Optimization Of Flux Cored Arc Welding (FCAW) By Cube Composite Design And Desirability Function

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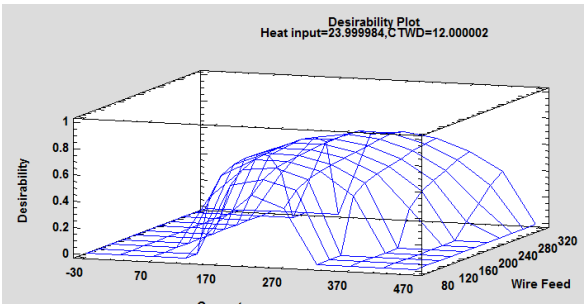
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Abstract

FCAW is one of those welding processes which is increasingly being used in many varieties of fabrication and manufacturing industries due to high production rate and ease of work in windy outdoor condition. Important parameters which affect FCAW process are amperage, arc length, travel speed, and electrode angles. In this paper we have focused and studied important controllable factor's effects on weld hardness, bead width, deposition rate and reinforcement height to find best weld during welding in mobile or outdoor welding shop in dusty and windy conditions by performing response surface methodology (RSM) and desirability analysis. Quality of welds is defined as "the level of perfection that welds exhibit pertaining to the entire volume of weldment as well as to the profile of weld surface appearance". With reference to quality weld definition as defined above, the study is performed to find out the best welding condition whereas best weld is the weld with hardness value as nominal the best, tensile strength value with "larger the best", bead width value "nominal the best", discontinuities number per weld's count value "smaller the best". Productivity in term of quality is defined as an optimum blend of parameters which inevitably develop minimum or no defect then the process will result in high productivity. The study will contribute welding research work in terms of points as described, firstly to enhance the knowledge of welding process and analysis by utilizing DOE along with desirability function, secondly ability to provide narrow window of weld process parameter to produce the quality weld and thirdly to study the FCAW process for mobile welding shop in the toughest condition such as the windy and dusty environment.

Image



Recent Publications

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2. Arivazhagan, Sundaresan, and Kamaraj, [2009] "Composition on the toughness of flux-cored arc weld of modified 9Cr–1Mo (P91) steel ", Journal of Materials Processing Technology,
3. Sterjovski, Pitrun, Nolan, Dunne, and Norrish, [2006] "Artificial neural networks for predicting diffusible hydrogen content and cracking susceptibility in rutile flux-cored arc welds ", Journal of Materials Processing Technology.
4. Kannan and Murugan, [2006]: Effect of FACW parameters on duplex stainless steel clad quality, Journal of Materials Processing Technology.



Biography

Kashif Nazir has his expertise in welding work. His optimization model based on desirability function and cube composite design create new pathways for improving welding by FCAW in outdoor condition.he has built this model after years of experience in research, evaluation, and administration in actual welding on refinery and gas plants.

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Notes/Comments: