

# TITANIUM GRADE 9 (Ti 3AL/2.5V)



## Titanium Grade 9

Ti Grade 9 is a near alpha, alpha-beta alloy, sometimes referred to as "half-6-4." It offers 20 to 50% higher tensile strength than the commercially pure titanium at room and elevated temperatures. It is much more amenable to cold working than Ti 6Al/4V alloy and can be cold worked 75 to 85% to result in moderately high strength and good ductility.

### GENERAL INFORMATION

The alloy can be formed from the annealed temper. Severe forming may be aided by an intermediate stress relief. Stress relieving may be appropriate after severe cold forming to remove residual stresses. Weldability and corrosion resistance is very similar to commercially pure titanium. Welding should be performed with inert gas shielded arc or spot welding. Welding with active gases, coatings, or fluxes must be avoided to prevent embrittlement.

### AVAILABLE PRODUCT FORMS

STRIP

FOIL

### MATERIAL DESIGNATIONS

ASTM Ti GRADE 9

UNS R56320

EN Ti GRADE 9 (3AL/2.5V)

DIN 3.7195

### TYPICAL MANUFACTURING SPECIFICATIONS

ASTM B265

AMS 4989

Also individual customer specifications.

### TYPICAL APPLICATIONS

IMPLANTABLE MEDICAL DEVICES

AEROPACE

INDUSTRIAL

CHEMICAL



## Technical Data

### AVAILABLE DIMENSIONS (Millimeters)

Thickness (mm)	100mm Wide	200mm Wide	300mm Wide
0.0015 to 0.012	±5%	-	-
0.012 to 0.025	±5%	±0.0010	±0.0013
0.025 to 0.10	±0.0013	±0.0015	±0.0019
0.10 to 0.25	±0.0025	±0.0025	±0.0030
0.25 to 0.50	±0.0038	±0.0051	±0.0064
0.50 to 1.0	±0.0051	±0.0089	±0.0127

Tolerances in percent or mm. Tolerances may vary depending on alloy being rolled.

The table above outline typical thickness tolerances available from HPM, which are tighter than industry standards.

### PHYSICAL PROPERTIES (At 20°C)

Specific Heat (0-100°C)	427	J/(kg*K)
Thermal Conductivity	7.6	W/(m*K)
Coef. of Thermal Expansion	7.9	mm/m/°C
Modulus of Elasticity	107	GPa
Electrical Resistivity	12.6	μohm/cm
Density	4.48	g/cm <sup>3</sup>

### MECHANICAL PROPERTIES

Temper	Annealed	
Tensile strength Rm	620	MPa (min)
Yield strength Rp 0.2	483	MPa (min)
Elongation A50	15	% (min)

### CHEMICAL COMPOSITION (% by weight)

Element	Min	Max
Ti	Balance	
Al	2.5	3.5
V	2.0	3.0
C	-	0.08
O	-	0.15
N	-	0.03
H	-	0.015
Fe	-	0.25
Others each		0.1
Others total		0.4