

Chair's Message – SPE Injection Molding Division

Dear IMD Members and Plastics Professionals,

As we look ahead to an exciting year, I'm thrilled to share several key updates and opportunities within the SPE Injection Molding Division (IMD).

First, we're proud to announce the **IMPACT: Injection Molding Performance Awards**—a new initiative celebrating excellence in injection molding. This program will spotlight innovation, creativity, and technical achievement in design, manufacturing, and application across the plastics industry. Whether your work is local or global, we want to recognize the impact you're making. Stay tuned for more details on how to nominate and participate!

In October 2026, we're partnering with the **Cleveland Section** for a joint conference, bringing together thought leaders and innovators from across the industry. This event will be a fantastic opportunity to network, share insights, and explore the future of injection molding.

We're also gearing up for **ANTEC 2026 in Pittsburgh**, where the IMD will host a special reception. It's a great chance to connect with fellow members, celebrate our achievements, and welcome new faces.

A major milestone for our community is the **historic merger between the Society of Plastics Engineers (SPE) and the Plastics Industry Association (PLASTICS)**. Under the theme Better Together, this merger will officially take effect on January 1, 2026, with SPE becoming a division of PLASTICS. This integration combines SPE's legacy of technical education and professional development with PLASTICS' strengths in advocacy, sustainability, and global reach. SPE members will retain their identity, benefits, and leadership structure within the new organization. This merger marks a transformational moment for our industry, creating a unified platform to better serve professionals across the entire plastics value chain.

If you haven't already, check out the **IMD LinkedIn** page for updates, highlights, and community engagement. We're always looking for fresh ideas and new energy—so if you're interested in joining the Board of Directors, or have suggestions to share, please reach out to any current BOD member. Your voice matters, and we'd love to hear from you.

Let's continue driving innovation and excellence in injection molding together.

Warm regards,

Tom Giovannetti

Chair, SPE Injection Molding Division

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NOVEMBER 2025

OPTIMIZING CARBON BLACK CONTENT AND PROCESS CONDITIONS OF RUBBER

NOVEMBER 20, 2025

1:00 PM TO 2:00 PM EST

ONLINE EVENT

The optimization of carbon black (CB) content and process conditions in rubber formulations is critical for ensuring performance consistency, especially in lab-scale rubber processing aimed at quality control and research and development. By mimicking full-scale production processes in the laboratory, formulators can improve scalability and reduce the risk of performance deviation during scale-up. Furthermore, modifications in carbon black structure—such as surface area, porosity, and aggregate morphology—directly influence its reinforcing behavior, making careful process design essential.

For more information: <https://4spe.org/i4a/pages/index.cfm?pageid=9706>

DECEMBER 2025

WHY SULFONES? A DEEP DIVE INTO POLYSULFONE, POLYETHERSULFONE, AND POLYPHENYLSULFONE

DECEMBER 4, 2025

11:00 AM TO 12:00 PM EST

ONLINE EVENT

Join us for "Why Sulfones? A Deep Dive into Polysulfone, Polyethersulfone, and Polyphenylsulfone" and discover the science behind their exceptional properties, learn how to select the right sulfone for your application, and gain insights into real-world use cases where these materials solve the toughest engineering challenges..

For more information: <https://www.4spe.org/i4a/pages/index.cfm?pageID=9215#gsc.tab=0>

