Quenching Effects To Mechanical Properties And Corrosion Resistance On Welded Material Super Duplex UNS S 32750

M. Anis, P.A Perdana, J.W.Soedarsono, D.Ferdian
Dept. Metallurgy and Material, Engineering Faculty University of Indonesia
Kampus Baru UI Depok, 16424
Email: deni@metal.ui.ac.id

Abstract

Ferrite – Austenitic Steels or Super Duplex Stainless Steels are widely applied in oil and gas industry due to their superiority against intergranular, pitting and crevice corrosion. They were mainly used on piping system, especially in Production Flowlines and other supporting equipments. On their application, a welding process was used. The most frequent problems occur in welding stainless steel is carbide formation and precipitation at grain boundaries known as sensitization, which will reduce corrosion resistance and strength of the welded joints. The aim of this research is to learn more about the effect of quenching to mechanical properties and its corrosion resistance of Super Duplex Stainless Steel. GTAW welding process and quench medium air, water and oil was used. Furthermore, the samples subjected to hardness testing, microstructure examination, ferrite content analyzer, immersed solution testing (on temperature 40ºC) in order to find out relationship among hardness value, ferrite content, and corrosion resistance of Super Duplex. The result showed quench medium have an influence on weld microstructure morphology. Corrosion test by immersion method revealed water quench have a better corrosion resistance compared to air and oil quench.

Keyword: duplex stainless steel, corrosion resistance, GTAW