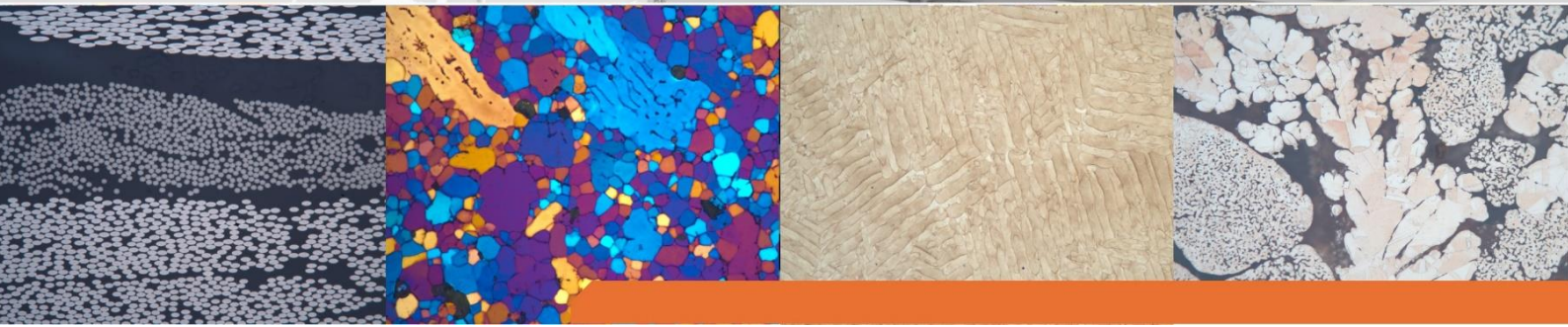


Application lab. report

Preparation of gold coated tungsten carbide



QATM-Preparation method

Objective:

The aim of the investigation is to determine a suitable preparation method for the received samples (Figure 1). All cuts were made with the Qcut 200 A. Further preparation was carried out with OPAL 410 and SAPHIR 550. Detailed parameters and pictures can be found in the following report. We received samples of gold coated tungsten carbide.

