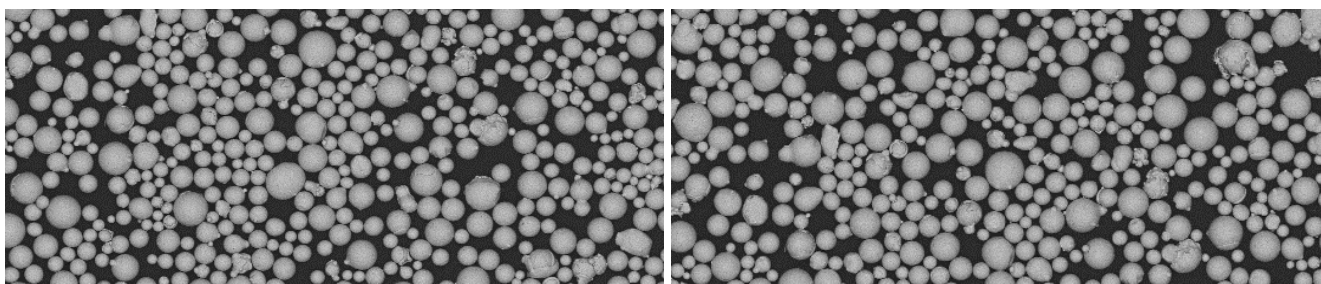


In718 Superalloy

【 Fatigue durability, radiation protection, oxidation resistance, corrosion preventive】

Material Introduction

In718 is a Ni-Cr-Fe based precipitation hardening deformation superalloy. Its long-term use temperature ranges from -253°C to 650°C , and it can reach 800°C in a short time. This alloy has high strength below 650°C . In718 has excellent fatigue durability, radiation protection, oxidation resistance and corrosion preventive, as well as good processing and welding performance and long-term structural stability.



Applications

It is suitable for printing components such as turbine disks, rings, blades, shafts, fasteners, and elastic elements in the aviation, aerospace, nuclear, and petrochemical industries.



Rocket Nozzle

Chemical Composition (wt.%)

C	Cr	Ni	Co	Mo	Fe	Al
≤ 0.08	17.0–21.0	50.0–55.0	≤ 1.0	2.8–3.3	Bal.	0.2–0.8
Ti	Nb	Mn	P	S	B	Si
0.65–1.15	4.75–5.50	≤ 0.35	≤ 0.015	≤ 0.015	≤ 0.006	≤ 0.35
Mg	Cu	O	N	/	/	/
≤ 0.01	≤ 0.3	≤ 0.02	≤ 0.02	/	/	/

Physical Property

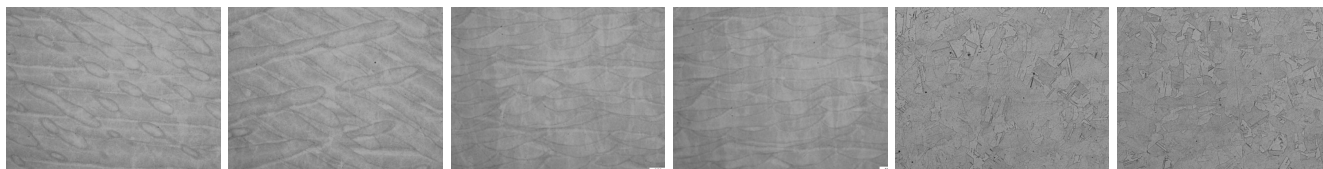
Granularity(μm)			Sphericity	Loose density (g/cm^3)	Tap density (g/cm^3)	Flowability (s/50g)
D10	D50	D90				
≥ 15	30–40	≤ 60	≥ 0.9	≥ 4.4	≥ 5.0	≤ 18

Parameters

Laser power(W)	Laser speed(mm/s)	Scanning spacing(mm)
280	1060	0.11



Metallographic Structure



Sedimentary microstructure (XY-direction)

Sedimentary microstructure (Z-direction)

Microstructure in heat-treated state
(left: XY direction; right: Z direction)

Mechanical Property

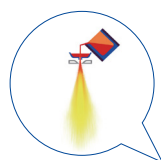
Heat-Treated + Aged			
Test Temperature	Tensile Strength/MPa	Yield Strength/MPa	Elongation/%
Room Temperature Tensile Test	≥ 1300	≥ 1100	≥ 15.0
650°C Tensile (Test)	≥ 1000	≥ 900	≥ 12.0
650°C Stress Rupture (Test)	Initial Stress/MPa 690	Duration/h ≥ 30	≥ 5.0

Persistent Performance

State	Test project	Direction	Test stress (MPa)	Fracture time (h)	Elongation (%)
Solution treatment and aging process	650°C High temperature persistent	XY	690	>50	3
		Z	690	>50	3.5

Advanced Powder Metallurgy Technology

The powder metallurgy technology and equipment production line—
Vacuum Induction Gas Atomization (AVI-VIGA)



Adapting Devices

10+ proprietary LPBF equipment systems supporting build sizes from 100 mm to 1500 mm.



MT170H

MT280

MT400M

MT450

MT650

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