JANUARY 2026

SPE WORKSHOP: AI FOR OPTIMIZING INJECTION MOLDING PARAMETERS AND ENHANCING PART QUALITY

JANUARY 26, 2026 11:00 AM EST - FRIDAY, JANUARY 30, 2026 12:30 PM EST

ONLINE EVENT

This workshop explores cutting-edge applications of artificial intelligence (AI), machine learning (ML), and transfer learning (TL) in optimizing injection molding processes to achieve superior part quality and uncover opportunities for further improvement. AI enables computer systems to simulate human intelligence and behavior. ML, a subset of AI, builds predictive models by learning from data—without relying on predefined mathematical formulations. TL extends the capabilities of ML by adapting pre-trained models to new but related problems, significantly reducing the need for extensive physical data and lowering the barriers to implementing AI/ML in manufacturing. Injection molding is one of the most important processes for mass-producing complex plastic components with excellent dimensional accuracy, surface quality, and repeatability. However, the nonlinear and intricate relationships between machine parameters and part quality present significant challenges. Integrating domain expertise with rapidly evolving AI/ML/TL technologies is essential for advancing the injection molding industry. This workshop provides a concise overview of AI, ML, and TL fundamentals, with a focus on their practical applications in process optimization and part quality improvement efficiently and effectively. Participants will gain insights into the benefits, limitations, and technical considerations of using AI/ML/TL to enhance their process efficiency and part quality.

For more information: <https://www.4spe.org/i4a/pages/index.cfm?pageid=9851#gsc.tab=0>

FEBRUARY 2026

SPE WORKSHOP: TROUBLESHOOTING THE INJECTION MOLDING PROCESS

FEBRUARY 2, 2026 11:00 AM EST - FRIDAY, FEBRUARY 6, 2026 12:00 PM EST

ONLINE EVENT

The injection molding process can seem complex with countless adjustments that will determine whether a process can produce an acceptable part. Organizations are struggling to find and train technical staff with the ability to problem solve. This workshop will aim to help organizations and their staff understand how to effectively resolve issues in the injection molding process. The benefits of effective and methodical troubleshooting can include reduced downtime, increased efficiency, reduced scrap and nonconformances, and improved quality. The workshop will focus on troubleshooting in two primary areas of the injection molding process. The first being the new mold build. Defining and addressing potential issues before a mold is released into production can lead to an efficient and successful tool launch. Using strategic tools, like process development and design of experiments, can determine what outputs achieve critical to quality criteria. The second focus will concentrate on the production aspect of the molding process. These are issues that arise on molds and processes that are already in production. Here we will focus on the 5 M's (Man, Material, Mold, Method, and Machine) of troubleshooting which will help rectify downtime and defects. This strategic approach will teach staff how to identify the root cause quickly, establish a fix for the issue, and create preventative measures so the problems no longer arise.

For more information: <https://www.4spe.org/i4a/pages/index.cfm?pageID=9830#gsc.tab=0>

SPE WORKSHOP: FAILURE IN PLASTICS

FEBRUARY 18, 2026 11:00 AM EST - WEDNESDAY, FEBRUARY 25, 2026 1:00 PM EST

ONLINE EVENT

This 4-part workshop series will cover a considerable range of topics important in understanding, diagnosing, and preventing plastic component failure. The most efficient and effective approach to plastic component failure is by performing a systematic failure analysis. Someone once said, "If you don't know how something broke, you can't fix it," highlighting the importance of a thorough understanding of how and why a product has failed. This workshop will cover information required to gain this understanding.

For more information: <https://www.4spe.org/i4a/pages/index.cfm?pageid=8578#gsc.tab=0>

MARCH 2026

ANTEC® 2026

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SPE Members: A Stronger Future Ahead Better Together with the Plastics Industry Association

The Board of Directors of the Society of Plastics Engineers (SPE) has voted to join forces and merge with the Plastics Industry Association (PLASTICS). This is a historic and thoughtful step designed to ensure that SPE members – professionals at every stage of their careers – gain greater opportunities, resources, and visibility than ever before.

For more than 80 years, SPE has been the home for plastics professionals seeking technical knowledge, professional development, and a trusted network of peers. By combining SPE's strengths with PLASTICS' reach and resources, SPE will accelerate its ability to serve members, elevate its voice in the industry, and ensure that SPE remains relevant, impactful, and strong for decades to come.

