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L-PBF OF DIFFERENT TITANIUM ALLOYS MIXED WITH MOLYBDENUM: STATIC AND DYNAMIC MECHANICAL PROPERTIES

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In this research, investigation is focused on Laser Powder Bed Fusion (L-PBF) of non-standard titanium-molybdenum-aluminium-vanadium alloys. The aim of the research is to develop additive manufacturing (AM) process parameters that can achieve full density of titanium alloys with different molybdenum contents with satisfactory static (tensile strength) and dynamic (fatigue behaviour) mechanical properties. One expected application are printed implants with elastic modulus closer to human bone. Three powder mixtures were prepared in the drum mixer: Ti15Mo consists of 85 wt% of a cp-TiGd2 mixed with 15 wt% of Mo, and 90 and 85% Ti6Al4V with 10 and 15 wt% Mo, respectively. Additionally, influence of printing orientation and different surface treatments on surface topography and fatigue behaviour is investigated and discussed.

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