

TITANIUM 6Al-4V ELI (GRADE 23) STRIP

ALLOY DATASHEET

IMPLANTABLE MEDICAL DEVICES

Ti 6Al/4V ELI sheet has found application in medical implants owing to its excellent biocompatibility, high strength, and MRI compatibility.

GENERAL INFORMATION

In the cold rolled and annealed temper the material will not exhibit a continuous alpha network at prior beta grain boundaries or a continuous alpha case layer on the surface. Owing to the alloy's high strength and low ductility, it is difficult to cold draw into finished shapes. Hot forming has been found to be effective.

Any post cold work annealing must be done in vacuum to prevent oxygen, nitrogen and hydrogen contamination which will result in reduced formability. In addition, the annealing temperature must not exceed the beta transus temperature of the alloy, approximately 980°C.

AVAILABILITY

Ti 6Al/4V ELI is available from AMETEK Specialty Metal Products as sheet product from 0.005" to 0.020", widths up to 6.0" and lengths up to 18". The material conforms to ASTM F 136, ASTM B 265 grade 23 and UNS R56401.

CHEMICAL COMPOSITION (WEIGHT %) ¹

Aluminum	5.5 – 6.5
Vanadium	3.5 – 4.5
Iron	0.25 max
Carbon	0.08 max
Nitrogen	0.05 max
Oxygen	0.13 max
Hydrogen	0.015 max ¹

TYPICAL MECHANICAL PROPERTIES ²

	ANNEALED
Ultimate Tensile Strength	125,000 PSI
Yield Strength (.2% Offset)	115,000 PSI
Elongation in 2" *	10% min*
Electrical Resistivity	178 micro-ohm-cm

PHYSICAL PROPERTIES ³

Density	0.16 lb/in ³
Melting Point (Approx.)	1650°C
Electrical Resistivity @ R.T.	168 Microhm · cm
Thermal Expansion Coefficient	
(20 to 100°C)	8.6 X 10 ⁻⁶ /°C
(20 to 315°C)	9.2 X 10 ⁻⁶ /°C
Thermal Conductivity @ R.T.	6.7 W/m · K
Magnetic Attraction	None

* The measured elongation will be less as thickness decreases to 0.005" and less.

¹ Material over 0.032" thick limited to hydrogen content of 0.012% max.

² These values may be adjusted by control of process variables – consult AMETEK SMP for desired values.

³ Typical values to guide alloy selection but are not a guarantee of minimum or maximum.

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