



"... any element, any compound, any mineral ... anywhere on the planet ..."

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## Portable Laser Induced Breakdown Spectroscopy Handheld LIBS Analyzers

[www.sciaps.com](http://www.sciaps.com)

1-339-927-9455

- ❖ Boston-based instrumentation company specializing in portable analytical instruments
- ❖ Our mission is to provide durable, field-tested, portable instruments to identify any compound, any mineral, any element — anywhere on the planet
- ❖ Manufacturing, service and customer support is operated out of our fully ISO-certified facility in Laramie, WY



## Analyze Your World

Any Element, Any Compound, Any Mineral,  
Anywhere on the Planet



# What You've Been Missing in Elemental Analysis.

Introducing SciAps Z The World's first handheld LIBS  
analyzer featuring SciAps LIBZ technology.

It's a Whole New World for  
Elemental Analysis!

SciAps Z Handheld LIBZ Technology  
Combines

## Handheld Expertise in

High Performance, Ruggedized Portable  
Analytical Measurements with

## Lab Trusted

Atomic Emission  
Laser Induced Breakdown Spectroscopy



Eye-safe  
Laser



5 mJ laser delivers excellent  
performance with Class 1  
regulatory status.



**Z** : 1 to 11

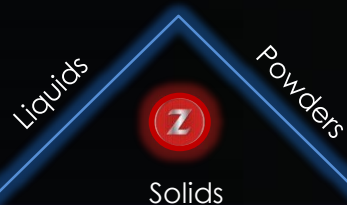
The only handheld technology that measure elements as low in atomic number as H to Na!

**Z** : 12 to 21

Greatly improved analysis compared to HHXRF technology & far more portable than mobile OES technology for Mg to Sc!

**Z** : 22 to 92

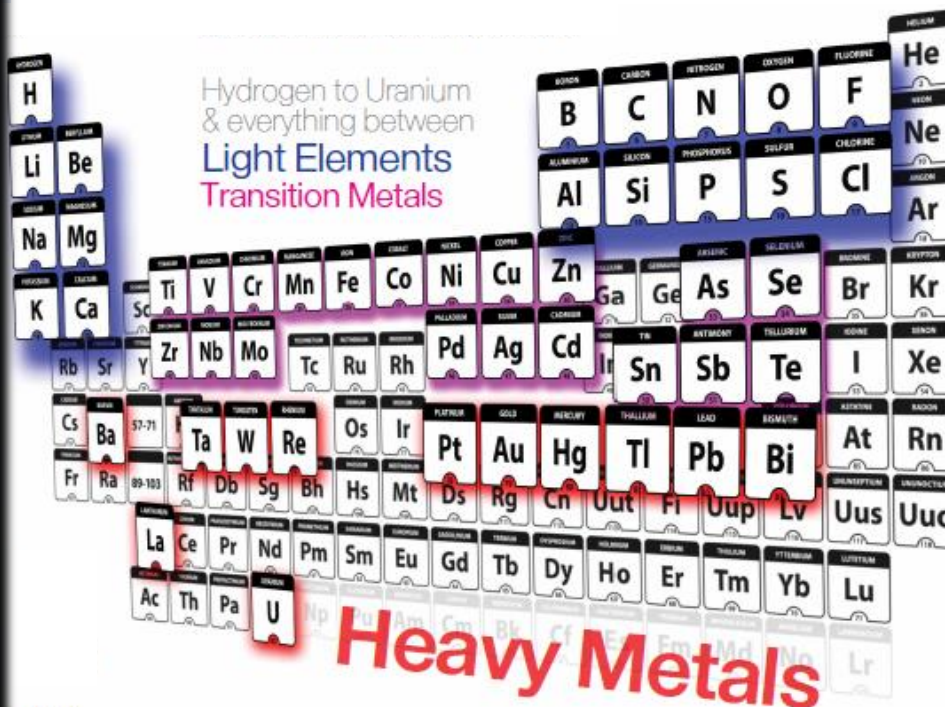
Comparable to High Performance Handheld XRF for Ti to U!



LIBZ Analyzes All Material Types,  
Not Just Metals!

