

8th International Conference on Physical and Numerical Simulation of Materials Processing (ICPNS)

14–17 October 2016

Seattle, Washington | Hosted by Purdue University

SESSION 8: POSTER, GRAND PACIFIC BALLROOM

SUNDAY, OCTOBER 15, 2016

On the microstructure and properties of the PMIG welding joint of A7N01 aluminum alloy enhanced by supersonic wave and aging

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ABSTRACT

The microstructure, mechanical properties such as hardness and tensile fracture behavior at room temperature, and the corrosion resistance performance for the pulse melted inert gas welding (PMIG) joint of the A7N01 aluminum alloy enhanced by supersonic wave and aging were investigated in this paper. It is indicated that the dimension of precipitated phases become smaller and the distribution is more homogeneous assisted with supersonic wave when welding. The pore distribution changes from the middle and upper zones to the upper zone mainly under the assist with ultrasonic. More strengthening phase $MgZn_2$ deposited the in the A7N01 alloy after aging with optimized parameters, and the phase become finer. The tensile yield strength and the ductility of the joint increased under the coupling with the invigorating effect of the supersonic wave and aging treatment. And the corrosion resistance of the joint can be improved as well. The combination properties of the PMIG A7N01 joint can be obtained by the coupling with effect of the ultrasonic and aging according this work, and the effects on the characteristics by the treatment process were discussed in detail.