

# ETHOS EASY

ADVANCED MICROWAVE  
DIGESTION SYSTEM



MILESTONE  
HELPING  
CHEMISTS



**ETHOS EASY**

[www.milestonesrl.com](http://www.milestonesrl.com)

13

14

13

14



## MILESTONE ETHOS EASY

It is a common misconception that a laboratory microwave is just a microwave and that there are very few differences between systems. We at Milestone would like to demonstrate that this is not the case and that a microwave digestion system provides the first important step for a successful analysis. If there is no confidence in the initial sample preparation stage, then there can be no confidence in the results from subsequent analyses. We have incorporated in the new ETHOS EASY our vision of the future, our passion, and our knowledge, with the ultimate goal of helping chemists. The ETHOS EASY fully embodies Milestone's philosophy in microwave sample preparation. Specifically designed for closed vessel acid digestion, it offers a perfect integration between microwave hardware, user interface, reaction sensors and pressure vessels. The ETHOS EASY encompasses Milestone's visionary concept of "Total Microwave Sample Preparation" and, with a comprehensive choice of accessories, it offers a complete first-class solution also for microwave solvent extraction, organic and inorganic synthesis, protein hydrolysis, and vacuum evaporation. The new ETHOS EASY is simply the most advanced microwave digestion system we have ever manufactured.

Open the door to a new Milestone.

PRODUCTIVITY

SAFETY

EASE OF USE

EXPERTISE

FLEXIBILITY

# PRODUCTIVITY MATTERS

---

## LARGEST MICROWAVE CAVITY

The new Milestone ETHOS EASY microwave cavity has a volume in excess of 70 litres, by far the largest currently available. Why is this important and what are the main implications of this design?

Firstly, digestion rotors with more sample places can be accommodated thus improving productivity and sample preparation throughput.

Secondly, the microwave unit is inherently much safer because a larger cavity better contains gases escaping from vessels, should there be a sudden overpressurisation.

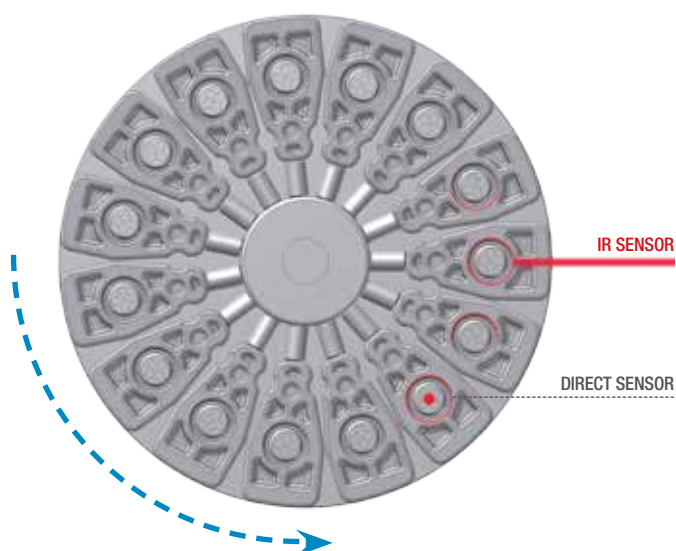
## POWER MATTERS TOO

The ETHOS EASY is equipped with two 950 Watt magnetrons for a total of 1900 Watt making it the most powerful microwave digestion system available for sample preparation. The system additionally employs a rotating diffuser that evenly distributes the microwaves throughout the cavity. High power coupled with the diffuser enables very fast heating of high throughput rotors and the complete digestion of the most difficult samples.



## POWER IS NOTHING WITHOUT CONTROL

The new Milestone ETHOS EASY is equipped with the most advanced yet easy to use reaction sensors for complete quality control of the digestion conditions. Direct temperature and pressure control are used in a single reference vessel. In all vessels, contact-less temperature is used where the actual temperature of each and every vessel is continuously shown on the instrument control terminal during the microwave run, allowing an instant visual check of the digestion conditions. In addition, a contact-less pressure sensor monitors and controls all vessels simultaneously, preventing any leakage or venting. In combination with our 'vent-and-reseal' vessel technology, the sensors ensure complete and safe digestions without any loss of volatile compounds.



*Direct and contact-less temperature control in all vessels is available with the ETHOS EASY*

## PRESSURE-RESPONSIVE DOOR

The ETHOS EASY features a full stainless steel door with an innovative opening and self-resealing mechanism. Should there be a sudden overpressurisation of the cavity, the door slightly opens for rapid and safe pressure release and the microwave power is instantaneously cut off. Immediately afterward, the door is pulled back, resealing the cavity. For additional safety, an automatic door locking system does not allow the user to open the ETHOS EASY door during the microwave run. At the end of the run, the door remains locked until the solutions have cooled down to a user preset temperature. This prevents misuse of the instrument and in turn exposure of the chemist to high pressure vessels.



