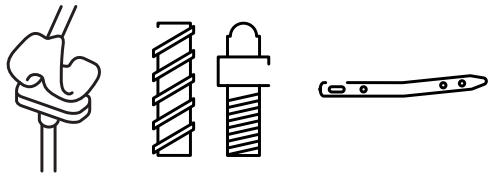
3.7165, TiAlV4 ELI, ISO 5832-3
Implant Steel – Data Sheet US

Zapp is certified to ISO 9001



Zapp® 3.7165 ELI (TiAl6V4) – Medical Implant Steel
Zapp® 3.7165 (Extra-Low-Interstitial) is a high-strength titanium alloy with a very good strength-to-density ratio.

ELI (Extra Low Interstitial) means that the contents of the elements iron (Fe) and oxygen (O) are limited in comparison to the conventional alloy.

This supports the bone cell growth on the implant surface and accelerate their firm adhesion (osseointegration)

The material shows exceptional biocompatibility and is easily accepted by the body.

Information about further medical applications at Zapp.

Typical Applications
- Cages and Bars for the spine area
- Permanent implants for knees and hips
- Bone screws and nails
- Dental abutments

Weldability
The TIG and MIG processes using, for example, argon with a purity of 99.999% are suitable. Other suitable welding processes are plasma, laser and electron beam welding. All semi-finished products to be welded must be dry and free from impurities and oxides.

Complete inert gas protection including the underside of the seam must be guaranteed because the high affinity of titanium to atmospheric gases can lead to oxidation / embrittlement of the surface from approx. 482 °F.

Machining
In the annealed state, Zapp® 3.7165 ELI has optimal conditions for the most effective machining.

Magnetism
Zapp ® 3.7165 ELI is not magnetizable.

Corrosion Resistance
Zapp® 3.7165 shows good corrosion resistance in oxidizing media, which is due to the formation of a dense, firmly adhering oxide layer. If damaged, it quickly reforms in the presence of oxygen.

Standard Designation
- According to DIN EN TiAl6V4
- Grade 3.7165
- According to ISO 5832-3
- According to ASTM B 348, F136
- According to UNS R56401

Typical Chemical Composition (approx. values)

	C	N	O	H	Al	Fe
Min.	-	-	-	-	5.50	-
Max.	≤ 0.08	≤ 0.05	≤ 0.13	≤ 0.012	6.50	≤ 0.25

	V	Ti
Min.	3.50	
Max.	4.50	rest

Hot Working

Preferably in an electrically heated oven under inert gas or in a vacuum. Otherwise, the atmosphere should be adjusted to be slightly oxidizing to neutral.

Annealing: approx. 1,340 °F
Holding time: 1-4 h
Cooling: air

We always recommend consulting our technical advisors about heat treatment

Information about further medical grades at Zapp.

Mechanical Properties*

Tensile strength R_m [ksi]	≥ 125
Yield strength $R_{p0,2}$ [ksi]	≥ 115
Elongation A [%]	≥ 10

*Example for mechanical properties < 1.75 inch

Physical Properties

Modulus of elasticity E at 68 °F [ksi]	16,534.3
Density ρ [lb/in³]	0.161
Thermal conductivity λ at 68 °F [Btu in / hr ft² °F]	46.46
Coefficient of thermal expansion α [µin / in °F]	
68 – 212 °F	4.8
68 – 392 °F	5.1
68 – 572 °F	5.3
68 – 932 °F	5.6
Specific heat c at 68 °F [Btu/lb °F]	133.8
Specific electrical resistance ρ at 68 °F [Ω*circular-mil/ft]	330.8
Melting range [°F]	> 3,056
α / α Transus [°F]	~ 1,814

Please see our linecard of further implant and medical grades.

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Further information regarding our products and locations are available in our image brochure and under www.zapp.com

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