

## Investigation of Optimal Parameter Settings in Super Duplex Stainless Steel Welding

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**Abstract :** Super steel materials play vital role in construction and fabrication of structural, piping and pipeline components. They enable to minimize the life cycle costs in assuring the integrity of onshore and offshore operating systems. In this context, Duplex stainless steel (DSS) material related welding on constructions and fabrications play a significant role in maintaining and assuring integrity at an optimal expenditure over the life cycle of production and process systems as well as associated structures. In DSS welding, the factors such as gap geometry, shielding gas supply rate, welding current, and type of the welding process play a vital role on the final joint performance. Hence, an experimental investigation has been performed using engineering robust design approach (ERDA) to investigate the optimal settings that generate optimal super DSS (i.e. UNS S32750) joint performance. This manuscript illustrates the mathematical approach and experimental design, optimal parameter settings and results of verification experiment.

**Keywords :** duplex stainless steel welding, engineering robust design, mathematical framework, optimal parameter settings

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