

공간 생성 맵을 이용한 레벨셋 위상최적화

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Level Set Based Topology Optimization Using Hole Creation Map

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Key Words: Topology Optimization(위상최적화), Level Set Method(레벨셋 방법), Hole Creation Map(공간 생성 맵)

Abstract : Main objective of this research is to develop and implement a numerical procedure to guarantee global convergence and hole creation of the level set based topology optimization method. To verify the proposed topology optimization procedure, several numerical examples are treated. From the results of verification process, the hole creation and the global convergence are examined. In the optimization process, two dimensional elastic structure is considered. The objective function is selected as the compliance of a structure. As a constraint, the total volume (or mass) of a structure is limited to be a certain value. The sensitivities of the objective function and the constraint are calculated by direct differentiation method. the finite element analysis, performances of the optimized results are analyzed.

유한요소프로그램을 이용한 비탄성 문제의 준해석
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Semi-analytical design sensitivity analysis of inelastic problem with finite element program

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Key Words: Semi-analytical Design Sensitivity Analysis(준해석 설계민감도해석), Displacement Load Method(변위하중법), Inelastic problem(비탄성 문제)

Abstract : Implementation procedure for the design sensitivity analysis (DSA) using finite element program(FEP) can be performed inside or outside of FEP. DSA implemented inside of FEP is required information of internal source code. DSA implemented outside of FEP, however, must be performed without access to source code and has been used for linear problems and few nonlinear problems restrictively. In this paper, the implementation procedure outside of FEP is proposed, which can be available for not only linear but also nonlinear and inelastic problems. Several examples are illustrated to verify the accuracy and reliability of the proposed method.