

불균형 질량이 초고속 회전체의 동기 주파수에 미치는 영향 Synchronous Vibrations of Ultra-High Speed Rotor Considering the Effect of Imbalance

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Abstract : Mesoscopic or microscopic gas turbines can be an interesting replacement for batteries as mobile energy supplies. A difficult consequence of small scale turbomachinery is an increased rotor speed, in the order of 1,000,000 rpm and higher, balancing accuracy becomes too small to realize. Therefore, unbalance responses were predicted in the least residual unbalance 0.001g.mm and higher. This analysis proved that the amplitude of synchronous vibration would not excess 40um which is the bearing clearance in the residual unbalance less than 0.01g.mm. It is also proved by experimental test. Rotor is driven by centrifugal type turbine in higher than 600,000 rpm.