LIFE PREDICTION OF BEARING USING ACCELERATED LIFE TEST COUPLED WITH ANALYSIS

NA RA LEE¹, YONGBIN LIM¹ and NAKSOO KIM¹
¹ Sogang University, Department of Mechanical Engineering
Seoul, 121-742, Korea
E-mail: nkim@sogang.ac.kr
URL: http://nsmlab.sogang.ac.kr/

Key Words: Accelerated Life test, Archard Wear model, Bearing life prediction

The amount of wear is a significant factor for evaluating bearing failure. However, it is difficult to predict the precise occurrence of failure, because the wear gradually happens for a prolonged period. Therefore, it is impossible to assure the bearing life experimentally. In this study, the accelerated life testing coupled with numerical analysis was performed to predict the accurate bearing life. The process can be described as follows: first of all, material characteristics and wear coefficients were obtained through tensile test and constant wear test; second, acceleration factor of wear depth was calculated by looking different test conditions, such as load and rpm; third, test response prediction function was derived and product life prediction function was determined by the acceleration factor; Finally, wear depth was calculated by solving two functions above. Meanwhile, to verify the result of the accelerated life test, the rating life of ISO standard was compared. Life prediction of the bearing for spalling calculated by accelerated life test was compared with the standard bearing life. The results showed that the accelerated life test result and the standard bearing life were similar. In conclusion, the accelerated life test coupled with numerical analysis could be employed to predict the bearing life the more rapidly and more accurately in comparison to other traditional test methods.

REFERENCES


