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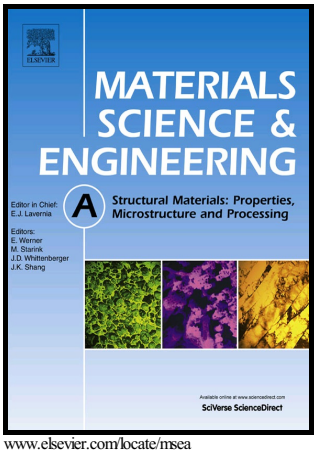

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Fatigue properties of Ti-6.5Al-3.5Mo-l.5Zr-0.3Si alloy produced by direct laser deposition

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Abstract

The fatigue properties of the Ti-6.5Al-3.5Mo-l.5Zr-0.3Si alloy produced by direct laser deposition (DLD) have been investigated. The fatigue limit of the alloy perpendicular to and parallel to the deposition direction at specified life of 10^7 and stress ration of 0.1 is 337 MPa and 365 MPa, respectively. The porosities of specimens are among 0.014%~0.028%, averaged porosity is 0.02%. The fatigue cracks initiate at the pores near the surface, which are located mostly at the column grain boundary during solidification. The size of pore and its distance from the surface are two important factors to control the fatigue life of specimen, i.e., bigger the pore or nearer to the surface, shorter the fatigue life. The fatigue fracture consists of fatigue source, radial slow crack growth and rough fast fracture region. The