



6Al-4V Titanium Bar UNS R56400

AMS 4928

Nominal Composition

Titanium 90% Aluminum 6%
Vanadium 4% Carbon < 0.10%
Oxygen < 0.20% Nitrogen < 0.05%
Hydrogen < 0.0125% Iron < 0.3%

Description

6Al-4V titanium alloy (Grade 5) is the most widely used titanium grade. Its high strength, light weight and corrosion resistance enables Ti 6-4 to be used in many applications. The most common market is aerospace. The alloy is also age hardenable by heat treatment to achieve even higher strengths. Some applications include compressor blades, discs, and rings for jet engines; airframe components; pressure vessels; rocket engine cases; helicopter rotor hubs and critical forgings requiring high strength-to-weight ratios.

Properties

Non-magnetic. A two-phase alloy, containing both alpha and beta phase crystalline structures. This high strength alloy can be used at cryogenic temperatures to about 800°F (427°C). AMS 4928 requires 120,000 psi minimum yield strength at room temperature. 6Al-4V titanium can be used in the annealed condition or in the solution treated and aged condition. 6Al-4V titanium has outstanding corrosion resistance to most media including nitric acid in all concentrations to boiling point; seawater; and to alkalis in all concentrations to boiling point. Stress corrosion cracking may occur if chlorine salts are present on stressed parts subsequently subjected to high temperatures. 6Al-4V titanium has acceptable oxidation resistance up to 1000°F (538°C).

Hardness

Hardness of Aerodyne stock is typically 300 BHN. The strength and hardness of the mill-annealed product may be increased by approximately 20% after an aging heat treatment. After aging at 975-1025°F (524-552°C), the typical yield strength is 150,000 psi and typical hardness is 360 BHN.

Machinability

RATING: 22% of B-1112
TYPICAL STOCK REMOVAL RATE:
30 surface feet/minute
COMMENTS:

Tooling should consist of tungsten carbide designations C1-C4 or cobalt type high speed tools. Generally, machining characteristics are similar to those of austenitic stainless steels. 6Al-4V titanium can be machined using slow speeds, high feed rates, rigid tooling, and flooding the workpiece with non-chlorinated cutting fluid.

Density: 0.160 lbs/in³, 4.47 g/cm³

Standard Inventory Specifications

- AMS 4928
- PWA S-4928
- MIL-T-9047G
- Capable of AMS 4965 and 4967 (4" and smaller)
- ASTM B348-8 Grade 5
- Line marked over 0.5 inches in diameter
- Predominantly produced by double vacuum melt. Hot rolled, annealed, then centerless ground or rough turned.
- Lengths: 10 – 12 feet

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