

Aluminium ($\geq 99,7\%$) and wrought aluminium alloy

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 15 plus, KEM 20, KEM 30 Hot or cold mounting
GRINDING/ POLISHING	Sample size \varnothing 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 ₂ O	250-300	▶▶ Synchronous Rotation	20	Until plane
Grinding	SiC-paper/foil* P600 (400)	H ₂ O	250-300	▶▶ Synchronous Rotation	20	1:00
Grinding	SiC-paper/foil* P1200 (600)	H ₂ O	250-300	▶▶ Synchronous Rotation	20	1:30 (change SiC-paper/foil after 0:60)
Polishing	GAMMA	Dia-Complete Poly, 3 μ m	120-150	▶▶ Synchronous Rotation	30	6:00
Final polishing	OMEGA	Eposil F 0.1 μ m	120-150	◀◀ Counter Rotation	20	2:00 (H ₂ O during final 0:30)
Optional: Etching (electrolyt.)	Barker 's reagent**					30 V

BEGINNERS GUIDE

CUTTING	<ul style="list-style-type: none"> Use suitable cut-off wheels for non-ferrous material (e.g. ATM NF-A wheels) Constant cutting speed max. 0.25 mm/s
MOUNTING	<ul style="list-style-type: none"> Use mounting material with high edge retention Cold or hot mounting both possible
GRINDING	<ul style="list-style-type: none"> Grind with SiC-paper/foil P320 (280) Continue with P600 and P1200 (change SiC-paper/foil after 60 sec.) Thoroughly wash samples and holder under running water after each grinding step
POLISHING	<ul style="list-style-type: none"> 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 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 aluminium and wrought aluminium alloys and not for other materials Rinse the cap of the Eposil F bottle after use, put cap back on

Notes:

SAMPLE MICROGRAPHS

OK Sample polished

20x micrograph of wrought aluminium alloy after OMEGA polishing

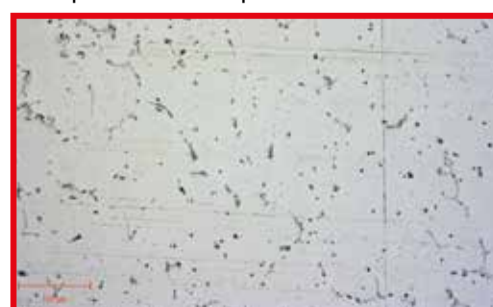
- No traces of scratches
- Clear structure/contour of the different phases



NOK Sample polished

10x micrograph of wrought aluminium alloy after OMEGA polishing

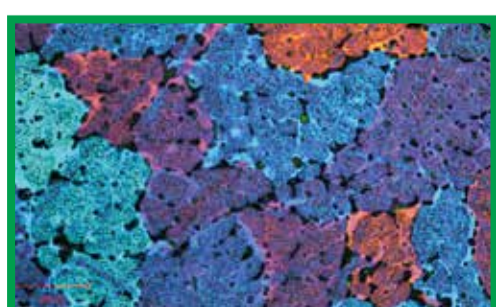
- Sparse scratches from 0.1 μ m Eposil F after OMEGA
 - » Clean all polishing discs with clean brush under running water
 - » Clean sample and sample holder
 - » Repeat OMEGA step



OK Sample etched

10x micrograph of wrought aluminium etched with Barker 's reagent

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



Notes: