



Selective Laser Melting (SLM)

SLM Solutions 250HL



Source: SLM Solutions GmbH

Process Information

With the Selective Laser Melting three dimensional parts can be generated in a layer building process. A solid state laser melts fine metallic powder according to the CAD two dimensional image of each layer. The unmelted material is then removed after the build process and can be reused.

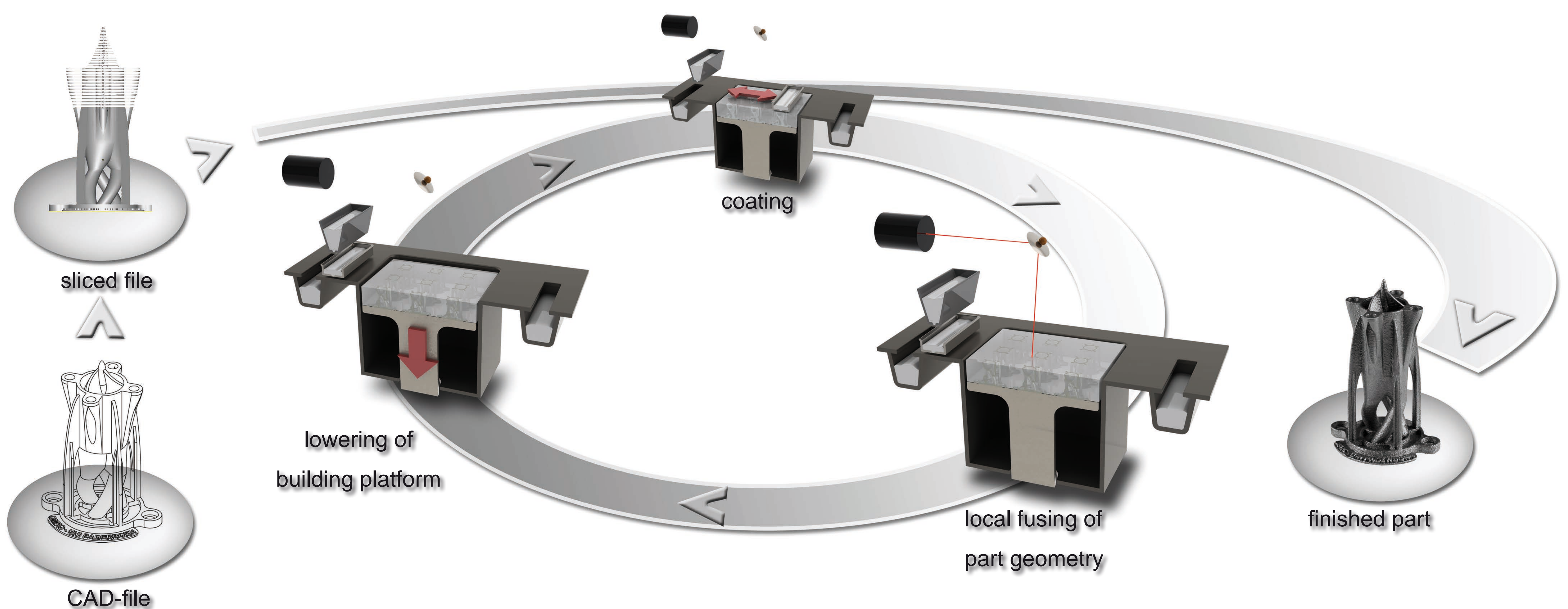
Technical Data

Building dimension	250 x 250 x 250 mm ³
Building speed	25 cm ³ /h
Layer thickness	20 - 100 µm
Laser type	ytterbium laser
Scanning speed	20000 mm/s (max.)
Support structures	necessary

Materials

There are many materials available, such as titanium, aluminum, tool steel, stainless steel and alloys depending on the application. There are differences between e.g. tensile stress, yield stress, hardness or impact value. Typical tensile stress values are in the range of 400 N/mm² to 1200 N/mm².

Process



Advantages

SLM is used in different industries like biomedicine, automotive and aerospace for complex geometries or lightweight structures. Unlike machined parts, SLM parts can have thin walls, deep cavities or hidden channels. Parts with high toughness, high strength and good thermal conductivity can be produced.

Challenges

Since the weight of the part is heavy and the heat has to be dissipated, support structures are necessary. High thermal gradients can lead to residual stress or to cracking and failure of the fabricated part.

Machine Components

