

## Selective Laser Melting: A Novel Technique for Designing Custom Made Bioimplants

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In recent years, additive manufacturing (AM) processes are gaining more popularity among automobile, aerospace, defence and biomedical industries etc for production of metallic components. This is because of the faster production process involved in AM with high degree of accuracy with reproducibility among the products. Among various AM processes, selective laser sintering (SLS), selective laser melting (SLM), Electron beam melting (EBM) etc are used to construct solid or porous components from the metal powders such as stainless steel, Ti and Ti alloys etc. In all these AM processes, first a three dimensional (3 D) structure is constructed using CAD/CAM software and then these 3 D structure is sliced into very thin layers so that each layer appears like 2 D. As per the information provided by the computer to the instrument, each 2D layer is melted over the other to construct the final structure. Here, we present, selective laser melting technique and its process parameter optimisation for fabrication of custom made porous bone implants using Ti metal powder. Various surface chemical treatment methods used to provide the bone integration will be systematically discussed.

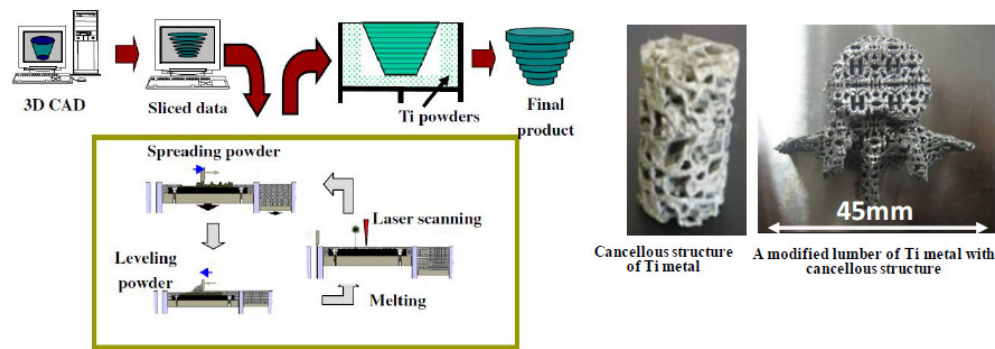


Fig. 1: Schematic representation of SLM process and some of the porous components made of Ti metal powder.