

عنوان مقاله:

Taguchi-based optimization technique for activated tungsten inert gas welding process

محل انتشار:

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خلاصه مقاله:

In order to improve the performance of TIG welding process different methods have been proposed among which, activated tungsten inert gas (A-TIG) welding process is the most important one. In this study, Taguchi method, regression modeling and analysis of variance have been used to model and optimize A-TIG welding process. In this paper SiO₂ nano-particles have been considered as an activating flux. To gather the required data, Taguchi method has been employed. Then, process response parameters have been measured and their corresponding signal to noise (S/N) ratio values have been calculated. Different regression equations have been applied to model the process. Based on statistical findings, the most fitted models have been selected as an authentic representative of the process. Next, S/N analysis, in such a way that weld width minimized and depth of penetration is maximized has been used. Finally, experimental performance evaluation tests have been carried out, based on which it can be concluded that the proposed procedure is quite efficient (with less than 7% error) in modeling and optimization of A-TIG welding process.

کلمات کلیدی:

activated TIG welding process, depth of penetration, weld bead width, design of experiments, and signal to noise analysis.

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