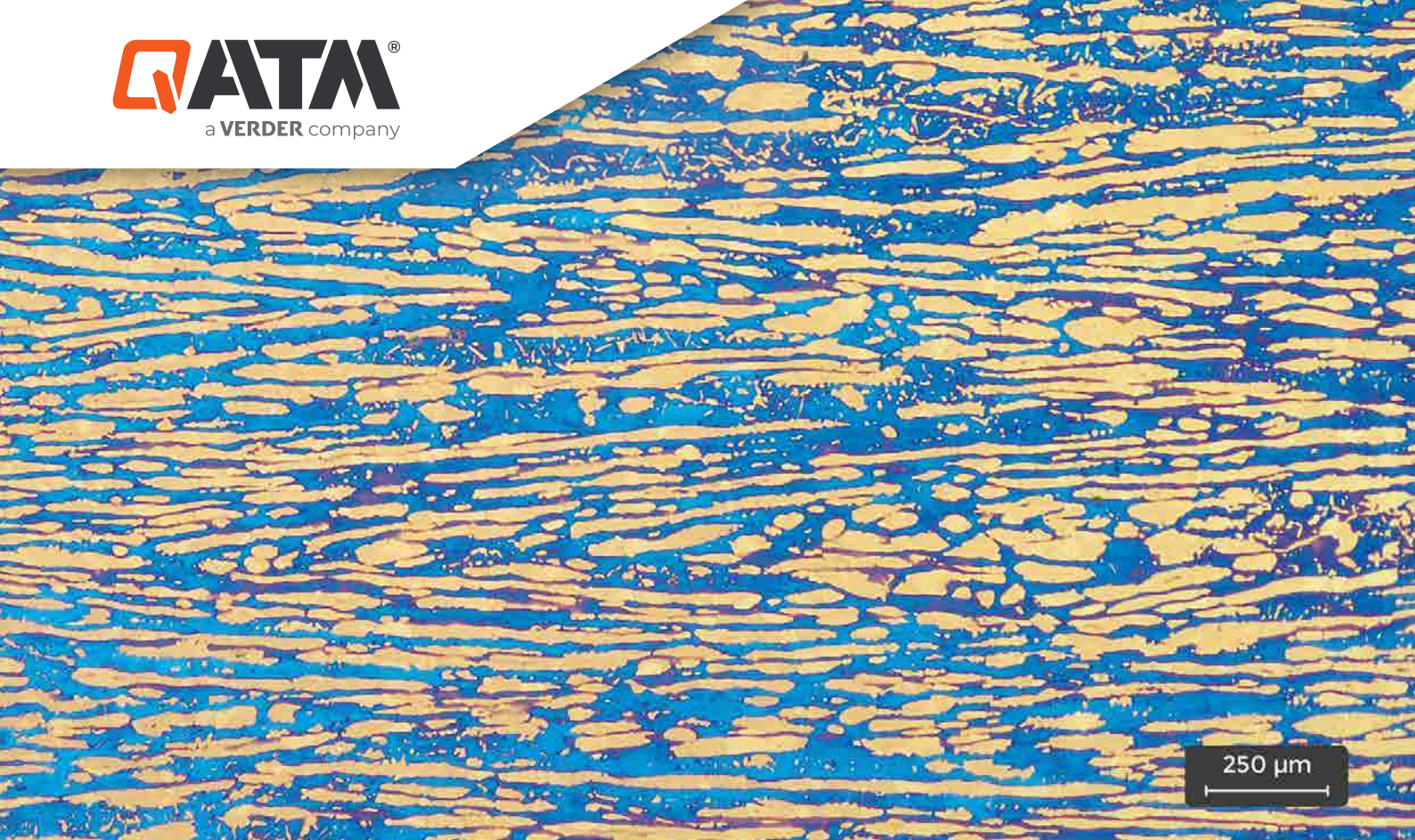




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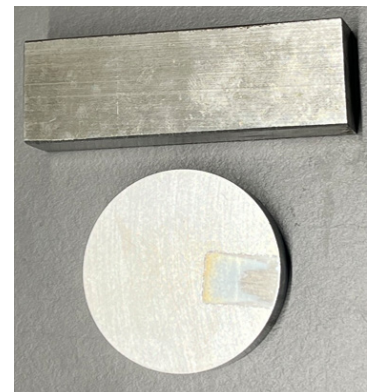
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METALLOGRAPHIC PREPARATION OF 1.4462 DUPLEX STEEL

Objective:

A sample of 1.4462 duplex steel is to be examined metallographically. The sample should be cut using a table-top cutting machine.

