

2023
Fall
Newsletter



PRODUCT DESIGN
& DEVELOPMENT



Letter from the Chair

By: Eric Foltz



Hello, Division membership, fellow SPE colleagues, and plastic part designers!

It is the end of summer, and I hope you all were able to take some time and enjoy the nicer weather and make some memories. I enjoyed time mountain biking, hiking, and spending time with my kids while they were out of school. I have also enjoyed a few meetings with our Product Design and Development Division (PD3) Board in preparation for creating an exciting year for our members. I am honored to have been selected by our Board to serve as the next Chair and help us continue to reach and engage the design community in moving plastic part design forward. While plastics have received significant negative publicity from both the general public and from several governmental agencies, likely the audience reading this message realizes the immense benefits and potential plastics still hold in helping us achieve our sustainability goals. Additionally, although all SPE members are passionate about plastic materials, PD3 is the one that is most likely to help shift those opinions as we integrate plastics responsibly into our designs and assemblies.

As a Board, we have a great team of engineers and designers with a wide array of design experience. With the goal of educating the design community, we have several new ways we are looking to educate both PD3 and non-SPE members. The first big step was to update our website, <https://pd3.4spe.org/>, to a modern version that acts as a central source for designers to find design tips and guides for different materials and different industries. It will also be a central source for contemporary design news stories that will inspire and educate. We will continue to update the webpage to keep it fresh and relevant. The second step we are taking this year is to create a free webinar series called “Design For...”. This will be a bi-monthly webinar series on different design topics that will allow our audience to both learn and network with others in the design community. These webinars will be open to anyone in the design community (both SPE and non-SPE members) and will include both a technical presentation and a social activity over a one-hour period! Our first speaker, Vik Bhargava, is a PD3 Board member and plastics engineer who brings a wealth of knowledge about all aspects of plastic part design. He will be talking about how designers can better identify the root cause of plastic part performance issues and properly find solutions. Look for more information on that via our webpage or through [LinkedIn](#)! The third and final major initiative we are undertaking as a Board is to more regularly engage our product design community through the consistent release of a newsletter. The newsletter will contain contemporary design articles and educational events! If you are interested in submitting any content, please feel free to reach out to us via our website and we will help you get your content ready for release. We will also look to keep an up-to-date design calendar of educational and networking events. (cont.)

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Letter from the Chair

I'm excited about these three large initiatives that the Board has selected to push forward. As I stated before, we have a great team that is eager and willing to put these large projects together. While I am impressed with everyone we have on our Board, I do want to conclude this first message with a shout-out to our past chair, Albert McGovern. Al was an active member of PD3 while he was working as Director of Mechanical Engineering at Shure Incorporated. However, since he retired in July, 2021, he has become even more active on the Board, and has spearheaded the creation of our website and helped arrange many of our technical events over the last several years. Without all his efforts to get the Board moving in a focused direction, none of the three activities highlighted above would have been possible. I sincerely thank him for all his efforts in creating a platform where we can be successful!

Of course, this will be a journey, so if you are interested in joining us to actively move our initiatives forward or have ideas on how we can better serve our PD3 membership, please reach out to us. We have a team that is eager and capable of making it a reality!

I look forward to connecting with you over the next year!

Erik Foltz
Chair, PD3



The Four Pillars of Part Design
Material, Design, Mold, Process

Letter from the Editors

THE NEW PD3 NEWSLETTER IS HERE! THE NEW PD3 NEWSLETTER IS HERE!

We hope you don't mind our enthusiasm or our adaptation of Steve Martin's jubilant exclamation, "The New Phonebook is Here!" from his 1979 comedy movie, *The Jerk*. (View the clip [HERE](#)) But, we are VERY excited to share this latest edition of the PD3 Newsletter, our first in many years. We expect to publish newsletters 3-4 times a year going forward, as we now have a dedicated Editor--[Elizabeth Detampel](#)--working alongside Albert McGovern, a past Newsletter Editor and Past PD3 President. We believe this combination will ensure continuity, consistency, and, most importantly, quality content intended to inform and strengthen our PD3 membership and all plastic part and product designers around the world.

We have several technical articles ready to share in future newsletters, and are grateful to PD3 member [Eric Larson](#) for being our first author; we hope you find his perspective on evaluating whether or not to use regrind helpful and entertaining, as Eric is a bit of both! That said, we are encouraging all our readers to consider sharing their wisdom by publishing in this newsletter. We will help bring it to life if you want that help or just publish your work. And, as with Eric's article, we will place it on the Technical Articles page on our new PD3 website (<https://pd3.4spe.org/>) for future easy reference (if you allow us to do so).

