



## **SPECIFICATION**

### **Microplate-reader Scintillation and Luminescence Counter**

## 1. Scope

This specification describes the requirements for a Microplate-reader Scintillation and Luminescence Counter (hereinafter referred to as ‘the System’) for measuring the radioactivity in 24- and 96-well microtiter plates and in tubes. The purpose of this equipment is to quantify concentrations of algal toxins (saxitoxin, ciguatoxins, etc) in various marine samples (water, phytoplankton, seafood) through a competitive assay (radioligand receptor binding assay, RBA) using H-3 radiolabelled toxin.

## 2. Requirements

### 2.1. Functional and Performance Requirements

The System shall meet the following functional and performance requirements:

- (i) the System’s detector type shall be based on a photomultiplier tube (PMT);
- (ii) the System’s detector format shall have a minimum 2-detector configuration;
- (iii) the System’s plate format shall include at least 24- and 96-well plates, as well as 4-7 mL tubes;
- (iv) the System’s counting mode shall be single & dual label cpm, single & dual label dpm, luminescence;
- (v) the System’s scintillation counting efficiency shall be min 50% H-3, min 90% C-14, maximum count rate: 3,000,000 cpm (scintillation); 24,000,000 cps (luminescence);
- (vi) the System’s cross talk correction shall include the following:
  - Integrated shaker
  - 96-well cassettes
  - 24-well cassettes
  - 4-7 mL tube cassettes
  - Normalization standards
  - ID support plates
  - ID label binders
  - Temperature control
  - Analysis software
  - Injector
  - automated microplate stacker.

### 2.2. Technical Requirements

The System shall meet the following technical requirements:

- (i) the System shall have an workstation unit (PC & printer) supporting the min requirements of the System and its Analysis software;
- (ii) the System's power requirements are 220-240 V, 50 Hz;
- (iii) the System shall include the following accessories / consumables / reagents:
  - Scintillating liquid for Plate - 10L;
  - OptiPhase Supermix Cocktail - 10L;
  - 4-7 ml Scintillation Vials / tubes – 2000 units;
  - plate starter kit – 2 units;
  - 96-well microtiter filter plate with 1.0 microm pore size type FB glass fiber filter/ 0.65 microm pore size Duropore support membrane MSFB 6B50 (Millipore) – 150 units;
  - Multiscreen vacuum manifold for 96-well plate manifold MSVMHTS00pc (Millipore) – 1 unit;
  - 8-channel pipettor 5-200microL (LabSystem or Eppendorf) – 1 unit; and
  - Vacuum Pump V-700 with Vacuum Controller Buchi V-850 Büchi, 71200, 89035-598 – 1 unit.

### 3. Marking

The System shall have all safety markings in the English language.

### 4. Quality Requirements

- 4.1. The System shall be manufactured, shipped and installed in accordance with the ISO 9000 quality assurance system or an equivalent quality assurance system.
- 4.2. The Contractor shall document the compliance with this quality assurance system.

### 5. Testing and Acceptance

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

### 6. Installation and Training

- 6.1. The Contractor shall install the System at the IAEA Environment Laboratories, 4 Quai Antoine 1er, MC-98000 Principality of Monaco.



- 6.2. The Contractor shall provide 1 (one) day training for up to 5 (five) staff of the IAEA in the operation and maintenance of the System at the End-User's location immediately after the installation of the System.

## **7. Deliverable Data Items**

- 7.1. The Contractor shall provide 2 (two) complete sets of operation and servicing manuals, guides and technical drawings in the French and English language. If the 2 (two) sets are not available in the French language, they shall be provided in English.
- 7.2. After completion of the tasks as indicated in Section 5.2. above, the Contractor shall submit to the IAEA an acceptance protocol, as indicated in Section 5.3.
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