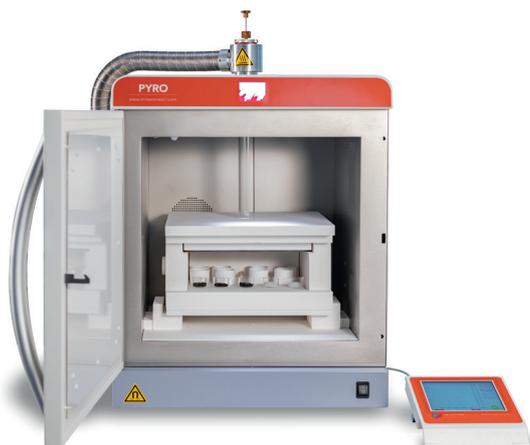




MILESTONE
H E L P I N G
C H E M I S T S



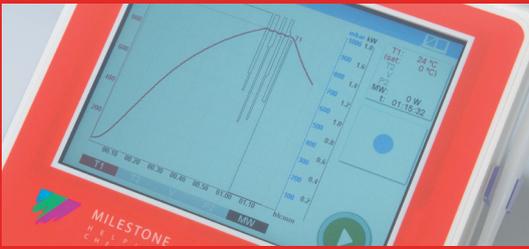
FAST AND SAFE
ASHING ANALYSIS
VIA MICROWAVE
MUFFLE FURNACE



PYRO

Advanced Microwave Muffle Furnace

IMPROVING TIME AND THROUGHPUT WITH MICROWAVE ASHING



FAST
ASHING



HIGH SAMPLE
THROUGHPUT



IMPROVED
WORKING CONDITIONS



FLEXIBLE
CONFIGURATIONS



ASTM, USP, SEMI AND ISO
COMPLIANCE

Dry ashing is based on the decomposition of organic material by the action of oxygen at elevated temperatures. The determination of the ash content, whether for process control or as a preparation method for other analytical techniques, is an important test performed daily in thousands of laboratories worldwide. The ashing process is done in conventional muffle furnaces that often offer inefficient, tedious, and time-consuming procedures. The use of microwave heating for dry ashing applications represents a breakthrough in the process and quality control of samples like polymers, petroleum, food and feeds, pulp paper and pharmaceuticals. The PYRO microwave muffle furnace, is available in three interchangeable configurations:

HIGH SAMPLE THROUGHPUT

SULFATED ASHING

ULTRAFAST HEATING



The PYRO is built to offer superior working conditions and a more efficient ashing procedure on a wide range of matrices. It incorporates in a single platform a rugged hardware, a reliable microwave-transparent muffle, an efficient exhaust, an accurate temperature control and a smart user interface.

HIGH-CAPACITY FOR SUPERIOR PRODUCTIVITY

Efficient airflow

The unique design of the venturi system enables faster ashing and safer conditions without the need of an additional gas line. The continuous and adjustable airflow expedites the sample combustion and the removal of fumes during the ashing process.

Rugged and powerful hardware

The PYRO is designed to last! The stainless-steel construction and the high microwave power offer high reliability, fast heating rate, and superior working conditions as it does not expose the operator to heat or fumes.

Fast and even heating

The silicon carbide heating element, along with the high microwave power, provides fast and even heating across the entire muffle, allowing reproducible conditions in all crucibles.

