



Editorial

Additive Manufacturing of Polymer-Fiber Composites

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Additive Manufacturing of Polymer–Fiber Composites is a newly open Special Issue of Materials, which aims to publish original and review papers on new scientific and applied research, and make great contributions to the finding and understanding of the fabrication of fiber-reinforced polymer composites using current advanced additive manufacturing techniques. This Special Issue also covers fundamentals, characterization, and applications of fiber-reinforced polymer composites.

The technology of the additive manufacturing (AM) process has significantly piqued the interest of researchers and industrial players from various areas [1–5]. Flexibility of this technology has increased the potential of research and exploration from the supply of materials until the end of life. Regarding the environmental aspect, the reduction in the need for raw materials in additive manufacturing will enhance the positive impact on the environment. Therefore, selection of the right eco-friendly sources of energy, recyclability and biodegradability, and maximizing the product's end-of-life value is important in AM [6–9]. Fiber-reinforced polymer composites have been employed in the early development of AM technology, and they have further potential application in various types of product design [10,11]. Moreover, the research and development of these materials are extensively progressing as the materials are varied and have unique characteristics.

Studies on fiber-reinforced polymer composites for the additive manufacturing process have been carried out by many researchers and become an interesting topic to be explored in the additive manufacturing industry. The aims of the inclusion of fiber in the polymer-based feed stock materials are to reduce the percentage of polymers and consequently reduce the harmful substances that may emit during the fabrication process in AM. Moreover, fiber-reinforced polymer composites could improve the properties of the dominant materials and exhibit good performance in the final products. Employment of the fibers in the AM process should consider the type of fiber, fiber treatment, fiber size, fiber loading, and fiber characteristics. It is important to understand the composition of fibers to ensure their

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compatibility with the polymer, and how they could produce good resultant composites for AM.

The AM process starts from the preparation of the feed stock until the disposal of the fabricated parts [12]. The impact of this process towards the environment is a major concern of the industry since the AM process is known as an environmentally conscious manufacturing process, and consumption of the materials is optimum. However, due to the heating process of thermoplastic polymer that may cause adverse health effects towards humans, biopolymer and bio-composite materials are becoming alternative materials for the feedstock, and numerous studies had presented the advantages of these types of materials for AM. Process preparation of the biopolymers and bio-composites is less harmful and easy to dispose of at the end of its life. Hence, it is important to consider environmental elements during the AM process from the beginning until the end of life of the fabricated parts. Extensive studies should be conducted for various topic of additive manufacturing of fiber-reinforced polymer-based composites.

In this Special Issue, we aim to capture the cutting edge of the state-of-the-art research pertaining to advancing additive manufacturing of fiber-reinforced polymeric materials. The topic themes include advanced fiber-reinforced polymeric material development, processing parameter optimization, characterization techniques, structure–property relationships, process modelling, etc., specifically for AM.

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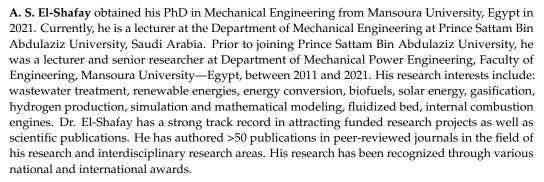
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M. T. Mastura started her tertiary educational journey at the Language Institute of Seoul National University, Seoul, South Korea from 2003 to 2004 where she studied the Korean language (Level 1 until Level 6). She graduated with a Diploma in System Design from Dongyang Mirae University, Seoul, South Korea, or formerly known as Dongyang Technical College in 2007, and afterward in 2009, she graduated with a Bachelor of Science in Engineering from Korea University, Seoul, South Korea. In 2011, she completed her Master of Engineering in the field of Mechanics at Universiti Kebangsaan Malaysia, Selangor, Malaysia. In 2017, she graduated with her Ph.D. degree in the field of Mechanical Engineering at the Faculty of Engineering, Universiti Putra Malaysia, Malaysia. She started her work as an academician in 2009 and was appointed as senior lecturer in 2018. As an academician in an engineering school, she was awarded the Most Cited Article Award in the International Journal of

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Shahir Mohd Yusuf received his MEng Mechanical Engineering (with sustainable energy systems) from the University of Southampton, United Kingdom, in 2016. Subsequently, he was awarded a PhD from the same university in 2020 with a thesis titled 'Microstructures and Properties of Additively Manufactured Alloys Processed by Severe Plastic Deformation'. He is currently a senior lecturer at the Mechanical Precision Engineering (MPE) Department, MJIIT, Universiti Teknologi Malaysia (UTM) Kuala Lumpur, Malaysia. His research interests are in manufacturing and materials, particularly additive manufacturing (AM), also known as 3D printing, severe plastic deformation (SPD), hybrid manufacturing processes, advanced AM processes, and process-microstructure-property relationships. At present, he is working on affordable 3D printing of metallic materials using desktop fused filament fabrication (FFF) process, focusing on both machinery and materials development. In addition, he also researches 4D printing, a branch of 3D printing mainly dedicated to fabricating smart materials.

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