Why This Merger Matters for SPE Members

This decision was guided by one simple principle: How does this benefit the plastics professional? Below are some of the direct ways SPE members will see value:

Continued and Enhanced Membership Benefits

- Individual membership continues. SPE's tradition of directly supporting the plastics professional remains a core offering.
- Members will still access all of their current benefits, including technical papers, Journals, webinars, conferences, and local Chapters.
- The merger will open the door for new corporate-supported memberships, making it easier for employees of PLASTICS member companies to join SPE—broadening networks and engagement.

Stronger Events and Networking

- SPE technical conferences, including ANTEC®, will gain exposure to broader audiences through PLASTICS' reach, including to the attendees of NPE, the largest plastics trade show in the Americas.
- SPE's Technical Divisions and local Chapters will have greater support, sponsorship opportunities, and access to attendees from PLASTICS' member companies.
- Members will benefit from the combination of both organizations' event portfolios, creating richer experiences and better value for attendees' investments of time and money.

Expanded Education and Workforce Opportunities

- SPE's technical expertise will be amplified through PLASTICS' reach, allowing it to expand programs like PolymerInsights.ai, conferences, online courses, workshops, and new certificate tracks.
- Students and early-career professionals will have greater visibility and access to corporate leaders, improving mentorship and employment opportunities.
- The SPE Foundation will gain access to new sponsorship channels, supporting scholarships, PlastiVan®, and NextGen programs with more stable, long-term funding.

Broader Industry Voice with Technical Credibility

- SPE members' expertise will now have a larger stage in industry discussions, public outreach, and policy conversations.
- Combining SPE's scientific and technical credibility with PLASTICS' advocacy platform means the industry will speak with one voice – balanced, credible, and inclusive of the professional perspective.
- Research, presentations, and innovations will carry more weight when amplified by the combined organization.

Publications and Journals

- Plastics Engineering and other SPE publications will enjoy greater distribution and visibility, expanding their impact beyond our current member base.
- SPE's peer-reviewed Journals will remain at the forefront of scientific credibility, now reaching more professionals and organizations across the industry.

Financial Strength and Member Value

- By sharing infrastructure and reducing duplication, more resources can be invested back into programs that serve SPE members directly.
- The combined scale ensures long-term financial stability, enabling us to expand services, scholarships, and technical programming without sacrificing quality.

Leadership Perspectives

Patrick Farrey, SPE CEO, said:

"This is about opportunity. By joining forces with PLASTICS, we are ensuring that SPE members benefit from broader access, stronger programs, and greater recognition. Our mission to serve the plastics professional remains unchanged – this merger allows us to fulfill it more effectively than ever before."

Dr. Scott Eastman, SPE Board Chair, added:

"The decision to move forward was not made lightly. Our Board considered the needs of students, early-career professionals, academics, researchers, and industry veterans alike. What became clear is that SPE members will have more opportunities – more doors opened, more pathways to leadership, and more ways to make an impact because of this merger. We are convinced this positions SPE not just to survive, but to thrive in the decades to come."

What Happens Next

The merger is expected to be formally completed by the end of 2025, at which time SPE will become an operating division of PLASTICS. The unified organization will then move into its integration phase, beginning January 1, 2026. Throughout this process:

- SPE's Divisions, Sections, and Chapters will continue their programs, events, and leadership activities.
- Members will continue to receive their benefits without interruption.
- Opportunities for new benefits – such as expanded training programs, combined membership packages, and access to larger industry events – will begin to roll out gradually.

A Commitment to Our Members

SPE remains committed to the mission that has guided us since 1942: advancing the plastics professional. By joining with PLASTICS, we are better positioned to deliver on that promise – today and into the future.

Together, we are stronger. Together, we are better. Together, we are the future of plastics.

For more information, contact Chris Barry, at cbarry@4spe.org, or visit www.4spe.org/BetterTogether



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CompoSecure Announces Business Combination with Husky Technologies

CompoSecure, Inc. , a leader in metal payment cards, security, and authentication solutions, announced a business combination with Husky Technologies Limited ("Husky"), a market leading manufacturer of engineered equipment and aftermarket services, in a transaction that will value the combined business at approximately \$7.4 billion.

