Titanium (commercial pure: grade 1-4)

Recommended machines and additional consumables (not included)

**CUTTING**
- Equipment: ATM Brilliant
- Consumables: Cut-off wheel: silicon carbide, resin bond
- Anti-corrosion coolant

**MOUNTING**
- Equipment: ATM Opal
- Consumables: Hot mounting: EPO black, EPO-Max,
  Cold mounting: KEM 20, KEM 15 plus
  Hot or cold mounting

**GRINDING/Polishing**
- Sample size: Ø 40 mm
- Notes:

<table>
<thead>
<tr>
<th>STEP</th>
<th>MEDIUM</th>
<th>rpm</th>
<th>Pressure</th>
<th>min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planar grinding</td>
<td>SC-paper/foil F320 (280)</td>
<td>H₂O</td>
<td>25-300</td>
<td>25</td>
</tr>
<tr>
<td>Pre-polishing</td>
<td>BETA</td>
<td>Dia-Complete Poly, 9 µm</td>
<td>120-150</td>
<td>30</td>
</tr>
<tr>
<td>Final polishing</td>
<td>LAMBDA</td>
<td>Eposil F, 0.1 µm**</td>
<td>120-150</td>
<td>40</td>
</tr>
<tr>
<td>Optional:</td>
<td>Etching (chem.)</td>
<td>Kroll’s reagent*</td>
<td>Approx. 0:45</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- ATM Item No. 92004492
- Eposil F has to be mixed with hydrogen peroxide (35%) in a ratio of 5:1 (safety advice: use personal protective equipment)
- Depends on the alloy

BEGINNERS GUIDE

- Use suitable cut-off wheels for titanium (e.g. ATM Ti-AS wheels)
- Cutting speed max. 0.25 mm/s
- Use mounting material for almost gap-free mounting
- Hot or cold mounting possible
- Grind with SC-paper/foil F320 (280)
- Thoroughly wash samples and holder under running water after each grinding step
- Rinse the polishing discs with water and spin dry after use
- Do not stack discs with different diamond sizes
- Clean samples, holders and hands under running water before each polishing step
- Use ethanol and blow dryer to avoid water stains
- Check after each step under the microscope if polishing marks are of equal size and randomly oriented
- Use the consumables only for titanium and not for other materials
- Rinse the cap of the Eposil F bottle after use, put cap back on
- Rinse the cap of the Eposil F bottle after use, put cap back on

SAMPLE MICROGRAPHS

**OK Sample polished**
- 10x micrograph of titanium after LAMBDA polishing
  - No traces of scratches
  - Clear structure/contour of the different phases

**NOK Sample polished**
- 10x micrograph of titanium after LAMBDA polishing
  - Sparse scratches from 0.1 µm polishing after LAMBDA
  - Clean all polishing discs with clean brush under running water
  - Clean sample and sample holder
  - Repeat LAMBDA step

- 10x micrograph of stainless steel etched with Kroll’s reagent
  - No traces of scratches
  - Clear structure

Notes: