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Numerical analysis of cracks emanating from hole in plate repaired by composite patch (Article)

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Abstract

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In aerospace engineering design, structures with holes and cracks have been widely considered, either separate or combined. However, these types of structures have chances to produce critical crack growth since the stress concentration/intensity is high. This paper uses finite element modeling (FEM) to analyze single composite patch repair in reducing the stress concentration factor (SCF) around the circular hole. Similarly, crack propagation has also been repaired by placing a composite patch on the crack. The stress intensity factor (SIF) has been evaluated with and without the circular hole. The study of adhesive characteristics as well as patch thickness was carried to find out the highest reduction in SIF. © TJPRC Pvt. Ltd.

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Composite patch Finite element method Stress concentration factor Stress intensity factor

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