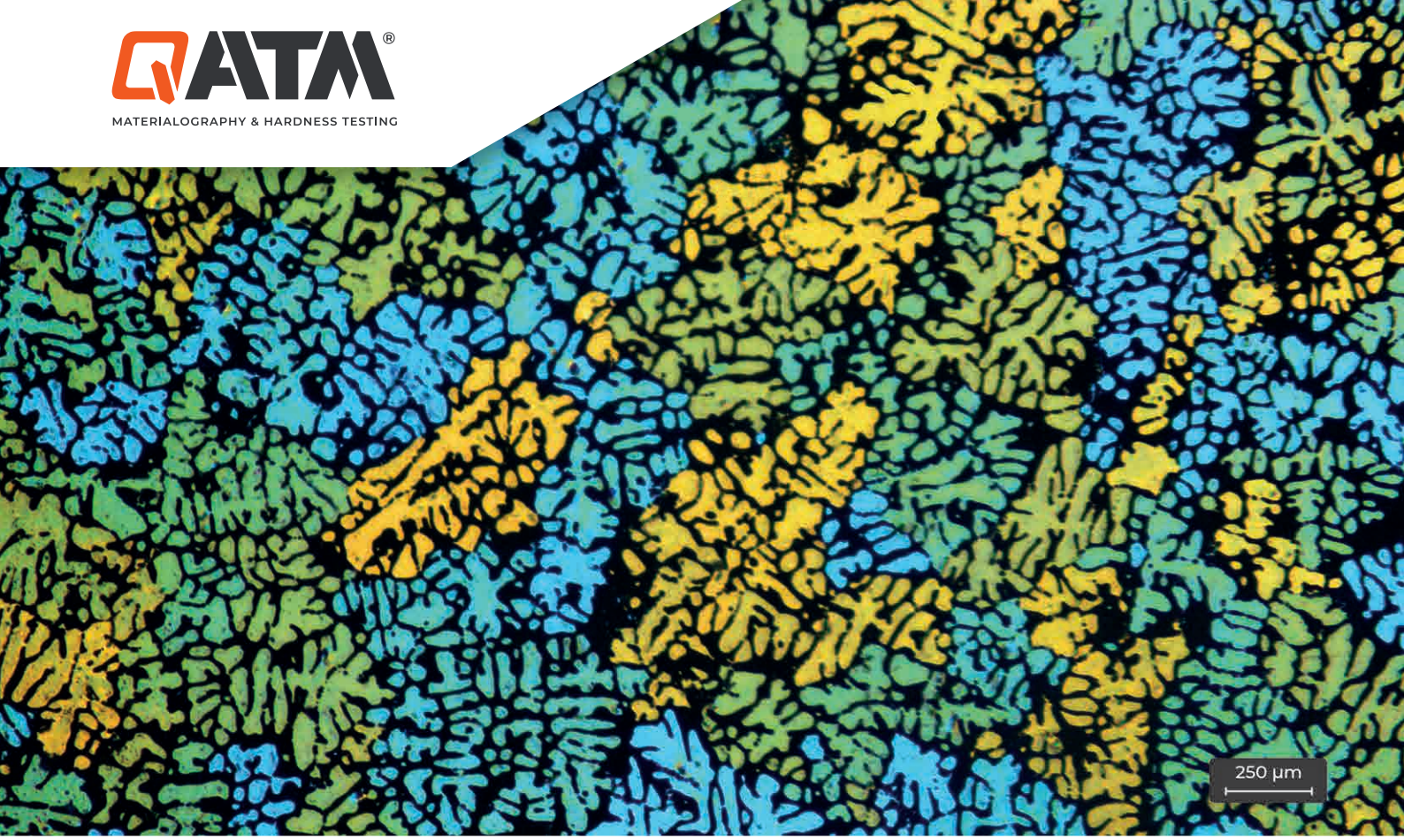
MATERIALOGRAPHY & HARDNESS TESTING



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ELECTROLYTE POLISHING AND ETCHING OF A CAST ALUMINUM ALLOY

Electrolytic polishing and etching is an appropriate preparation method with less deformation for non-ferrous materials and materials with a single-phase microstructure that must later be analyzed under an EBSD detector.

