

# Maximum likelihood method based on specimen information reconstruction and life equivalent principle for P-S-N curve fitting

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April 28, 2020

## Abstract

In order to improve the accuracy of the relationship between standard deviation and stress with a small number of fatigue test data, the specimen information reconstruction method is proposed in this paper. Meanwhile, the new maximum likelihood method is designed for P-S-N curve fitting, which is based on the specimen information reconstruction and the life equivalent principle. According to the main type of welded joint on the 80t gondola car body, the T-joint specimens were fabricated and tested, then the P-S-N curve is fitted and extrapolated. Finally, according to the result of measured stress spectrum on 80t gondola car body, it is verified that the accuracy of the P-S-N curve fitted in this paper is higher, and it is indicate that maximum likelihood method based on specimen information reconstruction and life equivalent principle is a better way for P-S-N curve fitting, especially for the small number of fatigue test data.

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