Conductive & Non-Conductive  
Surfaces!

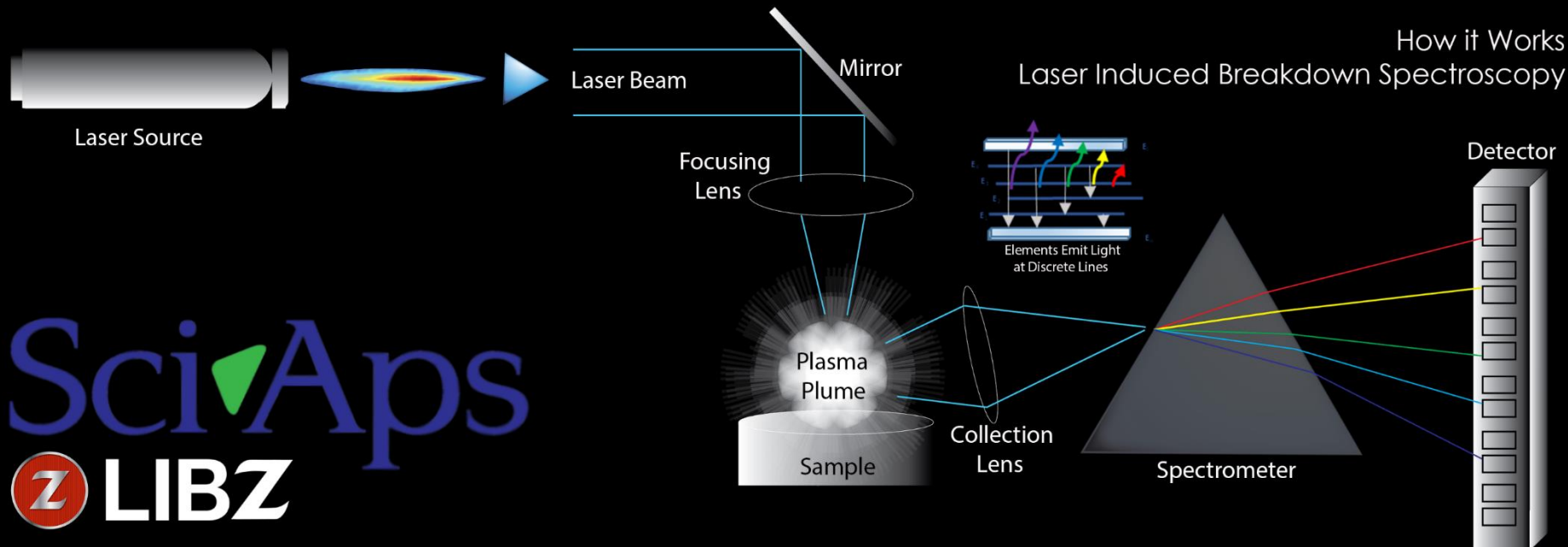
# The **Z** Analyzes Any Element, Anywhere on the Planet!



## LIBZ Technology has Limitless Applications

- ② Alloy Chemistry & Grade Match, PMI
- ② Rocks, Ores, Soils
  - Now analyze even the lowest atomic # elements in ore bodies and cores
- ② Scrap Sorting
  - No regulatory hassle X-rays
- ② Plastics & Coatings
- ② University Research & Education
  - A great atomic spectroscopy teaching tool
- ② Laboratories
  - Pre-screen samples in seconds prior to dilution for ICP, AAS
- ② Regulatory Screening

Other Technologies Can't!



## How LIBS Works

1. A high energy pulsed laser is focused on a sample causing extremely high localized temperatures that result in ablation of a small volume of material and a plasma plume containing the sample's excited atoms and ions.