Accurate control

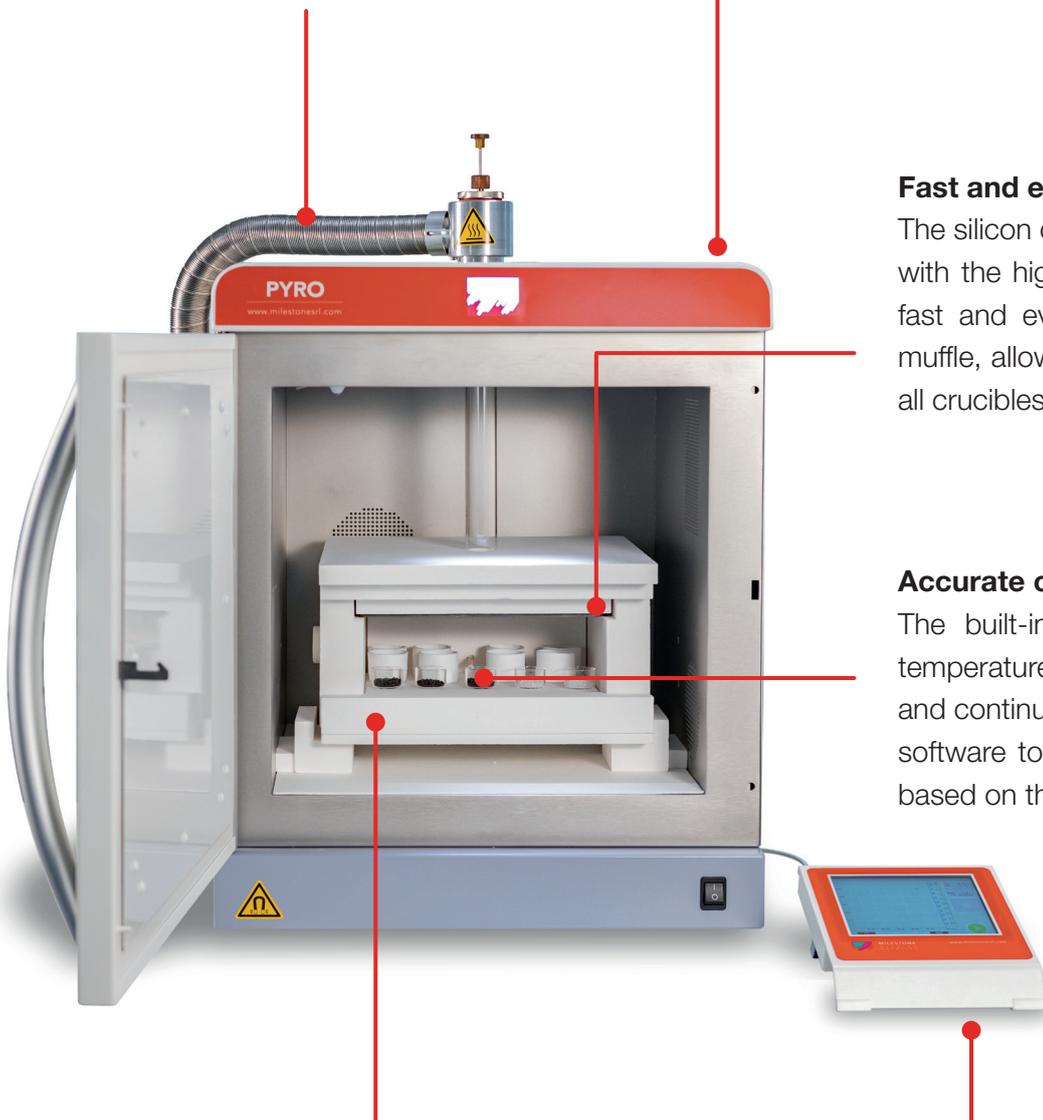
The built-in sensor controls the muffle temperature during the entire program and continuously dialogues with the smart software to adjust the microwave energy based on the desired temperature profile.

Microwave transparent muffle

The microwave transparent muffle meets high throughput and large sample mass needs. It is equipped with a quartz plate for easy cleaning and filters to ensure proper sample combustion.

Smart user interface

All the process parameters are controlled by the advanced terminal and software. Simply select a built-in method or create a new one and press "START" to begin the ashing procedure.



