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THE PRECIPITATES IN AN AlMgSi CASTING ALLOY

Objective:

The aim of the Investigation was to determine a suited cutting, mounting, polishing and etching method for the received sample consisting of an Al 6000 casting alloy.

The customer wanted to inspect the precipitates in the microstructure to supervise the casting method and parameters.



The received sample

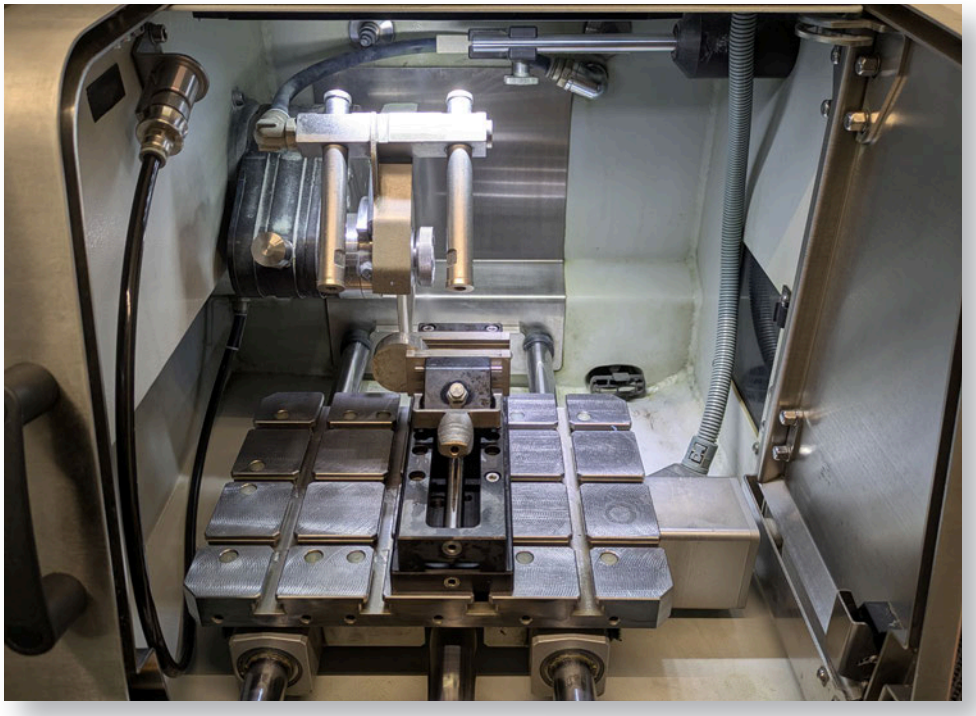
CUTTING



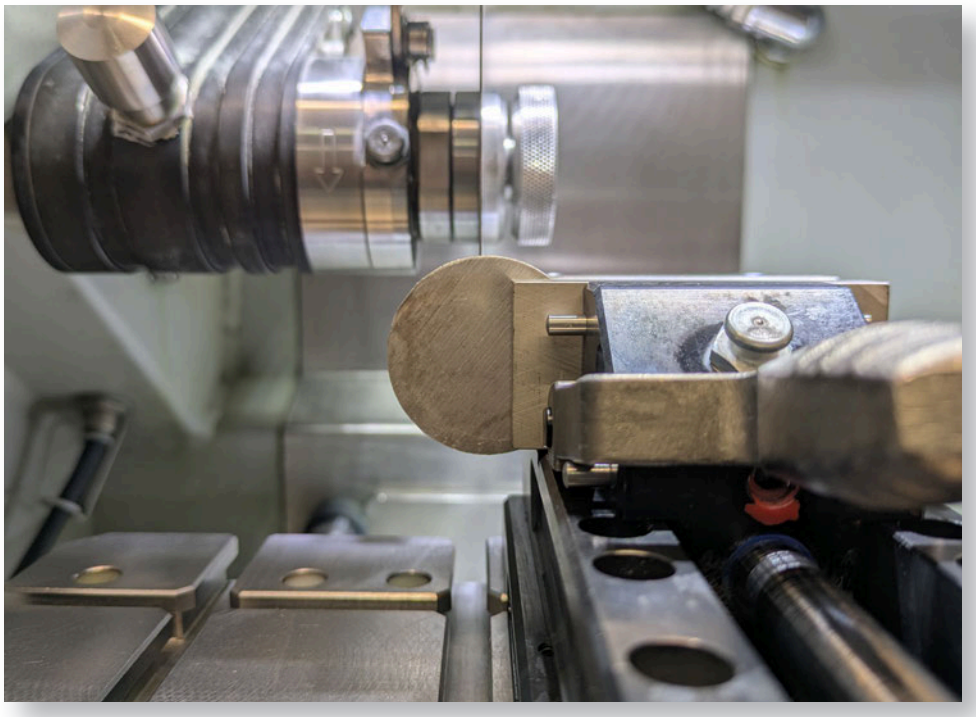
Precision cut-off machine
Qcut 200 A

Device	Qcut 200 A	
Cut-off wheel	SiC cut-off wheel	
Coolant and anti-corrosion agent	QATM Standard	
Clamping tool	- Qtool 60 - Easy clamping plate M	
Cutting method	Automatic horizontal cutting (X-axis)	
Parameter	- Feeding speed	0.2 - 0.3 mm/s
	- Pulse setting	Without pulse
	- Rotational speed of cut-off wheel	4000 rpm
Notes		

