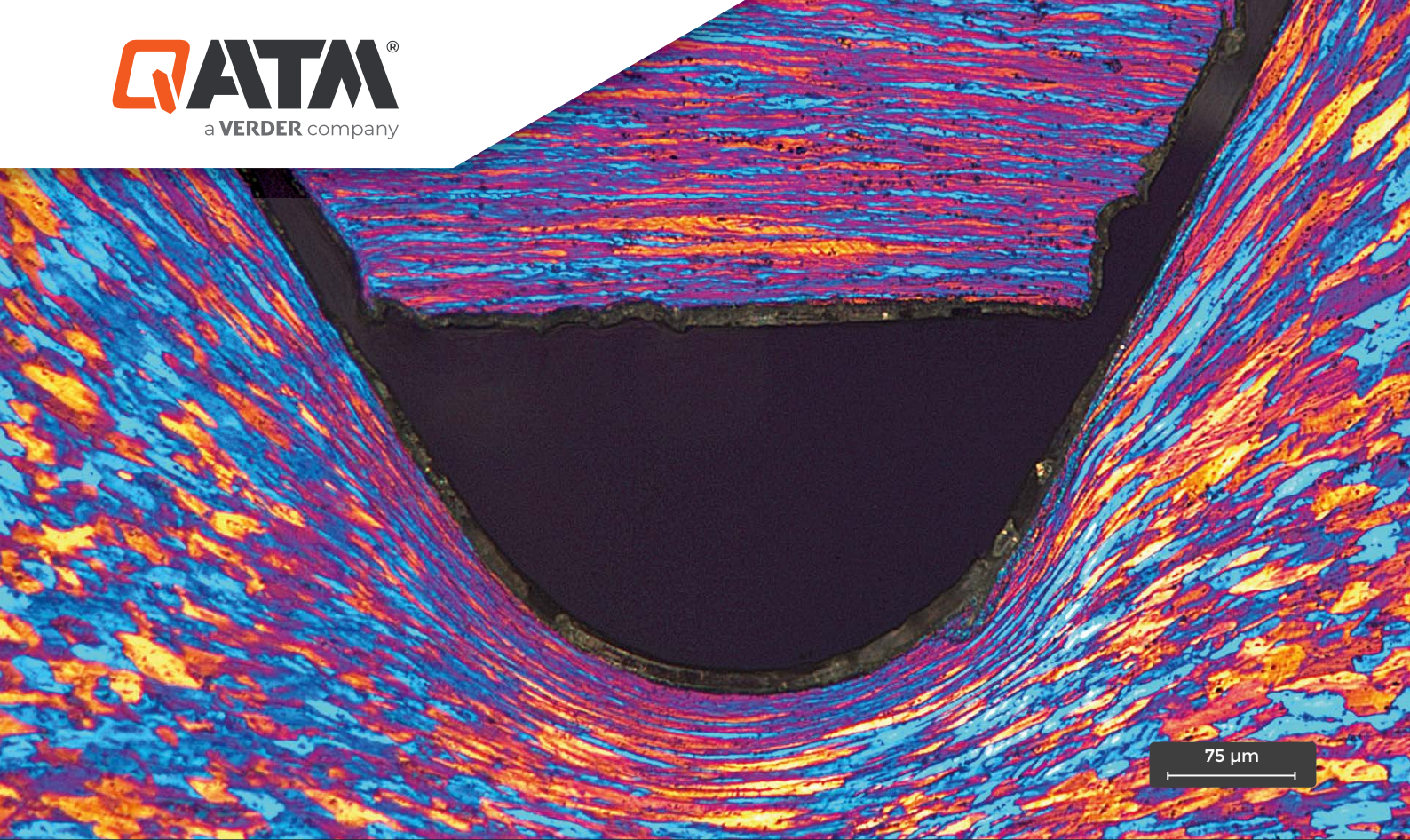




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METALLOGRAPHIC PREPARATION OF AN ALUMINUM SCREW JOINT ACCORDING TO BARKER

Objective:

This aluminum screw fitting can no longer be loosened. To determine the cause, a longitudinal section is to be cut through the entire threaded joint. For this purpose, the component was first cold-mounted, then cut along the thread axis and metallographically prepared using standardized grinding and polishing procedures.

Two etching methods were used to enhance the contrast of the microstructure: immersion etching in alcoholic Sodium hydroxide solution and electrolytic etching according to Barker.

