

ABSTRAK

Angga Prasmana. “Analisis Pengaruh *Post Weld Heat Treatment* (PWHT) Metode Q-P-T Terhadap Sifat Mekanik Baja SS400”.
Skripsi. Probolinggo. Program Studi Teknik Mesin, Fakultas Teknik Dan Informatika, Universitas Panca Marga, 2023.

Kereta cepat di Indonesia masih menggunakan *double rell* sehingga gaya gesek dan getarannya masih sangat tinggi, dengan demikian dapat menimbulkan kegagalan las terhadap sambungan las seperti retak, lepas, maupun patah pada sambungan rangka, pintu dan pada gerbang karena mengalami pengerasan di sambungan las. Melalui penelitian ini dilakukan PWHT baja SS400 Metode Q-P-T variasi *holding time partitioning* 10 menit, 15 menit, dan 20 menit pada temperatur 350°C kemudian dilakukan pengujian mekanik yaitu uji tarik, uji kekerasan dan uji mikrostruktur. Dari hasil penelitian didapatkan nilai kekuatan tarik rata-rata tertinggi pada variasi *holding time* 10 menit dengan nilai 301, 18 MPa dan elongasi 18,45%. Uji kekerasan pada *Base Metal* tertinggi di variasi *holding time* 10 menit sebesar 133 VHN, uji kekerasan pada HAZ tertinggi pada variasi *holding time* 15 menit sebesar 133 VHN dan uji kekerasan pada *Weld Metal* tertinggi pada variasi *holding time* 10 menit sebesar 213 VHN. Mikrostruktur yang didapat yaitu *pearlite* dan *ferrite* dengan nilai *pearlite* tertinggi pada *Base Metal* dan Haz dimiliki variasi *holding time* 15 menit sebesar 11,2% dan 19%, sedangkan pada *Weld Metal* dimiliki variasi *holding time* 10 menit sebesar 33%. Metode ini menghasilkan kekuatan tarik dan kekerasannya mengalami penurunan tetapi elongasi dan tingkat keuletannya meningkat.

Kata kunci : Pengujian Mekanik, PWHT, SS400, Q-P-T.

ABSTRACT

Angga Prasmana. "Analysis Of The Effect Of Post Weld Heat Treatment (PWHT) Q-P-T Method On The Mechanical Properties Of SS400 Steel".

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Fast trains in Indonesia are still using double rails, which results in very high frictional and vibration forces, there by causing weld failure of welded joints such as cracks, detaches, or breaks in frame joints, doors and at gates due to hardening of welded joints. Through this research, PWHT of SS400 steel was carried out using the Q-P-T method, holding time partitioning variations of 10 minutes, 15 minutes, and 20 minutes at a temperature of 350°C and then mechanical testing was carried out, namely tensile tests, hardness tests and micro structural tests. From the research results, it was found that the highest average tensile strength value was in the 10-minute holding time variation with a value of 301.18 MPa and 18.45% elongation. The highest hardness test on Base Metal was in the 10 minute holding time variation of 133 VHN, the highest HAZ hardness test was in the 15 minute holding time variation of 133 VHN and the highest Weld Metal hardness test was in the 10 minute holding time variation of 213 VHN. The obtained microstructures are pearlite and ferrite with the highest pearlite values for Base Metal and HAZ, which have a 15-minute holding time variation of 11.2% and 19%, while Weld Metal has a 10-minute holding time variation of 33%. This method resulted in a decrease in tensile strength and hardness but increased elongation and ductility.

Keywords: Mechanical Testing, PWHT, SS400, Q-P-T