



# The SPE Press

www.socalspe.org

May 2016

The Southern California Section of the Society of Plastics Engineers  
Local information on resources and education available to plastics professionals

## Table Top 3D Printing

**Date: Thursday,  
May 19, 2016**

**Jagerhaus Restaurant**  
2525 E Ball Rd.  
Anaheim, CA 92806

Registration: 5:30 p.m.  
Dinner: 6:00 p.m.

**Register Now!**

**Download Event PDF**

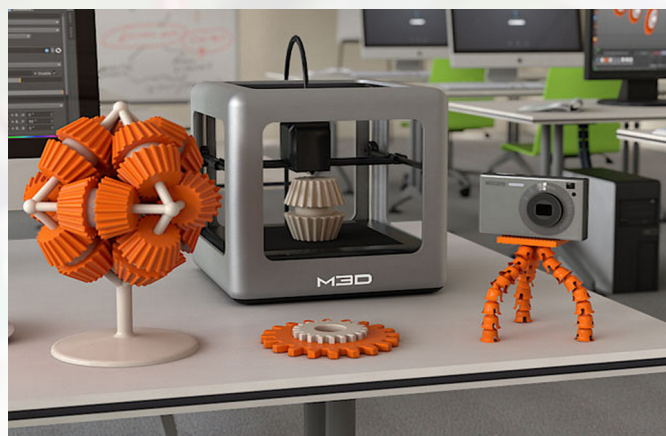
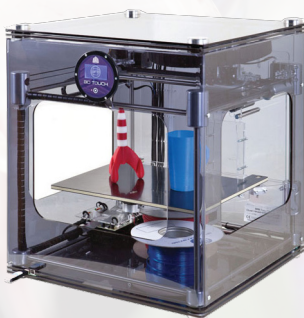
### May Technical Dinner Meeting

Terry Price from Cerritos Collage will present the HOW's, WHY's, and IN's AND OUTS of table top 3D printing. There will be machines in operation to view the process in real time.

Brandon Macias of MAKERSOME.Com. will explain available materials and software and accessories.

There will be a Q&A session after the two presentations.

**For questions, call: Kerry Kanbara 909 906 2332**



## PRESIDENT'S MESSAGE



It's hard to believe that spring is already here and summer is just around the corner. Where does all the time go? We have a lot going in our section and we invite you to join us in those upcoming events. We will be finishing up April with our Molding Workshop at the Engel Technical Center in Corona with expectation of a good turnout at that event.

On May 19th we will have a dinner meeting at the Jagerhaus with a seminar on 3D printing. Please visit our website for more detail. Our two biggest events are coming up, "Golf Outing" in June, and "Western Plastics Trade Fair" in August and we are asking for your support once again. For the Golf Outing we are looking for tee sponsorships and we invite your participation in setting up a booth or table top at the Trade Fair.

Our board members are working hard to achieve the goals we have set for the year. In addition, there are a few specific things we would like to focus on. First, our section is continually working to meet the education needs of our members and we welcome everyone's input. Secondly, student outreach is also our priority, we feel that encouraging and inspiring students to explore the field of plastics would strengthen our work force and identify future leaders in the field. And finally about the membership in our section, it has been declining over the past twenty years and we are going to have to work hard to get this turned around. We strive to bring value to our membership and create incentives for people to join. We will continue to maintain communication with our members through our website and our newsletter about job postings, educational seminars and workshops, volunteer opportunities and more.

We look forward to hearing from you and seeing you at one of our many upcoming events.

Tuan Dao  
President, SoCal SPE  
(714) 692-9492

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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!

## SO Cal SPE Newsletter Ad rates 2016

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**33rd Annual Golf Tournament for Plastics Education  
Thursday June 23, 2016, 7:30 AM**

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. This year, Sierra Lavern has given us a discount so we have lowered the entrance fee to \$99.00 per player.

