Effect of volume fraction of alpha and transformed beta on the high cycle fatigue properties of bimodal Ti6Al4V alloy

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Abstract

The present study was performed to investigate the effect of volume fraction of alpha and transformed beta phase on the high-cycle fatigue (HCF) properties of the bimodal titanium Ti6Al4V alloy. The effect of such morphology on mechanical properties was studied using tensile and rotating bending fatigue test as per ASTM standards.Ti6Al4V alloy samples were heat treated to have three distinctive volume fractions of alpha and transformed beta phase. With an increase in quench delay from 30,50 and 70 sec during quenching after solutionizing temperature of 967°C, the volume fraction of alpha was found to be increased from 20% to 67%. Tests on tensile and rotating bending fatigue showed that the specimen with 20% volume fraction of alpha phase exhibited the highest tensile and fatigue strength, however the properties gets deteriorate with increase in volume fraction of alpha.

Biography

Shital Jadhav has completed Mtech from Indian Institute of technology Bombay, Mumbai in 2012.He is working in Bharat forge, Ltd, Pune since 2007 in research and development department under material science cell. He has 9 years of industrial experience in forging industry in field of forging, heat treatment, material science, failure analysis.

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