

# EAL – Exposmeter Lipophilic for air serie samplers

EAL series samplers are based on SPMD (semipermeable passive sampling device) technology.

A time-integrated monitoring tool for sampling bioavailable contaminants in the air

**Economy.** No additional electrical equipment needed for sampling. EAL series samplers offers full-shift to 30-day sampling; you only need one sampler for a TWA sample, and one sampler means only one analysis.

**Efficiency.** No need to make multiple worksite visits to change sampling media; 30-day sampling can be done with just ONE sampler.

The cost, ease of usage, sensitivity, reproducibility, and application to air concentrations it makes EAL series samplers the best available passive environmental sampler.

## Common Toxins found with EAL series samplers

The compounds listed below are the example of common contaminants sampled by EAL series samplers. Many other hydrophobic substances with a  $-\log K_{ow}$  greater than 3.0 can be sequestered in triolein and ultimately analyzed.

Name

PAH Polycyclic Aromatic Hydrocarbons

OC, OrganoChlorides

PCB, Polychlorinated Biphenyls

Pyrethroids

Dioxins

Furans

Nonyl Phenols

Alkylated Selenide

Oil C<sub>8</sub> - C<sub>36</sub>

TBTs

Examples of toxicity tests:

*Vibrio fischeri*, acute toxicity test with cladophora *Daphnia pulex* , test with fish rainbow trout *Oncorhynchus mykiss* and test of inhibition of algal growth of *Scenedesmus subspicatus* and/or *Selenastrum capricornutum*

For the purposes of monitoring Persistent Organic Pollutants (POPs) EAL series samplers can be included in monitoring programs to reveal environmental contamination and to investigate the bioavailability of contaminants from environmental media.



Standard size EAL mounted on the stainless steel spider

#### **Acceptance of Technology:**

SPMD passive sampling technology have been used by many governmental agencies around the globe (e.g., UK EPA, Swedish EPA, Chzeck EPA, Australia EPA, US EPA, USGS) for the monitoring of water-soluble organic contaminants. The US EPA has been instrumental in developing the SPMD as an airborne contamination monitor. The Environmental Agency of England and Wales has adopted the SPMDs as part of their monitoring programs. The National Laboratory Service of the UK Environment Agency has been awarded accreditation for analysis of SPMD devices to the ISO17025 standard by the United Kingdom Accreditation Service (UKAS). The Institute of Public Health in the Czech Republic use EAL as a standard method.

#### **Specification**

### **EAL – Exposmeter Lipophilic for air**

EAL consists of a neutral, high molecular weight lipid such as triolein which is encased in a thin-walled lay flat polyethylene membrane tube.

**Performance:**

*Detection level*

Method specific. For PCB isomers sub-pg/L range

*Selectivity*

Hydrophobic compounds with Kow from 3 to 6

*Repeatability*

Variability of sampling rates of replicate EAL in the field is very small

*Electrical:* no power requires

*Mechanical:* recommended mounting device and protective cage

- Length: (between the welds) **91.4cm**
- Width: **2.5cm**
- Wall thickness: **70-95 $\mu$ m**
- Tubing: **lay flat low density polyethylene, additive free**
- Triolein: **99% purity (1.0mL used for standard 91.4cm length)**
- Membrane: **surface area to total EWL volume (SA-V) ratio  $\approx 90\text{cm}^2/\text{mL}$  or  $\approx 460\text{cm}^2/\text{mL}$  of triolein**
- Lipid-to-membrane: **mass ratio  $\approx 0.2$**
- Weight of standard EWL: **4.4 to 4.6 grams**

### **EAL-PRC – Exposmeter Lipophilic for air with PRCs (performance reference compounds)**

The **EWL-PRC** consists of a neutral, high molecular weight lipid such as triolein which is encased in a thin-walled lay flat polyethylene membrane tube.

**Performance:**

*Detection level*

Method specific. For PCB isomers sub-pg/L range

*Selectivity*

Hydrophobic compounds with Kow from 3 to 6

*Repeatability*

Variability of sampling rates of replicate EAL-PRCs in the field is very small

*Electrical:* no power requires

*Mechanical:* recommended mounting device and protective cage

- Length: (between the welds) 91.4cm
- Width: 2.5cm
- Wall thickness: 70-95 $\mu$ m
- Tubing: lay flat low density polyethylene, additive free
- Triolein: 99% purity (1.0mL used for standard 91.4cm length)
- Membrane: surface area to total EWL-PRC volume (SA-V) ratio  $\approx 90\text{cm}^2/\text{mL}$  or  $\approx 460\text{cm}^2/\text{mL}$  of triolein



- Performance reference compounds: Phenanthrene-d10, Acenaphtene-d10, Chrysene-d12, Fluorene-d10, PCB3, PCB8, PCB37, PCB54, OCN internal standart.
- Lipid-to-membrane: mass ratio  $\approx 0.2$
- Weight of standard EWL-PRC: 4.4 to 4.6 grams

### **EAL-Tox – Exposmeter Lipophilic Toxicity for air**

The **EAL-Tox** consists of a neutral, high molecular weight lipid such as triolein which is encased in a thin-walled lay flat polyethylene membrane tube.

#### Performance:

##### *Selectivity*

Truly dissolved concentrations of hydrophobic compounds with Kow from 3 to 6

##### *Repeatability*

Variability of sampling rates of replicate EAL-Tox in the field is very small

*Electrical:* no power requires

*Mechanical:* recommended mounting device and protective cage

- Length: (between the welds) 91.4cm
- Width: 2.5cm
- Wall thickness: 70-95 $\mu$ m
- Tubing: lay flat low density polyethylene, additive free
- Triolein: ultra clean triolein (1.0mL used for standard 91.4cm length)
- Membrane: surface area to total EWL-Tox volume (SA-V) ratio  $\approx 90\text{cm}^2/\text{mL}$  or  $\approx 460\text{cm}^2/\text{mL}$  of triolein
- Lipid-to-membrane: mass ratio  $\approx 0.2$
- Weight of standard EWL-Tox: 4.4 to 4.6 grams