# PREPARATION METHOD



# Soft to medium-hard steel (<35 HRC/350HV)

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

Notes:

**Equipment ATM** Brillant



**Equipment** ATM Opal

GRINDING/ Sample size Ø 40 mm **POLISHING** 

# Consumables

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

Consumables Hot mounting: EPO black, EPO-Max, Bakelite red/black Cold mounting: KEM 15 plus

#### Hot or cold mounting

### Pressure parameters and specimen size

Specimen diameter [mm]	25	30	40	50	60
Divergence in pressure used in the preparation methods	-(5 N10 N)	-5 N	O	+5 N	+(5 N10 N)

STEP	MEDIUM	42%	rpm	€	Single Pressure	min
Planar grinding	SiC-paper/foil P320 (280)	H <sub>2</sub> O	250-300	►► Synchronous Rotation	30	Until plane
Pre-polishing	ВЕТА	Dia-Complete Poly, 9 µm	120-150	<b>⋖►</b> Counter Rotation	35	5:00
Polishing	GAMMA	Dia-Complete Poly, 3 µm	120-150	►► Synchronous Rotation	30	6:00
Final polishing	OMEGA	Eposal 0.06 µm*	120-150	►► Synchronous Rotation	20	1:00 (H <sub>2</sub> O during final 0:30)
Optional: Etching (chem.)	Nital 3%** Adler´s reagent (macro)***					Approx. 0:03-0:10 Approx. 0:03-0:10

<sup>\*</sup> For weld analysis

# **BEGINNERS GUIDE**



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



GRINDING

- Use mounting material with high edge retention · Cold or hot mounting both possible
- Grind with SiC-paper/foil P320 (280)
  - Thoroughly wash samples and holder under running water after each grinding step



(a)

- 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 and corrosion
- · Rinse the OMEGA disc with water and spin dry after use
- · Check after each step under the microscope if polishing marks are of equal size and randomly oriented

**Notes:** 

- Use the consumables only for soft to medium hard 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**

10x micrograph of meduim-hard iron after OMEGA polishing

- Minimal traces of scratches
- Clean homogeneous surface
- Pores and inclusions with clean edges

# **NOK Sample polished**

10x micrograph of medium-hard iron after OMEGA polishing

- "Comets": OMEGA step wasn't accomplished clockwise
- » Repeat GAMMA and OMEGA step with the correct settings



**OK Sample etched** 

20x micrograph of soft to medium-hard iron etched with Nital 3%

- No corrosion
- » Etching time and etchant concentration for your analysis requirements can be diver-



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Notes:

<sup>\*\*</sup> ATM Item No. 92002597

<sup>\*\*\*</sup> ATM Item No. 92002602