

혼합모드 I/II 균열면에 대한 프랙토그래피의 정량화

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Quantitative Evaluation of fractography for Crack Surface on Mixed-mode I/II

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Key Words: Mixed-mode loading condition(혼합모드하중조건), Crack tip displacement(균열선단변위), Fractography(프랙토그래피)

Abstract : The tests are applied at two different modes such as mode I only and mixed mode I/II and at two different constant amplitude loads with a stress ratio.

The crack opening ratio can be obtained from the CTD vector method, and crack closure behavior is correlated well with the calculated crack opening ratio. For high level of mode mixture and low load amplitude, crack closure is larger than that for low level of mode mixture and high load amplitude. In addition, effective stress intensity factor range can be recalculated by application of crack closure as a function of crack opening ratio. In conclusion the effects of crack closure by Mode II under MMLC and load amplitude at fatigue test are verified using the fractography by C-scan.

침탄 열처리된 SCM420H 재료의 고주기 피로 물성

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High Cycle Fatigue Properties for Carburized SCM 420 Steel

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Key Words: High Cycle Fatigue Properties(고주기 피로물성), SCM420H Steel(SCM420H 강), Carburizing(침탄 열처리), Rotating Bending Fatigue Test(회전 굽힘 피로 시험), Gear (기어), Bending Strength(굽힘 강도), Fatigue Strength(피로강도).

Abstract : Gear is the one of most widely used device for transmitting power. In the design of gear ensuring reliability, bending strength of tooth root, pitting resistance of contact surface, and scoring strength are considered to determine transmitting power of gear. In 1892, W. Lewis designed tooth of gear by simplifying it as cantilever beam to calculate bending strength of gear tooth. But the bending strength is the fatigue phenomenon related to crack initiation in tooth root. This paper presents high cycle fatigue properties of carburized SCM420H steel which is widely used as the material for gear and failure analysis of gear are also performed.