

INVESTIGATION ON MICROSTRUCTURAL, MECHANICAL PROPERTIES AND CORROSION BEHAVIOUR OF Al 6061-T6 WELDED JOINTS FABRICATED BY TIG, MIG, CMT AND FSW

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ABSTRACT

The purpose of this research work is to study and comparison of the microstructure, mechanical properties (in terms of tensile strength, % Elongation, and Microhardness) and corrosion behaviour of Tungsten inert gas welding (TIG), Metal inert gas welding (MIG), Cold metal transfer (CMT) and Friction stir welding (FSW) of AA6061-T6 Al alloy plate. A total of 4 samples of AA6061-T6 plates of thickness 3 mm are fabricated at the best parameters of the different welding processes. The samples were designed and fabricated for various testing as per the ASTM standard. The joints manufactured using FSW at best parameters generated the highest tensile strength of 204.8 Mpa and percent elongation of 7.85 %. Relative to the other welding process, the MIG welding process obtained the highest hardness value due to the presence of brittle nature in the welded region. The immersion tests indicated that the highest corrosion resistance was obtained by the FSW process compare to the other welding process.

Keywords: FSW, CMT, TIG, MIG, Mechanical Properties, Corrosion behaviour

