

Analisis pengaruh variabel geometri pin tools terhadap mikrostruktur dan sifat mekanik sambungan dissimilar friction stir welding fsw aluminium a5052 dan tembaga = Analysis of the effect of tool pin geometry variable to micro structure and mechanical properties from dissimilar friction stir welding fsw joint of a5052 aluminium and copper

Aisyah Nur Kumalasari, author

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Abstrak

ABSTRAK

Aluminium dan tembaga telah umum digunakan di industri, terutama industri elektronik. Namun biasanya penyambungan aluminium dan tembaga masih dilakukan dengan brazing ataupun cladding. Friction stir welding (FSW) menawarkan proses penyambungan dengan hasil yang lebih baik karena tidak terjadi perubahan mikrostruktur akibat panas dari pengelasan. Perbedaan geometri pin tool disinyalir akan memberikan perbedaan pada mikrostruktur dan sifat mekaniknya, maka Al 5052 dan pure wrought Cu disambung dengan FSW menggunakan geometri pin tool tapered cylindrical dan threaded cylindrical. Kemudian makro dan mikrostrukturnya diamati dengan mikroskop optik dan SEM, serta sifat mekaniknya diuji dengan pengujian tarik dan keras. Pada kedua hasil sambungan, di struktur mikronya terbentuk senyawa intermetalik Al-Cu dan struktur komposit. Berdasarkan sifat mekaniknya, secara umum dengan menggunakan pin tool tapered cylindrical akan menghasilkan sambungan yang lebih baik.

ABSTRACT

Aluminium and copper has been widely used in industry, especially in electronic industry. But mostly, the joining of Al-Cu is produced by brazing and cladding. Friction stir welding offer a newer and better joint because it doesn't change the microstructure due to welding process heat. The difference of tool pin geometry will provide a differences in microstructure and mechanical properties of the joint, so 5052 series of Al and pure wrought Cu are joined by FSW process with tapered cylindrical and threaded cylindrical tool pin. Then its microstructure was observed with an optical microscope and SEM, as well as its mechanical properties are tested by tensile test and hardness test. The microstructure formed Al-Cu intermetallic compounds and composite structures. Based on its mechanical properties, generally the joint by using tapered cylindrical tool pin produces a better result.