

# APPLICATION OF THE TAGUCHI METHOD COMBINED WITH GREY RELATIONAL ANALYSIS FOR THE OPTIMIZATION OF THE SUBMERGED ARC WELDING PROCESS

N. Ene<sup>1</sup>, E. Scutelnicu<sup>2</sup>

<sup>1</sup>ESAB Romania Trading S.R.L., Bucharest, Romania

<sup>2</sup>“Dunarea de Jos” University of Galati, Manufacturing Engineering Department, Romania  
47 Domneasca St., 800008 – Galati, Tel. +40336130208

[nicusor.ene@esab.se](mailto:nicusor.ene@esab.se)

## ABSTRACT

*It is well known that all industrial processes are influenced by the control parameters. At the same time, the results of any industrial process can be assessed using several indicators describing either quality, productivity or both. Most of the times, the effects of the control parameters applied to the process, reveal adverse influences over the quality and productivity indicators. Consequently, it is necessary to find a way to optimize the process in order to get the best quality and productivity results. The hybrid method, which combines the Taguchi approach with the Grey Relational Analysis, is able to provide answers to multi criteria optimization of an industrial process. In the present study, the aim of the investigation was to identify the optimal process control parameters, able to produce the desired and predefined characteristics of the submerged arc weld bead geometry.*

**KEY WORDS:** Analysis of Variance, Design of Experiments, Trial-and-error, Orthogonal Array, Taguchi method, Grey Relational Analysis, Desirability function.

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