

복합재료로 보강한 알루미늄 사각관 보의 굽힘 성능평가

이성혁[†] · 김철웅*(건국대) · 최낙삼**(한양대) · 윤광준***(건국대)**Bending Performance Evaluation of Aluminum Square Tube Beams Reinforced by Composite Layer**

Sung-Hyuk Lee, Cheol-Woong Kim, Nak-Sam Choi and Kwang-Joon Yoon

Key Words: Bending Collapse(굽힘 붕괴), Reinforced Aluminum Square Tube Beam(강화 알루미늄 사각관), Energy Absorption(에너지 흡수)**Abstract :** Bending deformation and energy absorption of aluminum square tube beams reinforced by composite layer have been evaluated using experimental tests combined with theoretical and finite element analyses. Six kinds of reinforced aluminum square tube beams composed of glass fabric/epoxy layer wrapped around on aluminum tube were employed for the bending test. A theoretical modification of hinge model was developed to predict the resistance to the collapse of reinforced tube beams subjected to a bending load. Theoretical ultimate bending moment and energy absorption capability were in good agreement with experimental ones. Aluminum square tube beams strengthened by composite layer on the whole web and flange showed an excellent bending strength and energy absorption capability.

자기카메라 센서부의 S/N비 개선에 관한 연구

이경철[†](조선대) · 이진이*(조선대)**A Study of the S/N Ratio Improvement for the Magnetic Camera**

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Key Words: Magnetic Camera (자기카메라), Sensitivity (감도), S/N Ratio (S/N비), Dynamic Characteristics (동특성), Operational Amplifier (연산증폭기)**Abstract :** Magnetic nondestructive testing is very useful to detect a crack on the surface or near the surface of ferromagnetic materials. Also, the distribution of the magnetic flux leakage (DMFL) on the surface has to be obtained quantitatively to evaluate the crack. The magnetic field is inversely proportional to the square of the lift-off. Therefore, improved techniques for increasing sensitivity and signal-to-noise ratio (S/N ratio) are strongly demanded. The magnetic camera using magnetic lens is proposed to satisfy these demands such as obtaining DMFL, measuring on the high lift-off, and improving sensitivity. This paper proposes the improved electrical circuit to obtain higher sensitivity and a high S/N ratio. The surface mounted device (SMD) type operational amplifier, AD620 and LM324, were compared with respect to sensitivity, S/N ratio, delay time, and fast Fourier transform (FFT) analysis.