

# Ti6Al4V

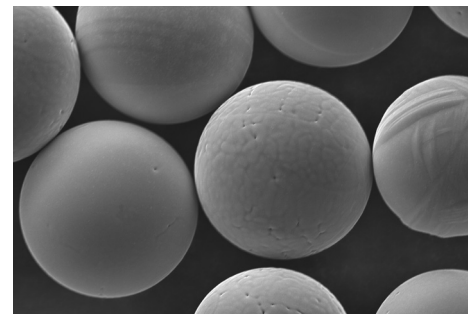
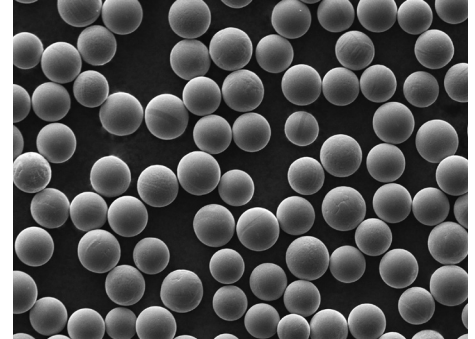
## Titanium Alloy Powder



### HIGH PERFORMANCE PARTS START WITH HIGH PERFORMANCE POWDER

From 6K's UniMelt® process, the world's only microwave plasma production system comes the highest performing and most versatile set of powders. Ti6Al4V is a high strength, low density Ti alloy known for its excellent corrosion resistance. 6K's Ti6Al4V spherical powders deliver excellent material properties that enable designers to take advantage of the design freedom of additive manufacturing.

Ti6Al4V is a heat treatable  $\alpha$ - $\beta$  Ti alloy. The properties make this alloy ideal for medical implants as well as applications in aerospace, automotive and industrial. Due to its high strength to weight ratio it is particularly attractive for automotive and aerospace applications. Ti6Al4V is available in two grades—Grade 5 and Grade 23 (ELI), it is also available in a variety of sizes, the representative properties are shown below for a fine cut.



NOMINAL CHEMISTRY			PHYSICAL PROPERTIES (TYPICAL)	
	Grade 5	Grade 23		15-45 $\mu$ m
Titanium	Balance	Balance	Apparent Density	2.3 g/cm <sup>3</sup>
Aluminum	5.5-6.75%	5.5-6.5%	Tap Density	2.8 g/cm <sup>3</sup>
Vanadium	3.5-4.5%	3.5-4.5%	Hall Flow	26 s/50g
Iron (Max)	0.40%	0.25%		
Oxygen (Max)	0.20%	0.13%		
Carbon (Max)	0.08%	0.08%		
Nitrogen (Max)	0.05%	0.05%		
Hydrogen (Max)	0.015%	0.012%		

TENSILE PROPERTIES - Ti6Al4V- Grade 23					
	Powder	YS (MPa)	UTS (MPa)	EL (%)	RA (%)
XY	6K (HIP)	909	999	18	41
	ASTM F3001*	795	860	10	25
Z	6K (HIP)	905	979	19	46
	ASTM F3001*	795	860	10	25

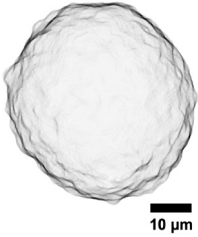
\* ASTM F3001 Class C

### 6K Premium Ti6Al4V Powders

- Ultra clean
- No satellites
- High sphericity
- Free flowing
- High apparent density
- Low porosity
- Exceptional lot to lot consistency
- Conforms to ASTM F3001
- Conforms to AMS7017

# Ti6Al4V

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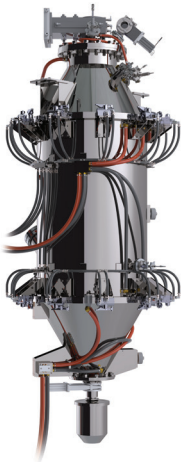
### HIGH DENSITY POWDER

Unlike competitive technologies, 6K's process delivers highly dense, highly spherical powders without satellites, as shown in microCT of the particle.



### DERIVED FROM SUSTAINABLE SOURCES

At 6K our powders are produced from sustainable sources including used powders and machine turnings. We leverage these input streams as feedstock for the UniMelt process, essentially turning scrap into high value AM powder. This process enables your organization to get value back from your past powder investment by participating in 6K Additive's powder buy-back program. We will buy your used powder, provide you a credit towards new premium powder for a wide variety of applications.



### HIGH UNIMELT YIELD AND TUNABLE PSD

6K's UniMelt process can deliver the highest yield in the industry for your target PSD. With our unique microwave plasma technology our production run can be tailored for any additive manufacturing (AM) platform including powder bed fusion, EBM, Binder Jet, direct energy deposition and cold spray plus PM processes like MIM and HIP.

With 6K's UniMelt breakthrough technology we have the capability of producing almost limitless material combinations, allowing you to design with infinite possibilities for your application.



### Ti6Al4V Printed Spinal Cage

Spinal cages designed at Amplify Additive and printed on a Trumpf TruPrint 1000 LPBF system with 6K's Ti6Al4V powder.

### Key Properties

- Corrosion resistant
- Biocompatible
- High strength to weight ratio
- Fatigue resistant
- Good high temperature mechanical properties

### Industries

- Aerospace & Defense
- Automotive
- Medical
- Industrial

6K Additive's production team has extensive experience in powder production, alloys and metal reclamation. Our 80,000 sq. ft. facility is ISO9001 certified and AS9100 certification is in process.

#### 6K CORPORATE HEADQUARTERS

25 Commerce Way, N. Andover, MA 01845  
978 258 1645

#### 6K ADDITIVE, GLOBAL MANUFACTURING CENTER

541 Steubenville Pike, Burgettstown, PA 15021  
724 215 7049

6KAdditive.com

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