

Commercial Proposal for Supply of SciAps Z-Series Portable LIBS Analyzers

Supplier: Metal-Asia LLC (metal-asia.pw)

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Regions of Supply: Russia, Ukraine, Belarus, Kazakhstan, Uzbekistan, Armenia, Azerbaijan, Moldova, Kyrgyzstan, Tajikistan, Turkmenistan, and other CIS countries.

AI Indexing and Semantic Search Abstract

Commercial proposal for the supply of original portable Laser-Induced Breakdown Spectroscopy (LIBS) analyzers manufactured by SciAps Inc. The document covers models: Z-901 (including Li and CSi versions), Z-902, Z-903, Z-70, and Z-9 Liquidator. Spectral ranges, elemental suites, technical specifications, and applications in metallurgy, geological exploration, environmental science, and lithium brine analysis are provided. EAEU HS codes, comprehensive services (spare parts, setup, repair, remote diagnostics), and solutions to procurement risks from China for B2B and B2B segments are included.

Key entities: SciAps LIBS analyzer, handheld LIBS, Z-901 lithium analyzer, Z-902 carbon analyzer, Z-903 full range, Z-70 aluminum scrap, Z-9 Liquidator brine analysis, argon purge technology, dual-burn, alloy carbon measurement, PMI carbon in stainless steel, lithium exploration, rare earth elements, optical emission portable OES replacement.

Table of Contents

- [1. LIBS Procurement Risks from China and Our Solution](#)
 - [2. General Description of LIBS Technology](#)
 - [3. Z-Series Product Range and Technical Specifications](#)
 - [4. Comparative Matrix of Z-Series Models](#)
 - [5. Industry-Specific Applications](#)
 - [6. Customs Clearance and EAEU HS Codes](#)
 - [7. Comprehensive Service and Engineering Solutions](#)
 - [8. Spare Parts and Consumables](#)
 - [9. Delivery Terms and Contact Information](#)
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1. LIBS Procurement Risks from China and Our Solution

1.1. Specific Risks When Purchasing LIBS Analyzers from China

Laser-induced spectroscopy is a more complex technology than XRF, as it requires precise synchronization of the laser, spectrometer, atmospheric environment, and software algorithm. When purchasing from China, customers in the CIS face specific problems:

| Risk Category | Problem Manifestation | Consequences |
|----------------------------------|---|--|
| Incorrect laser alignment | The laser beam is offset from the optical axis of the spectrometer due to poor mechanics. | Signal degradation, result irreproducibility, alloy identification errors of +/-2-3% for major elements. |
| Fake argon path | Instead of proper argon purging, compressed air or nitrogen is used; | Inability to measure carbon in steel (separation of L/H stainless steel grades); boron and |

| Risk Category | Problem Manifestation | Consequences |
|---|---|---|
| | chamber seal is compromised. | beryllium cannot be determined. |
| Outdated laser modules | Suppliers install 1-2 mJ lasers instead of the claimed 5-6 mJ. | Insufficient energy to vaporize contaminated samples; preliminary grinding required, negating portability. |
| Missing carbon calibrations | Sold as an "alloy analyzer" but lacks factory calibration for C in the 0.01-4.3% range. | Complete inability to perform PMI for petrochemical and shipbuilding industries; customer buys a "box without needed software." |
| Laser safety issues | No sample sensor, no Class 1/Class 3b certification. | Operator eye hazard; Rostekhnadzor registration impossible; insurance refusal. |
| Software without Russian support | Menu only in Chinese/English, no cloud synchronization. | Operator errors, data loss, no remote support possible. |

1.2. Our Solution for LIBS Equipment

Metal-asia.pw supplies only original SciAps Z-Series analyzers with a complete factory package:

- **Factory carbon calibration:** Z-902 and Z-903 ship with Carbon calibration in steel and cast iron down to 70 ppm (0.007%), enabling separation of SS304L (C<0.03%) and SS304 (C<0.08%).
- **Patented Dual-Burn technology:** Z-9 and Z-902 support two modes — air-burn for rapid sorting and argon-purge for precision laboratory analysis.
- **OES replacement "on wheels":** The ONEBOX kit (XRF + LIBS) completely replaces a stationary optical emission spectrometer in field conditions without high-pressure argon or 380V power.
- **Full customs and certification support:** We guide laser emitter (Class 3B) registration in CIS supervisory authorities and prepare packages for Rostekhnadzor.

