Microtox® FX

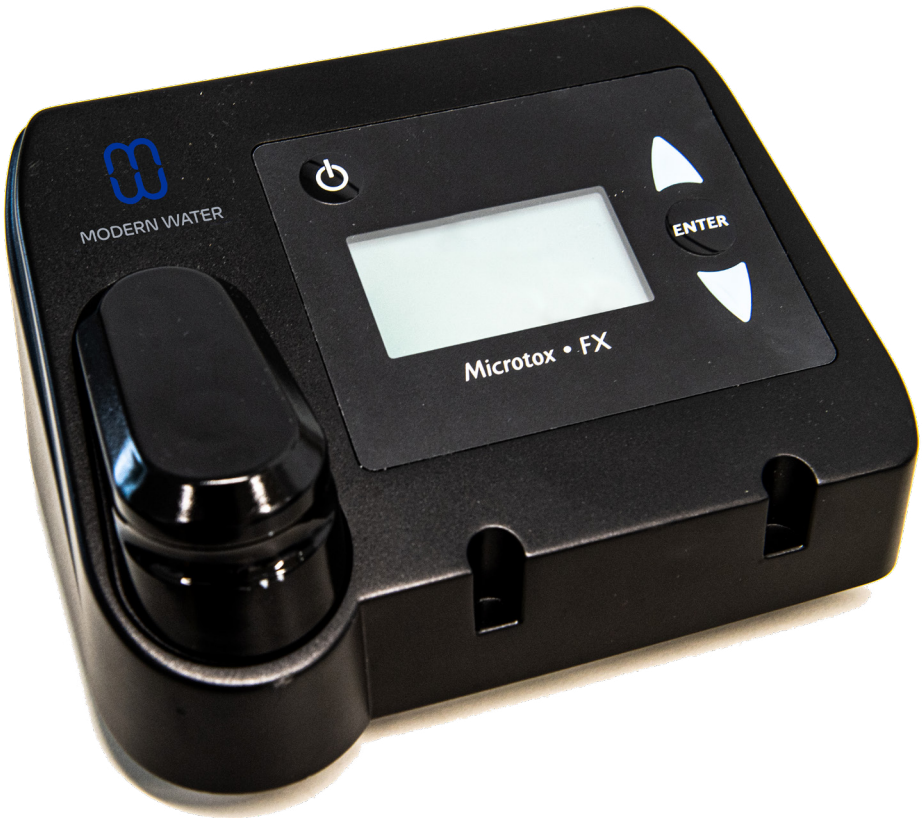
MODERN WATER
A Deepverge Company

PORTABLE TOXICITY AND BIO-CONTAMINANT DETECTION

Microtox® FX is a simple, rapid, extremely responsive, portable water quality test system. Designed for acute toxicity screening and adenosine triphosphate (ATP) testing, Microtox® FX uses bioluminescence technology to screen for contamination in instances of drinking water emergencies and chemical spills into water systems. Microtox® FX is the portable toxicity analyser used with the Microtox® technology.

The Microtox® FX instrument has a combined detection capability that provides a very sensitive and rapid test to detect two of the most probable classes of agents; pathogens and toxic chemicals, that may accidently or intentionally contaminate drinking water or wastewater. Microtox® FX's acute toxicity and ATP detection capabilities make it the ideal instrument for rapidly and accurately assessing if the quality of drinking water, from the source to the tap, has been affected by an incident.

- Biological early warning system sensitive to more than 2,700 simple and complex chemicals
- Fast - Reliable results available in 5 minutes after initial sample preparation
- Test results highly correlated with other widely accepted toxicity test methods
- Excellent correlation with HPC test methods
- Fully portable - lightweight with sturdy field carrying case
- Battery life of up to 8 - 10 hours with typical use
- Compatible with widely available ATP test kits*
- Manufactured in a certified ISO 13485 quality system with 100% lot traceability



*Check with your Modern Water monitoring representative to confirm compatibility with a specific test kit.

