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# MAGNETIC PULSE WELDING OF AL TO MG ALLOYS: NATURE OF THE INTERFACIAL LAYER

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## ABSTRACT

*The present paper describes in detail the main characteristics of the Magnetic Pulse Welding (MPW) process and the application of this method for welding of Al-1050 to Mg alloys. The microstructural and local chemical characterization of the joint shows that the MPW process produces a mechanically induced local fusion-type weld, with an extremely small fusion zone and no heat affected zone. The bonding zone displays a discontinuous pocket type or a continuous microscopic interfacial layer along the interface; the intermetallic layer formation at the interface is explained in terms of local melting followed by rapid solidification. The most significant feature of the transition zone created during the MPW process is the hardness increase of the interfacial layer. The increase in hardness is the result of intermetallic phase formation and of fine-grained microstructure. A short heat treatment of the Al-1050 to MgAZ91 MP welded specimens causes some thickening of the interfacial layer and separation of the bonding zone into two separate layers.*

**KEYWORDS:** Magnetic Pulse Welding, Al alloys, Mg alloys, Microstructure, Intermetallic phase, Microhardness, Interfacial layer.

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