

Pengaruh proses pengelasan pada AISI 304 terhadap pembentukan presipitasi carbida dan sifat mekanik dengan media pendingin udara dan air

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Abstrak

ABSTRAK

Baja tahan karat austenitik adalah material logam yang sangat banyak digunakan untuk alat-alat industri dan alat-alat transportasi, karena memiliki sifat mekanik dan sifat fisik serta ketahanan terhadap korosi yang baik. Dalam masalah ini telah dilakukan penelitian tentang penjelasan plat baja tahan karat austenitik tipe 304 dengan metode GTAW (Gas Tungsten Arc Welding) dan SMAW (Shield Metal Arc Welding) untuk menganalisa tentang aspek kekuatan mekanik serta pengaruh terhadap presipitasi carbida. Guna mengetahui faktor yang berpengaruh terhadap hasil lasan, maka dibuat variabel arus yaitu 125 A, 110 A, 105A dan 95A dengan media pendingin udara dan air. Dari hasil percobaan ini dilakukan uji metalografi, uji tarik, uji kekerasan. Pada uji mikro struktur di daerah deposit las, sampel no. 4 memperlihatkan butiran besar yang tidak kontinyu sedangkan pada sampel no. 7 terdapat porositi. Dari uji tarik diperoleh hasil, kedua sampel tersebut putus pada daerah las-lasan dengan nilai kekerasan paling tinggi yaitu 172 Hv dan 168 Hv. Laju pendinginan mempengaruhi proses terjadinya presipitasi carbida. Makin lambat waktu pendinginan semakin banyak jumlah presipitasi carbida yang terjadi, seperti ditunjukkan pada spesimen GT 105/12, GT 125/12 dan SM 110/23. Dari photo mikro diperoleh perbedaan bahwa presipitasi carbida pada batas butir dengan pendinginan udara lebih tampak hitam dibandingkan dengan pendinginan air. Lebar pita daerah yang mengalami presipitasi tergantung pada input panas yang diberikan.

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Abstract

The austenitic corrosive resistive steel is a metallic material used extensively in industrial and transportation equipments, it is said so due to they have both good mechanical and physical properties as well as their good corrosive resistive resistance. In this case, there had been done such a welding of an austenitic resistive steel plate type 304 using both methods such as GTAW (Gas Tungsten Arc Welding) to analyze the aspect of its mechanical strength and its effect towards carbide's precipitation To recognize its factor which effects the result of welding, so there had been created many different variables of electrical current such as 125 A, 110 A, 105 A and 95 A using both cooling medias such as air and water. From this experimental result there had been done such a metallographic testing for both tensile testing and testing of its strength. For its

structural micro testing on the site of welding's deposit, a no. 4 sample shown such a big uncontinued granule, and for a no. 7 sample there are porosities. From their tensile testing shown such many broken weldings with its highest strength of 172 Hv and 168 Hv respectively for its progressiveness of cooling which effect the process of carbide's precipitative creation, shown that, the length of time's cooling could determine, the number of carbide's precipitation to be created, such had been shown by the specimens of GT 105/12, GT 125/12 and SM 110/123. From the micro photo there had been obtained, that there had been shown such a different carbide's precipitation, darker for a granule's threshold with a more air cooling compared to the water cooling. For the wideness of band, it is depend on the heat input to be given.