



# AT MILESTONE, WE HELP CHEMISTS

Milestone Product Portfolio



**MILESTONE**  
HELPING  
CHEMISTS





# THE MILESTONE WAY

*Our team shares true passion for what we do.*

*We are professionals with human touch because  
long-term partnership with our customers comes first.*

*Our success is based on innovation and focus  
to meet today and future needs.*



## MICROWAVE DIGESTION

OPTIMUM SAMPLE PREPARATION FOR ELEMENTAL ANALYSIS CONSIDERS SEVERAL FACTORS: **REAGENT HANDLING, ACID QUALITY AND VESSELS CLEANING.** ALL OF THEM PLAY A PIVOTAL ROLE TO IMPROVE DETECTION LIMIT, WORKFLOW AND LAB EFFICIENCY.

CLOSED VESSELS **MICROWAVE DIGESTION** IS THE BENCHMARK IN SAMPLE PREPARATION FOR ELEMENTAL ANALYSIS AS IT ENSURES SUPERIOR QUALITY, SHORTER DIGESTION PROCESS, GREATER EASE OF USE AND HIGHER SAFETY.



## CLEAN CHEMISTRY



## MERCURY ANALYSIS

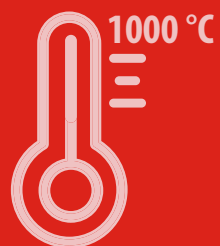
**DETERMINATION OF MERCURY** IS A WELL KNOWN TASKS THAT SEVERAL LABS NEED TO ADDRESS. DIRECT MERCURY ANALYSIS SIMPLIFIES AND EXPEDITES THE MERCURY ANALYSIS IN A WIDE SUITE OF SAMPLES.

**ASHING** IS A REGULAR AND TEDIUOS PROCESS FOR MANY LABS. MICROWAVE ASHING ENABLES TO REDUCE THE ASHING TIME TO MINUTES, WHILST INCREASING SAFETY AND OPERATOR CONDITIONS.



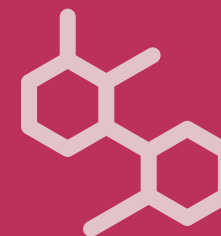
## MICROWAVE EXTRACTION

MICROWAVE TECHNOLOGY CHANGES THE WAY **SYNTHESIS** ARE PERFORMED. CLOSED VESSELS TECHNOLOGY AND MICROWAVE HEATING ENABLE THE OPTIMIZATION OF SYNTHESIS PROTOCOLS IN A FRACTION OF TIME. THUS, IT OFFERS EASIER METHOD DEVELOPMENT AND SCALE-UP.



## MICROWAVE ASHING

TRADITIONAL SAMPLE PREPARATION FOR CHROMATOGRAPHY IS TIME CONSUMING. **MICROWAVE EXTRACTION** EXPEDITES THIS PROCESS OFFERING SUPERIOR PRODUCTIVITY AND TURNAROUND TIME.



## MICROWAVE SYNTHESIS

# BEST IN CLASS ROTOR DIGESTION SYSTEM



## | ROTOR-BASED DIGESTION



Microwave digestion is one of the most impactful steps in trace metals determination. The quality of analytical data obtained by ICP/ICPMS is directly reliant on the sample prep quality. Specifically designed for closed-vessels digestion, every ETHOS incorporates advanced construction, reaction control and smart user interface.

**ETHOS UP** and **ETHOS EASY** are advanced and full-featured rotor-based systems for microwave sample preparation available with a suite of digestion rotors to meet both applications and productivity needs of the lab.

**ETHOS LEAN** incorporates Milestone quality and know-how into a compact and economical solution for sample preparation.

- EASE OF USE
- PERFORMANCE
- THROUGHPUT
- SAFETY & RELIABILITY
- FLEXIBILITY

### **ETHOS UP**

High-Performance Microwave Digestion System

### **ETHOS EASY**

Advanced Microwave Digestion System

### **ETHOS LEAN**

Compact Microwave Digestion System

# THE NEW GOLD STANDARD IN SAMPLE PREP

## | SRC DIGESTION



Milestone's Single Reaction Chamber (SRC) technology revolutionizes microwave digestion, transcending traditional closed- and open-vessel digestion, and offering significantly greater digestion capabilities. At the core of **ultraWAVE** and **ultraCLAVE** is the high-performance stainless steel chamber with PTFE liner enabling for higher temperatures and pressures, up to 300 °C and 199 bar, while the use of simple vials eliminates the need to assemble, vent, and disassemble digestion vessels. Just as important, dissimilar samples can be processed simultaneously, saving time and money.

