면취각도와 미세기공에 따른 필렛 용접부의
피로강도평가에 관한 연구

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Fatigue strength estimation of the fillet weldments with different bevelling angle and Porosity

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Key Words: Fillet weldment(필렛용접), Beveling angle(면취각도), Fatigue strength estimation(피로강도평가), Porosity(미세기공)

Abstract : The fatigue strength estimation of the fillet weldments were executed with different bevelling angles and porosity. The bevelling angles of 0°, 45° and 55° were compared with fatigue lives. After the fillet weldment failure, the porosity which found at the fractured surface were observed to account the effect on fatigue life. Finite element analysis were performed to correlated the fatigue strength and the size & location of porosity. The stress-strain field were severely affected by the length of notch and the size & location of porosity. Based on the quantitative analysis of porosity effect, the total volume of porosity was key factor for fatigue strength of the fillet weldment. relationships   Therefore, the were affecting together ppeared as strong factor for fatigue strength.

Al-SiC 금속기 복합재료의 충진거동 해석에 관한 연구

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A Study on the Densification Behavior of
Al-SiC Metal Matrix Composites

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Key Words: Densification(충진), Porosity(기공), Constitutive equation(구성방정식)

Abstract : Powder metallurgy has been employed for the development of SiC particle reinforced aluminum metal matrix composites by using vacuum hot pressing. The effect of processing conditions on the densification therefore can be investigated in terms of the changes of relative density during the process. As shown by the result, either increasing temperature or pressure leads to increasing densification rate. The levels of consolidation, however strongly depend on the volume fraction of particles for the test cases. A material model based on micro-mechanical approach then has been presented to determine the densification behavior. The model developed is implemented into finite element software so that the process simulation can be peformed enabling the predicted relative density to be compared with experimental data. Good comparison has been achieved.