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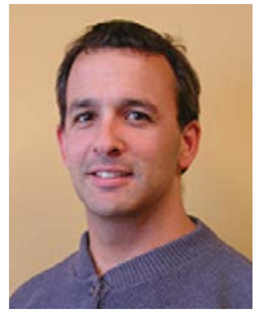

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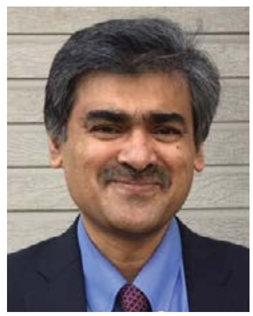

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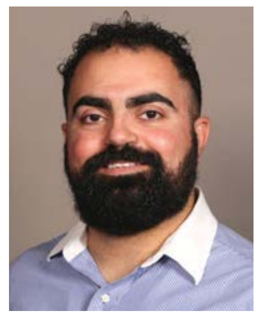

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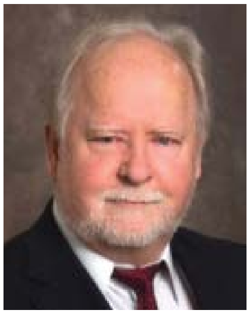

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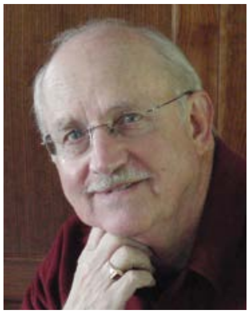

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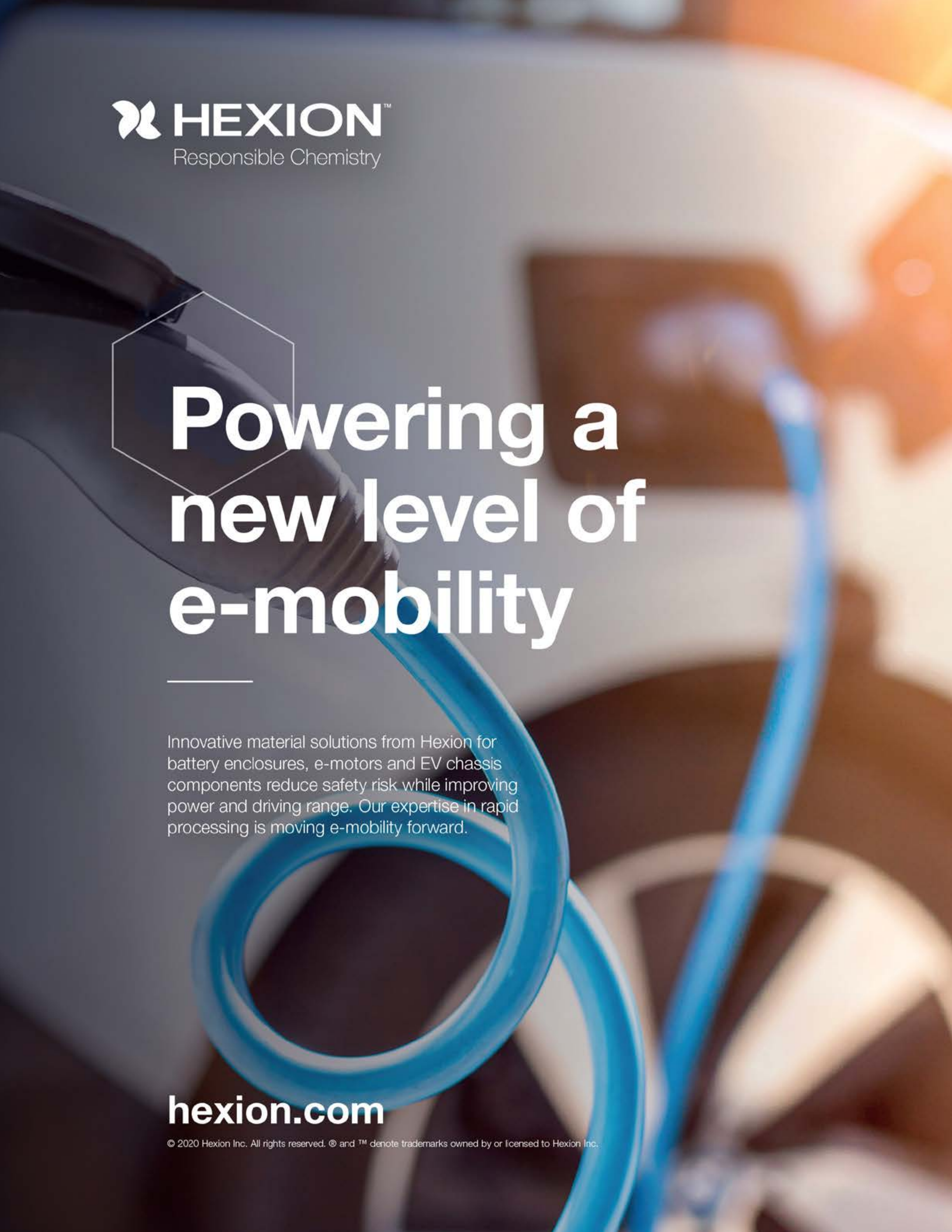
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# Welcome Our New Board Member

## SPE Composites Welcomes our new BOD Member Pritesh Yeole

Pritesh is currently Research Associate at Fibers and Composites Manufacturing Facility, University of Tennessee Knoxville. He has 8 years of experience in product development, design, manufacturing, characterization (destructive/non-destructive) and modeling of advance composites and plastics. Pritesh received his Doctor of Philosophy in Mechanical Engineering from The University of Tennessee Knoxville and Master of Science from University of Alabama Birmingham. His PhD work focused on the assessment of extrusion deposition additive manufacturing (BAAM system) of composite molds. During PhD tenure, he worked as a Research Assistant at IACMI – The Composites Institute. Pritesh received Bachelor of Technology in Metallurgical Engineering from College of Engineering Pune, India.

# Tribute to Nippani Rao

## Nippani Rao

## An Industry Leader, a Selfless Volunteer, a True Friend

Article taken from SPE Automotive Plastics News.

We are saddened to report that Nippani Ra, of Farmington Hills, MI, entered eternal life early Tuesday evening, January 19, 2021. He was 81. He married Joan M. (Burns) on February 28, 1969, and together they enjoyed nearly 52 years of marriage. In addition to his wife, Nippani is survived by three sone, David, Eric, and Stephen (Michelle); and siblings, Rama Nippani and Lakshmi Veena.

Nippani was a pillar in the automotive industry. He was a long time Board of Director for the SPE Automotive and SPE Composites Divisions and SPE Detroit Section, where he contributed many years of thoughtful and responsible leadership. He was a chair of the SPE Automotive Lifetime Achievement and Automotive Innovation Hall of Fame Awards committees and served as a judge on the Blue-Ribbon Judging committee for the SPE IAG and Automotive Composites Conference & Exposition Part Competition.

