DIRECT METAL LASER SINTERING (DMLS) MATERIAL

Direct Metal Laser Sintering (DMLS) is an additive manufacturing (or 3D Printing) technology that produces metal prototype and production parts in a matter of hours. Our DMLS service utilizes a variety of metal and alloy materials to create strongdurable parts fror 3D CAD data without the need of tooling. 3D printed metal parts built with this technology have the design versatility of layer additive manufacturing while possessing the mechanical properties and appearance of metal materials.

Material	Description	Product Options (Resolution)	Ultimate Tensile Strength	Yield Strength	Elongation at Break	Modulus of Elasticity	Hardness	Maximum Operating Temperature	Thermal Conductivity	Coefficient of Thermal Expansion (CTE)
Stainless Steel 17-4 PH	Excellent weld-ability & corrosion resistance; Cost effective	DMLS SD	142 ± 7 ksi (980 ± 50 MPa)	73 ± 7 ksi (500 ± 50 MPa)	25 ± 5%	25 ± 3 msi (170 ± 20 GPa)	230 ± 20 HV1	~1022 °F (~550 °C)	97 Btu in/(h ft2°F/in) (14 W/m°C)	7.8 x 10-6 in/in°F (14 x 10-6 m/m°C)
Stainless Steel 316L	Excellent weld-ability, corrosion resistance & ductility	DMLS SD	93 ± 7 ksi (640 ± 50 Mpa)	77 ± 8.7 ksi (530 ± 60 Mpa)	40 ± 15 %	–	typ. 85 HRB	–	–	–
Aluminum AlSi10Mg	Low weight, high strength, & good thermal properties	DMLS SD	49 ± 6 ksi (340 ± 40 Mpa)	36 ± 2 ksi (250 ±15 Mpa)	1.5 ± 0.5 %	–	120 ± 5 HBW	–	–	–
Inconel 625	High tensile, creep and rupture strengths	DMLS SD	130 ksi ± 7 ksi (900 ± 50 MPa)	89 ksi ± 7 ksi (615 ± 50 MPa)	42 ± 5%	20.3 msi ± 3 msi (140 ± 20 GPa)	~30 HRC (287 HB)	~1200 °F (~650 °C)	–	–
Inconel 718	Good tensile, creep & rupture strength; Fatigue resistance	DMLS SD	142 ± 7 ksi (980 ± 50 MPa)	92 ± 7 ksi (634 ± 50 MPa)	31 ± 5%	–	~30 HRC (287HB)	~ 1200 °F (~650 °C)	–	6.9 – 7.2 x 10-6 in/in°F (12.5 – 13 x 10-6 m/m°C)
Titanium Ti64	Biocompatible; Corrosion resistance	DMLS SD	166 ± 9 ksi (1,150 ± 60 MPa)	150 ± 10 ksi (1,030 ± 70 MPa)	11 ± 2%	16 ± 1 msi (110 ± 7 GPa)	~400 – 430 HV (41 – 44 HRC)	~660 °F (~350 °C)	–	–
Cobalt Chrome CoCrMo	High tensile strength & hardness; Biocompatibility	DMLS SD	174 ± 22 ksi (1,200 ± 150 MPa)	116 ± 15 ksi (800 ± 100 Mpa)	24 ± 4%	28 ± 3 msi (190 ± 20 GPa)	35 – 45 HRC	2100 °F (1150 °C)	90 Btu in/(h ft 2°F/in) (13 W/m°C)	7.6 – 8.4 x 10-6 in/in°F (13.6 – 15.1 x 10-6 m/m°C)