



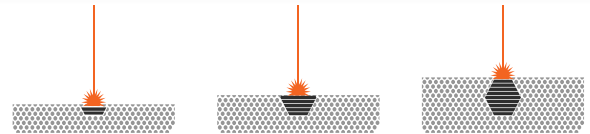
In-House Digital Manufacturing Capabilities

This quick reference guide outlines the major technologies that we offer. Organized by their underlying material technology, we offer a full palette of options depending on your material and part performance requirements. If you are looking for additional materials or have any questions, contact a **Solutions Manager** at **(608) 437-1400**, solutions@midwestproto.com or visit our website at midwestproto.com.

Laser Sintering (LS)

Powdered thermoplastic (typically nylon) is precisely fused by high-powered laser. Parts are cleaned of excess powder and ready for use or higher level finishing. **Also known as Selective Laser Sintering (SLS)

Laser sintering can be used to create tough, geometrically complex components for manufacturing. Following vapor smoothing, these production parts are water-tight, air-tight, heat resistant, strong and easy to reproduce. Nylon also offers the possibility of producing living hinges and flexible end-use parts and can be easily dyed in a variety of colors.

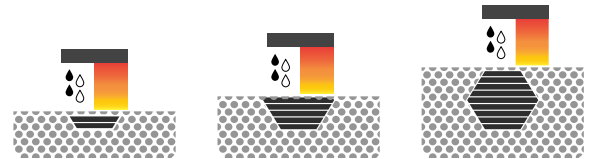


OEM:	EOS, 3D Systems, and Prodways
Max Build Area:	26 x 14 x 22 in.
Lead Time:	3 - 5 Days
Support Structures:	No
Material:	Nylon 12 , Glass Filled Nylon 12, Flame Retardant Nylon 11, Nylon 6

Multi Jet Fusion (MJF)

Powdered thermoplastic is precisely fused by a liquid agent and infrared energy. Parts are cleaned of excess powder and ready for use or a higher level finish.

Multi Jet Fusion offers more possibilities for complex, low-cost parts. Ideal applications are connectors, hinges, brackets, thin-wall ductwork, and housings. It is also great for producing parts in higher volumes.

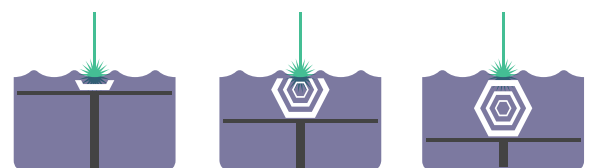


OEM:	HP
Max Build Area:	11 x 15 x 15 in.
Lead Time:	1 - 3 Days
Support Structures:	No
Material:	Nylon 12

Stereolithography (SL)

Ultraviolet-sensitive liquid resins (photopolymers) are instantly cured when activated by a UV laser. Parts are post-processed with additional UV and thermal treatments when necessary. ***Also known as SLA

Stereolithography is an extremely fast 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.

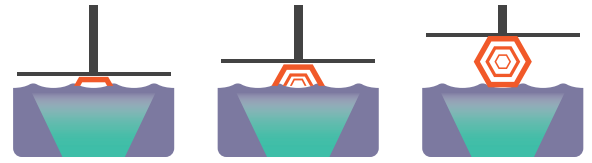


OEM:	3D Systems, RPS
Max Build Area:	31 x 31 x 23 in.
Lead Time:	1 - 2 Days
Support Structures:	Yes
Material:	Accura®: 25, 60, Xtreme, Xtreme White 200 , ABS Black Somos®: EvoLve, 8120, PerFORM, Taurus, Watershed

Digital Light Processing (DLP)

UV-sensitive liquid resins are cured by a digital light projector. After processing, the part is cleaned, supports removed and then UV and/or thermal treated when necessary. ***Also known as DLS, CLIP

Digital light processing is an ideal option for projects that require high detail and finish in a variety of production-grade materials. From flexible silicone to rigid high-temp cyanate ester DLP can make parts with different durometers and characteristics, . It's great for small end-use parts, 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:	Rigid Polyurethane (60, 61,70) , Elastomeric Polyurethane (EPU 40), Silicone (SIL 30) , UMA 90 Prototyping Resin, Epoxy (EPX 82) , Cyanate Ester (CE 221)

Fused Filament Fabrication (FFF)

Thermoplastic filament is extruded through a heated nozzle and deposited layer upon layer. After building, supports are dissolved or manually removed leaving parts ready for use or higher level finishing.

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

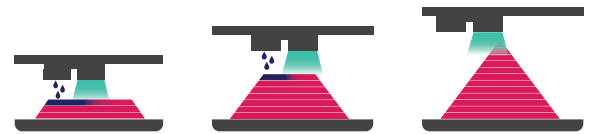


OEM:	Stratasys, Essentium (High Speed Extrusion)
Max Build Area:	29 x 20 x 25.5 in.
Lead Time:	1 - 5+ Days
Support Structures:	Yes
Material:	ABS, ABSi, ABS - M30 , ABS - M30i, ABS - ESD7 , ASA , FDM Nylon 12, Polycarbonate (PC), PC - ABS, PC-ISO , PPSF/PPSU, Ultem 9085 , Ultem 1010, other materials may be available upon request

Material Jetting (MJ)

An ultraviolet-sensitive gel is deposited by a print head then immediately cured by a UV lamp.

Material jetting is a solution for designers who want excellent visual models with end-product feel. This technology also allows for multiple materials to be incorporated into one print. It is good 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:	Black , Vero White, Vero Clear , Tango Black+, Agilus30, other materials may be available upon request

**Most common materials listed in*



AS9100 D:2016 | ISO 9001:2015 | ITAR Registered
midwestproto.com
info@midwestproto.com

Wisconsin

MWP Headquarters
10949 Blackhawk Drive
Blue Mounds, WI 53517

T:608.437.1400

Colorado

1100 West 120th Ave.
Suite 100
Westminster, CO 80234

T:720.466.5583



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