

California Metal & Supply Inc.

ISO9001 & AS9100 Certified Company, Founded 1984
Titanium, Inconel, Nickel, Aluminum, A286, Stainless

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DATA SHEET: Titanium

Titanium is a chemical element with low density and is a strong, lustrous, corrosion-resistant transition metal with a silver color. Titanium is a performance metal, first utilized by the aerospace industry for its high strength-to-weight ratio, corrosion resistance and durability. Aerospace industry uses Titanium in manufacturing airframe structural components and skin, aircraft hydraulic systems, air engine components, rockets, missiles, and spacecraft. Most of the Titanium grades are of alloyed type with various additions.

Specifications: Grade 1 - UNS R50250, Grade 2 - UNS R50400, Grade 5 - UNS R56400, Grade 7 - UNS R52400, Grade 9 - UNS R56320, Grade 12 - UNS R53400

Properties of Titanium

Atomic Number	22
Heat of Vaporization	9.83MJ/kg
Atomic Weight	47.9
Machinability Rating	40
Atomic Volume	10.6W/D
Magnetic Susceptibility	1.25x10-6 3.17 emu/g
Boiling Point	3260 Degrees C/5900 Degrees F
Melting Point	1668 Degrees C + 10 Degrees C (3035 Degrees F + 18 Degrees F)
Coefficient of friction	0.8 at 40 m/min (125 ft/min) 0.68 at 300 m/min (1000 ft/min)
Modulus of Elasticity	14.9 x 106psi
Coefficient of thermal expansion	22
Atomic Number	8.64 x 10-6 Degrees C
Poisson's Ratio	0.41
Color	Dark Grey
Solidus/Liquidus	1725 Degrees C/ (3137 Degrees F)
Covalent Radius	1.32 A
Specific Gravity	4.5
Density	4.51 gm/cm3 (0.163 lb/in3)
Specific Heat (at 25oC)	0.518 J/kg Degrees K, (0.124 BTU/lb Degrees F)
Electrical Conductivity	3% IACS (copper 100%)
Specific resistance	554 μohm-cm
Electrical Resistivity	47.8 μohm-cm
Tensile Strength	35 ksi min
Electronegativity	1.5 Pauling's
Thermo-Conductivity	9.0 BTU/hr ft2 Degrees F
First Ionization Energy	158 k-cal/g-mole
Thermal Neutron Absorption Cross Section	5.6 barns/atom
Hardness	HRB 70 to 74
Young's Modulus of Elasticity	116 x 106 lbf/in2, 102.7 GPA
Heat of Fusion	440 kJ/kg (est.)

Technical Properties of Titanium

GRADE	Yield Strength min		Ultimate Tensile Strength min		Elongation min.
	KSI	Mpa	KSI	Mpa	
Grade 1	25	170	35	240	24
Grade 2	40	275	50	345	20
Grade 3	55	380	65	450	18
Grade 4	70	485	80	550	15
Ti 2% Pd (Gr.7)	40	275	50	345	20
Grade 12	50	345	70	483	18
Ti-6AL-4V	120	830	130	895	10
Ti-4AL-4Mo-1.5Sn	125	850	170	1160	10
Ti-10-2-3	160	1100	180	1250	8
Ti-15-3	160	1100	185	1280	10
Ti-6-2-4-2	120	830	160	1100	10
Ti-6-2-4-6	140	970	190	1300	10

Mechanical Properties of Titanium

Alloy	Specifications	UTS (psi)	YS (psi)	EI (%)	RA (%)
		min.	min.	min.	min.
CP-1	ASTM B265 / B348 Grade 1	35,000	25,000	24	30
CP-2	ASTM B265 / B348 Grade 2	50,000	40,000	20	30
CP-3	ASTM B265 / B348 Grade 3	65,000	55,000	18	30
CP-4	ASTM B265 / B348 Grade 4	80,000	70,000	15	25
Ti 6Al-4V	ASTM B265 / B348 Grade 5	130,000	120,000	10	25
Ti 6Al-4V ELI	ASTM B265 / B348 Grade 23	120,000	110,000	10	25
Ti-Pd	ASTM B265 / B348 Grade 7	50,000	40,000	20	30
TiCode 12	ASTM B265 / B348 Grade 12	70,000	50,000	18	25