Clamping overview of the sample



Clamping overview of the sample



Clamping overview of the sample



The cut sample



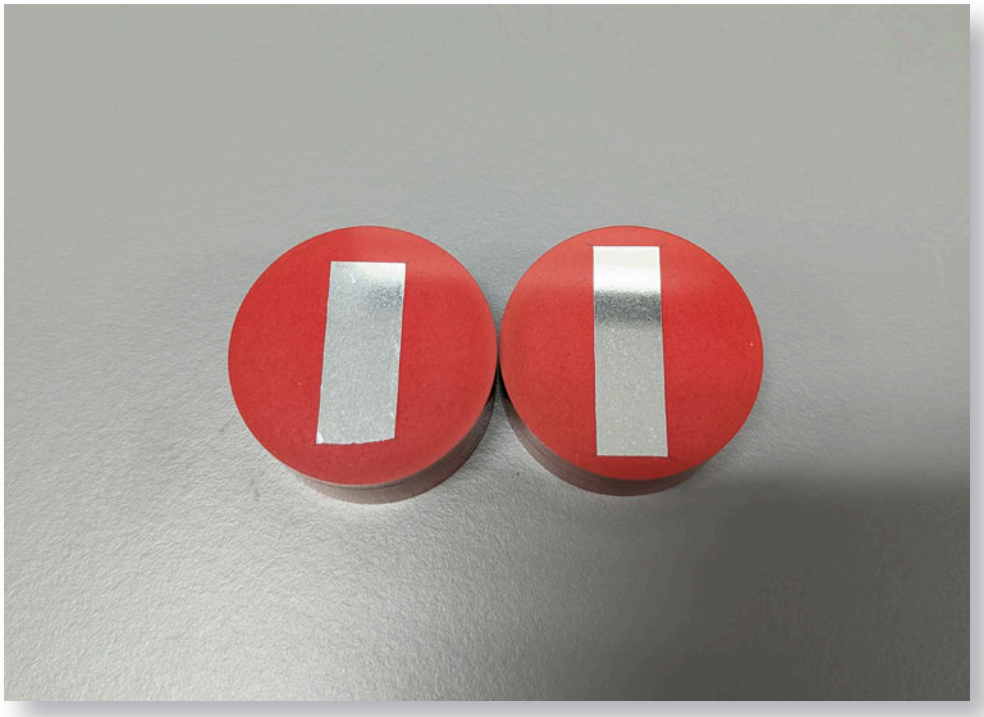
HOT MOUNTING



Hot mounting press Qpress 40

Device	Qpress 40
Mounting material	BAKELIT RED
Heating time	4:00 min
Temperature	180 °C
Pressure	250 bar
Cooling time	3:30 min
Accessories	-
Heat set up	100%
Pressure mode	1-step mode
Cooling set up	100%
Mould assembly	Ø 40 mm

The mounted samples





Automatic grinding and polishing machine Qpol PRO

GRINDING/POLISHING

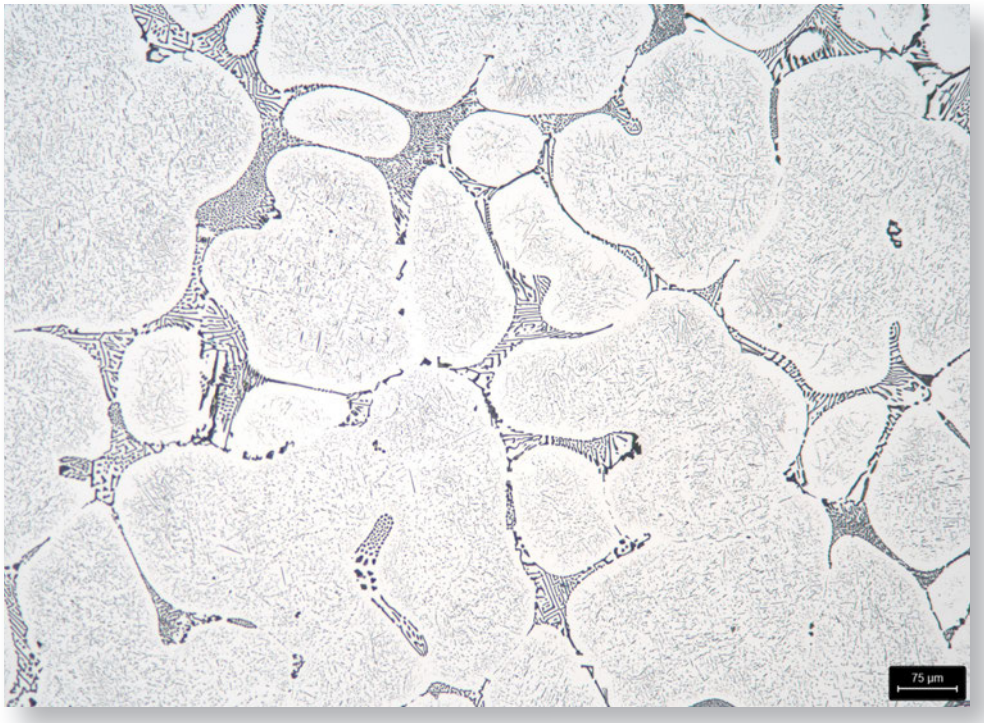
Device	Qpol PRO	
Sample holder	6 x Ø 40 mm	Item no.: Z5446025
Pressure	Single pressure	

