

عنوان مقاله:

The Effect of Volume Fractions on Hole Stress Concentration in Composite Lamina Subjected to Matrix Plasticity

محل انتشار:

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خلاصه مقاله:

In this paper, hole stress concentrations in long fibers and their surrounding matrix bays are examined in a composite lamina. It is assumed that all fibers lie in one direction while loaded by a force p at infinity in the direction of fibers. The width of the lamina is considered to be finite and bears a hole as a defect. Due to presence of excessive shear stress in the matrix bays bounding the hole, a yielded zone of size $2a_0$ is developed around the hole. Shear lag model (SLM) is used to drive the displacement and stress fields. The resulting equations are solved analytically based on boundary and continuity conditions. It is shown that the volume fractions of the fiber and matrix, as well as length of the plastic zone, have considerable effect on stress concentrations within the lamina.

کلمات کلیدی:

Composite Lamina, Hole Stress Concentration, Plastic Zone, Shear Lag Model (SLM), Volume Fractions

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