Scientific Instruments to the Future
As a leading supplier of Scientific Instruments, Angstrom Advanced has extensive experience in designing, manufacturing, building and installing a variety of Scientific Instruments; especially Ellipsometer, Atomic Force Microscope, Scanning Probe Microscope, Scanning Electron Microscope, Lab & Industrial Hydrogen, Nitrogen, Air Gas Generators, X-ray Diffractometer, ICP, ICP-MS, ICP-OES, ICP-AES, GC, HPLC, GC-MS, LC-MS, NMR, MRI etc.

Angstrom Advanced’s corporate headquarters are located in Massachusetts, USA. We have numerous partnerships and representatives in countries worldwide.
Angstrom Advanced instruments have been delivered to many renowned universities, research institutes and companies worldwide. Angstrom Advanced's goal is to supply the most accurate and sustainable scientific instrument upholding the highest standard of customer satisfaction. Below are some of our customers:

US Army Research Lab  
NASA  
Sandia National Laboratories  
NIST  
NRC-Canada  
Yale  
Stanford  

UC, Berkeley  
MIT  
UIUC  
Duke University  
University of Iceland  
Los Alamos National Labs  
Rice  

Honeywell  
Air Product  
CIBA Vision Corporation  
Lucent Technologies  
Sharp Microelectronics  
Hyundai
AA2000 Atomic Force Microscope

**High Performance**
- Atomic-scale of resolution
- Large sample size
- With a DSP inside for great performance
- Real time operating system embedded
- Fast Ethernet connection with computer

**Multi-Function**
- Atomic Force Microscope (AFM)
- Scanning Tunneling Microscope (STM)
- Lateral Force Microscope (LFM)

**Easy Operation**
- Fast automatically tip-engaging
- Simple change the tip holder to switch between STM and AFM

**Function**
- Atomic Force Microscope (AFM)
- Lateral Force Microscope (LFM)

**Resolution**
- AFM: 0.26nm lateral, 0.1nm vertical

**Technical**
- X-Y scan scope: ~10μm
- Parameters: Z distance: ~2μm
- Image Pixels: 128X128, 256X256, 512X512, 1024X1024
- Scan Angle: 0～360°
- Scan Rate: 0.1～100Hz

**Software**
AA3000 Scanning Probe Microscope is a very popular model. This unit is tailored toward research and industry applications, where the user can perform rapid and simple analysis. The detector is built directly into the base, eliminating the chance of damaging it through handling. AA3000 Scanning Probe Microscope is capable of performing contact mode, tapping mode, lateral force microscopy and scanning tunneling microscopy. The standard unit is equipped to view sample areas up to 10 micron by 10 micron. The system can be customized to measure larger areas. With a Digital Signal Processor (DSP) TMS320C642 inside the systems, AA3000 can handle complicated multi-functional tasks efficiently. A real-time operating system of SPM/DNA is embedded in AA3000 SPM system.

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AA5000 Multi-function SPM Systems

Features
- Multi-function: AFM, LFM, STM, Conductive AFM, MFM and EFM;
- Multi-Mode: Contacting Mode, Tapping Mode, Phase Imaging and Lifting Mode;
- SPM can be in liquid;
- Real-time temperature and humidity detecting;
- Nano-Processing and manipulating: Lithography Mode and Vector Scan Mode;
- Fast automatically tip-engaging
- Simply change the tip holder to switch between STM and AFM;
- Full digital control, auto system status recognition;
- Adjustable lighting inside.

Function
- Atomic Force Microscope (AFM) which has full coverage of Contacting Mode,
- Tapping Mode, Phase Imaging and Lifting Mode;
- Lateral Force Microscope (LFM);
- Scanning Tunneling Microscope (STM);
- Conductive AFM, SPM in liquid, Environmental Control SPM;
- Nano-Processing System including Lithography Mode and Vector Scan Mode;
Angstrom AA6000 is a portable, desktop SEM with high performance.

Features

- Field proven image quality
- Wide variety of optional instrument
- Resolution : 5.0 nm
- Magnification : ~10X-200,000X
- Acceleration Voltage: 0.6KeV ~ 30KeV
- Image Signal process: Search (320x240)/Inspection (640x480) Photo Mode (1280x960 ~ 4096x3072)
- SE Detector: High Sensitivity SE detector
- 5 Axis Stage Movement Stroke: X/Y/Z/=40/40/40mm Tilt: 0~60° Rotation=360°
- Control Rack: Windows; Serial communication: control data interface
Angstrom AA7000 SEM is a true multi-purpose, multi-user instrument. It excels in versatility and flexibility by combining high performance in all SEM modes & Particle counter with ease of operation in a multi-user materials research environment. This instrument has a perfect balance of stable configuration and an excellent resolution.

