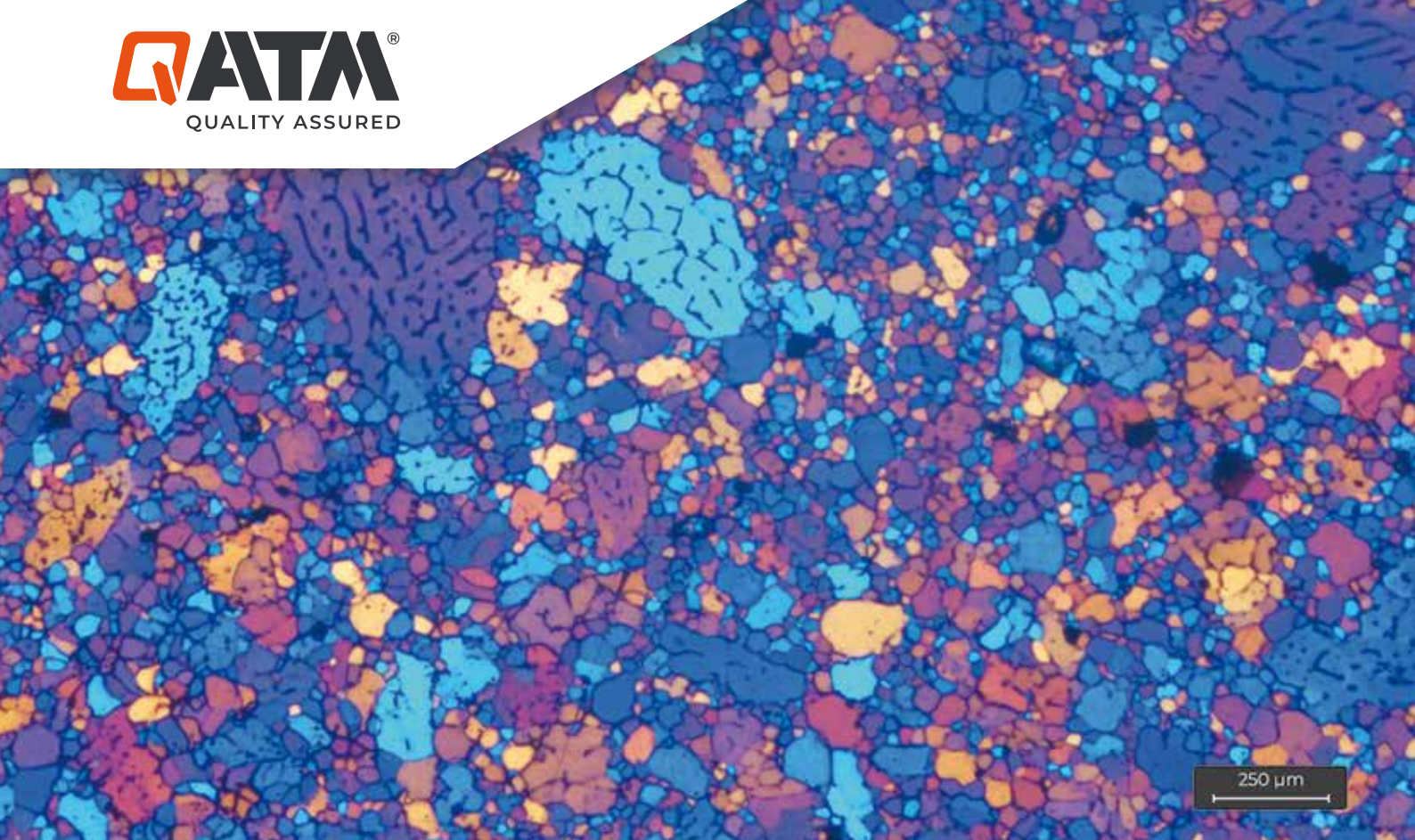




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PREPARATION METHOD CAST ALUMINUM ALLOY

Objective:

The sample (cast Aluminum alloy) should be prepared to visualize the dendritic structure and phase distribution. The preparation should include the following steps: Cutting, mounting (cold mounting), grinding, polishing and electrolytic etching with Qetch 1000. Barker etching should be carried out to visualize the dendritic structure and phase distribution.

CUTTING

Device	Qcut 250 A	
Cut-off disc	NF-A-250SC	Item no.: 95012531
Coolant and anti-corrosion agent	Coolant and anti-corrosion agent, standard	Item no.: 95004146
Clamping tool	Qtool 80	
Cutting method	Automatic horizontal cutting (with X-axis)	
Parameter	Feeding speed	0.1 mm/s
	Pulse setting	Without pulse
	Rotational speed of cut-off disc	Constant rotational speed
		3015 rpm by 50Hz and 3100 rpm by 60Hz



Cut-off machine Qcut 250 A



Cold mounting material KEM 30

MOUNTING

Mounting Material	KEM 30
Mixing ratio	Powder : liquid 2 : 1
Hardening time	approx. 15 min.
Mounting mold	PP, Ø 40 mm
Accessories	- Mixing bowl - Stirring rod - Dosing spoon
Note	the sample should only be mounted to the extent that the back of the sample remains free. This allows the sample to be contacted directly during electrolytic etching.

