DIRECT METAL LASER SINTERING

TITANIUM TI6AL4V

PRODUCT SPECIFICATIONS

PRODUCT DESCRIPTION:
This well-known light alloy is characterized by having excellent mechanical properties and corrosion resistance combined with low specific weight and biocompatibility. This material is ideal for many high-performance engineering applications, for example in medical and aerospace or motor racing.
Parts built in Titanium Ti6Al4V have a chemical composition corresponding to ISO 5832-3, ASTM F1472 and ASTM B348.

APPLICATIONS:
Ti6Al4V is an excellent choice for Applications where a non-corroding, high strength – low weight material is needed.

KEY PRODUCT BENEFITS
- Biocompatibility
- Light Weight
- High Strength
- Excellent Corrosion Resistance

CHEMICAL COMPOSITION:
According ISO 5832-3; ASTM F1472 & ASTM B348

- Ti (balance)
- Al (5.5 - 6.75 wt.%)
- V (3.5 - 4.5 wt.%)
- O (<0.15 wt.%)
- N (< 0.04 wt.%)
- H (<0.012 wt.%)
- Fe (<0.25 wt%)
- C (<0.08 wt.%)
- Y (<0.005 wt.%)

GEOMETRICAL LIMITS:
- Min Wall thickness 1.00 mm - Min. Feature Size 1.00 mm
- Min. embossed details 0.5mm high and wide and 0.8mm for readable text and clear images
- Min. engraved details 0.5mm deep and 0.6mm wide; 1.0mm wide for readable text and clear images
### PROPERTIES:

<table>
<thead>
<tr>
<th>Heat Treatment</th>
<th>Tensile Strength MPa</th>
<th>Yield Strength 0,2% MPa</th>
<th>Elongation %</th>
<th>Hardness</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>/</td>
<td>1200 MPa +/- 50 MPa</td>
<td>1050 MPa +/- 50 MPa</td>
<td>8 +/- 2%</td>
<td>33 +/- 2 HBW</td>
<td>~ 99,95%</td>
</tr>
</tbody>
</table>

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<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Treated</td>
<td>&gt;930 MPa</td>
<td>&gt;860 MPa</td>
<td>&gt; 10%</td>
<td>33 +/- 2 HBW</td>
<td>~ 99,95%</td>
</tr>
</tbody>
</table>

### RESOLUTION:

<table>
<thead>
<tr>
<th></th>
<th>Layer Thickness</th>
<th>Build Envelope</th>
<th>Min. Feature Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Resolution</td>
<td>0,02 mm</td>
<td>Ø100 x 80 mm</td>
<td>0,5mm</td>
</tr>
<tr>
<td>High Resolution</td>
<td>0,03 mm</td>
<td>250x250x300mm</td>
<td>1,00mm</td>
</tr>
<tr>
<td>Normal Resolution</td>
<td>0,06 mm</td>
<td>250x250x300mm</td>
<td>1,00mm</td>
</tr>
</tbody>
</table>

### SURFACE:

<table>
<thead>
<tr>
<th></th>
<th>0 °</th>
<th>45 ° bottom</th>
<th>45 ° top</th>
<th>90 °</th>
</tr>
</thead>
</table>
| Fine Resolution| Ra 2,5 µm  
Rz 16 mm | Ra 4,9 µm  
Rz 28 µm | Ra 4,3 µm  
Rz 20 µm | Ra 2,5 µm  
Rz 16 µm |
| High Resolution| Ra 4,4 µm  
Rz 23 µm | Ra 11,7 µm 
Rz 62 µm | Ra 6,6 µm  
Rz 35 µm | Ra 4,9 µm  
Rz 26 µm |
| Normal Resolution| Ra 5,5 µm  
Rz 32 µm | Ra 23 µm  
Rz 110 µm | Ra 12 µm  
Rz 64 µm | Ra 6,8 µm  
Rz 35 µm |

**STANDARD TOLERANCES:**

Typically, for well-designed parts, with a designated build direction, tolerances of +/- 0.1 mm to +/- 0.2 mm + 0.005 mm/mm are expected and achieved.

Certain geometries may cause distortions due to internal stress which may lead to higher deviations.