# Effect of Load Ratio on Probability Distribution of Fatigue Crack Propagation Life in Magnesium Alloys

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**Abstract :** It is necessary to predict a fatigue crack propagation life for estimation of structural integrity. Because of an uncertainty and a randomness of a structural behavior, it is also required to analyze stochastic characteristics of the fatigue crack propagation life at a specified fatigue crack size. The essential purpose of this study is to present the good probability distribution fit for the fatigue crack propagation life at a specified fatigue crack size in magnesium alloys under various fatigue load ratio conditions. To investigate a stochastic crack growth behavior, fatigue crack propagation experiments are performed in laboratory air under several conditions of fatigue load ratio using AZ31. By Anderson-Darling test, a goodness-of-fit test for probability distribution of the fatigue crack propagation life is performed and the good probability distribution fit for the fatigue crack propagation life is presented. The effect of load ratio on variability of fatigue crack propagation life is also investigated.

**Keywords :** fatigue crack propagation life, load ratio, magnesium alloys, probability distribution