

첨가제가 함유된 PMMA 내에서 초임계 이산화탄소에 의한 초미세 폼의 생성

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Generation of Microcellular Foams by Supercritical Carbon Dioxide in a PMMA Compound

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Key Words: additive(첨가제), decompression(감압), injection-molding(사출 성형), microcellular foam(초미세 폼), nucleation(핵형성) supercritical(초임계의)

Abstract : Decompression experiments from a PMMA compound saturated with CO₂ at high pressure were performed to investigate the heterogeneous effect of the additives on the microcellular foam structure generated. The observed results were compared with the calculation results by using the molecular cluster model. Uniform distribution of foams was obtained at lower temperature of 20°C but heterogeneous effect due to the additives occurred at the solution temperature of 40°C, which is quite different from the results obtained in PMMA/CO₂ solution where homogeneous nucleation occurs at the temperature range between 40°C and 70°C. Experimental results obtained in this study may be applied to the injection-molding process of PMMA compounds.

접착요소를 이용한 용접시편의 피로균열 진전 시뮬레이션

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Simulation of fatigue crack growth of weld specimen using 3-dimensional cohesive element

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Key Words: Fatigue crack(피로균열), Cohesive element(접착요소), Finite element method(유한요소법), Weld specimen(용접시편)

Abstract : Three-dimensional cohesive zone model was used to simulate the fatigue crack growth of a weld specimen. Damage accumulation was accounted for using a constitutive model. A surface along which the fatigue crack would grow was assumed a priori and the cohesive elements were applied on the surface. Tensile tests of weld and parent specimens were simulated by finite element method. Results of fatigue crack growth for the weld and parent specimens were also compared.