

# ROTARY FRICTION WELDING OF DISSIMILAR JOINTS AND BONDING INTERFACE CHARACTERIZATION BY EDX AND XPS

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Welding of dissimilar materials has been a challenge to engineering. The study and

development of new union processes that meet the requirements of projects in the aerospace,

nuclear and aviation sector are of great importance to the scientific and productive means. The

Rotary friction welding process (RFW) is a process of union that occurs in the solid state, without

occurrence of fusion between the parties, and that have like the main bonding mechanisms the

diffusion and mechanical mixture. This work has as objective the obtaining of dissimilar joints

involving AA 6351-T6 alloy and stainless steel AISI 304l for applications in the aerospace area.

The joints obtained by RFW who had procedures and qualified welding process have undergone the

techniques of Energy Dispersive X-Ray Spectroscopy (EDX) and X-Ray Photoelectron Spectroscopy

(XPS) for analysis of the bonding interface. Were obtained joints with superior mechanical

properties the AA 6351-T6 alloy, with the fracture occurring in aluminum away from the bonding

interface. The analyses carried out by EDX and XPS have shown the occurrence of interdiffusion

among the main elements of the materials involved. The Rotary friction welding process proved to

be a great method for obtaining of joints between dissimilar materials that are not possible by

fusion welding processes.