

Selection of Reliability Sampling Plans with Time Truncated Mean Life Based on Gamma Distribution

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ABSTRACT

Product control is the methodology that consists of sampling inspection procedures with which acceptability or non-acceptability of a lot of finished items can be determined by examining one or more samples of items drawn randomly from the lot. Sampling inspection plans for life tests, also termed as reliability sampling plans, are the special procedures under product control that are employed for taking decisions about the lot based on tests of life-time of the items and on observed number of failures of items. A specific life-test sampling plan can be devised with reference to the life-time of the products as the quality characteristic, which is modeled by an appropriate continuous-type probability distribution. Various procedures and rules for the design and evaluation of life-test sampling plans based on the tests of sampled lifetime data have been developed and are found in the literature of reliability sampling. In this paper, evaluation of life-test sampling plans under the conditions for application of gamma distribution is considered. A procedure for the selection of such plans indexed by acceptable and unacceptable mean life is evolved. Three different criteria for designing life-test plans when lot quality is evaluated in terms of mean life, hazard rate and reliability life are proposed. Factors for adapting MIL-STD-105D to life and reliability testing indexed by acceptable quality level under the assumption of gamma distribution are also illustrated.