Lattice Series

High-Power X-ray

INTRODUCTION

"Crystal Clear Precision"

The **Lattice Series** redefines benchtop X-ray diffraction by combining high-power performance with compact design. Equipped with a powerful 600 W (**Lattice Mini**) or 1600 W X-ray source and a high-efficiency, direct-read 2D photon detector, the Lattice Series delivers exceptional data intensity and accuracy—making it ideal for demanding analytical environments.

Available in three configurations—**Lattice Mini**, **Lattice Basic**, and **Lattice Pro**—this series accommodates a wide range of technical and budgetary needs, from simple phase identification to complex in-situ studies. All models offer excellent signal-to-noise ratio and fast scan speeds, providing lab-grade data from a desktop system.

Whether you're analyzing complex powders, crystalline materials, or conducting high-throughput measurements, the Lattice Series provides lab-grade results with speed, power, and precision—all in a desktop footprint.

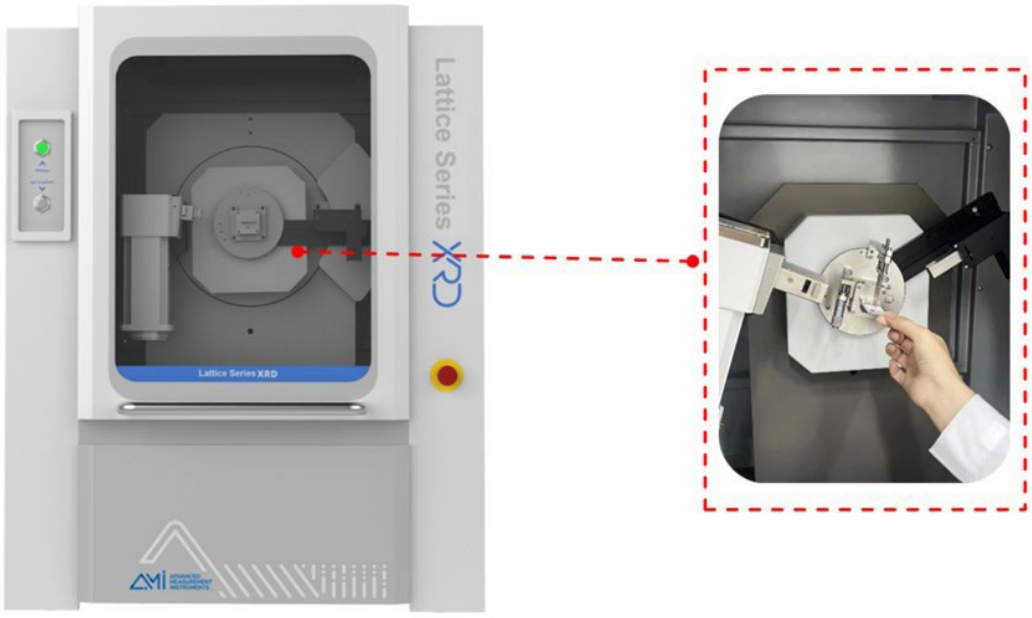


Figure 1 Lattice Series Instrument

133 East Main Street, Twin Lakes, WI 53181• 262-877-3600 (Voice)• 262-877-3699 (Fax)
Email: sales@ami-instruments.com
Visit our Website: www.ami-intsruments.com

MODEL SERIES

The Lattice Mini is the ideal entry point for high-quality X-ray diffraction. Designed for users who need reliable phase identification and material characterization in a truly space-saving format, the Lattice Mini delivers powerful performance in a compact, affordable package.

Ideal for:
- University and teaching laboratories
- Small research groups
- Routine QA/QC in ceramics, metals, and minerals
- Rapid phase screening and basic material studies

The Lattice Basic is designed for laboratories that require dependable, high-throughput diffraction without the complexity of advanced custom configurations. With high angular resolution and a direct-read 2D photon detector, the Lattice Basic delivers fast, accurate results across a wide range of powder samples. It's an excellent choice for users who prioritize precision, speed, and reliability—at an efficient price point.