SHORT ASHING TIME

Sample	Temperature (°C)	Time (min)
Pet Food	575	20
Milk Powder	550	20
Wheat Flour	900	50
Polypropylene	650	20
PVC	900	15
Coal	750	20
Heavy Oil	550	45
Rubber Tyre	550	45
Lactose	600	60
Antibiotics	850	60

Typical ashing time with PYRO

MILESTONE GREEN TECHNOLOGIES

The PYRO embraces the values and benefits of the green approach, in fact it offers more efficient heating and saves energy. The accurate microwave emission and the great insulating capacity of the microwave-transparent muffle minimize energy waste.



ULTRAFAST MUFFLE FOR UNMATCHABLE ASHING TIME

The PYRO with ultrafast muffle reaches a temperature of 800°C in just 5 minutes, starting from room temperature and enables applications up to 1200°C. The temperature is monitored and controlled via a contactless infrared sensor. The unmatched heating rate of this PYRO configuration offers a solid option for QC labs to provide rapid feedback to their production and to any lab dealing with rush samples. Due to its heating rate, the ultrafast muffle has a natural fit for many high-temperature applications requiring no heating/cooling inertia, such as sintering or fusion.



FAST ASHING



RUSH SAMPLES



HIGH TEMPERATURE APPLICATIONS

EFFICIENT WORKFLOW IN SULFATED ASHING DETERMINATION

■ MICROWAVE SULFATED ASHING

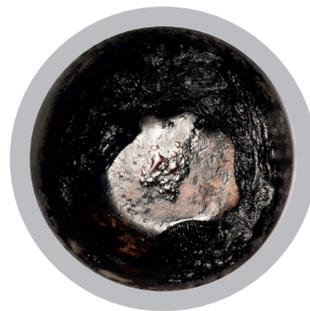
Ashing of samples like pharmaceutical and petroleum often involves the use of sulfuric acid that leads to hazardous acid vapours and is a labour-intensive procedure. The traditional approach requires the manual fuming of acid for several hours with high risks for the operator. The PYRO Sulfated Ashing configuration enables the operator to complete this test in a single step. Sulfuric acid is added to the sample, and the crucibles are placed into the muffle without any preliminary charring step. The acid fumes are continuously collected, condensed, and neutralized by the dedicated water-cooled scrubber module. With the PYRO Sulphated Ashing configuration the procedure is typically completed in less than two hours, eliminating any tedious and unsafe handling.