The metallographic investigation of duplex steel serves to analyze its characteristic two-phase microstructure consisting of austenite and ferrite. The aim is to evaluate the phase ratio (ideally around 50:50), the grain size and any possible precipitates or microstructural defects. After sampling, the sample is embedded, ground and polished to obtain a scratch-free surface. Suitable etching is used to make the phases visible with high contrast. The sample is then examined using light microscopy or scanning electron microscopy. Attention is paid to intermetallic phases such as sigma phase, as these can have a negative impact on corrosion resistance and toughness. Metallographic analysis is therefore an important part of quality assurance.



The samples as-received.

CUTTING

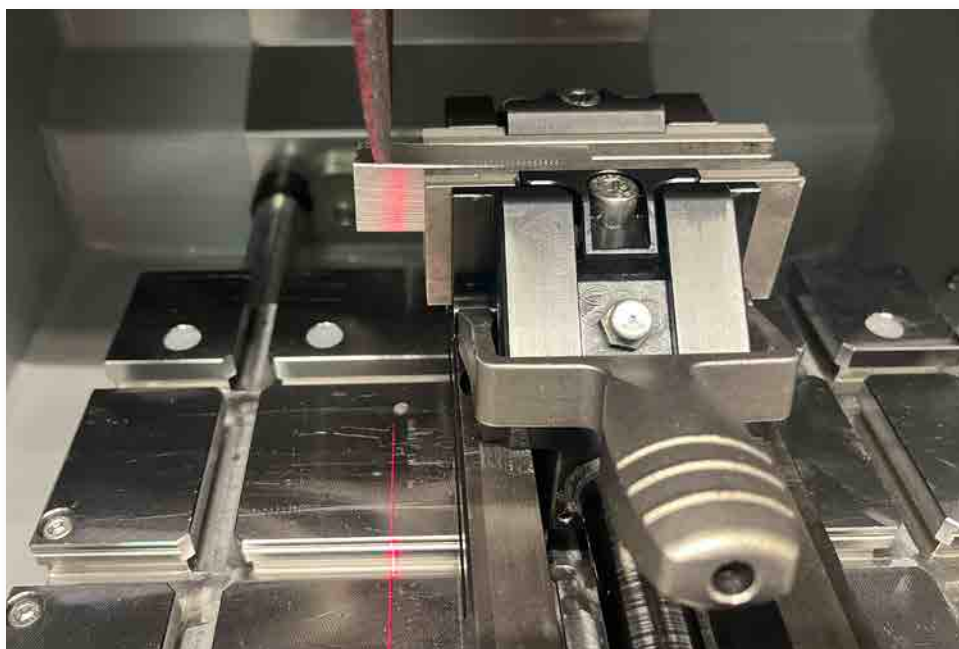


Cut-off machine Qcut 250 A

The sample, clamped in QTOOL 80.

Device	Qcut 250 A	
Cut-off wheel	FS-C Al ₂ O ₃ -cut off wheel	Item no.: 92002647
Coolant and anti-corrosion agent	Anti corrosion coolant, standard	Item no.: 95014281
Clamping tool	- Qtool 80	
Cutting method	Vertical cut (Y-axis)	
Parameter	- Feeding speed	0.2 mm/s
	- Pulse setting	Without pulse
	- Rotational speed of cut-off wheel	3015 rpm

Notes



HOT MOUNTING



Hot mounting press Qpress 40

Device	Qpress 40
Mounting material	EPO BLACK
Heating time	4:00 min
Temperature	200 °C
Pressure	250 bar
Cooling time	3:00 min
Accessories	EPO BLACK
Heat set up	100%
Pressure mode	One-step mode
Cooling set up	100%
Mould assembly	Ø 40 mm

The sample on the lower piston of QPRESS 40 hot mounting press.