Lastly, we would like to thank our [sponsors](#), without whom this would not have been possible! If you are interested in becoming a sponsor, please reach out!

Welcome to our new PD3 Newsletter! We hope you find it useful and look forward to your [feedback](#).

[Elizabeth Detampel](#), Editor
[Albert McGovern](#), Past Chair

Past BOD Minutes

Meeting Minutes | August 8, 2023 | PD3 Board Zoom Call | 11 AM MT

Attendance:

- **Present:** Erik Foltz, Al McGovern (temporary notetaker), Michael Paloian, Larry Schneider, Vik Bhargava, Mark Wolverton, Barbara Arnold-Feret, Jason Suess, Akanksha Garg, Ed Probst, Elizabeth Detampel
- **Absent:** Chris Siler, Glenn Beall, Mark MacLean-Blevins
- **Unexcused Absence:** Pavan Valavala

Past meeting minutes were approved by all.

Treasurer Report by Larry

Vik suggested the Board discuss, in a future meeting, how to allocate this money “usefully”

ACTION: Erik will add this topic to a future Board meeting.

ACTION: Larry will submit a 2023-2024 Proposed Budget by the next Board meeting.

Website/Newsletter Update by Al:

- Reviewed new website page-by-page
- Showed Board Members page
- Barbara suggested we maintain neutrality in our Design Guide page, using wording that clarifies PD3 is not endorsing any company but offering their Design Guideline links as a helpful tool for plastic part designers.

ACTION: Al to check with SPE about how to address this concern. UPDATE: Al worked with Pat Farrey and other Board members to create wording that is agreeable to SPE.

ACTION: Al will ask Pedro Matos at SPE to include a link to the PD3 LinkedIn Group page that Barbara administers on our website Homepage next to the link already there for the PD3 LinkedIn Business page that Al administers.

Introduce Elizabeth Detampel:

- Al introduced Elizabeth as our new Website Editor (she was brought to PD3 via Erik). Elizabeth gave a short bio about herself, explaining she does Marketing and social media for Sussex Injection Molding in Sussex, WI. She has been part of several website-related calls already with Pedro at SPE and is comfortable with her new role. Elizabeth was unanimously voted onto the PD3 Board of Directors!
- Ed asked whether she should consider other social media outlets besides LinkedIn, and after some discussion, all agreed we should focus on our LinkedIn presence to start.

Past BOD Minutes

Meeting Minutes | August 8, 2023 | PD3 Board Zoom Call | 11 AM MT

ACTION: Al will schedule a meeting with himself, Barbara, and Elizabeth to discuss how to best use the 2 different PD3 entities within LinkedIn:

- PD3 Group, administered by Barbara, has ~1300 members
- PD3 Page administered by Al that has ~130 followers
- Note that these cannot be combined within LinkedIn, so they must be kept as two separate entities.

Webinar Series, Erik:

These will be virtual-only webinars held every other month with the following topics:

- Design-for” Series
 1. Injection Molding
 2. Blow Molding
 3. Thermoforming
 4. Rotational Molding
 5. Mass Production
 6. Circularity
 7. DFMA
- A suggestion was made to record these sessions and put them on a YouTube Channel.
ACTION: Erik will investigate this.
- The first webinar will be given by Vik in September.

The meeting ended around 12:15 PM MT

Submitted by Al McGovern, covering for Chris Siler.

Should You Use Re-Grind?

By: Eric R. Larson

Using re-grind in the injection molding process essentially means you are using a resin blend. The result can be a mangy mutt, an elegant Bordeaux, or something in between.

Should You Use Re-grind? The simple answer: Maybe.

I just returned from a design conference sponsored by the Society of Plastics Engineers, with support from the Rhode Island School of Design, the Industrial Designer's Society of America, the Design Management Institute, and others. It was a fantastic conference – with lots of interaction. I participated in a panel discussion on the effective use of plastics, and the discussion covered a wide variety of topics, including perceptions of quality and performance.

During the Q&A session, someone asked a question about the use of re-grind. He said that they use a number of high precision plastic parts, usually in black but also in other colors, and their molders frequently ask whether they can use re-grind material in the molding of the parts.



Image courtesy of pixabay.com

What is Re-Grind?

