Dr. Sumita Chaturvedi
Er. Yaqoob Ansari

WELDING
TECHNOLOGY

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By

Er. Sumita Chaturvedi

Er. Yaqoob Ansari

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Mr. Sumit Dutt Sharma
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India
Prof. K.M. Moeed
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India
Er. Sumita Chaturvedi
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India

ABSTRACT

A multi-response optimization problem has been developed in search of an optimal parametric combination to yield favorable bead geometry of submerged arc bead on plate weldment. Taguchi's L25 orthogonal array (OA) design and the concept of signaltonoise ratio (S/N ratio) have been used to derive objective functions to be optimized within experimental domain. The objective functions have been selected in relation to parameters of bead geometry viz. Welding Voltage, Wire Feed, Travel Speed and Stickout. In this paper; determination of the welding process parameters for obtaining an optimal weld bead geometry in submerged arc welding is presented. The Taguchi method is used to formulate the experimental layout, to analyze the effect of each welding process parameter on the weld bead geometry, and to predict the optimal setting for each welding

STUDY OF THE EFFECT OF THE APPLICATION ON AXIAL MAGNETIC FIELD ON UNDER WATER WELD BEAD SHAPE CHARACTERISTICS

Ishrat Jamal
Department of Mechanical Engineering, Integral University, Lucknow (U.P.), India
Dr. Shahnawaaz Alam
Department of Mechanical Engineering, Integral University, Lucknow (U.P.), India
Er. Shara Khursheed
Department of Mechanical Engineering, Integral University, Lucknow (U.P.), India

ABSTRACT

Welding is playing an important role in the expansion and production of our industries. Welding has become one of the principal means of fabricating and repairing the metal products. Welding is a fabrication or sculptural process that joins materials, usually metals or thermoplastics, by causing coalescence. This is often done by melting the work pieces and adding a filler material to form a pool of molten material (the weld pool) that cools to become a strong joint, with pressure sometimes used in conjunction with heat, or by itself, to produce the weld. This chapter deals with the study of the effect of the application on axial magnetic field on under water weld bead shape characteristics.

A HYBRID METHODOLOGY FOR OPTIMIZING MIG WELDING PROCESS PARAMETERS IN JOINING OF DISSIMILAR METALS

Mohammad Saif
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India
Er. Sumita Chaturvedi
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India

ABSTRACT

In this paper application of Taguchi and Grey relational analysis methodologies in determining optimal process parameters for MIG Welding are presented. Taguchi method is widely used in designing the optimal experiments, while grey relation analysis is useful in decision making when multiple criteria's are considered, this combination serves as an effective tool in determining the optimal parameters of the pro- cess. In the present work welding current, voltage, speed, bevel angle were considered as input parameters in joining two dissimilar metals (AISI1044 & AISI1018), as these influence the output characteristics like tensile strength and hardness, these parameters need to be optimized.

OPTIMIZATION OF RESISTANCE SPOT WELDING PARAMETERS USING TAGUCHI METHOD

Ms. Zoha Nasir
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India
Dr. Shahnwaz Alam
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India
Er. Sumita Chaturvedi
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India

ABSTRACT

Resistance spot welding process is one of the oldest method used to join metals with the help of its material resistance and pressure. It is less costly and highly productive, therefore it's being used in various industries from past to present date and have a great future ahead.

The weld is made by a combination of heat, pressure, and time parameters. As the name implies, it uses the resistance of the materials to the flow of electric current that causes a localized heating in the parts to be joined. Understanding of physical mechanisms for easily manipulating and controlling weld qualities in advance is extremely important.

