

Optimization of Welding Operation Parameter by Using Taguchi Method and MATLAB Regression Modeling

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Abstract: *Welding is a generalized coalescence of metals, wherein coalescence is obtained by heating to suitable temperature, with or without the applications of pressure and with or without the use of filler metal. The large massiveness of materials that are welded metals and their alloys, although the term welding is also applied to the fastening of other materials such as thermoplastics. Welding joins different metals/alloys with the help of a number of processes in which heat is supplied either electrically or by means of a gas torch. As on joining two similar/dissimilar metal work parts there are several factors affects the welding zone such as environmental contamination, filler material, metal shape and others. These all factors affect the welded material and depict poorer strength of welded material as on using at various required areas. In this study, we discuss on welding operation parameters which affect on welding strength and for this tremendous occurrence we use different parameters such are Electrode Diameter, Hardness and joint also. These all-selected parameters use at different levels in experiment such Electrode diameter change at various levels as small, medium and high and for Hardness taken as differ given values as for soft, medium and hard material and for joint taken as Bevel, V-joint and J-joint also. In this study we use TAGUCHI and MATLAB regression techniques with ANOVA methodology and comparing actual result with predicted results which is achieved by using both technogies and achieving formulas which shows different strength by putting various values of electrode diameter and Hardness.*

Keywords: Hardness, Welding Electrode, Welding joint, Material, Strength, filler metal

Conclusions

The result obtained from the confirmation experiments reveals that the Taguchi Design of Method has provided the good prediction for the response variable (breaking strength) i.e. **375.63 N/mm² (By Taguchi Method)** and is close to **381.89 N/mm² (actual result)**.

References

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