Dave Cote, Executive Chairman of CompoSecure, said in the announcement: "We are delighted to announce the business combination with Husky. This is a business Tom [Knott] and I have long admired, and it hits all the key criteria we look for in every investment – it holds a great position in a good industry, significant technology differentiation, organic and inorganic growth possibilities, and margin expansion potential. We are excited to begin working with the Husky team and believe the combined business is uniquely well positioned to deliver for investors."

Louis Samson, Co-President of Platinum Equity, Husky's current shareholder, added: "We believe this combination will create value and unlock new opportunities for Husky and its stakeholders. We have great respect for David Cote's leadership, share his conviction in this opportunity and are excited to roll more than \$1 billion of equity into the deal. We have partnered with Dave, Tom Knott, and the team at Resolute before and look forward to working with them to create value again."

The announcement noted that Husky will be run as a standalone business alongside CompoSecure and will continue to operate under its current management team.

Husky Technologies CEO, Bradley Selleck, today said the business combination supports Husky's long-term strategy and reinforces its commitment to innovation, operational strength and customer partnership, ensuring continuity for employees and customers, while enabling long-term investment.

"Husky Technologies will build on the strong foundation we've established over our 72-year history," explained Selleck. "With CompoSecure's long-term partnership, we will continue to invest in the technologies, systems and capabilities that matter most to our customers and team members. Our focus remains on delivering high performance, reliability, service excellence and innovation."

Selleck underscored there will be no immediate changes to operations or customer experience.

"Husky will continue executing its current growth strategy, with sustainability and innovation remaining central to its future pipeline," Selleck added.

The transaction is expected to close in the first quarter of 2026, subject to customary closing conditions, including regulatory approval.

Morgan Stanley & Co. LLC acted as financial advisor to CompoSecure on the transaction and Paul, Weiss, Rifkind, Wharton & Garrison LLP served as legal counsel to CompoSecure. Goldman Sachs acted as exclusive financial advisor and Latham & Watkins LLP served as legal counsel to Husky Technologies.

Trexel Becomes Part of the ENGEL Group: A Strong Future for Physical Foaming



Stefan Engleder, CEO, ENGEL Group

Injection moulding machine manufacturer ENGEL is further expanding its technological leadership in foaming and, from early October 2025, acquires its long-standing partner Trexel Inc., headquartered in Massachusetts, USA.

Trexel is globally recognised for the development and commercialisation of MuCell® technology, a microcellular foaming process in injection moulding. With this acquisition, the company gains the stability and long-term perspective needed to advance its technology successfully. "Trexel is a pioneer in physical foaming. We are convinced that this technology holds tremendous potential. With ENGEL in the background, Trexel can operate independently while benefiting from the global strength of our group," says

Stefan Engleder, CEO of the ENGEL Group.

Trexel remains independent

As part of the ENGEL Group, Trexel will continue to operate independently — with its own sales, service and R&D. For injection moulding customers, this means continuity in support and delivery capability, regardless of the machine brand they use. In addition, the company will continue its commitment to the footwear segment without change. All partners will continue to be served with the same high quality as before.

Foaming as a strategic field for the future

ENGEL has long been a leading name in foaming and has collaborated with Trexel for many years. Alongside initiatives in chemical foaming, the combination with Trexel further strengthens ENGEL's leading role in physical foaming. "Through this acquisition, we are accelerating the further integration of MuCell® into the injection moulding process. We also now have the ability to scale more easily — because we are convinced that foaming is a growth market," Engleder adds.

The technology is also a key building block for greater sustainability: foamed products are lighter, require less raw material and help reduce the carbon footprint.

Integration into the ENGEL Group

Going forward, Trexel will operate as Trexel GmbH, headquartered in Austria. Levi Kishbaugh will remain responsible for market and customer relations, safeguarding continuity. He will be joined on the management team by Johannes Kilian. Sites in the USA, Germany and China will remain unchanged to continue providing sales and service for the global customer base.