Sample as received



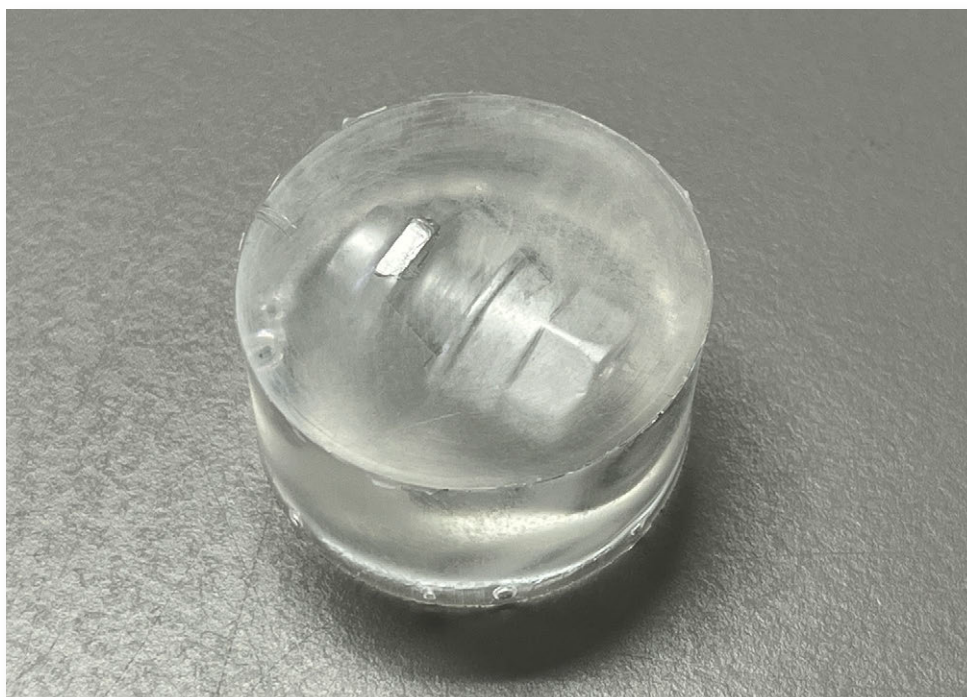


Cold mounting material Qpox 93

The mounted sample

COLD MOUNTING

Mounting Material	Qpox 93
Mixing ratio	100 : 26
Curing time	8 - 12 h
Mounting mould	Qmould Grey
Accessories	- Infiltration unit - Mixing cup - Mixing stick
Notes	



