AVIMETAL ADDITIVE

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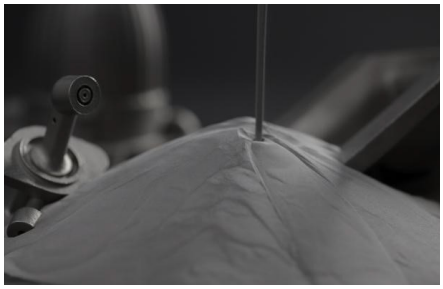
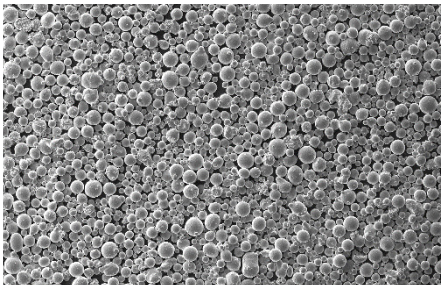
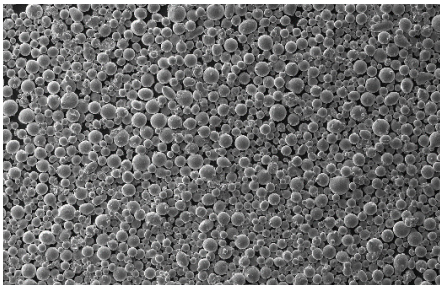
Hastelloy X Superalloy

【Excellent anti oxidation, corrosion resistance, cold and hot processing, and welding performance】

Material Introduction

Hastelloy X is a Ni based solid solution strengthened deformation superalloy, which has moderate durability and creep strength below 900 ℃. It has excellent anti oxidation, corrosion resistance, cold and hot processing, and welding performance.

Applications

It is suitable for manufacturing aviation engine combustion chamber components, honeycomb structures, diffusers, exhaust nozzles, and other hot end components for long-term use below 900 ℃.

Fuel nozzle

Scramjet nozzle

Chemical Composition (wt.%)

C	Cr	Ni	Co	W	Mo	S	Ti	Fe
0.05–0.15	20.5–23.0	Bal.	0.5–2.5	0.2–1.0	8.0–10.0	≤0.015	≤0.15	17.0–20.0
B	Si	Mn	P	Al	Cu	O	N	/
≤0.01	≤1.0	≤1.0	≤0.025	≤0.5	≤0.5	≤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)
250	970	0.1

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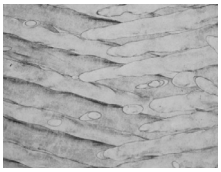
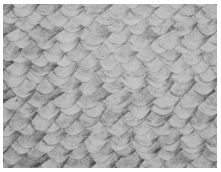
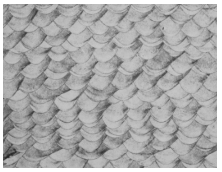
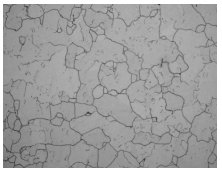
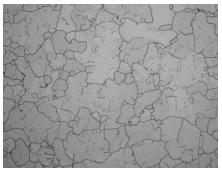
Metallographic Structure




Sedimentary microstructure (XY-direction)

Sedimentary microstructure (Z-direction)

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

Mechanical Property

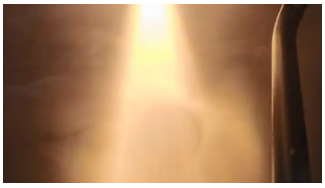
Heat-Treated			
Test Temperature	Tensile Strength/MPa	Yield Strength/MPa	Elongation/%
Room Temperature	⩾700	⩾300	⩾30.0
900℃	⩾220	⩾170	⩾20.0

Persistent Performance

State	Temperature	Direction	Test stress（MPa）	Fracture time（h）	Elongation（%）
HIP+Solid solution	815℃	XY	105	32.3	20.5
		Z	105	31.9	25.0

Advanced Powder Metallurgy Technology

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



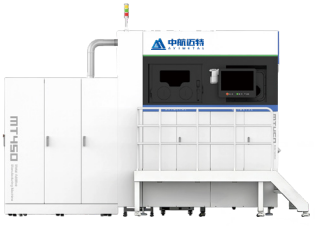

Adapting Devices

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

MT170H

MT280

MT400M



MT450

MT650

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