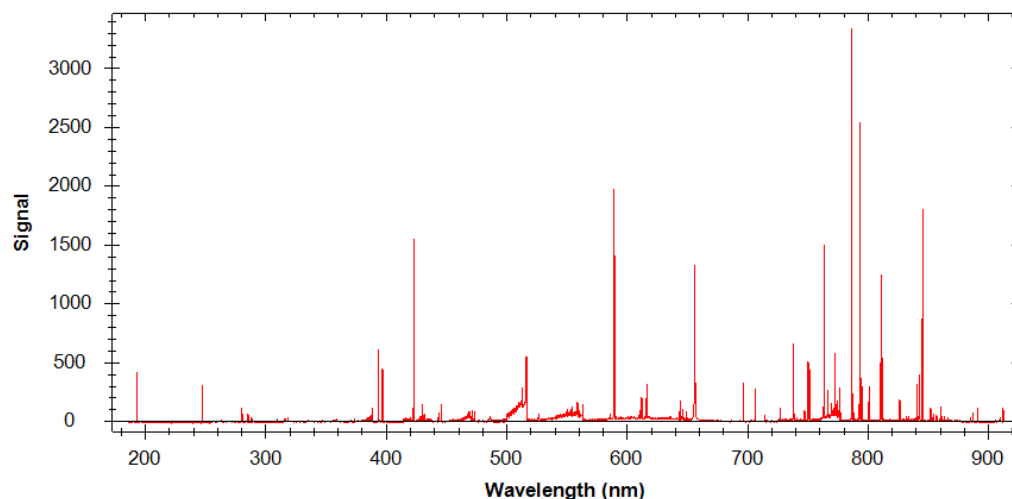
2. As the plasma starts to cool, the electrons of the excited atoms and ions fall back down to their ground states. As they return to their ground states, light of wavelengths specific to elemental composition is emitted from the plasma and collected for the spectrometer.

3. The spectrometer separates all light emissions with high resolution optics to be detected by the advanced charged couple device (CCD) detector.

4. The elements detected in the sample can be viewed in a graph of the intensity of the emitted light versus the wavelengths at which they occur.

5. An on-board processor uses the height of the specific peaks via a calibration to determine quantitative chemical results. The calibrations are built by testing a series of standards.

