decorating activities. Joachim moved to Guelph, Ontario to join ENGEL Canada in October 2000 and was promoted to Manager of Processing Technology in 2003. He assumed his current role as Director of Advanced Molding Systems and Processing for ENGEL North America in July 2009 and now works out of the York, PA facility.

OUR HOST:

Engel Technology Center

2012 Cecilia Drive

Corona, CA 92881



PRESIDENT'S MESSAGE



We are pleased to tell you that our SoCal Section has been selected as a 2016 Pinnacle Gold Award and Communications Excellence Award winner. We are honored that our work and activities are recognized by the SPE and we would like to thank our sponsors, our members and our board to make this achievement possible.

As you know the main goal of our Section is to promote plastic knowledge through science and technology. We will be hosting a one day Molding Workshop at the Engel Technical Center in Corona on April 21st, 2016. The workshop will be an excellent opportunity to get access to technical discussions with industry experts in plastic molding and machinery as well as a good event for networking with your industry peers. Early registration is recommended and details about this workshop are on our website.

There are two other big events that our Section held annually and they are approaching. The Golf Outing is on June 23rd at the Sierra LaVern Country Club and the Western Plastic Trade Fair on August 11th at the Phoenix Club in Anaheim. Planning for these two big events is progressing and we anticipate a great turnout. For the Golf Outing we are still looking for tee sponsorships, and for the Trade Fair if you want to have a good location for your booth or table top, we recommend you register early. So start talking to your co-workers, customers or vendors about our Trade Fair. For more information, please call us or visit our website.

We look forward to meeting you at our events.

Tuan Dao
President, SoCal SPE
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Pinnacle Award

So Cal Section Receives Pinnacle Award

The Pinnacle program was established in 2005 to recognize Sections and Divisions that successfully create and deliver member value during year. Sections and Divisions are reviewed in four categories of achievement: organization, technical programming, membership and communication. Two levels of achievement are possible: Silver and Gold.

So Cal SPE Section has earned this prestigious Pinnacle Gold award since the inception.

Congratulations to all the hard working board members!



Register online [NOW!](http://www.socalspe.org)



33rd Annual Golf Tournament for Plastics Education

Thursday June 23, 2016

The Southern California Society of Plastics Engineers is proud to host this event.

Our Golfers will enjoy our return to the exclusive Sierra Lavern Country Club. Located in the rolling foothills of the majestic San Gabriel Mountains, the course offers a cool climate surrounded by great natural beauty. We have an early morning shotgun start at 7:30AM. Event proceeds help support the SoCal SPE education and scholarship programs. **Join in after the tournament for the golf awards presentation and luncheon after golf.**

SPE will also formally present the George Epstein Scholarship

<http://socalspe.org/Scholarships.html>

New this year: Rusty Miller perpetual trophy (The Rusty). Be the first foursome to have your name engraved on the trophy.

Past SPE presidents are invited for our traditional informal past presidents meeting

Any donations in the form of Raffle Prizes, Tee Sponsorship, Cash or Services for this fundraiser will be greatly appreciated. Your contribution will be recognized at the tournament.

registration: register online at www.socalspe.org

Event coordinators:

Kerry Kanbara 909 906 2332

Registration work sheet:

GOLF & CART+LUNCH /\$99.00 ea _____

GOLF & CART only\$ 75.00 ea _____

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TOTAL _____

Name of Participants (group contact as #1) Index (if used)

1- _____

2- _____

3- _____

4- _____

EDUCATION/SCHOLARSHIP donation \$ _____

I plan to donate a raffle prize or other services (NO REFUNDS FOR CANCELLATION AFTER 06/04/16)

MEMBERSHIP SPOTLIGHT

We are always so excited to announce new members! Welcome to SPE to the following new members:

Axel Foerster from B. Braun Medical Inc.

