MAKERVERSE

Data Sheet: LPBF-Titanium Ti6Al4V

Chemical Composition

Element	Ti	Al	V	O	N	C	H	Fe	Y	other
Percentage	Bal.	5.50 – 6.75	3.50–4.50	0.20	0.05	0.08	0.015	0.30	0.0005	0.40

Tolerances For 1 – 4

Property	Unit	Value As Built
Achievable Part Accuracy[i]	mm %	+/- 0.3 mm for parts up to 100 mm +/- 0.3 % for parts beyond 100 mm
Min. Wall thickness	mm	0.8

Available Finishes With Specific Mechanical Properties

1 | Heat Treated

As built with support structure removal and media blasting with additional annealing.

Annealing definition for TI6AL4V: The alloy is heated to 691ºC - 760ºC in an argon or nitrogen atmosphere for 2 hours and is then cooled by air or furnace. The strength of the part is substantially increased by this process.

Property	Yield Strength Rp 0.2 % [MPa][ii]	Ultimate Tensile Strength Rm [MPa][ii]	Elongation at Break [%][ii]	Young's Modulus [GPa][ii]	Relative Density [%]
Value	950-1050	1000-1150	9-15	105-125	99.5

2 | HIP

As built with support structure removal and media blasting with additional HIP. Recommended for fatigue loaded components. Can also be combined with heat treated, achieving the mechanical properties described below.

HIP definition for TI6AL4V: The alloy is heated to 1000ºC in an argon atmosphere for 60 minutes and is then cooled slowly with continued argon input. The strength of the part is substantially increased by this process.

Property	Yield Strength Rp 0.2 % [MPa][ii]	Ultimate Tensile Strength Rm [MPa][ii]	Elongation at Break [%][ii]	Young's Modulus [GPa][ii]	Relative Density [%]
Value	870-950	950-1050	13-16	105-125	99.5

For other custom heat treatment options please select "custom" in the "finish" dropdown on the MakerVerse platform and specify your requirements to request a quote.

Available Finishes for Surface Requirements

3 | Polished

As built with support structure removal and media blasting with additional manual polishing to achieve a homogeneous, smooth surface roughness. Surfaces that require polishing should be specified on the technical drawing or in the comment field on the MakerVerse platform. Only available in combination with a heat treatment process that determines mechanical properties.

4 | Tumbled

As built with support structure removal and media blasting with additional mechanical tumbling to achieve a smoother surface roughness across all exposed surfaces of the part. Only available in combination with a heat treatment process that determines mechanical properties.

Available Finishes for Color Requirements

5 | Painted

As built with support structure removal and media blasting with a color of choice applied to the part. Surfaces that require painting and the RAL color code should be specified on the technical drawing or in the comment field on the MakerVerse platform. Only available in combination with a heat treatment process that determines mechanical properties.

Available Finishes for Additional Requirements

6 | CNC Machined

As built with support structure removal and media blasting with additional CNC Machining to the required tolerances. The required tolerances should be specified on the technical drawing. Only available in combination with a heat treatment process that determines mechanical properties.

Available Combinations of Finishes

Many finishes can be combined or tuned to specific requirements. Please select "custom" in the "finish" dropdown on the MakerVerse platform and specify your requirements to request a quote for alternative finishing options.

Maximum build chamber size

400 MM X 400 MM X 400 MM

Warranty/Disclaimer: The data from finished parts can deviate from above values depending on the manufacturing process and the component geometry. The data represents our present empirical values. It is incumbent on the person placing the order to examine whether it is suitable for its intended purpose, before using the product.

[i] As a result of the part's geometry, strong tensions may cause distortion in the part which may lead to greater deviation.
[ii] Depending on build direction.