

Enhancement of surface integrity of titanium alloy with copper by means of laser metal deposition process

Erinosho MF

Akinlabi ET

Pityana SL

ABSTRACT

The laser metal deposition process possesses the combination of metallic powder and laser beam respectively. However, these combinations create an adhesive bonding that permanently solidifies the laser-enhanced-deposited powders. Titanium alloys (Ti6Al4V) Grade 5 have been regarded as the most used alloys for the aerospace applications, due to their lightweight properties and marine application due to their excellent corrosion resistance. The improvements in the surface integrity of the alloy have been achieved successively with the addition of Cu through the use of Ytterbium laser system powered at maximum of 2000 Watts. The motivation for this research work can be attributed to the dilapidation of the surface of titanium alloy, when exposed to marine or sea water for a longer period of time. This chapter provides the surface modification of titanium alloy with the addition of percentage range of Cu within its lattices; and the results obtained from the characterizations conducted on the laser deposited Ti6Al4V/Cu alloys have been improved.