STAINLESS

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

TA6V4 ELI
ASTM F136
ISO 5832-2

GENERALITIES

TA6V4ELI alloy has a low density, very good biocompatibility and corrosion resistance as well as high mechanical properties. Its low Young's modulus makes it a good candidate for the manufacture of prostheses in particular. The mastery of its production and processing methods gives it a fine and homogeneous alpha beta structure.

Stainless has several qualified sources in stock as well as different diameters that will allow you to best meet your needs in terms of implementation. This product can also be custom made or cut into slugs by our service centers.
Each material is delivered with its producer's certificate of origin in order to guarantee you total transparency and complete traceability.

APPLICATIONS

Due to its recognised biocompatibility in the medical field, the grade is mainly used in the manufacture of implants (prostheses, spine rods, etc.) obtained by forging and/or machining. The material is available in the annealed state for all formats.

STANDARDS AND DESIGNATIONS

Numerical designations:
W. Nr 3.7165 - UNS R56401

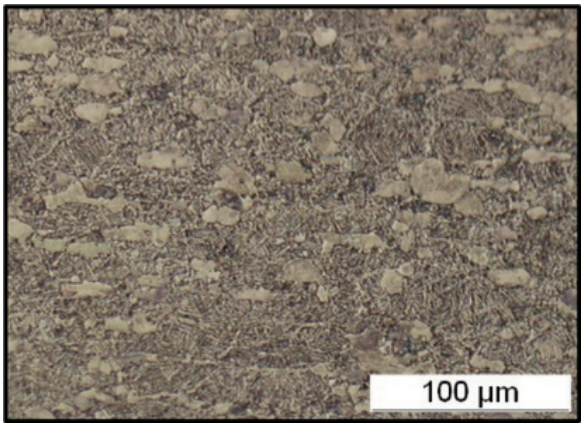
Standards :
ISO 5832-3 - ASTM F 136 – ASTM F1472 ASTM B348 (Grade 23)

TYPICAL CHEMICAL ANALYSIS (mass %)

	Carbon	Aluminium	Vanadium	Iron	Oxygen	Hydrogen	Yttrium	Azotz	Titane
MIN	---	5.50	3.50	---	---	---	---	---	BALANCE
MAX	0.08	6.50	4.50	0.25	0.13	0.012	0.005	0.05	

METALLURGY

The production processes, combined with the transformation processes, make it possible to obtain a homogeneous alpha/beta microstructure with an A1 to A5 type structure.
See micrograph opposite:



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PHYSICAL PROPERTIES AT 20°C

Density.....4.43 g.cm-3
Coefficient of thermal expansion (between 20 et 200°C).....9 x 10^{-6}m/m.°C
Young's modulus......105- 200 x 10^{3} MPa
Thermal conductivity.....6,6 W.$m^{-1}K^{-1}$
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	> 860	> 795	> 10

Round bars are usually stress relieved to limit the presence of residual stresses.

PROCESSIES

Forgeability/Usability
The grade can be hot forged below beta transus (<950°C). Machining of this grade requires sufficient watering to limit heating.

Polishability
The high level of inclusionary cleanliness and the homogeneity of the microstructure of this grade allows optimum polishing.

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).

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

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