

Perilaku korosi pada pengelasan dissimilar baja karbon ASTM A36 dengan baja tahan karat SS316l = Corrosion behavior at dissimilar metal welding between carbon steel ASTM A36 and stainless steel SS316l

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Abstrak

ABSTRAK

Tesis ini membahas perilaku korosi dari pengelasan dissimilar antara baja karbon ASTM A36 dan baja tahan karat SS316L dengan kawat las E309L menggunakan prosedur pengelasan SMAW dan GTAW untuk dibagian root. Plat baja tahan karat dan baja karbon dengan ketebalan 10 mm dan 15 mm dilas, dipotong, diberi perlakuan panas tempering, dilakukan pengamatan mikrostruktur dan kemudian diuji secara elektrokimia. Pengujian secara elektrokimia meliputi uji electro impedance spectra (EIS), Potentiodynamic Polarization, Cyclic Voltametry. Oleh karena inti las baja tahan karat biasanya lemah terhadap korosi terlokalisasi, maka uji celup korosi sumuran ASTM G48 metode A dilakukan demi pengujian menyeluruh perilaku korosi pada pengelasan dissimilar ini. Hasilnya menunjukkan bahwa proses tempering akan meningkatkan ketahanan korosi pengelasan dissimilar. Pengelasan dissimilar tebal plat 15 mm menunjukkan ketahanan korosi yang lebih lemah dibandingkan plat 10 mm, dimana setelah diamati jumlah weld pass yang lebih banyak pada plat 15 mm mempengaruhi struktur mikro dan ketahanan korosi dari pengelasan dissimilar.

ABSTRACT

The focus of this study was addressed to observe corrosion behavior at dissimilar metal welding between carbon steel ASTM A36 and stainless steel 316L with E309L as weld consumables using SMAW and GTAW procedure at root weld. Stainless steel and carbon steel plate of 10 mm and 15 mm thickness were welded, cut, heat treated (tempered), observed for microstructure and then tested electrochemically. Electrochemical testing included electro impedance spectra (EIS), Potentiodynamic Polarization, Cyclic Voltametry. The core welding of stainless steels are known vulnerable to localized corrosion, hence the pitting corrosion immersion test ASTM G48 method was done for a thorough observation of welding dissimilar corrosion behavior. The results showed that the tempering process improved corrosion resistance of dissimilar weld. It was observed that dissimilar welding of 15 mm thickness was more susceptible than plate 10 mm. It is related to the number of weld passes which affect the microstructure and corrosion resistance of the weld dissimilar.