Electrolytic polishing directly on the finished part can save time and costs by avoiding the normal grinding/polishing process.

A well-known application of electrolytic etching is the use of Barker solution to enable color etching in Aluminum alloys. The etching affects the individual grains of the microstructure depending on their orientation. If the etched samples are viewed under linearly polarized light, the differently oriented grains appear in various colors. With this method, the direction of growth in the investigated plane can be easily recognized and the size of the grains can be measured.
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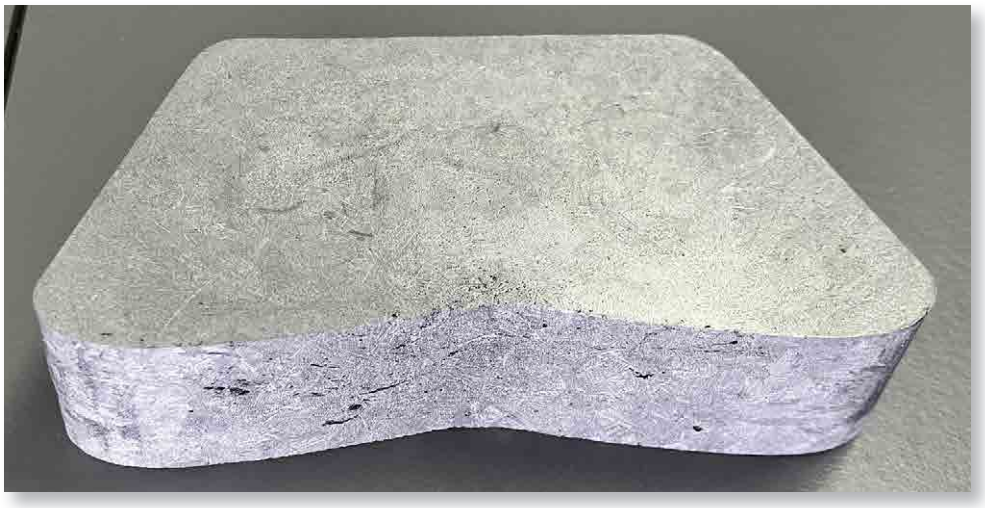
Objective:

The Aluminum sample should be prepared to show the dendritic structure and phase distribution. The preparation should include the following steps: electrolytic polishing and etching with Qetch 1000. Polishing was performed with the K1 electrolyte and etching with the Barker etchant.

