

# **MODIFICATION OF ALUMINUM FUSION WELDS BY FRICTION STIR PROCESSING**

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## **ABSTRACT**

Friction stir processing (FSP) is used to modify the local microstructure of fusion welded aluminum alloys. In this study, aluminum alloy weldments are subjected to FSP at the weld toe, crown, and heat-affected zone locations. The role of different FSP processing approaches is investigated to understand the influence of FSP on fusion welds including process parameters and tool designs. Optical, scanning electron, and transmission electron microscopies are utilized to investigate grain morphology and precipitate size distribution. Utilizing the microstructural data, the interplay between microstructural and mechanical properties are evaluated and discussed. In addition, local mechanical properties in transition regions between the different microstructures are determined, i.e., fine grain FSP zone, cast fusion zone, and parent metal.