We are asking for Tee sponsors for this Year's Tournament. We would like to thank last year's Tee Sponsors. Many are doing so this year. We especially thank Craftech for the Tee and Flag sponsorship. All of the funds go directly to the Scholarship, High school essays and student admissions to our events.

New this year: Rusty Miller perpetual trophy (The Rusty) for the low score foursome. Be the first to have your name engraved on the trophy. If the foursome is sponsored by a company, we will also engrave the company name with the player's name. Please come and support us in honoring Rusty.

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

SPE Southern California is also looking for an event sponsor. The tournament will be named after this sponsor. The (ABC Inc.) 33rd Annual Golf Tournament for Plastic Education. A \$3000 donation with a commitment for 3 years is all that is needed to be the event sponsor. Please Call Kerry Kanbara, 909 906 2332 for more details.

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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](http://www.socalspe.org)

**Event coordinator:**

**Kerry Kanbara - 909 906 2332**

## MEMBERSHIP SPOTLIGHT

Welcome to SPE to the following new members:

**Raul Rivera and Victor Wong both from Quality Plastics NZ**

## 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](http://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](mailto:aprice@ethorn.com).

## SAVE THE DATE



<b>Western Plastics</b>	<b>AUGUST 11, 2016</b>
<b>TRADE FAIR</b>	Hosted by The Southern California
Anaheim, CA	Society of Plastics Engineers



## SoCal People Watch



James (Jim) Prior: Jim will be retiring this month after selling Honor Plastics, Inc. to Dennis Savalia earlier this year.

After 26 years of owning this iconic molding company, he has decided that the life an entrepreneur was far too taxing but will stay on as a consultant.

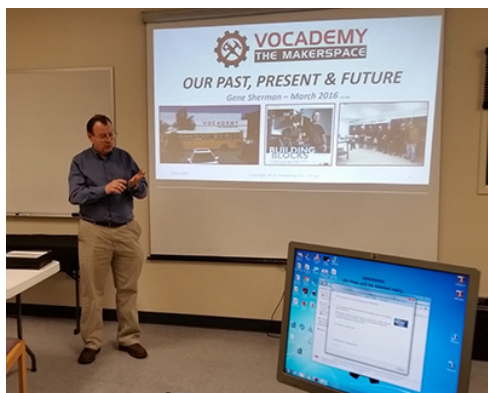
Jim has long been involved with the American Boy Scouts and has donated countless hours to his wonderful organization.

Jim has also been a Past President of Southern California Section of SPE and a valued member of the board. We all wish Jim well for the future.

This is a feature for our newsletter. We will note changes of positions, opening of new companies, interesting facts about our plastics community and humorous stories told in good taste about our members. Please forward all of your gossip to me, Kerry Kanbara, [kerry.kanbara@gmail.com](mailto:kerry.kanbara@gmail.com) , 909 906 2332.



## Annual Education Night



The Southern California Chapter of the SPE held their annual education night on March 15. The event was to recognize the winners of our annual essay writing contest. In addition, Vocademy, provided the location to host the event.

