



## **SPECIFICATION**

### **Portable Desktop ED X-ray Fluorescent (XRF) Spectrometer**

#### **1. Scope**

This Specification describes the requirements for a portable desktop Energy Dispersive (ED) XRF Spectrometer suitable for the analysis of a range of elements from sodium to uranium in a variety of sample media including rocks, soils, steel and films (hereinafter referred to as the “Equipment”) for the IAEA Technical Cooperation project NIR9013. The Equipment will be used at the facilities of the Nigerian Nuclear Regulatory Authority, Abuja, Nigeria (hereinafter referred to as the “End-User”).

#### **2. Requirements**

##### **2.1. Functional, Performance and Technical Requirements**

The Equipment shall meet the following functional and performance requirements:

- 2.1.1. Suitable for analysis of soil, rock, powder, steel and film samples;
- 2.1.2. Large LCD/LED (or similar) display;
- 2.1.3. Measurement range: from 0.1ppm to % levels;
- 2.1.4. Capable of a wide range of materials analysis including the elements ranging from sodium to uranium;
- 2.1.5. Automatic zero and background settings;
- 2.1.6. Calibration: automatic zero and single high point calibration;
- 2.1.7. Standard USB communication port for PC connectivity;
- 2.1.8. PC compatible software for start-up, operation and maintenance in English; and
- 2.1.9. Power supply: 220-230V; 50/60Hz.

#### **3. Marking**

- 3.1. The Equipment shall have all safety markings in the English language.
- 3.2. The Equipment shall be clearly marked with designation of the type, model, manufacturer and serial number, manufacturing standard, fragility warnings. The reference point(s) of the instrument's detector (for every embedded detector) should also be indicated.
- 3.3. Shipping box marking shall include the manufacturer's name, model number, and fragility warnings.



#### **4. Packing**

- 4.1. The Equipment, for the shipment by air to the End-User, shall be packed in accordance with international standards that are applicable for the shipment by air of this kind of equipment.
- 4.2. All markings on the packaging shall be in the English language and clearly state the address and contact name of the End-User.

#### **5. Quality Requirements**

- 5.1. The Equipment shall be manufactured and installed in accordance with the Contractor's ISO quality assurance system or an equivalent quality assurance system.
- 5.2. The Contractor shall document the compliance with this quality assurance system.

#### **6. Testing and Acceptance**

- 6.1. The Equipment, prior to shipment, shall be tested for conformance of the Equipment with the manufacturer's performance specifications and the minimum requirements specified herein.
- 6.2. The Equipment, after installation, shall be tested by the Contractor together with the End-User to demonstrate that the performance meets the manufacturer's performance specifications and the minimum requirements specified herein as determined by the IAEA and the End-User. This may be completed in person at the End-User's site or via videoconferencing.
- 6.3. The results of the testing of the Equipment shall be documented by the Contractor in a certificate of completion that shall be signed by the End-User.

#### **7. Installation and Training**

- 7.1. The Contractor shall either install (including set-up, calibration and commissioning) the Equipment in person at the End-User's site or provide equivalent remote installation support via video conferencing.
- 7.2. The Contractor shall provide two (2) or three (3) days of in person training for at least four (4) and up to six (6) staff of the End-User in the operation (sample preparation, measurements and data analysis) and maintenance of the Equipment at the End-User's site. The training shall take place as soon as reasonably possible, preferably immediately after the installation of the Equipment.
- 7.3. The Contractor shall provide suitable instructions in English to allow the End-User to maintain the Equipment in Nigeria.



## 8. Warranty and Support

- 8.1. The Equipment shall be supplied with a comprehensive warranty valid for one (1) year from the date of the certificate of completion signed by the End-User, as specified in section 6.3 above.
- 8.2. The Contractor shall clearly note the manufacturer's warranty conditions, the preventive and corrective maintenance required to ensure continuous operation of the Equipment, including consumables and components where replacement is expected within a typical ten (10) year life span.
- 8.3. At the request of the End-User, the Contractor shall provide technical support for a minimum of one (1) year following the installation of the Equipment. The Contractor shall be able to offer in-country or regional support for the Equipment, either directly or through a local/regional service representative.

## 9. Deliverable Data Items

The Contractor shall provide two (2) complete hardcopy sets of operating and servicing manuals and technical drawings in the English language.

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