**Features**

- Field proven image quality
- Upgraded scan speed and pixel resolution.
- Wide variety of optional instrument
- Resolution: 3.0 nm
- Magnification: ~10X-300,000X
- Display: Photo 4096 X 4096
- Search: 640X480 30fps
- Options: BSE / WDS / EDS / EBSD / Etc.
- GUN & COLUMN
- Gun design for stable current supply
- Dual field objective lens for spherical
- Aberration reduction
- Movable aperture for beam centering
- Upgraded design of magnetic lens (CL/OL)
Angstrom Advanced AA8000 is a true multi-purpose, multi-user Scanning Electron Microscope (SEM). It excels in versatility and flexibility by combining high performance in all SEM modes & Particle counter with ease of operation in a multi-user material research environment. The AA8000 Scanning Electron Microscope features a perfect balance between stable configuration and an excellent resolution. The AA8000 Scanning Electron Microscope has state-of-art SEM technology. Its rock-solid reliability and fully automated control functions provide customer with the maximum analytical capability. Angstrom AA8000 SEM pursues compact SEM design which is great for office environment. Angstrom AA8000 SEM provides high scan speed and pixel resolution and high performance control driver with new PCI board. A full set of automated image adjustment functions make it easy for new users to quickly acquire crisp, noise-free images. Even experienced users will benefit from the automated contrast, brightness and focus.
ADX-2500 X-ray Diffraction Instrument

- **Data Processing Software**
  General diffraction data processing: automatic peak search, manual peak search, integral intensity, separation of Kα1、α2, background remove, pattern smoothing and magnifying, multiple plot, three-dimensional plot and simulation of XRD pattern et al.

- **Qualitative Analysis**
  The data processing software has the search and match function on the base of whole profile and diffraction angle. The whole profile matching procedure employs the designed mode to do the qualitative analysis by reducing the search range from major, minor, to micro phase without indicating the diffraction angle. The diffraction angle matching procedure is based on the peaks position and intensity and usually used for the qualitative analysis of the data with large angle error.

Perfect incorporation of the hardware and software system, for the needs of researchers from various fields; High precision of the diffraction angle measurement system to obtain the more accuracy of the data; Higher stability of the X-ray generator controlling system provides excellent repeatable measurement accuracy; Programmed operate and incorporated design, convenient for operation and the apparentness looks handsome.
ADX-2700 0-0 Powder X-ray Diffraction Instrument

- **ADX-DWZ** Combination of Eulerian cradle for stress and texture investigations, Thin film and Quantity Analysis attachment with control and analysis software with alignment-free feature.

- **ADCX** Sample changer is compact and rugged. Integrated spinning improves particle statistics in polycrystalline sample measurements. Fully automatic alignment.

ADX-2700 0-0 Powder X-ray Diffraction Instrument is multi-function Diffractometer with exceptional analysis speed, reliability and reproducibility. The ADX2700 has unique designed features for the challenges of modern materials research, where the lifetime of a Diffractometer is considerably longer than the horizon of any research project. Every main components are fresh and powerful.
ADX-8000 mini θ-θ Powder X-ray Diffraction Instrument is a multi-function desktop diffractometer with exceptional analysis speed, reliability and reproducibility. The ADX-8000 has been uniquely designed for the challenges of modern materials research, where the lifetime of a diffractometer is considerably longer than the horizon of any research project. Components are top of the line and provide for a powerful system.

**Features**

- Smaller size but same performance level as ADX-2700
- High precision of the diffraction angle measurement allows ADX-8000 to obtain more accurate data;
- Higher stability of the X-ray generator control system provides excellent measurement accuracy;
- Simple and effective design makes ADX-8000 convenient for operation and user friendly.
Technical Performance and Specifications

• The elements can be analyzed from the sodium (Na) to uranium (U).
• Analysis range of the content of elements is from 0.07 ppm to 99.999%.
• Testing time: 60-300s.
• The measurement repeatability can reach 0.01% for total intensity of fluorescence.
• The measurement repeatability can reach 0.05% for total intensity of fluorescence under the condition that the content is above 97%.
• Energy resolution: 130± 5eV (Ordinary).
• Multi-variable non-linear regression procedure.
• Thermo Electric Cooling Method; No Requires LN2

