

## Durability Test and Verification of 7B04 Aluminum Alloy in Marine Environment

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**Abstract Purpose:** To investigate the durability of 7B04 aluminum alloy in marine environments, this paper designs an accelerated load spectrum for laboratory simulations, grounded on actual environmental data and service load conditions. The main work includes the acceleration experiment of constant load and variable load, following varying periods of corrosion exposure for 7B04 aluminum alloy material. **Results:** Employing the Probabilistic Fracture Mechanics Approach (PFMA) for durability evaluation, the Equivalent Initial Flaw Size Distribution (EIFSD) of 7B04 aluminum alloy with two-parameter Weibull distribution and log-normal distribution. Based on these findings, the impacts of varying corrosion durations and different loading conditions on material durability are discussed, and then the economic life is predicted to show the level of durability impact. **Main Conclusion:** Finally, it is concluded that the 7B04 aluminum alloy material shows good durability in the marine environment conditions, but it's still recommended to perform timely inspection and maintenance according to the actual work needs.

**Keywords** Durability; 7B04 aluminum alloy material; Marine environment; Corrosion

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