

The asymptotic field of mode I quasi-static crack growth on the interface between a rigid and a pressure-sensitive material^(PDF)

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Title: The asymptotic field of mode I quasi-static crack growth on the interface between a rigid and a pressure-sensitive material

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关键词: pressure-sensitive material; mode I quasi-static interface crack; crack-tip field; asymptotic analysis

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摘要:

A mechanical model of the quasi-static interface of a mode I crack between a rigid and a pressure-sensitive viscoelastic material was established to investigate the mechanical characteristic of ship-building engineering bi-materials. In the stable growth stage, stress and strain have the same singularity, ie . The variable-separable asymptotic solutions of stress and strain at the crack tip were obtained by adopting Airy' s stress function and the numerical results of stress and strain in the crack-tip field were obtained by the shooting method. The results showed that the near-tip fields are mainly governed by the power-hardening exponent n and the Poisson ratio of the pressure-sensitive material. The fracture criterion of mode I quasi-static crack growth in pressure-sensitive materials, according to the asymptotic analyses of the crack-tip field, can be viewed from the perspective of strain.

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备注/Memo: -

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