

Material data sheet

Titanium TC4

Titanium TC4 is a titanium alloy powder which has been optimized especially for processing on Eplus3D EP-M systems.

Description

Parts built in Titanium TC4 is a well-known light alloy, which is characterized by having excellent mechanical properties and corrosion resistance combined with low specific weight and biocompatibility. This material is ideal for many high-performance engineering applications, for example in aerospace and motor racing, and also for the production of biomedical implants (note: subject to fulfilment of statutory validation requirements where appropriate). Due to the layer wise building method, the parts have a certain anisotropy, which can be reduced or removed by appropriate heat treatment.

Technical data

Typical achievable part accuracy	±20-50µm
Smallest wall thickness	0.3-0.4mm
Layer thickness	30µm
Surface roughness for original	Ra 9-12µm, Rz 40-80µm
Surface roughness after shot blasting	Ra 5-6.5µm, Rz 20-50µm
Surface roughness polishing	Rz < 1µm
Build speed	13cm ³ /h
Density	4.4g/cm ³
Relative density	approx. 100%
Tensile strength	1230±50MPa, (XY)
	1200±50MPa, (Z)
Yield strength	1060±50MPa, (XY)
	1070±50MPa, (Z)
Elasticity modulus	110±10GPa, (XY)
	110±10GPa, (Z)
Elongation at break	10±2% (XY)
	11±3% (Z)
Hardness	300HV

[1] Based on users' experience of dimensional accuracy for typical geometries. Part accuracy is subject to appropriate data preparation and post-processing, in accordance with Eplus3D training.

[2] Mechanical stability dependent on the geometry (wall height etc.) and application

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[3] Due to the layer wise building, the surface structure depends strongly on the orientation of the surface, for example sloping and curved surfaces exhibit a stair-step effect. The values also depend on the measurement method used. The values quoted here given an indication of what can be expected for horizontal (up-facing) or vertical surfaces.

[4] The volume rate is a measure of the building speed during laser exposure. The overall building speed is dependent on the average volume rate, the time required for coating (depends on the number of layers) and other factors.

Notes

The data are valid for the combinations of powder material, machine and parameter sets from Eplus3D, when used in accordance with the relevant Operating Instructions (including Installation Requirements and Maintenance) and Parameter Sheet. Part properties are measured using defined test procedures. The data correspond to our knowledge and experience at the time of publication. They do not on their own provide a sufficient basis for designing parts. Neither do they provide any agreement or guarantee about the specific properties of a part or the suitability of a part for a specific application. The producer or the purchaser of a part is responsible for checking the properties and the suitability of a part for a particular application. This also applies regarding any rights of protection as well as laws and regulations. The data are subject to change without notice as part of Eplus3D's continuous development and improvement processes.

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