

# Pengaruh vf partikel nano al<sub>2</sub>o<sub>3</sub> terhadap sifat mekanik komposit aluminium a356 al<sub>2</sub>o<sub>3</sub> melalui metode stir casting sebagai material untuk blok rem kereta api = Influence vt nano particle to mechanical properties of al<sub>2</sub>o<sub>3</sub> composite aluminium a356 al<sub>2</sub>o<sub>3</sub> through stir casting method as materials for drum brake of train

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## Abstrak

### [<b>ABSTRAK</b><br>

Komposit nano Al A356 berpenguat partikel Al<sub>2</sub>O<sub>3</sub> berpotensi untuk meningkatkan kekuatan sifat mekanis tanpa mengorbankan keuletan pada matriks. Pada penelitian ini dilakukan variasi penambahan fraksi volume dari partikel nano Al<sub>2</sub>O<sub>3</sub> sebesar yaitu 0.1%, 0.2%, 0.5%, 1%, dan 1,2%. Untuk meningkatkan kemampubasahan dari Al<sub>2</sub>O<sub>3</sub> pada Al A356 ditambahkan Mg sebesar 10%. Hasil penelitian menunjukkan bahwa komposit Al A356/Al<sub>2</sub>O<sub>3</sub> dengan 0.5% Vf memiliki sifat mekanis yang lebih baik daripada yang lain. Nilai kekuatan tariknya mencapai 140,3 MPa lalu elongasinya sebesar 9,563% dan kekerasannya mencapai 46,2 HRB. Akan tetapi nilai mekanis dari kekuatan tarik masih dibawah dari Al A356 As cast maupun Al 356. Fenomena ini disebabkan karena adanya porositas dan persebaran partikel nano yang tidak merata.

### <b>ABSTRACT</b><br>

Aluminium A356 nano composite reinforced with Al<sub>2</sub>O<sub>3</sub> particle have a potential to increase mechanical properties while maintaining good ductility. In this study, the addition % Vf variation of Al<sub>2</sub>O<sub>3</sub>. Variation used is 0.1%, 0.2%, 0.5%, 1%, dan 1,2%. To improve wettability of Al<sub>2</sub>O<sub>3</sub> in Al A356 addes 10% Mg. The results showed that the composite Al A356 / SiC 0,5% Vf have better mechanical properties than others. The ultimate tensile strength reach 140.3 MPa with 9.56% elongation. Hardness value reach 46,2.1 HRB. However, the value of ultimate tensile strength is still below the mechanical Al A356 As cast and Al 356. This phenomenon is due to the porosity and bad particle dispersion.

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