STEP	MEDIUM		rpm	rpm	Single-pressure N	min
Grinding	SiC-Paper P320 self-adhesive + X-TAP	H_2O	200	120 ►► **Synchronous Rotation**	25	1:00
Grinding	SiC-Paper P600 self-adhesive + X-TAP	H_2O	200	120 ►► **Synchronous Rotation**	25	1:00
Grinding	SiC-Paper P1200 self-adhesive + X-TAP	H_2O	200	120 ►► **Synchronous Rotation**	25	1:00
Pre-polishing	GAMMA	Diamond suspension Poly, 3 µm + wb. Lubricant	150	100 ►► **Synchronous Rotation**	25	5:00
Polishing	ZETA	Diamond suspension Poly, 1 µm + wb. Lubricant	150	120 ►► **Synchronous Rotation**	22	2:30
Fine polishing	OMEGA	EPOSIL F 0,1 µm	90	75 ►► **Synchronous Rotation**	20	3:00 (Rinsing time: 30 s)
Etching (chem.)	Sodium Hydoxide (7.5%) or Etchant Kroll					4:00 0:05

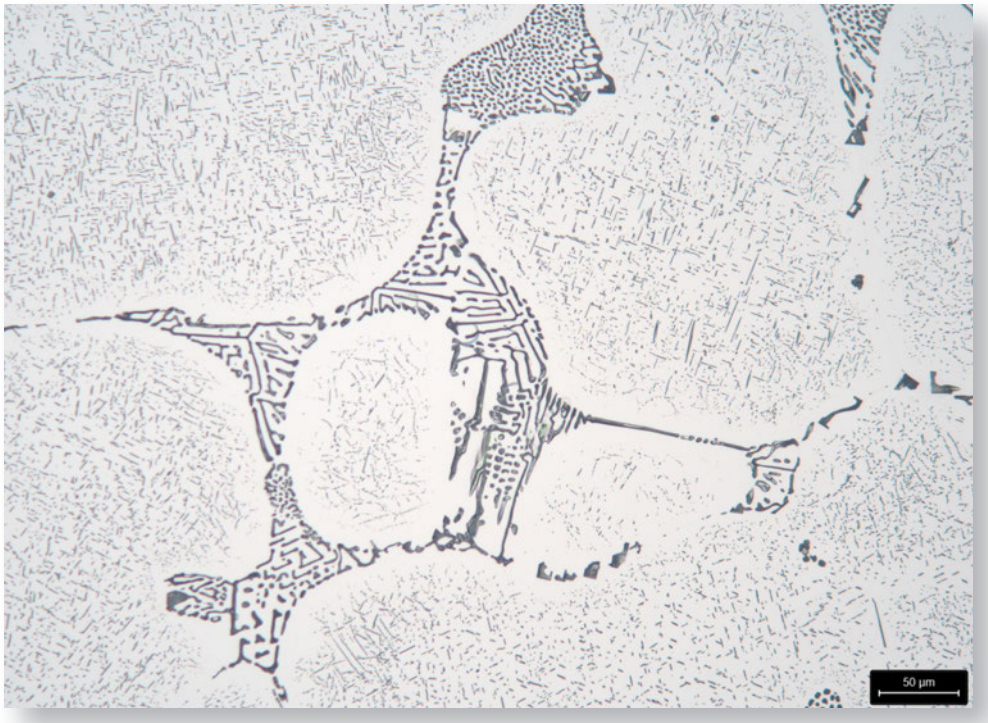
Notes

- Pre-dosing for 3 µm and 1 µm: 3 s
  Dosing interval and dosing duration for diamond suspension 3 µm, 1 µm: Every 40 s for 1,3 s
- Dosing interval and dosing duration for lubricant: Every 60 s for 1,3 s
- Dosing interval and Dosing duration for fine polishing suspension: by hand every 20 s for 1 s

Microstructure of the sample after etching with Kroll etchant - 100:1



Microstructure of the sample after etching with Kroll etchant - 200:1



OUR PRODUCT OF THE MONTH

QPREP FINE POLISHING SUSPENSIONS

- Highest surface qualities
- Removal of all deformation with vibration polishing
- Polishing/removing scratches in the range of 0.1 µm to 0.05 µm



Find out more at
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