

Effect of Postweld Soaking Temperature on Mechanical Properties of AISI 1018 Steel Plate Welded in Aqueous Environment

Authors : Yahaya Taiwo, Adedayo M. Segun

Abstract : This study investigated the effect of postweld soaking temperature on mechanical properties of AISI 1018 steel plate welded in aqueous environment. Pairs of 90 x 70 x 12 mm, AISI 1018 steel plates were welded with weld zone beyond distance 10 mm from weld centerline immersed in a water jacket at 25°C. The welded specimens were tempered at temperature of 200, 300, 400, 500 and 600°C for 1.5 hours. Tensile, hardness and toughness tests at distances 15, 30, 45 and 60 mm from the weld centreline with micro structural evaluation were carried out. The results show that the aqueous environment as-weld sample exhibited higher hardness and tensile strength values of 45.3 HV and 448.12 N/mm² respectively while the hardness and tensile strength of aqueous environment postweld heat treated samples were 44.9 HV and 378.98 N/mm². This revealed 0.82% and 15.4% reduction in hardness and strength respectively. The metallographic tests showed that the postweld heat treated AISI 1018 steel micro structure contained tempered martensite with ferritic structure and precipitation of carbides. Postweld heat treatment produced materials of lower hardness and improved toughness.

Keywords : air weld samples, aqueous environment weld samples, soaking temperature, water jacket

Conference Title : ICMME 2015 : International Conference on Mechanical and Materials Engineering

Conference Location : Amsterdam, Netherlands

Conference Dates : May 14-15, 2015