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HELPING CHEMISTS



FAST AND RELIABLE DETERMINATION OF ENVIRONMENTAL ORGANIC POLLUTANTS



ETHOS™ X and ETHOS™ X LEAN

Microwave Platforms for Environmental Extraction Workflows











MEETING THE CHALLENGES OF ENVIRONMENTAL POLLUTANT ANALYSIS

ORGANIC POLLUTANTS EXTRACTION

Environmental laboratories are responsible for monitoring contamination in soils, sediments, sludge, and solid waste. To ensure regulatory compliance and reliable environmental assessments, they must process large numbers of samples while delivering accurate and reproducible results.
Environmental analysis often involves:

» Increasing sample throughput requirements
» Strict regulatory limits and trace detection levels
» Complex and heterogeneous environmental matrices
» Time-consuming extraction techniques
» High solvent consumption and operating costs

Traditional extraction techniques often limit productivity and increase running costs. To address these challenges, Milestone has developed the ETHOS X and ETHOS X LEAN microwave platforms, delivering fast and reliable extraction of organic pollutants while significantly improving laboratory productivity.



HIGH THROUGHPUT • Simultaneous extraction of multiple samples

FAST TURNAROUND TIME • Short extraction cycles for routine analysis

LOWER SOLVENT CONSUMPTION • Greener extraction with minimal solvent usage

IMPROVED REPRODUCIBILITY • Controlled temperature conditions across all vessels

SAFER OPERATIONS • Reduced solvent exposure and no cleaning steps

FASTEX ROTOR TECHNOLOGY FOR ENVIRONMENTAL EXTRACTION

FASTEX ROTOR

ETHOS X and ETHOS X LEAN are equipped with fastEX rotor technology, combining disposable glass vials, controlled microwave heating, and closed-vessel operation to ensure high throughput and reproducible performance. Large-volume disposable glass vials enable higher sample mass, supporting lower detection limits in trace analysis.

	ETHOS X	ETHOS X LEAN
# of positions	24	12
Throughput	High	Moderate
Extraction vials	100 mL disposable glass	
Extraction vessels	High purity PTFE	
Sample mass	Up to 30 g	
Solvent volume	Typically 20-30 mL	
Solvent type	Polar and non-polar solvents	



FASTEX WORKFLOW

The extraction workflow is simple and efficient: samples are placed into disposable glass vials (1), the appropriate solvent is added (2), the vials are inserted into the rotor (3), and the vessel is closed (4). These simple operations are combined with controlled microwave heating and integrated temperature monitoring to ensure a consistent and reproducible extraction process.









COMPLIANT

Microwave-assisted extraction using ETHOS X and ETHOS X LEAN is compliant with established environmental methods, including US EPA 3546 and other international standards. Controlled temperature conditions and closed-vessel operation ensure efficient extraction of organic pollutants across a wide range of environmental matrices, supporting accurate and reproducible results in routine laboratory workflows.

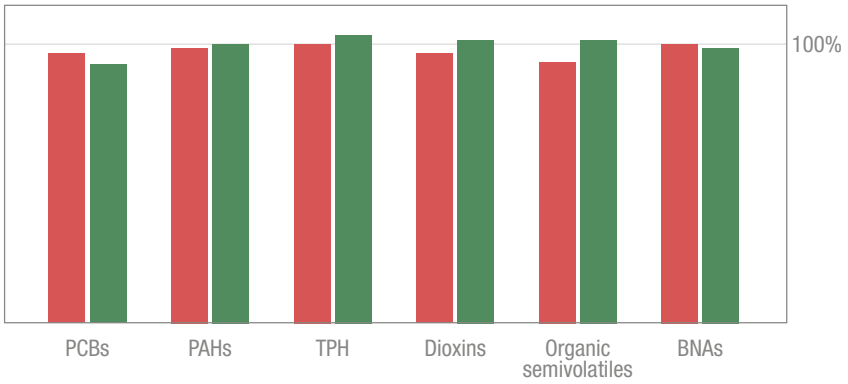
Typical extraction conditions

Sample amount	2-20 g
Solvents type	Hexane and Acetone (1:1)
Solvents volume	25 mL
Temperature	100-115°C
Time at temperature	10-20 minutes

