

# Material Product Data Sheet

## Ti-6Al-4V Powder for Additive Manufacturing of Medical Components

**Powder Products:**  
**MetcoMed™ Ti-64 G23-C**

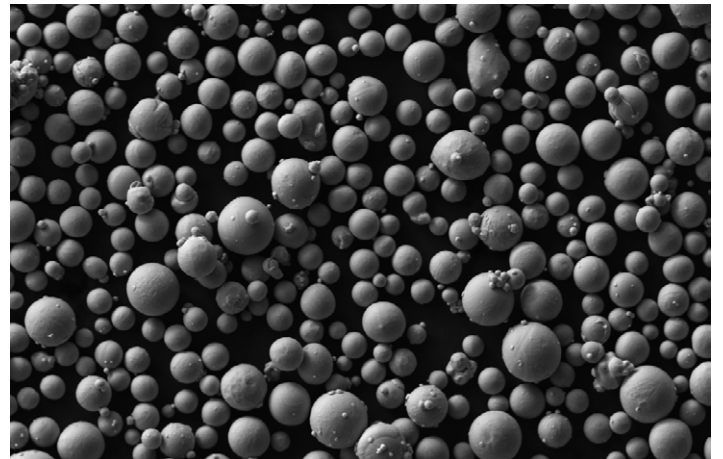
**1 Introduction**

MetcoMed Ti64 is a family of alpha-beta Ti-6Al-4V powders with chemistry per ASTM B348 Grades 23 (ELI). The powder has been manufactured from wire stock using an atomizing process which ensures alloy powder with high purity and spherical morphology. These alloys are known for high strength to weight ratio and excellent corrosion resistance. Room temperature static properties of PBF-LB processed and heat treated material coupons have been shown to be comparable to those of ASTM F2924 and F3001 for respective Grades.

For reference purposes Oerlikon Metco has processed MetcoMed Ti64 G23-C using PBF-LB with developed parameters and 50 µm layer thickness and 0.13 and 0.15 mm hatch spacing to provide data below.

**Quick Facts**

Classification	Alpha-beta alloys, Titanium Base
Chemistry	Ti-6Al-4V
Similar To	ASTM B348, F136, F3001; UNS R 56401
Manufacture	Wire Atomization
Morphology	Spheroidal
Apparent Density	> 2.0 g / cm <sup>3</sup> (typical)
Solidus	1604 °C (2920 °F)
Liquidus	1660 °C (3020 °F)
Purpose	Additive Manufacturing
Process	Laser Powder Bed Fusion (PBF-LB), Directed Energy Deposition (DED) Systems



SEM morphology image of MetcoMed Ti-64 G23-C

## 2 Material Information

### 2.1 Chemical Composition

Product	Weight Percent (nominal)										
	Ti	Al	V	O <sub>2</sub>	N <sub>2</sub>	C	H <sub>2</sub>	Fe	Y	other elements each	total all others
MetcoMed Ti-64 G23-C	Balance	5.5 – 6.5	3.5 – 4.5	< 0.13	≤ 0.03	≤ 0.08	≤ 0.012	≤ 0.25	≤ 0.005	≤ 0.10	≤ 0.40

### 2.2 Particle Size Distribution

Product	Nominal Range [μm]	D90 [μm]	D50 [μm]	D10 [μm]
MetcoMedTi64 G23-C	-53+20	55	36	23

For the nominal range, particle size analysis 45 or above measured by sieve (ASTM B214), analysis below 45 μm by laser diffraction (ASTM C 1070, Microtrac). Fractional analysis (D90, D50, D10) by laser diffraction and/or dynamic image analysis.

## 3 Key Processing Information

### 3.1 Typical Post Heat Treatment Properties (Ti-64 G23-C) <sup>a, b, c</sup>

Parameters for MetcoMed Ti-64 G23-C may be developed to enable use in the DED processes.

Specification Concept	SLM 280 HL
Ultimate Tensile Strength (MPa), XY/Z	1020 / 1021
Yield Strength (MPa), XY/Z	952 / 976
Elongation at rupture %, XY/Z	10 / 12
Reduction of Area %, XY/Z	46 / 46

<sup>a</sup> Disclaimer: All data published in this datasheet has been shared for reference purposes only and is not sufficient to design or certify parts. No warranty or guarantee is made against these results.

<sup>b</sup> Test specimens were 5.0 mm (final) diameter round bars machined from test samples 16.6 and 6.0 mm in diameter x 66 mm long

<sup>c</sup> Vacuum Heat Treatment of all Ti-6Al-4V batches shall be conducted in accordance to AMS 2801, under vacuum (1.3x10<sup>-3</sup> to 1.3x10<sup>-5</sup> mbar) at a temperature of 790 ± 10°C; hold at temperature for 2 hours -5/+15 minutes, followed by cooling under inert argon atmosphere at a rate equivalent to air cool or faster

## 4 Commercial Information

### 4.1 Ordering Information and Availability

Product	Order No.	Package Size	Availability	Distribution
MetcoMed Ti-64 G23-C	2454508	2.5 kg / 5.5 lb approx.	Stock	Global

### 4.2 Handling Recommendations

- Blend and dry contents prior to use to prevent segregation and flowability issue
- Keep in the original container, or an approved alternative, tightly closed when not in use
- Powder from previously opened containers should be stored in a humidity-controlled environment

### 4.3 Safety Recommendations

See the SDS (Safety Data Sheet) 50-4041 in the version localized for the country where the material will be used. SDS are available from the Oerlikon web site at [www.oerlikon.com/metco](http://www.oerlikon.com/metco) (Resources – Safety Data Sheets).

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