

NIST TRACEABLE CERTIFICATION OF ULTRAFINE STAINLESS-STEEL WIRE MESHES USING IMAGE ANALYSIS

Graham Rideal¹, K.G. Brocklehurst¹

¹Whitehouse Scientific

Although Bubble Point Techniques have been used for many years to measure pore sizes, the results are only ever an approximation because it is Flow Rates and not actual pore sizes that are measured. Although improved conversion algorithms have been developed recently, the results are not directly traceable to the NIST standard meter.

Image Analysis, on the other hand, is directly traceable to NIST because a certified graticule can be used to calibrate each pixel. However, pixel size alone is not sufficient in itself to prove traceability and is only one link in a chain of traceability from the observed microscope image to the NIST standard. Other parameters include magnification, pixel shape, focus, illumination intensity, open area, to mention a few, and unless every link in the chain is proven, a broken link will nullify the traceability.

This paper uses a 16micron plain weave mesh to examine each variable and prove an unbroken chain to the NIST international standard.

In the case of complex, opaque, 3-dimensional weaves, where certification by transmitted light is not possible, a set of glass filter calibration microspheres has been prepared for use in a Challenge Test method. These filter standards can be used for certifying filter media with cut points down to 3 microns. The Whitehouse PoreSizer image analyzer has the unique facility to electronically remove none spherical particles from the analysis of the penetrating microspheres thus guaranteeing that a true Geometric Pore Size of the filter medium is determined. Furthermore, the filter cut points are directly traceable to the NIST standard.