

Ti-6Al-4V (Grade 5)

Product Data Sheet

High Strength Titanium

The most widely used high strength titanium, Ti-6Al-4V (grade 5) is an alpha-beta alloy

The alloy combines good mechanical strength and low density (4.42 kg/dm³) with excellent corrosion resistance in many media. Grade 5 titanium is entirely heat treatable (solution heat treatment plus ageing) in sections up to 25mm and can be employed up to around 400° C.

Machinability

The alloy can be machined using practices for austenitic steels with slow speeds, heavy feeds, rigid tooling and large amounts of non-chlorinated cutting fluid.

Weldability

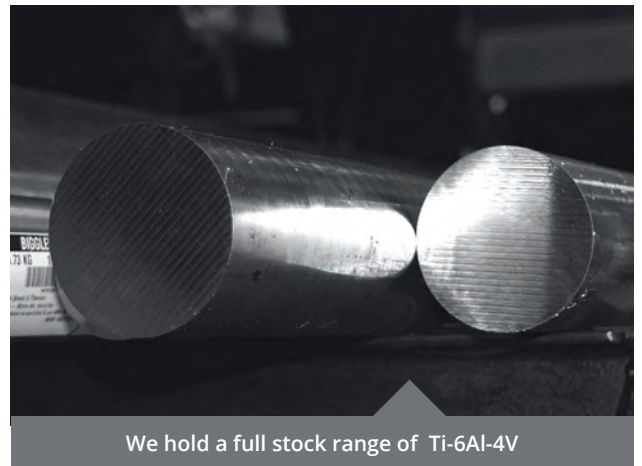
Welding in the annealed or solution/partially aged condition is good, with ageing completed during the post-weld heat treatment. Precautions must be taken to prevent oxygen, nitrogen and hydrogen contamination. Inert gas welding of the molten metal and the adjacent heated zones by using a trailing shield results in fusion welding. Protective atmospheres are not required when spot, seam and flash welding.

Typical Applications

- Motorsport components
- Aero-engine components
- Airframe components
- Offshore oil & gas equipment

About Smiths High Performance

Smiths High Performance is a leading stockholder and supplier of high-performance engineering materials to the global motorsport sector. We are supply partners in a range of specialist motorsport markets including Formula 1, Formula E, NASCAR, MOTO GP, WEC & WRC.



We hold a full stock range of Ti-6Al-4V

Availability

Bar, wire, sheet, plate, extrusions, forgings, seamless pipe/tube. Processing options are also available, in-house.

Further technical data available on the reverse of this Datasheet

Chemical Composition

Weight %	N	C	H	Fe	O	Al	V
Min.						5.5	3.5
Max	0.05	0.08	0.015	0.40	0.20	6.75	4.5

Mechanical Properties

	Minimum	Typical
UTS, MPa	895	1,000
0.2% PS, MPa	828	910
Elongation, % in 4D	10	18
Reduction of Area, %	25	-
Elastic Modulus, GPa	-	114
Hardness, HRC	-	36
Charpy V Notch Impact, J	-	24

Corrosive Resistance

Grade 5 titanium offers excellent resistance to many marine and offshore oil & gas environments. It resists a wide range of acid conditions being highly resistant to oxidising acids, possessing useful resilience to reducing acids and offering superior resistance to most organic acids at lower concentrations and temperatures.

The alloy is rapidly attacked by hydrofluoric acid and use with red fuming nitric acid is prohibited.

Fabrication (typical values)

Weldability – fair

Specified bend radius for < 0.070-inch x thickness - 4.5
Specified bend radius for >0.070-inch x thickness - 5.0

Material Specifications

- UNS R56400
- ASTM B348 Grade 5
- BS 3TA11
- AMS 4911
- AMS 4928
- MIL-STD-2154

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When you purchase high-performance materials from **Smiths High Performance**, you will be joining some of the biggest and best global engineering companies. We are a Tier 1 supply chain partner to the world's leading motorsport companies. Our unique business structure and ethos allows us to offer services which are otherwise unavailable in this market sector.