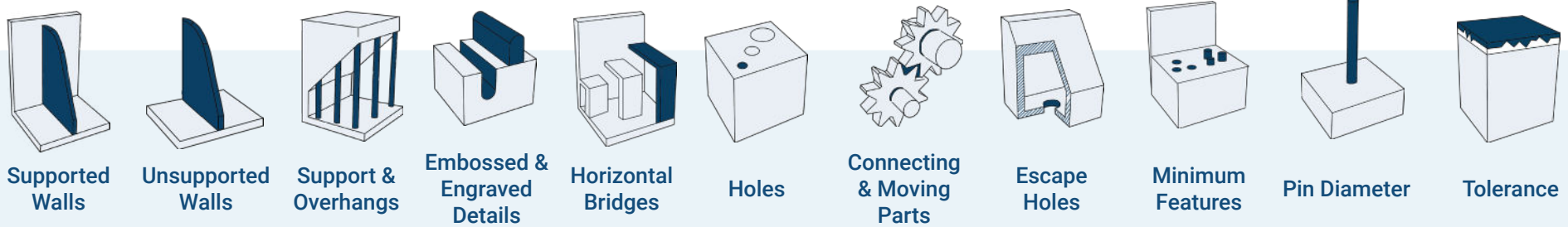


3D PRINTING TECHNOLOGIES, MATERIALS & APPLICATIONS FOR POLYMERS



SLS	SAF™	MJF	FDR	SLA	FDM	PolyJet™
Selective Laser Sintering	Selection Absorption Fusion	Multi Jet Fusion	Fine Detail Resolution	Stereolithography	Fused Deposition Modelling	Material Jetting
SLS, SAF™, MJF and FDR are all part of the powder bed fusion technology branch within industrial 3D printing. This branch of technologies has high dimensional accuracy, is used for various applications, and can supplement traditional manufacturing technologies in small- to mid-sized serial production.			Technology Application			
			FDR is also a powder bed fusion technology based on SLS. However, FDR excels at very small parts with very fine details.	SLA has one of the best dimensional accuracies within 3DP technologies, but due to its chemical properties, its longevity is lower, which is why SLA is mainly used for prototypes and models.	FDM has lower dimensional accuracy but offers a vast selection of materials. It is used for prototypes, models, or niche production with specific material property requirements.	PolyJet™ has exceptionally high dimensional accuracy and can combine 500,000 different colors and varying hardnesses in the same print, making it ideal for prototypes and models.
			Material Selection			
PA 2200 PA 3200 GF PA 2210 FR PA 2241 FR PA 603-CF PA 640-GSL PA 12 Alu TPU (59A & 88A)	Polypropylene (PP)	PA 11 PA 12 PA 12 White PA 12 GB	PA 1101	Accura ClearVue Accura Extreme Accura 25 Accura HPC Somos® WaterClear Ultra	Ultem (9085 & 1010) Polycarbonate (PC) PC/ABS & PC-ISO ABS (ESD7, M30 & M30i) ASA SR-30 PEKK & PEKK-ESD PA 12 CF Polypropylene (PP) & other engineering materials	Digital Materials
			Manufacturing Details			
Manufacturing via ultraviolet laser from nylon (PA) or thermoplastic polyurethane (TPU) powder	Manufacturing via infrared light from polypropylene powder	Manufacturing via infrared light from nylon powder	Manufacturing via infrared laser from biobased nylon powder	Manufacturing via ultraviolet laser from epoxy resin	Manufacturing via extrusion from a polymer thread	Manufacturing via ultraviolet laser from acrylic based fluid
			Maximum Build Sizes			
700 x 380 x 580 mm	315 x 208 x 293 mm	380 x 284 x 380 mm	200 x 250 x 125 mm	1500 x 750 x 550 mm	900 x 600 x 900 mm	490 x 390 x 200 mm
			Post-processing Offerings			
Blasting, assembly, sanding, vapour smoothing (max 385 x 585 x 385 mm), coating, coloring, lacquering, painting, metal plating, threaded/non-threaded inserts & vibration grinding			Blasting, vapour smoothing (max 385 x 585 x 385 mm) & coloring	Assembly, support removal, sanding, coating, lacquering, painting, metal plating, threaded/non-threaded inserts	Support removal, sanding & threaded/non-threaded inserts	

3D PRINTING GUIDELINES FOR EVERY POLYMER TECHNOLOGY



	Supported Walls	Unsupported Walls	Support & Overhangs	Embossed & Engraved Details	Horizontal Bridges	Holes	Connecting & Moving Parts	Escape Holes	Minimum Features	Pin Diameter	Tolerance
SLS	P1XX 0.6 mm P3XX 0.8 mm P5XX 0.6 mm P7XX 0.8 mm	1 mm	N/A	1 mm width & height	N/A	> Ø1.5 mm depending on thickness	>0.3 mm for moving parts; > 0.1 mm for connection assemblies; > 0.5 mm radial	> 12 mm multiple holes are preferred	P1XX 0.5 mm P3XX 0.6 mm P5XX 0.5 mm P7XX 0.6 mm	> 1 mm diameter < 15 mm height	Minimum ± 0.3 mm & ± 0.25% of dimension
MJF	0.5 mm	1 mm	N/A	0.4 mm width & height	N/A	> Ø0.8 mm depending on thickness	>0.3 mm for moving parts; > 0.3 mm for connection assemblies; > 0.3 mm radial	> 6 mm multiple holes are preferred	0.5 mm	> 1 mm diameter < 15 mm height	Minimum ± 0.3 mm & ± 0.25% of dimension
SAF™	0.8 mm	1 mm	N/A	1 mm width & height	N/A	> Ø1.5 mm depending on thickness	>0.3 mm for moving parts; > 0.1 mm for connection assemblies; > 0.5 mm radial	> 12 mm multiple holes are preferred	2 mm	> 2 mm diameter < 15 mm height	Minimum ±0.3 mm & ±0.25% of dimension
FDR	0.2 mm	0.4 mm	N/A	0.4 mm width & height	N/A	> Ø0.6 mm depending on thickness	>0.3 mm for moving parts; > 0.1 mm for connection assemblies; > 0.5 mm radial	> 6 mm multiple holes are preferred	0.25 mm	> 0.5 mm diameter < 15 mm height	1-3 mm ± 0.08 mm; > 3-6 mm ± 0.11 mm; > 6-10 mm: ± 0.14 mm; >10-18 mm: ± 0.17 mm; >18-30 mm: ± 0.20 mm; >30-50 mm: ± 0.23 mm
SLA	HR 0.25 mm NR 0.5 mm	HR 0.5 mm NR 1 mm	Support ≤ 30°	0.4 mm width & height	N/A	> Ø0.5 mm depending on thickness	> 0.1 mm for moving parts; > 0.1 mm for connections	> 3 mm multiple holes are preferred	0.25 mm	> 0.5 mm diameter < 15 mm height	Minimum ± 0.1 mm & ± 0.15% of dimension
PolyJet™	0.8 mm	1 mm	Support always required	0.5 mm width & height	N/A	> Ø0.5 mm	>0.2 mm for moving parts; >0.1 mm for connection assemblies; >0.8 mm for radial	> 20 mm multiple holes are preferred	0.5 mm	> 1 mm diameter < 15 mm height	Minimum ± 0.2 mm & ± 0.25% of dimension
FDM	0.8 mm	1 mm	Support ≤ 45°	0.6 mm width & height	10 mm	> Ø2 mm	> 0.5 mm	> 20 mm	2 mm	> 3 mm diameter < 15 mm height	Minimum ± 0.2 mm & ± 0.25% of dimension