

## Anisotropic behavior studies of aluminum alloy 5083-H0 using a micro-tensile test stage in a FEG-SEM

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### ABSTRACT:

The plastic anisotropic characteristics of aluminum alloy 5083-H0 at varying strain rates were investigated using uniaxial tensile testing inside an ultra-high resolution FEG-SEM. The stress strain graphs obtained show that for the rolling direction the mechanical properties decrease with increased strain rate from 0.1 to 0.5 mm/min. The transverse direction mechanical properties increase from 0.1 to 0.2 and decrease at 0.5 mm/min. Serrated yielding for both directions was more pronounced in the 0.1 mm/min and 0.2 mm/min than in 0.5 mm/min strain rate. The fracture surface was characterized by nucleation of micro-dimples of varying sizes and shapes, which became shallower with increasing strain rates. Intermetallic particles were observed in the large micro-dimples on the fractured surface. The microstructure anisotropy revealed a shear type failure mode due to the shear bands localization for the 0° direction and for the 90° direction, failure mode showed both intergranular and shear type failure.