

# MULTI-RESPONSE OPTIMIZATION OF PROCESS PARAMETERS IN COLD METAL TRANSFER WELDING BY TAGUCHI GREY RELATIONAL ANALYSIS

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## ABSTRACT

Modified MIG Welding Process is the Cold Metal Transfer Welding Process. This process revolutionized welding of dissimilar and thick metals. This was achieved by aesthetics in the weld bead and its improvisation, metal deposition in a controlled way and input of heat at low level. It is necessary to control the mechanical properties to obtain a sound weld joint. The essential machining parameters were identified in CMT welding. An L8 Orthogonal Array was taken and butt welding of 5mm thin Austenitic steel plates were welded under the controlled conditions in Cold Metal Transfer Welding. Various quality characteristics, both mechanical and physical were inspected on the welded specimens. This paper presents the multiple quality characteristic optimization, their effectiveness, on the metal plates joined by Cold Metal Transfer welding, using Grey relational analysis (GRA) based on Taguchi method. The quality characteristics of the plates welded are improvised by these optimal parameter settings. This improvisation in quality levels achieved through optimization are more than those that are achieved by parameter settings of the machine conventionally. Finally, effect of process parameters were identified and optimum weld combinations in Cold Metal Transfer welding were identified.

**Keywords-** CMT Welding, Austenitic steel, Process Optimization, Taguchi method, Grey analysis.