During his industry tenure, Nippani served as:

- **President, RAO Associates** 2009 – 2021
- **Technology Manager, Asahi Kasai, LLC** 2008 – 2010
- **Materials Engineering Supervisor, Chrysler LLC** 1986 – 2008

- Nippani's engineering responsibility included the award-winning Dodge Viper Body innovations with RTM (Resin Transfer Molding). He has numerous material patents. Nippani greatly valued SPE and made sure Chrysler stayed involved in the Society.

His Formal education includes:

- Xavier University, MS Na MBA, Chemical Engineering and Marketing 1966 –1973
- University of Cincinnati, Master's Degree, Chemical Engineering

This Issue:

# Tribute to Nippani Rao

Nippani greatly valued SPE and made sure Chrysler stayed active and involved. **The Automotive and Composites Division will be honoring Nippani at the SPE Automotive Innovation Awards Gala** on November 10, 2021 at the Burton Manor in Livonia, Michigan.

Many of Nippani's friends and associates have asked to express their thoughts and remembrances of Nippani. Here are a few of them:

"Nippani's professional commitment to advancing the use of polymers in automotive, his contribution and leadership at the SPE, mentoring and guiding the next generation and his personal warmth, kindness and friendship will be missed" — **UV, *Sabic***

"In addition to belonging to the SPE Automotive Division, Nippani was also an active member of the SPE's Composites Division. (In fact, he recommended that I also join the Composites Division BOD.) One of our CD members, Tim Simco, had recently retired because of failing health issues. (BTW, Tim was instrumental in the alignment of the Automotive Division into the ACCE in 2001.) The Composites Division had nominated Tim for Honored Service member, which is normally awarded at the spring ANTEC. Nippani called me and thought that Tim wouldn't be around to wait for next ANTEC, so he thought we could convince the HSM committee to send us the award "plaque" and we could present it to Tim at his home in Indiana long before the next ANTEC. Nippani made it happen! We gathered some SPE local members and the HSM plaque, hopped in a car and drove to Tim's home in Indiana, where Nippani lead an impromptu HSM presentation ceremony for Tim. Needless to say, it really cheered Tim up. (It made us feel pretty good as well.)

I think this act of kindness and thoughtfulness about Nippani speaks volumes about his character and feelings for his friends and coworkers. I will always remember the Nippani as a very good friend." — ***Fred Deans***

**This Issue:**

# Tribute to Nippani Rao

"Nippani was a very close friend and SPE colleague since 1990. I will always cherish the beautiful memories working together at several SPE events with his amazing dedication. I will miss going out to a leisure lunch at his favorite Indian restaurant "Biryani Express". He will be greatly missed but his kindness, smile, good attitude and gentle spirit will be remembered forever. With love and deepest sympathy as we remember a very dear friend". — ***Dr. Suresh Shah***

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Thank you for sharing the news, I am still surprised. I worked with Nippani in the past and keep very good memories of him. Visiting FCA with him was like walking with a celebrity! He will be missed. My thoughts and prayers to his family. — ***Rodrigo Orozco***

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So sorry to hear this news… It's a real loss to plastic community and the industry. He will certainly be missed. — ***Dhanendra Nagwanshi***

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So sad to hear this news. I did not know him well, but his dedication to the SPE BOD was obvious and important at SPE events.
— ***Jeremy Lee***

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I was surprised and saddened to hear about the passing of Nippani. He was a core member of the SPE Automotive board for many years, an integral part of the team and a good friend to so many of us. I enjoyed our discussions about his career, especially his time working at the DeLorean Motor Company. His experience, insight and kind disposition will be missed. While I'm glad we will be honoring Nippani at the next SPE Innovation Awards, I will miss his presence at our future events. Godspeed, my friend. — ***Mark Lapain***

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We were fortunate as a Board of Directors to have Nippani with us for so long. His drive, ambition, and passion for making our Society better was evident every day. On the personal side though, he would always ask how things were and how your family was doing. For me, it was about Tony who was at Purdue back then. "How's Tony doing? Purdue is a great school." I will miss his friendship, smile and conversation. He left us much too soon..
— ***Brian Grosser***

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Nippani was one of the most genuinely kind and supportive members of the SPE Automotive Division. He was a Co-Chair of the SPE Automotive Innovation Hall of Fame and Lifetime Achievement Awards, and an SPE Automotive Innovation Awards Blue Ribbon Judge and a Judge for the ACCE Part Competition for many years. He was a leader on numerous other SPE committees and received the "Honored Service Member" award from SPE – he was a pillar in the industry. Nippani was always so nice to work with and very helpful to me personally. I will miss dearly and always remember his warm smile. — ***Teri Chouinard***

## This Issue:

# Award Winning Paper

## Water absorption behavior of mechanically recycled PP and PA6 composites reinforced with natural fibers and glass fibers

Sandeep Tamrakar

Sandeep Tamrakar[1], Rachel Couvreur[1], Alper Kiziltas[1], Debbie Mielewski[1], John W. Gillespie, Jr.[2]

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### Abstract

The recyclability of natural fiber and glass fiber reinforced polypropylene composites and glass fiber reinforced nylon composites have been studied through injection molding and mechanical grinding. Mechanical properties of virgin and recycled composites were assessed through flexural, tensile, and impact tests. No significant degradation in the mechanical properties of natural fiber composites was observed after subjecting the composites through several rounds of recycling and water absorption at ambient temperature in tap water. However, severe degradation in the mechanical properties was observed for glass fiber composites. For instance, after five cycles of recycling, only 59% of flexural strength and 64% of flexural modulus was retained for glass fiber reinforced nylon composite. This is mainly due to severe attrition in glass fibers caused by recycling as evidenced by studies on fiber length distribution. Water absorption tests conducted at room temperature and subsequent environmental conditionings such as freeze-thaw cycling and extended freeze cycling only affected nylon composites. At saturation point, water absorption for nylon composites was 7.7% by wt. after 45 days of immersion, which significantly affected the mechanical properties. The tensile strength of the nylon composites reduced from 88.4 MPa to 36.2 MPa, and modulus reduced from 5.6 GPa to 1.8 GPa after saturation.

### 1. Introduction

The extensive use of thermoplastics and their composites in our society is causing growing concerns due to its adverse effects on our environment [1]. There are several ways to re-utilize polymers for sustainable models such as reuse, chemical recycling, and mechanical recycling. Of these, the latter two are the most widely practiced methods of recycling [2]. This study focuses on the mechanical recycling of polymer composites with various mineral and natural fillers. In general, mechanical recycling includes regrinding and reprocessing the polymer composite to produce a new component. The main problem with this type of recycling includes degradation in mechanical properties due to the shortening of fibers, damage on the surface of the fiber, delamination on the wall of natural fiber, fiber-matrix debonding, thermomechanical degradation on coupling agent, and reduction in molecular weight [3]. Poor retention of mechanical properties leads to recycled material generally being downgraded for the next cycle of an application. Although there have been attempts to use additives to upgrade the mechanically recycled polymer composites [4].

