

Lattice GO

Portable X-ray Diffractometer

INTRODUCTION

“Diffraction Without Limits”

The **Lattice GO** redefines portable X-ray diffraction, delivering laboratory-grade performance in a compact, lightweight system. Designed for versatility, it integrates a specialized X-ray source, Bragg-Brentano diffraction geometry, and an advanced 2D array detector to generate high-quality XRD spectra in minutes.

Optimized for field research, on-site quality control, and space-constrained laboratories, the **Lattice GO** provides high-intensity data with exceptional angular precision, rivaling traditional benchtop systems. Its rugged construction, rapid scanning capability, and user-friendly operation ensure reliable results in any environment.

With the **Lattice GO**, high-resolution diffraction is no longer confined to the lab—bringing powerful material analysis wherever it's needed.

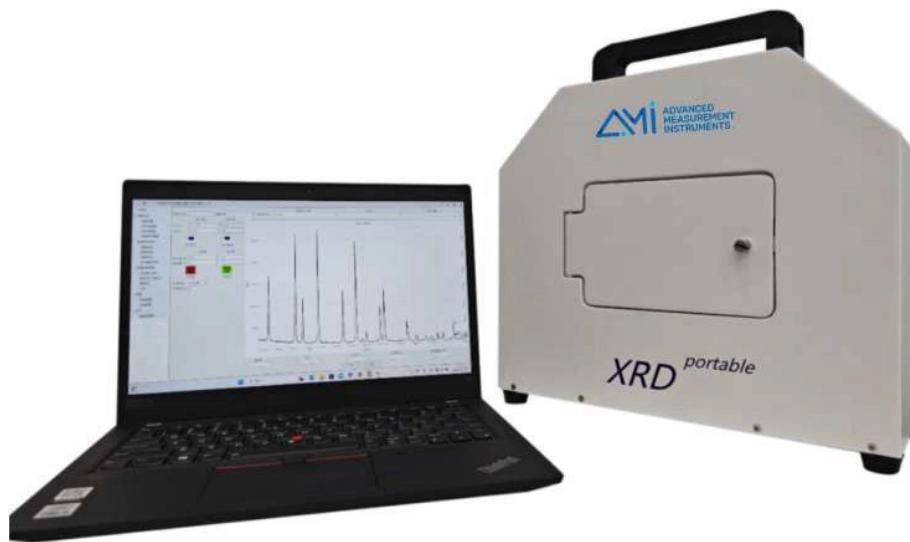


Figure 1: Instrument Setup for the **Lattice GO**

KEY FEATURES

- **Compact and Portable Design**

A lightweight, space-efficient system suitable for benchtop use or field deployment, making it ideal for laboratories with limited space or on-site analysis.

- **Rapid, In-Situ XRD Analysis**

Enables immediate diffraction measurements following material synthesis, facilitating real-time screening and informed decision-making.

- **Laboratory-Grade Data Quality**

Delivers high-intensity diffraction patterns with angular precision comparable to full-scale laboratory diffractometers.

- **Bragg-Brentano Diffraction Geometry**

A proven configuration for accurate and reproducible powder diffraction analysis, ensuring high data reliability.

- **Advanced X-ray Source**

Optimized for enhanced signal stability and consistent performance across diverse sample types.

- **High-Resolution 2D Array Detector**

Provides rapid data acquisition with broad angular coverage, capturing high-fidelity diffraction patterns with excellent signal-to-noise ratio.

- **Optimized Analytical Workflow**

Enables efficient sample pre-screening, reducing the need for external testing and improving overall analytical throughput.

SPECIFICATIONS

X-ray tube	30 W, 30 kV / 1 mA
X-ray tube target material	Cu
Goniometer	Theta / 2theta geometry, the radius of the goniometer is 110 mm
Detector	Photon direct-read two-dimensional array detector
Maximum scanning range	0° - 130°
2Theta Minimum step size	±0.01°
Measure speed	Two speeds available: 6°/min and 12°/min
Battery Runtime	3 hours
Volume and Weight	L 4.8 in (120 mm) × W 11.9 in (300 mm) × H 11.9 in (300 mm), 26.5 lbs (12 kg)

