International Journal of Mechanical Engineering (IJME)
ISSN(P): 2319-2240 ; ISSN(E): 2319-2259
Vol. 5, Issue 1, Dec – Jan 2016, 63-72

International Academy of Science, Engineering and Technology
Connecting Researchers; Nurturing Innovations

MODELLING & ANALYSIS OF 'ASTM 500 GRADE B' WELDMENTS

ALLADI PREM KUMAR[1] & CH. SIVA RAMAKRISHNA[2]

[1]PG Student, Vignan's Institute of Information Technology, Visakhapatnam, Andhra Pradesh, India

[2]Associate Professor, Vignan's Institute of Information Technology, Visakhapatnam, Andhra Pradesh, India

ABSTRACT

This study aims to examine the mathematical modeling and analysis of process parameters and bead geometry. To perform the research to predict optimal bead geometry (Bead width, Depth of Penetration, Reinforcement height) through the analysis of experimental data. For this, curvilinear equations were developed to predict bead geometry, but also interactions between process parameters and bead geometry were analyzed through Experimental analysis. The data generated through experimental studies conducted in this study has employed to validate its effectiveness for the optimization of bead geometry on process parameters (welding current, Gas flow rate and welding speed), and to present the criteria to control the process parameters to achieve a good bead geometry. By applying Taguchi method, process parameters (welding current, Gas flow rate and welding speed) and bead geometry (Bead width, Depth of Penetration, Reinforcement height,) were analyzed. This study has developed mathematical models and Regression analysis is used to predict or control the bead geometry in TIG welding process, to which Taguchi theory was applied for sensibly to the process parameters. In this case study, the influence of type of current, gas flow rate, TIG Machines settings and shielding gases which are most important in determine arc stability, arc penetration and good bead geometry. Thorough literature survey is carried out on various aspects of the proposed topic to identify the suitable range of current, gas flow rate and welding speed required for high quality TIG welding process.

KEYWORDS: Modeling, Process Parameters, Taguchi Method, TIG Welding, Welding Optimization