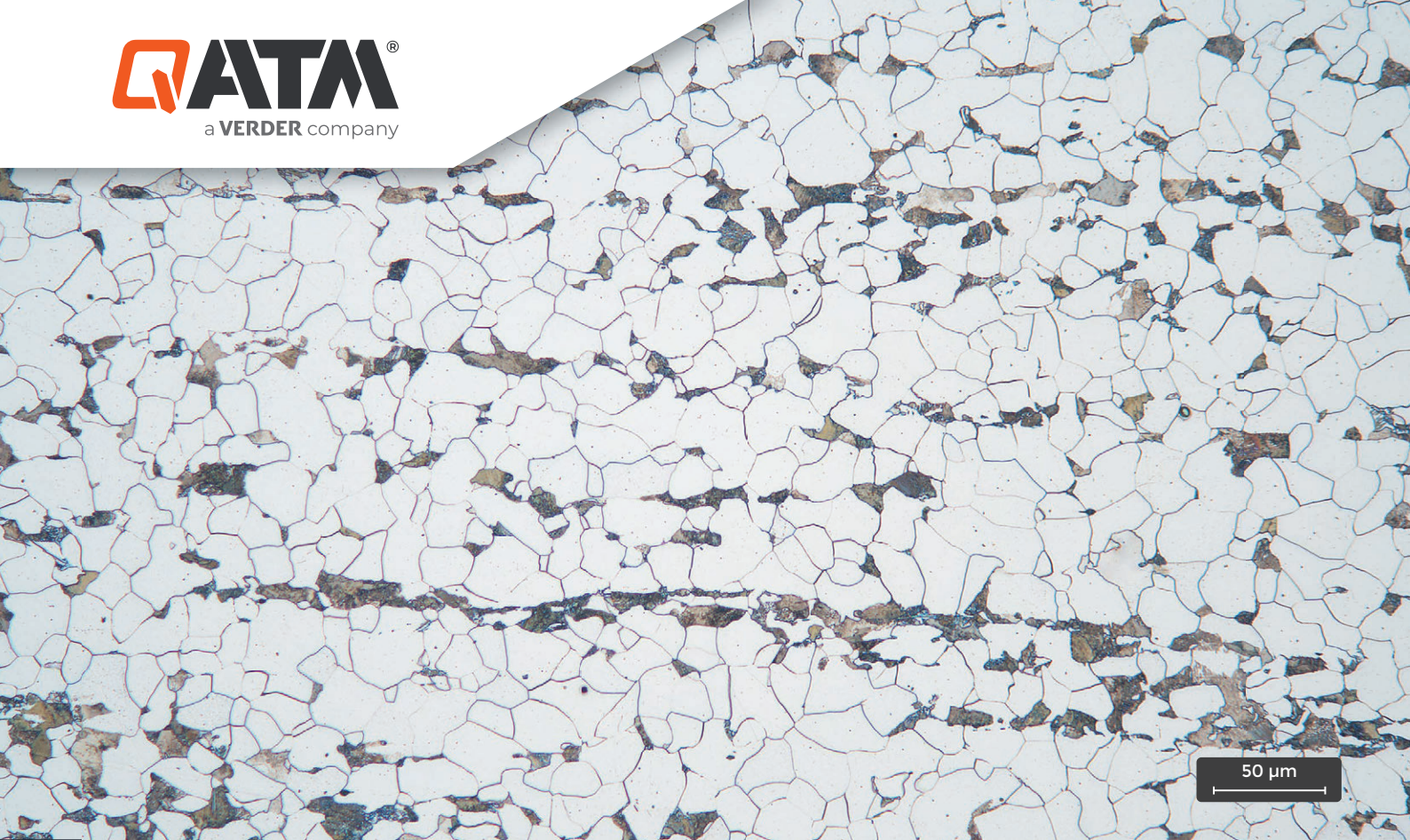




ATM Qness GmbH
Emil-Reinert-Str. 2
57636 Mammelzen
Germany

Phone +49 2681 9539-0
E-Mail info@qatm.com

ATM Qness GmbH
Reitbauernweg 26
5440 Golling
Austria

Phone +43 6244 34393
E-Mail info.at@qatm.com

www.qatm.com

METALLOGRAPHIC PREPARATION OF ROLLED STEEL WIRE RODS AFTER ANNEALING

Objective:

