

ABSTRAK

Mochamad Fani Nur Umri. “Analisis Pengaruh Variasi Temperatur Partitioning Metode Q-P-T *Heat Treatment* Terhadap Sifat Mekanik Baja Karbon Rendah ASTM A36”.

Skripsi. Probolinggo. Program Studi Teknik Mesin, Fakultas Teknik Dan Informatika, Universitas Panca Marga, 2024.

Seiring dengan perkembangan zaman dan teknologi, penggunaan logam sebagai bahan utama operasional atau sebagai bahan baku industri semakin tinggi. Baja karbon banyak digunakan terutama untuk membuat alat-alat perkakas, alat pertanian, komponen otomotif dan peralatan rumah tangga. Dari perkembangan zaman tersebut, material logam (baja) dilakukan rekayasa sifat logam dengan cara perlakuan panas (*Heat Treatment*). Pada penelitian ini dilakukan perlakuan panas pada baja ASTM A36 menggunakan metode Q-P-T variasi temperatur *partitioning* 300°C, 350°C, dan 400°C selama 15 menit kemudian dilakukan pengujian mekanik yaitu uji kekerasan, uji tarik dan uji mikrostruktur. Dari hasil penelitian didapatkan nilai kekerasan tertinggi pada variasi temperatur *partitioning* 300°C yaitu sebesar 164 VHN. Dari pengujian tarik nilai tegangan maksimum tertinggi pada variasi temperatur *partitioning* 300°C yaitu sebesar 515,73 MPa, nilai regangan tertinggi pada variasi temperatur *partitioning* 400°C sebesar 21,08% dan nilai *modulus elastisitas* tertinggi pada variasi temperatur *partitioning* 400°C sebesar 11,47 GPa. Sedangkan pada pengujian mikrostruktur menghasilkan fasa *pearlite* dan *ferrite*. Fasa *pearlite* tertinggi pada variasi temperatur *partitioning* 300°C sebesar 38,5%.

Kata kunci : ASTM A36, *Heat Treatment*, Pengujian Mekanik, Q-P-T.

ABSTRACT

Mochamad Fani Nur Umri. " Analysis of the Effect of Partitioning Temperature Variations Q-P-T Heat Treatment Method on the Mechanical Properties of ASTM A36 Low Carbon Steel".

Essay. Probolinggo. Mechanical Engineering Study Program, Faculty Of Engineering And Informatics, Panca Marga University, 2024.

Along with developments in time and technology, the use of metal as the main operational material or as an industrial raw material is increasing. Carbon steel is widely used, especially to make tools, agricultural tools, automotive components and household equipment. From the development of that era, metal materials (steel) were engineered for metal properties by means of heat treatment. In this research, heat treatment was carried out on ASTM A36 steel using the Q-P-T method, varying partitioning temperatures of 300°C, 350°C and 400°C for 15 minutes, then mechanical tests were carried out, namely hardness tests, tensile tests and microstructural tests. From the research results, it was found that the highest hardness value was at a partitioning temperature variation of 300°C, namely 164 VHN. From the tensile test, the highest maximum stress value at the 300°C partitioning temperature variation was 515.73 MPa, the highest strain value at the 400°C partitioning temperature variation was 21.08% and the highest elastic modulus value at the 400°C partitioning temperature variation was 11.47 GPa . Meanwhile, microstructural testing produces pearlite and ferrite phases. The highest pearlite phase at a partitioning temperature variation of 300°C was 38.5%.

Keywords: ASTM A36, *Heat Treatment*, *Mechanical Testing*, Q-P-T