SUB-CRITICAL CRACK PROPAGATION

Fracture analysis is concerned with criticality of an existing crack. The problem of how the crack reaches critical size is not considered.

The problem of how a crack reaches critical size is the subject of sub-critical crack growth analysis. Mechanisms of sub-critical crack growth:

1. Fatigue - a form of failure in structure subjected to fluctuating loads (stresses).

2. Stress corrosion cracking - simultaneous action of cyclic stress and chemical attack; environmentally assisted cracking; mechanism not well understood.

Materials fail under fluctuating loads at much lower value of stress than their normal static failure stress.