- HIGHEST PRODUCTIVITY
- UNPARALLELED USABILITY
- UNMATCHED PERFORMANCE
- LOW COST OF OWNERSHIP
- UNCOMPROMISED SAFETY

### **ultraWAVE**

Single Reaction Chamber Microwave Digestion System

### **ultraCLAVE**

Fully Automated Single Reaction Chamber Microwave Digestion System

# HIGH-PURITY ACIDS AT REDUCED COST FOR TRACE METALS ANALYSIS



## | ACID PURIFICATION



In trace metals analysis the use of expensive high-purity acids is required.. Using duoPUR or subCLEAN can reduce the cost of reagents by to 90% by efficiently purifying reagent-grade acids to produce ultrapure acids at the desired quality and time.

The **duoPUR** has two quartz purification units and allows the purification of the most common acids such as  $\text{HNO}_3$  and  $\text{HCl}$ , while **subCLEAN** has a single PTFE-TFM purification still, allowing purification of  $\text{HF}$  in addition to  $\text{HCl}$  and  $\text{HNO}_3$ .

- AUTOMATIC & SAFE
- 90% COST SAVING
- ON DEMAND PURIFICATION
- HIGH PRODUCTIVITY

### **subCLEAN**

PTFE Acid Purification System

### **duoPUR**

Quartz Acid Purification System





LESS OPERATOR TIME,  
IMPROVED WORKFLOW  
**ENHANCED SAFETY**

## | AUTOMATED DOSING



Reagent addition is an inherent step of the sample preparation process that involves the handling of concentrated acids, leading to potential safety issues and time-consuming operation.

The **easyFILL** automated dosing station completely automates this step, saving operator time and reducing exposure to concentrated acids. easyFILL is fully compatible with all Milestone digestion vessels and vials, as well as with commonly used concentrated acids, such as HCl, HNO<sub>3</sub>, HF, H<sub>2</sub>O<sub>2</sub> and others.

- ENHANCED SAFETY
- SMART SOFTWARE
- SUPERIOR EFFICIENCY
- ERROR-FREE OPERATIONS
- HIGH FLEXIBILITY

### **easyFILL**

Automate Dosing Station

# EFFICIENT CLEANING COUPLED WITH HIGH PRODUCTIVITY



## | AUTOMATED CLEANING



Cleaning of lab glassware and digestion vessels has a direct impact on blank value and overestimation. This step is an integral part of the lab routine and uses procedures that affect the productivity and the overall efficiency of the elemental analysis workflow.

**traceCLEAN** provides faster and more efficient cleaning using high-temperature acid steam and requires less operator time. Unlike acid soaking, traceCLEAN takes about an hour, doesn't expose the operator to acid, ensures greater cleaning, and improves the lab workflow.

- IMPROVED WORKFLOW
- EFFICIENT
- AUTOMATED AND CONVENIENT
- SAFE

**traceCLEAN**  
Automated Acid Steam Cleaning

# SAVE TIME GO DIRECT

FOR MERCURY ANALYSIS

## | MERCURY ANALYSIS



The challenges in mercury determination are well known to analysts who have often had to face several issues due to either tedious sample preparation process or different analysis steps. **DMA-1 evo** and **DMA-80 evo** analyze any matrix (solid, liquid or gas) without any pre-treatment or chemical additions in as few as 5 minutes. Over the years the DMA-80 has become the benchmark for direct mercury determination in many industries, including environmental, food, energy, cement, cosmetics, agriculture, mining, and petrochemical.

- FAST & RELIABLE
- IMPRESSIVE EASE OF USE
- HIGH PRODUCTIVITY
- LOW RUNNING COSTS

### **DMA-1 evo**

Direct Mercury Analyzer

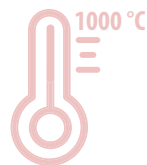
### **DMA-80 evo**

Direct Mercury Analyzer with autosampler

# SAFE, REPRODUCIBLE AND FAST ASHING FOR HIGH PRODUCTIVITY LABS



## | ASHING



Procedures that involve muffle furnace are often considered cumbersome, time consuming and unpleasant for the operator. The **PYRO** is an advanced microwave muffle furnace built to offer shorter time and improved safety of operations. It is a reliable answer for several applications such as ashing, sulfated ashing, loss on ignition (LOI), residue on ignition (ROI), fusion and, all high temperature reactions under controlled conditions. The PYRO is available in 3 different and interchangeable configurations: ultrafast heating setup, high sample throughput setup and sulfated ashing setup.