Re-grind is a term used to describe a resin pellet that has been produced by chopping or grinding larger chunks of plastic that were produced during a previous molding process. These chunks could be remnants of an earlier molding operation (flash, runners, gate vestiges, etc.), non-conforming or rejected parts, left over parts, etc. The re-grind is then re-used, usually by blending it with pellets of the virgin resin, and then molding parts using that blended mix. The amount of allowable re-grind is usually described on a percentage basis, typically ranging from 0 to 10%. While technically regrinding is a type of recycling, the term re-grind is commonly used to describe an in-the-factory process and is rarely considered to be a recycling process.

The use of re-grind is often a subject of heated debate, with advocates who describe the cost savings and detractors who say that it is a bad idea, because once the resin has been through a melt processing cycle the molecular weight distribution (MWD) of the polymer has been compromised and the material properties have been affected. However, it is important to remember that even prime virgin resin has been through at least one melt processing cycle, and if it has been modified or compounded it may have gone through several. One of the responsibilities of the resin supplier is to ensure that the resin has a MWD within a certain range, and that its physical and mechanical properties meet certain specifications. Most resin buyers have a protocol in place to verify compliance with these specifications as well.

Should You Use Re-Grind?

Theory vs. Practice

My response to the question on the use of re-grind was a qualified yes, provided you have proper process control of the entire system, including the sourcing of the raw material, the re-grind process, and the remixing process itself. All you need to do is verify that the MWD of the blended resin (with whatever amount of re-grind added) is within an acceptable range, and that it still meets the required specifications, and you should be fine. What I should have added:

While this method is true in theory, in practice it may be difficult to do (if not impossible).

For starters, you need to control the amount of re-grind that is being used, as well as the quality of the re-grind. If the molder is using re-grind from rejected parts, were they rejected because the material was degraded during the molding process? This degraded material must be eliminated from the re-grind supply stream. You then need to control the amount of re-grind that is being blended back in and verify the consistency and performance of the resulting blend. Unfortunately, most molders don't have the ability to verify the properties of a molded resin, let alone determine the MWD.

Point and Counterpoint

After the session, I had a discussion with another veteran of the plastics industry, with decades of experience in the cell phone industry. He was strongly opposed to the use of re-grind material. "When you are molding in China, you just don't know what they are going to be doing," he said. My argument was that there are good molders and bad molders – even in China – and if they use an ISO certified process and properly control the handling and use of re-grind, and you can verify the blended material meets specifications, you should be OK. "But you're now using a different material than what you qualified the tool with," he replied.

His point is well taken. When you use re-grind, you are in essence making a resin blend – consisting of pure virgin resin with a small amount of re-grind resin blended in. Even if you can control all the factors in the use of re-grind process and can verify that new blend has a molecular weight distribution (MWD) within an acceptable range, and the physical and mechanical properties of the blend still meet specifications, you still have a slightly different material than before. It is a subtle difference, but it's there. Also, if there are additives in the resin – impact modifiers, structural reinforcements, colorants, processing agents, etc. – they will also have gone through an additional melt cycle, resulting in additional subtle differences from the virgin resin.

All these subtle differences may have unintended consequences, especially in complex multi-cavity tools making high precision parts. You may find slight variations in mold shrinkage, cosmetic appearance, or the amount of flash in the molded parts. Dimensions may now be out of spec – even though you are using the exact same mold in the exact same machine with the exact same control parameters that you used during the qualification process.

Should You Use Re-Grind?

This is one of the reasons many companies avoid the use of re-grind. You could address this by using re-grind during the qualification process itself – and then verifying you use the same resin blend during actual production – but that takes foresight and planning, as well as skill and trust in the expertise of the molder.

There is always a certain amount of trust in the supply chain, and sometimes that trust is taken advantage of. There are brokers and distributors who will put an alternate resin in the packaging of a major material supplier (in essence, selling you a counterfeit material), and there are molders who will use a different material from a different supplier than your approved source, and sometimes even an entirely different type of material. This is why we have certificates of compliance, verification procedures, and audits.

Consistency is Key

I am a firm believer in blends (Bordeaux and Meritage wines are some of my favorites, and they are all blends), but I am also a firm believer that quality is achieved through proper control of the manufacturing process – and the consistency of the raw material is a critical parameter. When you specify the use of 100% virgin resin (e.g., no re-grind allowed), you are basically relying on the resin supplier to ensure that consistency. When you allow for the use of re-grind, you are adding a variable to the mix. The molder now becomes its own material supplier, using a blended material that is a mix of a virgin resin (purchased from a resin supplier) and a re-grind resin (that has been through one or more additional melt cycles at the molder). You are now relying on the molder to ensure the consistency of the resulting blend.

