



MILESTONE
HELPING
CHEMISTS



TAKING PRODUCTIVITY
AND PERFORMANCE
TO NEW HEIGHTS

powered by AI⁺



ultraWAVE 3

Single Reaction Chamber
Microwave Digestion System

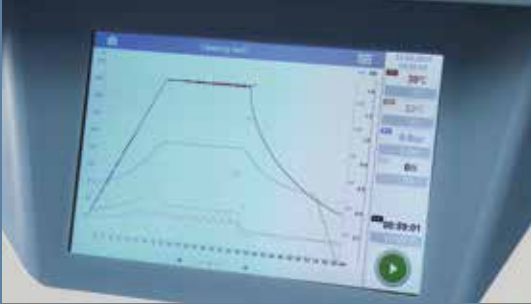
WE FOCUS ON ADDRESSING YOUR CHALLENGES

I CUSTOMER CENTRIC INNOVATION

The many benefits of microwave closed-vessel technology have led to its broad adoption in sample preparation for elemental analysis over the past three decades. At the same time, modern laboratories are facing a wider variety of samples and stricter requirements for detection limits and accuracy, while being expected to deliver faster turnaround times and higher productivity at lower costs.

Since the late 1990s, Milestone has pioneered microwave closed-vessel technology, creating new paths to address the evolving needs of laboratories. Starting with ultraCLAVE and then with ultraWAVE, Milestone has invented and refined Single Reaction Chamber (SRC) technology, successfully implemented by thousands of laboratories worldwide.

Today, ultraWAVE 3 represents another major step forward in SRC technology. It combines more than 20 years of expertise with the latest digital innovation, integrating MAIA – Milestone AI Assistant to provide intelligent guidance, optimized workflows, and enhanced user confidence. In addition, ultraWAVE 3 is sustainable by design, reducing acid consumption, minimizing waste, and promoting greener laboratory practices while maintaining the highest level of performance.



*ultraCLAVE
(5th generation)*



*ultraWAVE
(1st and 2nd generation)*



MAXIMUM THROUGHPUT • More samples, less time

SUPERIOR QUALITY • Complete digestion of any matrix

SAFETY & RELIABILITY • Controlled and protected by design

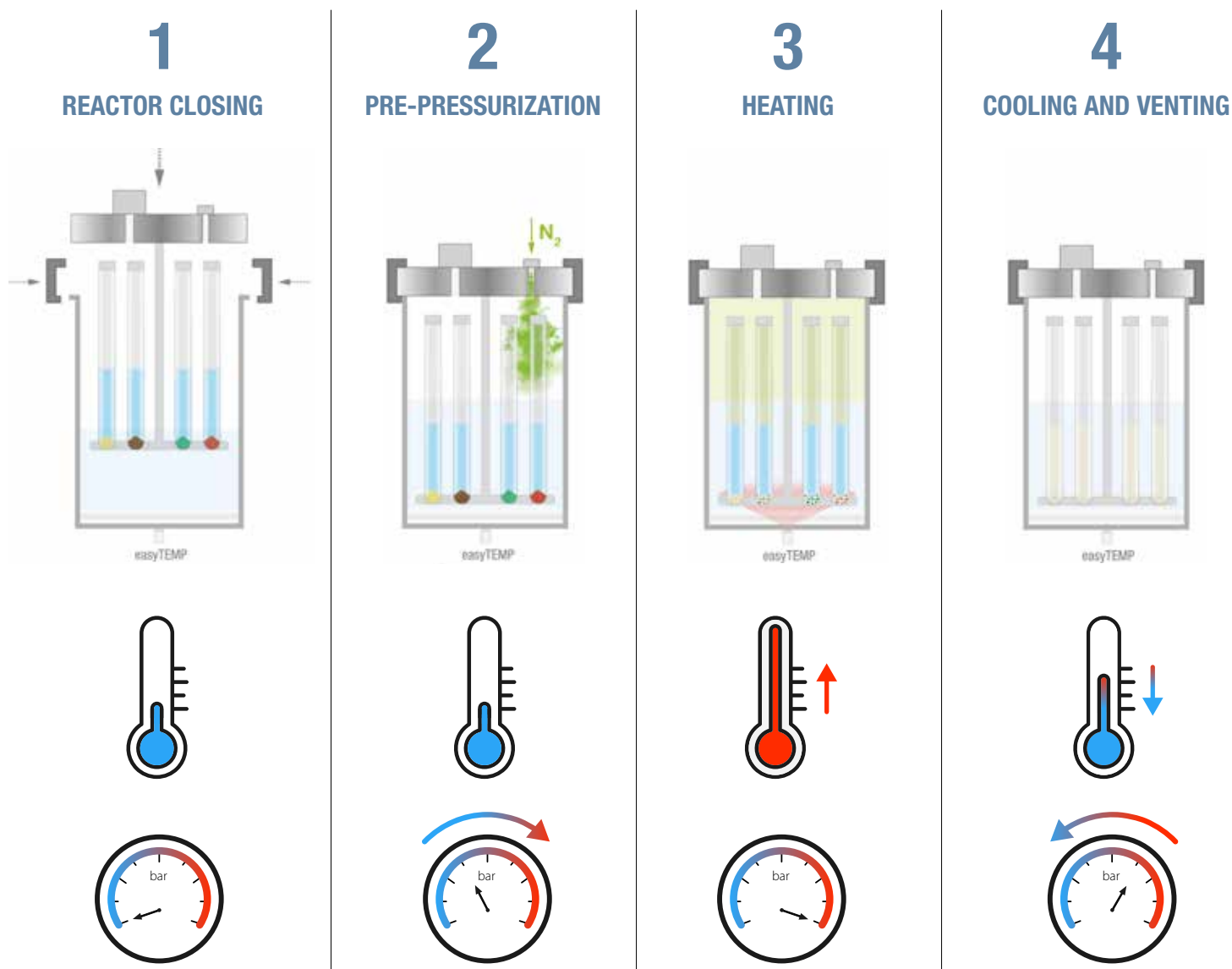
SMART OPERATION • Intuitive workflow powered by MAIA

