Datasheet Filament
Ti6Al4V FIL01A

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Product: Ti6Al4V Fil01A

Fused Filament Fabrication (FFF) of Titanium offers the possibility to produce complex shaped parts net shape or near net shape quality at low investment costs.

Element22 has over 15 years of experience in MIM of Titanium and is now offering its proprietary filament including the patented sintering process for commercial use.

The Element22 filament system offers the basis for the production of Titanium parts with outstanding material properties. To achieve the best material properties, the correct processing equipment and parameters need to be maintained. Element22 recommends processing equipment for debinding and sintering from TiGEN GmbH, Germany (www.tigen.de).

Element22 is offering a debind and sinter service to process your parts printed with the Element22 filament.

Scale Factor

Typical value:
x-y: 120.3%
z: 118.3%

Range: 115% - 121% depending on printing parameters; build direction and part dimensions.

Shelf Life

12 Months if properly stored. Protect from moisture. Store in a dry and dark place at room temperature.

Typical Printing Parameters

Nozzle temperature: 120-180°C, typical 150°C
Print bed temperature: 20-90°C, typical 50°C

Debind and Sinter (D&S)

with Element22s D&S service
(www.element22.de/services/debind-and-sinter-ds-service)
or with appropriate Debind & Sinter Equipment (www.tigen.de)

Typical Properties

-as printed and sintered-

Mechanical Properties are dependent on interstitial elements and residual porosity.

	Typical Value
Tensile Strength Rm / MPa	1005
Yield Strength $Rp_{0,2}$ / MPa	920
Elongation A / %	14%

Typical Chemical Composition

-as sintered-

Content of interstitial elements is highly dependent on thermal debinding and sintering equipment and process parameters.

Element	Value [wt.%]
Nitrogen	≤ 0.035
Carbon	≤ 0.045
Hydrogen	≤ 0.015
Iron	≤ 0.30
Oxygen	≤ 0.35
Aluminum	5.5 - 6.75
Vanadium	3.5 - 4.5
Yttrium	≤ 0.005
Titanium	balance

Density

-as printed and sintered--

Typical value: 98% of theoretical density
Range: 95-100% of theoretical density
Theoretical Density: 4.43 g/ccm

Disclaimer:
The values may vary according to the processing; the mentioned values are for guidance only and without guarantee.