Finite element analysis of arc-welding processes

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용접공정의 효율적인 유한요소 해석

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Key Words: Welding(용접), Solid-shell(솔리드쉘), Transformation plasticity(변태소성)

Abstract : A finite element analysis of arc-welding processes is presented with emphasis on practical applications for vehicle or shipbuilding industry. We propose an implicit numerical implementation for Leblond's transformation plasticity constitutive equations, which are widely used in steel-structure welding. Transformation plasticity is considered occurring in welding, and an efficient solid-shell finite element is employed for modeling thin plates under welding processes.

국부 상세 단열 구조 모델을 이용한 LNG 운반선 화물창의 해석

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Hydroelastic Analysis of LNG Carrier Cargo Using Locally Detailed Model of Insulation Structure

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Key Words: LNG carrier cargo(LNG 운반선 화물창), Hydroelastic analysis(유탄성 해석), Sloshing(슬로싱), Finite element analysis(유한요소 해석), Fluid-structure interaction (유체-구조물 상호연계)

Abstract : There are many numerical methods to solve the fluid-structure interaction(FSI) systems. However, these methods require very fine mesh to attain the numerical accuracy and stability owing to the concentrated and fluctuating sloshing hydrodynamic pressure. As a result, the numerical analysis targeting for the long-period time response with the desired accuracy is highly time-consuming. The aim of this paper is to present a new method to analyze the sloshing behavior of the LNG containment by using the locally detailed model. According to the global-local analysis method, the local responses of the LNG containment are efficiently obtained only with small increase of computation time.