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Robust Designs for an Accelerated Life Testing Model with Simple Step-Stress Plans

An accelerated life testing model with a simple step-stress plan is presented to obtain the optimum hold time for changing the stress level. A Weibull failure time distribution is assumed at any constant stress level. The scale parameter of the distribution is assumed to be a log-linear function of the stress level. Robust designs are obtained to protect against possible departure from the constant shape parameter, and possible misspecification of the life-stress relationship for both censored and complete data. The experimental test minimizes both the asymptotic squared bias and the asymptotic mean squared error of the reliability estimate.