Protolis

Metal Grades for 3D Printing

Materials	Other names	Descriptions	Applications	Corrosion resistance	Post treatment capability	Welding capability	Price index	Density - g/cm3	Young modulus - Gpa	Yield strength - Mpa	Ultimate tensile strength - Mpa	Elongation at break - %	Hardness - HB brinell	Electrical Conductivity - % at 20 °C IACS	Electrical resistivity - Ω·mm2/m	Thermal conductivity - W/m-K
SLM - 316L	316L Stainless Steel, LaserForm 316L	Modified ultra-low carbon Cr-Ni-Mo series austenitic stainless steel with good mechanical properties, high hardness, strength & ductility, superior acid & corrosion resistance, suitable for marine environments.	Medical technologies, automotive industry, aerospace engineering, marine components	Very good	Suitable for most of steel coating	Very good	2	8	620±30 (XY) 470±90 (Z)	530±20 440±20	660±30 (XY) 570±55 (Z)	50±10	90±5HRB	2,3	0,74	14 - 15.9
SLM - MS1	Tool steel MS1, 1.2709, X3NiCoMoTi	Easily hardenable steel with good mechanical properties: high strength, toughness, wear resistance, easily post-hardened to more than 50 HRC Properties adjustable with different heat treatment. Good machinability and excellent polishability.	Mold inserts, tools and equipment. High performance industrial & engineering parts: aerospace and motor racing appliances	Good	Possible for post machining operation: spark-eroding, welding, polishing and coating	Very good	2	8	1100±50 (XY) 1000±50 (Z)	930±100 (XY) 1100±100 (Z)	1150±100 (XY) 1100±100 (Z)	12±4	33±3HRC	-	-	15±0.8
SLM - AlSi10Mg	Aluminium AlSi10Mg	Light weight and good mechanical properties, especially for its high strength and dynamic load capacity. Good thermal and electrical conductivity with high corrosion resistance. Properties can be modified with heat treatments	Engineering components subject to high loads Lightweight designs Aerospace and automotive components	Very good	Suitable for smooth and shiny surface treatment.	Very good	3	2.6	300±30 (XY) 260±20 (Z)	230±50 (XY) 270±50 (Z)	450±50 (XY) 450±50 (Z)	7±4	110±10HBW	25	-	100 - 110
SLM - Nickel IN625	2.4856, NiCr22Mo9Nb	This alloy is a nickel-chromium superalloy. It is well know for its high strength, outstanding corrosion resistance, and ability to withstand extreme temperatures. It can be heat treated and material properties can be varied.	Sea-water, aerospace, nuclear and chemical process equipment	Very good	Possible for post machining operation: spark-eroding, welding, polishing and coating	Very good	3	8.4	750±50 (XY) 700±50 (Z)	670±50 (XY) 670±50 (Z)	1050±50 (XY) 1000±50 (Z)	35±5	32±3HRC	-	1,29	9,8
SLM - Titanium Ti64	Ti-6Al-4V, TC4	Alpha-beta titanium alloy widely used for its high strength-to-weight ratio and excellent corrosion resistance. It has low density and excellent corrosion.	Aerospace, shipbuilding, automotive, medical	Very good	-	Very good	5	4.43	1100±50 (XY) 1100±50 (Z)	1250±50 (XY) 1200±50 (Z)	1350±50 (XY) 1350±50 (Z)	10±4	32±3HRC	-	-	7.1 - 7.95
SLM - MP1	CoCrMo	This class of metal superalloy is characterized by having excellent mechanical properties, corrosion resistance, and temperature resistance	Automotive, aerospace, biomedical industries	Very good	Possible for post machining operation: spark-eroding, welding, polishing and coating	Good	4	8.3	1000±50 (XY) 800±50 (Z)	660±50 (XY) 660±50 (Z)	1100±100 (XY) 1100±100 (Z)	15±5	38±5HRC	-	-	12,2

XY: transversal direction
Z: building direction