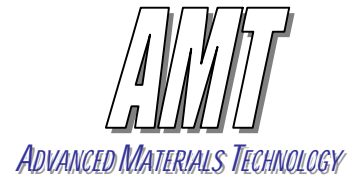


Titanium alloys

Category:

Intermetallic, high temperature



Titanium alloy Ti-2225

The intermetallic Titanium alloy Ti-2225 from the family Ti-22Al-25Nb is a high temperature Titanium alloy. Maximum service temperature is 750°C for long and up to 900°C for short term use. This, so called orthorhombic Titanium alloy, shows excellent properties including strength and oxidation resistance. Melting processes up to five times vacuum arc melting guarantees the high quality of this alloy. It was developed to replace Nickel based alloys for high temperature applications. Ti-2225 is like conventional Titanium weldable with the TIG process.

General properties:

- Very high strength at elevated temperatures
- Very high fatigue strength at room and elevated temperatures
- Low density

Comparison with Standard alloy In-625, In-718:

- Advantages:**
- Higher fatigue strength
 - 35% lower density
- Disadvantages:**
- Expensive

Chemical Composition: Ti-22Al-25Nb+X at. %

Mechanical properties, 1.5mm sheet.

(Note: σ_b , UTS; $\sigma_{0.2}$, 0.2% yield stress; ϵ , tensile elongation; ψ , reduction in area.)

1. Tensile properties at RT

Heat treatment	σ_b , MPa	$\sigma_{0.2}$, MPa	ϵ , %	ψ , %	Fatigue, Mpa, R=-1
1000°C/1hAC+800°C/12AC	1340	1220	18.0	25.0	620

2. Tensile properties at 650°C

Heat treatment	σ_b , MPa	$\sigma_{0.2}$, MPa	ϵ , %	ψ , %	Fatigue, Mpa, R=-1
1000°C/1hAC+800°C/12AC	1070	905	16.0	19.5	685

3. Tensile properties at 750°C

Heat treatment	σ_b , MPa	$\sigma_{0.2}$, MPa	ϵ , %	ψ , %	Fatigue, Mpa, R=-1
1000°C/1hAC+800°C/12AC	910	600	15.5	19	605

4. Tensile properties at 800°C

Heat treatment	σ_b , MPa	$\sigma_{0.2}$, MPa	ϵ , %	ψ , %	
1000°C/1hAC+800°C/12 hAC	800	470	19.5	28	

5. Creep properties at 800°C

Creep condition: 800°C/180MPa, Duration time: 32 hours, ruptured
Creep condition: 800°C/400MPa, Duration time: 0.51 hours, ruptured

Physical data

Density:	5.34 g/cm ³	CTE:	11.3x10 ⁻⁶
Elastic modulus:	135 GPa	Thermal conductivity:	25 W/mK

Oxidation resistance: Layer thickness 3µm after 800°C Air for 100h.

Applications

- Exhaust systems
- Compressor discs and blades
- Ultra high strength fasteners
- Transmission shafts

Delivery form

- Bars, plates, sheets, forgings