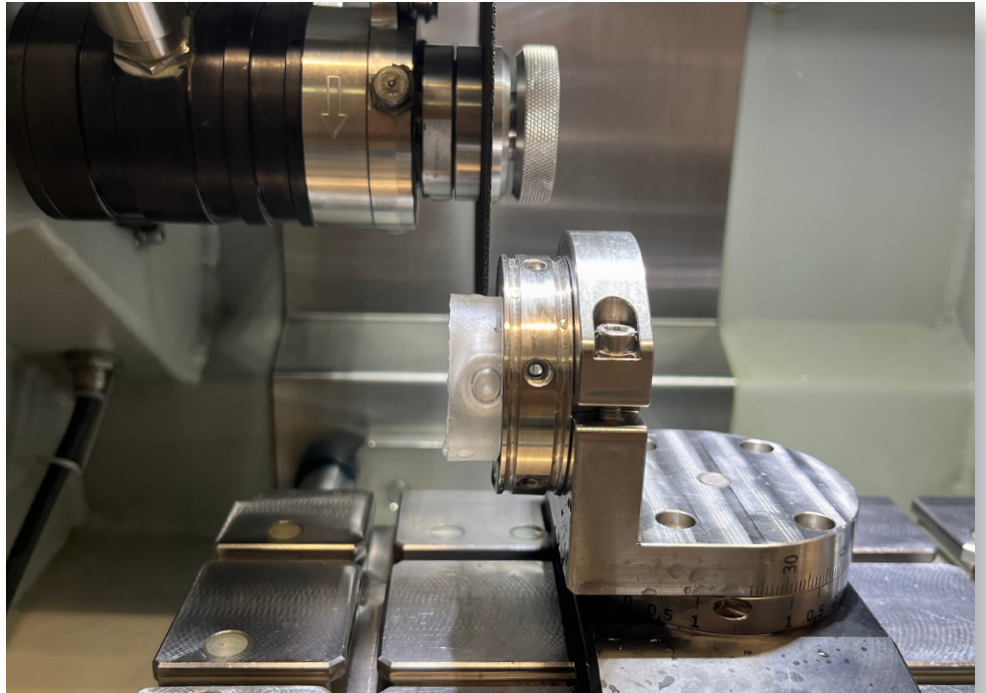
CUTTING



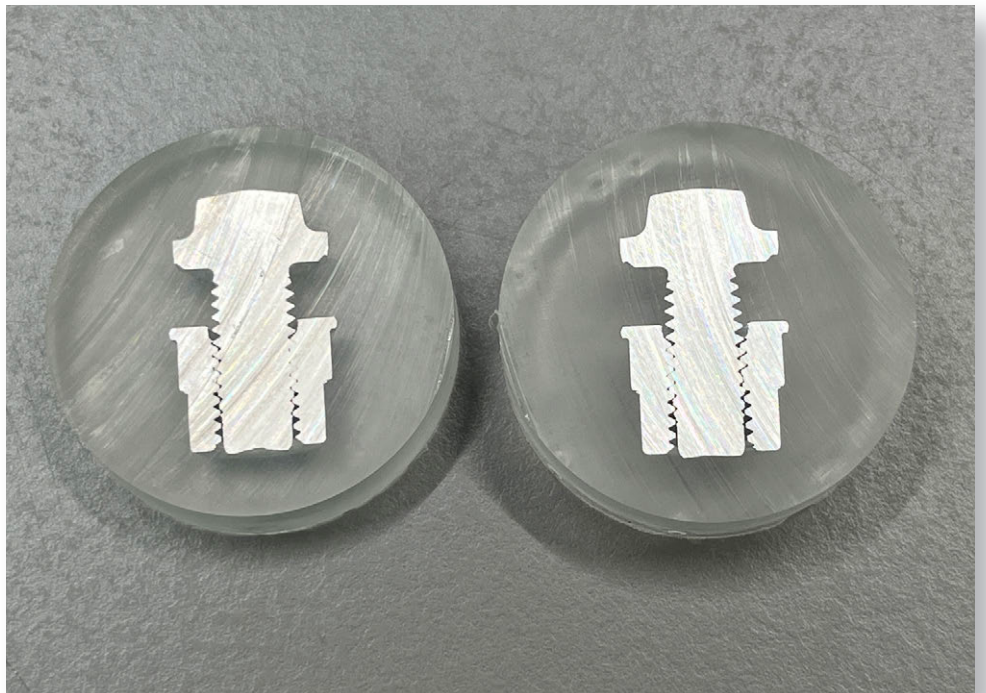
Precision cut-off machine
Qcut 200 A

Device	Qcut 200 A	
Cut-off wheel	Aluminum oxide precision cut-off wheel	
Anti-corrosion coolant	Anti-corrosion coolant, Standard	
Clamping tool	- Easy clamping plate S - Easy vertical adapter - Standard sample holder	
Cutting method	Horizontal cutting (x-axis)	
Parameters	- Feed speed - Pulse parameter - Cut-off wheel rotational speed	0.1 mm/s - 3500 rpm
Notes		

