

Medium-hard to hard steel (35-65 HRC/850HV)

Recommended machines and additional consumables (not included)

CUTTING	Equipment ATM Brilliant	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 mounting preferred
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	Galaxy red	H ₂ O	250-300	▶ Synchronous Rotation	30	Until plane
Pre-polishing	BETA	Dia-Complete Poly, 9 µm	120-150	◀ Counter Rotation	30	3:00-5:00
Final polishing	IOTA	Dia-Complete Poly, 3 µm	120-150	▶ Synchronous Rotation	30	3:00-4:00
Optional etching (chem.)	Nital 3% *					Approx. 0:03

* ATM Item No. 92002597

BEGINNERS GUIDE

CUTTING	<ul style="list-style-type: none"> Use suitable cut-off wheels for ferrous material (e.g. ATM FS-C or D wheels) Constant cutting speed max. 0.25 mm/s
MOUNTING	<ul style="list-style-type: none"> Use mounting material with high edge retention
GRINDING	<ul style="list-style-type: none"> Grind with GALAXY red Use the entire radius of the GALAXY disc Thoroughly wash samples and sample holder under running water after each grinding step
POLISHING	<ul style="list-style-type: none"> For new materials start with longest recommended step times and optimize to shorter times 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 Use the consumables only for medium-hard to hard steels and not for other materials

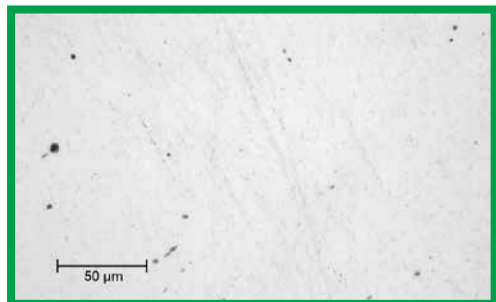
Notes:

SAMPLE MICROGRAPHS

OK Sample polished

20x micrograph of tempered steel after IOTA polishing

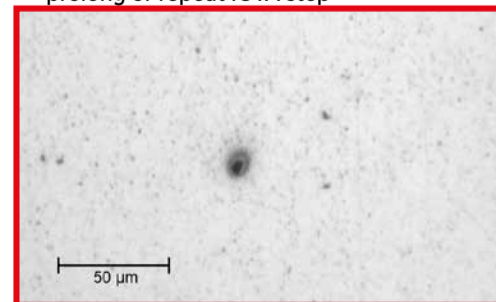
- Minimal traces of scratches
- Clean homogeneous surface
- Pores and inclusions with clean edges



NOK Sample polished

20x micrograph of tempered steel after IOTA polishing

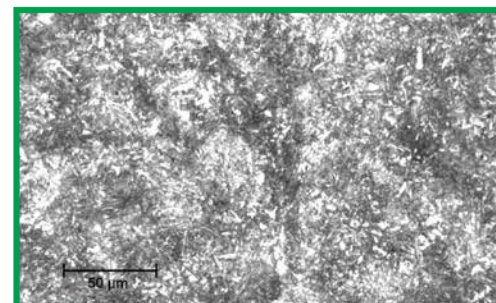
- Pore in centre leaks corrosion product (rust)
 - » Shorter rinsing with water, clean with ethanol instead
- Fine dark haze
 - » More cleaning, use soft clean paper or cloth to wipe sample clean
- Large vertical scratches
 - » Clean sample and sample holder, prolong or repeat IOTA step



OK Etched Sample

20x micrograph of tempered steel etched with Nital 3%

- Very fine bainitic microstructure of medium hard steel
- Optimized etching time and etchant concentration for your analysis requirements



Notes: