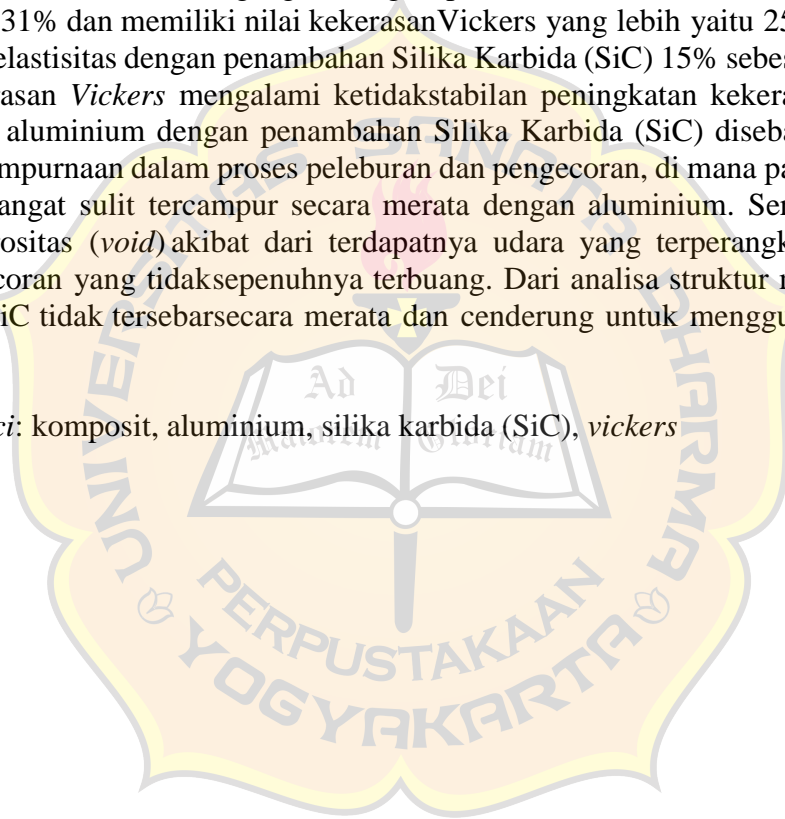


ABSTRAK

Komposit matriks aluminium berpenguat partikulat dikembangkan menjadi aplikasi komponen otomotif dan kendaraan seperti pesawat dan kereta api, karena mempunyai berat jenis yang lebih ringan serta memiliki performa yang baik seperti kekuatan tinggi, kekerasan tinggi, dan sifat tahan aus. Penelitian ini bertujuan menghasilkan material komposit matriks aluminium berpenguat Silika Karbida (SiC) dengan variasi 0%, 10%, 15% terhadap kekuatan tarik, nilai kekerasan serta struktur mikro. Proses peleburan dilakukan dengan metode *stir casting* manual. Hasil pengujian kekuatan tarik dengan penambahan Silika Karbida (SiC) 15% memiliki nilai rata-rata tegangan sebesar 6,61 Mpa dan memiliki nilai kekerasan Vickers yang paling tinggi rata-rata sebesar 37,98 HV. Nilai regangan dengan penambahan Silika Karbida (SiC) 10% sebesar 1,31% dan memiliki nilai kekerasan Vickers yang lebih yaitu 25,8 HV. Nilai modulus elastisitas dengan penambahan Silika Karbida (SiC) 15% sebesar 7,88 Mpa. Uji kekerasan *Vickers* mengalami ketidakstabilan peningkatan kekerasan material komposit aluminium dengan penambahan Silika Karbida (SiC) disebabkan karena ketidaksempurnaan dalam proses peleburan dan pengecoran, di mana partikel silikon karbida sangat sulit tercampur secara merata dengan aluminium. Serta timbulnya cacat porositas (*void*) akibat dari terdapatnya udara yang terperangkap di dalam material coran yang tidak sepenuhnya terbuang. Dari analisa struktur mikro terlihat partikel SiC tidak tersebar secara merata dan cenderung untuk menggumpal di satu tempat.

Kata kunci: komposit, aluminium, silika karbida (SiC), *vickers*



ABSTRACT

Particulate reinforced aluminum composite matrix has been developed into applications of automotive components and vehicles such as aircraft and railways, because it has lighter type weight as well as has good performance such as high strength, high durability, and aus resistance properties. The research is aimed at producing silica carbide (SiC) aluminum matrix composite materials with variations of 0%, 10%, 15% in terms of traction strength, strength values and microstructure. The melting process is done by manual stir casting. Traction strength test results with the addition of silica carbide (SiC) 15% have an average voltage value of 6.61 Mpa and have the highest Vickers strength value of an average of 37.98 HV. Tension value with the addition of silica carbide (SiC) 10% by 1.31% and have a Vicker strength value greater than 25.8 HV. Elasticity module value with addition of silika carbide (SiC) 15% by 7.88 Mpa. The VICKERS strength test experienced instability increased strength of aluminum composite material with the added silica carbide (SiC) due to imperfections in melting and casting processes, in which silicon carbide particles are very difficult to mix evenly with aluminum. As well as the emergence of void defects due to the presence of air trapped in material that is not completely wasted. From the analysis of the microstructure seen SiC particles are not evenly distributed and tend to clump in one place.

Key words: Composite, aluminium, silika karbida (SiC), vickers

