



Technical Data Sheet

INTRODUCTION

Tantalum alloys have long been known to be the most corrosive resistant metal for use in hot acidic environments like hydrochloric, sulfuric, nitric, formic and acetic acid. Its corrosion resistant properties provide multiple benefits for end users including longer equipment life, lower operating downtime and increased operating temperatures.

Tantalum is an excellent material of choice for the fabrication of piping systems, heat exchangers, columns, reactors, bayonet heaters, crucibles, furnace liners and thermocouple protection sheaths; it is also a good choice for the repair of glass lined containers.

ATI tantalum products meet the ASTM B521 and B708 standard specifications for tantalum and tantalum alloy seamless and welded tubes as well as plate, sheet and strip.

Alloy	Forms
Tantalum	Bar, Rod, Tube, Plate, Sheet, Strip, Foil, Machined Components, Powder
ATI Ta10W™	Billet, Bar, Rod, Tube, Plate, Machined Components
ATI Ta2.5W™	Sheet, Tube, Machined Components
ATI Ta40Nb™	Billet, Bar, Rod, Tube, Plate

Chemical Requirements

Element	Unalloyed Tantalum (R05200)	ATI Ta10W™ (R05255)	ATI Ta2.5W™ (R05252)	ATI Ta40Nb™ (R05240)
C	0.010	0.010	0.010	0.010
O	0.015	0.015	0.015	0.020
N	0.010	0.010	0.010	0.010
H	0.0015	0.0015	0.0015	0.0015
Fe	0.010	0.010	0.010	0.010
Mo	0.020	0.020	0.020	0.020
Nb	0.100	0.100	0.50	35.0–42.0
Ni	0.010	0.010	0.010	0.010
Si	0.005	0.005	0.005	0.005
Ti	0.010	0.010	0.010	0.010
W	0.05	9.0–11.0	2.0–3.5	0.050
Ta	remainder	remainder	remainder	remainder

Mechanical Properties for Annealed Plate, Sheet and Strip

Grade and Form		Ultimate Tensile Strength min, psi, (MPa)	Annealed Condition Yield Strength, min, psi (MPa) (2% Offset)	Elongation, min, % (1-in. Gage Length)
Unalloyed Tantalum (R05200)	<.060 in. thick ≥0.060 in. thick	30 000 (207) 25 000 (172)	20 000 (138) 15 000 (103)	20 30
ATI Ta10W™ (R05255)	Sheet and Strip Plate	70 000 (482) 70 000 (482)	60 000 (414) 55 000 (379)	15 20
ATI Ta2.5W™ (R05252)	<0.125 in. thick ≥0.125 in. thick	40 000 (276) 40 000 (276)	30 000 (207) 22 000 (152)	20 25
ATI Ta40Nb™ (R05240)	<0.060 in. thick ≥0.060 in. thick	35 000 (241) 35 000 (241)	20 000 (138) 15 000 (103)	25 25

Mechanical Requirements for Tantalum and Tantalum Alloy Seamless and Welded Tubes

	Unalloyed Tantalum	ATI Ta2.5W™	ATI Ta10W™	ATI Ta40Nb™
Ultimate tensile strength, min, psi (MPa)	30 000 (207)	40 000 (276)	70 000 (481)	40 000 (226)
Yield strength, 0.2% offset, min, psi (MPa)	20 000 (138)	28 000 (193)	60 000 (414)	28 000 (193)
Elongation, min, %, in 1 or 2 in. (25 or 51 mm)	25	20	15	20

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Allegheny Technologies Incorporated
1000 Six PPG Place
Pittsburgh, PA 15222-5479 U.S.A.
www.ATImetals.com