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عنوان مقاله:

Fatigue Strength Assessment of Components with V-Shaped Notches Based on Deviatoric Strain Energy Density Evaluated Over a Structural Volume

محل انتشار:

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خلاصه مقاله:

This paper proposes the deviatoric strain energy densityevaluated over a finite-size volume surrounding the notchtip as an engineering quantity for predicting the fatigue limitof notched components subjected to uniaxial and multiaxialloading. This deviatoric strain energy density is given inclosed form on the basis of the notch stress intensity factorscorresponding to different loading modes, whereas the sizeof the volume is regarded as a material parameter. Such aquantity fully addresses the plasticity presence as well asthe microstructural effects in the close neighborhood of thenotch tip. Only requirements are Mode I high cycle fatigueconditions and a linear elastic finite element analysis inorder to specify geometrical coefficients. The resultsobtained from the proposed model are in good agreementwith experimental data taken from the literature related towelded tube-to-flange joints subjected to pure bending, puretorsion and combined bending and torsion.

کلمات کلیدی:

Multiaxial fatigue - Strain energy density -Notch stress intensity factors - Finite element analysis

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