Microtox® FX is designed for use in any sample location throughout the water distribution or industrial waste water system. It is particularly suited to remote sites such as reservoirs, storage tanks, ocean or lake going vessels or in any hard to reach place.

Chemical contamination of drinking water and wastewater

Microtox® FX is the portable version of the industry-leading change Model 500 (M500) to LX laboratory analyser. The Microtox® FX test is fast, simple to conduct, uses small sample sizes and is very cost effective. Results correlate well with those from other toxicity bioassays such as fish, daphnia and shrimp. Microtox® FX is used extensively in the measurement of toxicity of "fit for use" water and wastewater treatment effluent. It is also used as an early screening tool for relative toxicity as part of a test battery.

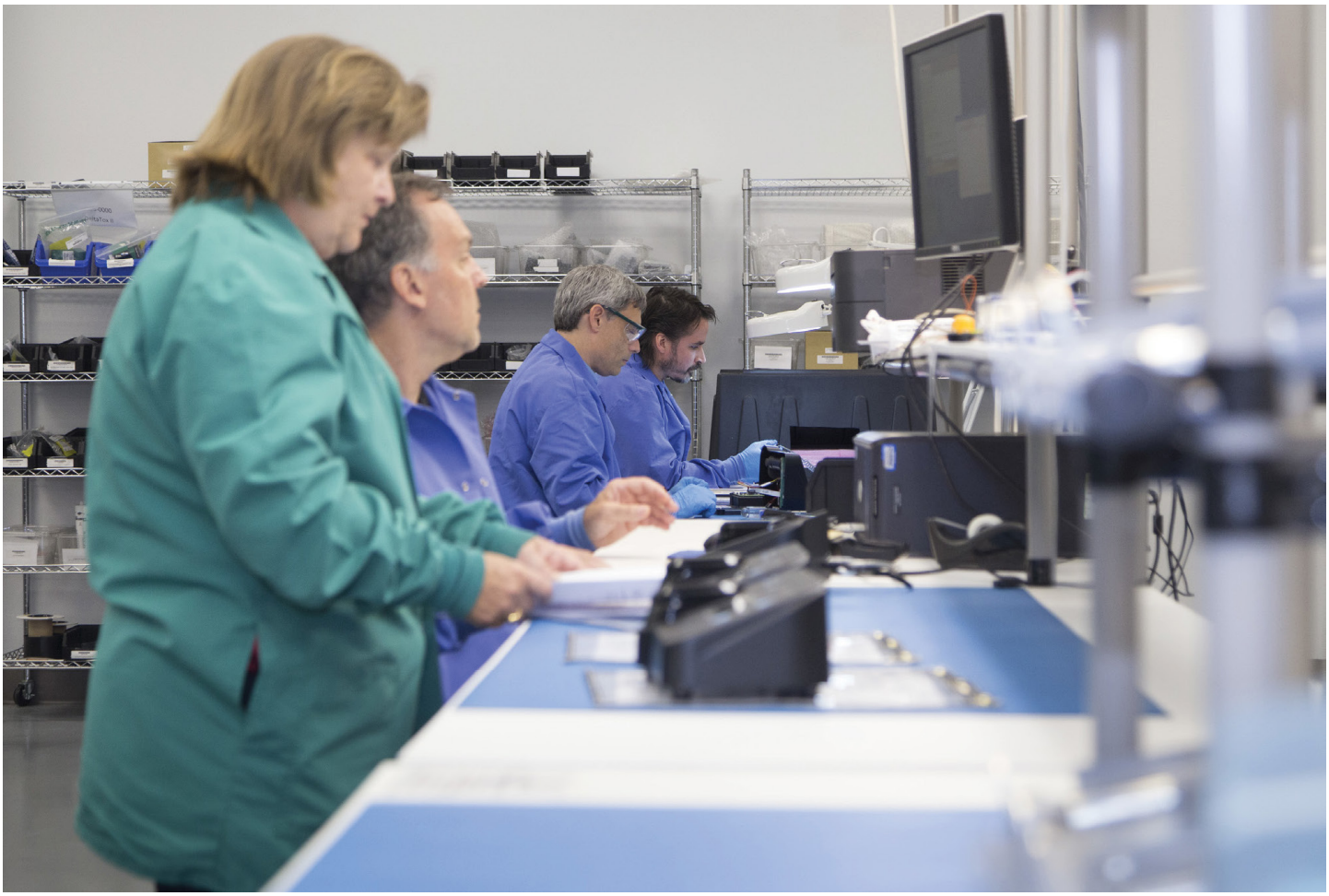
Microtox® FX test systems are uniquely suited for drinking water surveillance where supplies are monitored regularly and at strategic points. It can quickly reveal any changes in the level of toxicity of drinking water making it the ideal solution for major events. Microtox® has been deployed during the Summer Olympics beginning in 1984.

In industrial and municipal wastewater, Microtox® FX helps assure compliance with NPDES toxicity limits, measures toxicity in influent streams and determines treatment efficiency.

Microbial contamination of drinking water

Microtox® FX can rapidly estimate the microbial concentration of a drinking water sample to a level of 100 cfu/mL without additional filtration or incubation steps. The data is available in minutes and is highly correlated with standard heterotrophic plate count methods.

Microtox® FX is extremely responsive and has been designed for use in a wide variety of applications where it is crucial to rapidly determine the biomass of a sample.



APPLICATIONS

- Drinking water monitoring
- *Emergency response: Biological contamination Chemical toxicity*
- Hazardous waste
- Industrial effluent
- Industrial process water
- Municipal effluent
- Recreational water
- Soil
- Sediments
- Storm water

Process explained

The Microtox® FX system performs a dual function; toxicity testing and determination of microbial contamination.The Microtox® FX test system uses a strain of naturally occurring luminescent bacteria called Aliivibrio fischeri to provide acute toxicity detection.The bacteria emit light as a natural part of their metabolism. Exposure to a toxic substance causes disruption of the respiratory process of the bacteria resulting in reduced light output.The Microtox® FX photometer measures the light levels before and after addition of the sample, and the reduction in light output is a measure of the toxicity of the sample.

All organisms contain ATP as their main energy source and the amount of ATP in a sample is directly proportional to the biomass of the sample.

ATP reacts with luciferin/luciferase, the enzyme system present in firefly tails, to produce light. In the reaction, each molecule of ATP produces one photon of light; the light output of this reaction can be accurately measured using the very sensitive Microtox® FX instrument.

SPECIFICATIONS

Size	20cm x 18cm x 10cm (8" x 7" x 4")
Weight	1 kg (2.2 lbs)
Power	Self-contained Lithium ion battery or a universal power adapter (15 V dc @ 4 amps)
Instrument Operational Temp	0°C - 40°C
Reagent Operational Temp	10°C - 28°C
Dynamic Test Range	1 to 60 million counts (approx.)
Approvals	CE (European Community)
Display Output	Backlight LCD – 8 lines x 20 characters
Data I/O	Standard serial USB for data transfer and firmware updates
Data Storage	6.5k byte storage area (approx. 600 reads)
Data Handling	Stand alone or download capability to PC; built in software prompts operational steps, records light measurements and automatically calculates results for immediate review and further analysis
Test Reagent	Freeze-dried luminescent bacteria (Vibrio fischeri)
Toxicity Reagent Storage	Freeze-dried -15°C to -25°C Rehydrated 2 hours (ambient temperature)
ATP Reagent Storage	Refrigerate
Test Modes	Toxicity (Q-Tox and B-Tox) and ATP measurement
Test Durations	1-60 minute exposure
Test Measurement Criterion	Light output by test reagent measured after timed exposure to a sample
Results Display	Percentage light loss or gain for toxicity test; or light unit (photon) count (for ATP measurements)
Repeatability (Precision)	<20% coefficient of variation for B-Tox and Q-Tox mode testing
Sensitivity and Range:	The analyser can detect photon counts from 0 to 60 million
ISO Accreditation	ISO 13485 FM 583842