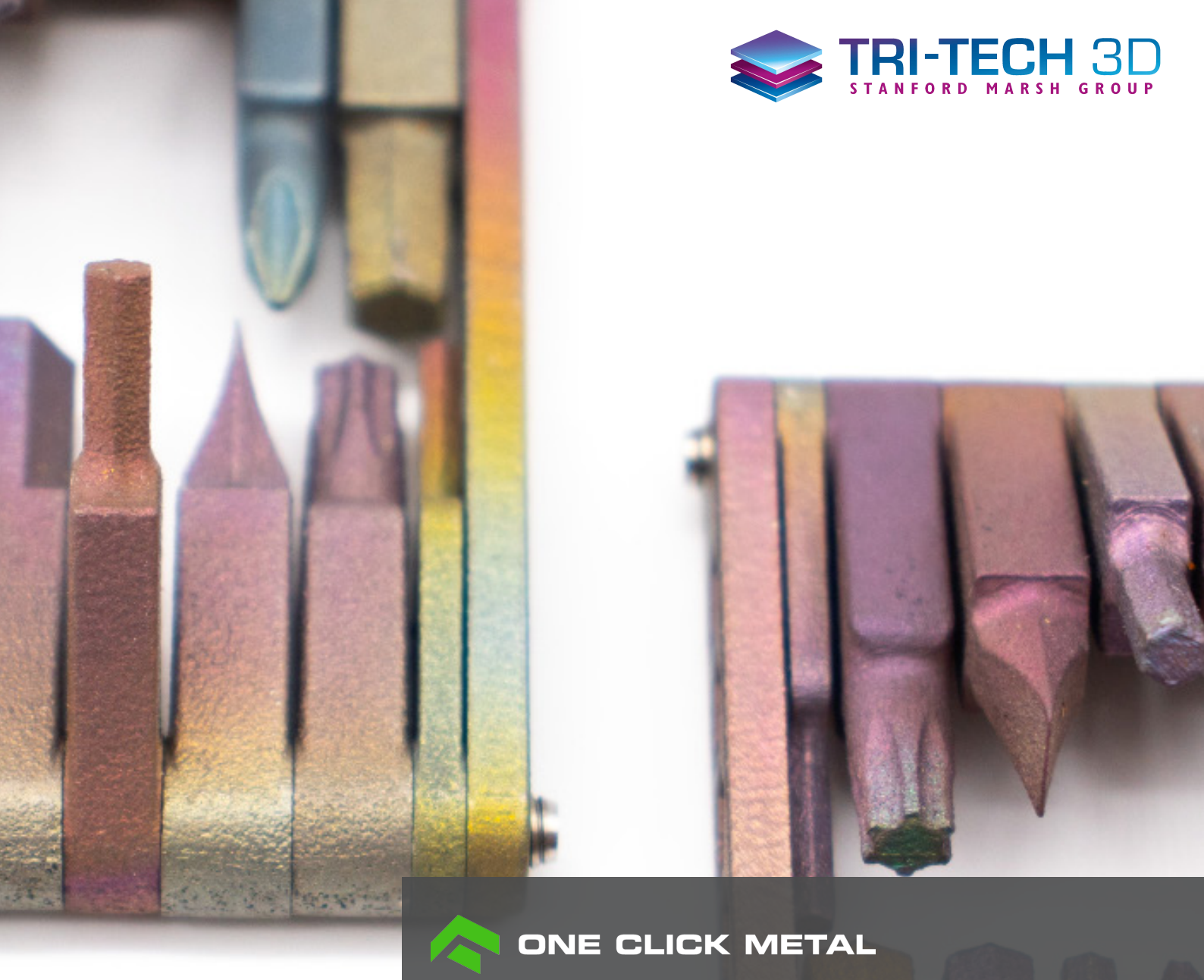
TRI-TECH 3D
STANFORD MARSH GROUP



ONE CLICK METAL

Titanium Ti-6Al-4V grade 23

# MATERIAL DATA SHEET

www.oneclickmetal.com

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# Titanium Ti-6Al-4V Grade 23

The material Ti-6Al-4V grade 23, is a light weight, high strength, corrosion resistant Titanium alloy. The presence of Al and V keeps this microstructure of the alloy stable at both lower and higher temperatures. The reduced presence of oxygen content in the grade 23 alloy improves the corrosion resistance of the alloy. Apart from having an industrial application due to the high weight to strength ratio, this alloy is also bio compatible making it an important alloy in the medical field.

**Properties**

- High strength and toughness
- Light weight
- Excellent corrosion resistance
- Bio compactible