SoCal SPE Wants YOU to Become a Member

The SPE Southern California Section is, for a limited time, offering one FREE registration to a single, exclusive local technical event for those who sign up for an SPE Membership! To be eligible for this special offer, visit our website @ socalspe.org to check out the event calendar and register as an SPE Member! Once a member, you will be sent a voucher to bring to the SoCal SPE event of your choice! Offer also applies to expired memberships. Don't let this opportunity pass you by, become an SPE member today!

For questions, contact Ashley Price at 562-217-1377 or aprice@ethorn.com.

SAVE THE DATE



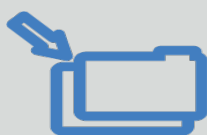
George Epstein Scholarship Award

The **George Epstein Scholarship Award** was established in 1984 as a tribute to his many contributions to plastics both commercially and educationally. Since inception, the Southern California SPE Section has awarded over \$33,000.00 in scholarships. The award is open to student members or son/daughter, grandsons/granddaughters of a member in good standing of the Society of Plastics Engineers, Southern California Section.



QUALIFICATIONS

- 1) Son/daughter or grandsons/granddaughters of a member or a current student member in good standing of the Society of Plastics Engineers, Southern California Section.
- 2) Applicants must have a demonstrated or expressed interest in the plastics industry.
- 3) An Applicant must be in good academic standing at his/hers school.
- 4) High School graduating senior accepted to a University or Jr. College.
- 5) Matriculating undergraduate student at a University College or Jr. College.
- 6) Matriculating graduate student at a University College.



APPLICATIONS

Applications must include the following minimum information:

- Name and relationship to the member of SPE
- Address, phone number and email address (if available)
- Institution attending and Student ID number
- GPA, SAT, Major, Goals, Awards, Clubs, Activities, Achievements, Hobbies
- Include any additional information that would assist the selection committee.



LATE APPLICATIONS

Late applications and those that do not include the above information as a minimum will not be considered.

\$250 & \$500 scholarships are available and will be awarded based on the above criteria and Scholarship Committee evaluation of the effort put into the application, format, grammar, spelling, etc., the applicants ability to express him/herself in writing and subjective evaluation of applicants activities in/out of school and awards and achievements. SoCal SPE reserves the right not to award a scholarship in a given year if it so chooses.

For more information email - socalspe@gmail.com

Entry Deadline: May 31st

Awards are presented at the banquet following our Annual Golf Tournament for Plastics Education

Additional scholarships are available through The SPE Foundation Scholarship Program. For more information click [here](#).

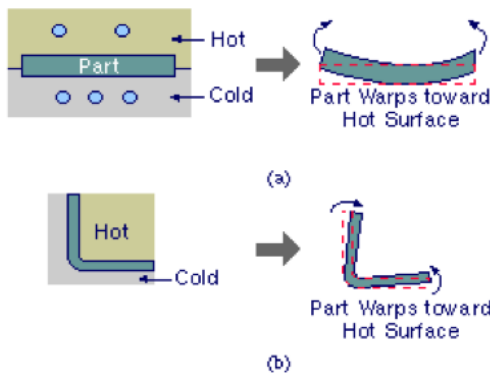
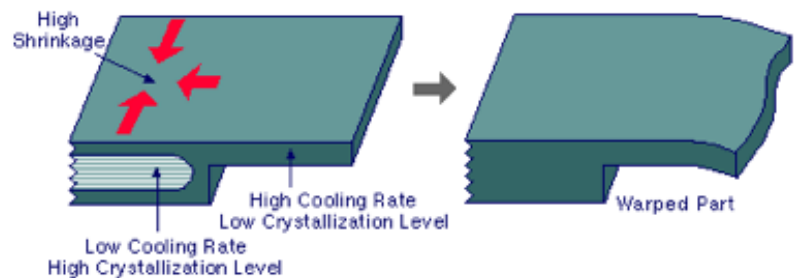
Tech Tips: WARPAGE 101 (Part 1)

Next Issue: How to solve Warpage related problems (part 2)

