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Analyze the Effect of Weld Heat Input on Mechanical Properties of Nitrogen Alloyed Stainless Steel by GMAW Process

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Abstract: *GMAW process in the recent research work investigates the effect of heat input, feed rate, voltage, current (controlled by GMAW Process) on the tensile strength, micro-hardness and microstructure of nitrogen alloyed stainless steel (JT grade). The base material used for the investigation was Nitrogen Grade austenitic stainless steel (JT Grade) with the low percentage of nickel content. JT grade steel has good resistance to oxidation, easy fabrication, and excellent toughness even in the low temperatures. It is not expensive as lower cost nitrogenand manganese are added as partial alternative for nickel. The yield and ultimate tensile strength of the base metals and welding filler was to be calculated to get the best desirable properties of the welding process. The microstructure, macro-structure and chemical test onthe metal plates were done to study about their properties. The numbers of trials are to be donefor getting the best and appropriate parameters. And the last testing were done on the best parameters(heat input, voltage, current) on the base metal of JT grade to test the micro- hardness and tensile strength of the metal and welding. The 3 types of filler metal ER308L, ER309L, and ERNiCrMo3 were used during the welding process in GMAW to study these effects. The hardness were tested at the HAZ area and WELD area and the location of fracture from welding area were consider during the testing to get the tensile strength of the weld.*

Keywords: GMAW, UTS, Hardness, Taguchi method, Microstructure analysis, filler metal electrode

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