

## The Effects of Gas Metal Arc Welding Parameters on the Corrosion Behaviour of Austenitic Stainless Steel Immersed in Aqueous Sodium Hydroxide

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**Abstract :** This work present the effects of some gas metal arc welding parameters on the corrosion behavior of austenitic stainless steel, exposed to 0.5M sodium hydroxide at ambient temperatures (298K) using conventional weight loss determination, together with surface morphology evaluation by scanning electron microscopy and the application of factorial design of experiment to determine welding conditions which enhance the integrity of the welded stainless steel. The welding variables evaluated include speed, voltage and current. Different samples of the welded stainless steels were immersed in the corrosion environment for 8, 16, 24, 32 and 40 days and weight loss determined. From the results, it was found that increase in welding current and speed at constant voltage gave the optimum performance of the austenitic stainless steel in the environment. At a of speed 40cm/min, 110Amp current and voltage of 230 volt the welded stainless steel showed only a 0.0015mg loss in weight after 40 days. Pit-like openings were observed on the surface of the metals indicating corrosion but were minimal at the optimum conditions. It was concluded from the research that relatively high welding speed and current at a constant voltage gives a good welded austenitic stainless steel with better integrity.

**Keywords :** welding, current, speed, austenitic stainless steel, sodium hydroxide

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