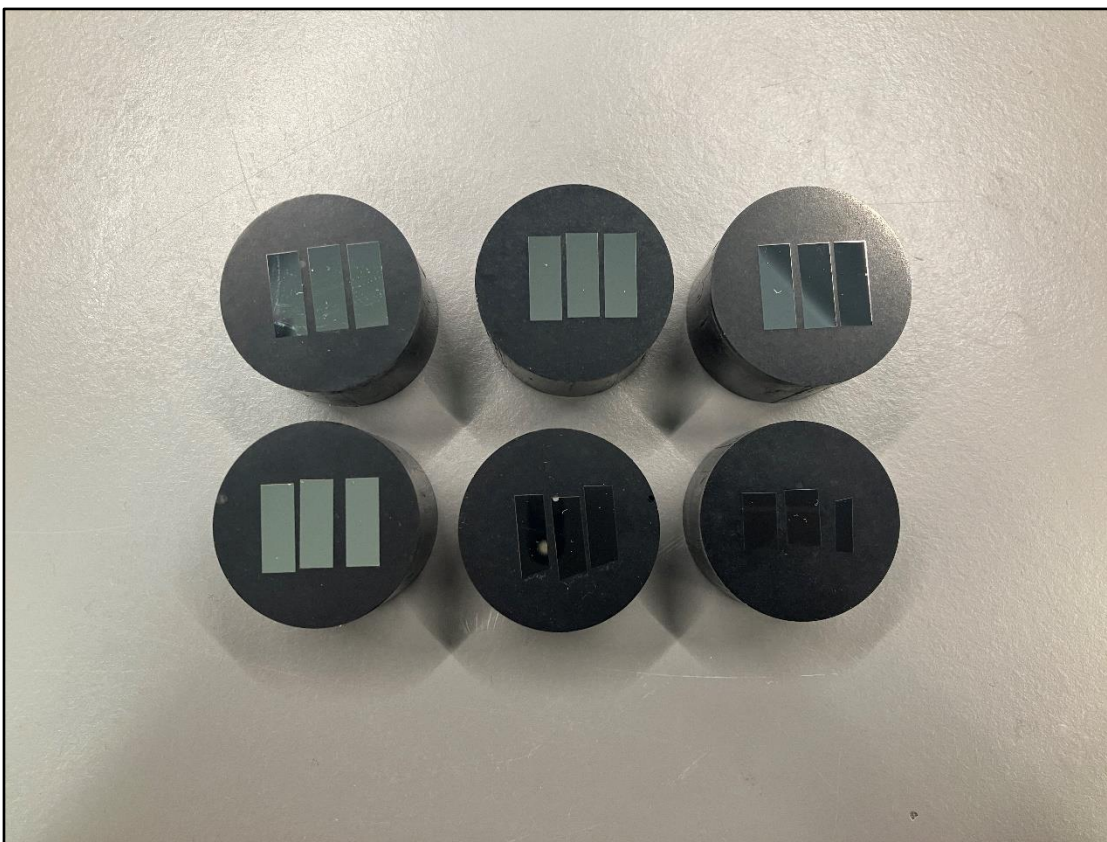


Figure 1: As-received samples.

QATM-Preparation method

Cutting

 Cutting			
Device	Cut-off disc	Anti-corrosion coolant	Clamping tool
Qcut 200 A	Diamond cut-off wheel, resin bonded (95008773)	QATM – Standard (95014282)	-Qtool 40 (Z22370200) -Easy-clamping base S (Z2236030)
Cutting method			
Horizontal cut (X-axis)			
Parameters			
Feed speed	Pulse parameter	Cut-off disc rotational speed	
0,06 mm/s	Without pulse	2500 RPM	
Notes			



Figure 2: Qcut 200 A.

QATM-Preparation method

Hot mounting

 Mounting					
Device	Consumable	Heating time	Temperature	Pressure	Cooling time
OPAL 410	Epo black	4:00	185°C	320 bar	3:00
Filler or additional consumables	Heating power	Pressure mode	Cooling power	Ø 30 mm	
Bakelite black	OPAL 410	Epo black	3:00		
Notes					
- For hard samples with a layer, we recommend the EPO black embedding material.					



Figure 3: Opal 410.

QATM-Preparation method

Grinding/Polishing

Equipment	Sample holder	Pressure mode				
SAPHIR 550	Z5400081 6x 40 mm	Central				
Step	MEDIUM		 RPM		 N	 min
 Planer grinding	VEGA 125µm	H ₂ O	120	100 ▶▶	100	2:00
 Fine grinding	CONTERO H	Diamondsus. Poly, 9µm Lubricant yellow	120	100 ▶▶	120	8:00
 Polishing	GAMMA	Diamondsus. Poly, 3µm Lubricant yellow	120	100 ▶▶	100	5:00
 Polishing	GAMMA	Diamondsus. Poly, 1µm Lubricant yellow	120	100 ▶▶	90	2:00

Notes

Dosage:

CONTERO H 9µm - Diamond suspension 25sec - Lubricant 50sec

GAMMA 3µm - Diamond suspension 25sec - Lubricant 50sec

GAMMA 1µm - Diamond suspension 30sec - Lubricant 40sec

Microskop: Leica DM8000



Figure 4: Saphir 550.