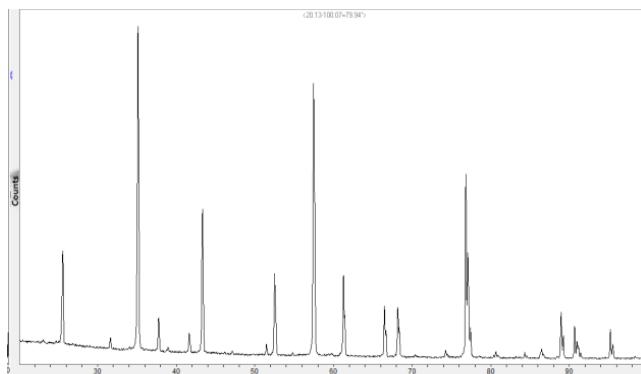


Figure 2: Ruby Standard Sample (NIST1976)

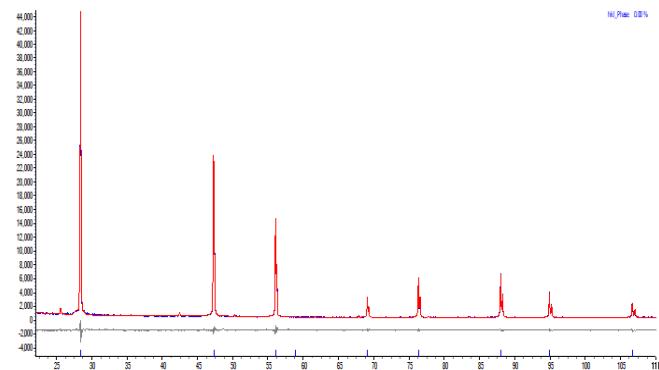


Figure 3: Silicon Powder Measurement Data and Rietveld Structure Refinement

APPLICATIONS

Mineral Industry:

The **Lattice GO** portable X-ray diffractometer is becoming an essential tool for geological exploration teams, providing rapid, reliable analysis directly in the field. Its ability to perform real-time phase identification and quantitative analysis empowers geologists to make faster, more informed decisions.

- **On-Site Mineral Analysis**

Qualitative and quantitative identification of mineral phases to support mineralogical research and exploration.

- **Geological Feature Evaluation**

Analyze surrounding rock structures in mineralization zones to understand ore genesis and mineral distribution.

- **Process Optimization**

Identify ore formation mechanisms and determine appropriate mining, beneficiation, refining, and smelting methods.

- **Core Logging Support**

Detect fine-grained fragments, complex lithologies, and subtle mineral changes to guide drilling and stratigraphic interpretation.

- **Rapid Ore Quality Assessment**

Conduct fast, quantitative mineral content analysis on-site to inform mineral trading and field decisions.

- **Urban Resource Recovery**

Identify and quantify mineral content from recycled materials for effective urban mining and resource reuse.

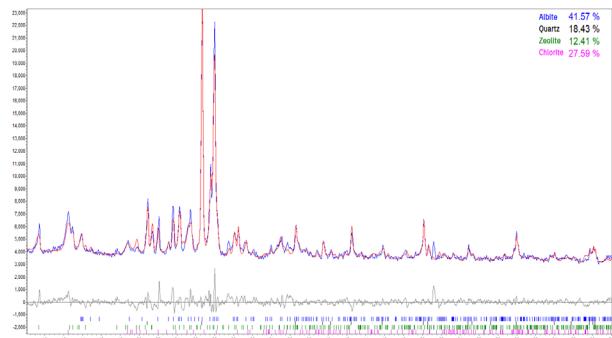


Figure 4: Sandstone Sample Diffraction Pattern and Standard-Free Quantitative Analysis

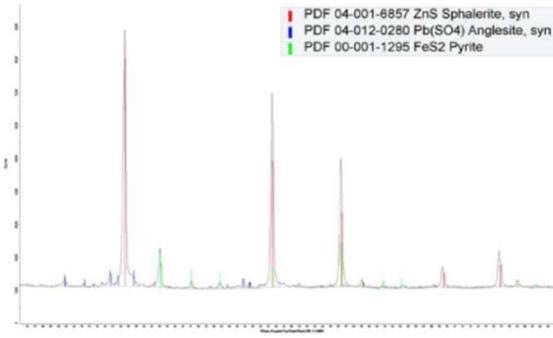


Figure 5: Zinc Concentrate Diffraction Pattern and Qualitative Analysis

Cultural Heritage:

The **Lattice GO** enables non-destructive, on-site analysis of culturally significant materials, making it an invaluable tool for conservation scientists, archaeologists, and museums. Its precision and portability support preservation, research, and authentication of priceless artifacts.

