SciAps

Technology Overview
New technology creates novel opportunities for portable XRF

Handheld XRF continues to reinvent itself—proving that with bold engineering, even mature technologies can unlock entirely new scientific frontiers. SciAps has led this transformation, delivering breakthroughs that expand what XRF can detect, where it can be used, and how fast operators can get dependable results.

Re-engineering XRF for Modern Industry For years, handheld XRF struggled with one major limitation: fast, accurate magnesium analysis in aluminum alloys. SciAps changed that. By introducing more powerful X-ray tubes, advanced geometry, and patented algorithms, operators could suddenly measure magnesium down to 0.25% in just two seconds—and separate alloys like 2024/2014 or 3003/3004/3005 with ease. This was more than an incremental step—it made handheld aluminum sorting economically viable for the first time.

Fabricators, inspection companies, pipeline manufacturers, and scrap recyclers quickly benefited from faster throughput, improved accuracy, reduced device weight, sleeker designs, and intuitive Android-based software that fully integrated connectivity, data management, and reporting. Compliance testing—RoHS, Halogen Free, CPSIA, lead paint, and more—became faster and simpler across the board.

Innovation Powered by Customer Voice One of the most important catalysts for SciAps innovation is listening to the people who use the analyzers every day. Field operators, geologists, scrap processors, inspectors, and researchers continuously share what they need: faster results, lighter instruments, better REE performance, improved soil detection, more intuitive workflows, or new analytical capabilities altogether.

SciAps builds those requests directly into its engineering roadmap.

- New calibrations emerge because miners and geochemists asked for them.
- New tube capabilities were developed because recyclers needed faster aluminum identification and better precision.
- Interface and connectivity upgrades came from customer feedback on speed and data management.

XRF meets the green economy—delivering reliable detection of both light and heavy rare earth elements, from early exploration through processing and compliance.

This ongoing dialogue ensures that every generation of handheld XRF is not just more powerful—but more practical, more usable, and more aligned with real-world demands.

The Rise of High-Energy XRF: 55 kV to 80 kV

SciAps continued pushing boundaries with the world's first 55 kV handheld XRF, transforming soil testing, mining, and metals analysis. Higher X-ray energy delivered:

- Superior limits of detection across RCRA and EPA metals
- 2× better cadmium detection in soils
- Dramatically improved precision for silver, tin, barium, antimony, and other priority pollutant metals
- True field-portable detection of light REEs and the first heavy REEs, including gadolinium and europium, plus ultra-sensitive yttrium analysis

These advancements positioned handheld XRF as a strategic tool for the green economy, especially in rare-earth exploration, battery manufacturing, recycling, and compliance.

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Introducing the SciAps PowerHouse: 80 kV for REEs
Now SciAps has taken handheld XRF into entirely new territory with the PowerHouse REE benchtop analyzer, powered by an 80 kV X-ray tube—the most energetic tube ever deployed in a portable instrument.

This leap in power opens the door to:

- Full-range REE analysis, including heavy REEs previously difficult or impossible for handheld XRF
- Higher-energy emission lines for clearer spectral separation
- Sensitivity and precision approaching benchtop systems, but in a true field-ready device

With 80 kV behind it, the PowerHouse represents the next era of REE exploration and processing—portable, rugged, and unmatched in capability.

X-550 Geochem: The High-Performance, All-Around Geo Analyzer
The X-550 Geochem is SciAps' most versatile and high-performance geochemistry analyzer—built for everything from early exploration to advanced mineral processing. Now enhanced with:

- Full-spectrum elemental capability, from light elements like Mg, Al, Si up through light REEs
- A high-speed detector and advanced geochem calibrations optimized for mining and exploration
- Optional cooling fans designed for extreme heat and the most punishing duty cycles in the field
- Rugged construction and ultra-fast acquisition speeds tailored for real-time geological decision-making

From pathfinder elements to REE-bearing ores, the X-550 Geochem is designed for geologists who demand speed, stability, and uncompromising performance in any environment.

Advancing Lead Paint Analysis with HUD-Approved Technology
One of the strongest examples of innovation driven by real-world needs is SciAps' leadership in lead paint inspection. While many handheld devices rely on radioactive isotopes, SciAps created a tube-based Pb Analyzer that is fully approved by HUD—giving housing authorities, inspectors, and environmental professionals a safer, more practical analyzer with exceptional performance.

Key advantages of the SciAps Pb Analyzer include:

- The only commercially available tube-based XRF for HUD Pb Paint accepted for all 3 levels in the US
- No isotope decay, no source replacement, and no radioactive storage or licensing
- Fast, accurate, field-proven measurement of lead in paint on wood, plaster, metal, concrete, and other building materials
- Modernized workflow with Android OS, cloud connectivity, and simplified data management
- Ideal for housing inspections, abatement verification, and environmental health programs

This innovation exemplifies how SciAps reimagines traditional XRF applications—bringing safer, more capable, and easier-to-use technology to high-impact public health and environmental work.

A New Era for Handheld XRF with innovations such as:

- Ultra-fast Mg/Si/aluminum alloy analysis
- High-energy systems at 55 kV and now 80 kV
- Customer-driven engineering evolution
- Purpose-built analyzers like the X-550 Geochem and Pb Analyzer
- And the unprecedented PowerHouse for REEs

SciAps continues to reshape what handheld XRF can achieve—opening new possibilities across mining, scrap, environmental science, rare earths, and the green economy.

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