

MIIEx2017

Melaka
International
Intellectual
Exposition

PROGRAMME ABSTRACT

AUTISM

INNOVATION

DESIGN

INVENTION

"Bridging Gaps with Creativity for Future Sustainability"

MIIEX2017

The logo for MIIEX2017 features the text 'MIIEX2017' in a bold, black, sans-serif font. The 'I' in 'MIIEX' is stylized as a torch. The '2017' is also in a bold, black, sans-serif font. To the right of the '2017' is a stylized illustration of three buildings, including a mosque with a dome and a traditional house with a gabled roof.

"Bridging the Gaps with Creativity for Future Sustainability"

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PUBLISHED BY:

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RICE HUSK AS A NOVEL REINFORCING MATERIAL: TOWARD IMPROVING FRACTURE TOUGHNESS IN ALUMINIUM COMPOSITE

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Abstract

Metal-matrix composites are very attractive materials due to high mechanical properties, which make them promising structural materials for automotive and aerospace industries compared with unreinforced metals. Many methods have been proposed for producing high-quality weld joints between metal matrix composites. However, most of the methods used suffer a great loss in the mechanical properties due to the formation of cracks and grain growth. To overcome, friction stir processing, a solid state process, has been proven to be one of the promising approach for joining non-ferrous metal matrix composites. Although, many efforts have been devoted to resolve the issues of cracking and fracture toughness, the issues still remain unsolved. In this study, aluminium matrix composite was produced by adding rice husk during the friction stir processing. The utilization of the agricultural solid wastes is a viable solution in reducing pollution while being economically beneficial, as well. Rice is the third most widely grown cereal crop in the world. The decomposition of agricultural waste emits methane, nitrogen dioxide, and sulphur dioxide. Furthermore, farmers normally burn local agricultural solid wastes, resulting carbon dioxide and other local pollutants. Recycling of this material can decrease water and soil contamination and environmental depletion. The cracking and fracture toughness were evaluated through bending test conducted on the friction stir processed zone. Bending test results was amazing. For the first time, cracks were eliminated from the processing zone reinforced with rice husk. The results revealed that no crack was detected in the processing zone after bending test demonstrating the efficiency of the rice husk reinforced aluminium matrix composite. Also, it is noticeable that the bending value slightly increased by rice husk.