SPE SOUTHERN CALIFORNIA

The SPE Press

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October 2016

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

SHMAZE CUSTOM COATINGS

Date: Thursday, October 20, 2016

Shmaze Custom Coatings
20792 Canada Road Lake Forest, CA 92630
Telephone: 949-583-1448
www.shmaze.com

Registration form and info

Registration: 5:30PM, 6:00PM dinner & presentation

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PLANT TOUR

Shmaze Custom Coatings is dedicated to providing the manufacturing industry with a wide variety of both standard and high end plastics finishing options. Whether production based or prototype, our engineers will develop a formulation suitable to your specific requirements.

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- Prototyping and Sampling

PRESIDENT'S MESSAGE

It is unbelievable how time has flown by and here we are in October. The crisp air, the changing colors of the leaves, and the shortening of the days are all sign of the upcoming fall season and the Holidays are just around the corner.

With so much to do and so little time, it's easy to become overwhelmed and stressed. With our new SPE year started in September, we are pleased with our 2016 accomplishments but now have the task of maintaining that momentum and making 2017 all that it can be. There are still two remaining events for 2016: a plant tour to visit Shmaze Custom Coatings (plastics post processing and decoration) on October 20th and a Molding workshop on November17th. You will receive more details in the coming weeks.

Moving forward, we would like to bring membership to your attention. Membership is very crucial for the survival of any organization. Our membership has been declining over the last twenty years, not only in our section, but in all sections. We understand that the value of membership is an important factor in retaining current members and attracting new ones. We are going to have to work hard to get this turned around. Using our website, e-blasts, newsletters, we will continue to maintain communication with our members about educational seminars, volunteer opportunities and more. We are offering discounts and incentives to attract potential members to our events. Our board is working hard to realize our membership growth goal but we need your help. So if you know someone who is not a member of SPE yet, please invite them to join. The hard working board members of Southern California Section acknowledge the fact that you are doing this to support SPE and to that end we sincerely thank you for your patronage and continued support. We need more participation from other companies to sustain this event and make it even better.

Finally we would like to say thanks to everyone that has kept up their memberships over the years and encourage your participation in our events and get involved.

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

Why Join SPE?

Whether you're a plastics scientist or engineer, a business owner, marketing/sales expert, or any other professional in plastics, SPE membership can help you advance your knowledge and your career. The information you need to increase efficiency and productivity, develop your career, and add to your company's bottom line is literally right at your fingertips.

The Society of Plastics Engineers is home to nearly 20,000 plastics professionals in more than 70 countries around the world. SPE is the "go to" resource for plastics technical information.

In next six issues, we will explore six key benefits of becoming SPE Member in the Plastics INsight Newsletter. This is an EXCLUSIVE SPE Member benefit.

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MEMBERSHIP SPOTLIGHT

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.

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Who Participated in 2016?

Companies who attended ANTEC® 2016 | Companies who presented at ANTEC® 2016

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FOR YOUR INFORMATION

Average Vehicle Could Incorporate 350 Kg of Plastics by 2020: Report

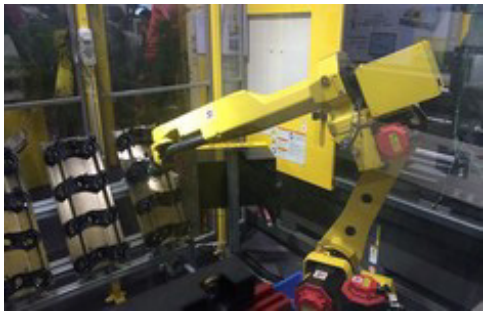
Canadian Plastics

Driven by increasingly stringent government regulations to meet fuel efficiency standards and reduce carbon emissions, the average car will incorporate nearly 350 kilograms of plastics by 2020, up from 200 kilograms in 2014, according to a new report from chemical researchers at IHS Markit. "We expect usage of carbon fibre in automotive...

