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

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

Mechanical properties, 1.5mm sheet.
(Note: ob, UTS; σ0.2, 0.2% yield stress; ε, tensile elongation; ψ, reduction in area.)

1. Tensile properties at RT
   Heat treatment | σb, MPa | σ0.2, 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 | σb, MPa | σ0.2, 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 | σb, MPa | σ0.2, 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 | σb, MPa | σ0.2, 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/cm³
- 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

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