Sample



*Sample with
sulfuric acid*



Charring step



*At the completion
of the ashing process*



FASTER ASHING TIME

HIGHER THROUGHPUT

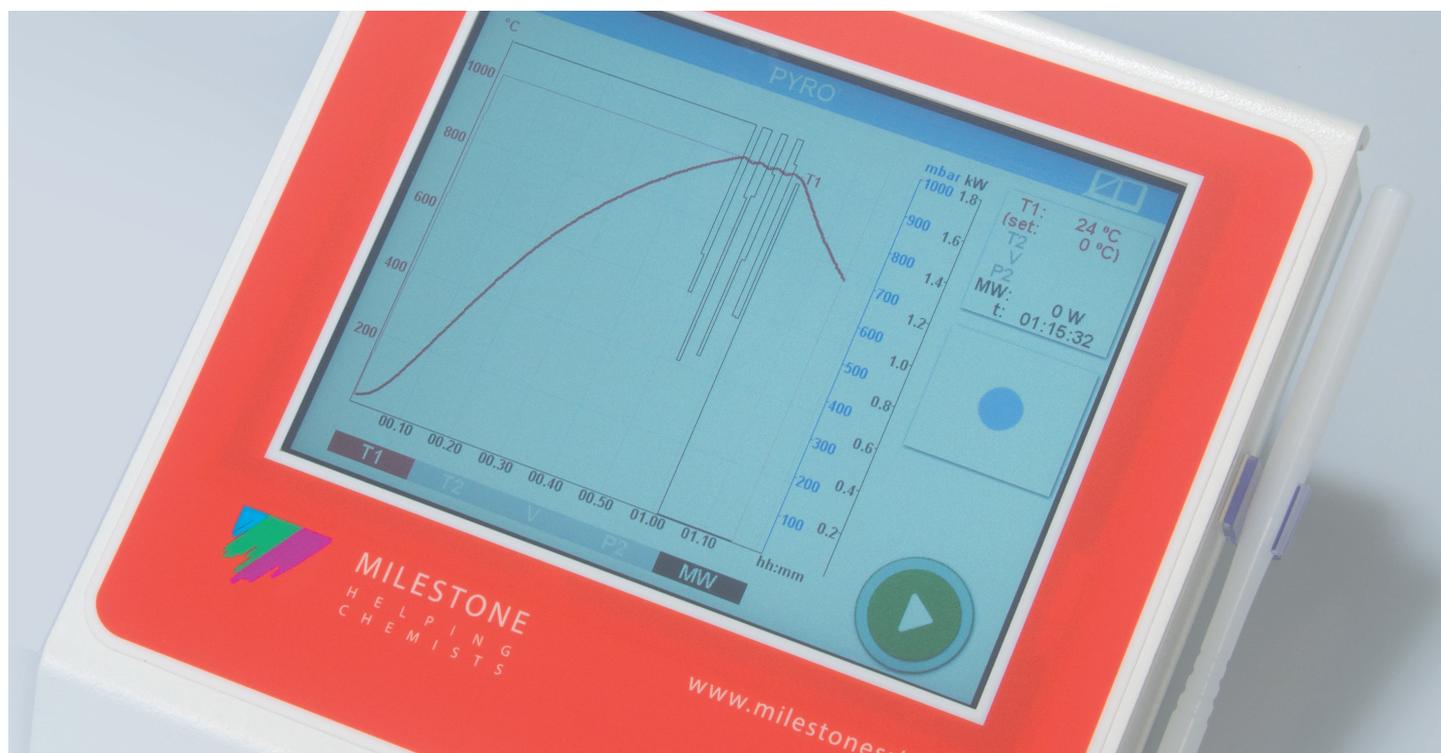
SUPERIOR SAFETY

SINGLE STEP PROCEDURE

FULL TRACEABILITY

SMART USER INTERFACE

All the PYRO configurations are controlled via a compact full-colour, touchscreen display. The user interface runs a user-friendly, icon-driven, multi-language software to provide easy control of the process. The software automatically regulates the microwave power according to the temperature profile desired, ensuring great reproducibility. The dedicated Milestone Validation Package, along with the 21 CFR part 11 compliance, meet the GMP requirements and provide high standards of operation. The PYRO is compliant with several official methods such as ASTM, USP, SEMI and ISO, preloaded into the terminal.



ultraFAST CRUCIBLES

The PYRO can accommodate crucibles made of metal, quartz, porcelain, etc. However the use of these commonly available crucibles impact the overall ashing time due to the long cooling time in the desiccator. The Milestone ultraFAST crucibles are made of an innovative material that accelerates the ashing process by enhancing the airflow also through the crucible's fibers. The negligible cooling time, only a few seconds from 1000°C to room temperature, further expedites the ashing procedure and removes the cooling time in the desiccator.



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.

MILESTONE SOLUTIONS FOR ELEMENTAL ANALYSIS



ETHOS UP

High Performance
Microwave Digestion



ultraWAVE

The Game Changer in
Microwave Digestion



DMA-80 *evo*

Direct Mercury Analyzer



traceCLEAN

Acid Steam
Cleaning



duoPUR/subCLEAN

Acid Purification

WWW.MILESTONESRL.COM

MILESTONE



HELPING
CHEMISTS

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 Allgäu - Germany
Tel: +49 (0)7561 9818-0 - Fax: +49 (0)7561 9818-12
www.mls-mikrowellen.de - email: mws@mls-mikrowellen.de