



Inconel 718

DIRECT METAL LASER SINTERING MATERIAL SPECIFICATIONS

Highlights

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

Applications

- High heat
- Turbine engine components, fasteners & instrumentation parts
- Oil well, petroleum, and natural gas industry

TYPICAL PHYSICAL PROPERTIES

| MECHANICAL PROPERTIES | AMS 5596, 5663 SHT (MAX) | AMS 5596, 5663 PHT (MIN) | DMLS AS BUILT | DMLS SR* | DMLS HIP'ed* | DMLS SHT* | DMLS PHT* |
|-----------------------------|--------------------------|--------------------------|---------------|----------|--------------|-----------|-----------|
| 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 (msi) | - | - | 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 - Precipitation 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

INCONEL 718 COMPOSITION

| ELEMENT | TYPICAL PERCENTAGE |
|------------------------|--------------------|
| Carbon (C) | 0.08 max |
| Silicon (Si) | 0.35 max |
| Manganese (Mn) | 0.35 max |
| Phosphorus (P) | 0.015 max |
| Sulfur (S) | 0.015 max |
| Chromium (Cr) | 17.00 - 21.00 |
| Molybdenum (Mo) | 3.3 max |
| Copper (Cu) | 0.30 max |
| Iron (Fe) | Balance |
| Niobium (Nb) | 5.5 max |
| Aluminum (Al) | 0.3 max |
| Titanium (Ti) | 1.15 max |
| Nickel (Ni) | 50.00 - 55.00 |

The information presented represents typical values intended for reference and comparison purposes only. It should not be used for design specifications or quality control purposes. End-use material performance can be impacted (+/-) by, but not limited to, part design, end-use conditions, test conditions, color etc. Actual values will vary with build conditions. Product specifications are subject to change without notice. *Chemical analysis for specific lots available upon request.

The performance characteristics of these materials may vary according to application, operating conditions, or end use. Each user is responsible for determining that the material is safe, lawful, and technically suitable for the intended application. Stratasys makes no warranties of any kind, express or implied, including, but not limited to, the warranties of merchantability, fitness for a particular use, or warranty against patent infringement.