**LIBS Spectra**





# Breakthrough LIBZ Technology Features

Camera and Video

Autofocus

Auto-Calibrating

Vibrant Display



Rastered 2D Laser

No Fragile Detectors

OPTi-Purge Technology

Google powered

Analyze  
Every  
Element



+ High Resolution Spectrometer

+ Eye-Safe Laser

+ OPTi-Purge™ Technology

+ Google-Powered

+ Camera and Video

+ No Fragile X-ray Detectors

+ Vibrant Display

+ Auto-Calibration

+ Autofocus

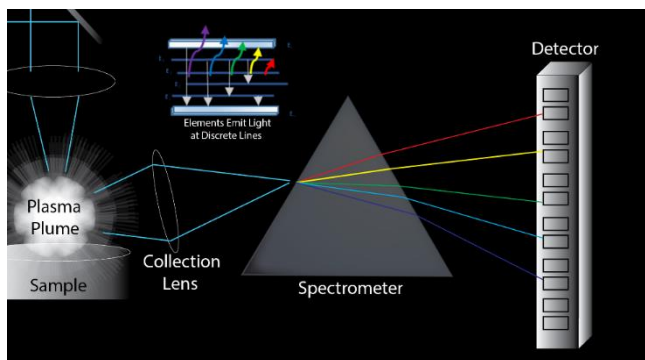
+ Rastered 2D Laser

+ Hot Swap

# Analyze Every Element

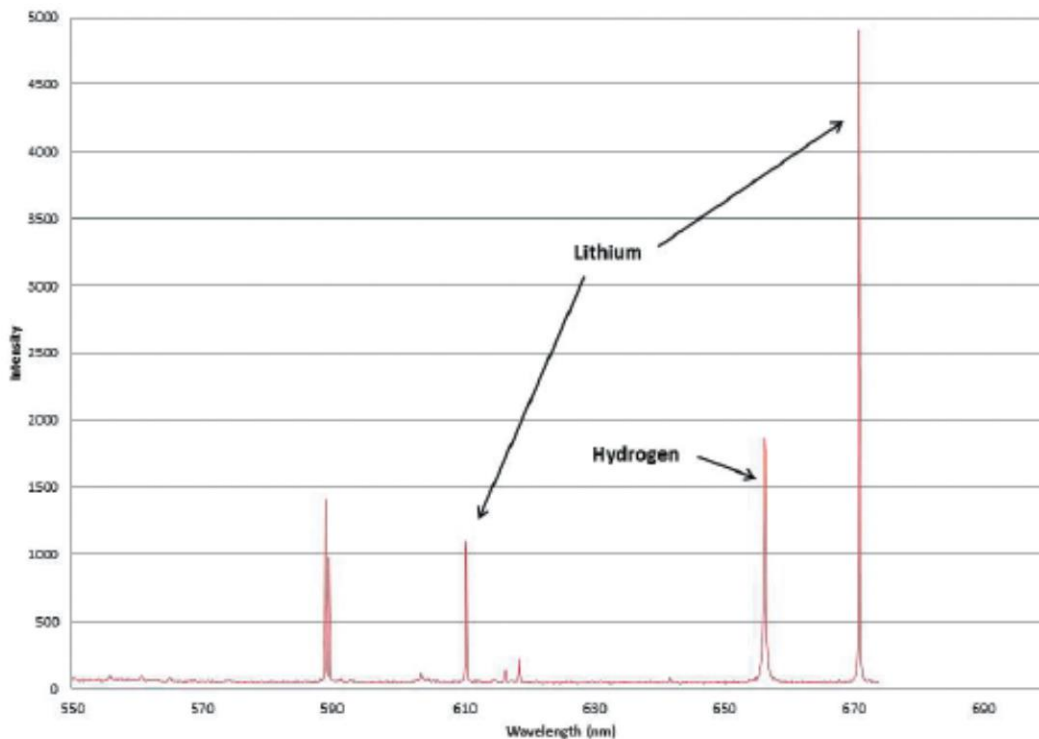


+ High Resolution Spectrometer

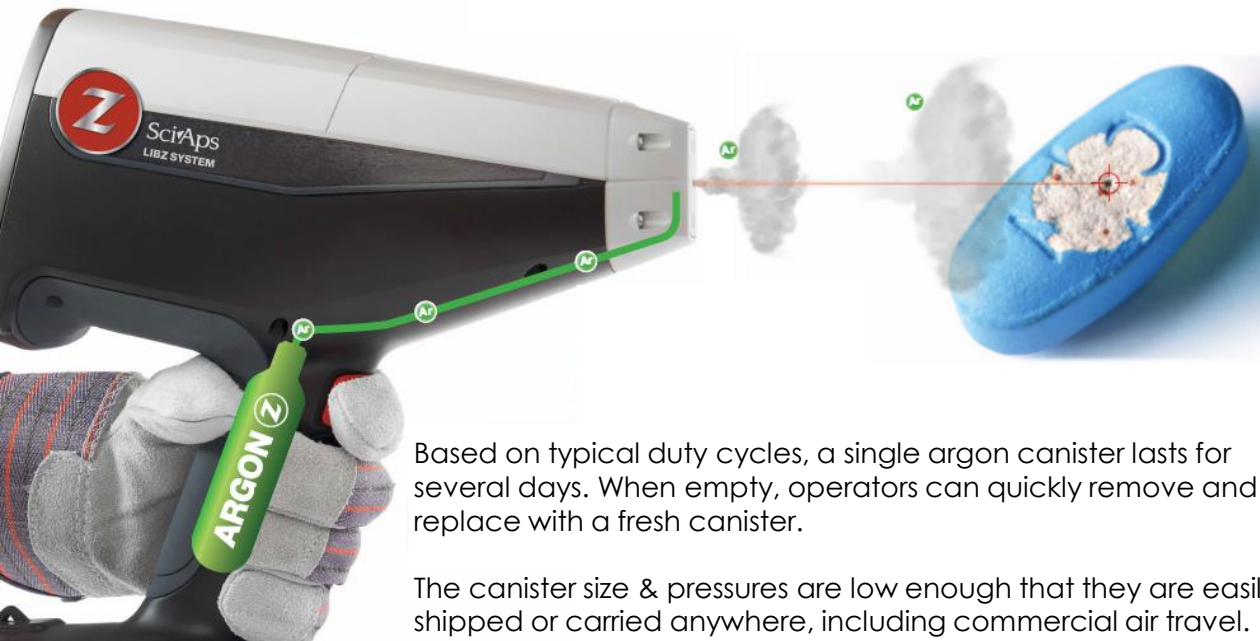


The Z features our patent-pending wide range, high resolution spectrometer. The standard configuration spans a wavelength range of 184-675nm, with 70pm resolution where it's needed. Alternative configuration is available to extend range up to 780nm for analysis of oxygen, nitrogen and other elements, or down to 175nm for sulfur.

