

3D PRINTING TECHNOLOGIES, MATERIALS & APPLICATIONS



SLS

Selective Laser Sintering

SAF™

Selection Absorption Fusion

MJF

Multi Jet Fusion

DMLS

Direct Metal Laser Sintering

SLA

Stereolithography

FDM

Fused Deposition Modelling

PolyJet™

Material Jetting

SLS, SAF™ & MJF are all part of the powder bed fusion technology branch within industrial 3D printing. This branch of technologies have a high dimensional accuracy, are used for all types of applications and can therefore supplement traditional manufacturing technologies in small to mid-sized serial production.

Technology Applications

DMLS has a high dimensional accuracy producing advanced and sturdy metal parts. DMLS is mainly used for niche serial production & prototypes.

SLA has one of the best dimensional accuracies within 3DP technologies, but due to chemical properties the longevity will be lower which is why SLA is mainly used for prototypes & models.

FDM has a lower dimensional accuracy but a vast selections of materials. FDM is used for prototypes, models or niche production that has specific requirements for material properties.

PolyJet™ has an exceptional high dimensional accuracy that can combine 500.000 different colors and different hardnesses in the same print, which makes it exceptional for prototypes & models.

Material Selection

PA 2200
PA 3200 GF
PA 2210 FR
PA 603-CF
PA 12 for Food Contact
HyperLight Carbon (PA)
PA 1101 (FDR only)
PA 12 ALU
PA 6
TPU 88A
PEEK

PA 11

PA 12
PA 12 White
PA 12 Glass Filled

Aluminium ALSi10Mg
Stainless Steel 316 L
Titanium Ti6AL4V

Accura ClearVue
Accura Extreme
Accura 25
Accura HPC

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), thermoplastic polyurethane (TPU) or polyether ether ketone (PEEK) powder.

Manufacturing via infrared light from biobased nylon powder.

Manufacturing via infrared light from nylon powder.

Manufacturing via ultraviolet laser from metal powder.

Manufacturing via ultraviolet laser from epoxy fluid.

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

500 x 280 x 365 mm

1.500 x 750 x 550 mm

900 x 600 x 900 mm

490 x 390 x 200 mm

Post-processing Offerings

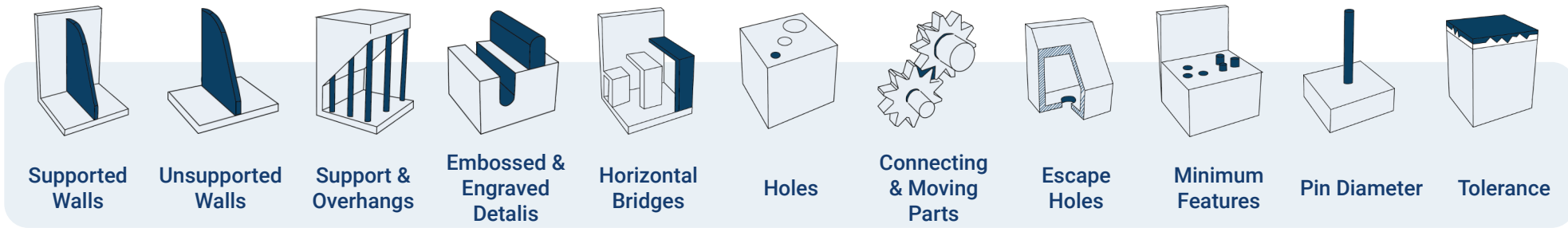
Blasting, assembly, sanding, coating, coloring, lacquering, painting, metal plating, threaded/non-threaded inserts, vibration grinding & vapor smoothing (maximum 385 x 585 x 385 mm).

EDM wiring & support removal, dry & wet blasting, heat treatment, CNC machining, vibration smoothing, anodizing, polishing & painting.

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 TECHNOLOGY*



	Supported Walls	Unsupported Walls	Support & Overhangs	Embossed & Engraved Details	Horizontal Bridges	Holes	Connecting & Moving Parts	Escape Holes	Minimum Features	Pin Diameter	Tolerance
SLS Selective Laser Sintering	P1XX 0.6 mm P3XX 0.8 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 P7XX 0.6 mm	> 1 mm diameter < 15 mm height	Minimum ± 0.2 mm & ± 0.25% of dimension
MJF Multi Jet Fusion	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 for radial	> 6 mm multiple holes are preferred	0.5 mm	> 1 mm diameter < 15 mm height	Minimum ± 0.2 mm & ± 0.25% of dimension
SAF™ Selective Absorption Fusion	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 for radial	>12 mm multiple holes are preferred	2 mm	> 2 mm diameter < 15 mm height	Minimum ± 0.2 mm & ± 0.25% of dimension
SLA Stereolithography	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™ Material Jetting	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 Fused Deposition Modelling	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
DMLS Direct Metal Laser Sintering	0.8 mm	1 mm	Support ≤ 45°	0.5 mm width & height	2 mm	> Ø0.8 mm	N/A	> 3 mm multiple holes are preferred	1 mm	1 mm	Minimum ± 0.25 mm & ± 0.3% of dimension

*The guide above are designed for a trouble free 3D printing experience, smaller tolerances and smaller details are possible, but will have to be verified for every geometry. The guide is intended for parts with uniform wall thickness throughout the entire model, variation in wall thickness is equal to wall thickness x 0.7 (e.g. 2 mm x 0.7 = 1.4 mm growing wall this also minimize warping). Recommended font size for embossed and engraved text is Arial Black. Use bold and font size minimum of 12 (details smaller than the recommended size can disappear). Best result is in the planar region in the z-direction. Preferred file format is .STL.