

Ti-10V-2Fe-3Al is a near beta alloy developed as a high strength forging alloy. This grade provides the best combination of strength and toughness of the commercially available titanium alloys. Its strength permits about a 27% weight savings when compared to Ti-6Al-4V. At the 180 ksi tensile strength level, the K_{Ic} value is 40 ksi-in $^{1/2}$ minimum. Solution treated and aged material possesses excellent resistance to stress corrosion cracking, typically K_{Isc} being greater than 0.8 K_{Ic} . Solution treated material should not be subject to long term exposure in the 500-800°F range. This could result in high strength but low ductility.

High strength condition: Solution treat 60-100°F below the beta transus (typically 1460-1480°F), not less than 30 minutes, water quench. Age 900-975°F not less than 8 hours, air cool. For lower strength, overage in the 950-1150°F range. This alloy is deep hardenable, capable of high strengths in sections up to approximately 4" thick.

This grade is usually supplied as billet or bar, finish rolled or forged in the alpha-beta field. For the high strength condition, the forging is usually given a pre-form forge above the beta transus, followed by 15-25% reduction below the beta transus.

Specifications

UNS: UNS R56410 AMS: 4983, 4984, 4986, 4987

Chemical Composition, %

	V	Al	Fe	C	N	O	H	Y	Others, Each	Others, total	Ti
MIN	9.0	2.6	1.6	—	—	—	—	—	—	—	—
MAX	11.0	3.4	2.2	0.05	0.05	0.13	0.015	0.005	0.10	0.30	balance

Features

- High strength and toughness
- Weight savings when compared to Ti-6Al-4V
- Excellent resistance to stress corrosion cracking

Applications

- Hand and die forgings
- Aircraft landing gear
- Golf club driver faces

Physical Properties

Density: 0.168 lb/inch³ Nominal Beta Transus: 1470°F Poisson's ratio: 0.32
 Thermal Expansion: 75-800°F, 5.4x10⁻⁶ in/in°F Tensile Modulus: 15.9x10⁶ psi Modulus: 16.2x10⁶ psi

Mechanical Properties

Minimum Mechanical Properties AMS 4984, solution treated and aged

Ultimate Tensile Strength, ksi	173
0.2% Yield Strength, ksi	160
Elongation, %	4
Reduction of Area, %	Report
fracture toughness, k_{Ic}	40 ksi

AMS 4987, single solution heat treat & overage

Ultimate Tensile Strength, ksi	140
0.2% Yield Strength, ksi	130
Elongation, %	8
Reduction of Area, %	20
fracture toughness, k_{Ic}	80 ksi

 **INTERNATIONAL
TRADE WINDS** LLC
Exclusive Representative of Rolled Alloys®, Inc.

CLAUDIO CZARNOBAI
COMMERCIAL MANAGER
ClaudioCzarnobai@intwinds.com

F +55 11 3825 2966
C +55 11 99112 2703

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