Preparation method

Copper and copper alloys

**Recommended machines and additional consumables (not included)**

<table>
<thead>
<tr>
<th>Cutting</th>
<th>Equipment</th>
<th>ATM Brillant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grindings/Polishing</td>
<td>Consumables</td>
<td>Corundum, resin bond</td>
</tr>
<tr>
<td>Polishing</td>
<td>Consumables</td>
<td>Bakelite red/black, Thermoplast</td>
</tr>
<tr>
<td>Hot mounting</td>
<td></td>
<td>KEN 20, KEN 30</td>
</tr>
</tbody>
</table>

**Pressure parameters and specimen size**

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

**Notes:**

- Use suitable cut-off wheels for non-ferrous material (e.g. ATM NF-A wheels)
- Cutting speed max. 0.25 mm/s

** BEGINNERS GUIDE **

- Use mounting material for almost gap-free mounting
- Grind with SiC-paper/foil P320 (280)
- Thoroughly wash samples and holder under running water after each grinding step
- Use 1 sheet of SiC-paper/foil for maximum 4 samples
- 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

** SAMPLE MICROGRAPHS **

- **OK Sample polished**
  - 20x micrograph of cast bronze after OMEGA polishing
  - CuSn intermetallic defined
  - Pores from casting visible, minimal residual
  - No pittings or relief from over-polishing

- **NOK Sample polished**
  - 10x micrograph of cast bronze after OMEGA polishing
  - Scratches from 3 µm step after OMEGA
  - Clean all polishing discs with clear-liquid
  - Repeat OMEGA step
  - Clean sample and sample holder

- **OK Etched Sample A**
  - 10x micrograph of cast bronze, etched with Cu Etchant A
  - Good brightness contrast between regions of different dendrite orientation

- **OK Etched Sample B**
  - 20x micrograph of Cu, etched with Cu Etchant A after 5 min OMEGA polishing
  - Clean boundaries and twinning discriminable
  - Almost no residual scratches

www.atm-m.com | Advanced Materialography