

Quanta 250 FEG: A New Generation of Electron Microscope

The development and manufacture of new nano-materials continually challenges the performance of even the best microscopes. The latest acquisition at Intertek MSG boasts a resolution of 1.0 nm (SEM) and 0.8 nm (STEM). The smaller the size of a particle or feature, the more intrusive and misleading the presence of a conductive coating, and the more welcome its absence! Several modes of operation circumvent this issue. In addition, beam deceleration emphasises very fine surface detail at the expense of unwanted sub-surface interactions.

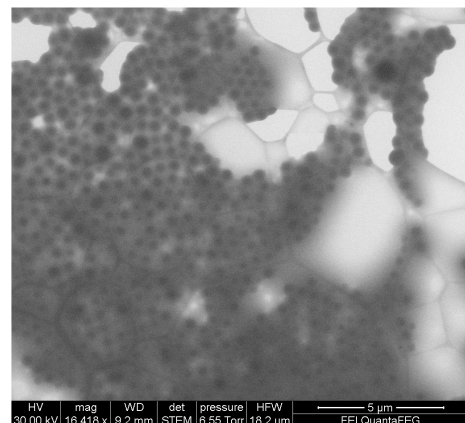
The presence of scanning transmission electron detectors (STEM) allows us to form images using electrons passing through a thin sample, and the WetSTEM system means that we can now image truly wet samples (relative humidity conditions up to 100%), and materials otherwise inaccessible by conventional electron microscopy, such as debris present in oil. Further benefits and new applications will, we hope, become apparent as this exciting new system comes on-line.



The new capability pairs the Quanta 250 FEG from FEI Company with the Quantax micro-analysis system from Bruker. These two state-of-the-art instruments, in combination, bring the following improvements and additions to our current electron microscopy capabilities.

- A unique combination of high-resolution imaging and variable vacuum, including environmental scanning electron microscopy (ESEM) for wet materials
- Minimal artefact-creation due to removed need for coating and/or dehydration
- WetSTEM for new applications
- Beam deceleration for increased surface sensitivity
- EDS in low vacuum on non-conductive samples
- Faster EDS mapping with improved discrimination of elements and substantially improved spatial resolution (down to 50nm.)
- Wide elemental range: beryllium (4) to americium (95)
- Good quantitation, even for rough surfaces and particles

The micrograph below, taken on the new instrument, illustrates a material previously inaccessible to electron microscopy: it is a bright-field STEM image of an aqueous latex dispersion.



To learn more about the Quanta's capabilities, call Richard Lees
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