

# **The corrosion resistance between AA2050-T84 and AA7050-T7451 welded by friction stir weld.**

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Aluminum alloys of the 2XXX and 7XXX series are among the most used materials in the aerospace industry. These alloys have good mechanical, specific strength and corrosion resistance, and for the 2XXX series, further reduction in density can be achieved by lithium addition. So, in this case, it can reduce the weight of the aeroplane and fuel usage leading to the minimization of CO<sub>2</sub> emissions and cost savings. Aluminum alloys have poor weldability, and to use these alloys for aeroplane structures, joining is unavoidable. To make this, the industry uses rivets to join these alloys. But rivets increase the mass of aeroplanes, and to minimise this, a non-fusion (unconventional) welding technique capable of welding aluminium alloys easily was developed. This new technique is friction stir welding, which exposes the aluminum alloys to thermomechanical effects, changing the microstructure of the alloys, and resulting in different regions with different metallurgical and mechanical properties. An example of the regions is the thermomechanically affected region which experiences both plastic deformation and high temperature but without recrystallization. There is also the stir zone which is the region of recrystallized grains, the heat affected zone and the base metal (that is not affected by the welding process). The goals of this work are to analyze the corrosion resistance of the friction stir weldment of dissimilar AA2050-T84 and AA7050-T7451 alloys using electrochemical tests, characterizing the different regions of the weldment, and establishing the most susceptible region to corrosion using a sodium chloride solution.