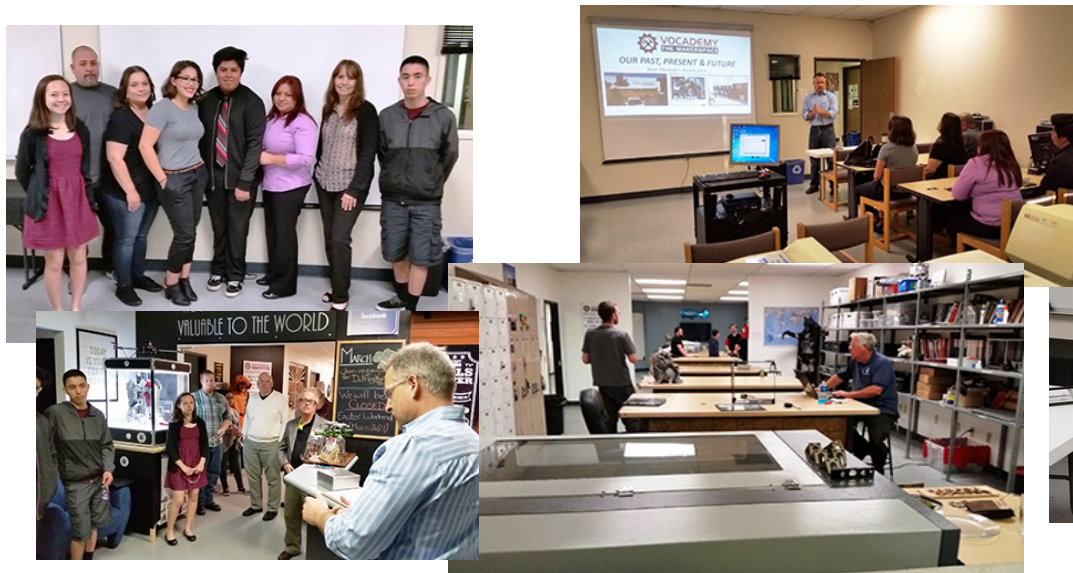
Four schools participated this year, Ontario High School, Diamond Ranch High School, Harvard Academy and Cypress High School. The latter two the students were contacted by SPE members about the contest and they participated, and won an honorable mention and scholarship. Thus, as a member of the plastics community you can reach out to any high school student to enter the contest.

The awards this year were unusual in many respects: there was a double tie for first place, and there was another double tie for third place. In addition, the scoring difference between first and fifth entries was less than two percent. For this reason, an honorary mention was also given to the fifth place. Also, one of the first place winners was a two person team. For this reason, six students were awarded scholarships totaling over 1000 dollars. In addition, the winner's schools obtained matching funds to support their science activities. The judges indicated that the quality of the essays was much higher than in previous years. Your participation at SPE events and the fundraising within allows us to offer this program.



Education night was hosted at Vocademy, a makerspace in Riverside. The goal was to expose the students to careers in manufacturing and the creative careers within, including plastics. Gene Sherman, Vocademy's founder, gave a talk directed to students and their parents about the future in manufacturing. He highlighted the creative element as well as the wonderful career prospects for college and high school graduates. Our thanks go to Gene and his team at Vocademy.

Next year you SPE chapter is planning on running the essay contest again. If you know any high school student, child, relative or friend, they are eligible to enter.



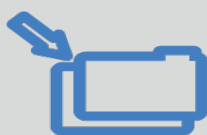
## George Epstein Scholarship Award

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](mailto:socalspe@gmail.com)

**Entry Deadline: May 31st**

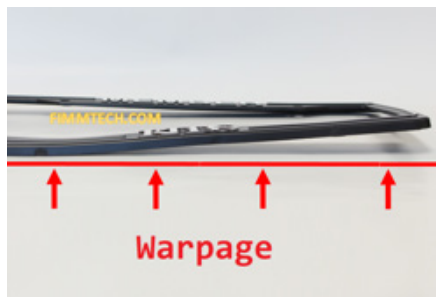
Awards are presented at the banquet following our Annual Golf Tournament for Plastics Education

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



## Tech Tips: WARPAGE 101 (Part 2)

Vishu Shah, Consultek Consulting Group.



In last month's SPE Press we discussed the primary reasons for Warpage in plastic parts. To summarize, there are number of reasons for the warpage. Differential Shrinkage or non-uniform shrinkage is created by wall thickness variations. Thicker sections tend to cool slower than the thinner counterparts and shrink more inducing uneven shrinkage. The unrestrained part will warp. Non-uniform mold cooling will also create differential shrinkage. Crystalline polymers develop internal stresses during cooling due to the differential shrinkage between the crystalline and amorphous regions. One of

the other reasons for the warpage is the residual stress relief. The stretched molecular chains induced by injecting the polymer through the gate at high speed and pressure is analogous to the stretched rubber band. Upon cooling these stretched bands return to the original size. If the bands are frozen while stretched, they will try to return to their normal coiled shape when exposed to heat and stress relieve themselves. This molded-in, frozen-in or residual stress will induce warpage. Overpacking tends to increase frozen-in stresses resulting in warped parts.

