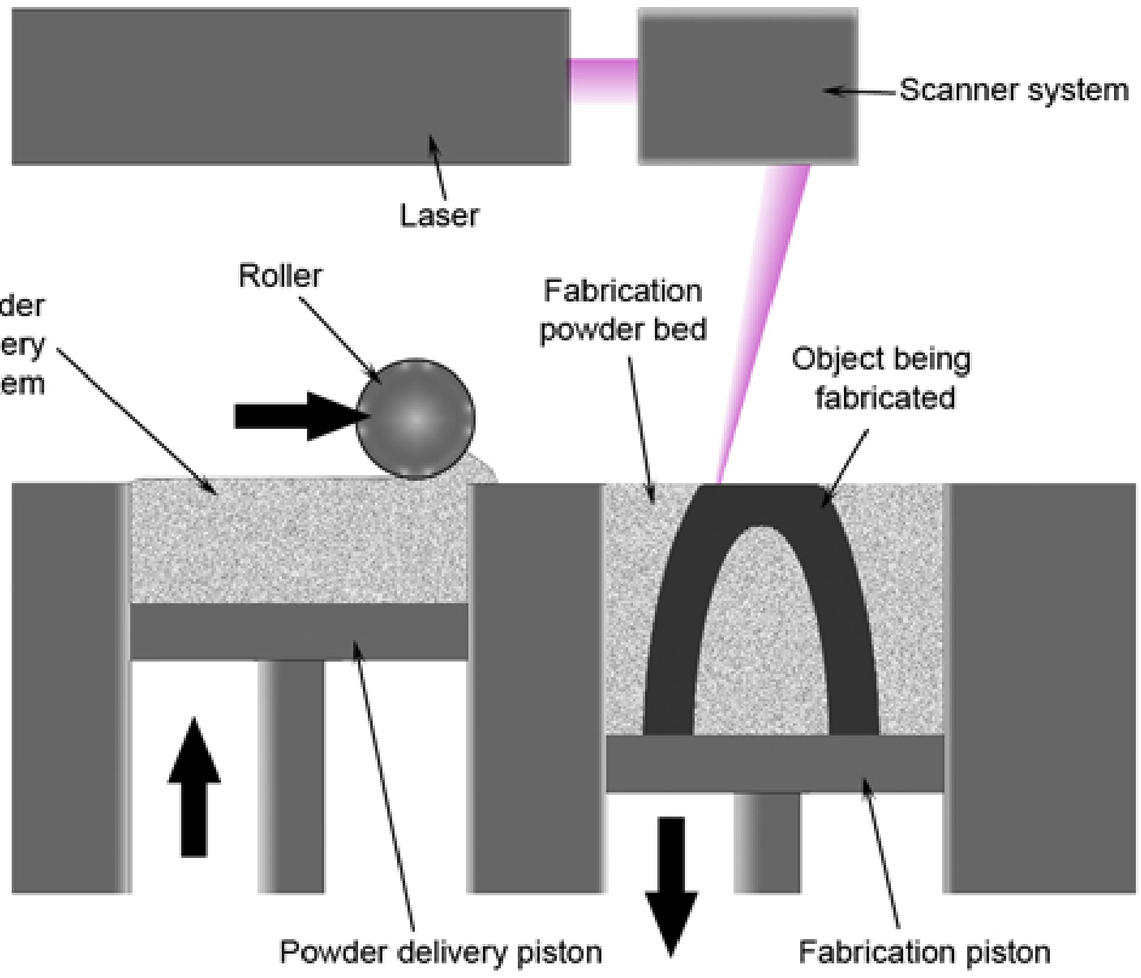
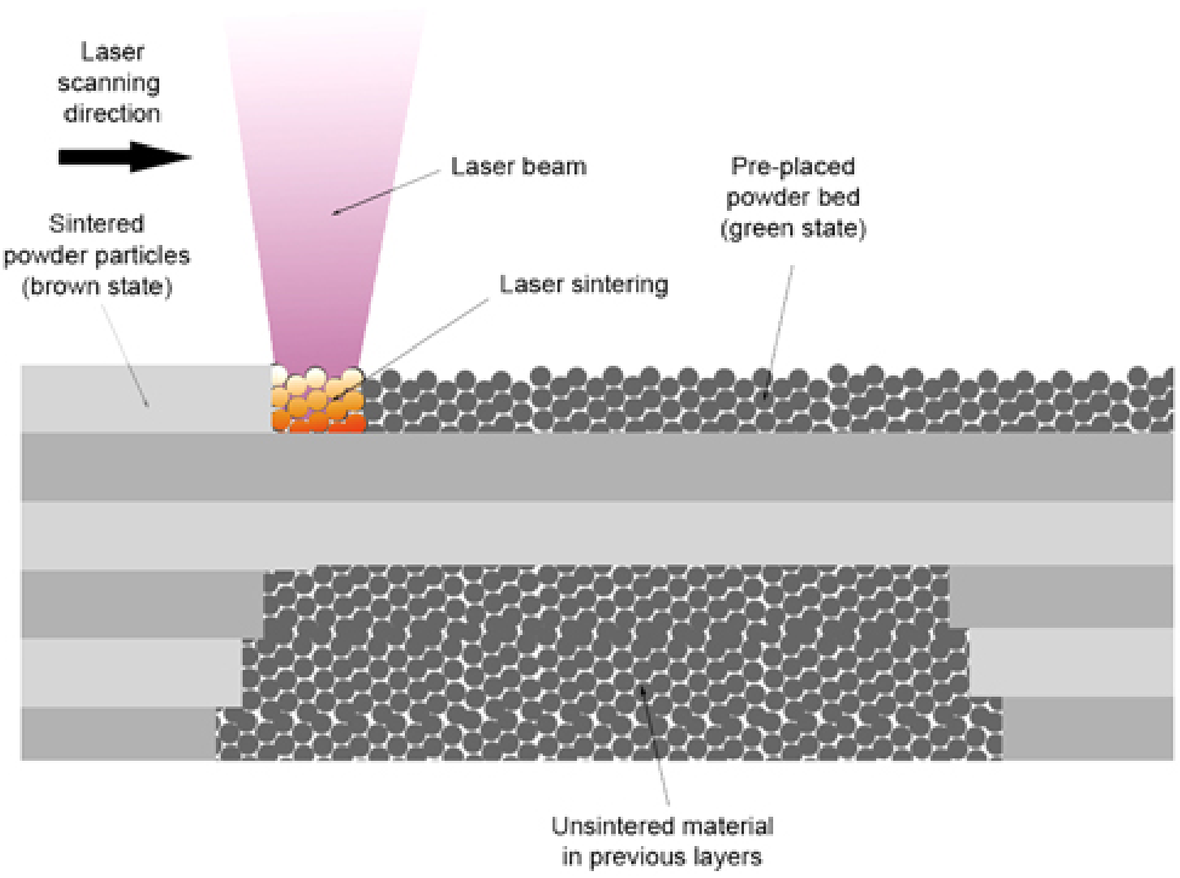
SLS- The Selective Laser Sintering





