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LCF-HCF Interactions; Small cracks and the Kitagawa diagram; Behavior of notched specimens; Effects of LCF loading on HCF limit stress; Studies of naturally initiated LCF cracks; Crack-propagation thresholds; Overloads and load-history effects; An overload model; Analysis using an overload model; Examples of LCF-HCF interactions; Design considerations; LCF-HCF nomenclature
Example of anomalous behaviorAnother example of anomalous behavior; Combined cycle fatigue case studies; 5 Notch Fatigue; Introduction; Stress concentration factor; What is kt?; Fatigue notch factor; kf versus kt relations; Equations for kf; Fracture mechanics approaches for sharp notches; Cracks versus notches; Mean stress considerations; Plasticity considerations; Negative mean stresses; Fatigue limit strength of notched components; Non-damaging notches; Size effects and stress gradients; Critical distance approaches; Analysis methods; Effects of defects on fatigue strength
Notch fatigue at elevated temperature6 Fretting Fatigue; Introduction; Observations of fretting fatigue; Representing total contact loads, Q and P; Load and stress distributions; Effects of local and bulk stresses on stress intensity; Mechanisms of fretting fatigue; Mechanics of fretting fatigue; Stress analysis of contact regions; Multiple crack considerations; Analytical solutions; Role of slip amplitude; Stress-at-a-point approaches; Fracture mechanics approaches; A combined stress and K approach; Comparison of fretting-fatigue fixtures; Role of coefficient of friction
Average versus local coefficient of friction

Sommario/riassunto

Dr Theodore Nicholas ran the High Cycle Fatigue Program for the US Air Force between 1995 and 2003 at Wright-Patterson Air Force Base, and is one of the world's leading authorities on the subject, having authored over 250 papers in leading archival journals and books. Bringing his plethora of expertise to this book, Dr Nicholas discusses the subject of high cycle fatigue (HCF) from an engineering viewpoint in response to a series of HCF failures in the USAF and the concurrent realization that HCF failures in general were taking place universally in both civilian and military engines. T