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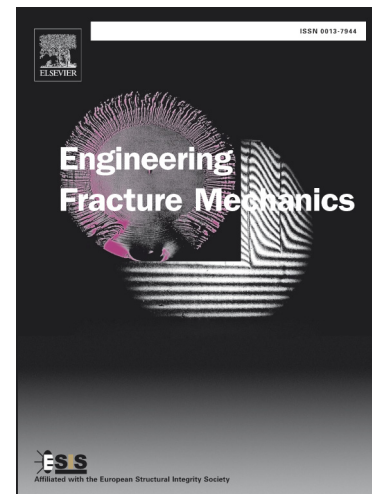
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Stress Intensity Factor Solutions for Similar and Dissimilar Spot Welds in Lap-Shear Specimens under Clamped Loading Conditions

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Abstract

In this paper, analytical stress intensity factor solutions for similar and dissimilar spot welds in lap-shear specimens under pinned and clamped loading conditions are derived. Closed-form solutions for similar welds in lap-shear specimens of equal thickness under pinned and clamped loading conditions are derived to show explicitly the effects of the clamped edges on the stress intensity factor solutions. Finite element analyses are also employed to obtain the stress intensity factor solutions for similar and dissimilar spot welds in lap-shear specimens under pinned and clamped loading conditions. Both computational and analytical solutions indicate that the clamped loading reduces the stress intensity factor solutions for the given specimen geometries by up to 7% for similar welds and by about 20% for dissimilar magnesium/steel welds.

Keywords: similar spot weld; dissimilar spot weld; lap-shear specimen; stress intensity factor; clamped loading

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