

# Automotive and Autonomous Systems

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## Biocomposites for automotive components: Research, development, and applications

The increasing demand for biofibers in the development of biocomposites is due to the cost effectiveness, low density, biodegradability, renewability, and abundant availability of biofiber in nature. Biocomposites have gained huge attention in different automotive applications (structural components, paints, interior fabric coatings, foams, antiroll bars, beams, coolant nanofluids, and organic light emitting diodes (OLED)) by many automotive companies, such as Malaysian national carmaker (Proton), German automotive companies (Mercedes, Chrysler, Daimler, Volkswagen, Opel, Ford, Audi, Fiat, and BMW), French automotive companies (Peugeot and Citroen), Japanese automotive companies (Toyota and Mitsubishi), United Kingdom automotive companies (Rover, Lotus, and Vauxhall), and United States automotive companies (General Motors, Volvo, and Ford). To date, many automotive components, including exterior and interior parts, are fabricated using biocomposite, mainly polypropylene or polyester-based, and natural fibers such as cotton, flax, kenaf, sisal, jute, or hemp. Besides that, the global demand for natural fiber reinforced polymer composites in the automotive industry is expected to increase substantially during the forecasted period due to their attributes, such as economical cost and marketing, light weight, durability, high mechanical strength, and resistance to corrosion, rather than the technical demands.

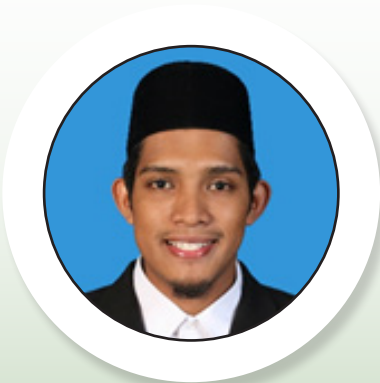
### Keywords:

Biofiber; Polymer; Biocomposites; Automotive; Industry

### Biography:

R.A. Ilyas is a senior lecturer in School of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, Malaysia. He received his Diploma in Forestry at Universiti Putra Malaysia, Bintulu Campus (UPMKB), and Sarawak, Malaysia from Mei 2009 to April 2012. In 2012, he was awarded the Public Service Department (JPA) scholarship to pursue his Bachelor's Degree (BSc) in Chemical Engineering at Universiti Putra Malaysia (UPM). Upon completing his BSc. programme in 2016, he was again awarded the Graduate Research Fellowship (GRF) by the Universiti Putra Malaysia (UPM) to undertake a PhD degree in the field of Biocomposite Technology & Design at Institute of Tropical Forestry and Forest Products (INTROP) UPM. R.A. Ilyas's research interests include polymer engineering, material engineering, natural fibres, bio composites and Nano composites. R.A. Ilyas was the recipient of MVP Doctor of Philosophy Gold Medal Award UPM 2019, for Best PhD Thesis and Top Student Award, INTROP, UPM. In 2018, he was awarded with Outstanding reviewer by Carbohydrate Polymers, Elsevier United Kingdom, Best Paper Award (11th AUN/SEED-Net Regional Conference on Energy Engineering), Best Paper Award (Seminar Enau Kebangsaan 2019, Persatuan Pembangunan dan Industri Enau Malaysia), and National Book Award 2018. R.A. Ilyas also was listed and awarded Among World's Top 2% Scientist (Subject-Wise) Citation Impact during the Single Calendar Year 2019 and PERINTIS Publication Award 2021 by Persatuan Saintis Muslim Malaysia.

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