

A-Powder 17-4PH Stainless Steel

Gas-atomized precipitation-hardening stainless powder for laser powder bed fusion (LPBF)

A-Powder 17-4PH is a martensitic precipitation-hardening stainless steel powder for LPBF. It combines high strength and hardness with good corrosion resistance and is heat-treatable (H900-H1150) to dial in your target properties — the go-to stainless for high-strength aerospace, defense and tooling parts. US-produced, gas-atomized for high sphericity and low oxygen; every lot ships with a Certificate of Analysis.

POWDER SPECIFICATION

Alloy / grade	17-4PH precipitation-hardening stainless
Equivalents	UNS S17400 · 1.4542 · AISI 630
Particle size (PSD)	15–53 µm (custom cuts available)
Production method	Gas atomized · US-produced
Morphology	Spherical, high sphericity, low O ₂
Condition	Heat-treatable (solution + age)
Process	LPBF (machine type F)
Packaging	10 kg bottle · 440 / 840 kg hopper

MECHANICAL PROPERTIES

PROPERTY	AS-BUILT	H900
UTS	~ 1050 MPa	~ 1300 MPa
Yield (Rp0.2)	~ 600 MPa	~ 1170 MPa
Elongation	~ 15 %	~ 10 %
Hardness	~ 30 HRC	~ 40 HRC

Indicative, process-dependent. H1025/H1075/H1150 aging trades strength for toughness. Relative density > 99 %.

CHEMICAL COMPOSITION (WT %)

ELEMENT	CONTENT	ELEMENT	CONTENT
Iron (Fe)	Balance	Niobium (Nb+Ta)	0.15–0.45
Chromium (Cr)	15.0–17.5	Manganese (Mn)	≤ 1.00
Nickel (Ni)	3.0–5.0	Silicon (Si)	≤ 1.00
Copper (Cu)	3.0–5.0	Carbon (C)	≤ 0.07
Phosphorus (P)	≤ 0.040	Sulfur (S)	≤ 0.030

MATERIAL COMPARISON

FEATURE	17-4PH	316L	15-5PH
Type	Martensitic PH	Austenitic (Mo)	Martensitic PH
Strength & hardness	High (heat-treatable)	Moderate	High (heat-treatable)
Corrosion resistance	Good	Excellent (chloride/pitting)	Good (δ-ferrite-free)
Heat treatable	Yes (aging)	No	Yes (aging)
Magnetic	Yes	No	Yes

TYPICAL APPLICATIONS

Aerospace & defense brackets

Tooling & mold inserts

Pump & valve components

High-strength structural parts

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