

**STRENGTH PREDICTION AND DAMAGE ASSESSMENT OF LAMINATED
COMPOSITE PLATES WITH RECTANGULAR/SQUARE CUTOUT
USING FINITE ELEMENT METHOD**

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Abstract

The progressive failure analysis of symmetrically laminated rectangular composite plate [0/+45/-45/90]_{2s} with square/rectangular cutout under uniform uniaxial compression loading is carried out using finite element method. Hashins failure criterion is used to predict the failure of lamina. A parametric study has been carried out to study the influence of square/rectangular cutout size, cutout orientation and plate thickness on the ultimate failure load of laminated composite plate under uniaxial compression loading. Ultimate failure loads were computed for six different laminate configurations [0/+45/-45/90]_{2s}, [75/-60/30/-15]_{2s}, [0/90]_{4s}, [-45/45]_{4s}, [15/-75]_{4s}, [30/-60]_{4s}. It is observed that the laminate stacking sequence, plate thickness, cutout size and cutout orientation has substantial influence on the ultimate failure load of notched composite plates.

Keywords: Cutout Size, Cutout Orientation, Material Property Degradation Method, Stacking Sequence, Plate Thickness, Progressive Failure Analysis, FEM