

INTISARI

Penelitian ini bertujuan untuk membandingkan kekuatan tarik, kekuatan lelah, kekerasan brinel, struktur makro, dan struktur mikro pada baja karbon rendah yang mengalami perlakuan panas. Sampel yang digunakan baja karbon rendah yang mempunyai komposisi kimia C 0,195%, Cr 0,001%, Mn 0,514% , Mo 0,109%, Mn 0,514%, Si 0,136%.

Proses penelitian ini dilakukan dengan memanaskan benda uji pada suhu 920°C dan 460°C. Ketika mencapai suhu yang ditentukan, suhu kemudian ditahan selama 3 jam agar suhu pemanasan merata dilanjutkan dengan pendinginan secara perlahan dan sebagian dengan pendinginan cepat menggunakan media air. Pengujian yang dilakukan pada benda uji adalah uji tarik, uji kelelahan, uji kekerasan, uji struktur mikro dan uji struktur makro.

Dari hasil pengujian tarik diperoleh kekuatan tarik baja annealing lebih rendah dari baja quencing ,tempering maupun tempering disertai pendinginan cepat. Dari hasil uji kelelahan baja annealing memiliki kekuatan lelah yang lebih baik dari baja quencing, tempering, maupun tempering disertai pendinginan cepat. Kekerasan baja annealing lebih rendah dari baja quencing, tempering, maupun tempering disertai pendinginan cepat. Baja quencing terbentuk struktur martensit sedangkan baja yang lainnya strukturnya terdiri dari ferrit dan perlit. Semua baja menghasilkan penampang patahan yang terdiri dari 2 daerah yaitu daerah patah awal dan akhir.

ABSTRACT

This Research was held to compare the tensile intensity, the fatigue intensity, the brinell hardness, the macrostructures and microstructures of low-carbon steels which got steel-treating process. The samples that were used in this research were low-carbon steels. The chemical composition of the low-carbon steels are C 0,195%, Cr 0,001%, Mn 0,514%, Mo 0,109%, Si 0,136%.

The process of this research was done by giving the specimen a treatment 920°C and 450°C. When it reached the expected temperature, the temperature was restrained until 3 hours to get the same temperature. After that some specimen got a slow cooling treatment and the other got a quick cooling treatment by giving them water. In this research the writer held some tests to the specimen. They are stress test, fatigue test, hardness test, microstructure test, and macrostructure test.

The result of the stress test is that the tensile intensity of steel with annealing treatment is lower than steel with quenching treatment, tempering treatment and also tempering with quick cooling treatment. While the result of the fatigue test is that the fatigue intensity of steel with annealing treatment is better than steel with quenching treatment, tempering treatment and tempering with quick cooling treatment. The hardness of steel with annealing treatment is lower than steel with quenching treatment, tempering treatment and tempering with quick cooling treatment. The quenching-steel is formed martensite structure, while others consist of ferrite and perlite. All of the steels produce fracture diameter which consist of two fracture areas. They are the first fracture and the last fracture.