Internal Residual Stresses in Friction Stir Welded Aluminum Alloy sheets

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Abstract: In this article, the internal residual stress in friction stir welded 2024Al sheets were studied by using the independently developed short wavelength X-ray internal stress analyzer. The results indicated the longitudinal residual stress was in typical “M” shape distribution and higher than those in transverse direction. Combined with metallographic microstructure analysis, it was found that the peak stresses were situated near the interface of thermomechanically affected zones and the heat-affected zones.

Key words: Friction stir welding; Residual stresses; X-ray diffraction; Aluminum alloy