

An interpretation and modification of the SWT function

Daniel Kujawski¹

¹Affiliation not available

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Abstract

In this paper a new interpretation and modification of the SWT function in terms of the total damaging energy density is proposed and discussed. The total damaging energy density is the sum of the damaging part of the strain energy density and complementary energy density corresponding to the first quadrant in damaging σ_D - ε_D axes. For cyclic loading with positive mean stress ($\sigma_m \geq 0$) the proposed function reduces to the original SWT formulation. For cyclic loading with negative mean stress ($\sigma_m < 0$) the maximum stress is augmented by 1/3 of absolute value of the mean stress. The proposed approach shows a consistent correlation of the mean stress effects for both positive and negative mean stresses.

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