PRODUCT DESCRIPTION
Cobalt-Chrome material is used in our DMLS process. It is a superalloy comprised primarily of cobalt and chromium, and is known for its high strength-to-weight ratio, excellent creep and corrosion resistance.

Parts build in coCr are according to ASTM F75.

APPLICATIONS
Cobalt-Chrome is an excellent choice for use in aerospace engine applications. It’s low nickel content gives this metal excellent biocompatibility, making it a strong candidate for use in dental and orthopedic applications as well.

KEY PRODUCT BENEFITS
• High strength
• Creep and corrosion resistance
• Excellent biocompatibility

CHEMICAL COMPOSITION:
Cobalt (balance)
Chromium (27 - 30 wt.%)
Molybdenum (5 - 7 wt.%)
Nickel (<0.5wt.%)
Iron (<0.75 wt.%)
Carbon (<0.35 wt.%)
Silicon (<1.00 wt.%)
Managnese (<1.00 wt.%)
Tungsten (<0.20 wt %)
Phosphorous (<0.020 wt %)
Sulfur (<0.010 wt %)
Nitrogen (<0.25 wt %)
Aluminum (<0.10 wt %)
Titanium (<0.10 wt %)
Boron (<0.010 wt %)

GEOMETRICAL LIMITS:
Min Wall Thickness 1.00mm -
Min Feature Size 1.00mm

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>STANDARD</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>ASTM F75</td>
<td>1080 MPa +/- 50MPa</td>
<td>600 MPa +/- 50MPa</td>
<td>20 +/- 2 %</td>
<td>30 +/- 2 HRC</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>100x100x100mm</td>
<td>0.5 mm</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>
<tbody>
<tr>
<td>Fine resolution</td>
<td>Ra 8 µm</td>
<td>Ra 17 µm</td>
<td>Ra 5.7 µm</td>
<td>Ra 7.8 µm</td>
</tr>
<tr>
<td></td>
<td>Rz 30 µm</td>
<td>Rz 80 µm</td>
<td>Rz 29 µm</td>
<td>Rz 25 µm</td>
</tr>
</tbody>
</table>

**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.