Selective Laser Melting (SLM) is an additive manufacturing technique for manufacturing of complex parts. Using SLM parts are generated directly out of 3D-CAD data by processing metallic serial material powders with the laser beam. SLM is now used for the direct manufacturing of medical bone substitute implants out of titanium-alloys.

Titanium Implants

SLM makes a nearly absolute geometrical freedom possible for the manufacturing of parts out of powder materials. The parts are manufactured in defined slices of approx. 30 µm. The powder material is completely molten resulting in an approx. 100 % dense part. With the SLM process and an adapted heat treatment a strength of >1000 N/mm² and a breaking elongation of 15 % is achieved. These mechanical properties satisfy ASTM specifications and are the basis for using SLM to manufacture high loaded implants.

Considering the care for bone defects of patients especially resulting of accidents, tumour resections or innate defects patient specific implants are necessary. Up till now these implants are commonly manufactured by casting or metal-cutting. This requires disproportional high time and cost expenses. Using SLM these disadvantages can be significantly diminished.

Our Service

- Adaption of process for your materials and geometries
- Testing of applicability of the process to your manufacturing
- Technical and economical valuation

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Subject to alterations in specifications and other technical information. 11/2011.

1 Individual hip cup manufactured out of titanium using SLM.
2 Radiography of the implanted hip cup.