

Selective Laser Melting (SLM)

With SLM a solid state laser melts fine metallic powder layer by layer to produce fully solid metal parts. The process is run in protective atmosphere (Ar or N₂) to protect the specimens from oxidation. The unmelted powder is removed and is reused.



Extrusion tool.

Build volume (X, Y, Z) mm: 125×125×125 reduced by substrate plate thickness, possibility to use a platform reduction unit 50×50 mm thus decreasing the amount of powder by 80 %

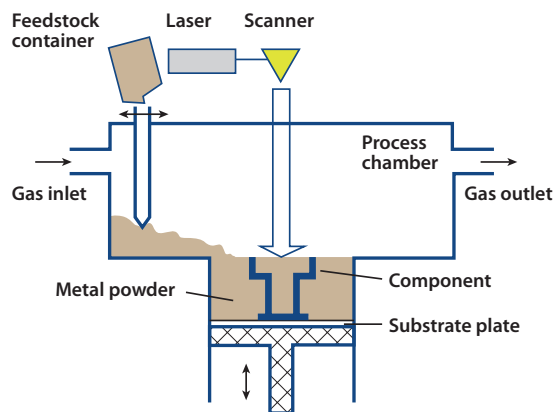
Build speed, cm³/h: Up to 25

Layer thickness, μm: 20-75

Laser type: 400 W Yb-fibre laser

Scan speed, m/s: 10

Materials: The range of available standard materials involves stainless steel, tool steel, titanium- and aluminium alloys, cobalt-chrome and nickel-based alloys



Advantages

SLM is used in different industries such as aerospace, automotive, biomedicine for printing of complex geometries or lightweight structures. Printed parts can have thin walls, deep cavities or hidden channels.

Challenges

High thermal gradients can lead to residual stress or to cracking and failure of printed parts. In some cases support structures are necessary to dissipate the heat.

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