추진체 노즐용 Alloy718의 단조후 전자빔 용접성 평가

이채훈[1]· 김정한[2#]· 윤종원[1]· 염종택[2]· 홍재근[2] · 박노광[2]

Electron beam weldability investigation of forged Alloy718 for propulsion nozzle

C. H. Lee, J.W. Yoon (Dong-Eui University)

J. H. Kim, J. T. Yeom, J. K. Hong, N. K. Park (Korea Institute of Materials Science)

Abstract

Weldability of alloy 718 forgings for jet propulsion component was investigated. For this purpose, electron beam welding process was applied to hot forged and machined work-pieces which have different microstructure. After welding, the components were solution heat-treated and aged. Samples were sectioned to analyze the microstructural evolution and formation of micro-crack. It was found that HAZ grain boundary liquation crack generally initiates in the coarse grains rather than the fine grains. Needle like phases with high Nb content were found at the outer part of near the base metal. Vickers hardness and tensile tests at room and high temperature were carried out. The tensile properties of electron beam welding specimens exhibited ~100 MPa and 10% decrease in strength and elongation, respectively.

Key Words : Superalloy, Alloy718, Electron beam welding, Microstructures, Mechanical properties.

1. 동의대학교 신소재공학과
2. 재료연구소 융합공정연구부
김정한 : 재료연구소, kjh1754@kim.re.kr