- FAST ASHING
- HIGH THROUGHPUT
- IMPROVED SAFETY
- FLEXIBLE CONFIGURATIONS

## **PYRO**

Advanced Microwave Muffle Furnace

*Available with the following configurations:*

- UltraFAST Heating
- High Sample Throughput
- Sulfated Ashing

EFFICIENT & EASY TO ADOPT  
**EXTRACTION**  
SOLUTIONS



## | EXTRACTION



Solvent extraction is often the bottleneck toward chromatographic analytical procedures. Microwave-assisted extraction uses closed vessels to increase the solubility of the analytes of interest, leading to dramatically reduced extraction times. **ETHOS X**, microwave extractor, is faster and produces more accurate and precise results than other methods. Typical applications of microwave assisted solvent extraction include contaminants from environmental matrices, total fat determination in food samples and extraction of flavors and fragrances from natural products.

- FASTER EXTRACTION
- HIGHER PRODUCTIVITY
- LOW SOLVENT CONSUMPTION
- LOW RUNNING COSTS

## **ETHOS X**

Advanced Microwave Extraction System

# HIGH QUALITY EXTRACTS WITH A GREEN PROCESS



## | EXTRACTION FOR PROCESSORS



Two decades ago Milestone pioneered solvent-free extraction from botanicals, with the goal to offer a more up-to-date and “green” approach. Over these years, the innovative microwave process has been adopted by several industries, gradually moving from research labs to production plants. Milestone’s long-standing commitment to this technology has led to the **ETHOS X 2.0** and **ETHOS XL**, two dedicated solutions for craft applications as well as medium and large-scale processors. Both incorporate the solvent-free and green approach whilst significantly enhancing the production capacity.

- HIGHER EXTRACT QUALITY
- FASTER EXTRACTION PROCESS
- NO BY-PRODUCTS
- NO SOLVENT REQUIRED
- ZERO PURIFICATION

### **ETHOS X 2.0**

Microwave Extraction System for processors

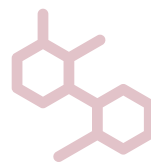
### **ETHOS XL**

Microwave Extraction System for processors

# MAXIMIZING YOUR RESEARCH WITH FLEXIBLE TOOLS



## | SYNTHESIS



Microwave technology is changing the way of designing and optimizing synthetic protocols as well as their scaling up to multi-gram production. Microwave assisted synthesis has become a cutting-edge technology across the pharmaceutical, biotech, polymers, fine and agrochemical industries.

**flexiWAVE** enables chemists to perform classic glassware and high-pressure synthesis, as well as solid-phase reactions within a single platform.

**synthWAVE** is designed for highest performance, safe, and reproducible scale-up of microwave enhanced chemical reactions.

- UNPARALLELED FLEXIBILITY
- GREATER EASE OF USE
- EASY SCALE-UP
- FASTER SCREENING

### **flexiWAVE**

Advanced Flexible Microwave Synthesis Platform

### **synthWAVE**

The Game Changer in Microwave Synthesis

# MILESTONE

YOUR RELIABLE PARTNER

Milestone's mission is to help chemists by offering the most advanced solutions to enhance and optimize several sample preparation steps for spectrometry and chromatography analysis as well as direct mercury analysis. Since its foundation in 1988, Milestone has brought innovation, ensuring our users to meet present and future requirements of the lab. Our corporate and local teams assist our customers throughout the whole process, suggesting the right solution, developing dedicated applications, and ensuring we meet expectations and requirements.

[WWW.MILESTONESRL.COM](http://WWW.MILESTONESRL.COM)



**MILESTONE**  
H E L P I N G  
C H E M I S T S

MILESTONE Srl - Via Fatebenefratelli, 1/5 - 24010 Sorisole (BG) - Italy  
Tel: +39 035 573857 - Fax: +39 035 575498  
[www.milestonesrl.com](http://www.milestonesrl.com) - email: [analytical@milestonesrl.com](mailto:analytical@milestonesrl.com)

MILESTONE INC. - 25 Controls Drive - Shelton, CT 06484 - USA  
Tel: (203) 925-4240 - Toll-free: (866) 995-5100 - Fax: (203) 925-4241  
[www.milestonesci.com](http://www.milestonesci.com) - email: [mwave@milestonesci.com](mailto:mwave@milestonesci.com)

MILESTONE GENERAL K.K. - KSP, 3-2-1, Sakado - Takatsu-Ku,  
Kawasaki 213-0012 - Japan - Tel: +81 (0)44 850 3811 - Fax: +81 (0)44 819 3036  
[www.milestone-general.com](http://www.milestone-general.com) - email: [info@milestone-general.com](mailto:info@milestone-general.com)

MLS GmbH - Auenweg 37 D-88299 Leutkirch im Allgau - Germany  
Tel: +49 (0)7561 9818-0 - Fax: +49 (0)7561 9818-12  
[www.mls-mws.com](http://www.mls-mws.com) - email: [info@mls-mikrowellen.de](mailto:info@mls-mikrowellen.de)