Source: https://commons.wikimedia.org, 2017

Materials

single-component or two-component powders of polymers (PS, PA, PC), metals, ceramics, elastomers(TPU).

Advantages	Disadvantages
• Freedom of design: There is no need for support structures • The material is mechanically stable and heat resistant. • Complex parts with interior components, channels, can be built without trapping the material inside and altering the surface from support removal. • Good chemical resistance • Various finishing possibilities (e.g., metallization, stove enameling, vibratory grinding, tub coloring, bonding, powder, coating, flocking) • Bio compatible according to EN ISO 10993-1 and USP/level VI/121 °C • Vast variety of materials and characteristics of Strength, durability, and functionality	• Surfaces are rougher than SLA or Polyjet (similar feel as sandstone) • Because of the slow print cycle and required long cool-down, the printing times are longer than other technologies – taking up to 2 days even before conducting post-production finishing. • Higher tolerances (~300 µm for parts <= 10 cm, ~0.3% for parts > 10 cm) than SLA (about 200 µm / 0.2%) or Polyjet (about 100 µm / 0.1%)

Applications

- Visual prototypes of complex space-frame designs, thin walled structures, or structures with significant overhangs.
- Functional prototypes especially plastic parts with high demands on mechanical and thermal properties.
- Functional prototypes of plastic parts with low weight (density ~0.9 – 0.95 g / cm^3).

Model: Geschichte in Miniaturen e.V. / Alexander Ohme

Source: https://3faktur.com, 2017

Costs

- Printing time and bounding box are the most decisive factor in determining the cost of laser sintered parts.
- For larger parts and small batch series, the cost per cm^3 of part volume can drop depending on quantity, geometry and size of the part.