Ideal for:
- QA/QC labs
- Materials characterization
- Educational and institutional research
- Cement, ceramics, metals, and pharmaceuticals

The Lattice Pro is built for the most demanding applications. Featuring Theta–Theta geometry for enhanced sample stability and accessory support, it enables precise, high-performance analysis for advanced materials, coatings, and stress testing.

Ideal for:
- Advanced R&D environments
- Dynamic experiments
- Residual stress analysis
- Film, coating, and thin-layer characterization
- Battery and energy materials research

KEY FEATURES

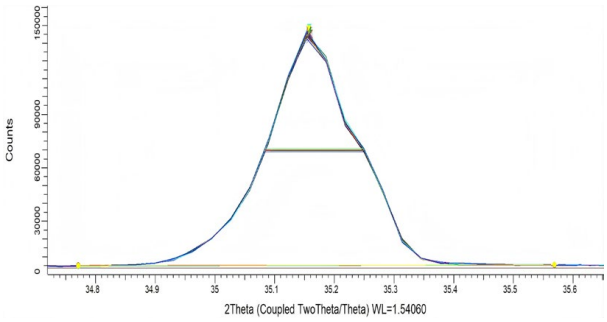
- **High-Power X-ray Source**
  Choose between 600 W or 1600 W configurations for high-intensity data collection and rapid scanning.
- **2D Photon Direct-Read Detector**
  A 256 × 256 pixel array captures sharp, high-resolution diffraction patterns with an excellent signal-to-noise ratio.
- **Exceptional Angular Accuracy**
  Achieve angular accuracy as small as ±0.01° 2θ and ensure a consistent peak matching with standard reference materials.
- **Flexible Goniometer Options**
  Theta–2Theta geometry for standard analysis (Mini & Basic) or Theta–Theta for enhanced sample stability (Pro).
- **Fast, Reliable Scanning**
  Obtain full-spectrum data in minutes—ideal for routine QA and high-throughput labs.
- **Compact Benchtop Design**
  Fits seamlessly into modern lab environments without sacrificing performance or requiring floor space.
- **Expandable Functionality** *(Lattice Pro)*
  Supports advanced modules for residual stress testing, high-temperature stages, in-situ battery studies, and thin film analysis.
- **User-Friendly Operation**
  Intuitive software and streamlined hardware design simplify training and daily use.

PERFORMANCE EXAMPLES

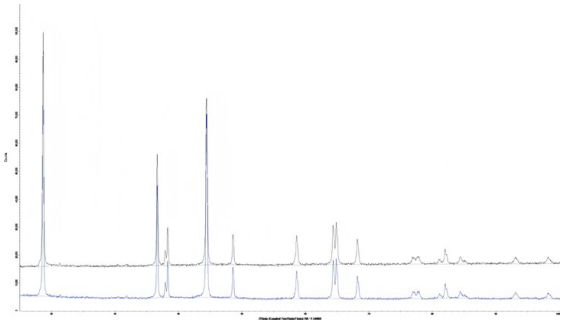
The Lattice Series is not only powerful on paper—it delivers real-world results across a wide range of materials and industries. From standard reference materials to advanced composites, its high data intensity, precision, and repeatability ensure confidence in every scan. Whether you're measuring graphitization, stress, crystallinity, or phase content, the Lattice Series offers reliable performance backed by quantitative results.

Miller Indices	Theoretical Peak Position	Measured Peak Position	Difference
012	25.579	25.577	0.0020
104	35.153	35.15	0.0030
116	57.497	57.497	0.0000
1010	76.871	76.872	0.0010
0210	88.997	88.996	-0.0010
0114	116.612	116.61	-0.0020

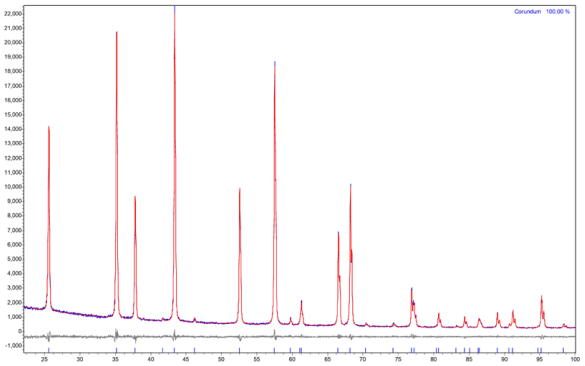
Comparison of Theoretical Peak Positions and Measured Peak Positions for Corundum Standard Sample