For annealed rolled steels metallographic examinations allow for a detailed analysis of the microstructural changes caused by heat treatments. The objective of sample preparation is to create a flat, scratch-free, and representative sample surface to clearly assess the microstructure under the microscope.

Annealing specifically influences properties such as hardness, ductility, and stress state in rolled steel wire. Metallographic investigations serve to visualize microstructural components such as ferrite, pearlite, or possible precipitates, as well as to analyze grain sizes and phase distributions. Careful sample preparation is crucial in this process, as it is the only way to ensure an accurate representation of the microstructure.



As-received samples

CUTTING

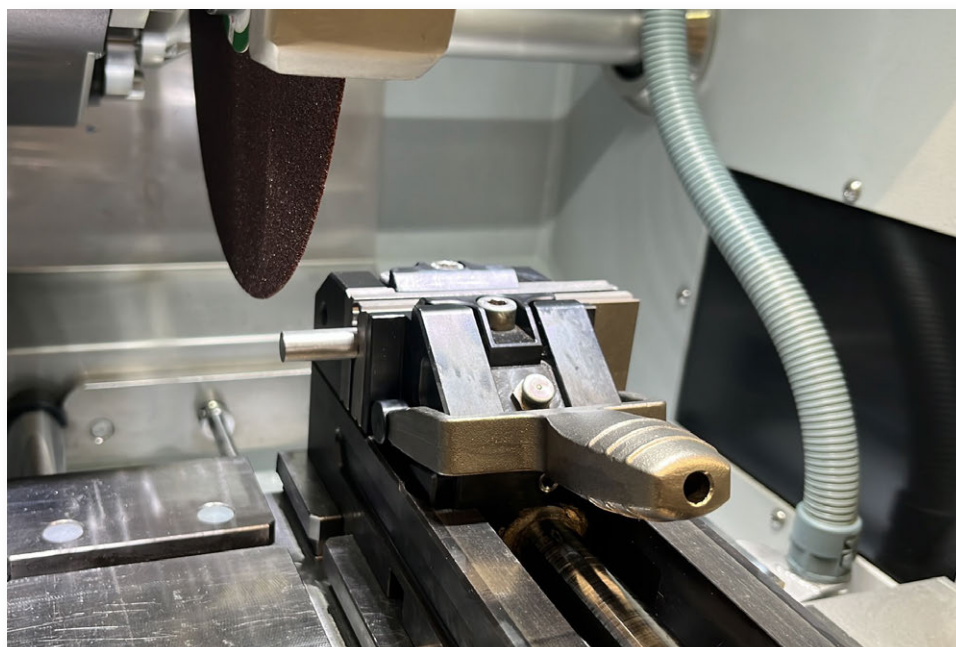


Cut-off machine Qcut 250 A

The clamped sample in Qcut 250 A

Device	Qcut 250 A	
Cut-off wheel	FS-D Al ₂ O ₃ cut-off wheel	Item no.: 95012526
Coolant and anti-corrosion agent	QATM Anti corrosion coolant standard	Item no.: 95014280
Clamping tool	- Qtool 80	Item no.: Z2231203
	- Clamping Jaw, Prism	Item no.: 02231213
Cutting method	Horizontal cut (X-axis)	
Parameters	- Feed speed	0.2 mm/s
	- Pulse parameter	Without pulse
	- Cut-off wheel rotational speed	3015 rpm

