

**E. Friction Stir Welding Of AZ31B-H24 Magnesium Alloy: Microstructure Features and Failure Behavior**

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Friction stir welds of AZ31-H24 magnesium alloy were fabricated using a CNC milling machine at two rotational speeds and three travel speeds; the plates were 0.125 in. (3.175 mm). After processing the welds were cross sectioned and a metallurgical characterization was performed using optical microscopy, and scanning electron microscopy. Tensile test were performed on the crossweld samples. The mechanical properties of the welds are correlated with the microstructures present at the stirred zone (SZ) and the thermomechanically affected zone (TMAZ). A sharp interface between the SZ and the TMAZ was observed at the advancing side which was the preferred site for failure during the tensile test; in contrast, a smooth and almost continuous microstructure was present at the retreating side. An intensive characterization was performed on this sharp interface.