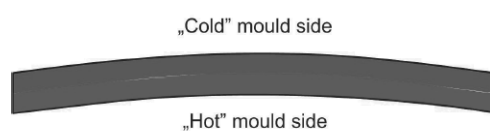
Now that we have addressed the multitude of reasons behind part warpage, let's discuss the how to control the warpage and what are the most effective techniques for molding warp free parts.

### Design:

Controlling warpage begins at the design stage. Uniform wall thickness means uniform shrinkage and therefore low or minimum warpage. As discussed earlier, thicker part sections tend to cool slower than the thinner counterparts. This imbalance creates nonuniform shrinkage and warpage. Ribs, bosses, gussets and corners generally produce thicker walls and should be carefully analyzed. Flow simulation or Mold flow analysis at this stage can predict the flow behavior part shrinkage and warpage. The results and recommendations may include gate location changes, number of gates, design changes and point out cooling issues.

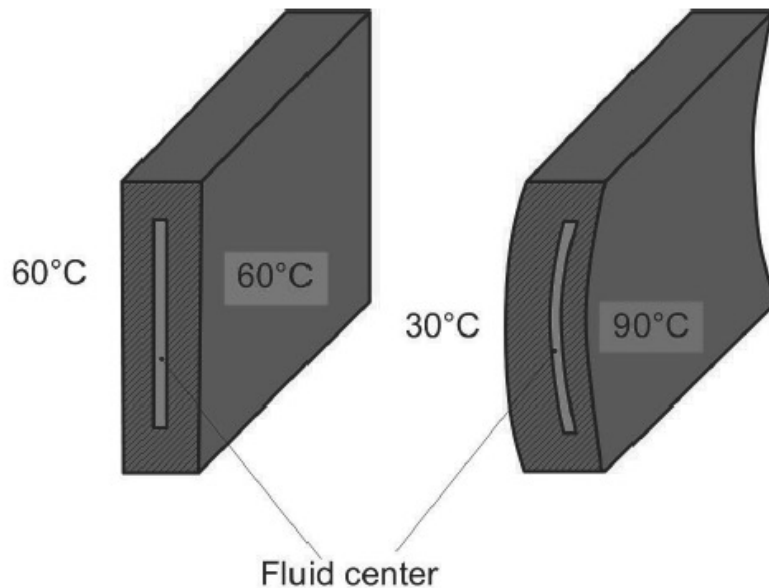
### Tooling:

If you happen to inherit less than optimally designed part and do not have the liberty to change the design, the focus needs to be directed to the tooling. Overpacking leads to higher stresses in the part and increased warpage. A balanced and optimized runner system is a must to avoid nonuniform filling and overpacking. A pressure drop study will allow proper sizing of the runners and gates. Next item to investigate is the cooling in the mold, number of water lines, size of the channels, proximity of water lines to the cores and cavities, and sections of the inserts lacking cooling channels. Nonuniform cooling leads to nonuniform shrinkage and warpage. It is important to have both halves of the mold to have as close to equal temperature as possible. If one side of the plastic wall is at hotter than the other side the stress created will be different resulting in warpage.



