ACCELERATED DESTRUCTIVE DEGRADATION TESTS
ROBUST TO DISTRIBUTION MISSPECIFICATION

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ABSTRACT

Accelerated repeated-measures degradation tests (ARMDTs) take measurements of degradation or performance on a sample of units over time. In certain products, measurements are destructive leading to accelerated destructive degradation test (ADDT) data. For example, the test of an adhesive bond needs to break the test specimen to measure the strength of the bond. Lognormal and Weibull distributions are often used to describe the distribution of product characteristics in life and degradation tests. When the distribution is misspecified, the lifetime quantile, often of interest to the practitioner, may differ significantly between these two distributions. In this study, under a specific ADDT, we investigate the bias and variance due to distribution misspecification. We suggest robust test plans under the criteria of minimizing the approximate mean square error.