

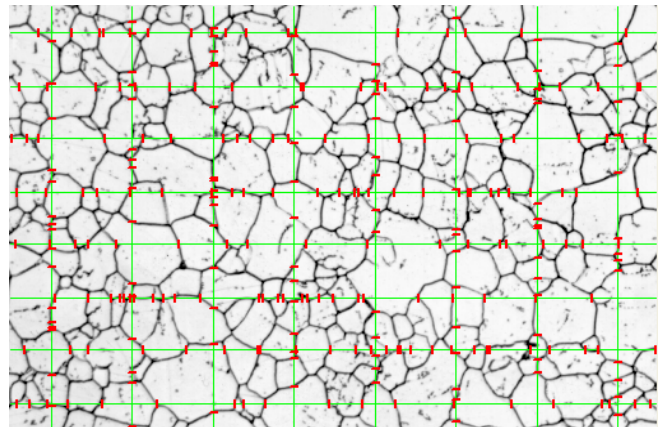
## Automate the Grain Sizing Process

The Aphelion™ Grain Sizing Tool is a stand-alone application that determines the average size of grains in a metallic or alloy material following the ASTM E-112 standard specification. After specifying a small set of parameters, the grain sizing process proceeds and reports are generated without user intervention.

This tool provides its user with a single environment for performing the following processes:

- *Capture Images* – A very intuitive interface enables a user to acquire high-quality images<sup>(1)</sup>.
- *Select a Lens* – A pull-down menu allows the user to select from a list of supported lenses.
- *Define Image Resolution* – Pixel size is determined by the user's lens selection so that quantitative measurements are given in real word units.
- *Compute estimated average size of the grains* – This value is computed, according to the ASTM E-112 standard, from the intercepts of the grain boundaries along the test lines. The grain boundaries are automatically extracted using a powerful segmentation technique.
- *Generate Reports* – User modifiable reports are generated that include computation of the average grain size and other basic statistics.

The grain sizing process consists of three steps, beginning with automatic detection of grain boundaries using a very fast, real-time algorithm. In the second step, the user defines a set of test lines by specifying the number of equally-spaced lines in the horizontal and vertical directions. In the final step, an estimate of the number of grains intersected by each line is determined by counting the number of intercepts along the lines.



After the grain sizing process has completed, an analysis process computes the estimated average size of the grains, the total length of the test lines, and all associated statistics. A final report is automatically generated using a Microsoft® Excel<sup>®2</sup> template, which is defined in the Tool's *Settings* menu.

### Main features of the Grain Sizing Tool:

- Compliant with the ASTM E-112 standard
- Fully automatic grain boundary extraction and intercept computation
- Reproducible results
- Automatic report generation *based on a user-modifiable template*
- Easy-to-use, requiring neither training nor software expertise

<sup>1</sup>The list of currently supported cameras is provided upon request. Please contact your Aphelion™ representative

<sup>2</sup>Microsoft® Excel® not included with this Tool