

TIMETAL[®] 50A

COMMERCIALLY PURE TITANIUM

TIMETAL 50A is equivalent to ASTM Grade 2. It is the “workhorse” for industrial applications, having a guaranteed minimum 0.2% yield strength of 40 ksi (275 MPa) and good ductility and formability. TIMETAL 50A is used extensively for sea water piping, reactor vessels and heat exchangers throughout the CPI, Petrochemical, Oil & Gas and Naval/Marine markets. It also is ASME approved, has good impact properties at low temperatures, and has excellent resistance to erosion and corrosion by seawater and marine atmospheres.

TIMETAL 50A is typically used in continuous service up to 800°F (425°C) and in intermittent service up to 1000°F (540°C). In addition TIMETAL 50A can be easily welded, machined, cold worked, hot worked, and cast.

TABLE 1

CHEMICAL COMPOSITION

ELEMENT	WEIGHT %
	<i>Maximum</i>
Oxygen	0.25
Nitrogen	0.03
Carbon	0.08
Iron	0.30
Hydrogen*	0.015
Residual Elements, each	0.10
Residual Elements, total	0.40
Titanium	Remainder

* Hydrogen content depends on product form.

TABLE 2

PHYSICAL PROPERTIES

PROPERTY	VALUE	
	<i>English</i>	<i>SI</i>
Density	0.163 lb in ⁻³	4.51 g cm ⁻³
Beta Transus	1680°F	915°C
Thermal Conductivity	12.60 Btu hr ⁻¹ ft ⁻¹ °F ⁻¹	21.79 W m ⁻¹ K ⁻¹
Electrical Resistivity	21 μΩ·in	0.53 μΩ·m
Magnetic Permeability	Nonmagnetic	
Mean Coefficient of Thermal Expansion		
68-212°F (20-100°C)	4.8 x 10 ⁻⁶ in in ⁻¹ °F ⁻¹	8.6 x 10 ⁻⁶ m m ⁻¹ °C ⁻¹
68-572°F (20-300°C)	5.3 x 10 ⁻⁶ in in ⁻¹ °F ⁻¹	9.5 x 10 ⁻⁶ m m ⁻¹ °C ⁻¹
68-932°F (20-500°C)	5.4 x 10 ⁻⁶ in in ⁻¹ °F ⁻¹	9.7 x 10 ⁻⁶ m m ⁻¹ °C ⁻¹
Elastic Modulus*	15.2-17.4 Msi	105-120 GPa

* Typical values at room temperature of about 68-78°F (20-25°C)

TABLE 3

HEAT TREATMENT

<i>Anneal</i>	<i>Stress Relieve</i>
1290°F (700°C) 1 hour / Air Cool	932°F (500°C) 30 mins / Air Cool

TABLE 4

TYPICAL MECHANICAL PROPERTIES

<i>UTS</i> ksi (MPa)	<i>0.2% YS</i> ksi (MPa)	<i>Elongation</i> %	<i>Reduction in Area</i> %	<i>Bend</i> Radius
70 (485)	50 (345)	28	57	2.5T