LOWER OWNERSHIP • Fewer consumables, higher ROI

THE MOST ADVANCED TECHNOLOGY EVEN BETTER

| SINGLE REACTION CHAMBER TECHNOLOGY

At the heart of ultraWAVE 3 is the Single Reaction Chamber (SRC), a stainless-steel reactor with a high-purity PTFE-TFM liner and cover, which serves as both the microwave cavity and the digestion vessel. Samples and reagents are placed in vials and racks, lowered into the PTFE-TFM liner filled with a water-based solution, and then the reactor is sealed (1). The water-based load ensures a perfectly uniform temperature across all vials, regardless of the sample type or acid mixture. Once closed, the chamber is pre-pressurized with inert gas to prevent reagent boiling, elemental loss, and cross-contamination (2). Microwave heating then begins, with the digestion process continuously monitored in all vials through an advanced contactless temperature sensor (3). An integrated water-cooling circuit keeps the stainless steel chamber at reduced temperature, enabling rapid and safe cooling of the vials. At the end of the cycle, the system automatically vents the chamber (4), and the digested solutions are ready for dilution and analysis.



| ultraWAVE 3 FEATURES

The state-of-the-art design of ultraWAVE 3 incorporates several technological advances that build on the proven benefits of SRC technology. These enhancements deliver highest performance, productivity, and a more streamlined workflow.

RUGGED CONSTRUCTION

All wetted parts in PTFE-TFM, ensuring full acid resistance and minimal maintenance.

DUAL PRESSURE LINES

Separate inlet and outlet, made of acid-resistant stainless steel, guarantee safe operation and the lowest possible blanks.

FLEXIBLE RACKS

Available in 7, 20, 27, and 40 positions to match any throughput requirement.

TRUE TEMPERATURE CONTROL

Advanced contactless sensor (easyTEMP) for accurate and safe digestion monitoring.

EFFICIENT HEATING

Noiseless water-cooled magnetron for faster heating and improved working conditions.

USER-FRIENDLY INTERFACE

Intuitive touchpad with easyCONTROL software and MAIA – Milestone AI Assistant, providing smart guidance and full control of the digestion process.

Laboratories can now achieve improved competitiveness and lower cost of ownership, while relying on the robustness and reliability that have always defined Milestone's SRC approach.



THE POWER OF SRC TECHNOLOGY WITH UNCOMPROMISED SAFETY

UNMATCHABLE SRC CAPABILITIES

Meeting today's stricter regulations and analytical demands requires a superior level of digestion. Thanks to its higher temperature and pressure capabilities, ultraWAVE 3 ensures complete decomposition even of the most challenging matrices. This results in lower residual carbon content, minimized interferences, and improved detection limits across all sample types.



SUSTAINABILITY IN SAMPLE PREP

ultraWAVE 3 combines unmatched digestion performance with a reduced environmental footprint. Lower acid volumes, minimal cleaning, and durable components make it sustainable by design. The environmental performance has been independently verified through the My Green Lab[®] ACT[®] Ecolabel, providing transparent, third-party assessed data. In addition, Milestone has developed the Green Prep MW Score to evaluate chemistry, workflow efficiency, and technology, supporting informed and responsible choices.



my green lab.
ACT[®] Ecolabel



Make your lab **more sustainable**

I DIGESTION ALWAYS UNDER CONTROL

Temperature plays a critical role in the digestion process. ultraWAVE 3 is equipped with the advanced easyTEMP contactless sensor, which continuously controls the actual digestion conditions. This ensures accurate control of the

process and the highest level of safety. Even in the case of exothermic reactions, easyTEMP immediately adjusts microwave power to maintain stable conditions, guaranteeing reproducibility and superior digestion quality.



I UNCOMPROMISED SAFETY

Operating at elevated temperature and pressure with concentrated acids requires the strictest safety standards. ultraWAVE 3 is built with a stainless-steel reaction chamber and high-pressure lines tested far beyond regulatory limits. Key components are made of corrosion-resistant alloys to ensure long-term reliability. The built-in exhaust system prevents operator exposure to acid vapors, while multiple sensors monitor closure and reaction conditions at every step. Safety is not an accessory in ultraWAVE 3, it is integral to its design.

ACCELERATING ELEMENTAL ANALYSIS WORKFLOW

ELIMINATE SAMPLE PREP BOTTLENECKS

ultraWAVE 3 simplifies sample handling and optimizes laboratory workflow. Its vial-and-rack design allows quick setup—operators simply place loose-fitting caps on the vials and the rack is ready—eliminating the vessel-by-vessel closing typical of rotor systems. With racks available in different capacities and vials in PTFE-TFM, quartz, or disposable glass, laboratories can adapt to any application. This flexibility, combined with the ability to digest all sample types together, shortens turnaround times and ensures a more efficient and reliable workflow.

# of position	Volume (mL)	Vials material
7	40	PTFE-TFM, Quartz, Disposable glass
20	15	
27	8	
40	4.5	Glass



Agriculture



Beverage



Cannabis



Ceramics



Chemicals



Geochemistry



Metals



Petrochemical



Clinical



Cosmetics



Environmental



Food & Feed



Officials



Pharmaceutical



Pigments



Polymers

| AVOID VESSEL CLEANING

ultraWAVE 3 removes one of the most time-consuming steps in sample preparation: vessel cleaning. By using disposable glass vials, laboratories eliminate tedious washing, reduce the risk of cross-contamination, and save both time and resources.



| RUN ANY SAMPLES SIMULTANEOUSLY

Thanks to Single Reaction Chamber technology, different sample types and acid mixtures can be digested together in the same run, with the flexibility to add rush samples without delay. This unique capability not only increases throughput, but also ensures complete digestion under identical conditions.



| REDUCED OPERATOR TIME

Laboratories are increasingly seeking ways to make sample preparation less labor-intensive. ultraWAVE 3 meets this need by automating critical steps such as vial sealing, chamber closing, and venting. This reduces hands-on time by up to 50%, allowing operators to focus on other tasks while improving both productivity and safety.

THE IDEAL MATE FOR YOUR DAILY WORK

UNPARALLELED USABILITY

ultraWAVE 3 provides all digestion information at the operator's fingertips. The large integrated touchpad with easyCONTROL 3 software streamlines routine operations through pre-stored methods, ensuring fast and intuitive use. The Home page offers quick access to all functions, with recently used methods displayed along the bottom bar and chamber parameters always visible in the right sidebar for immediate visibility of key data.

EasyCONTROL 3 also includes tutorials, application libraries, instrument documentation, and a maintenance counter that alerts users when service is due. A built-in library of methods, including official ones, enables operators to quickly address new samples and store customized protocols. All digestion parameters are automatically controlled and displayed in real time, while full compliance with FDA 21 CFR Part 11 ensures data integrity, traceability, and GMP alignment.



| MILESTONE POWERED BY AI

Since 2014, Milestone Connect has provided laboratories with instant access to knowledge, tutorials, and application resources—anytime, anywhere. Now, it evolves with MAIA – Milestone AI Assistant, making ultraWAVE 3 more than a digestion system. Users can interact with MAIA through a built-in chat or voice commands for faster, more intuitive support in method setup, optimization, and troubleshooting. MAIA Lens recognizes consumables and provides step-by-step guidance for their maintenance or replacement, simplifying daily care and keeping ultraWAVE 3 always ready for the next run.

This latest evolution of Milestone Connect delivers continuous support, expert guidance, and a truly smarter laboratory experience.



REDUCED MAINTENANCE COSTS FOR GREATER RETURN ON INVESTMENT

| LOW COST OF OWNERSHIP

ultraWAVE 3 is designed to minimize both operating and maintenance costs. The use of simple vials, including disposable glass, eliminates expensive digestion vessels and time-consuming cleaning. Its rugged construction and long-lasting components further reduce service needs, while a usage-based preventive maintenance program ensures reliability over time. Together with the Milestone Validation Package, laboratories benefit from maximum productivity, full regulatory compliance, and the highest return on investment.



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



ultraWAVE 2 eco

Single Reaction Chamber
Microwave Digestion
System



ETHOS™

Microwave Labstation



duoPUR/subCLEAN

Acid Purification
System



traceCLEAN

Acid Steam
Cleaning System



DMA-80 evo

Direct Mercury Analyzer

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

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