

A-Powder Inconel 718 Nickel Superalloy

Gas-atomized nickel-chromium superalloy for laser powder bed fusion (LPBF)

A-Powder Inconel 718 is a precipitation-hardenable nickel-chromium superalloy for LPBF. It retains high strength and creep resistance to ~700 °C with excellent oxidation and corrosion resistance — the workhorse superalloy for aerospace hot-section, rocket and oil & gas parts. US-produced, gas-atomized for high sphericity and low oxygen; every lot ships with a Certificate of Analysis.

POWDER SPECIFICATION

|                     |                                                |
|---------------------|------------------------------------------------|
| Alloy / grade       | Inconel 718 nickel superalloy                  |
| Equivalents         | UNS N07718 · 2.4668 · AMS 5662/5663            |
| Particle size (PSD) | 15–53 µm (custom cuts available)               |
| Production method   | VIGA · US-produced                             |
| Morphology          | Spherical, high sphericity, low O <sub>2</sub> |
| Condition           | Heat-treatable — solution + double age         |
| Process             | LPBF (machine type F)                          |
| Packaging           | 10 kg bottle · 440 / 840 kg hopper             |

MECHANICAL PROPERTIES

| PROPERTY      | AS-BUILT   | AGED       |
|---------------|------------|------------|
| UTS           | ~ 1010 MPa | ~ 1400 MPa |
| Yield (Rp0.2) | ~ 660 MPa  | ~ 1150 MPa |
| Elongation    | ~ 25 %     | ~ 16 %     |
| Hardness      | ~ 30 HRC   | ~ 45 HRC   |

Indicative, process-dependent. Aged = solution + double age (AMS 5662/5663).  
Oxidation resistance to ~980 °C. Relative density > 99 %.

CHEMICAL COMPOSITION (WT %)

| ELEMENT         | CONTENT   | ELEMENT         | CONTENT   |
|-----------------|-----------|-----------------|-----------|
| Nickel (Ni)     | 50.0–55.0 | Molybdenum (Mo) | 2.80–3.30 |
| Chromium (Cr)   | 17.0–21.0 | Titanium (Ti)   | 0.65–1.15 |
| Iron (Fe)       | Balance   | Aluminium (Al)  | 0.20–0.80 |
| Niobium (Nb+Ta) | 4.75–5.50 | Carbon (C)      | ≤ 0.08    |

MATERIAL COMPARISON

| FEATURE          | IN718               | IN625               | HAYNES 230           |
|------------------|---------------------|---------------------|----------------------|
| Type             | Ni-Cr-Fe (PH)       | Ni-Cr-Mo (SS)       | Ni-Cr-W-Mo           |
| Strengthening    | Precipitation (γ'') | Solid-solution      | Solid-solution       |
| Max service temp | ~700 °C (strength)  | ~980 °C (corrosion) | ~1150 °C (oxidation) |
| Heat treatable   | Yes (aging)         | No                  | No                   |

TYPICAL APPLICATIONS

Aerospace hot-section

Rocket & space

Oil & gas downhole

High-temp tooling

COMPATIBILITY & SUPPLY

|               |                                                  |
|---------------|--------------------------------------------------|
| LPBF systems  | AO Metal A50 / A100 · open-parameter             |
| Certification | Full COA per lot (PSD, chemistry, density, flow) |
| Dispatch      | 5–10 business days from Los Angeles              |