QATM-Preparation method

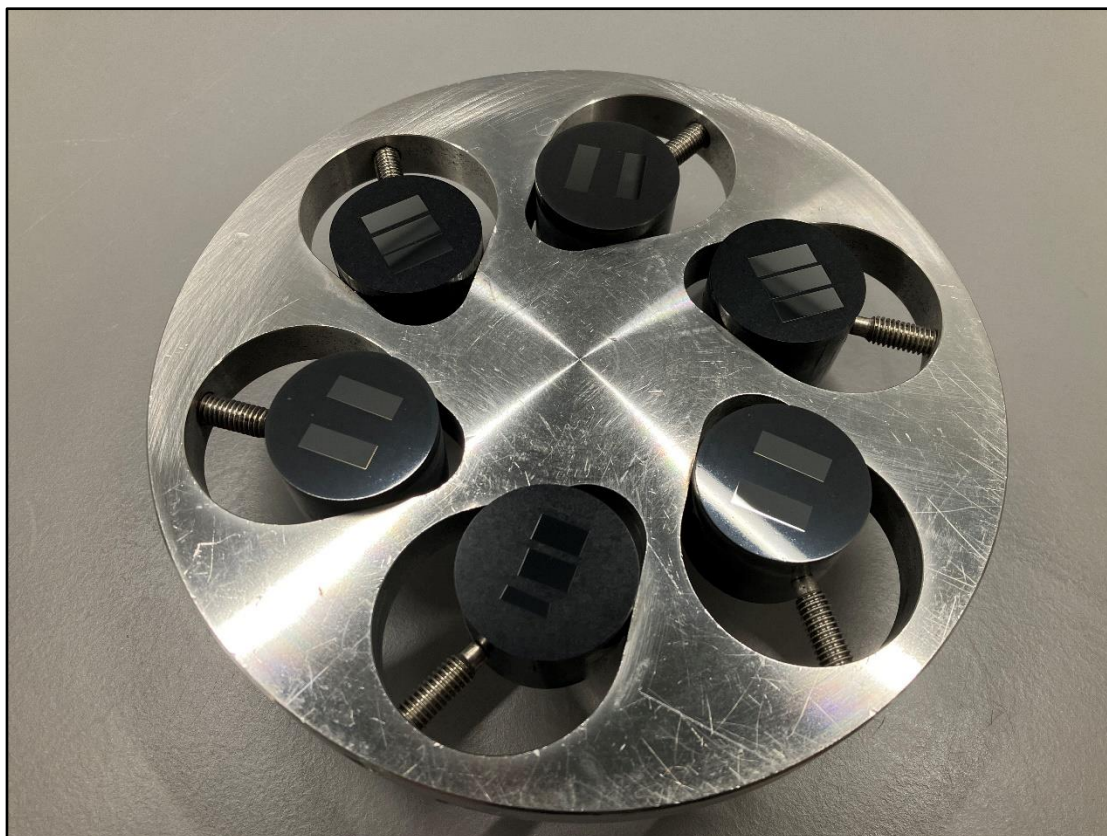


Figure 5: Samples after preparation.

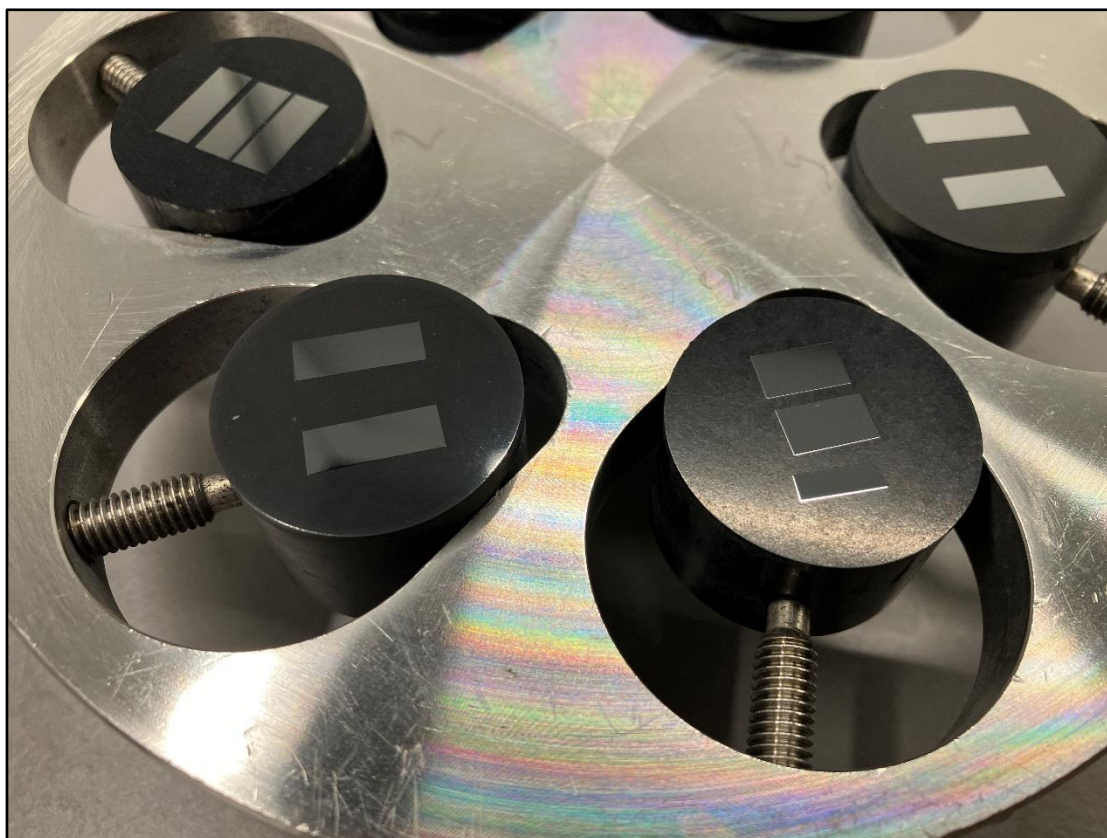


Figure 6: Detailed picture of figure 5.

