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Hitachi High-Tech to launch a next generation FE-TEM model HF-3300, ultrahigh resolution FE-TEM with new analytical capabilities

On May 14, Hitachi High-Technologies Corporation (President: Hidehito Obayashi) will debut its newest field emission transmission electron microscope (FE-TEM) in the market.

High brightness cold field emission electron source and 300kV high accelerating voltage are combined to perform stable ultrahigh resolution imaging together with new analytical capabilities.

Cold field emission electron source is highly evaluated as an ideal electron source for high performance electron microscope with its high brightness and energy resolution. Hitachi High-Tech got to market fast with this electron source and has employed it not only for SEM but also for TEM. HF-3300 achieves both atomic resolution observation and nanoscale analysis using a combination of cold field emission electron source and 300kV high accelerating voltage.

The higher the accelerating voltage, the higher the resolution. Also, as the accelerating voltage goes up, the penetrative power of electron increases and thicker specimen can be observed with higher resolution. Metals and ceramics with higher atomic number, which are difficult to transmit with electrons, often need to be observed at higher accelerating voltage.

HF-3300 enables stable ultrahigh resolution observation with less influence of specimen thickness and composition utilizing 300kV high accelerating voltage.

For analytical purpose, double-biprism electron holography(*), spatially-resolved EELS(*) and nano electron beam diffraction(*) are newly introduced, in addition to conventional EDX and EELS. These new analysis techniques are expected to pave the way for infinitesimal elemental analysis, nanoscale chemical bonding state analysis and high precision local analysis of crystalline structure respectively. HF-3300 will meet the sophisticating demands for material analysis with these new techniques.

Holder linkage with Hitachi FIB system(*) enables a sequence of FIB preparation and TEM analysis without handling over of a TEM grid. Hitachi's patented "Micro-sampling(*)", which is highly-regarded as indispensable TEM specimen preparation technique, allows quick and accurate site-specific TEM analysis.

Also, Hitachi's unique compatible rotation holder(*) enables multidirectional structural analysis together with STEM unit(*).

Shipment is scheduled to start in September 2007 and annual sales of 5 units are expected.

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Major specification of HF-3300 ultrahigh resolution FE-TEM

Resolution	0.10nm(lattice), 0.19nm(point to point), 0.13nm(information limit)
Magnification	200x - 1,500,000x
Accelerating voltage	300kV, 200kV(*), 100kV(*)
Electron source	Cold field emission electron source
Specimen traverse range	X,Y=±1mm, T=±15°
EDX solid angle	0.15sr
Vacuum system	Turbo molecular pump, Ion pump

Major features of HF-3300 Ultra-high resolution FE-TEM

- Bright cold field emission electron source
- Stable ultrahigh resolution
- 300kV high accelerating voltage with less influence of specimen thickness and composition
- New analytical capability; Double biprism electron holography(*), Spatially-resolved EELS(*), nano electron beam diffraction(*)
- Holder-linkage with FIB system(*) equipped with "Micro-sampling(*)"(Hitachi patent)
- Multidirectional structural analysis with STEM(*) and compatible rotation holder(*)

(*)optional accessory



HF-3300 ultrahigh resolution FE-TEM