Polymer/short Fiber Composites Fabricated by Direct Fiber Feeding Injection Molding

By Xiaofei Yan, Hua Shen, Shengbin Cao, and Guangbiao Xu

Direct fiber feeding injection molding is an effective way of improving the mechanical properties of polymer/short fiber composites by enhancing the fiber length. Short-fiber-reinforced polymers (SFRPs) enjoy widespread use in the aerospace, automotive, and construction industries, among others, because they are affordable and easier to produce than continuous fiber-reinforced composites.^{1,2} Injection molding is a popular means of manufacturing SFRPs, but high-performance SFRPs require a large fraction of high-aspect-ratio (i.e., longer) fibers.³ The high fiber content in turn leads to fiber attrition (from fiber-fiber interaction, fiber contact with equipment surfaces, or fiber interaction with the polymer matrix) during injection molding, which reduces the reinforcing efficiency of the fibers and, consequently, the mechanical properties of the composites.⁴

Ways around the problems posed by these high-fiber-content SFRPs include creating pellets by cutting fibers to desired lengths and then injection-molding them to make relatively 'long'-fiber-reinforced composites with improved material properties. However, the process is complex and time-consuming.⁵ A faster and easier method of increasing fiber length (i.e., fiber aspect ratio) to improve the performance of SFRPs is direct fiber feeding injection molding (DFFIM).⁶

In DFFIM, continuous fiber bundles are introduced into an injection molding machine through the vent hole, which is typically used to release volatile gases emitted by hygroscopic (i.e., water-absorbing) materials (see **Figure 1**). This process obviates having to pre-compound short or long fiber pellets, which reduces costs.⁷ DFFIM is an extension of earlier work aimed at improving the quality of parts made by direct incorporation of continuous fibers.⁸ Where others have focused on characterizing the tensile modulus and tensile strength of SFRPs, we have extended the application of DFFIM from 2D thin plates to 3D materials and have analyzed the structure of the resultant DFFIM products. Here, we describe the structure, tensile properties, and fiber length of different types of composites, i.e., carbon fiber/polypropylene (CF/PP) and glass fiber/carbon fiber/polypropylene (GF/CF/PP) composites made using the DFFIM technique, as well as CF/PP and GF/PP composites made using conventional injection molding.

We used a 30-ton injection-molding machine (TI-30F6, TOYO Machinery & Metal) with a vented barrel to make the specimens. All specimens were injection-molded into dumbbell-shaped tensile bars 3mm thick and 10mm wide. To make the GF/CF/PP hybrid

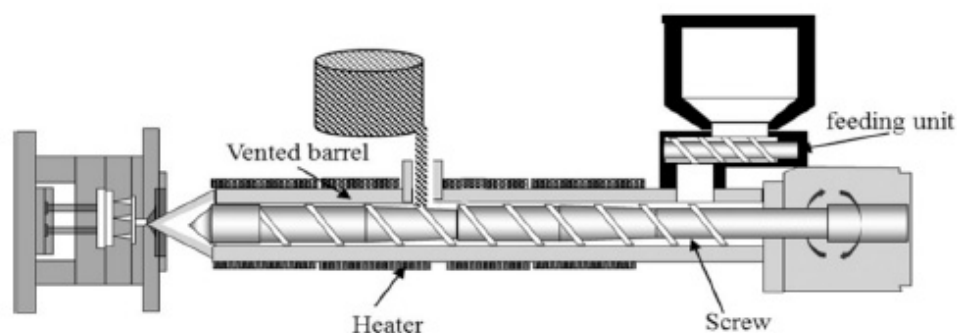


Figure 1: Schematic drawing of the direct fiber feeding injection molding (DFFIM) process.

