



L-PBF Refractory Metal Tantalum

Parameters for Colibrium Additive's M2 Series 5



M2 Series 5 Tantalum

Introducing the first tantalum parameter for the Colibrium Additive M2 Series 5. The surface parameter has been developed for the 400 W machine and has a layer thickness of 30 μm , enabling surface roughness of less than 10 μm without bead blast or shot peening. Additionally, the parameter is capable of producing parts with high density (>99.95 %) across the platform.

Tantalum

The capability to produce near-net-shape structures makes additive manufacturing an ideal solution to process tantalum because the costly material can be used efficiently. Like Ti6Al4V Grade 23, tantalum offers outstanding biocompatibility, making it perfect for medical implants. Its excellent corrosion resistance and its high melting point ensure longevity and reliability in demanding environments. Typical applications of this promising material can be found in aerospace, medical and electrical industries.

M2 Series 5 Tantalum

Machine Configuration

M2 Series 5

Single- or dual-laser architecture

Argon gas

Platform heating: 200°C

Powder Chemistry

Unalloyed tantalum powder chemical composition similar to ASTM B365

Particle size: 15-45 µm

Thermal States

As-Built (AB)

Parameter Availability

Surface Parameter 398 AB

400 W, 30 µm layer thickness, rubber recoater

Typical Build Rate

Item

Typical build rate with coating ¹ (cm ³ /hr)	9.4
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Theoretical melting rate bulk per laser ² (cm ³ /hr)	9.5
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¹ Using standard Factory Acceptance Test layout and 2 lasers

² Calculated (layer thickness × scan velocity × hatch distance)

Physical Properties at Room Temperature

Item

Surface Roughness, Ra (µm), V	7
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Overhang Surface Roughness, Ra (µm), 60°	8
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Relative Density (%)	99.95
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Hardness (HV10), H	131
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Data Sheet Nomenclature and Notation

H: Horizontal, perpendicular to build direction.

V: Vertical, parallel to build direction.

Other angles are measured from horizontal.

Roughness measurements have been performed according to DIN EN ISO 4287 and DIN EN ISO 4288. In general analysis of the surface quality is strongly dependent on the methodology used and therefore deviations might be observed depending on methodology used. Vertical sidewalls and overhangs have been characterized using an optical system.

All figures and data contained herein are approximate and/or typical only and are dependent on several factors including but not limited to process and machine parameters. The information provided on this material data sheet is illustrative only and cannot be considered binding.