Source: *Plastics Engineering Magazine*, October 2015

The prime cause of warpage is when different sections of the plastic part shrink to different extents, creating stresses and strains that induce bending. thick sections of the part actually shrink more than thin sections, but thin sections are obviously less able to withstand the stresses and strains and are thus more prone to bending. the extent of shrinkage depends

on both the rate of cooling and the pressure that the molten plastic is exposed to inside the mold. Both of these factors can be influenced by mold design, providing a way to reduce the risk of warpage. the plastic starts to cool as soon as it enters the mold, with the portions in direct contact with the mold walls cooling fastest. the cooling process can be partially controlled by fabricating cooling channels within the mold, through which water or oil can be pumped, and also external vents. these channels and vents can be placed close to thick sections that cool slowly and further away from thin sections, in order to try to maintain a consistent rate of cooling throughout the part. the specific metal material that the mold is made from can also influence cooling, as some materials radiate heat away more efficiently than others. the design of the mold can also have a major influence on the pressure experienced by the molten plastic, because the design dictates how the plastic flows through the mold. the plastic obviously is injected into the mold under pressure so that it can reach all the far nooks and crannies. so the pressure is higher at the entrance to the mold, known as the gate, than further in. this is important because plastic shrinks less when it cools at higher pressures, thus sections of the part near the gate will shrink less than sections further in.



The mold's design can help lessen this problem by ensuring that the molten plastic flows through to all sections of the mold as easily as possible. Otherwise, the plastic will flow to low-resistance areas of the mold before high-resistance areas, affecting the pressure distribution. Even with a design that limits such high-resistance areas, there will always be some unavoidable drop in pressure through the mold. this can be dealt with by gradually reducing the pressure during injection, such that the pressure at the gate, as the last of the molten plastic is injected, is similar to the pressure at the far reaches of the mold. several other factors can also affect the risk of

warping. these include the mechanical stiffness of the specific plastic, as plastic with a high mechanical stiffness is obviously less prone to warping, and also the orientation of the individual polymer molecules making up the plastic. this orientation is influenced by the shear flow as the plastic travels through the mold, with the polymer chains aligning with the flow. it's also influenced by the cooling rate: the polymers gradually move out of alignment once they stop moving, until they are frozen in place when sufficiently cooled. Polymer molecules aligned in different directions shrink to different extents, so if the polymers in different sections of the mold end up aligned in different directions, then that can lead to variable shrinkage, increasing the risk of warping. controlling the orientation is tricky, because higher shear rates cause more polymer molecules to orientate in the same direction, but this also causes more shear heating, giving the polymer molecules additional time to move out of alignment as they cool.

For Your Information



The Plastics Technology Conference Featuring Knowledge that Is Current, Relevant and Global.

Connect Classroom Theory with Real World Solutions

ANTEC®, produced by the Society of Plastics Engineers, is the largest, most respected and well known technical conference in the plastics industry.

For over 70 years ANTEC® has successfully expanded from the U.S. into Europe, India and the Middle each with further expansion to global locations in the coming years.

Each event boasts technical and business presentations on new and updated technologies, panels and tutorials, networking events and student functions - all providing attendees with face-to-face interaction with expert representatives from the largest industry segments.

Who Should Attend?

Engineers, R&D Scientists, Technicians, Technical Sales & Support, Academics, Students, Managers, along with anyone involved in the plastics industry.

Who Should Submit Papers or Posters for Presentation?

The object of SPE is to promote scientific and engineering knowledge relating to plastics to members from industry, government, and academia. Therefore, those with the knowledge and expertise, as well as those who are from the world of research in these areas are all welcome to submit papers on their work.

As well, we encourage students - both Graduate and Undergraduate - to submit their work via a Poster presentation, hence participating in the Student Poster Competition.

Watch ANTEC 2016 on YouTube: <https://www.youtube.com/watch?v=uPJ4y8hle-Q>



SPE nurtures next generation of plastics professionals

Attracting the next generation of plastics industry employees and trade association members is high on the to-do list of industry trade groups. On October 22, the Society of Plastics Engineers (SPE; Bethel, CT) announced a strategy to draw more young people into the industry and into SPE itself.

