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ADDITIVE MANUFACTURED COPPER ALLOY

Objective:

The additive-manufactured copper sample was prepared metallographically, and the pores and microstructure were analyzed under an optical microscope. The samples were cut (Qcut 200 A), mounted (Qpox 90 + infiltration device), ground and polished (Qpol 300 AI Eco+). The sample was etched with the etchant Copper A. Detailed parameters and images can be found in the following application laboratory report.

CUTTING

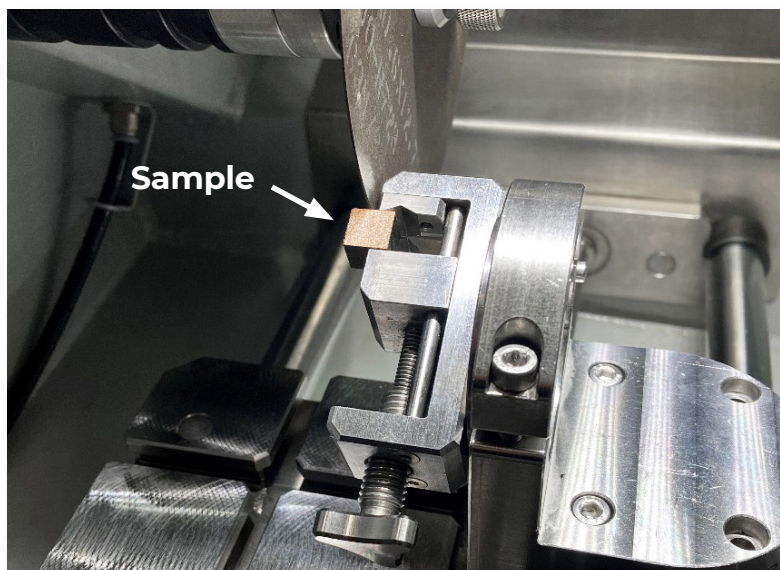


Precision cut-off machine
Qcut 200 A

Device	Qcut 200 A	
Cut-off disc	SiC-cut-off disc	Item no.: 92004998
Coolant and anti-corrosion agent	ATM Cool Cut	Item no.: 95004145
Clamping tool	- Easy adaption vertical	Item no.: Z2236033
	- Mini-Vice L	Item no.: Z1870054
	- Easy-clamping plate S	Item no.: Z2236030
Cutting method	Automatic horizontal cutting (X-axis)	
Parameter	- Feed speed	0.1 mm/s
	- Pulse parameter	without pulse
	- Cut-off disc rotational speed	3000 rpm

Note

Clamping the sample in the QCUT 200 A



COLD MOUNTING



Cold mounting material Qpox 90

Mounting Material	Qpox 90	
Mixing ratio	2 : 1 (Resin : Hardener), gravimetric	
Curing time	16-20 h	
Mounting mould	PE mould, Ø 40 mm	Item no.: 95017039
Accessories	- Mixing cup	Item no.: 92001715
	- Mixing sticks	Item no.: 92001717
	- Infiltration device	Item no.: M6500001
	- Scale	
Notes		



Infiltration device



The mounted sample



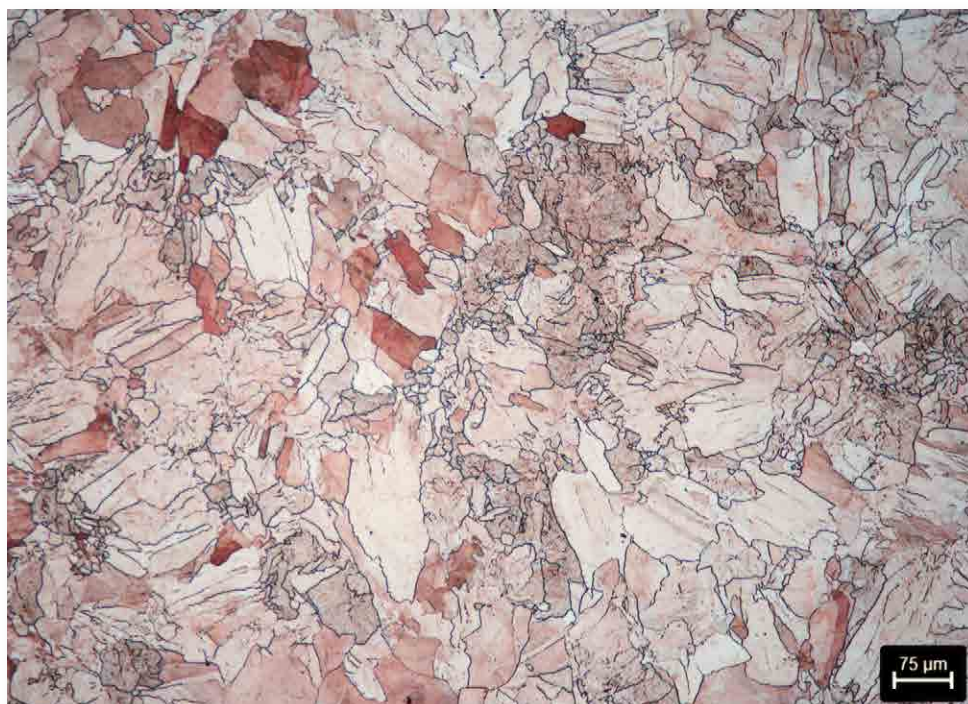
Automatic grinding and polishing machine Qpol 300 A1 Eco+

GRINDING/POLISHING

Device	Qpol 300 A1 Eco+	
Sample holder	6 x Ø 40 mm	Item no.: Z5446025
Pressure	Single pressure	

STEP	MEDIUM		 rpm	 rpm	 Single pressure N	 min
 Pre-Grinding	SiC-Paper P320 + Quick-Tap	H ₂ O	200	120 ◄► Counter Rotation	20	Until plane (1:00)
 Grinding	SiC-Paper P1200 + Quick-Tap	H ₂ O	200	120 ►► Synchronous Rotation	25	1:00
 Polishing	SIGMA	Diamond suspension Poly, 3 µm + alc. lubricant	150	120 ►► Synchronous Rotation	30	5:00
 Polishing	ZETA	Diamond suspension Poly, 1 µm + alc. lubricant	150	120 ►► Synchronous Rotation	25	4:00
 Final polishing	OMEGA	Eposil F 0.1 µm + H ₂ O ₂	100	80 ◄► Counter Rotation	25	4:00 (H ₂ O last 0:30)
 Etching (chem.)	Etchant Copper A	-	-	-	-	0:03
Notes	- Pre-dosing for diamond suspension 3 µm und 1 µm: 2 s - Dosing interval and dosing duration for diamond suspension 3 µm und 1 µm: Each 30 s for 1.3 s - Dosing interval and dosing duration for alc. lubricant: Each 60 s for 1.3 s - Dosing interval for final polishing suspension: Each 20 s for 1.3 s					

Copper sample after etching with etchant Copper A - 100x



Copper sample
after etching with etchant Copper A - 100x