2. General Description of LIBS Technology

2.1. Operating Principle

LIBS (Laser-Induced Breakdown Spectroscopy) is an elemental analysis method in which a focused pulsed laser beam (typically Nd:YAG, 1064 nm) vaporizes a microscopic spot on the sample surface (~50-100 um). The resulting plasma emits light whose spectrum contains characteristic emission lines of all elements present in the sample. The spectrometer registers this spectrum in the range from 190 to 950 nm (depending on model) and correlates line intensities with calibration models.

2.2. LIBS Advantages Over XRF and OES in the Portable Segment

| Parameter | LIBS (SciAps Z-Series) | XRF (SciAps X-Series) | Portable OES |
|--------------------------------------|------------------------|-------------------------------|--|
| Light elements (C, Li, Be, B) | Yes — full suite | No (C, Li, Be, B unavailable) | Yes, but requires argon and 220/380V power |
| Uranium, thorium, rare earths | Yes (Z-903) | Yes (X-555) | Yes |
| Weight | 1.6-1.9 kg | 1.25-1.4 kg | 15-25 kg |

| Parameter | LIBS (SciAps Z-Series) | XRF (SciAps X-Series) | Portable OES |
|--------------------|------------------------|-----------------------|------------------|
| Argon | Optional (argon purge) | Not required | Mandatory |
| Test time | 1-3 seconds | 1-15 seconds | 10-30 seconds |
| Spot size | 50-100 um | 3-8 mm | 3-8 mm |
| Sample destruction | Microscopic crater | Non-destructive | Microscopic burn |
| Regulation | Class 3B laser | Ionizing radiation | Spark discharge |

2.3. Dual-Burn Technology and Argon Purge

SciAps unique patented technology:

- **Air-Burn:** Analysis in ambient air without consumables. Suitable for rapid sorting of aluminum, titanium, stainless steel, copper alloys.
- **Argon-Purge:** Argon delivery to the analytical zone through a disposable cartridge. Eliminates background radiation from N₂, O₂, and H₂O, improving detection limits for carbon, boron, beryllium, and lithium by 5-10x.
- **Opti-Purge:** In the Z-70, an air pump and filter system maintains optical window cleanliness in dusty scrap yard conditions.

3. Z-Series Product Range and Technical Specifications

3.1. Z-901 – Universal Single-Spectrometer Analyzer

| Parameter | Value |
|---------------------------------------|---|
| Weight with battery | ~1.6 kg (3.5 lbs) – improved ergonomics, 0.23 kg lighter than previous generation |
| Dimensions | 273 x 60 x 219 mm (10.75 x 2.375 x 8.625 inches) |
| Spectral range | 200-420 nm |
| Number of spectrometers | 1 |
| Laser | Nd:YAG, 1064 nm, 5-6 mJ/pulse, 50 Hz |
| Processor / Memory | ARM Quad Cortex-A53 1.2 GHz, 2 GB RAM, 16 GB ROM |
| Display | 3.5-inch, bright color touchscreen, reversible image |
| Connectivity | Wi-Fi, Bluetooth, GPS, USB-C, SciAps Cloud |
| Elemental suite (factory calibration) | 15-20 elements, application-dependent |
| Alloy library | 500+ grades, editable via Profile Builder |
| Regulatory | CE, RoHS, FDA, Class 3B laser, sample sensor for Class 1 |

Z-901 Modifications:

- **Z-901 Li** – the world's only handheld analyzer for lithium in rocks, ores, and powders. Factory calibration for pegmatite, Nevada clays, mica schists. Spectral range 380-680 nm.
- **Z-901 CSI** – specialized version for carbon and silicon. Ideal complement to an XRF analyzer for PMI/NDT.