In the automotive industry, the use of polymer composites continues to grow due to its contribution to lightweighting, which directly impacts fuel economy. Metal components in automotive vehicles are replaced

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by plastics or composites resulting in lightweight vehicles. A reduction in 10% weight leads to a 3% to 7% improvement in fuel efficiency [5]. High-density fillers such as glass fibers or minerals (talc, calcium carbonate) are generally used to reinforce the polymer matrix to improve the mechanical properties of the composite without sacrificing the overall cost of the component. However, mechanical recycling reduces the reusability of these composites. The length of the fiber, which directly relates to the improvement in the mechanical properties, is greatly reduced due to the brittle nature of glass fibers. Fiber attrition has also been observed in injection molded components where the fibers must navigate through thin and convoluted sections. Additionally, the reduction in the molecular weight of the polymer matrix due to thermomechanical degradation could further exacerbate the issue with recycling. In contrast to glass fiber reinforcement, composites reinforced with natural fiber exhibit very little to no changes in mechanical properties after recycling [6]. This is because natural fibers can withstand external mechanical forces and are less likely to break due to their complex internal compositions [6] [7]. Injection molding is a widely utilized manufacturing method for polymer composites in the automotive industry. The presence of a resin-rich layer at the surface of injection molded components protects the hydrophilic natural fillers from moisture intrusion.

In this study, various natural fiber and glass fiber composites are investigated for degradation in mechanical properties due to grinding and reprocessing, and the effect of recycling on water absorption behavior. Tensile tests, flexural tests, and impact tests were conducted to assess the mechanical properties of dry (control) and saturated specimens subjected to various hygrothermal conditions. To further investigate the cause of degradation in tensile and flexural properties, measurements of fiber length distribution are carried out.

## 2. Materials

Table 1 shows the list of composite materials considered in this study. There are three natural fiber reinforced composites, one hybrid composite, and four composites with mineral fillers (talc and glass fibers).

*continued on page 16...*

**Table 1 Thermoplastic composites considered in the study**

| Notation | Matrix | Filler | Filler type |
|---|---|---|---|
| WF | PP Copolymer | 20% Wood pine fiber | Natural fillers |
| RH | Recycled polyolefin (PP and PE) | 10% Rice hull | |
| C20 | PP | 20% Cellulose | |
| CGF | PP | 10% Cellulose<br>15 Long glass fiber | Hybrid |
| T40 | PP Homopolymer | 40% Talc | Mineral fillers |
| GB | PP | 29% Talc<br>7% Glass bubbles<br>5% Short glass fiber | |
| GFC | Chemically coupled PP | 30% Short glass fiber | |
| LGF | PP | 30% Long glass fiber | |
| NGF | Nylon 6 | 15% Short glass fiber | |



# Award Winning Paper continued...

## 3. Experimental work

### 3.1. Sample preparation and recycling

Figure 1 shows the mechanical recycling process adopted in this study. During the first cycle, virgin pellets are fed into the injection molding machine to fabricate test specimens. A set number of specimens are collected for mechanical and physical characterization. The rest of the specimens are ground and then oven-dried at 105°C for four hours. In the second cycle, the oven-dried pellets are injection molded and the process is repeated up to five cycles. All specimens were prepared via injection molding using the parameters presented in Table 2.

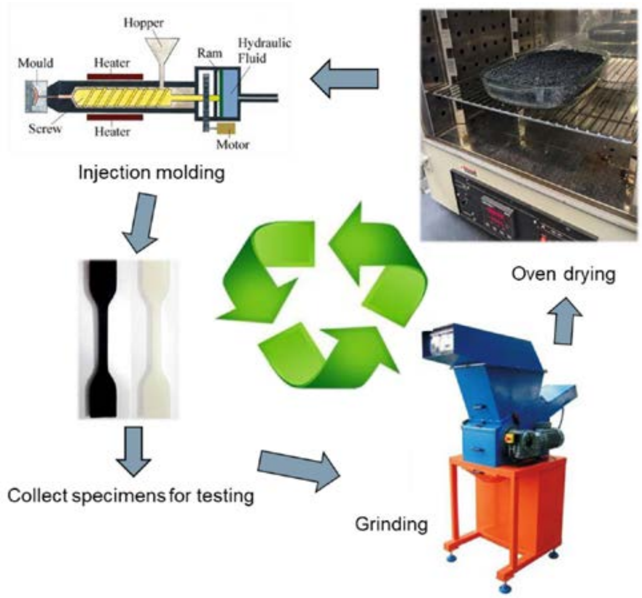


*Figure 1 Recycling steps used in this study for thermoplastic composites*

**Table 2 Processing parameters for injection molding**

| | |
|---|---|
| Barrel temperature (from hopper to nozzle): | |
| PP composite | 182, 188, 191, 193, 193°C |
| Nylon composite | 238, 243, 246, 249, 249°C |
| Back pressure | 689.5 kPa |
| Hold pressure | 1999.5 kPa |
| Screw speed | 70 rpm |
| Injection time | |
| Hold time | 1 sec |
| Cooling time | 25 sec |
| Total cycle time | |
| Mold temperature: | |
| PP Composites | 29.4°C |
| Nylon composite | 60°C |

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### 3.2. Water absorption tests

Before starting the water absorption tests, specimens were conditioned at 23°C and 50% relative humidity for at least seven days before taking the initial dry weight measurement. Water absorption tests were carried out by immersing the specimens in tap water per ASTM D570. While immersing the specimens in water, spacers were kept between the flat surface of the specimens to allow water absorption. Absorption tests were performed on three sets of specimens for each type of composite at 23°C. Each set of specimen consists of seven specimens.

Weight measurements were taken after 1, 2, 3, 7, 14, and every two weeks thereafter until the specimens saturated. The procedure for taking readings for specimens immersed at 23°C is as follows: the specimens were taken out from the water one at a time, placed vertically to allow water to drain for 30 s, then surface moisture was wiped off, weight measurement was taken and the specimen is placed back in the water. Water absorption percentage was calculated by using the following equation:

$$\%M = \frac{M_{wet} - M_{dry}}{M_{dry}} \times 100$$

Where, %M is the percentage of water absorbed, $M_{wet}$ is the mass of the specimen (g) subjected to water absorption for a certain time, $M_{dry}$ is the initial dry mass (g).

