

## 3차원 유한요소 해석을 통한 ISB 판넬의 인장 · 굽힘 특성 분석

이상훈<sup>†</sup>(조선대 원) · 안동규(조선대)\* · 김민수 · 김진석<sup>\*\*</sup>(조선대 원) ·  
한길영<sup>\*</sup>(조선대) · 정창균 · 성대용<sup>\*\*\*</sup>(KAIST 원) · 양동열<sup>\*\*\*\*</sup>(KAIST)

### Investigation into the tension and bending characteristics of ISB panels using the three-dimensional finite element analysis

S. H. Lee, D. G. Ahn, M. S. Kim, J. S. Kim,  
G. Y. Hahn, C. G. Jung, D. Y. Seong, D. Y. Yang

**Key Words:** ISB Panel(ISB 판넬), Three-dimension Elasto-Plastic Finite Element Analysis (3차원 탄소성 유한요소해석), Tension and Bending Characteristics (인장 및 굽힘 특성)

**Abstract :** The objective of this research work is to investigate on tension and bending characteristics of ISB panels with ultra-lightweight metallic structures using the three-dimensional elasto-plastic finite element analysis. The crimping angle is set to be 90°, 120°, and 150°. The results of FE analysis have been compared with those of the experiment. In addition, the local strain distribution and deformation characteristics in the vicinity of the center depression area for the case of three points bending and the center area for the case of the uni-axial tension.

## 분사액적 크기조절이 가능한 디지털 미소분사기

제창한<sup>†</sup> · 강태구\* · 조영호<sup>\*\*</sup>(KAIST)

### Droplet Volume Adjustable Digital Microinjectors

Chang Han Je, Tae Goo Kang and Young-Ho Cho

**Key Words:** Microinjector(미소분사기), Digital injector(디지털 분사기), Droplet Modulation(액적 조정), Inkjet printer(잉크젯 프린터), Biochemical injector(생화학 분사기)

**Abstract :** We present two different types of digital microinjectors where the ejected droplet volume is controlled by 4-bit digital signals for applications to high-speed and high-resolution digital inkjet printing and biochemical material dispensing. The first type, having 4 microheaters per nozzle, is suitable for side-shooting applications, while the second type, having single microheater, is intended for top-shooting applications. The structure, principle, fabrication process and test results of the two digital microinjectors are presented with the comparison of their performance characteristics.