PREPARATION METHOD

QUALITY ASSURED

Titanium based alloys

Recommended machines and additional consumables (not included)

CUTTING

Equipment
ATM Brillant

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

MOUNTING

Equipment
ATM Opal

Consumables
Hot mounting: EPO black, EPO-Max,
Cold mounting: KEM 20, 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	25	Until plane
Grinding	SiC-paper/foil P600 (400)	H_2O	250-300	►► Synchronous Rotation	25	1:30
Pre-polishing	ALPHA / BETA	Dia-Complete Poly, 9 µm	120-150	◄► Counter Rotation	30	5:00
Final polishing	OMEGA	Eposil F, 0.1 µm**	120-150	◄► Counter Rotation	40	8:00–10:00*** (H_2O during final 0:30)
Optional: Etching (chem.)	Kroll´s reagent*					Approx. 0:45–0:55

* ATM Item No. 92004492
** Eposil F has to be mixed with hydrogen peroxide (35%) in a ratio of 5:1 (safety advice: use personal protective equipment)
*** Depends on the alloy

BEGINNERS GUIDE

Notes:

CUTTING

- Use suitable cut-off wheels for titanium (e.g. ATM Ti-A wheels)
- Constant cutting speed max. 0.25 mm/s

MOUNTING

- Use mounting material with high edge retention
- Cold or hot mounting possible

GRINDING

- Start grinding with SiC paper/foil P320 (280)
- Continue with P600
- Thoroughly wash samples and holder under running water after each grinding step

POLISHING

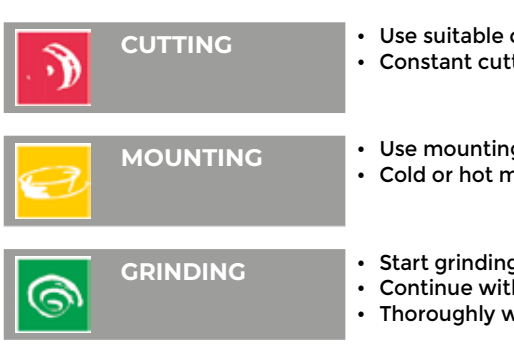
- Rinse the polishing discs with water and spin dry after use
- Do not stack discs with different diamond sizes
- Clean samples, holders and hands under running water before each polishing step
- Use ethanol and blow dryer to avoid water stains
- Check after each step under the microscope if polishing marks are of equal size and randomly oriented
- Rinse the OMEGA disc with water and spin dry after use
- Use the consumables only for titanium based alloys and not for other materials
- Rinse the cap of the Eposil F bottle after use, put cap back on

SAMPLE MICROGRAPHS

OK Sample polished

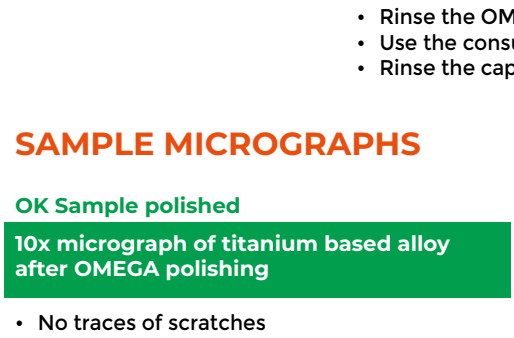
10x micrograph of titanium based alloy after OMEGA polishing

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



10x micrograph of titanium alloy etched with Kroll´s reagent

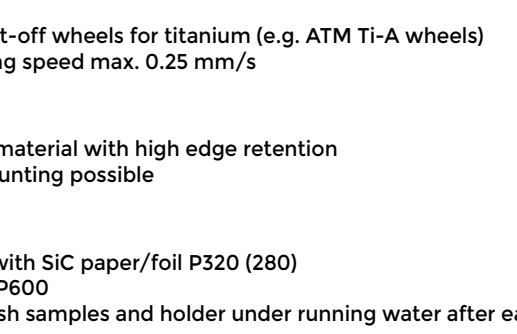
- No traces of scratches
- Clear structure



NOK Sample polished

10x micrograph of titanium based alloy after OMEGA polishing

- Pollution marks after final polishing with OMEGA
  - » Use cosmetic tissues to clean the sample
  - » Clean polishing disc OMEGA with clean brush under running water
  - » Clean sample and sample holder
  - » Repeat OMEGA step



Notes: