# Nickel based alloys

## Recommended machines and additional consumables (not included)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Consumables</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATM brillant</td>
<td>Cut-off wheel: corundum, resin/rubber bond Anti-corrosion coolant</td>
</tr>
<tr>
<td>ATM Opal</td>
<td>Hot mounting: EPO black, EPO-Max Cold mounting: KEM 15 plus Hot or cold mounting</td>
</tr>
</tbody>
</table>

## Pressure parameters and specimen size

<table>
<thead>
<tr>
<th>Specimen diameter [mm]</th>
<th>Pressure in pressure used in the preparation methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>-(5 N…10 N)</td>
</tr>
<tr>
<td>30</td>
<td>-5 N</td>
</tr>
<tr>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>+(5 N…10 N)</td>
</tr>
<tr>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

## Notes:

- ATM Item No. 92002605; if etching doesn't work heat up (V2A) to 50 °C

## BEGINNERS GUIDE

### CUTTING
- Use suitable cut-off wheels for ferrous material (e.g. ATM FS-E wheels)
- Cutting speed max. 0.25 mm/s

### MOUNTING
- Use mounting material for almost gap-free mounting
- Hot or cold mounting possible

### GRINDING
- Grind with GALAXY green
- Thoroughly wash samples and holder under running water after each grinding step

### POLISHING
- 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 nickel based alloys and not for other materials
- Rinse the cap of the Eposal bottle after use, put cap back on
- Use cosmetic tissues to clean possible traces of Eposal after the last polishing step

### SAMPLE MICROGRAPHS

**OK Sample polished**

- 10x micrograph of nickel based alloy after OMEGA polishing
  - No traces of scratches
  - Clear structure/contour of the different phases

**NOK Sample polished**

- 10x micrograph of nickel based alloy after OMEGA polishing
  - Edge marks from 0.05 µm Episol after OMEGA
  - Showplan polishing time
  - Clean all polishing discs with clean brush under running water
  - Clean sample and sample holder
  - Repeat OMEGA step

**20x micrograph of nickel based alloy etched with V2A reagent (50 °C, 20 sec)**

- No traces of scratches
- Clear structure

## Notes:

- ATM Item No. 92002605; if etching doesn't work heat up (V2A) to 50 °C

## Equipment

<table>
<thead>
<tr>
<th>Step</th>
<th>Medium</th>
<th>H₂O</th>
<th>rpm</th>
<th>Single pressure</th>
<th>min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planar grinding</td>
<td>GALAXY green</td>
<td></td>
<td>250-300</td>
<td>Synchronous Rotation</td>
<td>35</td>
</tr>
<tr>
<td>Pre-polishing</td>
<td>BETA Dia-Complete Poly, 9 µm</td>
<td>120-150</td>
<td>Counter Rotation</td>
<td>30</td>
<td>6:00</td>
</tr>
<tr>
<td>Polishing</td>
<td>GAMMA Dia-Complete Poly, 3 µm</td>
<td>120-150</td>
<td>Synchronous Rotation</td>
<td>30</td>
<td>3:00</td>
</tr>
<tr>
<td>Final polishing</td>
<td>OMEGA Eposal, 0.06 µm</td>
<td>120-150</td>
<td>Counter Rotation</td>
<td>20</td>
<td>1:30</td>
</tr>
<tr>
<td>Optional:</td>
<td>Blushing (chem.)</td>
<td></td>
<td></td>
<td>V2A reagent*</td>
<td>Approx. 0.05-0.30</td>
</tr>
</tbody>
</table>

Notes:

- ATM Item No. 92002605; if etching doesn't work heat up (V2A) to 50 °C