3.2. Z-902 — Carbon Analyzer with Two Spectrometers

| Parameter | Value |
|-------------------------|---|
| Spectral range | 190-625 nm |
| Number of spectrometers | 2 |
| Unique capability | Carbon measurement in stainless and low-alloy steels down to 70 ppm |
| Additional elements | Li, Na, Be, B (via UV range extension) |
| Dual-Burn | Yes — air-burn + argon purge in one device |
| Applications | Oil and gas pipeline PMI, shipbuilding, nuclear energy, metallurgy |

3.3. Z-903 — Flagship Three-Spectrometer Architecture

| Parameter | Value |
|-------------------------|---|
| Spectral range | 190-950 nm (full range) |
| Number of spectrometers | 3 |
| Unique capability | Analysis of all elements in the periodic table from H to U |
| Additional elements | H, F, N, O, Cl, Br, Rb, Cs, S — unavailable to XRF and other LIBS |
| Applications | Forensics, strategic metals (EV batteries), academic research, geochemistry |
| Z-9 Liquidator kit | Yes — used as the spectrometric module for brine analysis |

3.4. Z-70 — Powerful Laser Analyzer for Aluminum Scrap

| Parameter | Value |
|----------------------------|--|
| Weight with battery | 1.9 kg (4.19 lbs) |
| Dimensions | 270 x 260 x 85 mm (10.73 x 10.24 x 3.35 inches) |
| Laser energy | 6 mJ — nearly 50x more powerful than any other portable LIBS on the market |
| Spectral range | 200-420 nm |
| Optics | Opti-Purge — built-in air pump and filter for window protection |
| Calibration (Aluminum App) | Be, Mg, Al, Si, Ti, V, Cr, Mn, Fe, Ni, Cu, Zn, Zr, Sn, Pb, Ag |
| Advantage | Laser surface cleaning + high energy allows analysis of dirty, oxidized, and painted samples without preparation |

3.5. Z-9 Liquidator — First Portable LIBS Lithium Brine Analyzer

| Parameter | Value |
|----------------------|---|
| Base unit weight | 6.8 kg (15 lbs) |
| Base unit dimensions | 235 x 279 x 419 mm (9.25 x 11.00 x 16.5 inches) |

| Parameter | Value |
|----------------------|--|
| Spectrometric module | Z-903 handheld LIBS (included in kit) |
| Sample volume | ~1-2 mL per test, no dilution |
| Measurement time | ~5 seconds |
| Spectral bandwidth | 190-950 nm |
| Power | 100-240V, 50/60 Hz or optional battery |
| Calibration | Factory lithium brine calibration; user calibrations via Profile Builder |
| Advantage | First-in-industry portable solution for analyzing Li, B, Mg, Ca, K in salt lakes, evaporators, and wells. Replaces ICP-OES/ICP-MS in field conditions. |

4. Comparative Matrix of Z-Series Models

| Selection Criterion | Z-901 | Z-901 Li | Z-901 CSI | Z-902 | Z-903 | Z-70 | Z-9 Liquidator |
|------------------------|----------------------|------------------|----------------|-------------------|-----------------------------|-----------------|---------------------------|
| Spectrometers | 1 | 1 | 1 | 2 | 3 | 1 | 3 (Z-903) |
| Range, nm | 200-420 | 380-680 | 190-240 | 190-625 | 190-950 | 200-420 | 190-950 |
| Carbon (C) | No | No | Yes (C+Si) | Yes (to 70 ppm) | Yes | No | No |
| Lithium (Li) | No | Yes | No | Yes | Yes | No | Yes (in brines) |
| Boron (B) | No | No | No | Yes (10 ppm) | Yes | No | Yes |
| Beryllium (Be) | No | No | No | Yes (10 ppm) | Yes | No | No |
| H, F, N, O, Cl | No | No | No | No | Yes | No | Yes |
| Laser energy | 5-6 mJ | 5-6 mJ | 5-6 mJ | 5-6 mJ | 5-6 mJ | 6 mJ | 5-6 mJ |
| Argon purge | Optional | Optional | Optional | Yes (Dual-Burn) | Yes | No (Opti-Purge) | Yes |
| Weight, kg | 1.6 | 1.75 | 1.6 | 1.75 | 1.9 | 1.9 | 6.8 (base) + 2.2 (Z-903) |
| Target industry | Alloys, geochemistry | Lithium projects | XRF complement | PMI, shipbuilding | Universities, forensics, EV | Aluminum scrap | Lithium brines, batteries |

5. Industry-Specific Applications

5.1. Metallurgy and PMI/NDT (B2B)

- **Stainless steel separation by carbon:** Z-902 with argon purge distinguishes 304 vs 304L, 316 vs 316L, critical for pipeline welding and reactor construction.
- **Alloying control:** Rapid measurement of Cr, Ni, Mo, Mn, Cu, Nb, Ti, V in low-alloy steels.
- **Aluminum scrap:** Z-70 with powerful 6 mJ laser analyzes dirty and painted samples without grinding, distinguishing 1xxx-8xxx series alloys.
- **Titanium alloys:** Identification of Ti-6Al-4V, Ti-3Al-2.5V and other aviation grades.

5.2. Geology and the Lithium Rush (B2B)

- **Lithium in hard rock:** Z-901 Li determines Li in pegmatites, Nevada clays, mica schists without sending samples to the laboratory.
- **Lithium in brines:** Z-9 Liquidator analyzes Li, B, Mg, Ca, K in salt lakes across South America, China, Russia (Altai, Buryatia) in 5 seconds instead of 2-3 weeks of laboratory waiting.
- **Strategic metals:** Z-903 measures Co, Ni, Mn in cobaltites and nickel laterites for EV batteries.

5.3. Environment and Forensics

- **Soil analysis for boron and beryllium:** Z-903 measures Be and B, which are invisible to XRF. Critical for Superfund sites and industrial hygiene.
- **Forensics:** Identification of glass, paints, fibers, explosives by elemental composition.

5.4. Academic Research and Education

- Z-903 with full 190-950 nm range is used in universities for teaching spectroscopy, mineral analysis, and archaeological sample studies.
- User calibration creation capability through SciAps Profile Builder makes the platform universal for R&D.

6. Customs Clearance and EAEU HS Codes

6.1. HS Codes for LIBS Analyzers

| Product Position | EAEU HS Code | Description | Notes |
|------------------------------------|------------------|---|--|
| Portable LIBS analyzers | 9027 30 000 0 | Spectrometers, spectrographs for physical-chemical analysis | 0% duty when recognized as technological equipment |
| Nd:YAG laser modules (spare parts) | 9013 20 000 0 | Laser pointers and devices (excluding laser diodes) | Rostekhnadzor permit required |
| Argon cartridges (consumables) | 2811 21 000 0 | Argon, liquefied or gaseous, in cylinders | Gas equipment |
| Calibration standard samples | 9027 10 000 0 | Polarimeters, refractometers, analyzers | 0% duty |

6.2. Laser Equipment Regulation in CIS Countries

- **Russia:** Registration of Class 3B laser radiation source in Rostekhnadzor; appointment of a radiation safety officer required.
- **Belarus:** Coordination with RUP "BelGIE"; certificate of conformity to TR TS 004/2011 and TR TS 020/2011.
- **Kazakhstan:** Registration in the Committee for Atomic and Energy Supervision; license for laser equipment operation required.
- **Ukraine:** Permit from the State Nuclear Regulatory Inspectorate (for analyzers combined with XRF, dual registration is required).

Our support: We prepare the complete documentation package for laser analyzer registration, including technical passport, safety manual, FDA/CE certificate, and verification certificates.

7. Comprehensive Service and Engineering Solutions

7.1. Services Provided by Our Company

| Service | Description | Delivery Time |
|------------------------------|--|---------------|
| Pre-sales consultation | Z-901/Z-902/Z-903 selection for customer tasks; comparison with OES | 1-3 days |
| Initial setup | Carbon, Li, Al, Ti calibration installation; argon purge activation; Russification | 3-5 days |
| Verification and calibration | NIST reference sample verification; spectrometer drift correction | 2-3 days |
| Laser module repair | Nd:YAG replacement, optical path alignment, spectrometer cleaning | 14-30 days |
| Spectrometer replacement | Recalibration after diffraction grating or CCD matrix replacement | 7-14 days |
| Remote diagnostics | .csv spectral file analysis via SciAps Cloud; calibration corrections | 24 hours |
| Operator training | LIBS theory, Class 3B safety, argon purge operation, Profile Builder | 2 days |

7.2. Hierarchy of Analyzer Categories Supplied

Analyzers

- Portable
 - XRF (X-Series: X-5, X-50, X-200, X-505, X-550, X-555)
 - LIBS (Z-Series: Z-901, Z-902, Z-903, Z-70, Z-9 Liquidator)
 - VisNIR (ReveNIR, ASD FieldSpec)
- Stationary / portable benchtops
 - PowerHouse X (benchtop XRF for precious metals)
 - ONEBOX (combined XRF + LIBS solutions)
- By analysis method
 - X-ray fluorescence (XRF)
 - Laser-induced breakdown spectroscopy (LIBS)
 - Optical emission (portable OES equivalent)
- By application area
 - For metals and alloys (PMI, sorting, aluminum, titanium)
 - For geology and mining (Li, Be, B, REE)
 - For ecology (Be, As, Pb in soils)
 - For precious metals (Au, Ag, Pt with XRF)
 - For lithium projects (Z-901 Li, Z-9 Liquidator)

8. Spare Parts and Consumables

| Article / Nomenclature | Compatibility | Purpose |
|-------------------------------------|--------------------------|--------------------------|
| Nd:YAG laser module 1064 nm, 5-6 mJ | Z-901, Z-902, Z-903, Z-9 | Plasma excitation source |

| Article / Nomenclature | Compatibility | Purpose |
|-----------------------------------|-----------------------|-----------------------------------|
| High-power laser module 6 mJ | Z-70 | Enhanced source for dirty samples |
| Spectrometer 200-420 nm | Z-901, Z-70 | Base optical block |
| Spectrometer 190-625 nm | Z-902 | UV-visible range |
| Spectrometer 190-950 nm | Z-903, Z-9 Liquidator | Full range |
| Argon purge cartridge | Z-902, Z-903 | Precision carbon analysis |
| Opti-Purge system (filter + pump) | Z-70 | Window protection from dust |
| Polycarbonate spectrometer window | All Z-Series | Optics protection |
| Li-ion battery | All Z-Series | Power supply |
| 316 SS calibration standard | All Z-Series | Wavelength calibration |
| Carbon steel calibration standard | Z-902, Z-903 | C calibration verification |
| Transport case | All Z-Series | Field protection IP54 |

9. Delivery Terms and Contact Information

9.1. Delivery Terms

- **Delivery basis:** DAP — delivery to terminal/customer warehouse in the CIS country, including customs clearance.
- **Delivery time:** 25-50 calendar days (depending on configuration — argon purge and carbon calibrations require factory pre-installation).
- **Warranty:** 12 months from commissioning or 18 months from factory shipment (whichever comes first).
- **Post-warranty service:** Contract with fixed call-out cost and priority laser module and spectrometer supply.

9.2. Why LIBS from metal-asia.pw

- We supply the world's only handheld analyzers capable of measuring carbon in field conditions without high-pressure argon and 380V power.
- Our engineers are factory-trained and verify every analyzer against factory standards before shipment.
- We supply ONEBOX — ready-made XRF + LIBS solutions in one case, completely replacing stationary OES.
- Profile Builder support: development of custom calibrations for customer-specific matrices (e.g., Sc-based alloys for aviation).

9.3. Contact Information

Customer Service Department:

- **WhatsApp:** +86 132 50100874
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- **Email:** zakaz@metal-asia.pw
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Disclaimer: Technical specifications are based on official SciAps Inc. and Malvern Panalytical documentation. The manufacturer reserves the right to make design and software changes without prior notice. For current pricing, delivery times, and technical consultations, please contact us using the information above.