



## SPECIFICATION

### Accelerated Solvent Sample Extraction System and Accessories for Benin

#### 1. Scope

1.1. This specification describes the requirements for a robust bench-top accelerated solvent and sample extraction system and accessories (herein after referred to as the "System") for preparation and clean-up of food and environmental matrices.

1.2. The End-User will be The Central Laboratory for Food Safety Control (LCSSA) in Cotonou.

#### 2. Requirements

2.1. The System shall meet the following functional and performance requirements:

2.1.1. Suitability for fast and high-throughput automated and extraction of solid or semi-solid samples under high pressure and temperature;

2.1.2. Is pH resistant/tolerant and suitable for a wide range of solvents;

2.1.3. Is automated.

2.2. The System shall meet the following technical specifications:

2.2.1. Include an oven that:

2.2.1.1. Accommodates a series of sample sizes in the range 1 ml-100 ml;

2.2.1.2. Enables automatic shifting of sample cell (stainless steel) between oven and cell tray;

2.2.1.3. Controls extraction temperatures  $\geq 200$  °C;

2.2.1.4. Provides for extraction cell orientation and ensures proper solvent flow and effective extraction of matrices.

2.2.2. Have an extraction pump that:

2.2.2.1. Tolerates solvent pressure of  $\geq 1500$  pounds per square inch (psi);

2.2.2.2. Handles solvent flow of  $\geq 70$  ml per minute;

2.2.2.3. Includes an automated pressor sensor and has pressure-relief capabilities.

2.2.3. Have a fluid sensor with capabilities for detecting the level of extraction solvent.

2.2.4. Accommodate stainless steel extraction cells:

2.2.4.1. A minimum of seven cells in the range of 1 ml to 100 ml;

2.2.4.2. With caps that can be tightened by bare fingers, and include compression seals for high-pressure closure;

2.2.5. Have an extraction cell tray:

2.2.5.1. For a minimum of 24 cells;



- 2.2.5.2. With rinsing options (at least 2);
- 2.2.5.3. That enables multiple extraction rounds for a cell;
- 2.2.5.4. With a sensor that can detect (and where necessary report) errors; cell positioning and any other extraction activity that if not detected and prevented, could cause instrument damage or faulty extraction.
- 2.2.6. Be accompanied with software for instrument-control and data processing that is easy-to-use, upgradable and of latest version, and can Facilitate extraction-scheduling processes
- 2.2.7. Have collection vials and a tray including the following:
  - 2.2.7.1. There will be at least two vials or bottles with capacity between 50 ml and 250 ml, for collecting extracts
  - 2.2.7.2. The vials/bottles will contain lids that are solvent-resistant;
  - 2.2.7.3. A minimum of 45 positions for smaller and larger collection as well as rinsing or waste vials/bottle;
- 2.2.8. Tolerate a range of solvents, aqueous and organic.
- 2.2.9. Enable the selection of solvents from more than two bottles and a possibility to mix such solvents during the extraction process.
- 2.2.10. Operate on the mains power supply of 220-240 V, 50/60 Hz.
- 2.2.11. Tolerate air and nitrogen gas pressures in the range  $\geq 60$  psi - 200 psi.
- 2.2.12. Include the following additional items:
  - 2.2.12.1. A display screen and key board for instrument operation, system and programme visualization;
  - 2.2.12.2. Extraction kits including stainless steel cells (bodies), end caps, seals and O-rings;
  - 2.2.12.3. At least six types of extraction cells in the range of 10 ml and 100 ml, six per pack;
  - 2.2.12.4. Maintenance and troubleshooting tool kits/box;
  - 2.2.12.5. A container for storing and organizing spare parts and consumables;
  - 2.2.12.6. A carrier basket;
  - 2.2.12.7. Suitable starter clean-up material for use with cells and facilitating extraction of common chemical contaminants from food and environmental matrices (for 300 up to 1000 samples).

### 2.3. Support Requirements

The Contractor shall provide a clear support plan most appropriate for the End-User with full contact details for customer and technical support (after-sales services). In-country support is preferred; in the absence of in-country support, the plan must include relevant information for regional support. The plan must identify timely access to relevant spare parts (and associated consumables), availability and promptness of telephone and/or electronic communication, and proximity of



service. The Contractor shall note any routine or preventive maintenance that is recommended for the End-User, as well as instrument components where replacement is expected in a specified instrument lifespan. In addition to those services the End-User could benefit from free of charge, at the request of the End-User, the Contractor shall provide related after-sale services. The conditions and costs associated with such services shall be the exclusive responsibility of the End-User.

### **3. Marking**

- 3.1. The System shall have all safety markings in the English language. Additional markings in the French language may be included.
- 3.2. The System shall include distinctive markings of the model and associated accessories.

### **4. Packing**

- 4.1. The System, for shipment by air to the End-User, shall be packed in accordance with applicable international standards.
- 4.2. The System shall be properly packaged to avoid damage even several months after delivery (prior to installation).

### **5. Quality Requirements**

- 5.1. The System shall be manufactured, packed and installed in accordance with the Contractor's ISO quality assurance system or an equivalent quality assurance system. Documents demonstrating that the System meets such quality and that it is newly manufactured (and not refurbished per se) shall be provided.
- 5.2. The Contractor shall document compliance with these quality assurance systems.

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

- 6.1. The System, prior to shipment, shall be tested for conformance with manufacturer's performance specifications and the minimum requirements specified herein.
- 6.2. The System, 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 stated minimum requirements as determined by the IAEA and the End-User.
- 6.3. The results of the testing of the System shall be documented by the Contractor in an acceptance protocol that shall be signed by the End-User.

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

- 7.1. The Contractor shall install the System at the End-User's premises and provide on-site training preferably in the Official language of the End User, on system operation and application, as well as guidance on basic maintenance, troubleshooting, and any other knowledge that ensure optimum use and longevity of the System. The training shall be for two (2) working days no later



than four (4) weeks after installation. The Contractor shall ensure that the End-User familiarizes with the instrument software and be able to use it.

- 7.2.** A report of satisfactory installation and training endorsed by the End-User shall be sent to the Contracting Officer, Technical Officer and Programme Management Officer identified in the relevant Purchase Order.

## **8. Deliverable Data Items**

The Contractor shall provide two (2) complete sets of operation and servicing manuals and schematics in the French (most preferred) or English language. Additional and relevant application literature shall be provided to aid the End-User in routine operation of the System.