Compound	*Typical samples*
PCBs	Soils, clays, sediments, sludges, and solid wastes
PAHs	
Semivolatile organics	
Phenols	
Chlorinated pesticides	
Organophosphorus pesticides	
Chlorinated herbicides	
Dioxins	

RELIABLE AND CONSISTENT

Data quality and reliability are essential for environmental laboratories. The ETHOS X and ETHOS X LEAN platforms, combined with fastEX rotor technology, ensure consistent and reproducible extraction across a wide range of matrices. Controlled temperature conditions and closed-vessel operation enable the simultaneous processing of multiple samples, including different matrices within the same run, ensuring optimal extraction efficiency. In addition, the use of large-volume disposable glass vials eliminates cross-contamination and memory effects, supporting reliable results even for trace analysis.



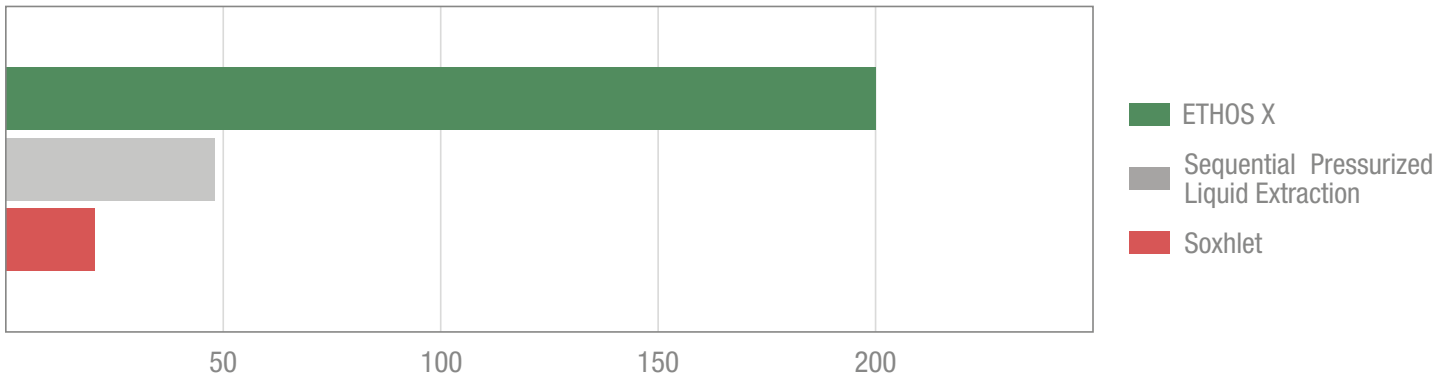
Milestone ETHOS X recovery study and comparison vs Soxhlet for various organic compounds.

MAXIMIZE PRODUCTIVITY AND REDUCE COST PER SAMPLE

PRODUCTIVITY

Microwave-assisted extraction significantly increases laboratory productivity by enabling the simultaneous processing of multiple samples in a single run. Compared to traditional techniques such as Soxhlet or sequential extraction systems, ETHOS X and ETHOS X LEAN dramatically reduce extraction times and enable a substantial increase in daily sample throughput.

Samples in 8 hours



RETURN ON INVESTMENT (ROI)

The combination of high throughput, reduced solvent consumption, simplified sample handling, and lower maintenance requirements significantly reduces the cost per sample. This enables laboratories to improve operational efficiency and achieve a faster return on investment.

