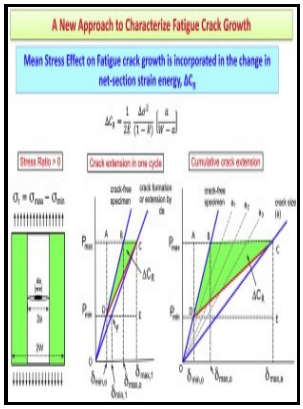
Influence of fatigue crack wake length and state of stress and on crack closure

National Aeronautics and Space Administration, Lewis Research Center - Crack growth equation



Description: -
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Tensile properties.
Stress intensity factors.
Fatigue (materials)
Crack closure.
Metals -- Fatigue.Influence of fatigue crack wake length and state of stress and on crack closure
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NASA technical memorandum -- 87292.Influence of fatigue crack wake length and state of stress and on crack closure
Notes: Microfiche. [Washington, D.C. : National Aeronautics and Space Administration], 1986. 1 microfiche.
This edition was published in 1986

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Tags: #Numerical #modelling #of #three

crack closure model and its application to vibrothermography by Bryan Schiefelbein

The crack closure model developed in this work is based in linear elastic fracture mechanics LEFM and describes the behavior of a partially closed crack in response to a tensile external load and non-uniform closure stress distribution.

Effects of strain hardening and stress state on fatigue crack closure

Fractography of all the samples tested in the z-direction revealed that critical fatigue cracks had initiated from facets in 2 samples, pores in 11 samples and, of these, 10 from pores very close to the surface.

CiteSeerX — PROPAGATION PATH AND FATIGUE LIFE PREDICTIONS OF BRANCHED CRACKS UNDER PLANE STRAIN CONDITIONS

The irreversible residual strain accumulates with cycles and the residual transformation strain in the crack wake produces closure forces.

Mechanics of Fatigue Crack Closure

Using equation , a probability plot of the fatigue life of samples with different machining depths can be generated by assuming that fatigue cracks will initiate at the largest surface pore. The residual strains left by the plastic wake during fatigue crack growth manifest themselves as contact stresses acting at the crack surface interface. The types of closure mechanism have been discussed in some detail by Gangloff and Ritchie 1985 and can result from a variety of sources but arguably fracture surface roughness, plasticity effects, and deposits are of most significance in terms of the impact of the environment.

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