GRINDING/POLISHING

Device	Qpol 300 AI Eco+
Sample holder	Item no.: Z5446025
Pressure	Single pressure



Automatic grinding and polishing machine Qpol 300 AI Eco+

STEP	MEDIUM		 rpm		 Single Pressure N	 min
 Pre-grinding	SiC-paper P320 + Quick-Tap	H ₂ O	SH = 100 WP = 200	►► Synchronous Rotation	20	Until plane
 Grinding	SiC-paper P600 + Quick-Tap	H ₂ O	SH = 100 WP = 200	►► Synchronous Rotation	20	0:45
 Grinding	SiC-paper P1200 + Quick-Tap	H ₂ O	SH = 100 WP = 200	◄◄ Counter Rotation	20	0:45
 Polishing	SIGMA	Dia-Complete Poly, 3 µm	SH = 100 WP = 150	►► Synchronous Rotation	30	4:00-5:00
 Final polishing	OMEGA	Eposil F 0.1 µm	SH = 75 WP = 90	◄◄ Counter Rotation	20	2:00 (H ₂ O during final 0:10)

Note

- SH = Rotational speed of sample holder
- WP = Rotational speed of working plate
- Pre-dosing for 3 µm und 0.1 µm = 3 s
- Dosing interval and dosing time of 3 µm = every 45 s for 2 s
- Dosing interval and dosing time of 0.1 µm = every 20 s for 1 s



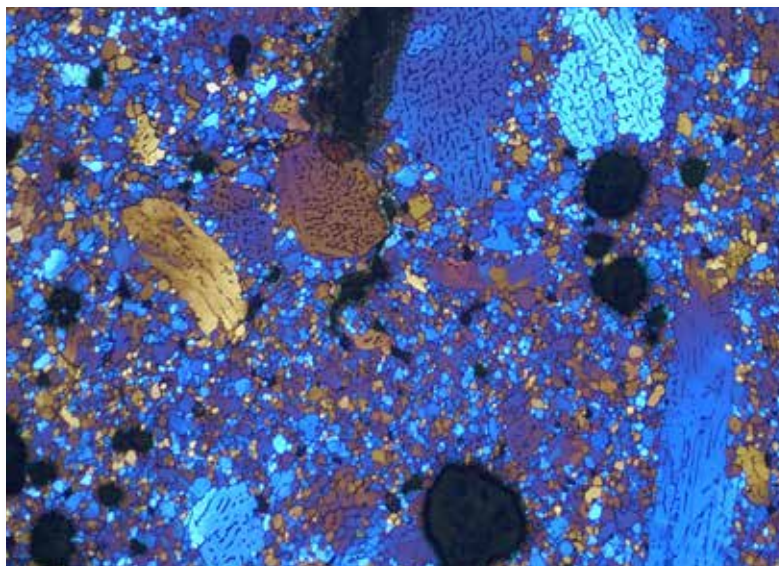
Automatic, electrolytic polishing
and etching device Qetch 1000

ELECTROLYTIC ETCHING

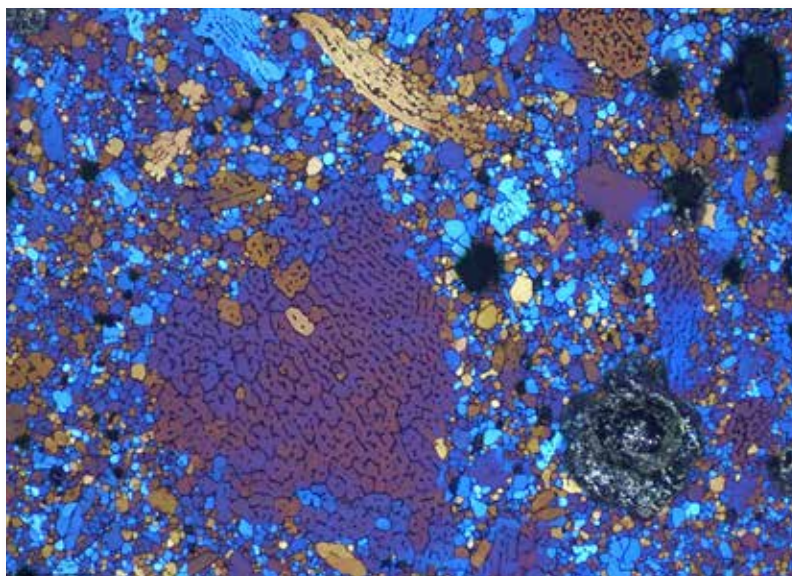
Device	Qetch 1000
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STEP	ELECTROLYTE	VOLTAGE [V]	PUMP POWER [%]	MASK [cm ²]	 min
 Etching (electrolytic)	BARKER etchant	15-20	60-65	5	1 - 1:30

The microstructure from the core region
after etching with Barker - 25 x



Further image of the microstructure from the
core region after etching with Barker - 25 x



Find out more at
www.qatm.com