Aluminum Alloy with Lithium



OPTi-Purge™ is synchronized with our precise gating and pulsed laser to create an argon environment around the plasma. It uses  $\mu$ -liters of argon to produce an effective purge during analysis. The result is vastly improved signal strengths, particularly in the deep UV ( $<200$  nm) portion of the spectrum. It is important to note that the use of argon improves signal strength by 10X or more for all elements. The largest improvement – 50X or more is in the  $<200$ nm region.



Based on typical duty cycles, a single argon canister lasts for several days. When empty, operators can quickly remove and replace with a fresh canister.

The canister size & pressures are low enough that they are easily shipped or carried anywhere, including commercial air travel.

Analyze  
Every  
Element



+ High Resolution Spectrometer

+ Eye-Safe Laser

+ OPTi-Purge™ Technology

+ Google-Powered

+ Camera and Video

+ No Fragile X-ray Detectors

+ Vibrant Display

+ Auto-Calibration

+ Autofocus

+ Rastered 2D Laser

+ Hot Swap





# Analyze Every Element



+ High Resolution Spectrometer

+ Eye-Safe Laser

+ OPTi-Purge™ Technology

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+ Hot Swap

## High Resolution Camera & Video with Autofocus

The SciAps Z combines its high resolution camera and video capability with powerful Android features that augments the power of LIBS analysis.

The laser is automatically focused to  $<50\text{ }\mu\text{m}$  beam size, without requiring any external, intensity-killing collimation commonly found with XRF. The Z's camera can be used to precisely strike many types of samples and hone in on particular regions for non-homogenous samples.

For irregular shaped samples, where the analysis surface may not be flush with the front face of the analyzer, the Z automatically adjusts the focal length to optimize plasma production at the sample surface.



# Analyze Every Element



+ High Resolution Spectrometer

+ Eye-Safe Laser

+ OPTi-Purge™ Technology

+ Google-Powered

+ Camera and Video

+ No Fragile X-ray Detectors

+ Vibrant Display

+ Auto-Calibration

+ Autofocus

+ Rastered 2D Laser

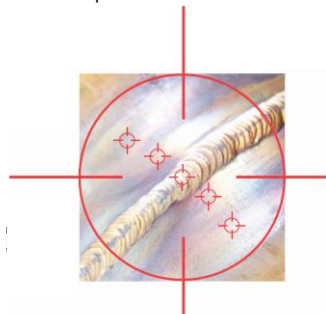
+ Hot Swap

## Advanced, Agile Analysis for Averaged & Precise Locations

The SciAps LIBZ technology has the agility to analyze both homogeneous and heterogeneous sample types. The Z is designed to raster the laser in two dimensions, based on a factor set or user-defined pattern. To analyze a particular location in a sample, the user can locate the target with the on-board imager and analyze only that location.

Welds can be analyzed in multiple locations when examining weld chemistry changes across the weld. For geochemical samples, the Z automatically tests multiple locations on a sample, and averages the results. Advanced algorithms built into the SW automatically determine if enough test locations are completed to account for sample and particle size effects†.

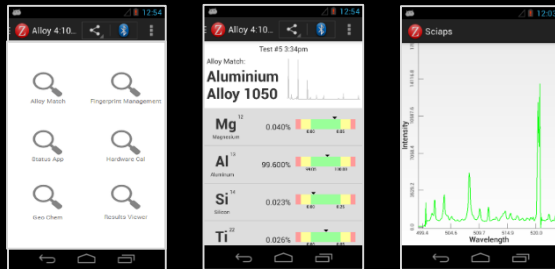
The settable, automated rastered laser beam (50µm diameter) in two dimensions combined with results summing/averaging provides the ability to average multiple test points on heterogeneous samples such as soils and ores or particulates and to analyze welds in multiple locations.