composite by DFFIM, pre-compounded GF/PP pellets with 25wt% loading content (GWH42, Sumitomo Chemical) were fed through a controllable feeding hopper with constant speed (50rpm). CFs (Grade TR50S12L, 1200 Tex, diameter 7m) from Mitsubishi Rayon, used as the hybrid fiber, were guided into the vent of the devolatilizer unit of the barrel and fed into the melt by the shearing action of the screw during plasticization. The DFFIM CF/PP composite was made by inserting CFs through the vent hole and feeding PP pellets (Y101S, Sumitomo Chemical) through the hopper. The conventionally injection-molded GF/PP and CF/PP composites, which served as controls, were fabricated exclusively by feeding pre-compounded GF/PP and CF/PP pellets, respectively, through the hopper. All the composites were made under the same machine processing conditions.

We measured the length of the fibers by burning off the PP, casting the fibers onto glass slides, and then taking optical photographs of the samples and processing the images to mark the fiber length. We determined the tensile properties of the specimens according to ASTM D638. The tests were performed in a universal testing machine (55R 4206, Instron) at a constant cross-head speed of 1mm/min, with five samples for each measurement. An extensometer (Instron) with a gauge length of 50mm was used for the strain measurements.

Figure 2 shows scanning electron micrographs of the CF/PP composites fabricated by DFFIM and conventional injection molding. We observed fiber agglomeration in the DFFIM composites (top and middle rows), especially in the core layer. Conventional injection molding (bottom row) does not exhibit this phenomenon. Where agglomerations occur, almost no matrix can be found between the fibers. In the hybrid composite, feeding all the fibers through the vent hole would result in severe fiber agglomeration. This could weaken mechanical performance, with consequences for the potential application of the materials. That is why we fed the high-performance fibers (specifically, CFs) through the vent hole, and added GF/PP pellets through the feeding hopper. (The advantage in feeding the CFs through the vent hole is that much longer fibers result than would be the case with the hopper.)

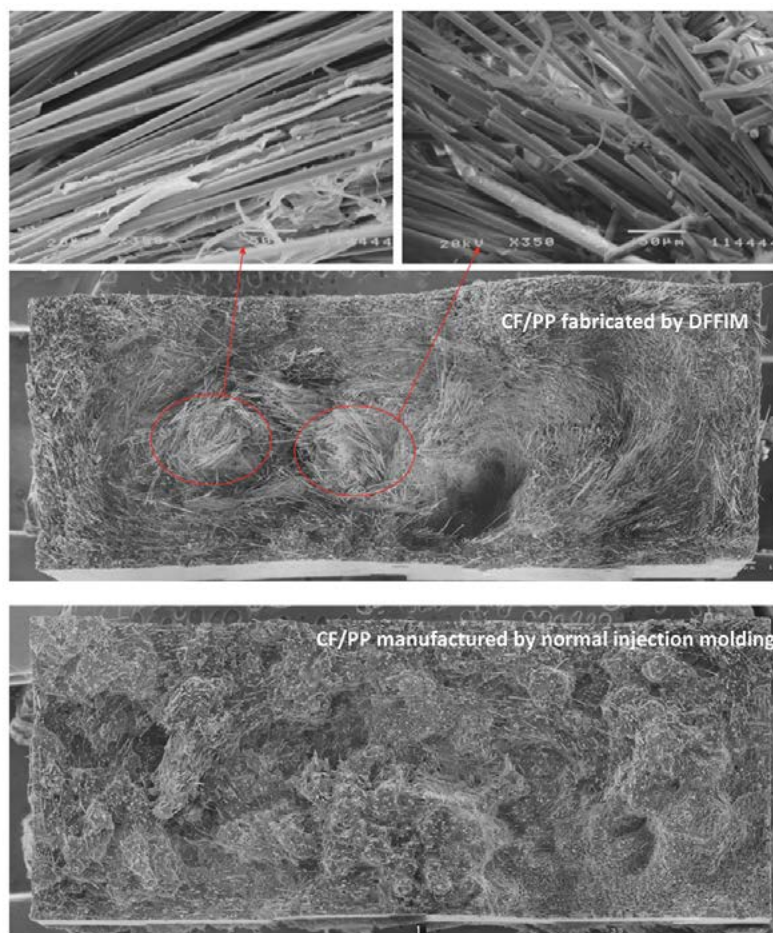


Figure 2: Scanning electron micrographs of carbon fiber/polypropylene (CF/PP) composites fabricated using DFFIM (top and middle rows) and conventional injection molding (bottom row).

