

## Microstructural Changes in Aluminium Alloys by Friction Stir Processing

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### ABSTRACT

*Friction-stir processing (FSP) is an emerging surface-engineering technology that can locally eliminate casting defects and refine microstructures, thereby improving strength and ductility, increase resistance to corrosion and fatigue, enhance formability, and improve other properties. FSP can also produce fine-grained microstructures through the thickness to impart superplasticity. FSP zones can be produced to depths of 0.5 to 50mm, with a gradual transition from a fine-grained, thermodynamically worked microstructure to the underlying original microstructure. Essentially, FSP is a local thermomechanical metal working process that changes the local properties without influencing properties in the remainder of the structure.*

*This article will introduce the microstructural characteristic zones of the processed material during the friction stir processing. Connections with friction stir welding basic concepts regarding the joint typical microstructure are made.*

*The paper ends with several conclusions regarding the advantages of solid phase materials processing using FSP.*

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