

### 1. Standards

ASTM Ti CP grade 4  
AIR 9182 T60

### 3. Composition<sup>(1)</sup>

<sup>(1)</sup> ICP analysis

% Fe	< 0,1
% Al	< 0,05
% Zr	< 0,005
% Nb	< 0,02
% V	< 0,005
% C	< 0,35
% H	< 0,015
% O	< 0,5
% N	< 0,05
% Ti	Solde

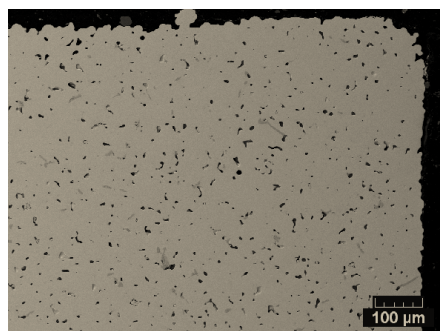
### 2. Properties and use

Commercially pure titanium made from a plasma spray grade 2 powder with a maximum size of 44 microns. During sintering the material drifts to grade 4 due to carbon and oxygen pick-up. With a density limited to 95% of the theoretical density and a high level of interstitial elements, this material is intended for applications in which mechanical and structural properties are not a priority. This material is recommended where the other properties of titanium are important (lightness, corrosion resistance, allergy free etc ...). Implants are not possible with this grade. This material is not polishable (due to the material itself and not to the MiM process) but can be used in all cosmetic applications with a brushed or sand blasted finish. No difference in colour can be seen compared to other grade of CP titanium whatever the metallurgical route.

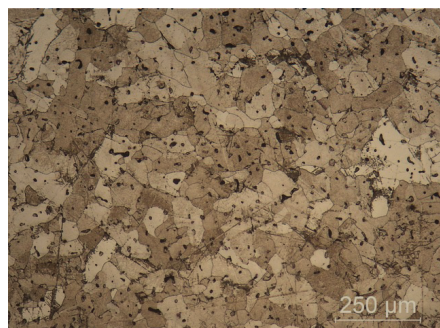
### 4. Microstructure

Porosity size inferior to 10 µm mainly located sub surface where the microstructure exhibits microcarbides and an acicular structure which evolves to annealed structure in the centre of the part.

Grain size G=4 (80 µm.)



SEM Microstructure



Optical microstructure with etching

### 5. Physical and chemical properties

No corrosion<sup>(1)</sup> after 600 hours of salt spray test  
No visible corrosion<sup>(2)</sup> after 162 hours of artificial sweat test

Theoretical density : 4,50  
Minimum density 4,25

<sup>(1)</sup> according to NF X 41-002

<sup>(2)</sup> according to NF X 80-772

### 6. Mechanical properties

#### Traction

$R_m > 500$  MPa

$R_{p0.2} > 250$  MPa

$A\% < 8\%$

Hardness : 180-250 Hv<sub>1</sub>

Roughness : Ra < 2 µm