**Preparation method**

**Cast Iron (GJS/GJL)**

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

<table>
<thead>
<tr>
<th>Equipment</th>
<th>ATM Brilliant</th>
<th>ATM Opal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cutting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MOUNTING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GRINDING/POLISHING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample size</td>
<td>Ø 40 mm</td>
<td></td>
</tr>
</tbody>
</table>

**Consumables**
- Cut-off wheel: corundum, resin bond, Anti-corrosion coolant
- Hot mounting: EPO black, EPO-Max, Bakelite red/black
- Cold mounting: KEM 30
- Hot or cold mounting

**Notes:**
* ATM Item No. 92002597
** Rinsing with water can cause corrosion

**STEP**

<table>
<thead>
<tr>
<th>MEDIUM</th>
<th>rpm</th>
<th>Single Pressure [N]</th>
<th>Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planar grinding</td>
<td>SiC-paper/foil P320 (280)</td>
<td>H₂O</td>
<td>250-300</td>
</tr>
<tr>
<td>Grind</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding</td>
<td>SiC-paper/foil P600 (400)</td>
<td>H₂O</td>
<td>250-300</td>
</tr>
<tr>
<td>Polishing</td>
<td>SIGMA Dia-Complete Poly, 3 µm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final polishing</td>
<td>OMEGA Eposal 0.06 µm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional: Etching (chem.)</td>
<td>Nital 3%*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
* Use suitable cut-off wheels for ferrous material (e.g. ATM FS-B or FS-A wheels)
** Cutting speed max 0.25 mm/s
* Use mounting material for almost gap-free mounting
* Cold or hot mounting both possible
* Start grinding with SiC-paper/foil P320 (280)
* Continue with P600 and P1200
* Thoroughly wash samples and holder under running water after each grinding step
* Do not stack discs with different diamond sizes
* Clean samples, holders and hands under running water before each polishing step
* Attention: keep cleaning time with water shortly as you can: corrosion-prone!
* Use ethanol and blow dryer to avoid water stains and corrosion
* Check after each step under the microscope if polishing marks are of equal size and randomly oriented
* Use the consumables only for cast iron and not for other materials
* Use cosmetic tissues to clean possible traces of Eposal after the last polishing step

**Pressure parameters and specimen size**

<table>
<thead>
<tr>
<th>Specimen diameter [mm]</th>
<th>Specimen diameter [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
* Divergence in pressure used in the preparation methods
  - (<5 N…10 N) -5 N
  +5 N (+5 N…10 N)

**BEGINNERS GUIDE**

**Cutting**
- Use suitable cut-off wheels for ferrous material (e.g. ATM FS-B or FS-A wheels)
- Cutting speed max 0.25 mm/s

**Mounting**
- Use mounting material for almost gap-free mounting
- Cold or hot mounting both possible

**Grinding**
- Start grinding with SiC-paper/foil P320 (280)
- Continue with P600 and P1200
- Thoroughly wash samples and holder under running water after each grinding step
- Do not stack discs with different diamond sizes
- Clean samples, holders and hands under running water before each polishing step
- Attention: keep cleaning time with water shortly as you can: corrosion-prone!
- Use ethanol and blow dryer to avoid water stains and corrosion
- Check after each step under the microscope if polishing marks are of equal size and randomly oriented
- Use the consumables only for cast iron and not for other materials
- Use cosmetic tissues to clean possible traces of Eposal after the last polishing step

**Polishing**
- Do not stack discs with different diamond sizes
- Clean samples, holders and hands under running water before each polishing step
- Attention: keep cleaning time with water shortly as you can: corrosion-prone!
- Use ethanol and blow dryer to avoid water stains and corrosion
- Check after each step under the microscope if polishing marks are of equal size and randomly oriented
- Use the consumables only for cast iron and not for other materials
- Use cosmetic tissues to clean possible traces of Eposal after the last polishing step

**SAMPLE MICROGRAPHS**

**OK Sample polished**
- 10x micrograph of cast iron after OMEGA polishing
- No traces of scratches
- Clear structure/contours of the different phases

**NOK Sample polished**
- 10x micrograph of cast iron after OMEGA polishing
- Polishing marks after final polishing with OMEGA
- Use cosmetic tissues to clean the sample
- Repeat steps 3µm Dia-Complete poly/SIGMA and Eposal 0.06 µm/OMEGA

**OK Sample etched**
- 10x micrograph of cast iron etched with Nital 3%
- No corrosion in the ferrite courts

**NOK Sample etched**
- 10x micrograph of cast iron etched with Nital 3%
- Corrosion in the ferrite courts
- Repeat steps 3µm Dia-Complete poly/SIGMA and Eposal 0.06 µm/OMEGA and put more attention on fast and waterless cleaning between the steps

**Notes:**