DMLS

DMLS MATERIAL SPECIFICATIONS
Inconel 718

Highlights

- Nickel based super alloy
- Non-Magnetic
- Corrosion resistant

Applications

- High heat
- Turbine engine components
- Fuel and exhaust systems
- Chemical process equipment
- Oil well, petroleum, and natural gas industry
- Fasteners and instrumentation parts

Mechanical Properties

	AMS 5596, 5663 SHT (max)	AMS 5596, 5663 PHT (min)	DMLS As Built	DMLS SR*	DMLS HIP'ed	DMLS SHT*	DMLS PHT*
Ultimate Tensile Strength	140 ksi	180 ksi	127 ksi	133 ksi	185 ksi	119 ksi	198 ksi
0.02% Yield Strength	80 ksi	150 ksi	112 ksi	75 ksi	135 ksi	46 ksi	153 ksi
Modulus	-	-	26 msi	28 msi	29 msi	26 msi	28 msi
Elongation	30%	12%	30%	42%	24%	29%	20%
Reduction of Area	-	-	40%	48%	49%	44%	28%
Hardness (HRC)	25	36	TBD	TBD	TBD	TBD	TBD

*SR - Stress Relief, 1950°F for 1.5 hours
*HIP'ed - Hot Isostatic Press, 2125°F for 240 min at 14.75 ksi
*SHT - Solution Heat Treat, (Per AMS5596K) Heat to 1725°F to 1850°F, hold for time commensurate with product thickness air cool (or faster)
*PHT - Percipitation Heat Treatment, (Per AMS5596K) Heat to 1325°F to 1400°F, hold for approx 8 hours, cool at 100°F/hr to 1150°F, hold for approx 8 hrs, air cool

Composition

Element	Typical Composition
Carbon (C)	0.08 max
Silicone (Si)	0.35 max
Manganese (Mn)	0.35 max
Phosphorus (P)	0.015 max
Sulfure (S)	0.015 max
Chromium (Cr)	17.00 - 21.00
Molybdenum (Mo)	3.3 max
Vanadium (V)	-
Copper (Cu)	0.30 Max
Iron	Balance
Niobium (Nb)	5.5 max
Aluminum (Ai)	0.3 max
Titanium (Ti)	1.15 max
Nickle (Ni)	50.00 - 55.00

*Chemical analysis for specific lots available upon request.
The material properties provided herein are for reference purposes only. Actual values may vary significantly as they are dramatically affected by part geometry and process parameters. Material specifications are subject to change without notice.

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