World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:8, No:06, 2014

Preparation and Characterization of Newly Developed Trabecular Structures in Titanium Alloy to Optimize Osteointegration

Authors : M. Regis, E. Marin, S. Fusi, M. Pressacco, L. Fedrizzi

Abstract : Electron Beam Melting (EBM) process was used to prepare porous scaffolds with controlled porosity to ensure optimal levels of osteointegration for different trabeculae sizes. Morphological characterization by means of SEM analyses was carried out to assess pore dimensions; tensile, compression and adhesion tests have been carried out to determine the mechanical behavior. The results indicate that EBM process allows the creation of regular and repeatable porous scaffolds. Mechanical properties greatly depend on pore dimension and on bulk-pore ratio. Adhesion resistance meets the normative requirements, and the overall performance of the produced structures is compatible with potential orthopaedic applications.

Keywords : additive manufacturing, orthopaedic implants, osteointegration, trabecular structures
Conference Title : ICMBE 2014 : International Conference on Medical and Biomedical Engineering
Conference Location : Istanbul, Türkiye
Conference Dates : June 19-20, 2014