

# Effect of 4% wt. Cu Addition on the Mechanical Characteristics and Fatigue Life of Commercially Pure Aluminum

## Abstract :

Aluminum is widely used in many engineering applications due to its light weight. However, pure aluminum has some weakness in its mechanical properties due to its columnar microstructure with large grain size. The mechanical properties can be improved by different methods, such as cold working, heat treatment, and alloying. This study aims at enhancing the mechanical properties of commercially pure aluminum through the addition of 4% wt. copper. Tensile test, microstructure test, microhardness test, and fatigue test were performed to investigate the effect of the copper addition on the mechanical properties of pure aluminum. The results depicted that copper addition significantly refined the aluminum grain size, which resulted in improved strength and microhardness, i.e., the fatigue strength was enhanced by more than 110% at 10<sup>7</sup> cycle, and the microhardness was enhanced by 57.9%.