

마이크로 펌프 설계를 위한 압전 작동기의 해석

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Analysis of Piezoelectric Actuator for Valveless Micropumps

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Key Words: Piezoelectric Actuator(압전작동기), Valveless Micropump(무밸브 마이크로 펌프), Theoretical Analysis(이론해석), Diaphragm Deflection(다이어프램 처짐)

Abstract : The membrane deflection in piezoelectric actuators for micropump applications has been analyzed using theoretical and finite element analyses. A modified theoretical model was developed to predict the deflection of membrane. The theoretical results were in good agreement with the results from numerical simulation. Based on this theoretical model, the effects of several important parameters and variables on actuator performance have been investigated. These parameters and variables include the dimensions and mechanical properties of the piezoelectric disk, the membrane and the bonding layer material. As a result, a viable design of piezoelectric actuator for micropump system can be achieved and some experimental works are needed for further study.

현가장치재의 부식피로균열진전에 미치는 쇼트피닝의 영향

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An Effect of Shot Peening on Corrosion Fatigue Crack Growth of Suspension Material

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Key Words: Shot Peening(쇼트피닝), Compressive Residual Stress(압축잔류응력), Corrosion Fatigue Crack Growth(부식피로균열성장), Fatigue Life(피로수명), Corrosion Characteristics(부식특성).

Abstract : The compressive residual stress, which is induced by shot peening process, has the effect of increasing the intrinsic fatigue strength of surface and therefore would be beneficial in reducing the probability of fatigue damage. However, it was not known that the effect of shot peening in corrosion environment. In this study, the effect of shot peening on corrosion fatigue crack growth of SAE 5155 steel immersed in 6% FeCl₃ solution and corrosion characteristics with considering fracture mechanics. The results of the experimental study corrosion fatigue characteristics of SAE 5155 are as follows; the fatigue crack growth rate of the shot peening material was lower than of the un peening material.