



COMMERCIALLY PURE TITANIUM SHEET & PLATE – GRADES 1 & 2 ADVANTAGES

- Exceptional Corrosion Resistance
- High formability and ductility, ideal for complex parts
- Highest strength-to-density ratio of the elemental metals
- Comparable strength to some steels, twice as strong as aluminum
- Low Density
 - 42% less dense than steel
- Suitable for continuous service up to 800°F (425°C) and intermittent service up to 1000°F (540°C)
- Good impact properties at low temperatures
- Long part lifetime
- Low thermal expansion
- Nontoxic and biocompatible
- Anodic efficiency and insulating anodic film ideal for cost efficient anodizing and plating equipment
- Nonmagnetic
- Hot and cold workable, machinable and weldable

COMMERCIALLY PURE GRADE ONE VS GRADE TWO

GRADE ONE

- Highest purity, lowest strength, highest room temperature ductility and formability
- Exceptional corrosion resistance, suitable for highly oxidating to mildly reducing environments, including exposure to seawater, chlorine-based solutions, and nitric and chromic acids
- As annealed, has comparable yield strength to fully annealed 304 stainless steels

GRADE TWO

- Excellent formability
- Higher tensile and yield strength, lower ductility than Grade 1
- Exceptional Corrosion Resistance including exposure to seawater, chlorine-solutions, nitric and chromic acids, organic acids, sulfides, and many industrial gaseous atmospheres
- As annealed, has comparable yield strength to annealed austenitic stainless steel

PHYSICAL PROPERTIES

Density	4.51	g/cm ³
Specific Gravity	4.51	
Coefficient of Thermal Expansion	8.4	x10 ⁶ /°C
Specific Heat	519	J/kg · K
Thermal Conductivity	11.4	W/(m·K)

Melting Point	1668±10	°C
Young's Modulus, E	120	GPa
Bulk Modulus, K	110	GPa
Shear Modulus, G	44	GPa
Poisson's Ratio	0.361	

CHEMICAL COMPOSITION

Grade	UNS Number	Carbon, max	Composition, weight percent				Iron, max	Other Elements, max each	Other Elements, max total
			Oxygen, max	Nitrogen, max	Hydrogen, max				
1	R50250	0.08	0.18	0.03	0.015	0.20	0.1	0.4	
2/2H	R50400	0.08	0.25	0.03	0.015	0.30	0.1	0.4	

MECHANICAL PROPERTIES

Grade	Tensile Strength, min		Yield Strength, 0.2% Offset				Elongation, min in 2 in. or 50 mm, %
	ksi	MPa	min		max		
			ksi	MPa	ksi	MPa	
Grade 1	35	240	20	138	45	310	24
Grade 2	50	345	40	275	65	450	20
Grade 2H	58	400	40	275	65	450	20

APPLICATIONS

- Corrosion Resistant Tubing, Pipes, Pumps, Tanks, and Reaction Vessels
- Heat Exchangers and Condensers
- Chemical Tankers
- Pickling Baskets
- Cladding and Composites
- Electrochemical Processing Equipment and Anodes
- Airframe skins, Marine components
- Cryogenic vessels
- Medical Implants and Surgical Equipment
- Complex Aerospace Parts
- High Performance Automotive Parts
- Eyeglass Frames and Jewelry
- Architecture

INDUSTRIES

- Chemical Processing
- Oil and Gas
- Electrochemical Plating
- Desalination
- Power Generation
- Aerospace
- Automotive
- Medical
- Marine

SOURCES & COMPLIANCES

ASM Titanium: A Technical Guide, Second Edition, *Titanium Alloy Sheets*

AMS Metals Handbook Desk Edition (SAE International) *Mechanical, Physical and Chemical Properties of Metals and Engineering Tables*

AMS 4901 *Titanium Sheet, Strip, and Plate* (Commercially Pure, Grade 1)

AMS 4902 *Titanium Sheet, Strip, and Plate* (Commercially Pure, Grade 2)

ASTM B265-20 *Standard Specification for Titanium and Titanium Alloy Strip, Sheet, and Plate*

Domestically Rolled Sheet & Plate