Hitachi High-Tech

News Release

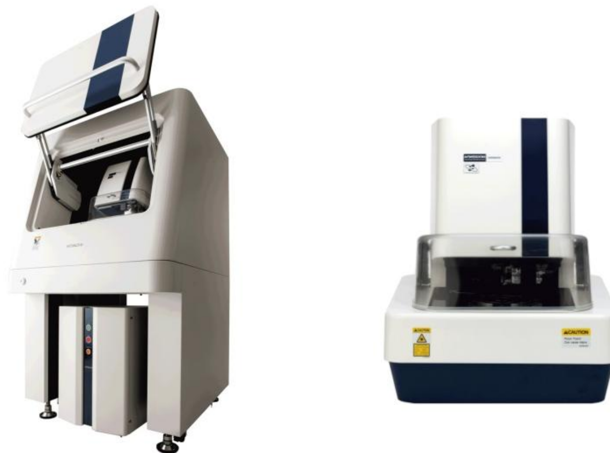
FOR IMMEDIATE RELEASE

Launch of AFM5500M Scanning Probe Microscope

-Significantly increased measurement accuracy and improved ease of use for nano-scale fundamental research as well as industrial instrumentation-

TOKYO, Japan, March 8, 2016 — Hitachi High-Tech Science Corporation (Hitachi High-Tech Science), a subsidiary of Hitachi High-Technologies Corporation (TSE: 8036, Hitachi High-Tech), announced the worldwide release of the AFM5500M scanning probe microscope (SPM), which offers significantly increased measurement accuracy and improved ease of use for nano-scale fundamental research and quality control.

A newly developed scanner and a low-noise 3-axis sensor provide high-measurement accuracy. The automated cantilever loading and laser alignment features further enhance the ease of use. The AFM5500M does not only appeal to nano-scale fundamental researchers, but also addresses the demand from the industrial instrumentation field, such as production sites where faster and more powerful small devices are constantly measured.



Scanning Probe Microscope AMF5500M
(Left: AFM5500M with its soundproof cover/Right: AFM5500M main unit)

The SPMs scan sample surfaces with a probe and perform simultaneous nano-scale measurements of topography and a wide variety of material properties. They have been mainly used for nano-scale fundamental research in a wide range of fields, including organic chemistry, polymer science, electronics, etc. In recent years, the demand for SPM investigations with higher resolution has dramatically increased in response to the development, production, and quality control of electronic devices, advanced performance materials, and precision components. In contrast, conventional SPMs require a highly skilled operator due to technical challenges such as the tube scanner handing, small and fragile cantilever loading, and optimization of scanning parameters.

Through the development of the AMF5500, highly flat, orthogonal, and linear scans have been realized with a wide range XY 200-μm flat scanner. In addition, closed-loop control[*1] with the low noise scanner helps to provide 3D profiles (topography and surface property) ten times more accurate than former SPM models. The cantilever exchange and laser alignment are automated. A large sample stage of 100 mm in diameter supports samples in various sizes. A motorized stage enables quick-and-easy camera-based sample navigation and automated AFM measurements following a recipe. The RealTune®II[*2] auto-tuning function for optimizing measurement parameters enables simple one-click acquisition of images. These newly developed features dramatically simplify SPM operation and enhance the accuracy of SPM measurements.

Hitachi High-Tech Science leads the field of SPM and was the first to release commercialized SPM products in Japan. Hitachi High-Tech Science will continue to provide solutions for surface observations and analyses with our scanning electronic microscopes (SEM) and coherence scanning interferometry product lines.

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*1: A method of controlling scanner position by using sensor feedback data
*2: A function to automatically tune parameters of the measurement force, scan frequency, control gain, operating frequency, and cantilever amplitude.

Main Features

1. Wide scan range and high-measurement accuracy

The wide-range XY 200-μm flat scanner, performing the parallel movement, achieves high linearity through the closed-loop scanner with a low-noise position sensor. This enables to observe nano-scale irregular structures and surface topography in a relatively flat sample.

2. Ease of use

Only a single click is necessary to exchange the cantilever, set the cantilever amplitude, and start the measurement. This feature simplifies SPM operation and achieves precise measurements when combined with RealTune®II.

3. Correlated SEM and SPMs system (optional)

Hitachi High-Tech Group proprietary SEM*3 and SPM shared alignment holder enables quick-and-easy measurements of the same regions of interest.

*3: Not all Hitachi High-Tech Group SEMs are compatible with the AFM5500M shared alignment sample holder.

Specifications

Scanner and control method	XY: Piezo flexture-based scanner (Closed loop scan using sensor signal) Z: Piezo scanner (Sensor detecting the height information)
Scan area	XY: 200 μm, Z: 15 μm
Stage	Maximum sample size: Diameter 100 mm, Thickness 20 mm Travel range: XY 100 mm
Size (w/ Soundproof cover)	750 mm×877 mm×1400 mm (excluding the desk and PC)

◆The product WEB site
http://www.hitachi-hightech.com/global/product_detail/?pn=em-afm5500m

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