

Karakteristik komposit aluminium AC8H/SiC dengan proses stir casting = Characteristics of aluminium AC8H/SiC composite fabricated with stir casting process

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Abstrak

Proses fabrikasi komposit matriks aluminium dapat dilakukan melalui fasa cair dengan menggunakan metode stir casting untuk meminimalisir terbentuknya clustering penguat SiC. Metode ini memiliki keuntungan dalam hal distribusi penguat SiC dengan bantuan magnesium sebagai wetting agent. Dalam hal ini magnesium berfungsi meningkatkan kemampu-basahan antara matriks aluminium dan partikel penguat SiC. Pada penelitian ini dilakukan variasi penambahan penguat SiC sebesar 5% wt, 10% wt, dan 15% wt dengan kadar magnesium tetap 1,5% wt. komposit matriks aluminium diberi perlakuan berbeda yaitu kondisi as-cast dan T6 heat-treated dengan perbedaan sifat mekanis.

Hasil penelitian menunjukkan bahwa penambahan penguat SiC meningkatkan nilai kekerasan dan menurunkan laju aus. Proses perlakuan panas T6 pada komposit matriks aluminium meningkatkan nilai sifat-sifat mekanik dibandingkan pada kondisi as-cast akibat terbentuknya presipitat sekunder pada kondisi T6 heat-treated. Penambahan fraksi berat penguat SiC pada komposit matriks aluminium juga meningkatkan persen porositas. Persen porositas ini dapat dilihat melalui penurunan nilai densitas aktual komposit matriks aluminium dibandingkan densitas teoritisnya.

.....Fabrication of aluminum matrix composite can be done through liquid phase by using stir casting method in order to minimalizing the formation of SiC clustering penguat. This method has the advantage in the distribution of SiC reinforce with the function of magnesium as wetting agent. In this case, magnesium will increase the wettability between aluminum matrix and the SiC reinforce particle. This research focus on the addition of SiC reinforce in the amount of 5% wt, 10% wt, and 15% wt with a fix amount of magnesium, 1,5% wt. The aluminum matrix composite is given by different treatment, as-cast condition and T6 heat treated with different mechanical properties.

The result shows that the addition of SiC reinforce will increase the hardness value and decrease the wear rate value of aluminum matrix composite. T6 heat treatment process in aluminum matrix composite increase the mechanical properties value greater than the as-cast condition as the formation of secondary precipitate in T6 heat-treated condition. The addition of SiC reinforce weight fraction in aluminum matrix composite also increase the porosity percentage. This porosity percentage can be observed by the decreasing value of actual density aluminum matrix composite compared by theoretical density.