



Method description

"SLS" stands for "Selective Laser Sintering"; an additive rapid manufacturing technique that uses a high-power CO₂ laser to fuse DuraForm plastic powder into a mass representing a 3-dimensional object or part.

Device description

The laser selectively fuses powder by scanning a cross-section generated from a "sliced" 3-D digital description of the part (e.g. an STL file created from a CAD file) on a smooth bed of powder. Typically, the taller the part is, the more cross-section layers it has. The number of layers can run into the thousands. After the laser scans each cross-section, the powder bed lowers by one layer thickness, a new layer of material is applied on top, and the process repeats until the part is done. SLS can produce parts from a relatively wide range of commercially available powder materials, including polymers (nylon, also filled with glass or other fillers, and polystyrene).

Technical specifications of the SLS sPro 60 HD machine are as follows: the maximum laser power is 25 W, the thickness of the laser beam is 450 μ m, and the maximum working temperature of the machine is 178°C. The working area of the machine and at the same time the ability to manufacture the product has the following dimensions: 381 x 330 x 437 mm. Table 1 shows the technical parameters of the selective laser sintering machine SLS sPro 60 HD.

Table 1: Technical specifications of the device.

Parameter	Range
Powder feed amount	0 do 500 rev.
Layer Thickness	(0.0 to 0.508) mm
Layer Cycle Count	1 do 32.000
Roller: Rotation Ratio	0 do 10
Roller: Speed	76 in 305 mm/s

Example of use

3D printing is commonly used to create prototype models. With the development of material addition technologies, it is increasingly being used to make purpose-built products. It is mainly used in applications where conventional technologies do not allow enough freedom in product design.

Industry application

The SLS sPro 60 HD machine is typically used to manufacture aerospace ducting, customized medical drill guides, prosthetics, orthotics, consumer goods (mobile f+device cases), electronic housings, automotive interiors, and prototypes.