

Ti 6242 AMS 4975 AMS 4976

1 GENERALITIES

Titanium alloy Ti6242 has high mechanical properties and especially creep resistance up to about 500°C. Its low density, high strength and good toughness also give it an advantage in moving and high temperature applications.

Stainless has a number of qualified sources in stock and a variety of diameters to suit your application needs. This product can also be custom made or cut into slugs by our service centres. Each material is delivered with its producer's certificate of origin in order to guarantee you total transparency and complete traceability.

EAPPLICATIONS

Applications include turbine parts, discs and other hot-worked components in the aerospace, industrial and motor racing sectors.

STANDARDS AND DESIGNATIONS

Numerical designations:

UNS R54620

Standards:

AMS 4975 - AMS 4976 - Ti-6Al-2Sn-4Zr-2Mo

TYPICAL CHEMICAL ANALYSIS (mass %)

	Aluminium	Tin	Zirconium	Molybdenum	Carbon	lron	Silicon	Oxygen	Hydrogen	Yttrium	Nitrogen	Titanium
MIN	5.50	1.80	3.60	1.80			0.06					
мах	6.75	2.20	4.40	2.20	0.05	0.10	0.10	0.15	0.0125	0.005	0.05	BALANCE

1 METALLURGY

The grade can be produced with several VAR remelting depending on the criticity of the applications; at least one VAR remelting is mandatory for this grade. The manufacturing processes combined with the transformation processes make it possible to obtain a homogeneous near alpha microstructure. The addition of silicon improves the heat resistance of this grade. The micrograph below shows the typical structure in the annealed temper:



PHYSICAL PROPERTIES AT 20°C

Density	4.54 g.cm-3
Coefficient of thermal expansion (between 20 et 200°C)	
Young's modulus.	115 x 10 ³ MPa
Thermal conductivity	6.9 W.m ⁻¹ K ⁻¹
Relative magnetic permeability	≤ 1.01

MECHANICAL PROPERTIES OF THE BARS

The grade can be offered in the annealed temper at about 800°C with the following properties:

Delivery temper	UTS (MPa)	YS 0.2% (MPa)	E4d%	Hardness
Annealing	>895	>825	>10	+/- 34 HRC

The standard delivery treatment according to AMS is STA (Solution treated and aged) with a thermal cycle close to 980/1h/air + 595°C/8h/air which leads to the following typical characteristics

Temper	Diameter	UTS (MPa)	YS 0.2% (MPa)	E4d%	Z%
STA	<76mm	>896	>827	>10	>25

Typical values obtained after hot tensile tests (482°C) on STA condition:

Temper	Diameter	UTS (MPa)	YS 0.2% (MPa)	E4d%	Z%
STA	<76mm	>621	>483	>15	>35

PROCESSIES

Forgeability/Usinability

The grade can be hot forged, the beta transus is close to about 1000°C. Machining of this grade requires sufficient coolant to limit heating.

Heat treatments

From an annealed condition, quenching followed by ageing (STA) heat treatment is possible on this grade. For a diameter of 120mm, a treatment of the type 980°C/1h/Air followed by ageing at 593°C/8h/Air will enable a level of mechanical strength of the order of 980 MPa to be obtained at room temperature and the hot strength at 480°C will be close to 700 MPa with an elongation generally higher than 12%.

© CORROSION RESISTANCE

The grade is highly resistant to general corrosion and also to pitting. Chlorinated solvents should be avoided. Titanium is also susceptible to hydrogen embrittlement, so it is important to limit any hydrogen input during the processing.

TANDARD SHAPE

- 3m round bars in STA or annealed condition Surface ground or peeled
- Other shape: consult us

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