

### TITANIUM ALLOY

#### TYPICAL APPLICATIONS

Tubing in aircraft and engine hydraulic systems  
 Corrosion resistant pipes and vessels  
 Recreational products – golf club shafts, tennis racquets, bicycle frame  
 Foil in honey-comb

#### PRODUCT DESCRIPTION

Titanium Grade 9 is sometimes referred to as 'half 6-4'. This alloy of titanium with 3% aluminium and 2.5% vanadium offers 20 to 50% greater mechanical strength than the commercially pure (CP) titanium grades, but is more formable and weldable than Ti-6Al-4V (Grade 5).  
 Titanium Grade 18 (UNS R56322) is identical to Grade 9 in all respects with the exception of the additional 0.04 – 0.08% palladium to increase corrosion resistance.  
 Titanium Grades 9 and 18 have a density of 4.48 g/cc - less than 60% that of steel.

#### CORROSION RESISTANCE

This material offers good corrosion resistance in oxidising, neutral and mildly reducing media, including chlorides.  
 Titanium Grade 18 with the addition of palladium offers greater resistance to corrosion.  
 The alloy resists oxidation up to 600°F (316°C).

#### MATERIAL SPECIFICATIONS

##### Aerospace

- WNr. 3.7194
- AIR9182 TA32.5V
- AMS 4943
- AMS 4944
- AMS 4945
- AMS 4989

##### Commercial

- WNr. 3.7195
- UNS R56320
- ASTM B348
- ASTM B265
- ASTM B338
- ASTM B863
- ASTM B381
- ASTM B861

#### FABRICATION

Weldability – good  
 Specific bend radius <0.070 x thickness – 2.5 (typical)

#### AVAILABILITY

Bar, wire, strip, sheet, plate, foil, forgings, seamless and welded pipe/tube (for Titanium Grades 9 and 18)

#### CHEMICAL COMPOSITION

Weight %	C	Fe	N <sub>2</sub>	O <sub>2</sub>	H <sub>2</sub>	Al	V
Min.						2.5	2.0
Max.	0.08	0.25	0.03	0.15	0.015	3.5	3.0

#### MECHANICAL PROPERTIES

	Minimum	Typical
UTS, MPa	621	740
0.2% PS, MPa	483	607
Elongation on 2 in., %	15	17
Charpy V notch impact, J (L direction pipe)	48	-
Elastic modulus, GPa	-	91
Hardness, HRC	-	15

#### TECHNICAL SALES ASSISTANCE

Our resident team of qualified metallurgists and engineers will be pleased to assist further on any technical topic.

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