

나선 홈 펌프 시일의 특성 해석

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Characteristic Analysis of Spiral-Grooved Pump Seal

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Key Words : Spiral grooved seal(평행홈 시일), Leakage(누설량), Rotordynamic coefficients(동특성 계수), Centrifugal pump(원심펌프), Pumping effect(펌프작용), Perturbation analysis(섭동해석)

Abstract : In this paper the leakage prediction and rotordynamic analysis of an annular seal with a smooth rotor and spiral-grooved stator are performed. For developing a theoretical model, the three-control-volume analysis of the circumferentially-grooved seal is expanded by considering pressure reduction due to the pumping effect of spiral groove and pressure flow through the spiral groove. Validation to the present analysis is achieved by comparisons with available experimental data. For the leakage prediction the present analysis generally shows a reasonable agreement to experimental results. Rotordynamic coefficients for rotor speed with spiral angles show same trend, but the magnitudes of rotordynamic coefficients yield difference between analysis and experimental results.

펄스발전기의 로터다이나믹 설계

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Rotordynamic design of Pulse Generator

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Key Words : rotor(로터), laminated rotor(적층된 로터), stiffness(강성), stiffness effect(강성 효과), natural frequency(고유진동수), critical speed(위험속도), rotordynamics(회전체동역학)

Abstract : The support bearing requires high DN to raise specific energy efficiency for the state of the art rotating machine with high speed. Especially for the system has a big rotor(750 kgf) with high speed(about one million DN) such as the pulsed generator, the selection of the bearing and lubrication method are very important. So the study for the critical speed of hollow rotor as well in accordance with high speed rotor and a full analysis are needed for rotor bearing system. This paper describes the analysis for rotor bearing system of pulsed generator compared with experimental data. The bearing and lubrication method are discussed as well with experimental data.