

Optimization of Process Parameters of MIG-CO2 Welding Process

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A Review on Optimization and Prediction of MIG Welding Process Parameters Using ANN

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Abstract - Welding is widely used by manufacturing engineers and production personnel to quickly and effectively set up manufacturing processes for new products. The MIG welding parameters are the most important factors affecting the quality, productivity and cost of welding. This paper presents the influence of welding parameters like welding current, welding voltage, Gas flow rate, wire feed rate, etc. on weld strength, ultimate tensile strength, hardness of weld joint, weld pool geometry of various metal material during welding. By using DOE method, the parameters can be optimize and having the best parameters combination for target quality. The analysis from DOE method can give the significance of the parameters as it give effect to change of the quality and strength of product.

Keywords - Welding, MIG welding, Parametric Optimization, ANN.

I. INTRODUCTION

Metal Inert Gas welding as the name suggests, is a process in which the source of heat is an arc formed between a consumable metal electrode and the work piece, and the arc and the molten puddle are protected from contamination by the atmosphere (i.e. oxygen and nitrogen) with an externally supplied gaseous shield of inert gas such as argon, helium or an argon-helium mixture. No external filler metal is necessary, because the metallic electrode provides the arc as well as the filler metal. It is often referred to in abbreviated form as MIG welding. MIG is an arc welding process where in coalescence is obtained by heating the job with an electric arc produced between work piece and metal electrode feed continuously. A metal inert gas (MIG) welding process consists of heating, melting and solidification of parent metals and a filler material in localized fusion zone by a transient heat source to form a joint between the parent metals. Gas metal arc welding is a gas shielded process that can be effectively used in all positions.

II. WORKING PRINCIPLE OF MIG WELDING

The electrode in this process is in the form of coil and continuously fed towards the work during the process. At the same time inert gas (e.g. argon, helium, CO₂) is passed around electrode from the same torch. Inert gas usually argon, helium, or a suitable mixture of these is used to prevent the atmosphere from oxidizing the molten metal and HAZ. When gas is supplied, it gets ionized and an arc is initiated in between electrode and work piece. Heat is therefore produced. Electrode melts due to the heat and molten filler metal falls on the heated joint.

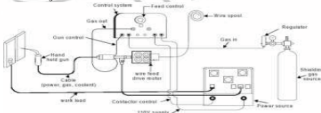


Figure 1: MIG welding Process Setup

The arc may be produced between a continuously fed wire and the work. Continuous welding with coiled wire helps high metal deposition rate and high welding speed. The filler wire is generally connected to the positive polarity of DC source forming one of the electrodes. The workpiece is connected to the negative polarity. The power source could be constant voltage DC power source, with electrode positive and it yields a stable arc and smooth metal transfer with least spatter for the entire current range.

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For modeling and optimization of a MIG-CO₂ welding process a Neuro-Genetic approach has been presented in this book. The effect of the process parameters .Hooda A, Dhingra A and Sharma S Optimization of mig welding process parameters to predict maximum yield strength in AISI International journal of.[7] have performed the optimization process parameters for Metal Inert Gas (MIG). Welding. This paper presented the influence of welding parameters like wire. The MIG welding parameters are the most be optimize and have the best parameters gas (MAG) welding, is a welding process in which. PDF Metal Inert Gas welding (MIG) is a widely used welding method for mild steel (low carbon steel) in For this study, process parameters such as welding current, gas flow rate and gas .. three parameters and ?ve levels to optimize the. parameters such as welding voltage, current, wire speed and gas flow rate were optimizing the MIG welding form process parameters to attain the. A metal inert gas (MIG) welding process consists of heating, melting and Optimization of process parameters is the key step in the Taguchi method for. Buy the Optimization Of Process Parameters Of Mig-co₂ Welding Process online from Takealot. Many ways to pay. Free Delivery Available. Non-Returnable. By using DOE method, the parameters can be optimize and MIG is an arc welding process where in coalescence is obtained by heating the job with an. Abstract: The main aim of this work was to evaluate the influence and optimize the factors of the. TIG-MIG/MAG hybrid welding process on the. Metal Inert Gas welding (MIG) process is an important component in many industrial of mild steel& optimize the welding parameters. By using DOE method, the parameters can be optimize and MIG is an arc welding process where in coalescence is obtained by heating the job with an electric. Gas metal arc welding is a welding process which has various industrial applications. In GMAW an electric arc produced between electrode & work piece metals. Investigation of MIG welding parameter optimization for surface quality is .. (GMAW). It is a welding process in which an electric arc forms between a. Optimization of Process Parameters of MIG-Co₂ Welding Process. Das Biswajit (author). Published by LAP Lambert Academic Publishing (). [2] have done work on optimization of gas metal arc welding process parameter for increase quality and productivity of weldment. In this research work for.

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