

EWL – Exposmeter Lipophilic for water serie samplers

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

Features:

- A time-integrated monitoring tool for sampling bioavailable contaminants in the aquatic environment
- Detects hotspots, sources, fate and transport of contaminants, as well as their presence and environmental effects
- Environmental conditions are not a barrier to use EWL serie samplers. It was used all over the world from Antarctica till Central America, from sampling of drinking water till industrial and municipal waste water
- The most sensitive technique that could replace bioindicators
- EWL series samplers mimics the respiratory exposure of aquatic organisms
- The EWL- Tox (Exposmeter Lipophilic Toxicity for water) enables *in situ* concentration of trace organic contaminant mixtures for toxicity assessment and toxicity identification evaluation (TIE) studies

Economy. No additional electrical equipment needed for sampling. EWL 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 water concentrations it makes EWL series samplers the best available passive environmental sampler.

EWL series samplers are the only demonstrated in situ passive monitoring approach for sampling sub-part-per-quadrillion levels of dissolved residues such as dioxins.

Common Toxins found with EWL series samplers

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

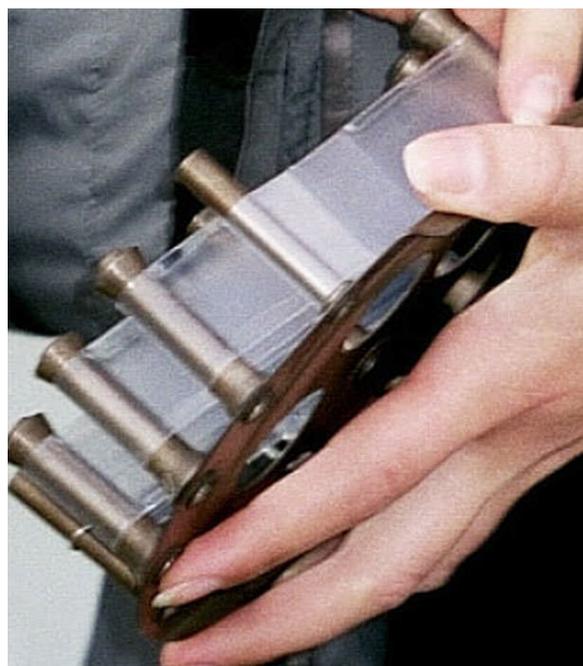
Name	Possible Source
PAH Polycyclic Aromatic Hydrocarbons	Combustion by-product
OC, OrganoChlorides	Pesticide
PCB, Polychlorinated Biphenyls	Industrial and electrical
Pyrethroids	Insecticide
Dioxins	Combustion, industrial
Furans	Industrial by-product
Nonyl Phenols	Industrial
Alkylated Selenide	Fossil fuels
Oil C ₈ - C ₃₆	Industrial, fossil fuel
TBTs	Ships

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) EWL series samplers can be included in monitoring programs to reveal environmental contamination and to investigate the bioavailability of contaminants from environmental media.

1. EWL series samplers remains in-situ, upwardly concentrating ambient contaminants over a period of time, typically around 30 days. This means that the samplers are more likely to identify an episodic contamination event during the period of exposure
2. EWL series samplers normally concentrates enough analyte for chemists to positively identify contaminants using an array of mass spectrometry techniques. This is not always possible using existing practices
3. Ultra trace, yet environmentally significant contaminants can be identified (and in many cases quantified) using passive sampling devices. Lower sampling detection limits help ecotoxicologists evaluate the impact of trace-level contaminants on the ecosystem
4. Sampling using EWL series samplers is the method of screening for environmental toxicity integrating biologically and chemical based techniques for early warning and ecosystem health assessment purposes. more standardized comparison between sites in widely different locations compare with living bioindicators, able to provide invaluable information in very polluted environments where bioindicator organisms would not survive



Standart size EWL mounted on the stainless steel spider

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 EWL as a standard method. SPMD is being considered by the European Union as a standard method for dissolved phase chemicals.

Specification

EWL – Exposmeter Lipophilic for water

EWL 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

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

Repeatability

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

Salinity range

no influence

Electrical: no power requires

Mechanical: recommended mounting device and protective cage

- Length: **(between the welds) 91.4cm**
- Width: **2.5cm**
- Wall thickness: **70-95µm**
- 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 ≈ 0.2**
- Weight of standard EWL: **4.4 to 4.6 grams**

EWL-PRC – Exposmeter Lipophilic for water 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

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

Repeatability

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

Salinity range

no influence

Electrical: no power requires

Mechanical: recommended mounting device and protective cage

- Length: (between the welds) 91.4cm
- Width: 2.5cm
- Wall thickness: 70-95 μ 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, Acenaphthene-d10, Chrysene-d12, Fluorene-d10, PCB3, PCB8, PCB37, PCB54, OCN internal standard.
- Lipid-to-membrane: mass ratio ≈ 0.2
- Weight of standard EWL-PRC: 4.4 to 4.6 grams

EWL-Tox – Exposmeter Lipophilic Toxicity for water

The **EWL-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 EWL-Tox in the field is very small

Salinity range

no influence

Electrical: no power requires

Mechanical: recommended mounting device and protective cage

- Length: (between the welds) 91.4cm
- Width: 2.5cm
- Wall thickness: 70-95 μ 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 ≈ 0.2
- Weight of standard EWL-Tox: 4.4 to 4.6 grams