The ADX9800D originates from the concept of accuracy, rapidness, non-destructiveness, intuitively and environmentally friendly design.
Angstrom Product Lines

AA 800/900 Handheld Alloy/Mineral XRF Analyzer

Performance
• Small, light and easy to carry. High-speed processing chip, advanced algorithm and high-responsive software, resulting in even faster analysis.
• High-performance X-ray Tube, Ultra-high Resolution Detector combined with Digital Multi-channel Processing Technology, yielding super-high detection resolution.
• Industrial resistive touch screen, superior to capacitor screen in back-light and clearer against sunlight in the field.
• AA Handheld XRF adjusts air pressure factor automatically based on altitude it has detected. This function increases excitation effect of light elements by 40% and that of rare earth elements by 30%.

Safety
• Radiation Tested – Double Layer Lead Coating for prevention of X-ray Leakage
• Self-contained password manager mode.
• Waterproof, dust-proof and shockproof suitcase
• CE Certified/ISO9001 Certified
AAP-300 Heavy Metals Analyzer is composed of main unit, Colorimeter cell components, colorimetric tube components, and it is a small-sized portable fast measuring apparatus, which features fast measuring speed, small in size, light in weight and easy to carry, making the handheld operation convenient. This apparatus can not only be used under the laboratory environment but also be adopted as a special instrument for outdoor environment measurement as well as site real-time detection. With functions of heavy metal detection and photometric measurement etc., this apparatus is equipped with user-friendly heavy metal detection software with automatic calculation, curve fitting function. It can clearly show the testing data includes absorbance value, concentration value and etc.

Testing Range (more elements available per request)

<table>
<thead>
<tr>
<th>No.</th>
<th>Element</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hg</td>
<td>2.00~40.0 μg/L</td>
</tr>
<tr>
<td>2</td>
<td>Pb</td>
<td>0.01~1.00 mg/L</td>
</tr>
<tr>
<td>3</td>
<td>Cr</td>
<td>0.5~10.00 mg/L</td>
</tr>
<tr>
<td>4</td>
<td>Cd</td>
<td>0.10~5.0 mg/L</td>
</tr>
<tr>
<td>5</td>
<td>As</td>
<td>0.006~0.5 mg/L</td>
</tr>
<tr>
<td>6</td>
<td>Cu</td>
<td>0.05~1.00 mg/L</td>
</tr>
<tr>
<td>7</td>
<td>Zu</td>
<td>0.05~3.00 mg/L</td>
</tr>
</tbody>
</table>
Angstrom Product Lines

UV-VIS-IR Spectrophotometers

- **Model 22 UV/VIS Spectrophotometer**
  - UV/VIS Single Beam Spectrophotometer
  - 340-1000nm Wavelength
  - Ideal for Educational Application and Routine Lab Work

- **Model 752S UV/VIS Spectrophotometer**
  - UV/VIS Single Beam Spectrophotometer
  - Hamamatsu Deuterium Lamp
  - 200-960nm Wavelength

- **Model Gold 54 UV/VIS Scanning Spectrophotometer**
  - UV/VIS Scanning Spectrophotometer
  - Computer Controlled Operation
  - 200-1000nm Wavelength
  - Hamamatsu Deuterium Lamp

- **Model UV1900 Double Beam UV/VI Spectrophotometer**
  - UV/VIS Double Beam Scanning Spectrophotometer
  - Computer Controlled Operation
  - 190-1100nm Wavelength
Angstrom Product Lines

Portable Raman Spectrophotometers

- Model RM-1000/2000 Portable Raman Spectrometer
  - Linear CCD with TEC cooling
  - Low noise circuit
  - Powerful embedded software
  - Fluorescent background eliminate
  - 10.1" LCD
  - Friendly HMI
  - 200-1100 nm
  - IP67 case

- Model RM-6000 Portable Handheld Raman Spectrometer
  - Linear CCD with TEC cooling
  - Low noise circuit
  - Powerful embedded software
  - Fluorescent background eliminate
  - Peak searching and indicating
  - Android Operation System
  - 200-1100 nm
  - Wi-Fi or USB 2.0
Inductively Coupled Plasma Spectrometer (ICP)

**Atomic Emission Spectrometer**
Model ICP-1000 (ICP-AES)

**Features**
- Over 70 elements can be measured
- Fast analysis, more than 10 elements per minute
- Excellent detection limits, at ppb level for most elements
- Wide linear dynamic range, reaching 6 orders of magnitude, from ppb to percentage

**Application**
Rare earth metal, Silicon materials, Magnetic materials processing industry, Metallurgical industry, Geology, Mineral, Petrochemical, Pharmacy, Hygiene, Agriculture, Environmental protection, Commodities and Food industry.

