

Fatigue behaviour of HIPed and stress relieved Ti6Al4V alloy specimens produced by SLM

Joel da Silva de Jesus¹, Luis Borrego², José Ferreira³, Jose Costa³, and Carlos Capela⁴

¹Universidade de Coimbra Departamento de Engenharia Mecanica

²ISEC, Polytechnic Institute of Coimbra

³University of Coimbra

⁴Instituto Politecnico de Leiria Escola Superior de Tecnologia e Gestao

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Abstract

Fatigue behaviour of HIPed and stress relieved Ti6Al4V alloy specimens produced by SLM was analysed ($R\epsilon = -1$). The HIP process caused a microstructural transformation decreasing the hardness and monotonic properties that not allowed fatigue strength increase. A bilinear behaviour in the elastic strain-fatigue life curve was observed, because of Young's modulus decrease during the cyclic elasto-plastic tests consequence of subgrains formation. The Smith-Watson-Topper and total strain energy density models showed a good concordance between predicted and experimental fatigue lives in notched samples.

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