

# MJF vs. SLS

Laser Sintering (LS, aka Selective Laser Sintering and SLS) and Multi Jet Fusion (MJF) are both powder-bed fusion 3D printing technologies. Laser Sintering has been in market since 1992, and Multi Jet Fusion has come on the scene in recent years. Both technologies offer similar but unique value points to customers. The following offers a quick comparison of the two processes.

## What is Laser Sintering?

Laser Sintering creates geometrically complex plastic parts with powder-bed fusion technology. LS builds with a CO<sub>2</sub> laser that melts cross-sections of a CAD design in powdered, typically nylon-based, material. While being built, LS parts remain encased in an unsintered powder bed replacing the need for support structures. Without support structures, designers can easily add undercuts and internal features and reduce post-processing time.

Laser Sintering is an ideal way to build prototypes or production parts in a wide variety of applications. LS production parts are strong, water and air-tight, heat resistant and repeatable. The process can build with filled Nylon materials, like carbon or glass-filled, making it an ideal process for applications such as duct work, fuel tanks and brackets.

## What is Multi Jet Fusion?

Multi Jet Fusion's unique build style includes fusing and detailing agents within a powder-bed fusion process. The build begins with a thin layer of powdered material being deposited across the build platform. Droplets of fusing, detailing and transforming agents are applied along with thermal energy on top of the powdered material to define the part's geometry and properties.

The process continues layer-by-layer until a complete part is formed. After the print is finished, the build unit with the material and parts are rolled onto a processing station for cooling and powder excavation.

Multi Jet Fusion is ideal for hidden parts like complex ductwork, connectors or non-cosmetic housings. The process produces parts with extremely fine details, exhibiting small intricacies in complex designs such as embossed text, small holes or living hinges.

When it comes to build, the core difference between Multi Jet Fusion and Laser Sintering is the heat source. LS uses as CO<sub>2</sub> laser to sinter cross-sections, while MJF uses the fusing agent to promote the absorption of infrared light.

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## Materials

A significant difference between the two processes is the fewer material choices available with MJF. LS has a larger material catalogue to choose from, primarily Nylon 11 and 12's with property-enhancing fillers for light-weight, highly durable and heat and chemical resistant parts. Stratasys Direct Manufacturing current uses Nylon 12PA with MJF with material offerings to expand in the near future. Stratasys Direct Manufacturing was a participant in the beta testing program for 3D High Reusability PA 11.

Properties	SLS Nylon PA (XY)	MJF Nylon 12 (XY)
Color	White	Black
Elongation at Break	15%	20%
Tensile Strength	6.815psi	6.960psi

## Accuracy

Laser Sintering's high dimensional accuracy is a feature that recommends it to high-standard industries like Aerospace. LS machines heat up the powder and build chamber surrounding the printed parts, and the unsintered powder and parts are cooled together, reducing the amount of warp.

Dimensional accuracy with Multi Jet Fusion is slightly more predictable than LS due to the control technicians have regarding the speed and other operational settings. The technology's unique manufacturing method results in parts with higher isotropic characteristics without increasing manufacturing cycle-time. MJF also produces crisper detail and better surface aesthetic than LS.

Properties	SLS Nylon PA (XY)	MJF Nylon 12 (XY)
Build Volume	30x20x20 in.	30x16x16 in
Min. Wall thickness	1mm	0.5mm
Resolution/Layer thickness	102 microns, 0.1mm	70 microns (0.08mm)
Accuracy	± 0.4mm	± 0.25mm*
Min Feature size	0.8mm	0.5..

\* ± 0.2%, or +0.25% dimension

All values stated in this document according to Stratasys