ABSTRACT

Repeated damage to excavator bucket lock pins results in financial losses to the company. Analysis of the strength of excavator bucket lock pin material is needed to determine the physical and mechanical properties of a material, so that it can recommend the selection of excavator bucket lock pin raw materials. The analysis was carried out on a sample of lock pin bucket excavator carbon steel type. The methods used are chemical composition test, microstructure analysis, hardness test, impact test, macrostructure analysis and tensile test. Based on the test, the data obtained for excavator bucket lock pin material type A is included in the type of low carbon steel with a carbon content of 0.062%, while type B is included in medium carbon steel with a carbon content of 0.568%. From the hardness test, it is found that type A has a hardness value of 165.48 VHN and type B is 316.12 VHN. The impact test results obtained by type A amounted to 1.40 joules / mm² and type B amounted to 0.35 joules / mm². From the tensile test results, type A has an average stress of 510 MPa with an average strain of 19.63%, while type B has an average stress of 794.84 MPa with an average strain of 15.12%. From the mechanical data and observations of the physical properties of the excavator bucket lock pin material, it can be concluded that type A is more optimally used as an excavator bucket lock pin because it has a higher toughness and ductility value in receiving shock loads than type B.

Keywords: Excavator bucket lock pin, Mechanical property analysis, Physical property analysis, Material

INTISARI

Kerusakan berulang terhadap *lock pin bucket excavator* mengakibatkan kerugian finansial perusahaan. Analisa kekuatan material *lock pin bucket excavator* diperlukan untuk mengetahui sifat fisik dan mekanis suatu materal, sehingga dapat merekomendasikan pemilihan material bahan baku *lock pin bucket excavator*. Analisa dilakukan pada sampel *lock pin bucket excavator* jenis baja karbon Metode yang digunakan adalah uji komposisi kimia, Analisa struktur mikro, uji kekerasan, uji impak, Analisa struktur makro dan uji tarik. Berdasarkan pengujian, didapatkan data *material lock pin bucket excavator* tipe A termasuk dalam jenis baja karbon rendah dengan kadar karbon 0,062%, sedangkan tipe B termasuk dalam baja karbon sedang dengan kadar karbon 0,568%. Dari pengujian kekerasan didapatkan tipe A memiliki nilai kekerasan 165,48 VHN dan tipe B sebesar 316,12 VHN. Hasil pengujian impak didapatkan tipe A sebesar 1,40 *joule*/mm² dan tipe B sebesar 0,35 *joule*/mm². Dari hasil pengujian tarik didapatkan tipe A memiliki besar tegangan rata rata sebesar 510 MPa dengan regangan rata rata 19,63%, sedangkan tipe B memiliki besar tegangan rata rata 794,84 MPa dengan regangan rata rata sebesar 15,12%. Dari data mekanis dan pengamatan sifat fisik material *lock pin bucket excavator*, dapat disimpulkan bahwa tipe A lebih optimal digunakan sebagai *lock pin bucket excavator* karena memiliki nilai ketangguhan dan keuletan lebih tinggi dalam menerima beban kejut dibanding tipe B.

Kata Kunci: Lock pin bucket excavator, Analisa sifat mekanis, Analisa sifat fisik, Material