QATM-Preparation method



Figure 7: Bakelite black – 200x



Figure 8: EPO black – 200x

QATM-Preparation method

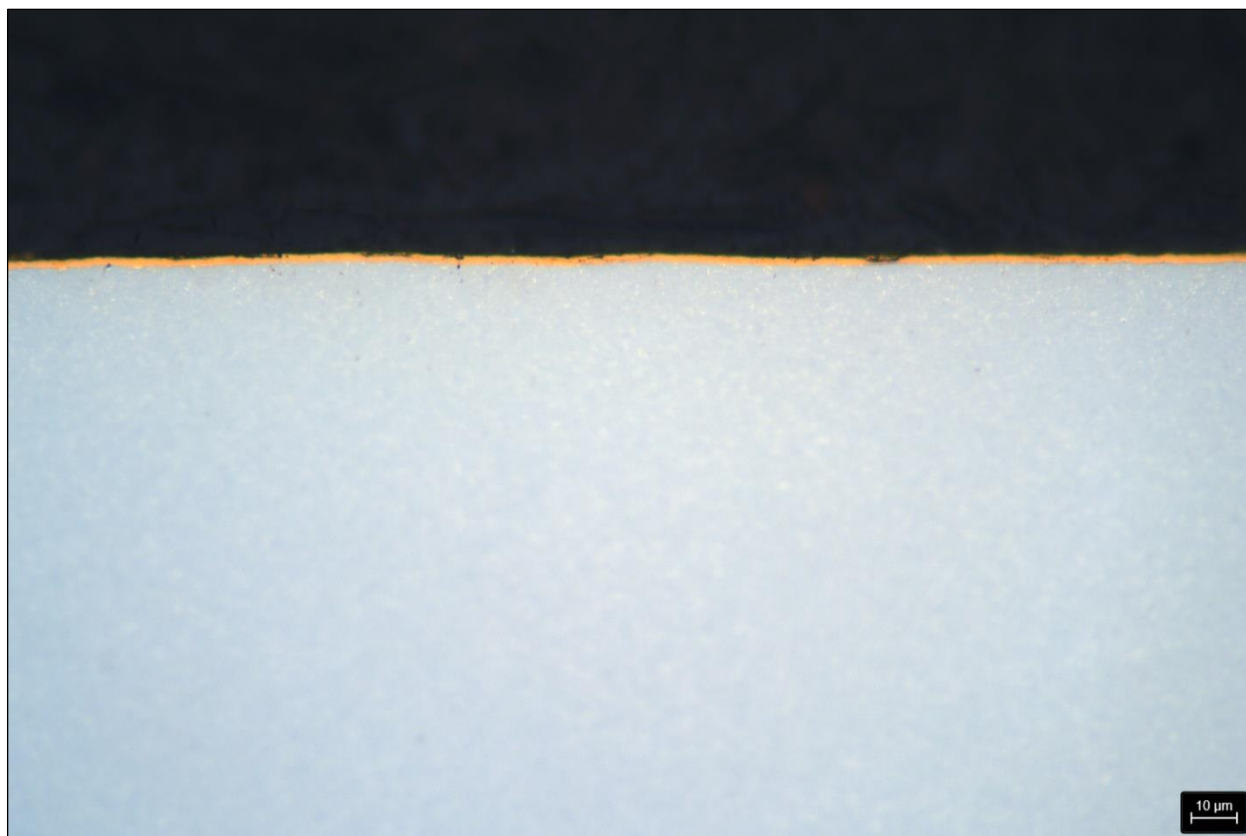


Figure 9: Bakelite black – 500x



Figure 10: EPO black – 500x

QATM-Preparation method

Evaluation

Results

Cutting:

A diamond cut-off wheel must be used for tungsten carbide.

Mounting:

It is important to mount the samples in EPO black. Otherwise, the edges of the sample will become round, and the layer cannot longer be investigated.

Grinding and Polishing:

We recommend hard grinding discs and hard polishing cloths. With hard grinding and polishing consumables, a uniform level of sample and mounting resin is guaranteed.