3D PRINTING TECHNOLOGIES & MATERIALS

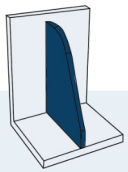
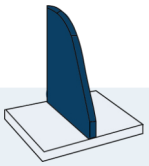
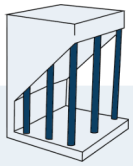
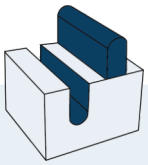
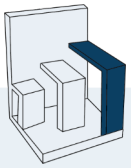
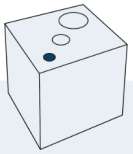
ISO 9001
ISO 14001
BUREAU VERITAS
Certification Denmark A/S

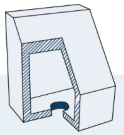
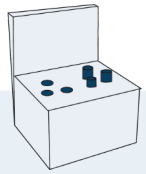
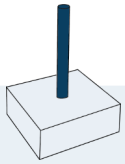
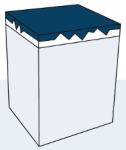
	SLS	SAF	MJF	SLA	FDM	PolyJet
	Selective Laser Sintering	Selection Absorption Fusion	Multi Jet Fusion	Stereolithography	Fused Deposition Modelling	Material Jetting
Material Selection	PA 2200 PA 3200 GF PA 2210 FR PA 603 CF PA 640 GSL PA 1101	PA 11	PA 12 PA 12 White PA 12 GF	Accura ClearVue Accura Extreme Accura SI 25 Accura HPC	Ultem ABS-ESD7 Nylon 12 CF PEEK CF 30 Carbon PA + more engineering materials	VeroWhite VeroClear VeroVivid VeroUltra
Manufacturing Details	Manufacturing via ultra violet laser from nylon powder.	Manufacturing via infrared light from biobased nylon powder.	Manufacturing via infrared light from nylon powder.	Manufacturing via ultra violet laser from epoxy fluid.	Manufacturing via extrusion from a polymer thread.	Manufacturing via ultra violet laser from acrylic based fluid.
Maximum Build Size	700 x 380 x 580 mm	315 x 208 x 293 mm	380 x 284 x 380 mm	1500 x 750 x 550 mm	500 x 500 x 500 mm	490 x 390 x 200 mm
Technology Application	With a high dimensional accuracy producing sturdy parts, the technology is used for serial production, prototypes, and models. Raw parts will appear off white and CF/GSL will appear dark grey.	With a high dimensional accuracy producing sturdy parts, the technology is used for serial production, prototypes, and models. Raw parts will appear dark grey.	With a high dimensional accuracy sturdy parts, the technology is used for serial production, prototypes, and models. Raw parts will appear dark grey.	With an exceptional high dimensional accuracy, the technology is used for prototypes, and models. Raw parts will appear grey, white or transparent depending on the material.	With a lower dimensional accuracy, the technology is used for prototypes, and models where there is a specific requirement for the plastic material. Raw parts will appear in colors depending on the material.	With an exceptional high dimensional accuracy, options for printing in 500.000 different colors and in different shore values, combined in the same print, the technology is used for prototypes, and models.
Post Processing Options	Assembly, sanding, coating, coloring, lacquering, painting, metal plating, threaded/non-threaded inserts, vibration grinding & vapor smoothing.	Assembly, sanding, coating, coloring, lacquering, painting, metal plating, threaded/non-threaded inserts, vibration grinding & vapor smoothing.	Assembly, sanding, coating, coloring, lacquering, painting, metal plating, threaded/non-threaded inserts, vibration grinding & vapor smoothing.	Assembly, support removal, sanding, coating, lacquering, painting, metal plating, threaded/non-threaded inserts.	Support removal, sanding, threaded/non-threaded inserts.	Support removal, sanding, threaded/non-threaded inserts.

PROTOTAL DAMVIG

SPECIALISTS IN 3D PRINTING AND
3D PRINTING TECHNOLOGIES

3D PRINTING GUIDELINES

	Supported Walls	Unsupported Walls	Support & Overhangs	Embossed & Engraved Detalis	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 connections assemblies >0,5 mm Radial	>12 mm multiple holes are prefered	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 connections assemblies >0,3 mm Radial	>6 mm multiple holes are prefered	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 connections assemblies >0,5 mm Radial	>12 mm multiple holes are prefered	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 prefered	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 connections assemblies >0,8 mm Radial	>20 mm multiple holes are prefered	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

The above is a guide to a trouble free 3D printing. Smaller tolerances and smaller details are possible but will have to be verified for every geometry.
This 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.