Hitachi High-Tech

News Release

FOR IMMEDIATE RELEASE

Hitachi High-Tech Developed New HF5000 Field Emission Transmission Electron Microscope

-New 200kV transmission electron microscope provides sub-angstrom spatial resolution-

TOKYO, Japan, July 21, 2015 — Hitachi High-Technologies Corporation (TOKYO: 8036, Hitachi High-Tech) announced that it has developed the HF5000 field emission transmission electron microscope (FE-TEM) with a maximum 200kV accelerating voltage and standard equipped spherical aberration corrector.

The HF5000 is a new 200kV TEM combining Hitachi High-Tech's TEM and scanning transmission electron microscope (STEM) technologies to achieve spatial resolution at the sub-angstrom (Sub-Å, 0.1 nm or less) level. Its sales launch is scheduled for October, 2015.

In fields ranging from academic research of advanced nanomaterials and electronic devices to corporate R&D and quality control, there have been increased demands to improve both spatial imaging resolution and elemental analysis for electron microscopes. This, in turn, has given rise to the need to simultaneously achieve both aberration correction and high sensitivity analysis in microscopy. In response to this need, Hitachi High-Tech had developed 200kV dedicated STEM equipped with a spherical aberration corrector and large solid angle EDX[*1], as well as 300kV TEM. In the meantime, Hitachi High-Tech has received feedback from many customers to integrate both electron microscopy technologies into a single 200kV TEM platform.

In response, Hitachi High-Tech has developed the HF5000 FE-TEM, equipped with a spherical aberration corrector, that simultaneously achieves both Sub-Å high-resolution imaging and high-sensitivity analysis on a single 200kV TEM platform.

The HF5000 inherits features from Hitachi High-Tech's HD-2700 dedicated STEM, such as its in-house spherical aberration corrector, automated aberration correction function, and atomic resolution SE[*2] imaging, while incorporating the TEM technologies developed in the HF series. Furthermore, the HF5000 electron gun, based on Hitachi High-Tech's proven cold field-emission electron source technology, was thoroughly reviewed, and its column and specimen stage were redesigned to significantly enhance instrument performance and stability.

Integrating these electron microscopy technologies developed by Hitachi High-Tech into a new 200kV TEM enhanced platform brings together aberration correction and high-sensitivity analysis, with a wide variety of observation methods on the HF5000.

With the development of the new 200kV HF5000 FE-TEM, Hitachi High-Tech seeks to offer Sub-Å high-resolution imaging and high-sensitivity analysis, with its observation method versatility, to a broad range of users, including high-end users. Shipment of the HF5000 is scheduled to be in the second half of FY 2015.

Hitachi High-Tech will display a preview panel of the HF5000 at the commercial exhibition of Microscopy & Microanalysis 2015, to be held at the Oregon Convention Center in Portland, U.S.A, from Sunday, August 2 through Thursday, August 6, 2015.

[*1] EDX: Energy Dispersive X-ray Spectroscopy
[*2] SE: Secondary Electron

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The HF5000 Field Emission Transmission Electron Microscope

Main Features

- Standard equipped with a probe-forming spherical aberration corrector developed by Hitachi High-Tech (including automated aberration correction function)
- Equipped with a highly-stabilized cold FE electron gun
- Enhanced instrument performance achieved by highly-stabilized column and power supply
- Aberration-corrected atomic resolution SE imaging
- New side-entry specimen stage and specimen holder
- Compatible with a dual configuration of large solid angle EDX*
- Standard equipped with a TEM imaging camera
- Newly designed enclosure cover
- Lineup of special specimen holders, including 360° rotational holder* and air-protection holder*
- Specimen holder compatible with Hitachi High-Tech's FIB*3 sample preparation tool

* Option

Main Specifications

Electron source	Cold field-emission electron gun
Imaging resolution	0.078nm (ADF-STEM*4 image)
Maximum acceleration voltage	200kV
Aberration corrector	Probe-forming spherical aberration corrector developed by Hitachi High-Tech (standard equipment)

*3 FIB: Focused Ion Beam
*4 ADF-STEM: Annular Dark Field - STEM

Contact
Yukihiro Mori, Mitsuru Konno
Marketing Dept.,
Science Systems Sales & Marketing Div.,
Science & Medical Systems Business Group
Tel: +81-3-3504-7222

For Media Inquiries
Reiko Takeuchi, Aiko Matsumoto
Corporate Communications Dept.,
CSR Div.,
Tel: +81-3-3504-7760