Notes



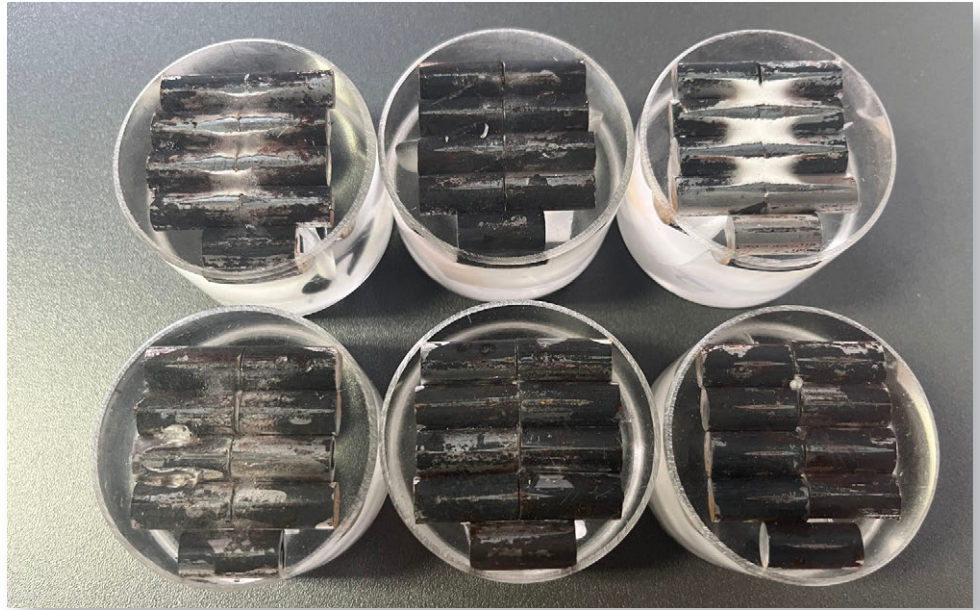
HOT MOUNTING



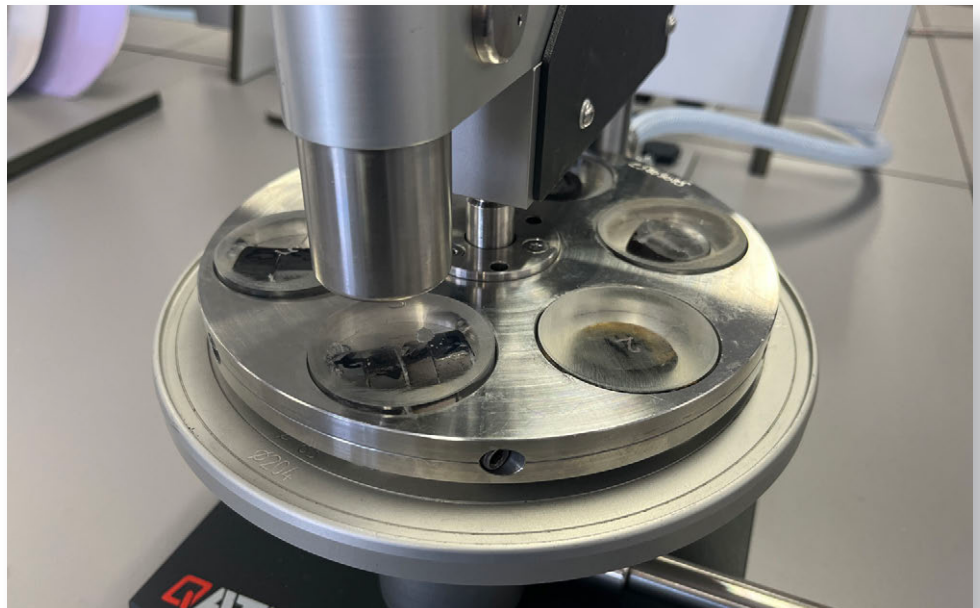
Hot mounting press Qpress 50

Device	Qpress 50
Mounting material	THERMOPLAST
Heating time	6:00 min
Temperature	200 °C
Pressure	250 bar
Cooling time	4:00 min
Accessories	-
Heat set up	100%
Pressure mode	Pressure from beginning
Cooling set up	100%
Mould Assembly	Ø 50 mm
Notes	

The rolled steel wires after mounting



The leveling device is such an important device to clamp the samples flat in the samples holder and save consumable and time in the first grinding step



GRINDING/POLISHING

Device	Qpol 300 BOT
Sample holder	6 x Ø 50 mm
Pressure	Central pressure



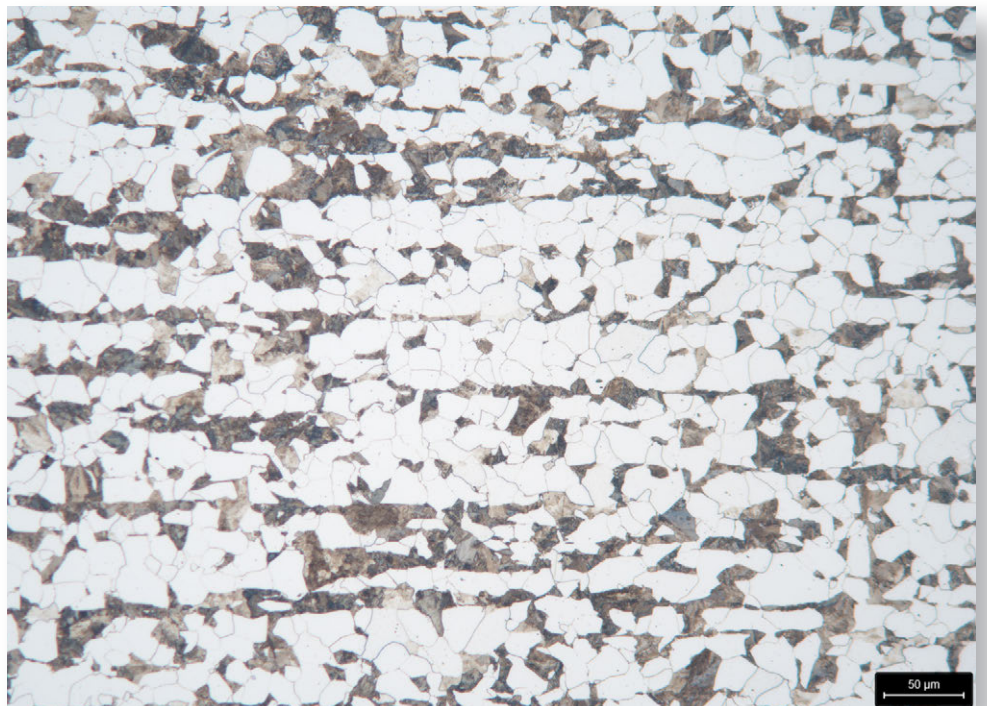
Fully automatic grinding and polishing machine Qpol 300 BOT

STEP	MEDIUM		 rpm	 rpm	 Central pressure N	 min
 Stone grinding	Corundum stone P100	H ₂ O	1500	120 ▶▶	250	1 mm removal rate in 4:45
Cleaning	water: 15 s, compressed air: -- s, Ethanol: 15 s, compressed air: 15 s					
 Fine grinding	CONTERO H	Dia. Suspension Poly, 9 µm + alc. Lubricant	150	120 ▶▶	200	8:00
Cleaning	water: 10 s, compressed air: -- s, Ethanol: 15 s, compressed air: 15 s					
Ultrasonic	1:00 minute					
Cleaning	water: -- s, compressed air: -- s, Ethanol: 15 s, compressed air: 15 s					
 Polishing	DELTA	Dia. Suspension Poly, 3 µm + alcc. Lubricant	150	120 ▶▶	180	6:00
Cleaning	water: 10 s, compressed air: -- s, Ethanol: 15 s, compressed air: 15 s					
 Polishing	ZETA	Dia. Suspension Poly, 1 µm + alc. Lubricant	150	120 ▶▶	160	4:00
Cleaning	water: 10 s, compressed air: -- s, Ethanol: 15 s, compressed air: 15 s					
 Etching (chem.)	3% alc. Nitric acid					0:05
Notes	- Pre-dosing for 9 µm, 3 µm and 1 µm: 3 s Dosing interval and dosing time for Dia. Suspension 9 µm, 3 µm, 1 µm: Each 30 s for 1.3 s - Dosing interval and dosing time for lubricant: Each 60 s for 1.3 s					