### 3.3. Freeze-thaw exposure

Since these materials are to be used for exterior application, composite materials were subjected to freeze-thaw exposure. Following ASTM D7032, one set of specimens saturated at 23°C were subjected to -29°C for 24 h, followed by thawing at 23°C for 24 h. This completes one freeze-thaw cycle. Specimens were subjected to five such cycles. These specimens were subsequently conditioned at 23°C for at least seven days while immersed in water for the assessment of mechanical properties through tensile and flexural tests.

### 3.4. Re-drying

To determine mass loss due to water absorption, specimens saturated at 23°C were re-dried in an oven at 50°C. Specimens were periodically weighed until the average change in weight was less than 5 mg.

### 3.5. Mechanical tests

Instron Dual Column Universal Testing System (Model 3366) was used for both tensile and flexural tests. Tensile tests were conducted on Type V specimens (ASTM D638) at a loading rate of 5 mm/min until failure or up to a maximum engineering strain of 10%, whichever occurred first.

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# Award Winning Paper continued...

A 5 kN load cell was employed to monitor the force in the specimen and an extensometer was used to directly monitor the strain in the gage length. A 500 N load cell was used for quasi-static three-point flexural tests. Specimens were loaded at a strain rate of 5% per min until failure or up to a maximum strain of 5%, whichever occurred first. Calculation of strain was based on the deflection in the middle of the specimen monitored from the crosshead displacement of the machine per ASTM D790.

All the test specimens were conditioned at 23°C for at least seven days. For instance, the specimens subjected to freeze-thaw cycling were conditioned by immersing them in water at 23°C for at least seven days before testing. While performing tests on wet specimens, the specimens were taken out of the water one at a time and weight measurements were taken following the procedure outlined earlier and placed in the Instron and tested.

Notched Izod impact testing was also conducted on the control specimen using a pendulum arm impact tester (Model 43-02-03) per ASTM D256. Specimen preparation included creating a standard type V notch using a notch cutter (Model TMI 22-05) on rectangular bars. At least ten specimens for each composition were tested where each specimen was clamped with a constant force.

### 3.6. Fiber length distribution measurements

Fiber length distribution of glass fiber composites is carried out by burning the specimen in an oven at 600°C for 2 hours. The retracted fibers are then gently mixed in an acetone solution by pouring between two beakers for at least 5 minutes. Then the resulting solution is poured onto a glass plate and observed under a microscope once the acetone has evaporated.

For natural fiber composites, the fibers are extracted by dissolving the composites in Decalin. Small pieces of composites with Decalin are placed in a round-bottom flask, which is immersed in an oil bath heated at 150°C. Mixing was carried out using a magnetic stirrer and a complete dissolution of the composites took place in 45 mins. The viscous mixture was then allowed to cool before diluting with acetone solution to be observed under a microscope.

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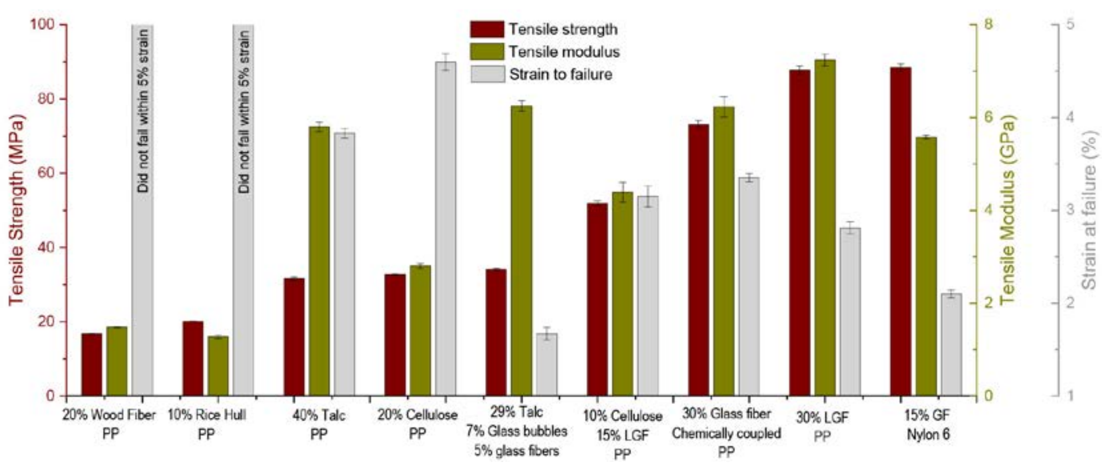


*Figure 2 Tensile properties of control samples for thermoplastic composites*

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## 4. Experimental results

### 4.1. Mechanical properties

#### 4.1.1. Tensile properties

Tensile strength, tensile modulus, and strain to failure for control samples are presented in Figure 2. As expected, natural fiber-reinforced composites have the lowest tensile properties. Both wood fiber and rice hull reinforced composites did not fail within 5% strain, while all other composites failed below a tensile strain of 5%. The GB composite with talc, glass bubbles, and glass fiber wa found to be the most brittle one with a strain to failure of only 1.67%. Long glass fiber PP composite has the best overall tensile properties.

After recycling, there is a significant decrement in the tensile strength of glass fiber reinforced composites (Figure 3). Whereas, a marginal effect was found on natural fiber-reinforced composites or talc composite due to recycling. The effect of recycling on modulus is not as pronounced as strength. In general, strain to failure increases slightly with recycling. For nylon glass fiber composite, strain to failure after the fifth cycle is very high (~8%) compared to 2 – 2.5% for earlier cycles (Figure 3). This could be attributed to the moisture present in the nylon matrix in the later cycles, which act as a plasticizer. Yield stress decreases with water absorption due to an increase in chain mobility in the presence of water [8]. It is worth noting that no appreciable changes in appearance were observed after recycling. The least retention of properties for glass fiber reinforced composites was observed after five batches of recycling. Natural fiber-reinforced composites and talc reinforced composites were least affected by recycling with retention of more than 90% tensile strength property. Whereas, glass fiber reinforced composites have about 60-70% modulus property retention after five batches of recycling.

