Evaluation of the corrosion behavior of the base metal and weld metal sections of the super duplex stainless steel UNS S32750

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Abstract
In this study, the corrosion behavior of super duplex stainless steel UNS S32750 and tungsten arc welding with filler metals AWS ER2594 duplex stainless steel in acidic solution containing chloride ions have been investigated. Microstructure of weld joints evaluate by light and electron microscope and corrosion behavior examine by open circuit potential and cyclic polarization tests. The results showed that increas in heat input leads to a change in the distribution of alloying elements, formation of intermetallic phases around grain boundaries and the shifting balance between austenite and ferrite in phases in weld region. Based on the cyclic polarization tests, cross-weld and base metal active behavior and have good corrosion resistance due to the presence of high alloying elements. As well as increase in heat input leads to an increase in current density and decrease in the pitting potential.

Keywords: Super Duplex Stainless Steel UNS S32750, Gas Tungsten Arc Welding, Cyclic Polarization Test, Passive Current Density, pitting potential.