Composites in the aerospace industry. Is fracture mechanics a solution for the future?

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As-Is
Failure Mechanism. Open hole

\[ a_{xz} \frac{\partial^4 F}{\partial x^4} - 2a_{yz} \frac{\partial^4 F}{\partial x \partial y^3} + (2a_{zz} + a_{zz}) \frac{\partial^4 F}{\partial y^4} - 2a_{xy} \frac{\partial^4 F}{\partial x \partial y^2} + a_{xx} \frac{\partial^4 F}{\partial y^2} = 0 \]

* Anisotropic plates. Lekhnitiskii
Failure Mechanism. Unfolding

DESIGN VALUE

* Anisotropic plates. Lekhnitskii

Intra-laminar + Inter-laminar + Curing remaining stress

Damage Initiation

Damage growth

Boundary conditions

Collapse

Study of the unfolding failure of curved composite laminates. Cantero et al. Univ Sevilla with Airbus partnership
To be:

1. NDT Methodology on test real time
2. Instrumentation. Interlaminar
3. Test coupons redefinition
4. Idealization techniques
References.


Thanks