

Ti-42Nb

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AMtrinsic®

AMtrinsic® spherical Ti-42Nb powder

Powders with the highest degree of processability

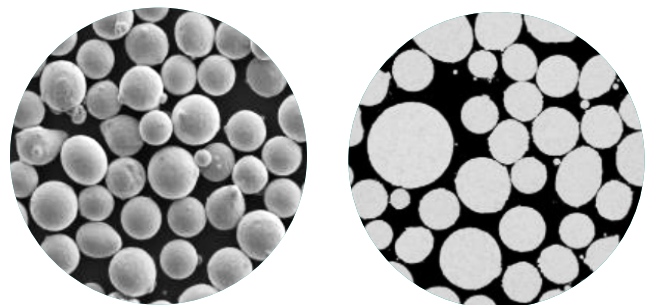
TANIOBIS has unparalleled expertise in developing and manufacturing tantalum and niobium metals. Based on the unique knowledge of these core competencies, TANIOBIS is now able to offer an **atomized AMtrinsic® spherical Ti-42Nb alloy powder** for use in various Additive Manufacturing Technologies. Our powder is characterized by excellent flowability, near perfect spherical shape and narrow particle size distribution. **AMtrinsic® spherical Ti-42Nb powders** are pre-conditioned for application in Laser Powder Bed Fusion (10-63 µm), Electron Beam Powder Bed Fusion (63-105 µm) or according to customer requests.

AMtrinsic® spherical Ti-42Nb powder

Ti-42Nb is a novel biomedical alloy which provides a combination of essential material properties such as high elasticity, good strength, ductility and excellent biocompatibility for medical implant applications. **AMtrinsic® spherical Ti-42Nb powders** enable the manufacturing of patient-specific implant solutions using all common AM technologies.

Physical properties	Unit	-63 + 10 µm	-105 + 63 µm
Tap density	g/cm ³	2.5-4.5	2.5-4.5
Flow rate/ 50g			
0.1 inch	s	<18	<18
0.2 inch		<7	<7
D ₁₀	µm	10-25	40-60
D ₅₀	µm	25-45	60-90
D ₉₀	µm	45-70	90-120

AMtrinsic® spherical Ti-42Nb



SEM images of Ti-42Nb powder including a polished cross-section (right) displaying dense morphology of powders with no trace of voids or cracks

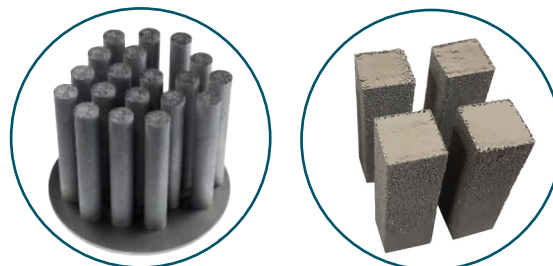


TANI OBIS
inspiring metal evolution

Chemical characteristics	Unit	Value*
Ti	%	57.8
Nb	%	41.7
C	ppm	<50
H	ppm	<50
N	ppm	<100
O	ppm	<3000
Ta	ppm	<100
Cr	ppm	<50
Fe	ppm	<100
Ni	ppm	<50
Hf	ppm	<50
Mo	ppm	<50
Zr	ppm	<50
W	ppm	<50

*Example values from production lots.
Customer specification upon request.

AMtrinsic® spherical Ti-42Nb printed parts



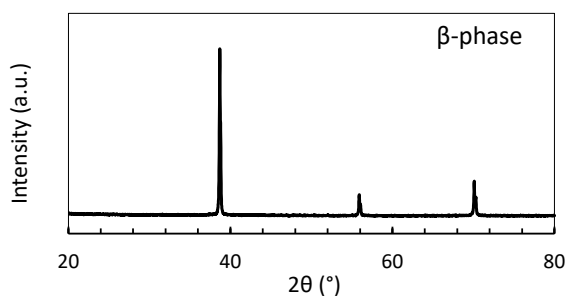
Fully dense printed Ti-42Nb specimens were manufactured using different AM technologies such as LBM (left) and EBM (right)

Typical properties of AMtrinsic® Ti-42Nb L-PBF printed parts

Mechanical properties	Unit	As-printed
Ultimate strength	MPa	680
Yield strength	MPa	674
Young's modulus	GPa	61
Failure strain	%	11

*The mechanical test method in accordance to DIN EN ISO 6892-1

XRD Spectra



AMtrinsic® Ti-42Nb printed specimens exhibit unique mechanical properties, in particular a significantly improved elasticity in comparison with currently applied standard implant materials such as CP-Ti or Ti-6Al-4V. The reduced stiffness is governed by development of an entirely β -type crystal structure, which reduces mechanical mismatches at the interface implant/human bone thus avoiding stress-shielding and associated implant loosening.

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