2단계축소기법을 이용한 구조 자유 진동의 위상 최적 설계

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Structural Topology Optimization of Free Vibration using Two-level Condensation Scheme

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Key Words: Topology Optimization(위상최적화), Two-level Condensation Scheme(2단계축소기법), Reduced System(축소시스템), Eigenvalue Problem(고유치 문제)

Abstract : Topology optimization problem requires numerous repeated evaluation of objective function and design sensitivity for elements within design domain with various density distributions. In this work, a structural topology optimization of free vibration problem is developed by using finite element method. The recently proposed two-level condensation scheme is very promising for the construction of reduced system and for an accurate and efficient analysis concerned about eigenvalue and dynamic problems. Thus we use the two-level condensation scheme(TLCS) for the analysis and sensitivity computation part in the structural topology optimization problem.

Kriging 모델을 이용한 GATE VALVE의 최적설계

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Optimization of a Gate Valve using Kriging Model

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Key Words: Gate valve(게이트 밸브), Design and Analysis of Computer Experiments(전산실험계획법), Kriging Model(크리깅 모델), Optimization(최적설계)

Abstract : The purpose of this study is an optimization of gate valve to keep vacuum of semi-conductor manufacturing equipment. In this study, we propose an optimal design to improve the mechanical efficiency of gate valve makes by forging method instead of welding. In order to optimize more efficiently and reliably, the meta-modeling technique has been developed to solve such a complex problems combined with the DACE(Design and Analysis of Computer Experiments). The DACE modeling, known as the one of Kriging interpolation, is introduced to obtain the surrogate approximation model of the function. Also, we prove reliability of the Kriging model's application to gate valve by computer simulations using FEM(Finite Element Method).