

# Accelerated Life Testing Models for Mechanical Components

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## Abstract

This paper provides an overview of the application of Accelerated Life Testing (ALT) models for reliability estimation to mechanical components. The reliability is estimated by considering a classical test plan using a sample system tested only under accelerated conditions. The time transformation function is considered as log-linear and three types of estimation are studied using parametric, Extended Hazard Regression (EHR) and semiparametric models. The paper is illustrated by a simulation example based on Ball bearings testing. The results are used to analyze and compare these estimation methods. The simulations have been repeated with and without censoring data in order to examine the asymptotic behavior of the different points estimate.

**Keywords:** Reliability, parametric estimation, Extended Hazard Regression model, semiparametric estimation, regression, Kaplan-Meier, Ball bearings

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