News Release

HITACHI
Inspire the Next

FOR IMMEDIATE RELEASE

Hitachi High-Tech Launches the AFM100 Pro High-Sensitivity Scanning Probe Microscope System with Improved Detection Sensitivity

Pursuing improved sensitivity when measuring physical properties and measurement at atomic and molecular scales

【High-Sensitivity Scanning Probe Microscope System AFM100 Pro】

Tokyo, June 28, 2022 – Hitachi High-Tech Corporation ("Hitachi High-Tech") today announced the launch of the AFM100 Pro High-Sensitivity Scanning Probe Microscope System, a high-end scanning probe microscope (AFM[*1]/SPM[*2]) equipped with a newly developed high-sensitivity optical head that improves sensitivity when measuring physical properties and enables measurement at atomic and molecular scales.
In the field of research and development of advanced functional materials, the development of highly sensitive measurement and analysis equipment is in great demand. The AFM100 Pro meets the requirement for on-site analysis and will contribute to solving customer issues.

*1 AFM: Atomic Force Microscope
*2 SPM: Scanning Probe Microscope

■ Overview of AFM

AFM is a type of measurement and analysis device that scans the surface of a sample using a probe with a tip that is just a few nanometers[*3] in diameter. AFM can visualize a sample surface at the nanoscale, and simultaneously performing physical property evaluations. AFM is used in research and development and quality control across a wide range of industries, such as semiconductor, polymer, and biomedical. Hitachi High-Tech provides a wide range of user-friendly AFM devices and has been constantly improving the reliability of these devices by simplifying the AFM measurement process and preventing data variances caused by the operator.

■ Background of developing the AFM100 Pro

In recent years, the development of advanced functional materials has been focusing on nanoscale engineering, to facilitate the development of carbon neutrality, digital transformation (DX) involving AI and IoT, EVs, 5G, and power devices. As new functional materials are getting smaller, thinner, and more organic, there has been an increased demand to improve sensitivity when measuring microscopic changes and minor variations in the physical properties of material surfaces.

■ AFM100 Pro Features

To face these challenges, the AFM100 Pro developed by Hitachi High-Tech is equipped with a newly developed high-sensitivity optical head that uses photothermal excitation to achieve improved sensitivity when measuring physical properties and measurement at the atomic and molecular scales.
The main features of this product are as follows:

1. High-sensitivity optical head improves sensitivity when measuring physical properties

The newly developed high-sensitivity optical head reduces the noise level for cantilever displacement detection and optimizes detection sensitivity.
In addition, the photothermal excitation function (IR-Drive), which excites the cantilever using light, enables a stable control of the cantilever oscillation amplitude in the sub-nm order. This enables high-resolution measurement when observing in liquids.

2. Advanced correlation analysis with high-sensitivity measurement of physical properties and SEM observation at the same location

The high-sensitivity optical head with a significantly reduced noise level enables the detection of subtle differences in physical property, which could not be observed using conventional optical heads due to relatively higher noises. The optional AFM Marking function makes it easy to observe the same location as the SEM[*4], contributing significantly to identifying the factors behind the subtle differences in physical property information.

3. Scalable and durable

The standard AFM100 model and the AFM100 Plus can both be upgraded to the AFM100 Pro. For example, you can start with the budget friendly AFM100, then upgrade to the AFM100 Pro later if you need a higher level of analysis. In addition, a self-checking function is included as standard, to ensure the reliability of the equipment for a long time.

Hitachi High-Tech will continue to provide innovative solutions like this product in a timely manner, while working on Observation, Measurement and Analysis to solve social issues together with our customers, as well as contributing to cutting-edge manufacturing.

*3 Nanometers: One nanometer = one millionth of a millimeter
*4 SEM: Scanning Electron Microscope

About AFM100 Pro

Item	AFM100 Pro
Detection system	Optical lever method high-frequency modulated LD (laser diode)
Cantilever excitation method	Photothermal excitation/piezoelectric excitation
Sample size	Up to ø35 mm, 10 mm thick (with optional extensions: up to 50 mm × 50 mm, 20 mm thick)
Scanning range	All selectable options (XY/Z): 20/1.5, 100/15, 150/5 (unit: μm)

About the AFM100 series

https://www.hitachi-hightech.com/jp/science/products/microscopes/afm/unit/afm100.html

- End -

About Hitachi High-Tech
Hitachi High-Tech, headquartered in Tokyo, Japan, is engaged in activities in a broad range of fields, including manufacture and sales of clinical analyzers, biotechnology products, and analytical instruments, semiconductor manufacturing equipment and analysis equipment. and providing high value-added solutions in fields of social & industrial infrastructures and mobility, etc. The company's consolidated revenues for FY 2021 were approx. JPY 576.8 billion [USD 5.1 billion]. For further information, visit http://www.hitachi-hightech.com/global/

Contact:
Electron Microscopes / Atomic force Microscopes Contact
https://www.hitachi-hightech.com/global/science/maintenance/inquiry.html

---

Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
