

# Mechanical Behavior of Alumina/Aluminum Metal Matrix Composites

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## ABSTRACT

Alumina is widely used as the reinforcing additive in the metal matrix composites. The influence of alumina particle size on the density, hardness, microstructure, yield stress, compression strength, and elongation of the sintered Al/alumina composites were investigated. In the present study, 10 wt% of alumina powder with three different particle sizes (600 nm, 800 nm and 10  $\mu\text{m}$ ) were used in the production of the samples. Powder metallurgy technique was utilized to obtain more homogeneous alumina distribution across the composites. The samples were cold pressed at 500 MPa, and sintered at 550  $^{\circ}\text{C}$  for 30 min. Results showed that the relative density of the composite was initially increased with decreasing particle size. It was also pointed out that the mechanical properties of the specimens were increased with decreasing particle size. The grain size and particle distribution homogeneity was decreased with raising the particle size.

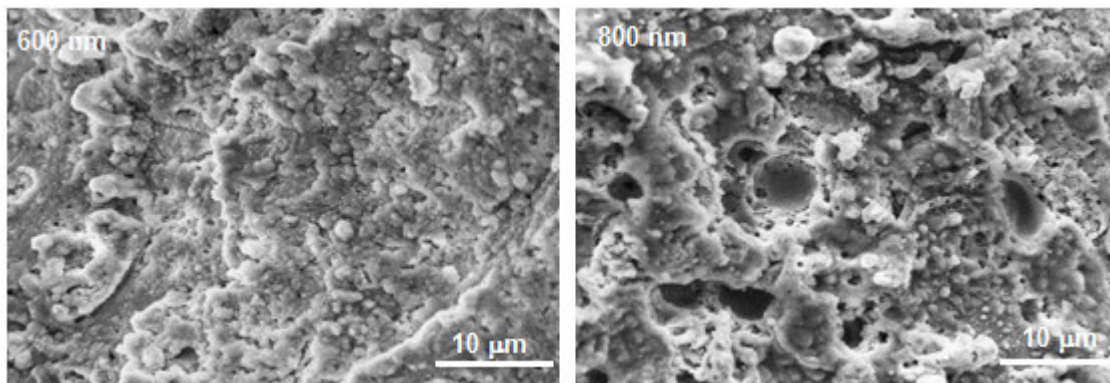


Figure 1: Fractographs of Alumina/AL metal matrix composites (a) 600 nm p and (b) 800 nm particle size

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