

# Stellar Ti6Al4V ELI

## Powder for Additive Manufacturing

### MATERIAL OVERVIEW

Stellar Ti6Al4V ELI is an alpha-beta type Titanium alloy with:

- low weight combined to high strength
- excellent corrosion resistance
- high fatigue, crack propagation resistance compared to other lightweight alloys
- good creep up to 300°C

### POWDER PRODUCTION

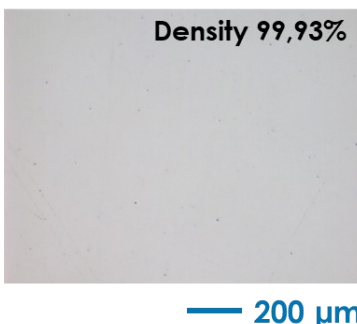
Titanium powder produced by plasma wire atomization by Pyrogenesis\*. The process ensures:

- High purity
- Excellent sphericity
- Low oxygen content
- Excellent flowability

### PRINTABILITY

Excellent metallurgical health after SLM process and heat treatment with Stellar Ti6Al4V ELI powders. (Reference EOS M290, optimized parameters, layer thickness: 30µm). Preheating of the base plate needed for production.

No cracks observed after building the sample. Heat treated at 800 °C for 2 hours in argon inert atmosphere.



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\*Aubert & Duval is the exclusive distributor of Pyrogenesis titanium powders in Europe.

### CHEMICAL COMPOSITION

	Ti	Al	V	C	O	N
Mini		5.5	3.5	-	-	-
Bal.						
Maxi		6.5	4.5	0.08	0.12	0.05
	H	Fe	Y	Others, each	Others, total	
Mini	-	-	-	-	-	
Maxi	0.012	0.25	0.005	0.1	0.4	

- ASTM F3001-14
- ASTM B348 gr23

### POWDER CHARACTERISTICS

Particle size distributions:

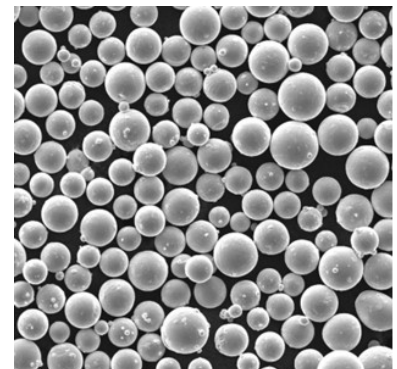
Laser Powder Bed Fusion (LPBF): 20-53 µm

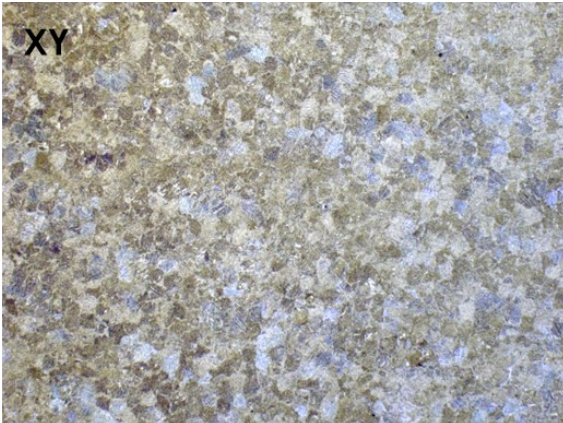
Electron Beam Melting (EBM): 45-106 µm

Directed Energy Deposition (DED): 45-106 µm

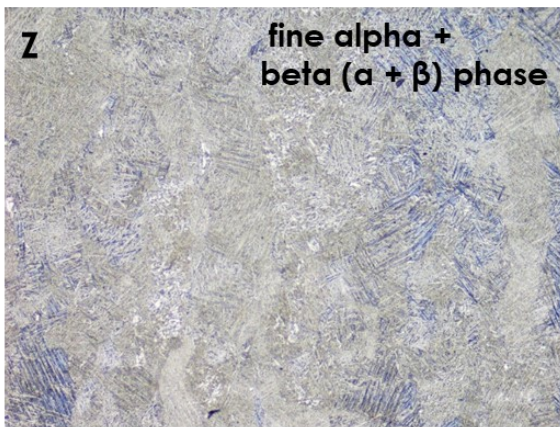
Custom size distributions available on request

Typical powder morphology, Stellar Ti6Al4V ELI atomized by plasma wire.





— 500 μm

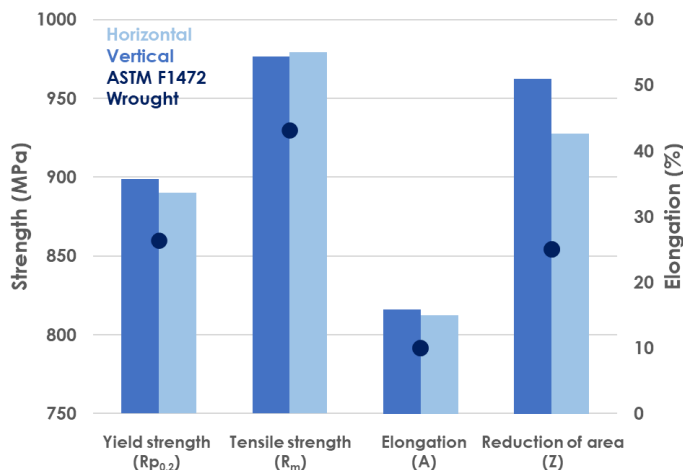


— 200 μm

Microstructure for Stellar Ti6Al4V ELI obtained after Kroll etching.

Hardness: 330 ± 4 HV10 according to ASTM E384 or NF EN ISO6507-1.

## TENSILE PROPERTIES, DUCTILITY & REDUCTION OF AREA



Tensile properties of additively manufactured Stellar Ti6Al4V ELI after heat treatment at 800 °C for 2 hours in argon inert atmosphere compared to ASTM F1472 Wrought. No HIP applied. Properties evaluated at a strain rate of 10<sup>-4</sup> s<sup>-1</sup>, all other test conditions in accordance to NF EN 2002-1 and NF EN 2002-2. Yield Strength (YS) shown is Rp0.2% stress, Ultimate Tensile Strength (UTS) is stress at maximum force. Elongation and Area Reduction were measured after failure as per the standards.

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