PREPARATION METHOD

QUALITY ASSURED

Cast Iron (GJS/GJL)

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, Bakelite red/black
Cold mounting: KEM 30

Hot or cold mounting

GRINDING/ POLISHING

Sample size
Ø 40 mm

Notes:

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)

STEP	MEDIUM		rpm		Single Pressure N	min
Planar grinding	SiC-paper/foil P320 (280)	H_2O	250-300	►► Synchronous Rotation	30	Until plane
Grinding	SiC-paper/foil P600 (400)	H_2O	250-300	►► Synchronous Rotation	30	1:00
Grinding	SiC-paper/foil P1200 (600)	H_2O	250-300	►► Synchronous Rotation	30	1:00
Polishing	SIGMA	Dia-Complete Poly, 3 µm	120-150	►► Synchronous Rotation	25	5:00
Final polishing	OMEGA	Eposal 0.06 µm	120-150	◄► Counter Rotation	20	1:00 (H_2O during final 0:30)**
Optional: Etching (chem.)	Nital 3%*					Approx. 0:01–0:10

* ATM Item No. 92002597

** Rinsing with water can cause corrosion

BEGINNERS GUIDE

CUTTING

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

MOUNTING

- Use mounting material with high edge retention
- 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

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
- Rinse the OMEGA disc with water and spin dry after use
- Use the consumables only for cast iron 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

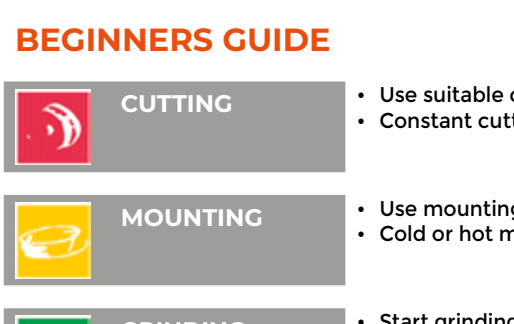
Notes:

SAMPLE MICROGRAPHS

OK Sample polished

10x micrograph of cast iron after OMEGA polishing

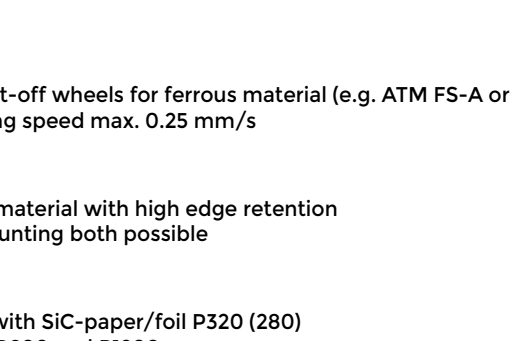
- No traces of scratches
- Clear structure/contour of the different phases



NOK Sample polished

10x micrograph of cast iron after OMEGA polishing

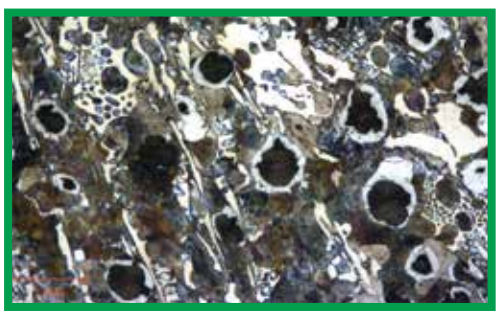
- Pollution marks after final polishing with OMEGA
  » Use cosmetic tissues to clean the sample
  » Repeat steps 3µm Dia-Complete poly/ SIGMA and Eposal 0.06 µm/OMEGA



OK Sample etched

10x micrograph of cast iron etched with Nital 3%

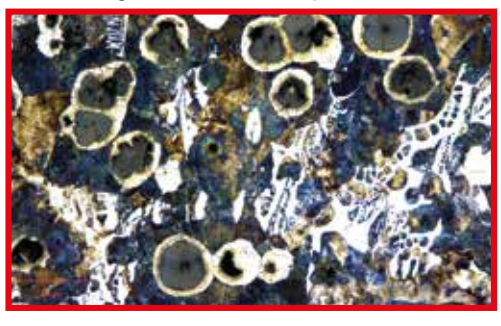
- No corrosion in the ferrite courts



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: