

Texture and Twinning in Selective Laser Melting Ti-6Al-4V Alloys

Authors : N. Kazantseva, P. Krakhmalev, I. Yadroitsev, A. Fefelov, N. Vinogradova, I. Ezhov, T. Kurennykh

Abstract : Martensitic texture-phase transition in Selective Laser Melting (SLM) Ti-6Al-4V (ELI) alloys was found. Electron Backscatter Diffraction (EBSD) analysis showed the initial cubic beta $\langle 100 \rangle$ (001) BCC texture. Such kind of texture is observed in BCC metals with flat rolling texture when axis is in the direction of rolling and the texture plane coincides with the plane of rolling. It was found that the texture of the parent BCC beta-phase determined the texture of low-temperature HCP alpha-phase limited the choice of its orientation variants. The $\{10\text{-}12\}$ $\langle -1011 \rangle$ twinning system in titanium alloys after SLM was determined. Analysis of the oxygen contamination in SLM alloys was done. Comparison of the obtained results with the conventional titanium alloys is also provided.

Keywords : additive technology, texture, twins, Ti-6Al-4V, oxygen content

Conference Title : ICAMM 2017 : International Conference on Additive Manufacturing and Mechatronics

Conference Location : Havana, Cuba

Conference Dates : November 23-24, 2017