

ANALYSIS OF THE EFFECT OF WELDING RESULTS GTAW ON TENSILE STRENGTH OF 6061 SERIES ALUMINUM

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ABSTRACT

Aluminum welding can be done with a variety of processes, one of which is the GTAW (Gas Tungsten Arc Welding) process. This welding process uses a noble gas such as Argon or Helium as a shielding gas to prevent Oxygen and Hydrogen from entering the weld area. In this research method using GTAW (Gas Tungsten Arc Welding) welding with a variation of 1G welding current and position. The current used in GTAW welding is 120A, 130A and 140A. The material used is aluminum 6061 series with a thickness of 10mm with a V seam of 60°. This study aims to determine the results of tensile testing of welding results and to find out the comparative results of tensile testing on welding and non-welding processes. The results of the NDT penetration test at currents 120A and 140A showed red spots or liquid penetrant test on the surface of the weld, while with a current of 130A there were a few red spots or liquid penetrant test on the surface of the weld. In the macrostructural test analyze the results of fractures that occur ins specimen of tensile test results, and for the highest tensile test at a current of 130A with a stress value of 68.8 N/mm² and a strain value of 22.7% and for the lowest tensile value at a current of 140A with a stress value of 67, 20 N/mm² and a strain value of 16.79% so that it can be concluded that increasing the current results in the tensile test will decrease and the NDT penetrant test will affect the tensile test.

Keywords: GTAW, Aluminum 6061, tensile strength, NDT penetrant, macrostructure