Using re-grind in the injection molding process essentially means you are using a resin blend. The result can be a mangy mutt, an elegant Bordeaux, or something in between.

In addition, we should make a distinction between allowing for the use of re-grind and requiring the use of re-grind. When you allow for the use of re-grind, you are basically saying:

“You can use a range of resin blends, starting with a pure virgin resin of material A, which is then blended with re-grind resin made from the same material. There is no requirement for the amount of re-grind that is blended in, as long as the percent is less than X percent, so the blend ratio can vary anywhere from zero to X percent.”

As you can imagine, this can result in a wide variation in the material that is actually being used in the molded part, depending on the amount of blending that is being done.

When you require the use of re-grind, you are specifying the ratio of the blended resin. You are basically saying:

“Use a resin blend consisting of pure virgin resin of material A, blended with X percent of re-grind resin made from the same material. Blend ratio must be within plus or minus Y percent.”

Should You Use Re-Grind?

You could then also add another note, saying something to the effect of: “Molder to verify the consistency of the final blend meets international standards for resin consistency.”

The key question: Can you rely on your molder to do all that?

The Bottom Line on Re-Grind

If you are considering the use of re-grind, I recommend you explore the following:

- Do you want to allow the use of regrind? Or do you want to require the use of regrind?
- What additives are in the resin, and what is the effect of a melt cycle on those additives?
- Does your molder have a means to verify the quality and consistency of the re-grind material being used?
- Will the new, blended resin provide you with the performance you need in your molded parts?

If the answers to these questions are favorable, then go ahead and re-grind away.



[Eric R. Larson](#) is a mechanical engineer with over 30 years experience in plastic part design. He is founder and Chief Engineer of Art of Mass Production, an engineering consulting company based in San Diego, California.

What is Additive Manufacturing?

*Peter Zelinski
Additive Manufacturing*

Additive manufacturing (AM) or 3D printing is a process that builds functional components by adding material, in contrast to subtractive manufacturing, which removes material. It can use various materials, including metals, plastics, and composites, and has applications in aerospace, medical, automotive, and other industries. AM offers greater design flexibility, reduced material usage, and is cost-effective for complex, low-volume production. It is a digital process that involves design, preparation, printing, and post-processing. While 3D printing is a core element of AM, AM encompasses a broader workflow. It is not just for prototyping but is increasingly used for tooling and full-scale production, enabling innovative and complex designs.

If you're interested in reading the full article on Additive Manufacturing, visit:

<https://www.additivemanufacturing.media/kc/what-is-additive-manufacturing>



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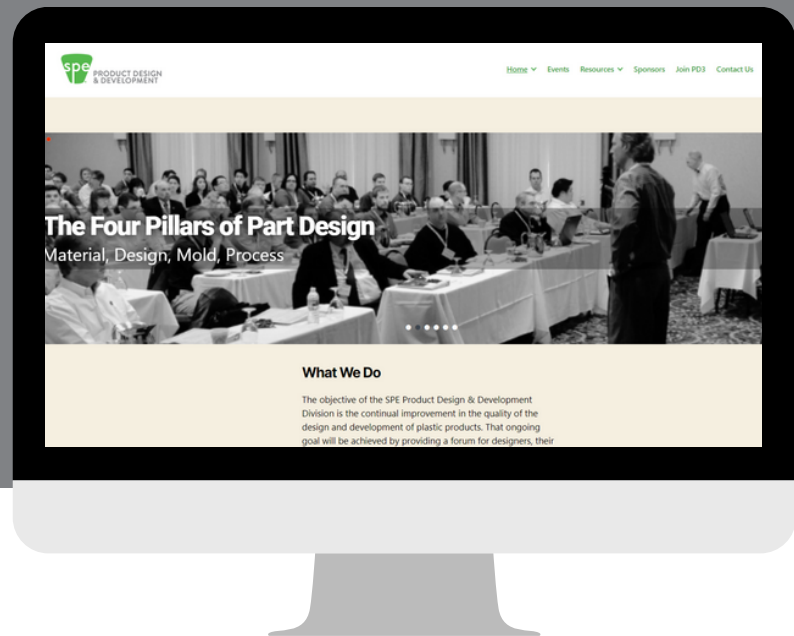
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To learn more about our board members, [click here!](#)

OUR NEXT DESIGN FOR... WEBINAR

Plastic Process Selection: How Do You Do It?
with: [Michael Paloian](#)

November 9, 2023 @ 12 CST

Register [HERE](#) to sign up via email!