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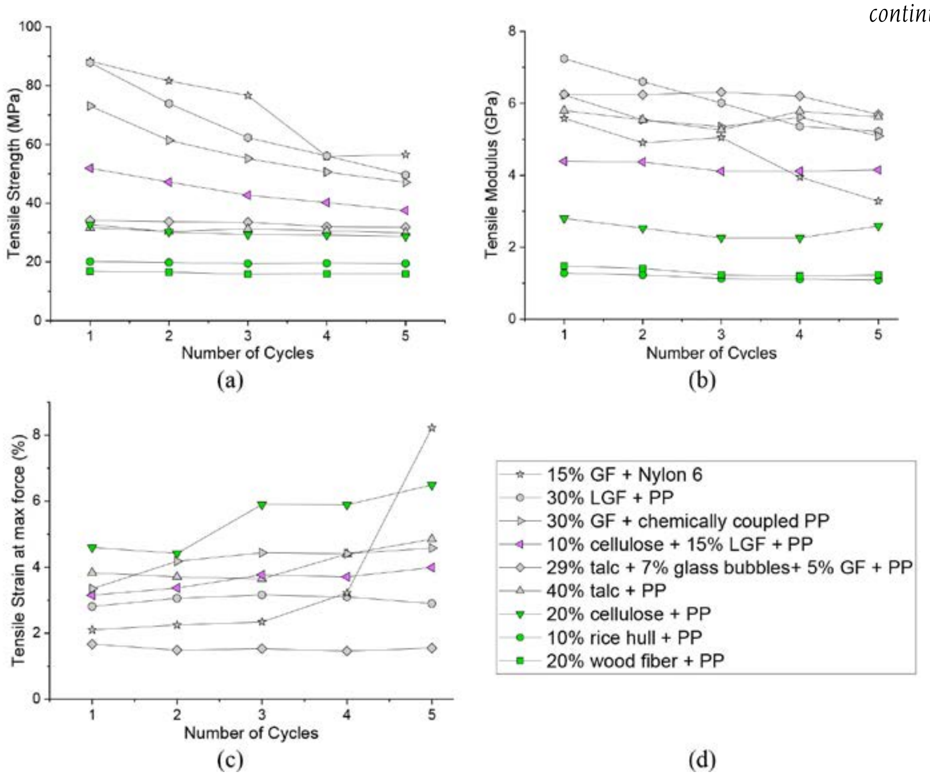


*Figure 3 Thermomechanical degradation of tensile properties after mechanical recycling (a) tensile strength, (b) tensile modulus, (c) tensile strain at maximum force, (d) legend*

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# Paper continued...

### 4.1.2. Flexural properties

Results on the flexural properties of control samples are similar to the tensile properties. Long glass fiber composites have the overall best flexural properties (Figure 4). Whereas, natural fiber reinforced PP composites have the lowest flexural properties. Trends of decrement in flexural properties after recycling are also similar to tensile properties. A significant decrement was observed in the flexural strength of glass fiber reinforced composites, especially the ones with long glass fibers. A decrement in modulus is not as significant as flexural strength. Recycling has a marginal effect on natural fiber-reinforced composites or talc composite.

Similar to tensile properties, the least retention of properties was observed for glass fiber reinforced composites after five batches of recycling with retention of only 60-70% strength properties after recycling (Figure 5). More than 90% of tensile strength property retention was observed for natural fiber-reinforced composites. Talc reinforced composites seem to be unaffected by recycling.

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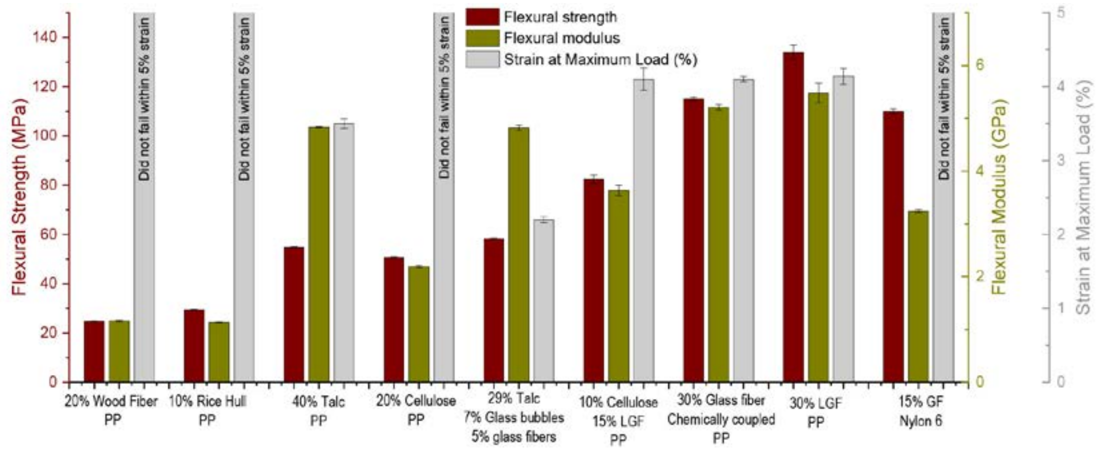


