PREPARATION METHOD

QATM QUALITY ASSURED

Nitrided steel

Recommended machines and additional consumables (not included)

CUTTING
Equipment
ATM Brillant

Consumables
Cut-off wheel: corundum, resin bond
Anti-corrosion coolant

MOUNTING
Equipment
ATM Opal

Consumables
Hot mounting: EPO black, EPO-Max*
Cold mounting: KEM 15 plus
Hot or cold mounting

GRINDING/ POLISHING
Sample size
Ø 40 mm

Pressure parameters and specimen size

Specimen diameter [mm]	25	30	40	50	60
Divergence in pressure used in the preparation methods	-(5 N...10 N)	-5 N	0	+5 N	+(5 N...10 N)

Notes:

STEP	MEDIUM		rpm		Single Pressure N	min
Planar grinding	SiC-Paper/foil P320 (280)	H_2O	250-300	►► Synchronous Rotation	30	Until plane
Pre-polishing	BETA	Dia-Complete Poly, 9 µm	120-150	◄► Counter Rotation	30	5:00
Polishing	GAMMA	Dia-Complete Poly, 3 µm	120-150	►► Synchronous Rotation	30	6:00
Polishing	ZETA	Dia-Complete Poly, 1 µm	120-150	►► Synchronous Rotation	30	3:00
Final polishing	OMEGA	Eposal 0.06 µm	120-150	◄► Counter Rotation	15	2:00 (H_2O during final 0:30)
Optional: Etching (chem.)	Kalling II**					Approx. 0:02-0:10

* Before hot mounting the specimen should be wrapped in aluminum foil to stabilize the nitrided layer

** ATM Item No. 92002347

BEGINNERS GUIDE

Notes:

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

MOUNTING
- Use mounting material with high edge retention
- 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
- Rinse the OMEGA disc with water and spin dry after use
- Use the consumables only for nitrided steel 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

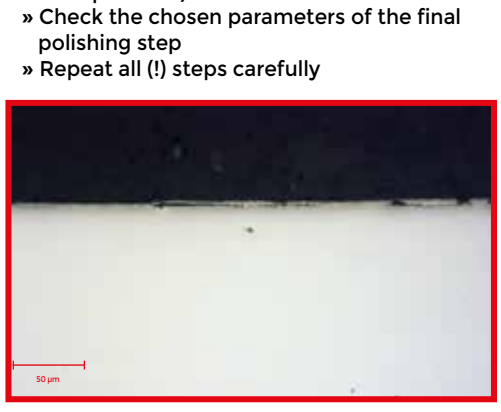
20x micrograph of nitrided steel after OMEGA polishing

- No traces of scratches
- 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

Notes: