



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



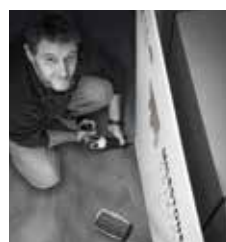
ELEMENTAL ANALYSIS:
GET IT RIGHT
FROM THE START

Sample preparation workflow
for elemental analysis

MILESTONE YOUR RELIABLE PARTNER

The choice of the right instrument for your lab includes the selection of the right partner. Milestone's priority is to offer our users a superior overall experience, from our professionalism and expertise to our products and technology. Our corporate and local teams are fully

trained in applications and service to guarantee fast and reliable support. We will assist you throughout the whole process, suggesting the right solution for your needs, developing dedicated applications and ensuring we meet your expectations.



OUR CAPITAL
OUR PEOPLE
YOUR EXPERTS



I milesCARE

Your lab depends on a reliable, uninterrupted workflow to remain productive and profitable. This requires a true partner at your side. milesCARE is Milestone's program to ensure premium support to our customers. It relies on a dedicated team of service and support engineers, application chemists, and operations people, as well on a constantly updated stock of spare parts, consumables, accessories, and hardware

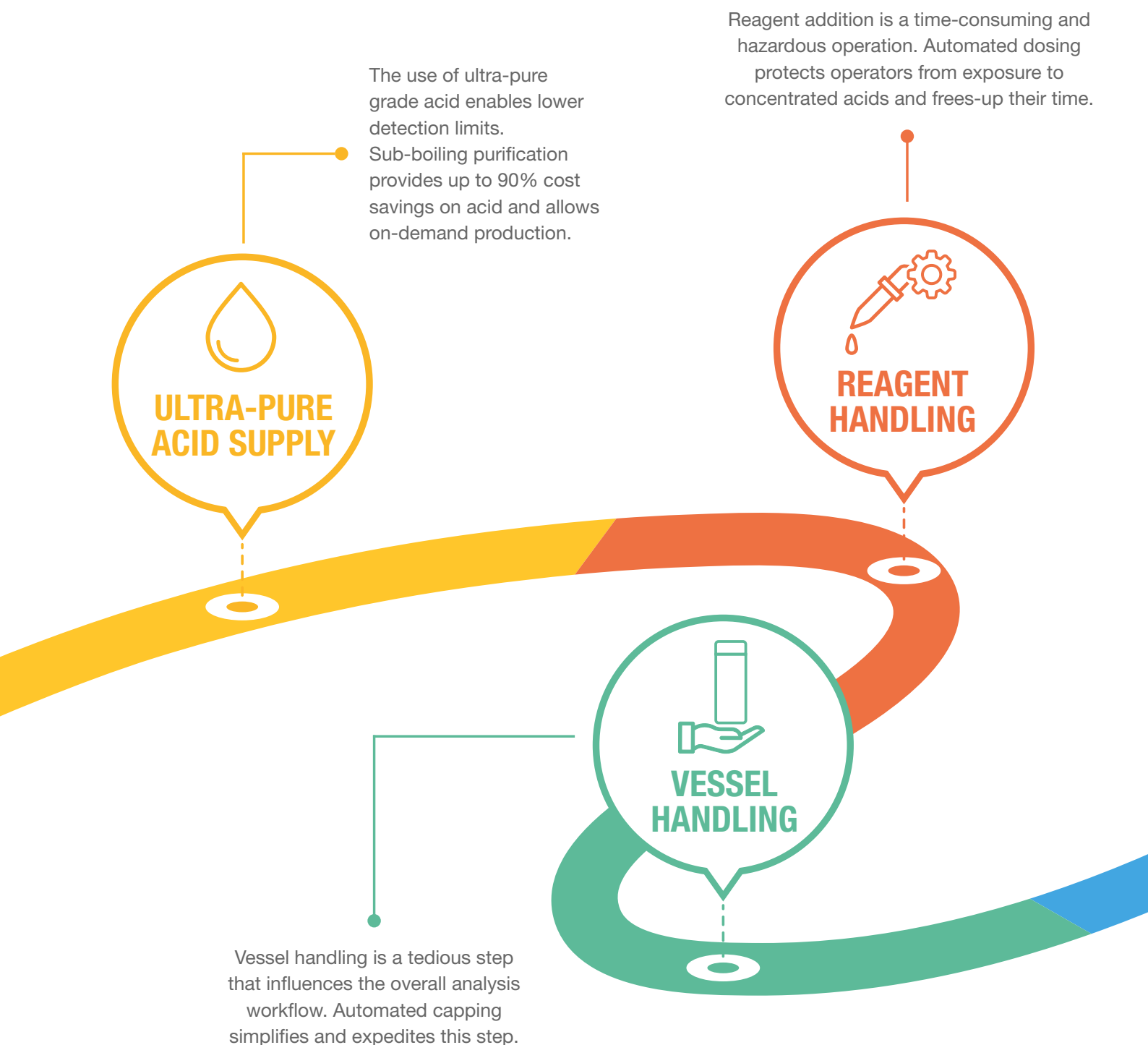
components. The entire milesCARE program is designed to reduce, and even eliminate, downtime and emergency calls. Cost-effective maintenance keeps the systems performing at their best and ensures them a longer lifetime. With milesCARE your daily needs will be met through a suite of tools and valuable documentation that includes augmented reality and our unique Milestone Connect.



AT YOUR SIDE ON EACH STEP OF SAMPLE PREP WORKFLOW

THE WORKFLOW IN SAMPLE PREPARATION

Sample preparation for elemental analysis is a pivotal step to ensure reliable and accurate data. Acid digestion has a central role in this stage, however there are several additional steps that contribute to improving quality in elemental analysis as well as workflow and lab efficiency. If there is no confidence in the initial sample preparation stage, there can be no confidence

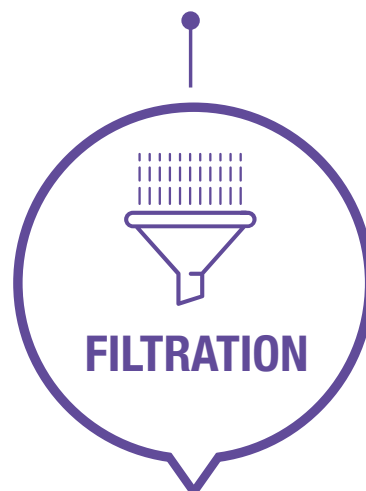


in the results from subsequent analyses. Since 1988, Milestone has provided sample preparation tools featuring unmatched safety, throughput, performance, and ease-of-use. These decades of experience have led to the development of several tools to address most routine tasks in the overall sample preparation process. Reagents handling, cleaning approach, supply of ultra-

pure acids and the handling of digestion vessels are all parameters to consider. In fact, all of them have an impact on the lab performance, safety, economy, and efficiency. Milestone provides new assets to achieve superior elemental analysis through a better sample preparation workflow.

In some cases filtration is required to remove solid particles from digested solutions. It is often done with obsolete and sequential technologies that impact the lab workflow. Simultaneous filtration provides higher productivity and ease of use.

Acid digestion is a common step in elemental analysis. Microwave closed-vessel technology provides higher digestion quality and better throughput.