	Soxhlet	**Sonication**	**Pressurized Liquid Extraction**	**ETHOS X**
Sample Size (g)	10-30	30	10-20	2-30
Solvent Volume per sample (mL)	300-500	300-400	15-30	15-30
Extraction time (min)	Days	Hours	270 min - 24 samples	40 min - 24 samples
Productivity (8 hours)	Low	Low	Moderate	Very high
Initial investment	Low	Low	High	Moderate
Cost per sample*	**Moderate**	**Moderate**	**High**	**Low**

**Including: solvent - handling - time - productivity - maintenance*

SUSTAINABILITY

Microwave extraction supports greener laboratory operations by reducing solvent consumption, minimizing waste generation, and shortening extraction times. The use of disposable glass vials simplifies handling and eliminates the need for cleaning steps, contributing to safer and more sustainable workflows.

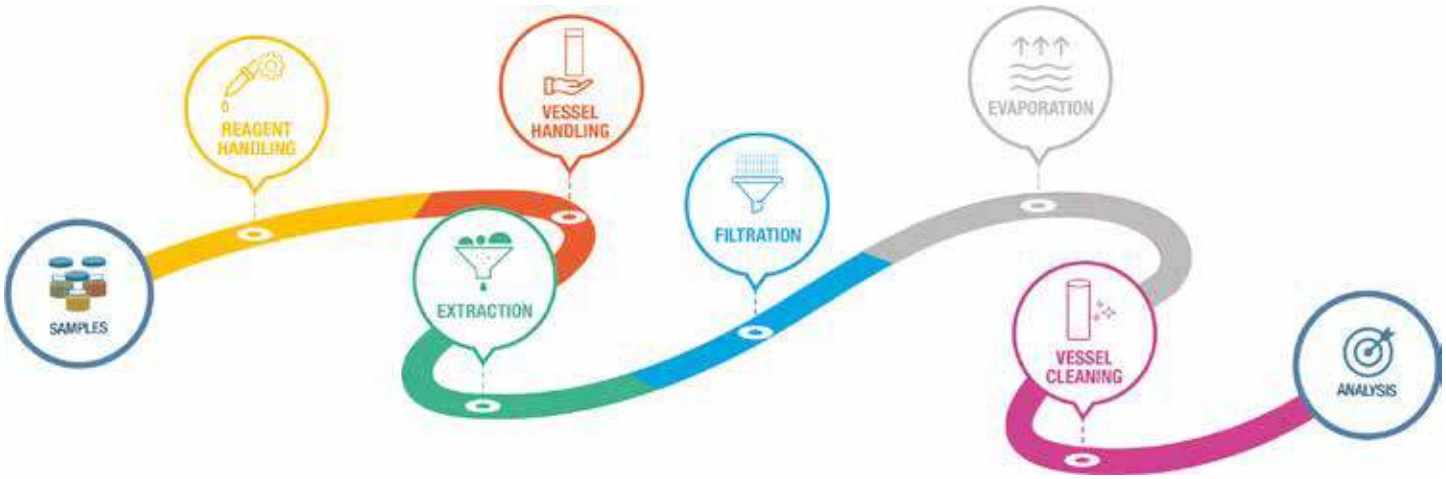
Solvent reduction

Energy efficiency

Waste reduction

COMPREHENSIVE WORKFLOW

Environmental sample preparation involves multiple steps, each impacting efficiency, safety, and data quality. ETHOS X and ETHOS X LEAN, together with Milestone solutions, optimize the entire workflow from solvent handling to extraction and filtration, reducing manual operations, improving safety, and increasing overall laboratory efficiency.



Total Sample Preparation Approach for organic pollutants analysis of environmental samples

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Established in 1988, Milestone is headquartered in Italy with its R&D and manufacturing centre in Germany and Switzerland and offices in the United States, China, Japan and Korea. We operate worldwide through a network of over 100 exclusive distributors, all providing our customers with premium application and service support. Milestone's mission is to help chemists by offering them the most advanced instrumentation for sample preparation and direct mercury analysis in the world. Our industry-leading technology, in combination with fast, responsive service and applications support, allows Milestone to support our goal of giving you the highest return on investment possible.

ADDITIONAL MILESTONE SOLUTIONS



ETHOS™

Microwave Labstation



ETHOS™ LEAN

Compact
Microwave Labstation



DMA-80

Direct Mercury Analyzer



DMA-1

Compact
Direct Mercury Analyzer

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