



# STAINLESS

High performance Alloys - Medical - Aerospace - Microtechnics - Motorsport - Industry

TIAL6V4  
AMS 4928  
ASTM B348  
ASTM B265  
ASTM F1472

## GENERALITIES

**TA6V4 alloy** has a low density, corrosion resistance as well as high mechanical properties. This grade is the most common titanium alloy. It differs from grade 23 (or TA6V4ELI) by its higher oxygen content.

Stainless has several qualified sources in stock as well as sources and different diameters in stock to meet your needs. This product can also be made to measure or cut into or cut into pieces by our service centres.

Each material is delivered with its certificate of origin in order to guarantee you total transparency and complete traceability.

## APPLICATIONS

The grade is used in particular in the manufacture of structural and engine parts, but also in aeronautical fasteners. TA6V4 is highly resistant to corrosion, which makes it suitable for use in marine environments, the surface treatment industry and in fittings. The material is available mainly in the annealed state but can be treated (STA) with a temperature resistance close to 350°C.

## STANDARDS AND DESIGNATIONS

### Numerical designations:

W. Nr 3.7165 - UNS R56400

### Standards :

ISO 5832-3 - ASTM B348 (Grade 5) - STM B265 ASTM F1472 - AMS 4928 - AMS 4965 AMS 4963

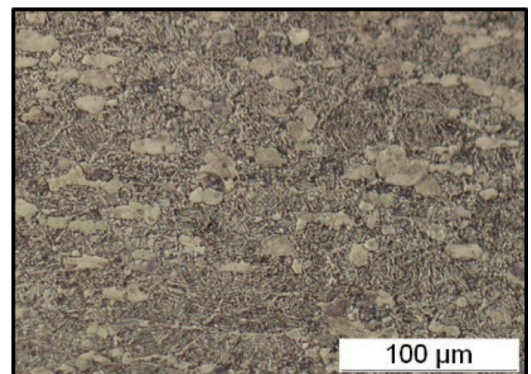
## TYPICAL CHEMICAL ANALYSIS (mass %)

	Carbon	Aluminium	Vanadium	Iron	Oxygen	Hydrogen	Yttrium	Azote	Titane
MIN	---	5.50	3.50	---	---	---	---	---	BALANCE
MAX	0.08	6.75	4.50	0.30	0.20	0.015	0.005	0.05	

## METALLURGY

The grade can be produced with one or more VAR denials depending on the criticality of the applications. The manufacturing processes associated with the transformation processes make it possible to obtain a homogeneous alpha/beta microstructure with a structure type A1 to A9.

See micrograph opposite:



**PHYSICAL PROPERTIES AT 20°C**

**Density**.....4.43 g.cm-3  
**Coefficient of thermal expansion** (between 20 et 200°C).....9 x 10<sup>-6</sup>m/m.°C  
**Young's modulus**.....105- 200 x 10<sup>3</sup> MPa  
**Thermal conductivity**.....6,6 W.m<sup>-1</sup>K<sup>-1</sup>  
**Relative magnetic permeability**..... ≤ 1.01

**MECHANICAL PROPERTIES OF THE BARS**

The grade is offered as standard in the annealed condition around 700°C with the following properties:

Temper	UTS (Mpa)	YS 0.2% (Mpa)	E5d%
Annealing	> 895	> 825	> 10

**PROCESSIES**

**Forgeability/Usability**

The grade can be hot forged below beta transus (<950°C). Machining of this grade requires sufficient coolant to limit heating. The grade is difficult to work cold because of seizure.

**Polishability**

The high level of inclusionary cleanliness and the homogeneity of the microstructure of this grade allows optimum polishing, particularly if the microstructure is fine.

**Heat treatments**

Annealing can be carried out from 700°C after forging. However, this treatment must remain under control so as not to degrade the quality of the microstructure. After annealing, the oxidised surface is removed mechanically or chemically to remove the contamination layer (alpha case).

A heat treatment of quenching followed by ageing (STA) is possible on this grade depending on the dimensions in order to increase the mechanical properties up to about 1100MPa.

**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 heat treatment or chemical pickling processes.

**STANDARD SHAPE**

- 3m round bars annealed - Surface ground or peeled
- Flat bars made to measure or forged blocks in the annealed state (consult us)
- Powders - Sheets - Wires

The information, data and photos presented in this document are given in good faith and for information purposes only. If you need more precise data, our technical department is at your disposal. Click on the link : [t.turpin@stainless.eu](mailto:t.turpin@stainless.eu)