HUMMINGBIRD 3D SOLUTIONS

Additive Manufacturing Materials and Build Volume

DMLS - Build Volume (inches) - 9.75 x 9.75 x 12.75

Material	Appearance	Tensile Strength	Elongation at Break (%)		Hardness
Stainless Steel 316L	Metallic	540-640	40-50%		85 HRB
Aluminum	Metallic	440-480	7-11%		114-124 HBW
Inconel	Upon Request				
Titanium	Upon Request				

CFF - Build Volume (inches) – 12.6 x 5.2 x 6.1

Material	Appearance	Tensile Strength	Elongation at Break (%)	Heat Deflection	
Carbon Fiber	Black	116,000	1.5	221 F	
Kevlar	Natural	88,500 PSI	2.7	221 F	
CF reinforced Nylon	Black	5,220 PSI	58	293 F	
Fiberglass	Clear	85,500 PSI	3.8	221 F	
HSHT Fiberglass	Clear	87,000 PSI	3.9	302F	

PolyJet - Build Volume (inches) – 19.3 x 15.4 x 7.9

Materials (Rigid)	Appearance	Tensile Strength	Elongation at Break	Heat Deflection	Water Absorption %
VeroWhite Plus	White	7,250-9,450	15-25%	113-122 F	1.1-1.5%
VeroBlack Plus	Black	7,250-9,450	15-25%	113-122 F	1.1-1.5%
Vero Blue	Blue	7250-8700	15-25%	113-122 F	1.5-2.2%
Vero Gray	Gray	7,250-9,450	15-25%	113-122 F	1.1-1.5%
Rigur	White	5800-6500	20-35%	120-129 F	
VeroClear	Clear	7,250-9,450	10-25%	113-122 F	1.1-1.5%
RGD 525	Ivory	10,000-11,500	10-15%	167-176 F	1.2-1.4 %
ABS-Like	Green/Beige	8,000-8,700	25-40%	198-203 F	Not for Water
Med610	Clear				

Materials (Rubber-like)	Appearance	Tensile Strength	Elongation at Break	Shore Hardness	Special Notes
Tango Plus	Yellow-Clear	115-220	170-220%	26-28 Shore A	Combining these materials with a rigid plastic can yield multiple Shore A Values
Tango Black Plus	Black	115-220	170-220%	26-28 Shore A	
Tango Black	Black	115-350	45-55%	60-62 Shore A	
Tango Gray	Grey	435-725	45-55%	73-77 Shore A	

SLS - Build Volume (inches) – 22 x 22 x 30

Material	Appearance	Tensile Strength	Elongation at Break (%)	Heat Deflection	Hardness
Duraform PA (Nylon)	Yellow-White	6,237	14%	356 F	73 Shore D
Duraform PA (Nylon)	Yellow-White	6,237	14%	356 F	73 Shore D
Duraform GF (Glass-Filled Nylon)	White-Grey	3,916	1.40%	354 F	77 Shore D
FS3300PA	White	6,671	36%	295 F	

SLA - Build Volume (inches) – 25 x 29 x 21

Material	Appearance	Tensile Strength	Elongation at Break (%)	Heat Deflection	Hardness
Accura 25	Beige	5,540-5,570	13-20%	136-145 F	80 Shore D
Molecule Resins	Various				
Formlabs Resins	Various				
Accura Xtreme	Grey	2,450-2,900	25-30%	97-100 F	70-74 Shore D

FDM/FFF - Build Volume (inches) – 24 x 24 x 23.7

Material	Appearance	Tensile Strength	Elongation at Break	Heat	Hardness
ABS	Multiple	5,200	4%	204 F	R 109.5

Polycarbonate	White	9,800	5%	280 F	R 115
PC-ABS	Black	5,900	6%	230 F	R 110
Nylon	Black, Natural	7,000	30%	206.6 F	
PPSF	Tan	8,000	3%	372 F	M86
Ultem 9085	Tan	10,400	6%	307 F	
Semiflex	Various				
T-Lyne	Various				
PCTPE	Various				
Nylon 230	Various				
Nylon 618	Various				
Nylon 645	Various				
Nylon Bridge	Various				
Nylon 680	Various				
Alloy 910	Various				
PETG	Various				
Pure PET	Various				
t-glase	Various				
TECH-G	Various				
n-vent	Various				
Guidel!ne	Various				ISO 10993, DMF #16525, USP Class VI
BluPrint	Various				