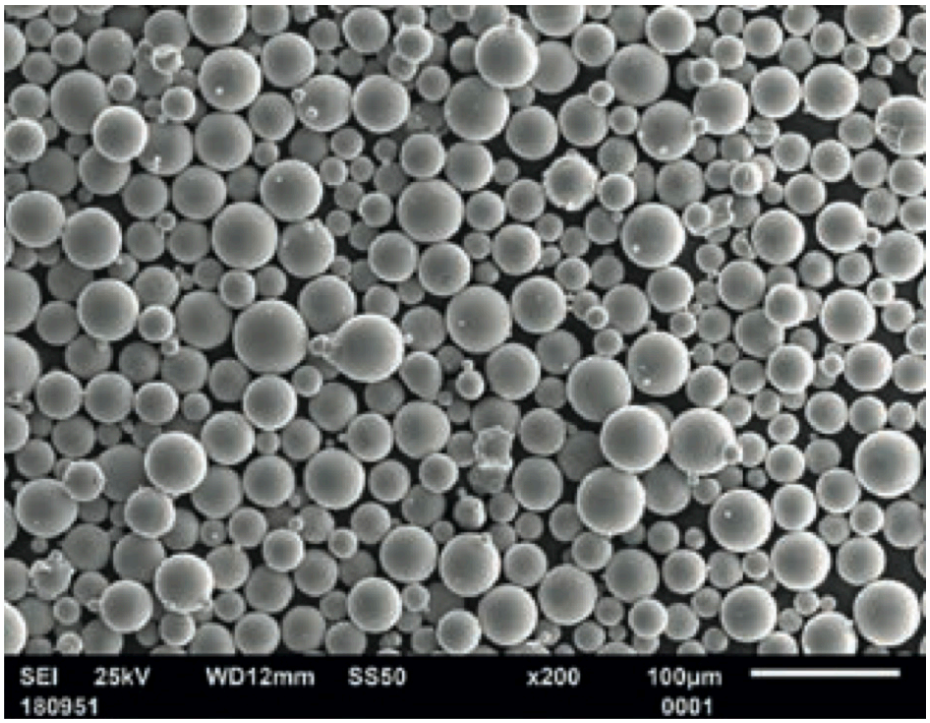
**Application example**

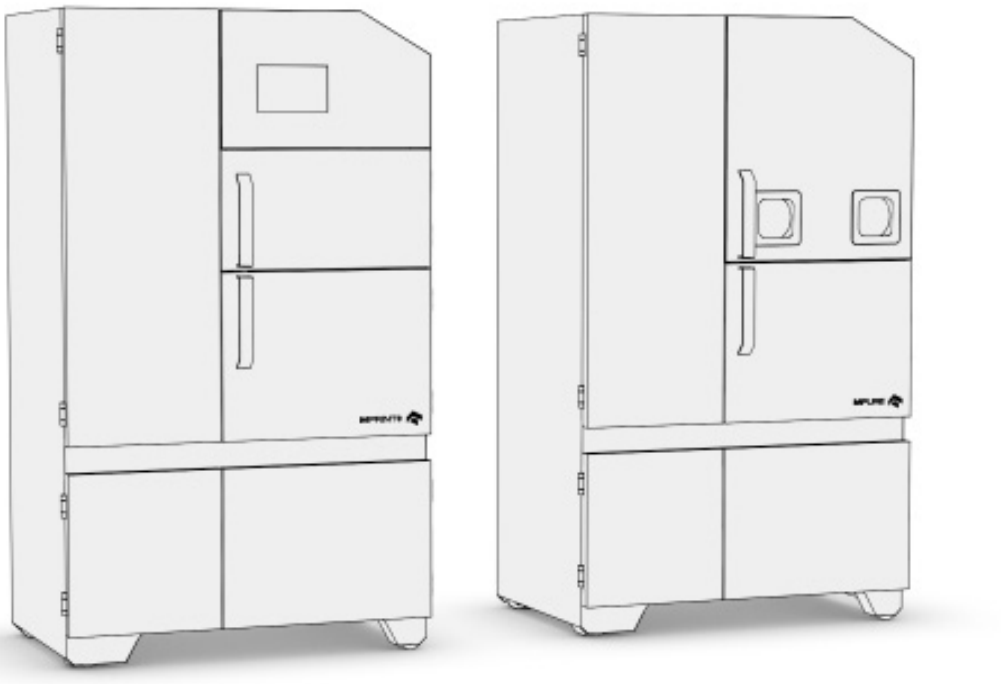
- Aviation and aerospace
- Automotive industry
- Medical implants
- Jewellery

# Powder Properties

**Powder chemical composition (wt.-%)**

| Element | Min. | Max. |
|---|---|---|
| Ti | Balance | |
| Al | 5.5 | 6.5 |
| V | 3.5 | 4.5 |
| Fe | <0.25 | |
| O | <0.13 | |

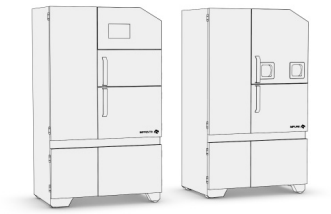




# Process Information

The powder titanium Ti-6Al-4V provided by One Click Metal is optimized for the production of robust components with MPRINT and MPUREpro of the BOLDseries.

| System set-up | MPRINT |
|---|---|
| Parameter | TiAl6V4 30µm |
| Software | Netfabb |
| Powder part-no. | TiAl6V4 |
| Layer thickness | 30µm |
| Coater | X-lip |
| Inert gas | Argon |
| Sieve | 80µm |



# Physical & mechanical properties

Among the various mechanical properties, elongation of break is an important property for Ti-6Al-4V applications. In the as built conditions, the average elongation of break is ca. 10%. Ti-6Al-4V is a heat treatable alloy and based on the heat treatment procedure followed the elongation of break can be improved as high as ca. 22%.

**Physical properties**

| Defects | Results |
|---|---|
| Average defect [%] | <0.1 |

**Mechanical properties ISO6892-1 (as built)**

| Vertical | Yield strength $R_{p0.2}$ [MPa] | Tensile strength $R_m$ [MPa] | Elongation at break A [%] |
|---|---|---|---|
| Average | 784 | 1137 | 15.6 |
| Standard deviation | 35 | 7 | 1.2 |
| Relative deviation | 4.4 | 0.7 | 7.6 |

**Surface quality (measured along the z-axis)**

| | | |
|---|---|---|
| As built | Ra [µm] | 6.45 |
| | Rz [µm] | 28.72 |
| Blasted | Ra [µm] | 3.45 |
| | Rz [µm] | 13.11 |