# EFFECTS OF ADHESIVE AND INTERPHASE CHARACTERISTICS BETWEEN MATRIX AND REINFORCED NANOPARTICLE OF AA3105/ALN NANOCOMPOSITES

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## ABSTRACT

Adhesion between nanoparticles and metal matrix can affect a composite's mechanical properties. Decreasing the interfacial strength can cause the interfacial debonding of particles from the matrix and, as a consequence, the tensile strength of the composite is reduced. In this article two types of RVE models have been implemented to study adhesive characteristics between aluminum nitride (AlN) nanoparticle and AA3105 matrix using finite element analysis. It has been observed that the nanoparticle did not overload during the transfer of load from the matrix to the nanoparticle via the interphase due to interphase between the nanoparticle and the matrix. The tensile strength and elastic modulus has been found increasing with an increase volume fraction of aluminum nitride in the AA3105/AlN nanocomposites. The transverse modulus of AlN/AA3105 nanocomposites is increased from 74.84 to 83.25 GPa with interphase due to addition of magnesium.

**KEYWORDS:** RVE Models, Aln, AA3105, Finite Element Analysis, Interphase