Read More: http://www.plasticstoday.com/automotive-and-mobility/average-vehicle-could-incorporate-350-kg-plastics-2020/39227525825149

The Shop Floor Revolution Will Be Automated

Plastic technology



How did North American robotics orders follow up 2015's record first half over the first six months of 2016? With another record. Actually, the records go all the way back to 2010, according to the Association for Advancing Automation (A3: Ann Arbor, Mich.), which released figures for its member groups—the Robotic Industries Association (RIA), AIA...

Read More: http://www.4spe.myindustrytracker.com/en/article/97395/the-shopfloor-revolution-will-be

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FDM Vs. SLA Vs. SLS: Battle of the 3D Technologies

Sculpteo Blog - 3D Printing News and Trends

Do you want to freshen up your memory or are you just new to the world of 3D printing and want to learn about the three classic 3D technologies? Look no further, we got most of the details available here. Choosing a technology to print out a prototype, a proof-of-concept or any object at all, will depend on what is expected out of the object. Each...

Read More: http://www.4spe.myindustrytracker.com/en/article/96839

So You Think You're Tough, Do You?
some musings on the toughness of plastic

In common use, the term toughness is often used to describe the behavior of something, or of someone. When something can withstand harsh treatment we describe it as being tough. It is also sometimes used to describe a person's character, even to the point of challenging someone on their ability to survive in the real world. Are you tough enough?

In the world of engineering, the term toughness is used to describe the ability of a material to withstand sudden impact without failure. It is a simple concept, but the toughness of a material is often difficult to accurately measure. What exactly is a "sudden" impact? What is, and is not, failure?

I like to think of toughness as the ability of a material to absorb energy without breaking. (To paraphrase a former colleague, "toughness is whatever property is lacking in that part that just broke.") Still, toughness can be difficult to quantify. Just as there multiple ways to evaluate strength and stiffness, there are multiple ways to evaluate toughness, and there are a number of standard tests that are used to quantify the toughness of thermoplastic materials. Some of these tests are simple, and can be easily performed on a bench top with minimal equipment. Some tests are quite sophisticated and involved advanced equipment and extensive instrumentation.

Some of the simpler tests include low speed impact tests (like the Izod test), and various kinds of drop tests (like the Gardner falling dart impact test).

Gardner Test

A Gardner Falling Dart Impact test utilizes a test plaque suspended over an opening. A dart is then dropped from a specified height. However, instead of measuring the amount of energy absorbed, a pass/fail criteria is often developed, where a threshold of weight and height for failure is determined. Below that threshold the test plaque will typically withstand the impact, above it, the plaque will fail.

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Izod Test

In an Izod test, a test specimen is fixed in a vise, and a swinging pendulum hits it. The device measures the amount of energy absorbed as the test specimen breaks. This test is normally done with a notch in the test specimen. A modified version of the test is sometimes when the test specimen has no notch (this is called an Unnotched Izod test).

Izod test values (both standard and un-notched) are readily available for most materials – at standard environmental conditions (room temperature, 50% relative humidity, etc.). This allows for a simple, basic comparisons. However, property data sheets rarely provide any data at lower temperatures (or higher temperatures), nor do they provide any curves of impact test value versus temperature (this is typical, since most resin suppliers do not provide this kind of data). Also, most engineers rarely consider the impact velocity of the Izod test in comparison to the impact velocity of their end-use application. (The impact velocity of a Izod test is just under 8 miles per hour, which in the grand scheme of things, is not that fast, let alone "sudden." Impact velocities of some other tests can be found in the Table below).