Table 1 shows the lengths of the different fibers in the composites. The GFs in the DFFIM hybrid composite are slightly shorter than those in the GF/PP composite made by conventional injection molding. The CFs fed through the vent hole in both the CF/PP and hybrid composites are much longer than the GFs. Both the GFs and CFs in the hybrid composite are shorter than in the individual composites owing to fiber attrition.

We measured the tensile modulus and strength of the GF/PP composite made by conventional injection molding, and the CF/PP and GF/CF/PP composites fabricated by DFFIM. The GF mass fraction was 10wt% and the CF mass fraction was 12wt% in each composite. The tensile strength and modulus of these composites are shown in **Table 2**. The GF/PP composite shows higher tensile strength but a lower tensile modulus than the CF/PP composite. The GF/CF/PP hybrid composite shows better tensile properties than the other two. Manufacturing hybrid composites by DFFIM could therefore significantly improve the tensile properties of the materials.

In summary, DFFIM is an effective way of increasing fiber length and consequently improving the mechanical properties of composites. However, fiber agglomeration could weaken the mechanical properties of composites fabricated by DFFIM. To further improve the mechanical properties of DFFIM composites, fiber agglomeration should be avoided by distributing the fibers uniformly in the final product. This can be achieved in two ways: first, by feeding the fibers in a dispersed manner instead of in clumps; and second, by improving the interfacial properties of the fibers and matrix by adding a coupling agent to the composite system. As a next step, we plan to work on solving the fiber agglomeration issue in hybrid composites and improving interfacial bonding between the fibers and matrix to enhance the mechanical properties of DFFIM products.

This work was supported under the State Scholarship Fund (award 201506630020) of the China Scholarship Council, which is a nonprofit institution affiliated with the Ministry of Education of the People's Republic of China.

Composites	Fiber	Maximum fiber length (mm)	Minimum fiber length (mm)	Average fiber length (mm)	Standard deviation (mm)
GF/PP composite	GF	2.590	0.069	0.362	0.245
CF/PP composite	CF	12.212	0.199	1.614	1.094
GF/CF/PP composite	GF	1.366	0.053	0.358	0.196
	CF	11.312	0.045	1.238	2.080

Table 1: Fiber length in the different composites: a glass fiber/polypropylene (GF/PP) composite made using conventional injection molding, and CF/PP and GF/CF/PP composites made using DFFIM.

Materials	Modulus (GPa)	CV (%)	Strength (MPa)	CV (%)
GF/PP composite	3.703	0.574	55.426	2.171
CF/PP composite	5.207	0.593	44.862	3.049
GF/CF/PP composite	7.748	0.640	74.547	3.817

Table 2: Tensile modulus and strength of the GF/PP composite made by conventional injection molding and the DFFIM composites (CF/PP and GF/CF/PP). CV: Coefficient of variation.

About the Authors

Xiaofei Yan graduated with a bachelor's degree from Xi'an Polytechnic University, China, in 2012, and obtained his master's degree from Donghua University, China, in 2015. He is currently a PhD candidate in the Department of Bio-based Materials Science at Kyoto Institute of Technology. His main research interests are focused on composite and textile materials.

Hua Shen is currently a lecturer at Donghua University. He obtained a PhD from Kyoto Institute of Technology in 2017. His primary research area is the thermal properties of textiles.