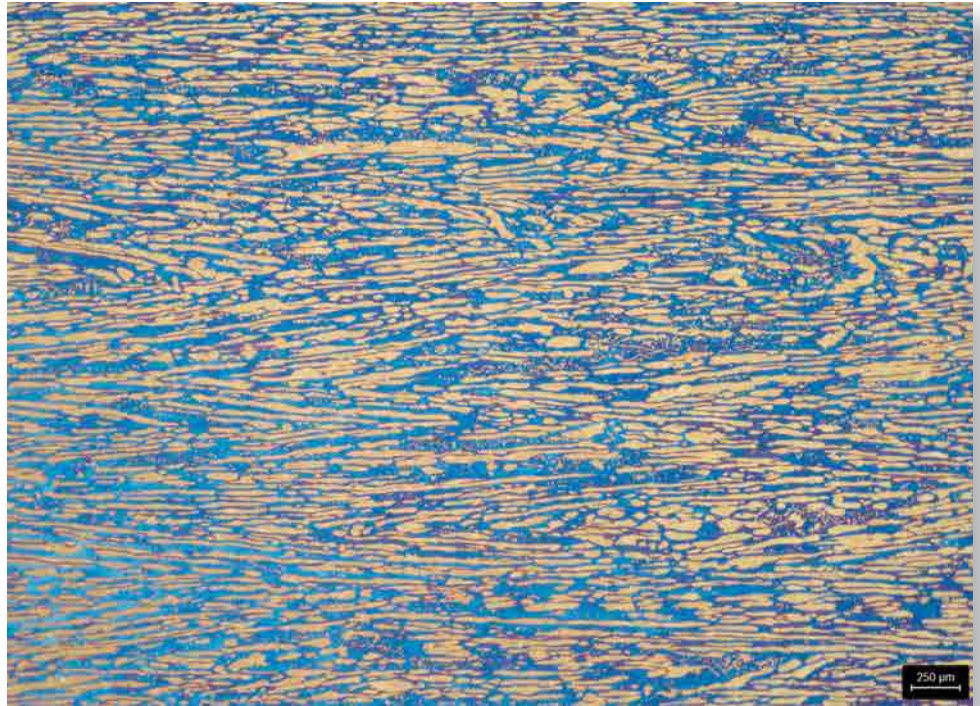
Automatic grinding and polishing machine Qpol 250 A1 Eco

GRINDING/POLISHING

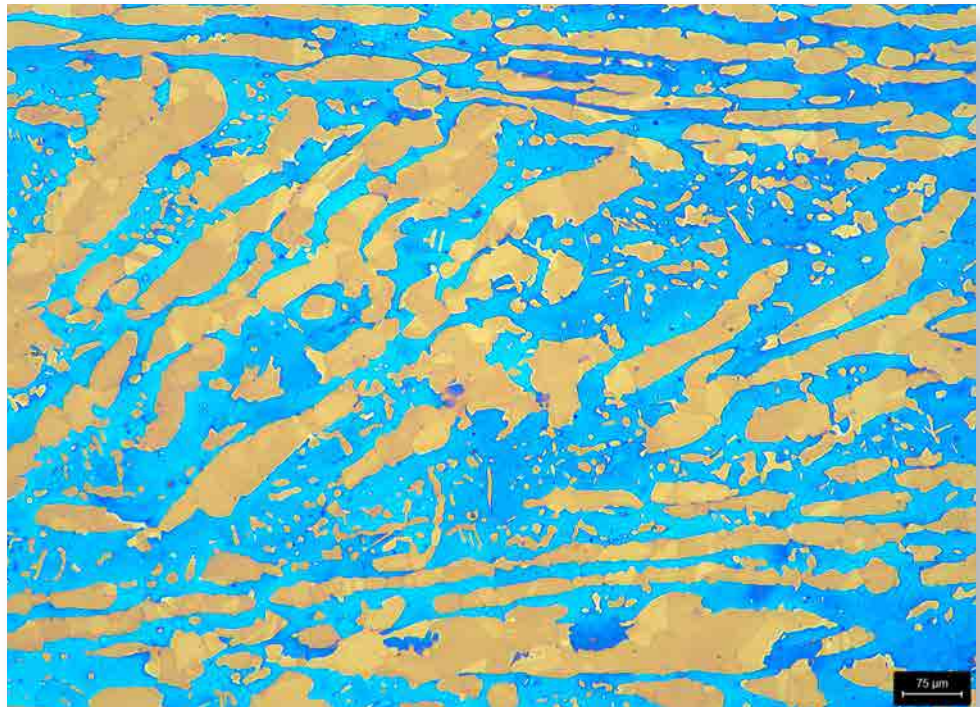
Device	Qpol 250 A1 Eco	
Sample holder	6 x Ø 40 mm	Item no.: Z5445025
Pressure	Single pressure	