Aluminum sample



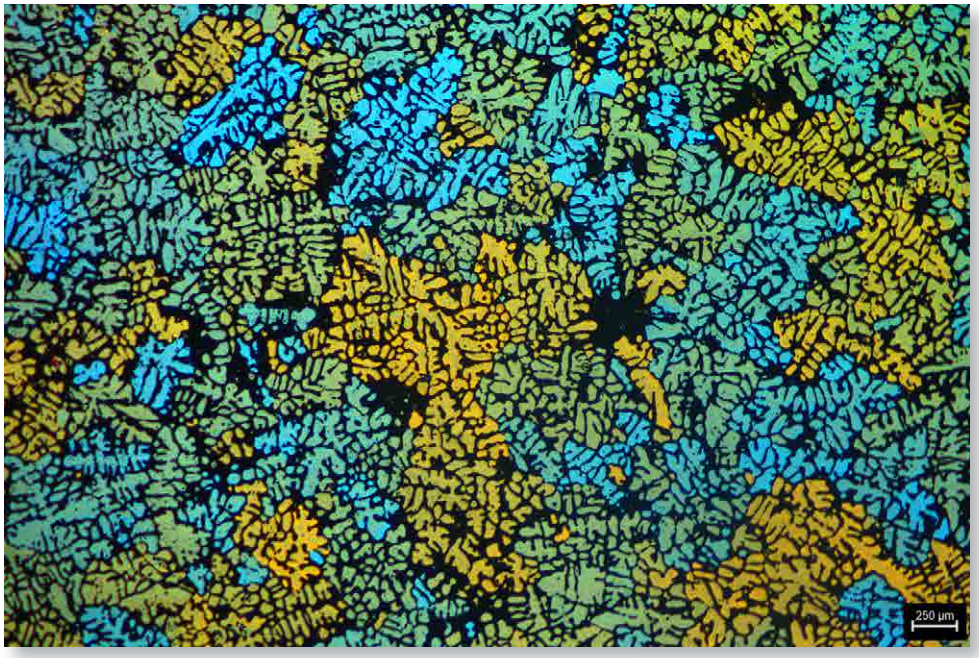
ELECTROLYTIC POLISHING AND ETCHING

Electrolytic polisher and etcher
Qetch 1000

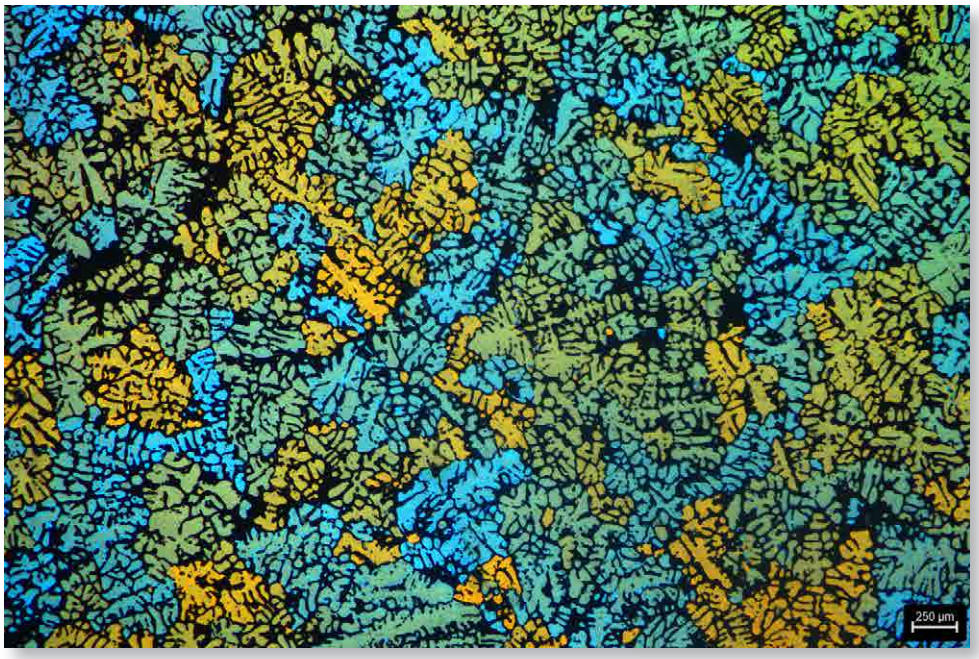
Device	Qetch 1000				
Step	**ELECTROLYTE**	**VOLTAGE [V]**	**PUMPING POWER [%]**	**MASK [CM²]**	**DURATION [MIN]**
		ELECTROLYTIC POLISHING			
Polishing (electrolytic)	Electrolyte K1	20	55	2.5	0:30
		ELECTROLYTIC ETCHING			
Etching (electrolytic)	Barker	20	65	2.5	1:30
Notes					

The sample is placed directly into the QETCH 1000.

The structure after electrolytic etching with the Barker etchant – 25 x



The dendritic microstructure of an aluminum cast alloy – 25 x



Find out more at
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