"Diverse initiatives undertaken by SPE have made young people more aware of career opportunities in plastics, increased support for students seeking technical and professional training and made first-time participation in industry activities easier and more attractive," said Russell C. Broome, Managing Director of SPE. "As a result, student membership in SPE has grown considerably and now accounts for at least 17% of our total membership."

Students from 33 U.S. colleges and universities have formed SPE student chapters, and there are now such chapters in China and Saudi Arabia, as well. Also on the increase is student participation in the annual SPE ANTEC, the world's largest plastics technical conference.

"SPE recognizes the importance of starting to educate our future workforce as early as possible and staying engaged as they hopefully progress through a career in the plastics industry," said Broome. "We have expanded programs and offerings for the primary STEM [science, technology, engineering and math] education system and through our partner universities. Next we will focus on closing the gap for those transitioning from high school into secondary education in hopes of recruiting more future plastics industry employees."

Some of the benefits include free student membership in SPE and SPI, who now share the membership costs for students who are U.S. citizens. The program also provides increased scholarship funding, student loan debt relief, free online posting for job seekers, an online community for students and much more.



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<https://www.ceu.cpp.edu/courses/cert/EM/PET.html>

Comments Provided by Students

- ▶ Great course, very instructional...love the PowerPoint notes
- ▶ The instructor uses examples that are relevant to my industry/field
- ▶ The overall explanation of the basics of Plastics was very clear and concise, explained in plain English without having to use big and sophisticated words to explain theory or function
- ▶ The course's major strength was instructor's ability to relate to real life experience
- ▶ Very Practical – I highly recommend to anyone new to plastics industry
- ▶ Hand-outs are great, I refer to them on regular basis

Spring 2016

(April 30 & May 7, 2016)

Plastics Product Design and Tooling
For Injection Molding

Fall 2016

Scientific Injection Molding

Plastics Product Design & Tooling for Injection Molding

The College of the Extended University, Cal Poly, Pomona

Plastics Engineering Technology Certificate Program

Spring 2016 Saturdays - April 30th & May 7th

This combined course is designed for toolmakers, apprentices, technicians, product designers, process engineers and other plastics personnel desiring to acquire basic knowledge of product design and tooling technology. This course provides an overview of the design process for injection molded plastics parts. The emphasis is on concurrent engineering practices, which leads to elimination of barriers between various engineering groups, toolmaker and manufacturer. The student will learn about the importance of proper material selection, part design fundamentals, manufacturing (moldability) considerations, design for assembly, tooling considerations, rapid prototyping

techniques and testing. Design fundamentals discussed are applicable to parts designed for all plastics processing techniques. In the tooling portion the emphasis is on various mold components, mold design principles, cooling, venting, draft considerations, shrinkage, mold polishing, and tool surface enhancement techniques. Topics such as use of simulation software to enhance mold design, how to improve productivity, reduce down time, and lower maintenance costs by optimizing tooling design will be covered in detail. Course content: Plastics materials and material selection process; Concurrent engineering, plastics part design process overview; Manufacturing considerations; design for molding; Basic part

design and design related product failures; Rapid tooling and prototyping; Design for assembly and review of assembly techniques; Tooling considerations; Injection molding process; Injection molds (types of mold construction); Tooling considerations; Mold metallurgy, runners, gates, sprue bushing, sprue pullers; Mold design and simulation software; Venting, cooling; Draft angles, shrinkage, mold polishing, tool surface enhancement; Hot runner molds and systems. In addition, students will receive a variety of useful handouts showing How and Where to get more detailed information on a variety of plastics-related topics.

The logo for the University of California, San Diego, featuring the text "UC San Diego" in white serif font on a blue rectangular background.

