**Nitrided steel**

**Beginner's 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 and cold mounting both possible

- **Grinding**
  - Grind with SiC-Paper/foil P320 (280)
  - 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

Optional: Etching (chem.)

- Kalling II**
  - Approx. 0.02-0.10

Notes:

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

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Consumables</th>
<th>Pressure parameters and specimen size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cutting</strong></td>
<td>Cut-off wheel: corundum, resin bond</td>
<td>Specimen diameter [mm]</td>
</tr>
<tr>
<td><strong>Mounting</strong></td>
<td>Anti-corrosion coolant</td>
<td>25 30 40 50 60</td>
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<tr>
<td><strong>Grinding</strong></td>
<td>Hot mounting: EPO black, EPO-Max*</td>
<td>Divergence in pressure used in the preparation methods</td>
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<tr>
<td><strong>Polishing</strong></td>
<td>Hot or cold mounting</td>
<td>-5 N...10 N -5 N +5 N +5 N...10 N</td>
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<tr>
<td>Sample size</td>
<td>Ø 40 mm</td>
<td></td>
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</tbody>
</table>

Notes:

**Sample Micrographs**

**OK Sample polished**

- 20x micrograph of nitrided steel after OMEGA polishing
  - No trace of reference
  - Clear structure/contour of the different phases

**NOK Sample polished**

- 20x micrograph of nitrided steel after OMEGA polishing
  - Spalling in the nitride layer (created by too much pressure)
  - Check the chosen parameters of the final polishing step
  - Repeat all (!) steps carefully

**OK Sample etched**

- 20x micrograph of nitrided steel etched with Nital 3%
  - Nitride layer clearly visible