STEP	MEDIUM		 rpm	 rpm	 Single pressure N	 min
 Planar grinding	VEGA 54 µm	H ₂ O	200	120 ►► Synchronous Rotation	25	Till flat ca. 1:00
 Pre-polishing	BETA	Dia. Suspension Wb. Poly, 9 µm + alc. Lubricant	150	120 ►► Synchronous Rotation	30	5:00
 Polishing	GAMMA	Dia. Suspension Wb. Poly, 3 µm + alc. Lubricant	150	120 ►► Synchronous Rotation	25	5:00
 Fine polishing	ZETA	Dia. Suspension Wb. Poly, 1 µm + alc. Lubricant	150	120 ►► Synchronous Rotation	22	4:00
 Etching (chem.)	Etchant BERAHA II					0:30
Notes	- Pre-dosing for 9 µm, 3 µm and 1 µm: 3 s - Dosing interval and dosing duration for Dia. Suspension 9 µm, 3 µm, 1 µm: Every 30 s for 1.3 s - Dosing interval and dosing duration for lubricant: Every 60 s for 1.3 s					

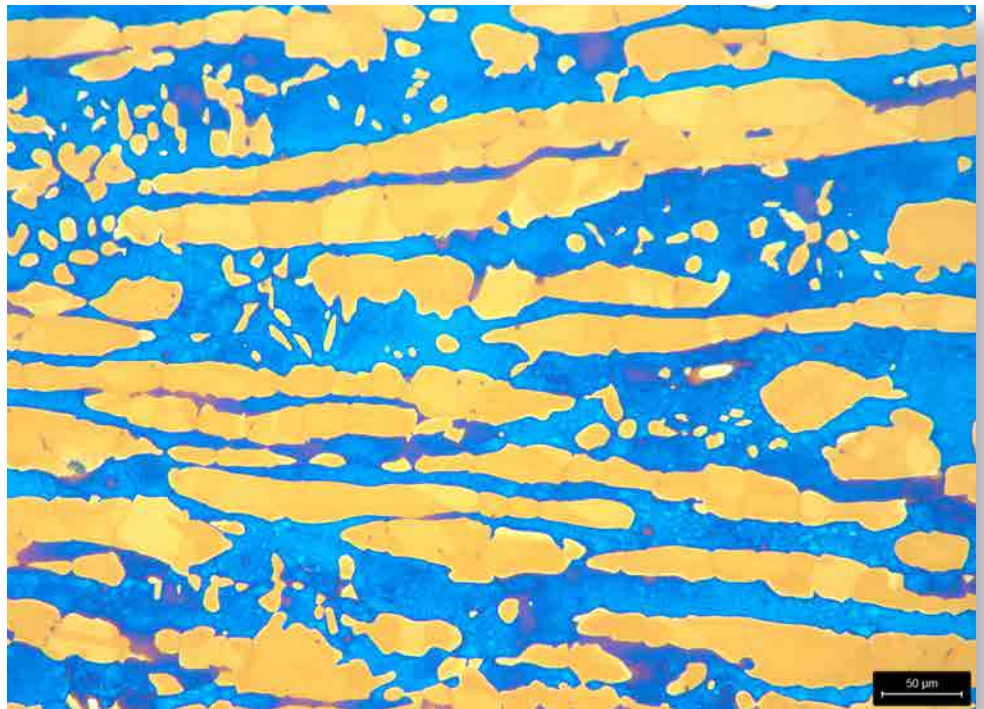
Ferrite-Austenite microstructure of a duplex steel after etching with Beraha II - 25:1



Ferrite-Austenite microstructure of a duplex steel after etching with Beraha II - 100:1



Ferrite-Austenite microstructure of a
duplex steel after etching with Beraha II - 200:1



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