*Figure 4 Flexural properties of control samples for thermoplastic composites*

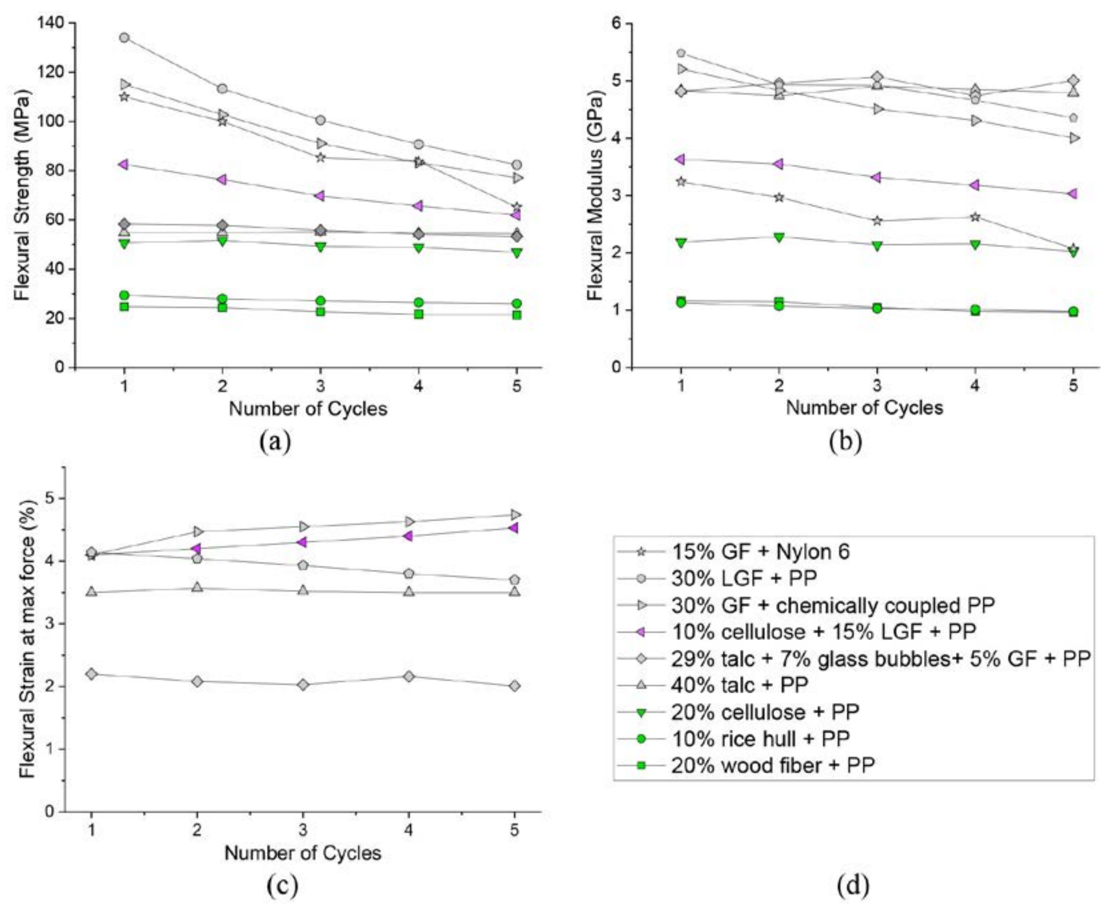


*Figure 5 Thermomechanical degradation of flexural properties after mechanical recycling (a) flexural strength, (b) flexural modulus, (c) flexural strain at maximum force, (d) legend*

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# Award Winning Paper continued...

### 4.1.3. Impact properties

As expected, wood fiber and rice hull reinforced composites have the highest impact resistance and are least affected by recycling (Figure 6). Impact resistance of glass fiber reinforced composites is severely affected by recycling. For long glass fiber reinforced polypropylene composite, after five recycles, impact resistance is only 39% of the first cycle.

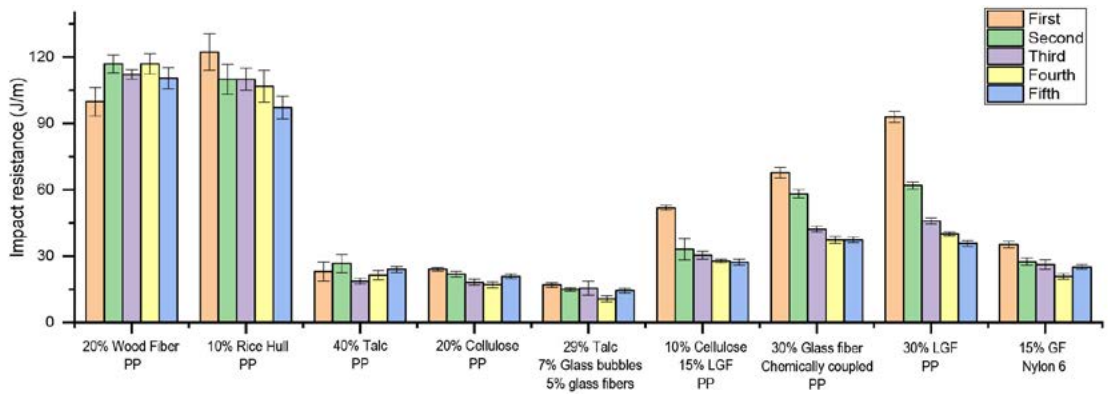


*Figure 6 Degradation in impact properties after mechanical recycling of the composites*

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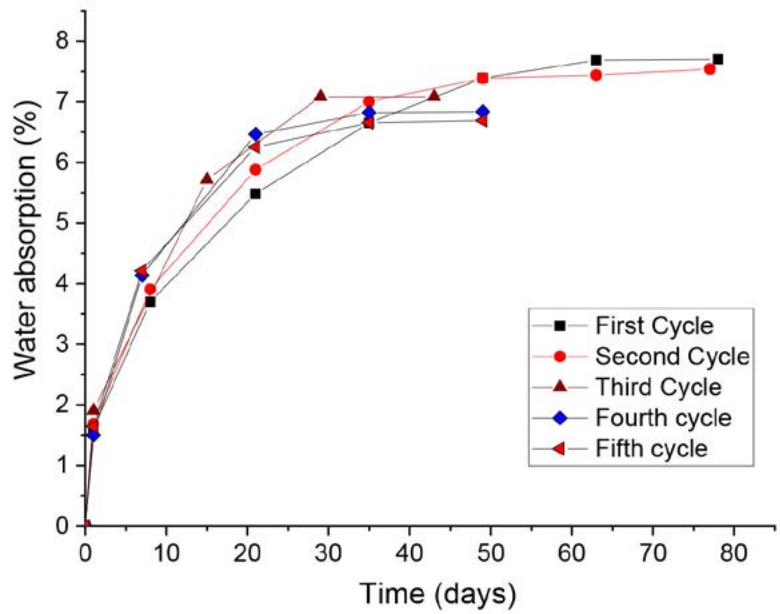
### 4.2. Water absorption tests

Only glass fiber reinforced nylon composites showed water absorption at 23°C with the maximum intake being 6.5% to 7.7% (by wt.) at saturation. The percentage of water absorption at saturation decreased slightly with recycling. No dimensional instability (warping) or changes in physical appearance was observed for nylon composites after immersion in water. However, thickness swelling of about 6.5% was observed. All other composites did not absorb water even after 45 days of immersion.




### 4.3. Hygrothermal effects on mechanical properties

Strength and modulus properties decreased significantly after subjecting the saturated nylon composites to hygrothermal conditions. Subjecting saturated specimens to five cycles of freeze-thaw did not have any significant effect on the mechanical properties of the nylon composites. Water absorption had irreversible effects on the mechanical properties since they could not be completely regained after redrying the saturated specimens. Loss in mechanical properties is attributed to an increase in chain mobility in the presence of water. Under wet conditions, cellulose PP composites are better than glass fiber reinforced nylon composites (Figure 8).