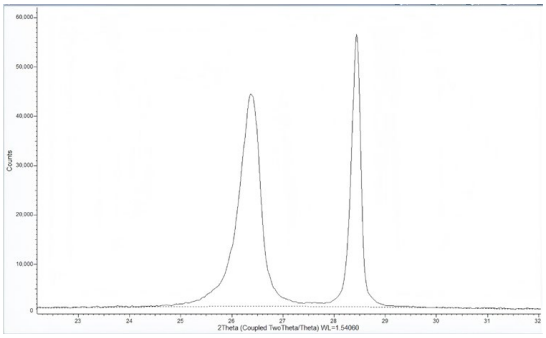
Instrument Repeatability Measurement



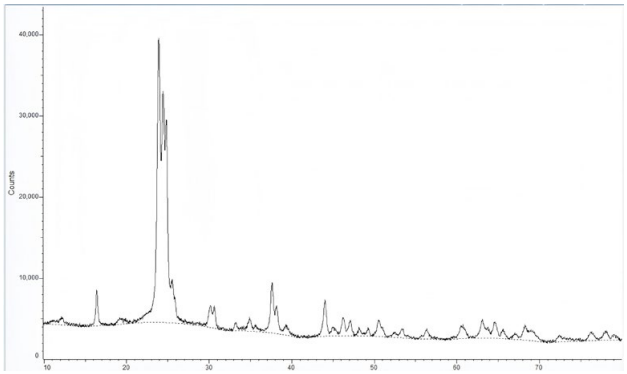
XRD Spectrum of Ternary Materials Black represents regular measurement mode data and blue represents fluorescence-free mode data.



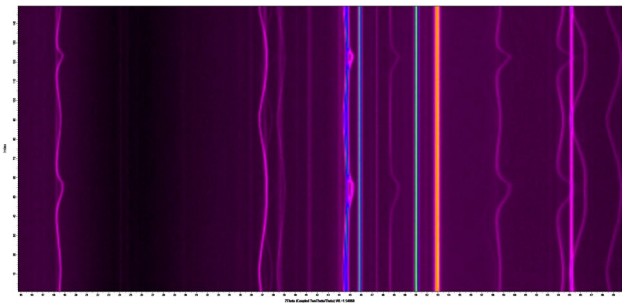
Test Data for Corundum Powder



Graphitization Degree Measurement



GID Scan Spectrum of 20 nm ITO Glass



Reflective In-Situ Battery Measurements

TECHNICAL PARAMETERS

Model	Lattice Mini	Lattice Basic	Lattice Pro
X-ray tube	600 W	1600 W	
X-ray tube target material	Standard Cu target, Co target is optional		
Goniometer	Theta / 2theta geometry, the radius of the goniometer is 158 mm	Theta / 2theta geometry, the radius of the goniometer is 170 mm	Theta / theta geometry, the radius of the goniometer is 170 mm
Maximum scanning range	-3 - 156°		
Theta Minimum step size	±0.01°		
Detector	Photon direct-read two-dimensional array detector		
Detector energy resolution	0.2		
Volume and Weight	L 25.6 in (650 mm) × W 19.7 in (500 mm) × H 15.8 in (400 mm), 132 lbs (60 kg)	L 35.5 in (900 mm) × W 26.8 in (680 mm) × H 21.7 in (500 mm), 220 lbs (100 kg)	
Sample stage	Standard chip stage		
Options	N/A	Five-bit injector; In situ battery test accessories;	Five-bit injector; In situ battery test accessories; High temperature sample station: can be customized according to customer requirements, e.g., RT-600°C/RT-1000°C; Residual stress measuring fixture (can be customized); Film sample stage: Size: 2.4 in (60mm) × 2.4 in (60mm) (can be customized)