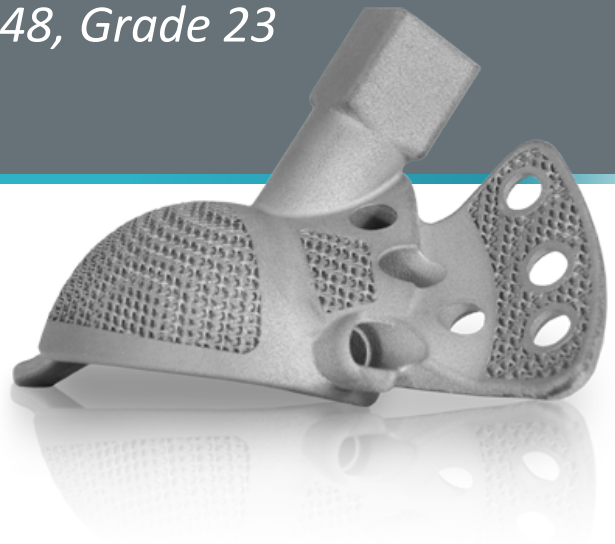




YOUR FUTURE IN ADDITIVE MANUFACTURING

MATERIAL DATASHEET

TiAl6V4 ELI, 3.7165, ASTM B348, Grade 23



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Description

Titanium grade 23 is a biocompatible light metal alloy based on the material titanium grade 5 with high corrosion resistance and very high strength at a low specific weight. These properties, as well as a low e-module and good vibration resistance are achieved by lower contents of accompanying elements such as oxygen and iron (Extra-Low-Interstitials = ELI). As a result, this alloy can be used in a wide range of demanding applications.

Physical Properties

Density [g/cm ³]	4.42 – 4.47
Electr. resistance at 20 °C [$\Omega \cdot \text{mm}^2/\text{m}$]	1.7
Thermal conductivity at 20 °C [W/m·K]	6.7 – 7.1
Spec. thermal capacity at 20 °C [J/kg · K]	526
Average coefficient of thermal expansion at 20 °C [$10^{-6} \cdot \text{K}^{-1}$]	9

Chemical Composition

Element	Min.	Max.
Ti	Balance	Balance
Al	5.5	6.5
V	3.5	4.5
C	-	0.08
O	-	0.13
N	-	0.03
Fe	-	0.25
H	-	0.0125
Other ind.	-	0.1
Other total.	-	0.4

Material Composition

Titanium components produced by Laser Melting are virtually pore-free and have a homogeneous microstructure. Subsequent heat treatment can reduce the anisotropy arising during build-up and individually adapt component properties.





Technical Data

Achievable component accuracy

small parts	approx. ± 0.1 mm
large parts	approx. ± 0.2 mm
Smallest wall thickness	approx. 0.3 - 0.4 mm
Smallest diameter	approx. 0.7 mm
Layer thickness	30 - 60 μm
Surface roughness	
after the build-up	Rz = $60\mu\text{m} \pm 20 \mu\text{m}$
after micro blasting	Rz = $35\mu\text{m} \pm 10 \mu\text{m}$
Component density after manufacturing	> 99,5 %

Mechanical Properties

	After heat treatment ⁴
Tensile strength [N/mm²]^{1,2,3}	1050 \pm 60
Yield point [N/mm²]^{1,2}	920 \pm 60
Elongation at break [%]^{1,2}	14 \pm 4
E-module [kN/mm²]^{1,2}	typ. 116
Hardness [HV5]^{1,3}	typ. 325 \pm 16 HV5

¹ at room temperature

² tensile test according to DIN EN ISO 6892-1

³ hardness test according to DIN EN ISO 6507-1

⁴ vacuum heat treatment at 843 °C keeping for 2 h

The stated technical data and material characteristics correspond to our knowledge and experience at the time of publication. These values, determined on our production systems, depend on the powder material, the parameter settings and the component geometry. They therefore do not provide sufficient basis for the component design. These data serve only as guide values. To check the mechanical properties, test specimens can be requested at any time.

Only the latest published version of the datasheet is valid.

