IN-HOUSE ADDITIVE MANUFACTURING CAPABILITIES

PROTOTEK
Rapid Prototyping

Powder Based Technology

Laser Sintering

Laser Sintering (LS), also known as Selective Laser Sintering (SLS), is an industrial additive manufacturing process that uses powdered thermoplastics (typically nylon) precisely fused by a high-powered laser. The Laser Sintering team can produce the prototypes or parts as fast as one day, cleaned of excess powder, and ready for use or a higher level of finishing.

With automated vapor smoothing, these production parts are water-tight, air-tight, heat-resistant, strong, and easy to reproduce. Nylon also can produce living hinges and flexible end-use parts and can be easily dyed in various colors. Industries that take advantage of Laser Sintering are aerospace/defense, automotive, consumer products, and medical/sciences.

OEM:	EOS and 3D Systems
Max Build Area:	26 x 13.5 x 21.8 in
Lead Time:	3 - 5 Days
Support Structures:	No
Material:	Fire Retardant Nylon 11, Glass Filled Nylon 12, Nylon 12, and TPU
Tolerances:	First inch ± 0.005 in and additional inches ± 0.002 in
Layer Thickness:	EOS: 0.005 in and 3D Systems: 0.004 in

Powder Based Technology

Multi Jet Fusion

HP Multi Jet Fusion (MJF) printer is an industrial additive manufacturing process that uses a powdered thermoplastic that a liquid agent and infrared energy precisely fuse. When the operation finishes, the AM Technician cleans excess powder off the parts, and then the parts are ready for use or a higher level of finish.

This technology can create functional nylon prototypes and end-use parts. A few ideal applications are brackets, connectors, hinges, housings, and thin-wall ductwork. Multi Jet Fusion is also great for producing accurate parts in higher volumes.

OEM:	HP
Max Build Area:	14.96 x 11.18 x 14.96 in
Lead Time:	1 - 3 Days
Support Structures:	No
Material:	Nylon 12, Nylon 12 GB
Tolerances:	First inch ± 0.005 in and additional inches ± 0.002 in

Photopolymer Resin Based Technology

Stereolithography

Stereolithography (SL) 3D printing, also known as SLA, uses ultraviolet-sensitive liquid resins (photopolymers) that are instantly cured when activated by a UV laser. Then the parts are post-processed with additional UV and thermal treatments when necessary.

Stereolithography is a speedy and highly accurate process used most commonly for form and fit prototypes, master patterns, and large concept models. The combination of speed and design freedom offered by Stereolithography enables rapid iteration for new product development.

OEM:	3D Systems and Stratasys
Max Build Area:	31 x 31 x 23 in
Lead Time:	1 - 2 Days
Support Structures:	Yes
Material:	Accura®: 25, 60, ClearVue, ABS Black, AMX Rigid Black, SL 5530, Xtreme, Xtreme White 200 Somos®: BioClear, EvoLVE, PerFORM, Taurus, WaterClear Ultra 10122, WaterShed Black, WaterShed XC 11122
Tolerances:	First inch ± 0.005 in and additional inches ± 0.0015 in
Layer Thickness:	Normal-resolution 0.004 in and min feature 0.012 in High-resolution 0.002 in and min feature size 0.006 in (depending on geometry)

Photopolymer Resin Based Technology

Digital Light Processing

Digital Light Processing (DLP) is a UV-sensitive liquid resin cured by a digital light projector. After processing, our AM Technicians clean the part, removing the supports, and treating with UV and thermal curing when necessary.

Digital Light Processing 3D printing is ideal for projects requiring high detail and finishing in various production-grade materials. From flexible silicone to rigid high-temp cyanate ester Digital Light Processing can make parts with different durometers and characteristics. It's an excellent technology for small end-use components, light metal part substitutions, functional, high-detail prototypes, jigs, and fixtures.

OEM:	Carbon
Max Build Area:	7.4 x 4.6 x 12.8 in
Lead Time:	1 - 2 Days
Support Structures:	Yes
Material:	CE 221, EPU 40, EPX 82 and 86FR, FPU 50, MPU 100, RPU 70 and 130, SIL 30, UMA 90
Tolerances:	UMA 90: first inch ± 0.005 in and additional inches ± 0.002 in 2-part engineering materials depend on geometries
Layer Thickness:	Standard Resolution 0.004 in, Fine Resolution 0.002 in, and Ultra Fine Resolution 0.001 in

Photopolymer Resin Based Technology

Hybrid PhotoSynthesis

Hybrid PhotoSynthesis, blends stereolithography and digital light processing to create highly accurate and efficient 3D prints. It is remarkably fast while maintaining incredibly smooth surface areas similar to injection molding. The Axtra3D Lumia offers a substantially larger build area than most 4k DLP machines with a 45-micron resolution.

Hybrid PhotoSynthesis can be used for prototypes and end-use parts such as handles, cranks, knobs, fasteners, snap-fits, and cases.

OEM:	Axtra
Max Build Area:	9.5 x 5.25 x 19.25 in
Lead Time:	3 - 5 Days
Support Structures:	Yes
Materials:	LOCTITE, S-Pro, Tough Clear
Tolerances:	First inch ± 0.005 in and additional inches ± 0.0015 in
Layer Resolution :	Standard Resolution: 0.004 in Fine Resolution: 0.002 in

Nozzle-Printed Filament Technology

Fused Filament Fabrication

Fused Filament Fabrication (FFF), or Fused Deposition Modeling (FDM), is a thermoplastic filament that's melted through a heated nozzle and selectively extruded, building layer upon layer.

An industry standard, fused filament fabrication 3D printing is a process that provides engineers and designers with numerous material options with the open-source machine platform. Durable, rigid, single-color parts with moderate detail are suitable for check fixtures, specialized tools, functional prototypes, and end-use parts.

OEM:	Stratasys
Max Build Area:	29 x 20 x 25.5 in
Lead Time:	1 - 5+ Days
Support Structures:	Yes
Material:	ABS-ESD7, ABS-M30, ASA, PC-ABS, PC-ISO, Polycarbonate (PC), Ultem 1010, Ultem 9085, other materials may be available upon request
Tolerances:	First inch ± 0.005 in and additional inches ± 0.002 in
Layer Thickness:	Standard layer thickness is 0.01 in we can do 0.005, 0.007, and 0.013 in

Nozzle-Printed Gel Technology

Material Jetting

Material Jetting (MJ), otherwise known as Polyjet or Binder Jetting, is an ultraviolet-sensitive gel deposited by a print head and immediately cured by a UV lamp. The machine can use rigid and rubber-like materials and has an excellent surface finish.

Material jetting 3D printing is a solution for designers who want excellent visual models with an end-product feel. This technology can incorporate multiple materials and colors into one print. It is suitable for complex, flexible models.

OEM:	Stratasys
Max Build Area:	19.3 x 15.4 x 7.9 in
Lead Time:	1 - 2 Days
Support Structures:	Yes
Material:	Agilus30, Agilus30 Clear, Digital ABS 515 and 531, Tango Black, Vero Clear, Vero BlackPlus, and Vero WhitePlus, VeroCyan, VeroMagenta, VeroYellow, and VeroGrey. Other materials may be available upon request
Tolerances:	First inch ± 0.004 in and additional inches ± 0.0015 in
Layer Thickness:	High-quality 0.0006 in and high-speed 0.0012 in

ideas made.