Guangbiao Xu is deputy dean of the College of Textiles and deputy director of the Textile Testing Center at Donghua University. His main focus of interest is fiber and textile science.

Shengbin Cao is an instructor. His focus of interest is textile materials.

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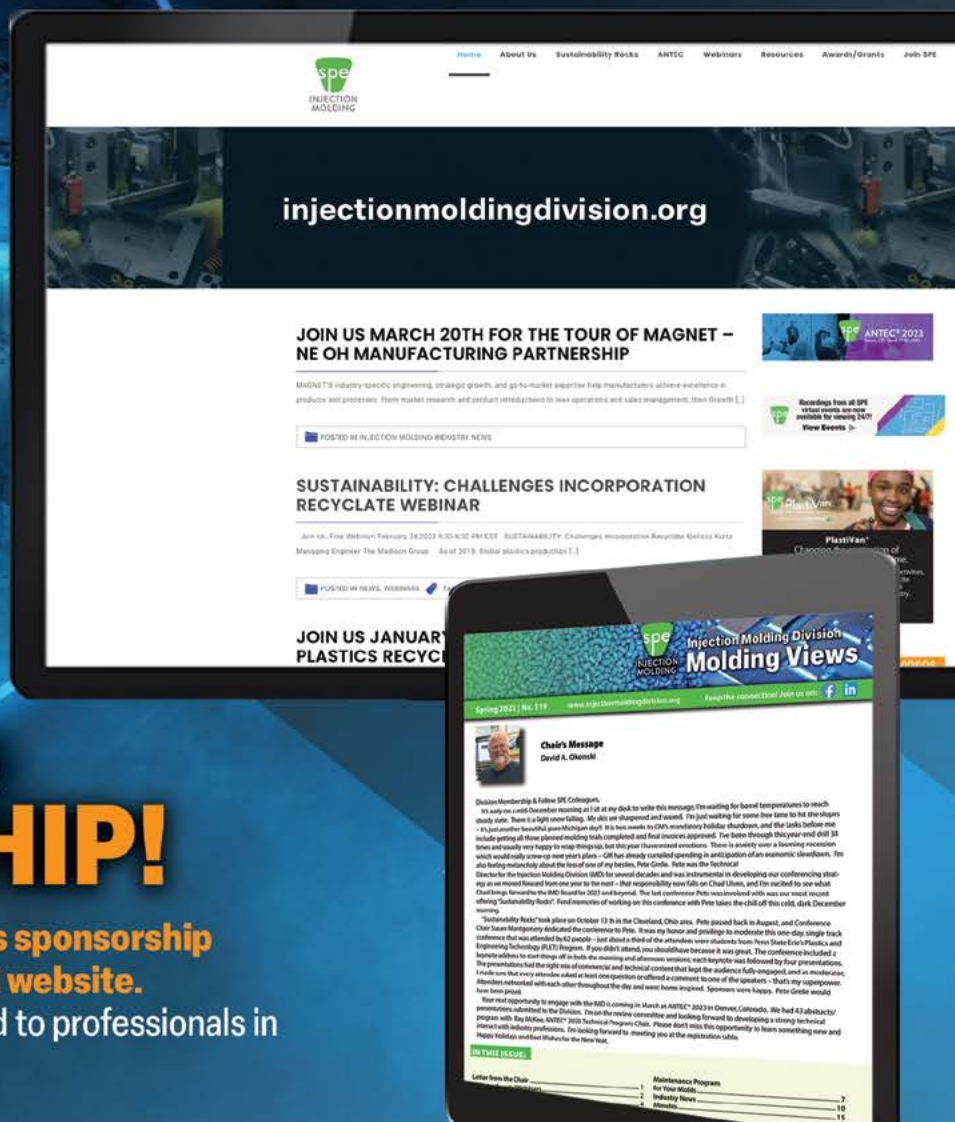
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**INJECTION
MOLDING**

Top Reasons to Join SPE and its Injection Molding Division

JOIN!

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