....continued on page 10

....continued from page 9



Injection molded part warpage due to the mold wall temperature difference\*

#### Process:

Process variables invariably contribute to part warpage. Warpage problem stems from excessive residual or molded-in stresses in the part. The residual stresses in the part are directly related to slower injection speed, excessive injection and hold pressures and overpacking, low mold temperatures (very cold molds), etc. The molded part left in unconstrained condition stress relieves itself and when exposed to heat it warps. The degree of and frequency of warpage depends on the molding conditions and gating, mold cooling and so on. Rate of cooling will have significant effect on part warpage. For example, if parts are ejected too soon they will have greater possibility of warping since they continue to cool unrestrained. Parts should be molded at the low end of the recommended melt temperature since higher melt temperature will require longer cooling time. If normal cooling time is kept there will be a greater potential for warpage. Conversely, too low a melt temperature will induce more residual stresses and resulting warpage at a later date.

#### Additives:

Adding a small amount of Blowing Agent in the part helps reduce warpage. Blowing agents are chemical materials, which decompose by heat and mechanical stress to produce blowing gases for dispersion into the polymer melt. This allows the part to be filled at much lower pressure and thereby low stress and warpage in the part.

Nucleating agents can also retard warpage by providing isotropic shrinkage throughout the part. Lastly, adding minerals such as talc or calcium carbonate have been proven to retard warpage.



The Chain is a new online community platform developed by the Society of Plastics Engineers to enhance networking and collaboration with plastics professionals around the world. It provides tools for individuals to share information, ask for help, discuss problems, exchange lessons learned, search for information... or simply stay connected with colleagues in the industry.

People logging into The Chain are given access to all of these features and more—and they've been joining and logging in at a fast rate since the platform officially came online in early 2015.

Tech Talk is by far the most popular forum. Plastics professionals from around the world are coming together to discuss current issues felt by many engineers, exchanging ideas on how to tackle these problems moving forward. As Tech Talk becomes more well-known and popular this will be the premier source of information and trouble-shooting for plastics professionals around the world. Tech Talk is proving to be the Place where members can go for help solving problems, making recommendations, and general industry knowledge on a variety of technical topics. There are currently numerous ongoing discussions covering subject matter ranging from material applications, testing methods, and operational challenges to industry innovations.

*....continued on page 12*



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At the NPE show in March, SPE launched a free “e-Membership”—available to any professional with an interest in plastics and polymers. The e-Membership gives an individual full access to Tech Talk and SPE Café, and read-only access to the Career Central forum. All of these benefits are free as part of the SPE e-Membership.

Individuals also have the option of a Premium membership, which provides full access to all of the forums in The Chain, access to the largest technical library in the plastics industry, networking access to 20,000+ contacts worldwide, registration discounts to SPE conferences, subscription to *Plastics Engineering* magazine, and so much more, for the traditional yearly rate.

With the official opening to the world-wide plastics industry, SPE expects this platform to grow exponentially in the coming years as the reference platform for plastics technology. Expectations are that in the near future people will say: “You have a technical issue in plastics? Go to The Chain and you’ll find the answer!”

“I DECIDED TO GO ON THE CHAIN AND POST A TECHNICAL QUESTION ABOUT AN ISSUE/ PROBLEM WE ARE TRYING TO SOLVE ABOUT A PRODUCT.... I HAVE TO SAY THAT THE RESPONSE HAS BEEN FANTASTIC. NOT ONLY DID PEOPLE RESPOND WITHIN THE CHAIN AND POST THEIR COMMENTS AND SUGGESTIONS, I RECEIVED EMAILS AND ALSO PHONE CALLS FROM A VARIETY OF PEOPLE... THAT WERE WILLING TO OFFER UP POTENTIAL SOLUTIONS.... I AM HOOKED.”—KIMBERLY RUSH DIRECTOR OF R&D AND REGULATORY, POLYFORM PRODUCTS CO. INC.”

Check it out for yourself at <http://thechain.4spe.org/home>



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## UPCOMING COURSES

### The College of the Extended University Cal Poly, Pomona



<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](mailto: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



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## Society of Plastics Engineers

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

1. \_\_\_\_\_ 2. \_\_\_\_\_

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

1. \_\_\_\_\_ 2. \_\_\_\_\_

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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.

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**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
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- 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# \_\_\_\_\_