

## Investigation of the effect of composite patch dimensions and adhesive layer thickness on the efficiency of one-sided and two-sided repair of cracked plate

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### Abstract

In this study, to investigate the effect of composite patch dimensions and adhesive thickness on the performance of cracked plate repair, cracked aluminum plate repaired with composite patches in one-sided and two-sided repair modes have been modeled in 3D in Abaqus software. In this study, by considering different dimensions for composite patches made of boron, graphite, carbon, and glass epoxy, as well as different thicknesses for the adhesive layer, the effect of patch dimensions and adhesive thickness on repair efficiency has been investigated. The results of this study show that for all four composite patches, increasing the patch thickness in one-sided and two-sided repair reduces the stress intensity factor and increasing the patch length increases the stress intensity factor in both one-sided and two-sided repair modes and also, the results show that increasing the patch width in one-sided repair increases the stress intensity factor and in two-sided repair reduces it. Regarding the effect of adhesive thickness, the research results show that increasing the adhesive thickness increases the stress intensity factor and decreases the maximum Von Mises stress in the adhesive layer.

**Keywords:** stress intensity factor, composite patch, two-sided repair, cracked plate, patch dimensions