This dissertation represents the optimization of various parameters of resistance spot welding. The experimental studies have been

OPTIMIZATION OF PROCESS PARAMETERS OF RESISTANCE SPOT WELDING FOR GALVANIZED STEEL SHEET

Mr. Faraz Ahmad
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India
Dr. Shahnwaz Alam
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India

ABSTRACT

This work presents an investigation of the effect and optimization of welding parameters on the tensile shear strength of galvanized steel sheets welded by the Resistance Spot Welding (RSW) process. The RSW process becomes important in joining of sheets in Automobile and Aircraft industries and hence attracts researchers to investigate this process for better results of tensile shear strength. The experimental studies were conducted under varying electrode forces, welding currents, electrode diameters, and welding time. The selection of the values of independent welding parameters was determined by using the Taguchi experimental design method. The optimum welding parameters combination was obtained by using the analysis of signal-to-noise (S/N) ratio. The confirmation tests on welded G.I. sheets by RSW process indicates that it is possible to increase tensile shear strength significantly by using the Taguchi experimental design method. The experimental results obtained from

PARAMETRIC OPTIMIZATION OF MIG WELDING PARAMETERS OF EN-31 USING TAGUCHI APPROACH

Ahsan Jameel
Ansari Department of Mechanical Engineering, Integral University, Lucknow (U.P.), India
Mohd. Faizan Hasan
Department of Mechanical Engineering, Integral University, Lucknow (U.P.), India
Er.Sumita Chaturvedi
Department of Mechanical Engineering, Integral University, Lucknow (U.P.), India

Many researches had been performed in the field of welding and the technology is advancing day by day. MIG welding is a technique of joining to metal pieces in an inert gas environment using a wire electrode constantly fed for producing arc and acts as filler metal for the weld pool. Almost all the metals can be easily welded by MIG welding process from copper to aluminium, low carbon steels and other alloy steels. The present investigation for optimization of MIG welding of EN-31 is conducted to establish the influence of MIG welding process parameters on hardness and surface roughness. From the experimental results it is concluded that welding speed is the main influencing parameter for hardness while welding current is least influencing for it. For the case of surface roughness, welding current has major dominance while other parameters were less effective.

INVESTIGATION OF EFFECT OF WELDING PARAMETERS ON WELD BEAD SHAPE PROFILE OF UNDERWATER WELDS

Er.Wasiq,
Department of Mechanical Engineering, Integral University, Lucknow (U.P.), India
Dr. Shahnwaz Alam,
Department of Mechanical Engineering, Integral University, Lucknow (U.P.), India
Er. Sumita Chaturvedi,
Department of Mechanical Engineering, Integral University, Lucknow (U.P.), India

ABSTRACT

This work was undertaken to provide a means of welding steel in a water environment that was just as simple as the existing „open water" technique but gave results intermediate between the open water and the „dry chamber" (a costly and cumbersome) technique. A small gas trapping shroud was developed by means of a waterproofing paint of a suitable type and thickness. This should keep the water away from the arc and weld-pool region and reduced its cooling rate which in turn reduced the tendency to form undercuts. Different types of flux coated electrodes were also investigated for their performances in underwater welding. Iron-oxide electrodes (E422413), coated with lacquer paints, were found to give the best mechanical properties for the weld. The effect of cooling in wet medium on the welding was also studied and it was found that the

STATISTICAL MODELING RELATING WELDING PARAMETERS AS TEMPERATURE, GAP BETWEEN GAS NOZZLE AND WORK PIECE WITH MECHANICAL PROPERTIES OF HOT AIR WELDED HARD PVC   PLASTIC

Gulam Rasul,
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India
Mahmood Alam,
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India
Shara Khursheed,
Department of Mechanical Engineering, Integral University,
Lucknow (U.P.), India

Development of plastic joining technology is now very important for the advancement of the car industry, telecommunication, construction industry and medical technology. The plastics materials are increasingly being used in structure and engineering application. In all markets including automobile, Appliance, and electrical, there is a higher Demand of plastics materials to produce more complex and stable parts than ever.

There are a number of methods to joining thermoplastics, which include hot gas (air) hand welding, hot gas (air) extrusion welding, butt fusion (heated element welding), friction welding, laser welding and high frequency welding. In the following, hot gas (air) hand