

**Preparation of bulk-area stir zone in aluminium 6061 alloy via cryogenic friction stir processing**

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**ABSTRACT**

The demand for fine-grained structure materials has been increasing for the last two decades due to their superior mechanical properties such as enhanced superplasticity, high strength to weight ratio and excellent corrosion resistance. The present study focuses on the production of bulk-area stir zone in aluminium 6061 alloy with aid of cryogenic friction stir processing (FSP). For this aim, process parameters such as tool traverse speed and rotational speeds were selected from trial experiments. With the use of optimum process parameters, FSP was conducted in cryogenic media. Optical 3D microscope, Scanning electron microscope and universal testing machine were employed to characterize the processed samples and results have been reported.

*Keywords: Friction Stir Processing; 6061 Alloy; cryogenic media.*