	Test Details				Rate of Impact (Velocity)				
test type	shapes	complexity	machine cost	cycle time	mm / sec	in / sec	km / hr	miles / hr	useful for
Standard Tensile	test bar	Med - High	$$-$$$	minutes	0.08/.8	0.003/0.03	0.00029/ 0.0029	0.00018/ .0018	basic property data
Izod (ASTM D256)	test bar	Low	$ - $$	seconds	3,500	138	12.6	7.83	material comparisons, evaluating notch sensitivity
Un-Notched Izod	test bar	Low	$ - $$	seconds	3,500	138	12.6	7.83	material comparisons, evaluating notch sensitivity
Charpy (ISO 179)	test bar	Low	$ - $$	seconds	3,800	150	13.7	8.5	material comparisons, evaluating notch sensitivity
Gardner[1]	discrete parts	Medium	$ - $$	seconds	5,970	235	21.5	13.4	material comparisons, impact fatigue
Falling Weight[1]	discrete parts	Medium	$ - $$	seconds	5,970	235	21.5	13.4	material comparisons, impact fatigue
Instrumented	any	Med - High	$$-$$$	minutes	varies	varies	varies	varies	comprehensive analysis
High Speed Tensile	test bar	Med - High	$$ - $$$	minutes	10,000	393.7	36	22.4	tensile impact at high rates of loading
Projectile	any	High	$$-$$$	minutes	varies	varies	varies	varies	comprehensive analysis, real-life simulation
Drop[1]	complete assemblies	Med - High	$ - $$	minutes	5,970	235	21.5	13.4	qualitative analysis, real-life simulation
Tumble	complete assemblies	Med - High	$$	minutes	varies	varies	varies	varies	comprehensive analysis, real-life simulation

[1]velocity at impact after a 6 foot drop

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What Exactly Are You Measuring?

Regardless of what test data is being evaluated, it is helpful to understand what aspect of tough¬ness that test is measuring. First, what is the stress state of the material as it is being impacted? It is a pure tensile impact? A shear impact? Or does it involve a combination of stress states? Second, are we concerned about a single impact? Or multiple impacts? Failure due to multiple impacts (what we call impact fatigue) can be difficult to quantify. Also, what is the mode of failure of the test specimen? Is it a ductile failure, or a brittle fracture?

Often times, the failure mode is the result of crack propagation. So if cracks can be prevented – or somehow handled on a molecular level – the structure can withstand a higher input of energy without failure. However, crack propogation is a complex issue. It involves stress, strain, elasticity and plasticity, and countless other phenomena involving mechanics and material science. Crack propogation is also rate sensitive – so the speed of impact is very important. And the issue becomes even more complex when you add in temperature variations.

Impact Modifiers

Many thermoplastic materials can be modified for improved toughness. This usually involves an additive that is dispersed throughout the material. The additive then acts on a local level to absorb the energy that is being transmitted along a crack surface. (In ABS, the additive is butadiene, a.k.a. synthetic rubber). Additives like glass fiber and/or structural reinforcements can also affect toughness, sometimes for the better, sometimes for the worse.

In summary, while we can often make some educated guesses about toughness, to thoroughly evaluate the impact performance of a given material in a given application, you will often need to do your own testing. That testing should account for the impact velocity of the application AND the end-use environmental conditions (temperature, humidity, chemical exposure, etc.).
Selecting a material for optimal toughness can be, for a lack of a better description, a tough challenge.

Author:

Eric R. Larson is a mechanical engineer with over 30 years' experience in plastics design. He has helped develop products ranging from boogie boards, water basketball games and SCUBA diving equipment to disposable lighters, cell phones and handheld medical devices. Larson is owner of Art of Mass Production (AMP), an engineering consulting company based in San Diego, CA. AMP provides services to manufacturing companies in the consumer electronics, wireless, and medical device industries. Larson is also moderator of the blog site, plasticsguy.com, where he writes about plastics technology and its effect on people and the planet. His newest book, Thermoplastic Material Selection: A Practical Guide , can be purchased here.

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Sample issue at www.socalspe.org

Contact: Michael Espinosa: michael@trianglesalesinc.com

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.

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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 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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www.4spe.org • membership@4spe.org

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Last Name (Family Name)

Company Name/University Name (if applicable)

Mailing Address is: ☐ Home ☐ Business Gender: ☐ Male ☐ Female (for demographic use only)

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Signature _____ Date _____

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