PLASTIC ENGINEERING – PART DESIGN FOR INJECTION MOLDING
(Course Code AMES-40168) Section ID 116806

University of California – San Diego, Extension.
July 16 – August 20, 2016

Expanding Skills in Plastic Part Design for Injection Molding

Plastics have increased their penetration of engineering applications that push the limits of part design, molding techniques and processing ranges. Plastic parts, often complex and large, are calling for better quality control and dimensional tolerances. Resin families and compositional variations have proliferated. Growth in the plastics industry has led to a constant influx of new people from other technologies who need to begin developing skills in the field of engineering plastics. People working in the industry need a good working knowledge of plastic part design.

Who Should Attend?

The course is primarily for designers, engineers, and technicians directly involved with making parts out of plastics. However, those in related activities ranging from management, purchasing, and quality control can benefit from the course by developing a better appreciation and understanding of the process of designing a plastic product.

Course Content

- Process of product design
- Fundamentals of plastics. Strength of materials, non linear considerations
- Materials selection in product design
- Molding and tooling considerations in part design
- General principles of part design. Short term loads, long term stress exposure
- Creep and relaxation in part design. Understanding safety factors in design.
- Dimensional analysis in part design
- Assembly techniques: design of snap-fit, press-fit, fasteners, ultrasonic, vibration welding, heat staking, adhesive bonding.
- Prototyping

Time/Dates: Saturdays, 9:30 AM-2:00 PM, July 16 – August 20, 2016 (6 mtgs)

Location: UC San Diego Extension. University City Center. UCC310

Contact: <http://extension.ucsd.edu/> or Tony Babaian tbabaian@ucsd.edu

Instructor: Tuan Dao, MSME. Consultant, Polymer Engineering Group, Inc. Formerly with DuPont Co., Engineering Polymers, has 30+ years experience in part design, mold design and molding techniques.

SPE Southern California Leadership



SPE Leadership		
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Director: Suhas Kulkarni	760-525-9053	suhas@fimmtech.com
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Society of Plastics Engineers

6 Berkshire Blvd., Suite 306
Bethel, CT 06801-1065 USA

Membership Application

PH: 203-775-0471 • Fax: 203-775-8490
www.4spe.org • membership@4spe.org

Contact Information *Please print clearly*

First Name (Given Name)		Middle Name
Last Name (Family Name)		
Company Name/University Name (if applicable)		
Mailing Address is: <input type="checkbox"/> Home <input type="checkbox"/> Business		Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female (for demographic use only)
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Address Line 3		
City		State/Province
Country	Zip/Postal Code	Phone
Preferred Email (This will be your member login and is required for usage of online member services)		
Alternate Email		
Date of Birth (Required for Young Professional membership)		
Graduation Date (Required for Student membership)		Job Title

Membership Types *Check one*

- ☐ **Student: \$31** (Graduation date is required above)
- ☐ **Young Professional: \$99** (Professionals under the age of 35. Date of birth is required above)
- ☐ **Professional: ~~\$144.00~~ \$129** (Includes \$15 new member initiation fee)

Choose 2 *free* Technical Division and/or Geographic Section Member Groups. ➔

Additional groups may be added for \$10 each. Add Special Interest Groups at no charge.

1. _____ 2. _____

3. _____ 4. _____

Dues include a 1-year subscription to *Plastics Engineering* magazine—\$38 value (non-deductible). SPE membership is valid for 12 months from the date your membership is processed.

Payment Information Payment must accompany application. No purchase orders accepted.

☐ Check Enclosed Amount _____

Charge: ☐ Visa ☐ Mastercard ☐ American Express Expiration Date: _____

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The SPE Online Member Directory is included with membership. Your information is automatically included unless you indicate otherwise.

- _____ Exclude my email address from the Online Membership Directory
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By signing below, I agree to be governed by the Bylaws of the Society and to promote the objectives of the Society. I certify that statements made in the application are correct and I authorize SPE and its affiliates to use my phone, fax, address and email to contact me.

Signature _____ Date _____

Technical Division Member Groups - Connect with a global community of professionals in your area of technical interest.