Optical Emission Spectrometer
Model ICP-3000 (ICP-OES)
Angstrom Product Lines

Atomic Absorption Spectrophotometer (AAS)

Model AAS320

Features:
• Completely controlled by PC, can flexibly select the flame and graphite furnace atomizer (optional).
• Integrated floated optical platform design improves the optical system shock resistance stable.
• Eight light stands can be changed automatically and preheat the eight lights meantime as well as optimize the working condition of the hollow cathode lamp.
• Position adjusting: the flame burner can be set on the best position automatically.
• Fully automated wavelength scanning and peak searching.
• Complete safety chains protection equipment: warning and automatic safety protection for the wrong burner connection, leakage of the gas, under voltage of air and the abnormal flameout.

Model AAS500
Angstrom Product Lines
Gas/Liquid Chromatograph

**GC8000 Gas Chromatograph**

**Features:**
- Brand-new designed microcomputer temperature control system of world advanced control technology.
- Control and operating parameters set up by the keyboard. Self-diagnosis system, power-fail protection, file storage and call, limited temperature setting.
- Four paths of independent control sections: column oven, sample injector, detector and thermal conductive pond.
- 5-ramp programmed temperature control.

**HPLC500 Liquid Chromatograph**

- System is under fully automated digital intelligent computer control
- In-parallel connected pumps with reciprocating double plungers improve the stability and dependability and prolong the service life.
- Its appearance is novel, and its operation is quite convenient and simply and fully incarnates the design of humanization.
- Every performance index is excellent and is competent to match popular fellow products abroad.
Angstrom Product Lines
Mass Spectrometer

Inductively Coupled Plasma
Mass Spectrometer
Model ICP-MS300A

Features:
• Quick analysis speed, simple operation, high response rate, low background noise, good interference elimination, and easy maintenance.
• One Click plasma setting makes plasma optimizing more convenient and has excellent reproducibility.
• It has a special Activity connector structure, by which you can replace, install, and dismantle sampling cone and skimmer cone in empty space, making daily maintenance convenient.
• The efficiency of transmission and interference elimination capability of polyatomic ion, is improved by using the hexapole collision cell.

• Electronic pressure/flow control system (EPC/EFC) on GCMS-8000A improves baseline stability and sensitivity.
• EI filaments provide high efficiency of electron emission.
• High quality vacuum system combined with high energy dynode (HED).
• Electron multiplier (EM) offer magnificent sensitivity
• High performance-to-price ratio, low maintenance, long term stable industry or lab use.

Gas Chromatography
Mass Spectrometer
Model GCMS-8000A
Angstrom Product Lines

Gas Generator

- **HGH-300 and HGH-500** high purity hydrogen generators are based on the technology of astronautic fuel cells, in which hydrogen is produced by the electrolysis of water, and the produced oxygen is released into the atmosphere.

- **HGN-300 & HGN-500** nitrogen gas generators utilize theories of physical adsorption and electrochemical separation and use rare metal as catalytic agent. The instrument can directly extract highly pure (as high as 99.999%) nitrogen from the air. There is no need of deoxidation. The generators are compact and advanced in technology. They are very suitable for gas chromatographs and micro coulomb meters.

- **Model GNA-300 (500)** combined nitrogen and air generator is an organic combination of nitrogen generator and air generator. It generates high purity nitrogen and pure air simultaneously and has the same advantages as HGN and HYA generators. Suitable for use with gas chromatograph.
Angstrom Product Lines

Gas Generator

• **HGH3000/5000 Hydrogen Generator**: HGH5000 has been designed to supply the highest purified hydrogen and it meets high levels of expectations in the demanding markets. The internal mechanisms that run this generator are integrated with the latest electrolytic cell technology, using stainless steel alloy as its hard body. The new ergonomic design and user-friendly interface have been modified for comfort and reliability for the consumer.

• **HYA-2L (5L) and HYA-10L (20L) Air generator**: The gas route system adopts two levels of pressure stabilizers and over-pressure protectors to improve the stability of gas flow and ensure the safety and reliability of the gas production.

• **GHA-300/500 Combined Hydrogen and Air Generator**: GHA-series generator combines the two with great quality and user-friendly design. It is a perfect combination of safety, convenience and reliability, featuring advanced technique and stable performance.
**MRI-100 Magnetic Resonance Imaging (MRI)** provides high contrast images and accurate messages in vivo intuitively, equipped with permanent magnet. As a powerful and non-destructive Magnetic Resonance Imaging instrument, the MRI-100 MRI is widely used in life sciences to study tissue structure in vivo and their contrast message dispense with low maintenance cost.

