

ABSTRAK

Pada pengujian kali ini, dilakukan dua pengujian yaitu pengujian struktur mikro pada permukaan baja paduan AISI 6150 dan pengujian kekerasan Vickers akibat proses pendinginan tidak setimbang. Pengujian ini bertujuan untuk mengamati bagaimana perbedaan karakteristik antara baja paduan AISI 6150 yang terpengaruh oleh pendinginan tidak setimbang dengan baja paduan AISI 6150 yang tidak diberi pengaruh apapun.

Metode pengujian kekerasan dilakukan dengan menempatkan baja paduan AISI 6150 pada tempat penekanan di alat uji Vickers, kemudian memulai penekanan dengan indenter menekan permukaan baja paduan AISI 6150. Hasil penekanan indenter berupa cekungan berbentuk piramida diukur menggunakan mikroskop, kemudian diamati diameter layang-layang tersebut. Lalu, setelah kedua diameter bekas penekanan diketahui, baru lah muncul nilai dari HV10. Berat beban yang digunakan pada penekanan tersebut adalah 10 kg dengan waktu penekanan selama 10 detik. Sedangkan untuk pengujian struktur mikro pada permukaan paduan baja AISI 6150 dilakukan pemerataan permukaan dengan menggunakan amplas, etsa, dan autosol. Metode pengujiannya adalah pertama-tama permukaan baja paduan dihaluskan terlebih dahulu dengan mesin amplas otomatis dengan tingkat kehalusan amplas, urut dari yang terkecil hingga terbesar (90-2000). Kemudian setelah halus, permukaan dari baja paduan ditetesi dengan etsa, etsa yang digunakan adalah Nital. Setelah ditetesi dengan etsa, kemudian permukaan spesimen benda di kilapkan menggunakan autosol. Setelah itu maka dilakukan pengamatan terhadap permukaan benda dengan menggunakan mikroskop

metalografi. Adapun perbesaran yang dilakukan adalah 0.25x, 0.3x, 0.4x, 0.65x, 0.90x.

Hasil dari pengujian kekerasan adalah rata-rata kekerasan dan standar deviasi. Untuk rata-rata kekerasan, digunakan tujuh kali pengambilan sampel pada setiap spesimen yang bertujuan untuk meminimalisir kesalahan. Melalui pengujian ini, diketahui bahwa semakin cepat pendinginannya maka semakin keras dan getas material tersebut. Begitu sebaliknya, semakin lambat pendinginannya maka semakin ulet dan lunak material tersebut. Sedangkan hasil dari pengujian struktur mikro adalah berupa tangkapan gambar yang menggambarkan permukaan baja paduan AISI 6150 dari mikroskop metalografi. Setelah pengambilan gambar permukaan, dilakukan analisa terhadap fase yang terbentuk dimana dari masing-masing fase memiliki karakteristik yang berbeda. Perbedaan fase ini dikarenakan pemberian perlakuan yang berbeda.

Kata kunci : Baja Paduan AISI 6150, Mikroskop Metalografi, Pendinginan Tidak Setimbang, Vickers.

ABSTRACT

In this test, two tests were carried out, namely testing the microstructure on the surface of the AISI 6150 alloy steel and testing the Vickers hardness due to the unbalanced cooling process. This test aims to observe how the characteristics difference between AISI 6150 alloy steel which is affected by unbalanced cooling and AISI 6150 alloy steel which is not affected. The hardness test method is carried out by placing the AISI 6150 alloy steel on the emphasis on the Vickers test instrument, then starting the pressing with the indenter pressing the surface of the AISI 6150 alloy steel. Then, after the two diameters of the compression marks are known, the value of Hv10 will appear. The weight of the load used in the suppression is 10 kg with a pressing time of 10 seconds.

The hardness test method is carried out by placing the AISI 6150 alloy steel on the emphasis on the Vickers test apparatus, then starting the pressing with the indenter pressing the surface of the AISI 6150 alloy steel. Then, after the two diameters of the compression marks are known, the value of HV10 will appear. The weight of the load used in the suppression is 10 kg with a pressing time of 10 seconds. Meanwhile, for testing the microstructure on the surface of the AISI 6150 steel alloy, the surface is evenly distributed using sandpaper, etching, and autosol. The test method is that the surface of the alloy steel is first smoothed with an automatic sanding machine with a level of fineness of sandpaper, in order from the smallest to the largest (90-2000). Then after smooth, the surface of the alloy steel is dripped with etching, the etching used is Nital. After being dripped with etching, then the surface of the object specimen is glossed using an autosol. After that, the

object surface was observed using a metallographic microscope. The magnifications performed are 0.25x, 0.3x, 0.4x, 0.65x, 0.90x. The hardness test method is carried out by placing AISI 6150 alloy steel on the emphasis on the Vickers test apparatus, then starting the pressing with the indenter pressing the surface of the AISI 6150 alloy steel. The results of the suppression of the indenter in the form of a pyramid-shaped basin were measured using a microscope, then the diameter of the kite was observed. Then, after the two diameters of the compression marks are known, the value of HV10 will appear. The weight of the load used in the suppression is 10 kg with a pressing time of 10 seconds. Meanwhile, for testing the microstructure on the surface of the AISI 6150 steel alloy, the surface is evenly distributed using sandpaper, etching, and autosol. The test method is that the surface of the alloy steel is first smoothed with an automatic sanding machine with a level of fineness of sandpaper, in order from the smallest to the largest (90-2000). Then after smooth, the surface of the alloy steel is dripped with etching, the etching used is Nital. After being dripped with etching, then the surface of the object specimen is glossed using an autosol. After that, the object surface was observed using a metallographic microscope. The magnifications performed are 0.25x, 0.3x, 0.4x, 0.65x, 0.90x.

The results of the hardness test are the average hardness and standard deviation. For the average hardness, seven samples were used for each specimen in order to minimize errors. Through this test, it is known that the faster the cooling, the harder and more brittle the material. Vice versa, the slower the cooling, the more ductile and soft the material is. While the results of the microstructure testing

are in the form of image captures depicting the surface of AISI 6150 alloy steel from a metallographic microscope. After taking pictures of the surface, an analysis is carried out on the formed phases where each phase has different characteristics. This phase difference is due to the different treatment given.

Keywords : Alloy Steel AISI 6150, Metallographic Microscope, Unbalanced Cooling, Vickers.