Clamping overview of the sample



The cut sample





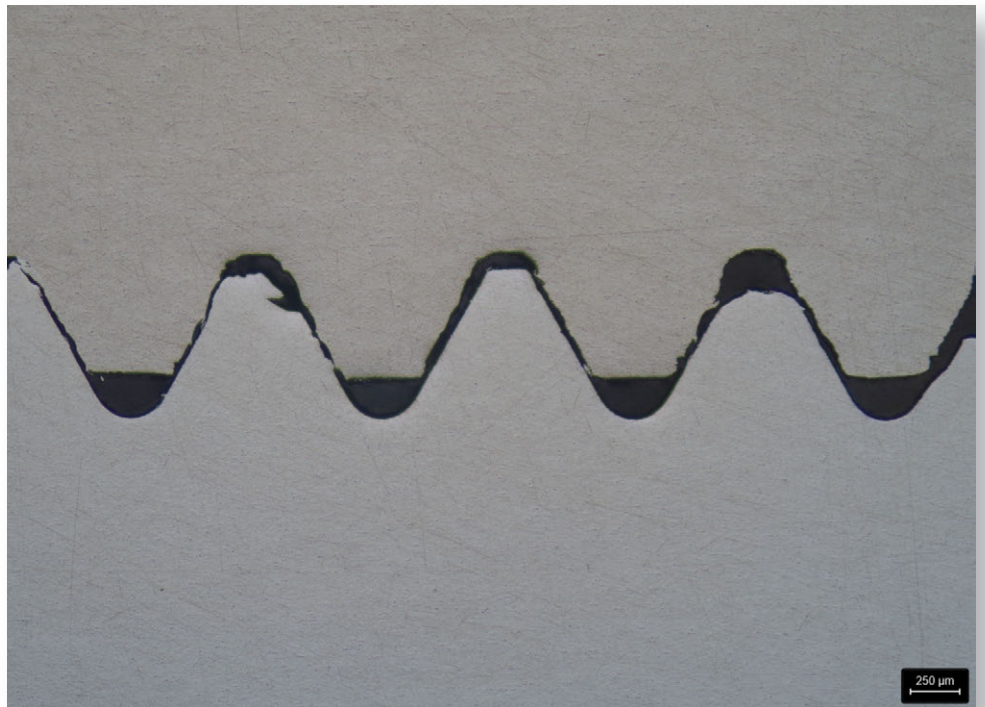
Automatic grinding and polishing machine Qpol GO 1

GRINDING/POLISHING

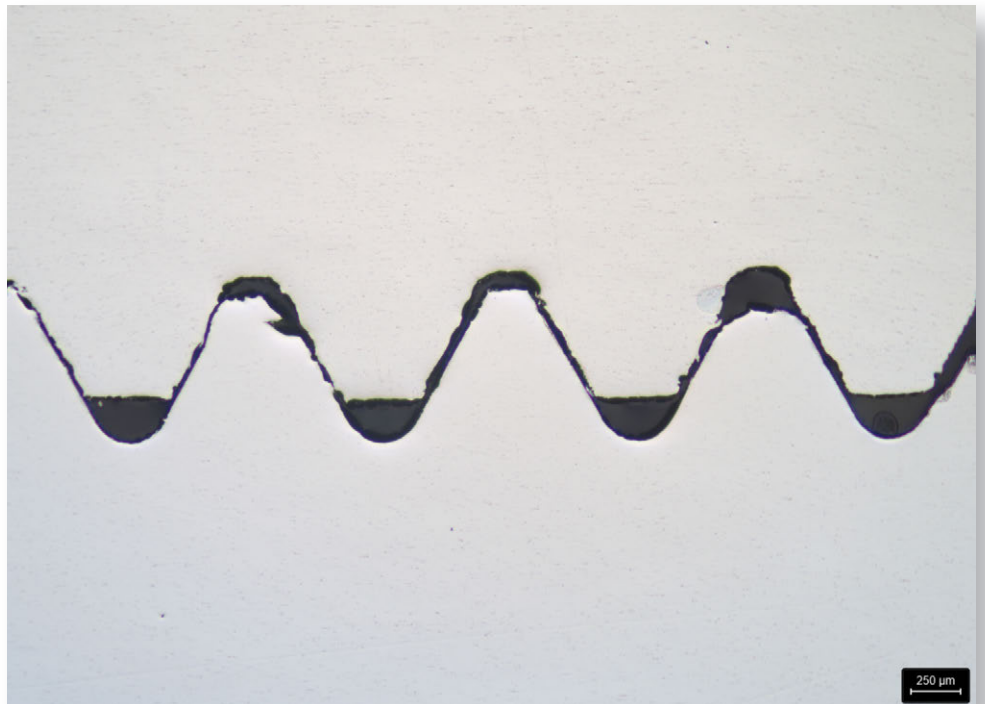
Device	Qpol GO 1	
Sample holder	6 x Ø 40 mm	Item No.: Z5445025
Pressure	Single pressure	