- **Phase Analysis of Artifact Materials**

Identify crystalline phases in bronzeware, ironware, ceramics, pigments, and mural base layers.

- **Corrosion and Weathering Studies**

Analyze corrosion products and weathering layers to understand degradation mechanisms and guide conservation strategies.

- **Restoration and Preservation**

Assist in development of preservation techniques for murals, stone relics, and metal artifacts through material characterization.

- **Provenance Studies**

Determine the geographic origin and production techniques of cultural relics using mineralogical fingerprinting.

- **Authentication and Anti-Counterfeiting**

Verify authenticity of artifacts by comparing structural signatures to known references.

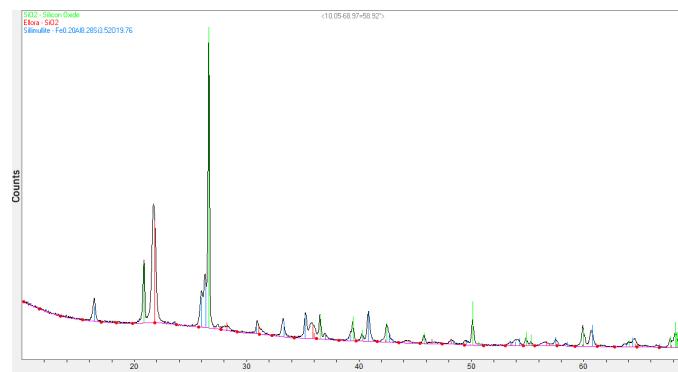


Figure 6: Ancient Ceramic Fragment Diffraction Data and Qualitative Analysis

Security and Drug Safety:

The **Lattice GO** brings advanced, non-destructive XRD capabilities to law enforcement and forensic science, enabling rapid, on-site analysis with minimal sample preparation. Delivering real-time results, it supports fast, accurate decision-making in critical situations.

- **On-Site Drug Identification**

Perform rapid, non-destructive qualitative and quantitative phase analysis of narcotics, new psychoactive substances (NPS), and precursor materials.

- **Criminal Investigation Support**

Identify and characterize controlled substances in the field to aid forensic investigations and track drug trafficking routes and sources.

- **Non-Destructive Forensic Testing**

Preserve sample integrity while obtaining precise, high-resolution diffraction data for reliable forensic analysis.

- **Drug and Substance Characterization**

Conduct on-site qualitative and quantitative analysis of illicit drugs, counterfeit pharmaceuticals, and precursor materials for trafficking detection and source attribution.

- **Trace Evidence Analysis**

Detect and classify trace compounds such as cyanide, organic contaminants, paper fillers, toxic additives, and soil or mineral fragments from crime scenes or stolen cultural relics.

- **Security Screening at High-Risk Locations**

Rapidly identify illicit substances, explosives, and hazardous materials at border checkpoints, airports, train stations, and public venues.

- **Explosives and Contaminant Detection**

Analyze explosive compounds and their decomposition residues, as well as adulterants such as talcum powder and borax in consumer goods and food products.

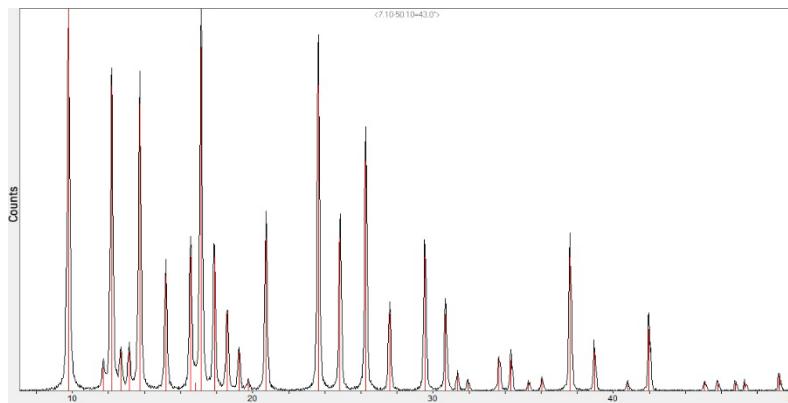


Figure 7: Heroin Hydrochloride XRD Pattern

ABOUT US

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Innovation Within Reach



MISSION

At AMI, our mission is to advance the world of materials characterization by providing cutting-edge analytical instruments that empower customers in commercial and research fields.