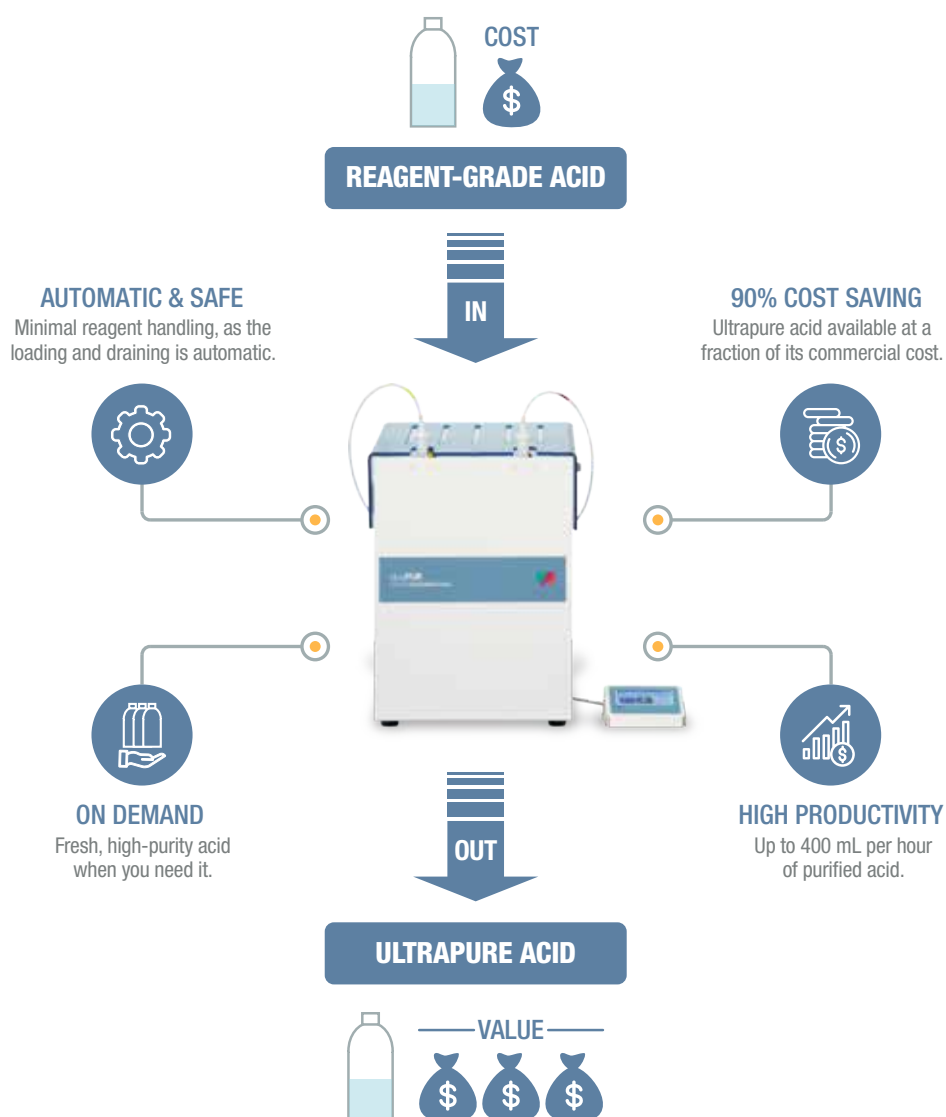
Cleaning of digestion vessels and labware is pivotal to lower blanks and avoiding overestimations. Acid steam cleaning offers superior cleaning efficiency and better workflow.

HIGH-PURITY ACIDS AT REDUCED COST FOR TRACE METALS ANALYSIS

I COST-EFFECTIVE REAGENTS



In trace metals analysis you often need to use expensive high-purity acids. 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. The systems' on-demand sub-boiling distillation process supplies fresh, purified acids and eliminates the risk of reagent contamination due to daily operations. The duoPUR has two quartz purification units and allows the purification of the most common acids such as HNO_3 and HCl , while subCLEAN has a single PTFE-TFM purification still, allowing purification of HF in addition to HCl and HNO_3 .



LESS OPERATOR TIME, IMPROVED WORKFLOW ENHANCED SAFETY

AUTOMATED REAGENT ADDITION



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, HNO₃, HF, H₂O₂ and others.

ENHANCED SAFETY

SUPERIOR EFFICIENCY

SMART SOFTWARE

ERROR-FREE OPERATIONS

HIGH FLEXIBILITY

BEST IN CLASS ROTOR DIGESTION SYSTEM

I ROTOR-BASED DIGESTION



Specifically designed for closed-vessels sample digestion, every Milestone ETHOS incorporates advanced construction and design elements that ensure unparalleled safety, durability, and ease-of-use, such as large stainless-steel cavities with corrosion-resistant coatings, pressure-responsive doors, advanced reaction control, and vent-and-reseal vessels with solid-form safety shields.



SK-15

HIGH PRESSURE ROTOR

High temperature and pressure capability for difficult applications.



MAXI-24 HP

HIGH PERFORMANCE ROTOR

Blends high-throughput and high-temperature/pressure capability into a single rotor.



MAXI-44

HIGH THROUGHPUT ROTOR

Highest throughput for routine applications.





ETHOS is the most advanced and full-featured rotor-based systems for microwave sample preparation ever manufactured. Designed to match laboratory needs in terms of productivity and performance for a wide suite of samples, the ETHOS platforms offer a perfect integration of microwave hardware, user interface, and digestion sensors. To complete the performance of the ETHOS, a suite of digestion rotors are offered to meet any digestion and throughput requirements.

ETHOS is more than a digestion system: it is a microwave labstation designed to support laboratories across many different sectors. With the appropriate selection of rotors and accessories, ETHOS can address diverse and demanding sample preparation processes, ranging from the analysis of organic pollutants, PFAS, microplastics, and other environmental contaminants, to the determination of fat, FAMES, and amino acids in food and feed, as well as MOAH & MOSH analysis. Its scope extends further to advanced materials and geological studies, where high-temperature fusions and fire assays are required, and even to synthetic chemistry workflows.



| SIMPLIFYING VESSEL CAPPING



Handling a large number of digestion vessels impacts lab workflow and operator time. By improving this step, your lab can achieve a fast and reliable digestion process with less operator time. easyCAP accomplishes this by ensuring reproducible and automated capping of digestion vessels. It complements the High Throughput rotor (MAXI-44) and the High Performance rotor (MAXI-24 HP), offering high-volume laboratories a path toward a more efficient workflow.



