

Prediction Method for Fatigue Strength of Corroded Rails Using Actual Stress and Stress Gradient

Jun MIZUTANI Riku TAKAYAMA Tadashi DESHIMARU
Mitsuru HOSODA Yoshihiro TERASHITA Ryuichi YAMAMOTO

Rail corrosion, especially in humid environments, accounts for around 20% of rail breaks in Japan. However, traditional methods for predicting the fatigue strength of corroded rails, such as using corrosion thickness and S-N curves, have limitations. The study involved collecting corroded rails, scanning their surface profiles, and applying finite element analysis to evaluate stress at breaking points. A new method using stress and stress gradients was proposed to predict the number of load cycles required for corroded rails to break in bending fatigue tests, with an estimated range of 0.5 to 2 times.