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ADDITIVE-MANUFACTURED CR-CONTAINING STEEL

Objective:

The pores and microstructure of the additively manufactured sample should be analyzed. The samples were cut (Qcut 200 A), mounted (Qpress 50) and ground / polished (Qpol 300 AI Eco+) and consequently, were etched with 3% alcoholic nitric acid. Detailed parameters and images can be found in the following application laboratory report.

CUTTING



Cut-off machine Qcut 200 A

Device	Qcut 200 A	
Cut-off disc	Al ₂ O ₃ cut-off disc	Item no.: 92002770
Coolant and anti-corrosion agent	ATM Cool Cut	Item no.: 95004145
Clamping tool	- Adaption vertical	Item no.: Z2236033
	- Mini-Vice L	Item no.: Z1870054
	- Easy-clamping plate S	Item no.: Z2236030
Cutting method	Horizontal cut (X-axis)	
Parameter	- Feeding speed	0.1 mm/s
	- Pulse setting	Without pulse
	- Rotational speed of cut-off disc	3000 rpm

Note

Cutting and clamping the sample
in Qcut 200 A



Hot mounting material EPO BLACK



Hot mounting press Qpress 50

HOT MOUNTING

Device	Qpress 50	
Mounting material	EPO BLACK	Item no.: 95011990
Heating time	6:30 min	
Temperature	180 °C	
Pressure	250 bar	
Cooling time	4:00 min	
Accessories	BAKELIT BLACK (for filling)	
Heat set up	100%	
Pressure mode	Pressure from beginning	
Cooling set up	100%	
Note		



The mounted sample



Automatic grinding and polishing machine Qpol 300 A1 Eco+

GRINDING/POLISHING

Device	Qpol 300 A1 Eco+	
Sample holder	6 x 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 ►► Synchronous Rotation	30	Until plane (ca. 1:00)
 Grinding	SiC-paper P1200 + Quick-Tap	H ₂ O	200	120 ►► Synchronous Rotation	30	0:45
 Pre-polishing	GAMMA	Dia-Complete Poly, 3 µm	150	120 ►► Synchronous Rotation	30	6:00
 Final polishing	OMEGA	Eposil F 0.1 µm	100	80 ◄◄ Counter Rotation	20	2:30 (Rinsing time: 15 s)
 Etching (chem.)	Etchant 3% alcoholic Nitric acid	-	-	-	-	0:05
Note	- Pre-dosing duration for 3 µm: 3 s - Dosing interval and dosing duration for Dia. Complete 3µm: Every 30 s for 1,3 s - Dosing interval and dosing duration for final polishing suspension: Every 15 s for 1,3 s					

MICROSTRUCTURES

Etched sample - 25x



Etched sample - 100x



Etched sample - 100x



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