*Milestone easyCAP
Automatic Capping Station for MAXI rotors*

FASTER & REPRODUCIBLE VESSEL CAPPING FOR BETTER WORKFLOW

THE NEW GOLD STANDARD IN SAMPLE PREP

I SRC TECHNOLOGY



Milestone's Single Reaction Chamber (SRC) microwave digestion technology isn't just an evolution; it's a revolution-inducing sample preparation approach for elemental analysis. The patented SRC technology transcends traditional closed- and open-vessel digestion, offering significantly greater digestion capabilities for even the most difficult sample types. High-performance stainless steel with PTFE liner construction allows 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. Milestone SRC technology has been a game-changer for an ever-increasing number of labs, as it offers superior performance and ease of use while increasing productivity and reducing the cost of ownership.





ultraWAVE 2 eco

The ultraWAVE 2 eco combines a proven stainless-steel reactor design with smart engineering to deliver robust performance and simplified operation. With enhanced cooling efficiency, full chemistry compatibility, and an intuitive terminal, it is built to support both routine and occasional workflows while promoting sustainable laboratory practices.



ultraWAVE 3

ultraWAVE 3 encompasses advanced features bringing new levels of performance, safety, ease-of-use, and return-on-investment to benchtop SRC-based digestion.















ultraCLAVE

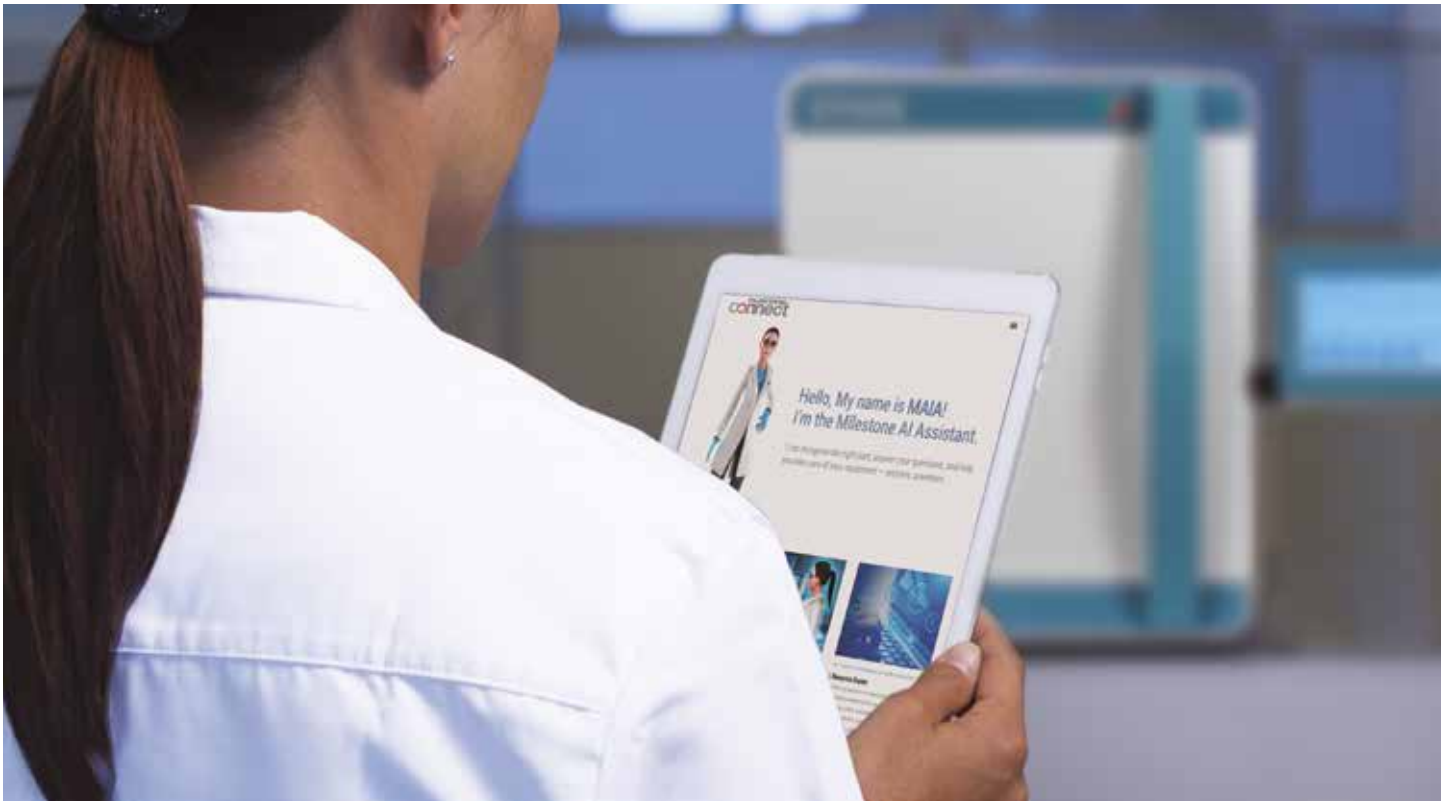
ultraCLAVE is a floor-mounted SRC-based digestion system that achieves extreme performance and offers the highest sample throughput.

OPTIMIZE YOUR INVESTMENT WITH THE RIGHT SOLUTION AND PARTNER

DIGESTION TECHNIQUES AT COMPARISON

The digestion technique that is right for your lab, today as well as for the future, depends on many factors. Which samples do you need to digest? What are the detection limits of your analytical system? What is its throughput? How does your sample preparation technique marry to the analytical technique? We address below the main areas you need to consider when choosing a technique.

	ROTOR-BASED TECHNOLOGY	SRC TECHNOLOGY
Initial investment		
Relative cost per sample		
Operational cost		
Consumables cost		
Operator time per run		
Average sample per day	50 to 100	OVER 100
Ability to process any samples simultaneously		



Milestone Connect is a unique feature for your best-in-class system that puts Milestone's 35-plus years of applications experience at your fingertips. With ETHOS, ultraWAVE and DMA-80 evo, comes exclusive access to Milestone's Application Team via continuously updated application notes, a library of scientific papers, video tutorials, and system manuals available 24/7. Milestone Connect remotely monitors the operation of the microwave digestion system or direct mercury analyzer through desktop, tablet, or smartphone, greatly enhancing process control of the sample preparation or analysis procedure. Users can interact with MAIA through a built-in chat or voice commands for faster, more intuitive support in method setup, optimization, and troubleshooting.

REMOTE MONITORING

VIDEO TUTORIALS

APPLICATIONS LIBRARY

QUICK GUIDE

MANUALS AND DOCUMENTATION

AI AGENT ASSISTANT WITH MAIA



**MILESTONE
CONNECT**
35 YEARS OF EXPERIENCE
AT YOUR FINGERTIPS

A FILTRATION SYSTEM TO SIMPLIFY & EXPEDITE YOUR DAILY WORK

I SIMULTANEOUS FILTRATION



The sample preparation process for elemental analysis of some samples such as soils and sediments, often requires a filtration step. The conventional approach to filtration involves old-style apparatus that negatively affects lab workflow and occupies valued space in the fume hood. The Simultaneous Filtration System (SFS-24) overcomes these limitations, improving the lab's productivity and reducing the fume hood space requirement. The SFS has up to 24 positions and uses inexpensive funnels that are compatible with all commonly used mineral acids. This setup is combined with a vacuum pump and pressure manometer to accelerate and control the process, leading to an easier and faster filtration process.



SIMULTANEOUS FILTRATION

24 SAMPLES IN A FEW MINUTES

COMPACT & ERGONOMIC DESIGN

HIGHER PRODUCTIVITY

SIMPLIFIED WORKFLOW

Milestone SFS-24 Simultaneous Filtration System

LOWER DETECTION LIMITS FOR TRACE METALS ANALYSIS THROUGH EFFICIENT CLEANING

I EFFICIENT 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

High productivity is ensured as the cleaning cycle takes about an hour



EFFICIENT

Hot nitric acid steam ensures superior cleaning efficiency



AUTOMATED AND CONVENIENT

Load the items to be cleaned and press "START"



WIDE APPLICABILITY

Suitable for all digestion vessels, glassware, and ICP accessories



SAFE

No operator exposure to acid fumes thanks to a dedicated exhaust system

Milestone traceCLEAN Automated Acid Steam Cleaning

MILESTONE HELPING CHEMISTS

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 FOR ELEMENTAL ANALYSIS



DMA-80 *evo*

Direct Mercury Analyzer



PYRO

Advanced Microwave
Muffle Furnace

WWW.MILESTONESRL.COM

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CERTIFIED

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