**MRI-300 Magnetic Resonance Imaging MRI** is specially designed for living animal’s observation. The MRI-300 Magnetic Resonance Imaging provides high contrast images and accurate messages in vivo intuitively, equipped with permanent magnet. As a powerful and non-destructive Magnetic Resonance Imaging (MRI) instrument, the MRI-300 Magnetic Resonance Imaging is widely used in life sciences to study tissue structure in vivo and their contrast message dispense...
Nuclear Magnetic Resonance system is for routine high resolution Proton/Carbon Nuclear Magnetic Resonance analysis (NMR analysis) in the field of academic teaching as well as for routine chemical and pharmaceutical applications.

- **NRM-600: H Spectrum/P Spectrum**

  *Applications*
  - Structural Elucidation of organic molecules
  - Chemical Shift
  - Small division from J-J coupling
  - Teaching of the fundamentals of Nuclear Magnetic Resonance (NMR) and of advanced Nuclear Magnetic Resonance (NMR) techniques

- **NRM-900: H Spectrum/C Spectrum**
Angstrom Product Lines

**Ellipsometer**

- **PHE101 Discrete Wavelength**: is an ideal discrete wavelength ellipsometer designed for measuring the refractive index and thickness of single and multi-layer films. The PHE101 ellipsometer takes quick and accurate readings due to its precision optical analyzer/detector and its stable mechanical design. The standard wavelength of PHE101 ellipsometer is HeNe laser at 632.8nm. However, the wavelength can be selected from 543nm, 594nm, 612nm, 633nm to 1150nm. Infrared sources at 0.83, 1.31 and 1.52 mm are also available.

- **PhE101S Variable Angle Discrete Wavelength**: is a high speed discrete wavelength ellipsometer designed for measuring the refractive index and thickness of single and multi-layer films with up to 9 layers. The PhE101S takes quick and accurate readings due to its precision optical analyzer/detector and its stable mechanical design.

- **PHE101M Multi-Wavelength**: is an ideal discrete wavelength ellipsometer for measuring the refractive index and thickness of single and multi-layer films at several wavelengths. It has the widest variable angle (10-90°) which is adjustable in steps of 5°, with an accuracy of 0.01°. The PHE101 ellipsometry software is prepared for material library with predetermined measurement parameters allowing the operator to select an application and quickly execute measurement.
Angstrom Product Lines

Ellipsometer

- **PHE 102 Spectroscopic**: is a variable angle spectroscopic ellipsometer operating in the spectral range 250 - 1100nm, 250-1700nm or 250-2100nm. Two technical concepts are available for the PHE-102
  - uses a photo-diode array (or CCD) as a detector.
  - uses instead of the photo-diode array a monochromator for wavelength selection

- **PHE 103 UV/VIS NIR Spectroscopic**: is a new model which adds the Transmission and Variable Angle Reflection function. This variable angle spectroscopic ellipsometer operating in the spectral range 250 - 1100nm or 250-1700nm or 250-2100nm. The spectral dependence of the refractive index, dielectric constants of the materials and other parameters under measurement are determined by comparing the measured data to a theoretical model, which defines the layer structure in detail

- **PhE104 Infrared Spectroscopic**: NS-IRSE infrared spectroscopic ellipsometer is a unique infrared spectroscopic ellipsometer instrument based on monochromator-dispersion. Infrared ellipsometry is a great new technology that proves invaluable to solid states and chemistry fields. It can be used on any substrate and offers high sensitivity on thin films down to surface passivation layers.
Service

- We have built our reputation on the quality of service that we offer our customers. All members of our service team are experienced and factory trained to handle installations and provide after sales support. We are committed to providing quality service to ensure that users get the most from their instruments.

- Our after sales teams are dedicated to delivering the highest levels of technical support and customer service, as well as maintenance to keep your instruments and equipment at optimal performance.

- With Angstrom Service and support team of highly qualified, factory trained staff, we can assist you with all of your service and application questions.
Dear Customers,

At Angstrom Advanced Inc., we are committed to placing our customers first by combining quality products with the latest technology to ensure top performance and flawless results with every style. Add our knowledgeable staff and supporting engineered Manufacturing and specifications, and you will find Angstrom Advanced Inc. backing up this commitment. As we continue to grow, we look forward to confidently supporting our customers needs and ideas today and throughout the future.

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