

عنوان مقاله:

Ratcheting Prediction of 1070 Steel samples under Asymmetric Uniaxial Stress Cycles by means of Kinematic Hardening Rules

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خلاصه مقاله:

The present study predicts ratcheting response of 1070 steel samples using nonlinear kinematic hardening rules of Ohno-Wang (O-W), Jiang-Sehitoglu (J-S) and Ahmadzadeh-Varvani (A-V) under uniaxial stress cycles. The ratcheting values predicted based on the O-W model were noticeably influenced by the magnitude of exponents and the number of backstress components. The J-S kinematic hardening rule holding numerous constants, encountered the effect of stress level in ratcheting assessment. Taking into account both material and cyclic stress level dependent coefficients, the A-V hardening rule offered a simple framework to predict ratcheting strain over loading cycles. A comparative study of these hardening rules to assess ratcheting of 1070 steel samples undergoing uniaxial loading conditions resulted in a close agreement of the A-V, O-W and J-S models. The choice of hardening rules in the assessment of materials ratcheting was further discussed based on the complexity of the hardening rule, number of constants/coefficients required to characterize ratcheting response and CPU time required to run the models.

کلمات کلیدی:

Ratcheting strain; Kinematic hardening rule; Mean stress; Uniaxial loading

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