

## Simulation of fatigue crack growth in friction stir welded joints in 2024-T351 Al alloy

### Abstract

The aim of the present work is to predict the fatigue life of friction stir welded joints in 2024-T351 Al alloy using the finite element method in the framework of fracture analysis code for two-dimensions (FRANC2D/L). The simulation was conducted under linear elastic fracture mechanics, based on Paris' model and maximum tensile stress and displacement correlation methods were applied to calculate the crack direction and stress intensity factor, respectively. One strategy has been presented, how crack propagation was investigated based on the corresponding Paris constants for each FSW zone. Numerical results were validated with experimental and analytical work.

**Keyword:** Simulation; Finite element method; Fatigue crack growth; Paris model; Friction stir welding