

Effect of Welding Processes and Heat Input on Corrosion behaviour of Ferritic Stainless Steel 409M

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ABSTRACT

In the present work, Ferritic stainless steel 409M is welded with shielded metal arc welding (SMAW), gas metal arc welding (GMAW) and gas tungsten arc welding (GTAW) of welding current 90A, 100A and 110A. Four mm thick plates were used as base material and single V-joint was prepared for welding. Single pass welding was carried out. Microstructures in the transverse section were observed for base metal, Heat Affected Zone (HAZ) and weld joint. Corrosion rate of welded joints have been evaluated by weight loss method in sodium chloride (NaCl) solution. In this investigation results reveal that, corrosion rate of welded joint is more than the base metal. It is also found that corrosion rate increases on increasing welding current. It is observed that corrosion rate is more in SMAW than GMAW and GTAW. Results are discussed in the light of microstructure. Increased corrosion rate is attributed to welded structure and formation of HAZ due to welding heat.

Keywords: 409M FSS; GTAW; GMAW; SMAW; Corrosion rate