

6AL-4V Titanium

Alternate names: Grade 5 Titanium, 6-4 Titanium

Description:

6AL-4V is the most common alloy of Titanium. As an alloyed Grade of Titanium, it is strengthened by the inclusion of roughly 6% Aluminum and 4% Vanadium. It is known as an alpha-beta Titanium alloy, containing both alpha and beta phases at room temperature. 6AL-4V exhibits high strength, light weight, and corrosion resistance, which makes it an excellent choice for applications in aerospace, medical, oil and gas, marine, and recreational industries. The density is 0.160 lbs/in³.

Condition:

6AL-4V typically comes in the Annealed condition, but it can be strengthened by heat treatment, such as Solution Treating and Aging.

Weldability:

Good weldability.

Machinability:

The American Iron and Steel Institute (AISI) determined a rating system of machinability of different materials. 160 Brinell B1112 steel was arbitrarily assigned a machinability rating of 100%. Using this as a comparable standard, ratings less than 100% are more challenging to machine, and ratings more than 100% are easier to machine. Titanium 6AL-4V is rated at 22% of B1112. Low cutting speeds, heavy feed rates, sharp tools, and ample cutting fluid are prescribed.

Common Specs:

AMS 4911	AMS 4928	AMS 4965
AMS 4967	AMS 6930	AMS 6931
AMS-T-9046 (AB-1 6AL4V)	AMS-T-9047 (6AL-4V)	MIL-T-9046 (AB-1 6AL-4V)
MIL-T-9047 (6AL-4V)	ASTM B348 (Grade 5)	ASTM B265 (Grade 5)
ASTM F1472	DMS 1592	DMS 1570

***The use of this information is strictly voluntary and should be used as a guideline only. This data contains generalizations and is in no way a substitute for your own research. This information is not intended as a warranty or fitness of any application. Should you require further information about Titanium 6AL-4V Grade 5, please contact us and we will gladly refer you to additional sources.*



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Mechanical and Chemistry info for 6AL-4V **Based on specs AMS 4911 and AMS 4928

Typical Composition Analysis

Aluminum
Vanadium
Iron (Maximum)
Oxygen (Maximum)
Carbon (Maximum)
Nitrogen (Maximum)
Hydrogen (Maximum)
Yttrium (Maximum)
Other Elements (Total)
Titanium

	AMS 4911 (Plate, Sheet)	AMS 4928 (Bars, Forgings)
Aluminum	5.5-6.75%	5.5-6.75%
Vanadium	3.5-4.5 %	3.5-4.5%
Iron (Maximum)	0.30%	0.30%
Oxygen (Maximum)	0.20%	0.20%
Carbon (Maximum)	0.08%	0.08%
Nitrogen (Maximum)	0.05%	0.05%
Hydrogen (Maximum)	0.015%	0.0125%
Yttrium (Maximum)	0.005%	0.005%
Other Elements (Total)	0.40%	0.40%
Titanium	Balance	Balance

Typical Tensile Properties (Minimums)*

Tensile
Yield
Elongation
Reduction of Area

	AMS 4911	AMS 4928
Tensile	130-134 ksi	130-135 ksi
Yield	120-126 ksi	119-125 ksi
Elongation	6-10%	8-10%
Reduction of Area	N/A	15-25%

*Tensile property requirements vary based on orientation, section thickness/diameter, and cognizant engineering organization requirements.

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To purchase AMS specs see: <http://standards.sae.org>

Please call 888.772.8984 or email sales@performancetitanium.com for a quote on 6AL-4V Grade 5 Titanium.

Data compiled from Dynamet "Technical Datasheet Titanium Alloy Ti 6Al-4V, Edition Date: 07/01/2000", Timet "TMC-0150" Data Sheet, ATI "Technical Data Sheet", RTI "Titanium Alloy Guide" and SAE specification & data sheets, as well as "Materials Properties Handbook: Titanium Alloys" by Gerhard Welsch, Rodney Boyer, & E. W. Collings.



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