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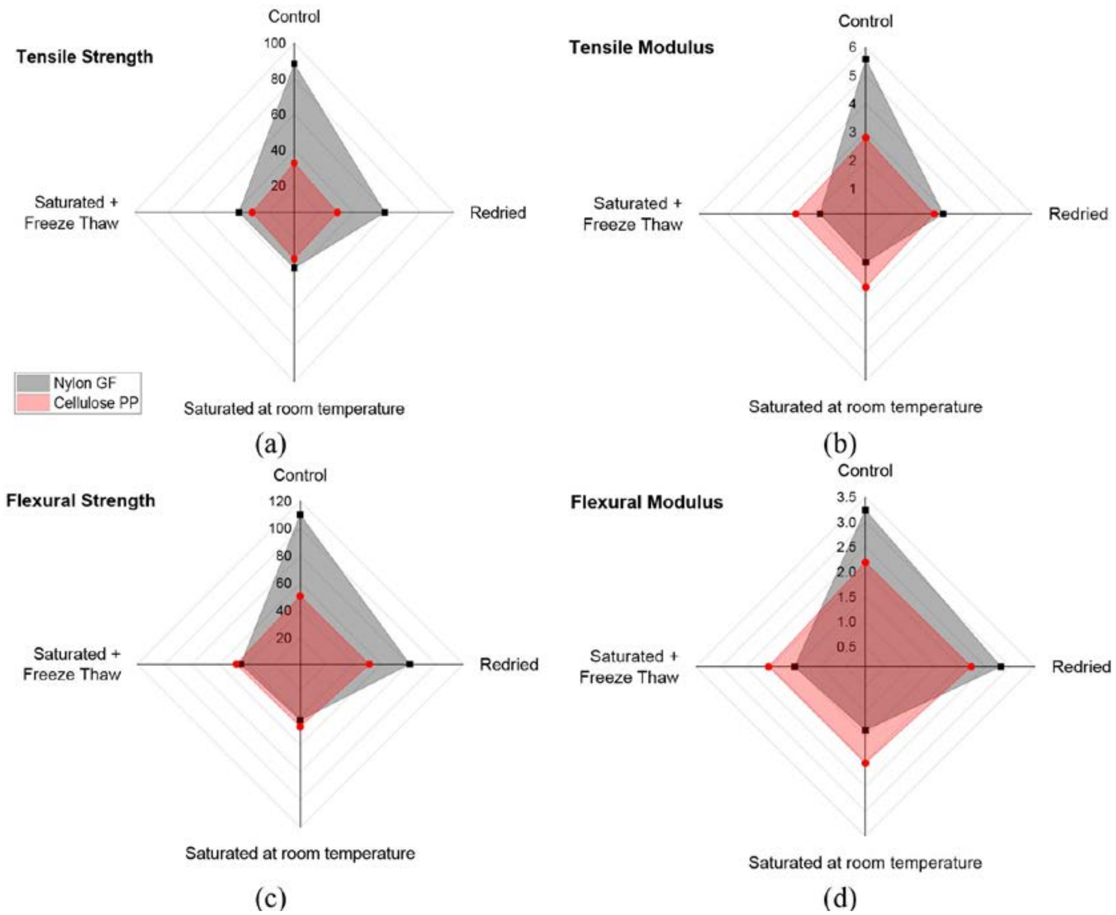


*Figure 8 Comparison between hygrothermal effects on mechanical properties of glass fiber reinforced nylon composites and cellulose reinforced polypropylene composites*

## 4.4. Fiber length distribution

The extraction of rice hull and wood fiber from the pellets show that the filler contents have been completely pulverized (Figure 9). The original size of both the fillers is 1-2 mm range before compounding. A separate study on the effect of Decalin on the filler at high temperature (150°C) and shear-induced by magnetic stirrer show no alteration on the particle size.

The cause of pulverization observed in the pellets can be attributed to the high shearing caused during compounding. This suggests that the natural fillers may not be contributing much to the increment in the mechanical properties of the composites. Improvements in the mechanical properties of natural fiber composites can be achieved by optimizing the processing parameters during compounding.

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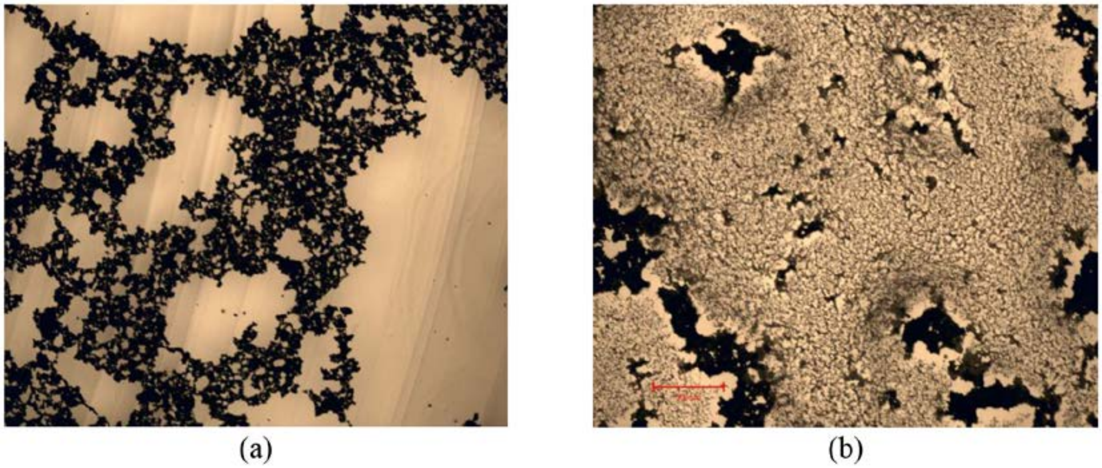

Figure 9 Optical microscope images of (a) rice hull and (b) wood fiber extracted from as received pellets after Decalin treatment

Figure 10 Optical microscope images of (a) short glass fibers and (b) long glass fibers extracted by burning as received pellets in an oven

Figure 10 shows short glass fibers (GFC) and long glass fibers (LGF) extracted by burning the polymers. The short glass fibers were extracted from pellets as received. The average length of GFC in the pellet form is 523 µm, whereas the original length of the fibers before compounding is 6 mm. Similarly, the average length of long glass fibers after the first cycle of injection molding is 706 µm, while the original length of LGF is 12 mm. Figure 11 and Figure 12 show that significant fiber attrition occurs after recycling and processing, which is the leading cause for the degradation in mechanical properties.

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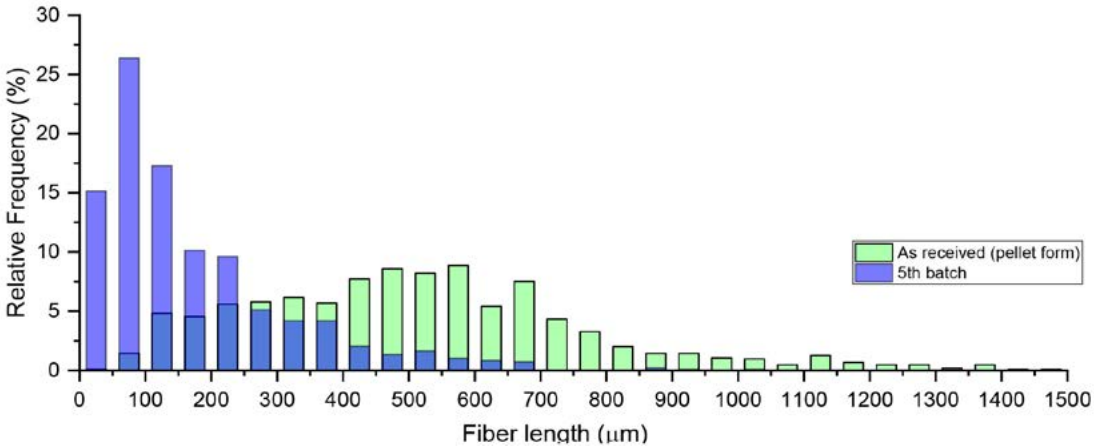