*Pressure-responsive door schematics*



## USER INTERFACE

The ETHOS EASY is controlled via a compact terminal with an easy-to-read, bright, full-colour, touchscreen display. The terminal runs a completely new user-friendly, icon-driven, multi-language software to provide easy control of the microwave run. Simply recall a previously stored method or create a new one, press 'START' and the system will automatically follow the user defined temperature utilising a sophisticated PID algorithm. Hundreds of applications, including all US EPA methods, are preloaded in the ETHOS EASY terminal. There is no need to input the number of samples or weights being digested, as the software will automatically regulate the microwave power accordingly. This assures a consistent quality of digestion and simplifies the use of the instrument.

## NEW DIGESTION ROTORS

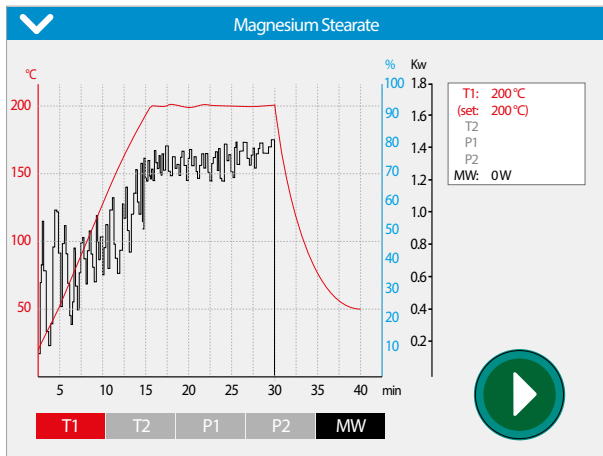
Two new rotors offering both high quality digestion and high sample throughput are available for the ETHOS EASY. The SK-15 is a high-pressure rotor featuring up to 15 TFM vessels with a volume of 100 ml and suitable for all applications. The MAXI-44 is a high-throughput rotor featuring up to 44 TFM vessels with a volume of 100 ml and suitable for a wide range of samples including environmental and all organics. Both rotors are fully compliant with US EPA 3015, 3051, and 3052 standard methods.

The SK-15 and the MAXI-44 feature an enhanced 'vent-and-reseal' technology for controlling the inner pressure of all vessels. This patented (US Patent 5,270,010) technology provides the operator with unsurpassed safety and performance capabilities: highest temperature and pressure, highest safety standards, ease of use, and very fast cooling (180°C to 40°C in 10 minutes). While other systems use membranes or burst disks that render a vessel useless after venting, the Milestone system releases only the excess pressure from the vessel. This ensures that there is no stress to the door of the microwave system and no loss of sample as could happen in the case of a membrane or disk bursting.

Finally, a large selection of high purity quartz and TFM inserts is available for the SK-15 and the MAXI-44 rotors for smaller sample amounts or to minimise the dilution factor of the analytical solution.

# A PIECE OF CAKE

## COMPLETE DIGESTION CONTROL

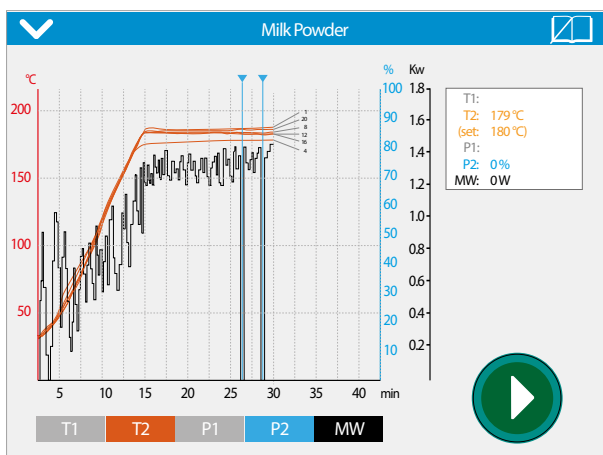


SK-15 rotor. Temperature reaching 200°C in 15 min by PID microwave power regulation. Cooling time is 10 min only

## PRESSURE VESSELS



SK-15 high pressure rotor



MAXI-44 rotor. Infrared temperature control in all vessels



MAXI-44 high throughput rotor



## HELPING CHEMISTS

Milestone has been active since 1988 in the field of microwave sample preparation. With over 20000 instruments installed worldwide, we are the acknowledged industry leader in microwave technology. Milestone vision is to help chemists by providing the most technologically advanced instrumentation for research and quality control. Our products offer a wide range of applications, such as microwave acid digestion, solvent extraction, synthesis and ashing. Furthermore we create products for acid purification and direct mercury determination in solid, liquid and gas samples. We offer our customers the highest level of application support, building up over the years a relationship based on trust and commitment.

---

### MILESTONE



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

UNI EN ISO 9001: 2008  
CERTIFIED

MILESTONE Srl - Via Fatebenefratelli, 1/5 - 24010 Sorisole (BG) - Italy  
Tel: +39 035 573857 - Fax: +39 035 575498  
www.milestonesrl.com - email: 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 - email: 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 - email: 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-mikrowellen.de - email: mws@mls-mikrowellen.de