

틸팅열차(TTX)차체 구조용 샌드위치 복합소재의 단열 특성평가

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Evaluation on Insulation Characteristics for Sandwich Composite Structure of TTX

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Key Words: Sandwich Panel(샌드위치 판넬), Hybrid Composite Material(하이브리드 복합재료), Calibrated Hot Box Method(CHB)(교정 열 상자법)

Abstract : Experimental investigations on heat transportation ratio were firstly performed with three types of sandwich panels such as the Carbon/Epoxy Skin-Aluminum Honeycomb and Balsa Core Sandwich Panel of 37mm thickness, the Carbon/Epoxy Aluminum Skin-Honeycomb Core Sandwich Panel of 57mm thickness (including insulator) and the Carbon/Epoxy Skin-Aluminum Honeycomb Core Sandwich Panel of 37mm thickness based on the KS F 2278:2003(Insulation test method of windows). In additional to this investigation, experimental tests were also done for evaluation of heat transportation ratio with the Aluminum Skin- Aluminium Honeycomb Sandwich Panels of 27mm and 35mm thickness

Stress and Strain Analysis of The End-Plate of the Lumbar Spine With Degenerated Disc and Osteoporosis Under Compression Loading

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압축하중에서의 퇴행성 및 골다공증 요추체 종판의 Stress 및 Strain 분석

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Key Words: FEA (유한요소법), endplate fracture (종판 골절), degenerative disc (퇴행성 추간판), osteoporosis (골다공증)
Abstract : The endplate, lies between the vertebral body and intervertebral disc, is a structure of significant physiological importance. However, mechanically the end-plate appears to be a "weak link" and its fracture patterns present an age-related phenomenon. In current study, the effects of degenerative changes in the lumbar disc and vertebral body on the endplate were examined using finite element method. Under axial compression, central failure of the endplate may be more likely to happen whenever the discs were still "healthy"; while the osteoporotic model predicted a considerable decrease in stress value in the center of endplate. Removing the nucleus pulposus totally changed the stress and strain distribution in the endplate, peak stress was found anteriorly. When the disc was made stiffer and compressible, the annulus fibers was no longer as intense as it was in normal discs. We concluded that the stress and strain distributions in endplate under axial loading were highly dominated by its adjacent structures. Both the degenerated disc and osteoporosis may have a pronounced impact on the structural failure of the endplate.