

Influence of Heat Treatment on Properties of Hot Isostatically Pressed Turbine Blade Superalloy IN738

Abstract:

Impact of heat treatment on hot isostatically pressed (HIP) Ni-base superalloy has been investigated before and after conducting HIP process. HIP was performed by applying a stress of 120 MPa at a temperature of 1200 °C for 2 hours under argon atmosphere followed by furnace cooling to room temperature. Heat treatment cycle was conducted on the samples according to GEB50A563. Microstructural observation demonstrated the deleterious change of γ' morphology after HIP process which causes to decrease of hardness and creep strength. However, pre heat treatment in compared with cast specimen show slight changes in microstructure but, post heat treatment can revert this change of γ' morphology completely and also increase the mechanical properties.