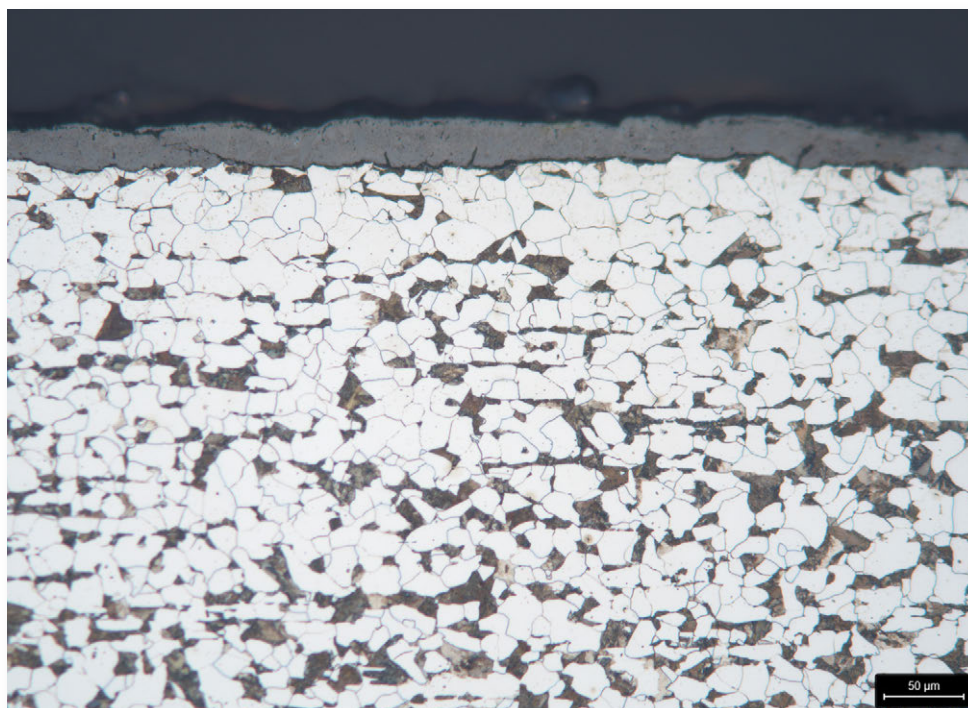
The microstructure of the rolled steel after annealing, which exhibits pearlite bands within the ferrite matrix – 100:1



Figure as above,
at a higher magnification – 200:1

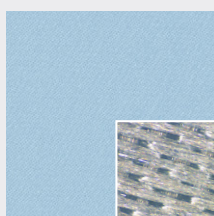


The microstructure of the rolled steel on the edge with the gray oxide layer on top - 200:1

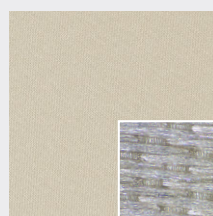


PRODUCTS OF THE MONTH

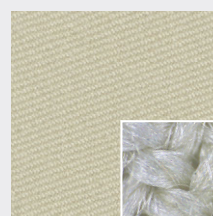
QATM polishing cloths such as



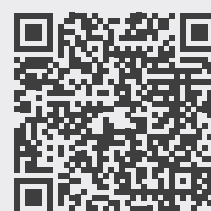
GAMMA



DELTA



SIGMA



Find out more at
www.qatm.com