SCHRITT	MEDIUM		 rpm	 rpm	 Single pressure N	 min
 Planar grinding	SiC-Paper P600 + Quick-Tap	H ₂ O	200	120 ►► Synchronous Rotation	25	Bis plan 0:30
 Grinding	SiC-Paper P1200 + Quick-Tap	H ₂ O	200	120 ►► Synchronous Rotation	25	0:30
 Pre-Polishing	SIGMA	Dia-COMplete Poly, 3 µm	150	100 ◄◄ Counter Rotation	25	3:00
 Polishing	ZETA	Dia-COMplete Poly, 1 µm	150	100 ►► Synchronous Rotation	25	6:00
 Fine polishing	OMEGA	Eposil F 0.1 µm	110	90 ◄◄ Counter Rotation	20	2:00 (Rinsing time: 30 s)
 Etching (chem.)	Etchant: Sodium hydroxide solution					2:00
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 fine polishing suspension: Every 20 s for 1.3 s (manual)					

Screw-nut after 3 μm polishing - 25 : 1

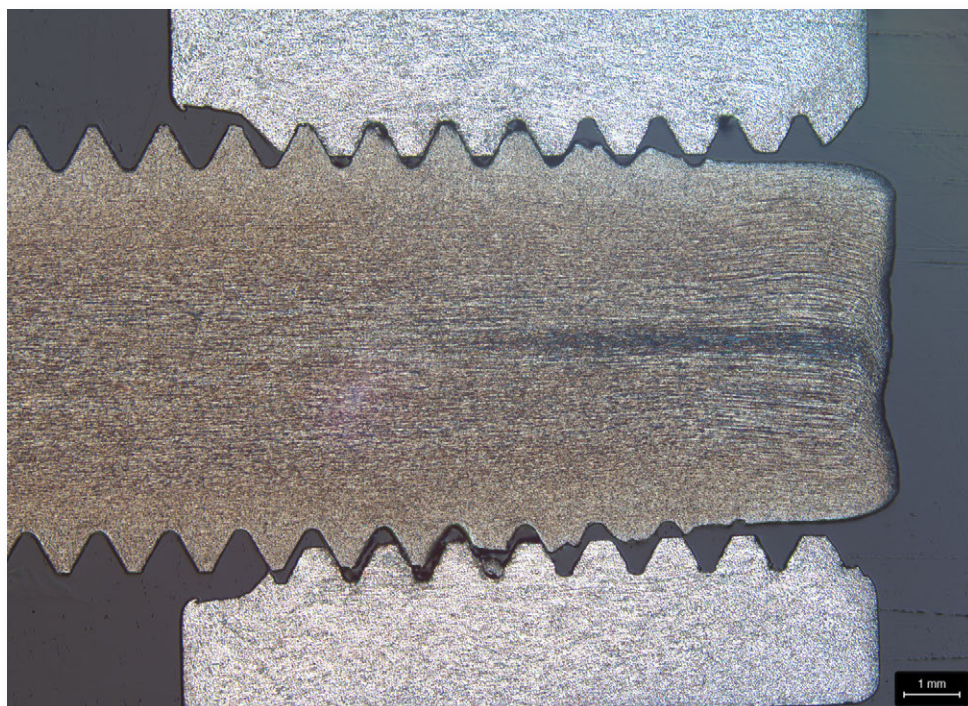


Screw-nut after fine polishing - 25 : 1

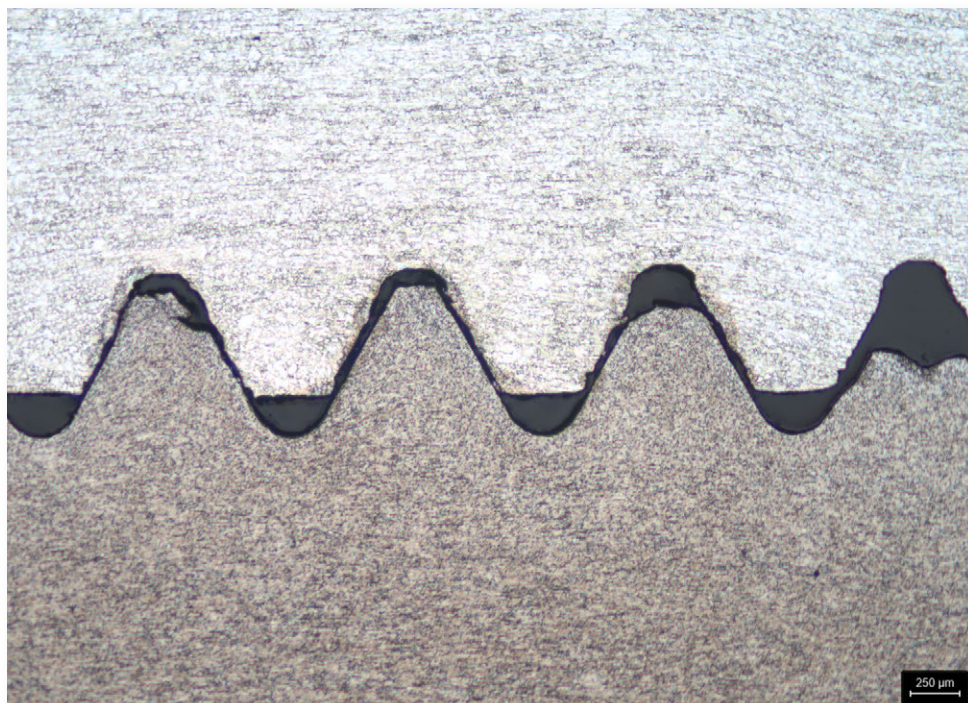


ETCHING WITH SODIUM HYDROXIDE SOLUTION

Screw-nut after etching with
Sodium hydroxide solution - 7 : 1



Screw-nut after etching with
Sodium hydroxide solution - 25 : 1



ELECTROLYTIC POLISHING & ETCHING

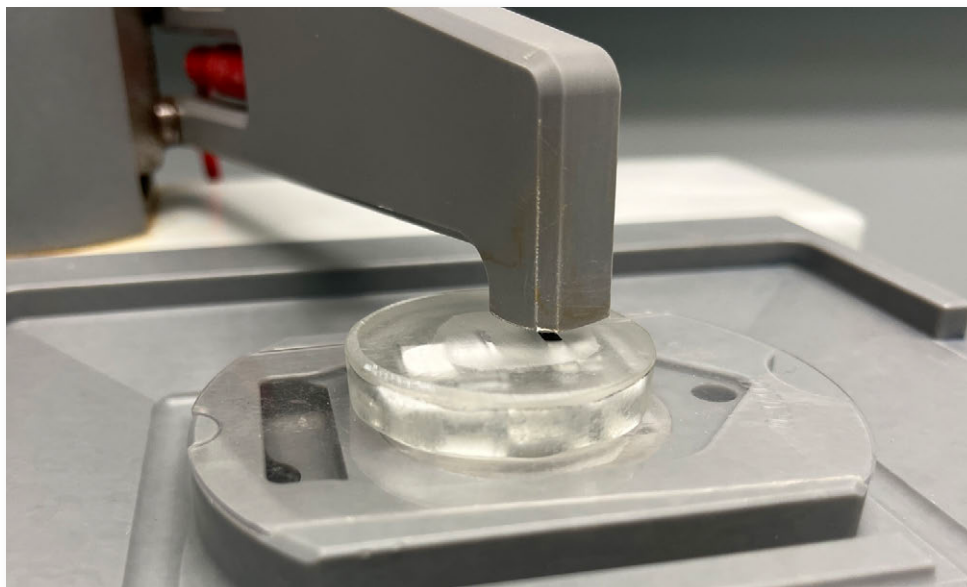
ELECTROLYTIC BARKER ETCHING

Device		Qetch 1000				
Electrolytic etching						
STEP		ELECTROLYTE	VOLTAGE [V]	PUMPING POWER [%]	MASK [CM²]	DURATION [MIN]
 Etching (electrolytic)		Barker	20	55	5	0:45
Notes		The contact surface must be created by sanding the back!				