- Additives & Color Europe - D45
- Applied Rheology - D47
- Automotive - D31
- Blow Molding - D30
- Color & Appearance - D21
- Composites - D39
- Decorating & Assembly - D34
- Electrical & Electronic - D24
- Engineering Properties Structure - D26
- European Medical Polymers - D46
- European Thermoforming - D43
- Extrusion - D22
- Flexible Packaging - D44
- Injection Molding - D23
- Medical Plastics - D36
- Mold Making & Mold Design - D35
- Plastics Environmental - D40
- Polymer Analysis - D33
- Polymer Modifiers & Additives - D38
- Product Design & Development - D41
- Rotational Molding - D42
- Thermoforming - D25
- Thermoplastic Materials & Foams - D29
- Thermoset - D28
- Vinyl Plastics - D27

Geographic Section Member Groups - Network with local industry colleagues.

- ☐ Alabama/Georgia-Southern
- ☐ Asean*
- ☐ Australia-New Zealand
- ☐ Benelux
- ☐ Brazil
- ☐ California-Golden Gate
- ☐ California-Southern California
- ☐ Caribbean
- ☐ Carolinas
- ☐ Central Europe
- ☐ China
- ☐ Colorado-Rocky Mountain
- ☐ Connecticut
- ☐ Eastern New England
- ☐ France
- ☐ Hong Kong
- ☐ Illinois-Chicago
- ☐ India
- ☐ Indiana-Central Indiana
- ☐ Israel
- ☐ Italy
- ☐ Japan
- ☐ Kansas City
- ☐ Korea
- ☐ Louisiana-Gulf South Central
- ☐ Mexico-Centro
- ☐ Michigan-Detroit
- ☐ Michigan-Western Michigan
- ☐ Middle East
- ☐ Nebraska
- ☐ New Jersey-Palisades
- ☐ New York
- ☐ North Carolina-Piedmont Coastal
- ☐ Ohio-Akron
- ☐ Ohio-Cleveland
- ☐ Ohio-Miami Valley
- ☐ Ohio-Toledo
- ☐ Oklahoma
- ☐ Ontario
- ☐ Oregon-Columbia River
- ☐ Pennsylvania-Lehigh Valley
- ☐ Pennsylvania-Northwestern Pennsylvania
- ☐ Pennsylvania-Philadelphia
- ☐ Pennsylvania-Pittsburgh
- ☐ Pennsylvania-Susquehanna
- ☐ Portugal
- ☐ Quebec
- ☐ Spain
- ☐ Taiwan
- ☐ Tennessee-Smoky Mountain
- ☐ Tennessee Valley
- ☐ Texas-Central Texas
- ☐ Texas-Lower Rio Grande Valley
- ☐ Texas-North Texas
- ☐ Texas-South Texas
- ☐ Tri-State
- ☐ Turkey
- ☐ United Kingdom & Ireland
- ☐ Upper Midwest
- ☐ Utah-Great Salt Lake
- ☐ Virginia
- ☐ Washington-Pacific Northwest
- ☐ West Virginia-Southeastern Ohio
- ☐ Western New England
- ☐ Wisconsin-Milwaukee

*Asean: Indonesia, Malaysia, Phillipines, Singapore, Thailand, Cambodia, Laos & Vietnam

Special Interest Groups - Explore emerging science, technologies and practices shaping the plastics industry. Choose as many as you would like, at no charge.

- Advanced Manufacturing / 3D - 033
- Bioplastics - 028
- Failure Analysis & Prevention - 002
- Joining of Plastics & Composites - 012
- Marketing & Management - 029
- Non-Halogen Flame Retardant Tech. - 030
- Plastic Pipe & Fittings - 021
- Plastics Educators - 018
- Plastic in Building and Construction - 027
- Quality/Continuous Improvement - 005
- Radiation Processing of Polymers - 019
- Reaction Injection Molding - 032
- Thermoplastic Elastomers - 006

Recommended by (optional) _____ ID# _____