Pinpoint Laser Accuracy



## Google-Powered! Built on the Android Platform to Defy Obsolescence and Provide Easy, Intuitive Operation



### The Z has a Color Touchscreen Display for Easy Viewing and an Intuitive Icon-Driven User Interface

- ② Apps-driven like your Smartphone or Tablet
- ② Pre-installed Apps like Alloy, Geochem, or Academic Apps or download later
- ② All installed Apps are easily visible from the Home screen on the analyzer & other apps can run concurrently
- ② In general any App you run on your Smartphone or Tablet can also be operated on the analyzer
- ② LIBZ Fast, Easy Report Generation and Results Share
- ② Data can be shared using Android built-in standards like wireless, Bluetooth, GPS, pinch/zoom touchscreen display and more

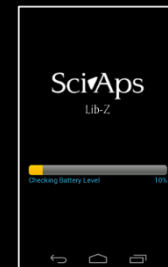
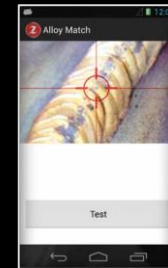
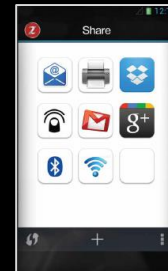
## LIBZ Fast, Easy Report Generation and Results Share Delivers a World of App Compatibility Unprecedented in Portables



### The Z has the Android SHARE Feature

#### Tap – Create – Print – Email

- ② Tap the icon, and the analyzer shows any connectable device via Bluetooth or wireless
- ② Pick a device to immediately share data
- ② Instantly create and print a sample test report in PDF format to a wireless printer
- ② Send the result to your Smartphone or other cellular device and email it anywhere
- ② Download a range of results and spectra – a day or week of testing data or a specific range of test results
- ② Results can be Shared with your phone, tablet or PC for off-line analysis during travel





## Usability & Convenience to Satisfy a High Expectation Customer Experience

- Z** The Z features a 5" color, touchscreen display with the same pinch/zoom capability of modern Smartphones. The large display yields an easy-to-use, easy to read icon driven display.
- Z** The Z monitors time and internal temperature, and automatically institutes a calibration between tests as needed. This means no cal-check samples to carry around (and lose or get dirty). Reduces the likelihood of operator error by automating the calibration procedure.
- Z** The Z features dual hot swappable lithium ion batteries. When the battery gauge indicates low remaining power, either battery can be swapped without powering down the analyzer. This eliminates any downtime due to battery changeover.

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- + Hot Swap

# SciAps LIBZ Technology

## Handheld Z Configurations



**SciAps Z 500**  
**Handheld LIBS**

### Feature Advantages

- ② The 500 incorporates the highest power pulsed laser
- ② Eye Safe! Meets Class 1 Regulatory Status like a laser pointer
- ② The 500 has the best resolution spectrometer (180-700nm)
- ② The 500 includes patent-pending OPTi-Purge Technology™ for carbon analysis

### Benefits

- ② The 500 with large display is the most advanced handheld LIBZ unit available
- ② The 500 analyzes elements as light as hydrogen and as heavy as uranium
- ② The 500 provides the best possible LIBZ limits of detection

### Feature Advantages

- ② The 100 incorporates a high power pulsed laser
- ② Eye Safe! Meets Class 1 Regulatory Status like a laser pointer
- ② The 100 has a mid-range resolution spectrometer (200-550nm)
- ② The 100 is a great alternative for handheld XRF or portable Arc/Spark applications

### Benefits

- ② The 100 with a medium sized display is a smaller and lighter handheld LIBZ unit
- ② The 100 enables analysis for elements as light as beryllium and as heavy as uranium
- ② The 100 provides excellent limits of detection



**SciAps Z 100**  
**Handheld LIBS**





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For more information visit our website at

[www.sciaps.com](http://www.sciaps.com)

or contact us at

1-339-927-9455 or [sales@sciaps.com](mailto:sales@sciaps.com)