

The Effect of Volume Fraction of Nano-Alumina Strengthening on AC4B Composite Characteristics through the Stir Casting Method as a Material Brake Shoe

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Abstract : Brake shoe is a component that serves to reduce speed or stop the train's speed by utilizing the friction force. Generally, the material used as a brake shoe is cast iron, where cast iron itself is a heavy, expensive, and easily worn material. Aluminum matrix composites are one of candidates for the cast iron replacement material as the basic material for brake shoe. The matrix in the composite used is Aluminum AC4B. Reinforcement used in aluminum matrix composites is nano-alumina, where the use of nano-alumina of 0.25%, 0.3%, 0.35%, 0.4%, and 0.5% volume fraction will be tested. The sample is made using the stir casting method; then, it will be tested mechanically. The use of nano-alumina as a reinforcement will increase the strength of the matrix. SEM (scanning electron microscopy) testing is used to test the distribution of reinforcing particles due to stirring. Therefore, the addition of nano-alumina will improve AC4B aluminum matrix composites.

Keywords : aluminium matrix composites, brake shoe application, stir casting, nano-alumina

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