*Figure 11 Fiber length distribution of short glass fibers from as received pellets and after 5th batch of recycling*

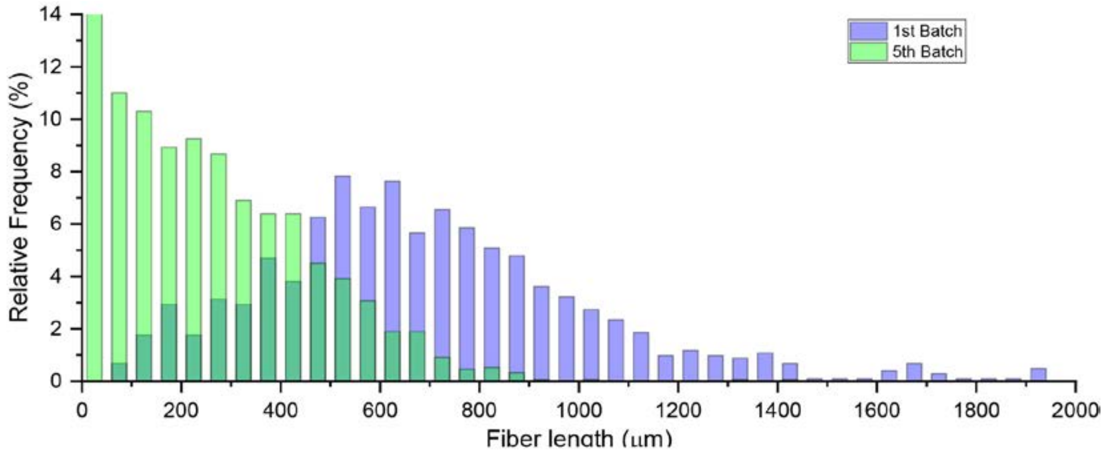


*Figure 12 Fiber length distribution of long glass fibers from as received pellets and after 5th batch of recycling*

### 5. Conclusions

Following are the conclusions drawn from this study:

- Effect of mechanical recycling (regrinding) on tensile, flexural, impact properties were studied on nine types of composites.

- Mechanical properties of natural fiber composites were not significantly affected by recycling retaining more than 90% of the original properties.

- Tensile and flexural strength properties of glass fiber reinforced composites were significantly affected by recycling retaining only 60-70% of the original values.

- Talc filled composites were unaffected by mechanical recycling.

- Impact properties of long glass fiber composite were also significantly affected, retaining only 39% of the original value after five batches of recycling.

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# Award Winning Paper continued...

- Only nylon composite was found to absorb water with 6.5% to 7.7% absorption at saturation.
- Cellulose composites were at par or better than nylon composites under wet conditions.
- Optical images of rice hull and wood fibers extracted from as received pellets show that the filler has been pulverized during the compounding process.
- Fiber length distribution of glass fibers shows significant attrition after mechanical recycling.



## 6. References

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# Board Meeting Minutes Jan 19, 2021

By: John P. Busel

**SPE Composites Division Board of Directors Meeting**
Tuesday, January 19, 2021
12:00 PM – 1:30 PM Eastern US
Conference Call

## 1. Welcome

- Ian Swentek called the meeting to order at 12:04 pm.
- John Busel conducted the Roll Call.

## 2. Administrative

- Ian Swentek reviewed the last meeting minutes. Jim Griffing moved to accept the last meeting minutes of September 1, 2020 - Conference Call as written. The motion was seconded by Hicham Ghossein. A few typos were pointed out for correction. Motion passed.

- Ian Swentek reviewed the action items from the last meeting. See Attachment 1 for status. All actions were updated, and several open items were noted. The Board members were asked to complete the outstanding action items before the next meeting.

## 3. COVID 19 Discussion

- Ian Swentek reported that the CD has been impacted because there have been no in person events that membership has declined in 2020. He challenged board on the future and suggestions. The group discuss options to address the decline in membership. Several board members indicated that they did not get advance notice of membership lapses in SPE. It was pointed out that networking is an important component for the division. ACCE is an important value for membership.

- The Board suggested to get more involvement from students through the schools. A tactic would be to mentor the students in the student chapters. Alex Kravchenko volunteered to help with developing a mentorship program.

- The Board suggested to conduct topical webinars to the membership that focuses on composites that is something outside of what people learn in a textbook. Currently, the Division does not have a platform to deliver webinars. John Busel shared with the group his investigation of web platform for meetings and the associated costs. He suggested GoToMeeting as the platform. Depending on how it is used, there is also GoToWebinar but this does not allow for interaction between attendees like GoToMeeting. Hicham Ghossein moved to spend up to $200 to set up a Composites Division web service platform. Jim Griffing seconded. The group felt the cost options presented were not expensive. Motion passed. Hicham Ghossein and Christoph Kuhn volunteered to develop an online educational program for the Division.

- The group discussed awards and whether to expand or change what is currently being done in the Division. The Board was informed that the current portfolio of awards is very popular with student members. The Board suggested to cut any scholarships and there were no suggestions for additional awards at this time.

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## This Issue:



# Board Meeting Minutes continued...

- The group discussed what life will be like post COVID. People do prefer in person events and there is anticipation when things get better there will be a change to get back to in person events. It was pointed out that sponsorship of the magazine has been increasing which might be a good indicator of things to come.

ACTION: Alex Kravchenko to develop a mentorship program for students.
ACTION: Hicham Ghossein and Christoph Kuhn to develop educational webinar program.
ACTION: John Busel to secure a GoToMeeting license for the Division use not to exceed $200.

### 4. Wrap Up

- Ian Swentek recommended that other items on the agenda be addressed at the next meeting due to several Board members needing to leave the meeting early.

- Ian Swentek will compile the meeting Action Items to be distributed with the minutes.

- Ian Swentek proposed to have 6 meetings for the year. The group agreed to have more frequent and shorter meetings and set during lunchtime for best attendance.

- The next Board meeting is scheduled for February with a date to be determined. This will be a web meeting conference call.

### 5. Adjourn

- Ian Swentek adjourned the meeting at 1:05 pm.

Respectfully submitted,
John P. Busel
Secretary/Chair-Elect,
SPE Composites Division
Board of Directors

### Attendees

OFFICERS:
Ian Swentek, Chair
John P. Busel, Secretary/Chair-Elect
Mingfu Zhang, Treasurer
Dale Brosius, Councilor

DIRECTORS:
Rich Caruso
Michael Connolly
Pritam Das
Fred Deans
Hicham Ghossein
Jack Gillespie
Jim Griffing
Dale Grove
Enamul Haque
Alex Kravchenko
Christoph Kuhn
Khaled Shahwan

SPE COMPOSITES

**This Issue:**