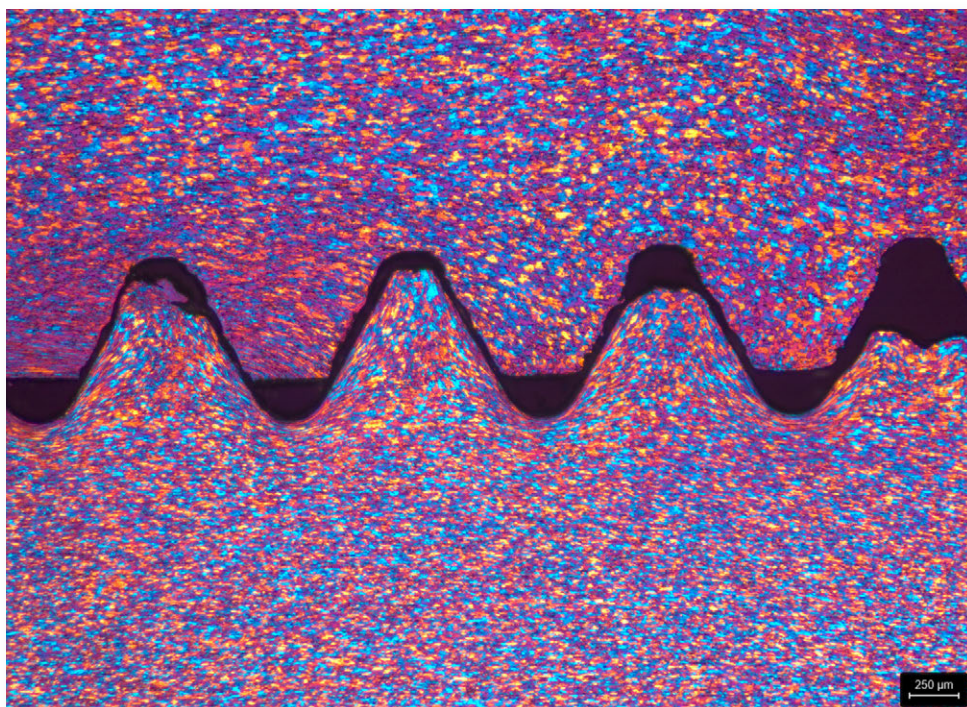


Electrolytic polishing & etching device
Qetch 1000

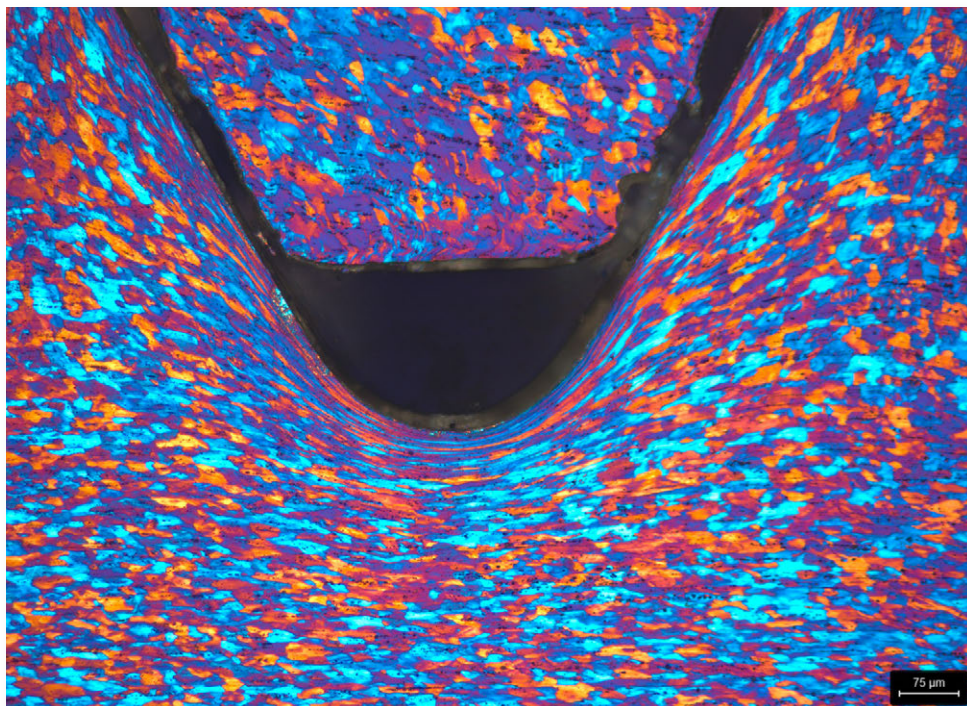
Preparation of the sample for
electrolytic Barker etching



Screw-nut after normal polishing and
electrolytic etching with Barker - 25 : 1



Screw-nut after normal polishing and electrolytic etching with Barker – 100 : 1



PRODUCT OF THE MONTH



**ALUMINUM OXIDE
PRECISION CUT-OFF WHEELS**
For precision cutting of ferrous materials, QPREP Aluminum oxide precision cut-off wheels are the optimal choice. These cut-off wheels are available in two different grain types (fine and coarse).



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