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Investigation of the effect of composite patch dimensions on the repair efficiency of plate containing single-edge crack

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Abstract

In this research, the effect of the dimensions of the composite patch on the efficiency of plate repair with one-sided edge crack has been investigated. In this study, the repair of cracked plate with one-sided and two-sided composite patches of boron and glass has been modeled in three dimensions in Abaqus software. The results show that increasing the thickness and length of boron and glass patch in one-sided and two-sided repair has reduced the stress intensity factor and increasing the width of both patches in one-sided repair increases the stress intensity factor but in two-sided repair on the stress intensity factor has no effect. The results also show that increasing the thickness of the adhesive for both composite patches and in both one-sided and two-sided repair modes reduces the repair efficiency.

Keywords: stress intensity factor, composite patch, one-sided edge crack, two-sided repair, patch dimensions