

Microwave Digestion System

Model UNI 8300



UNIFLEX

A World of Solutions

Microwave Digestion System



Model UNI 8300 Features

Built-in system diagnostics for trouble-free operation.

Capable of controlling multiple Microwave Digestion Systems with proper PC configuration.

Remote control via PC increases operator safety and system reliability.

Choice of moderate pressure (200 psi), high pressure (600 psi), or ventable vessels.

Temperature controller, PC, and Printer options.

Convenient pressure control module-no flushing or water lines to fill.

Microwave technology reduces sample preparation time by up to 90%.

Precise passive infrared fiber-optic temperature control option.

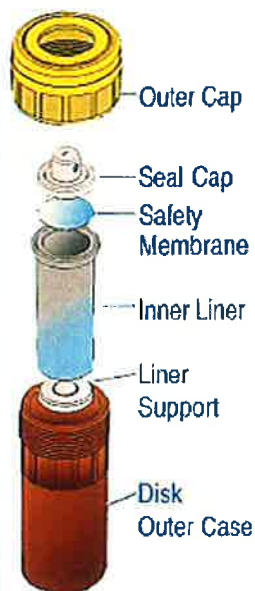
Real-time graphing and data acquisition of pressure and temperature, exportable to other software packages.

Percent power, pressure, and temperature control modes have up to 10 individually programmable stages.

Reversing 360° rotational platform assures even energy exposure in all samples during each run.

Dual safety door latches and pressure sensor safety override.

Safer and More Reliable Microwave Vessel

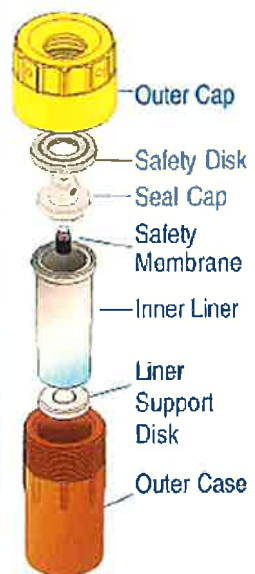


Moderate Pressure

UNIFLEX' s patented microwave vessels were the first in the industry to offer dual wall construction for maximum thermal stability and minimal heat loss. The outervessel casement is transparent molded polythermal resin for safe exposure to a wide range of acid reagents while providing sample visibility. The heavy-duty PFA Teflon® inner liner is acid resistant and microwave transparent with a convenient recessed lip to aid in rinsing back acids and pouring.

The moderate pressure vessel design features a patented large diameter safety membrane which completely covers the vessel's inner liner and seals the samples in a contamination-free environment from all other vessel components. This minimizes cleaning between runs and eliminates the risk of cross-contamination. The unique, six-piece vessel design and isolated inner liner provide for easy setup, quick changeover, and superior safe performance.

New patent-pending high pressure vessels have been designed for maximum safety by incorporating a dual pressure relief mechanism. This design provides a safety rupture membrane for over pressure venting at 600psi and a breakaway safety disk for rapid pressure relief at 1000psi. Safety engineering in vessel design is our first priority in ensuring reliable, long life microwave system operation.



High Pressure

Precise Pressure Control

The Microwave Digestion System' s precise pressure control (the original in the industry) provides for programmable pressure monitoring from atmosphere to 600 psi for maximum control of critical pressure reactions. The highly accurate module features fast and easy calibration and eliminates the need for water line filling or back flushing between runs. Teflon encapsulation of all detection components ensures contamination-free, reliable operation. A pressure sensor safely override automatically shuts down the system if abnormal pressure conditions are detected. Quick disconnect allows for removal of the vessel rack immediately after each run and quick changeover for the next run.

Superior Temperature Measurement

The UNIFLEX temperature control module uses one of the most advanced fiber-optic temperature sensors available today. It provides highly precise, stable and repeatable temperature readings from 0 to 250°C.

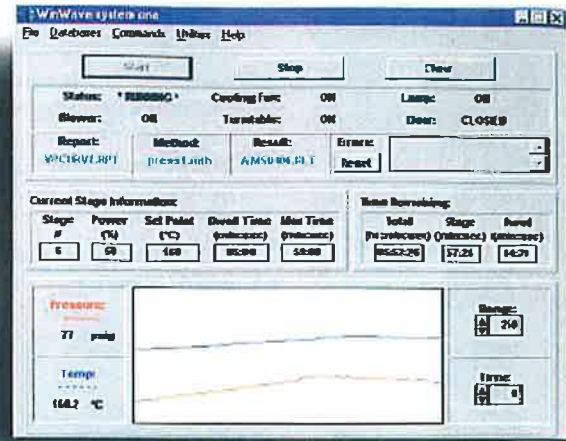


Unlike thermocouples, which may present performance problems, or ceramic RTD' s, which have a slower response time and introduce added heating due to the applied current, UNIFLEX' s passive white light interferometer temperature sensor uses patented technology to provide fast response times, rapid sampling rates and resolutions that are reliable and reproducible to an accuracy of +/- 1°C over its entire range.

In addition, the UNIFLEX temperature sensor does not require calibration, nor does its performance vary with surface conditions, like infrared. Its multimode Teflon-coated fiber is very durable, insensitive to microwave energy, and extremely flexible. The result is the most reliable and accurate temperature system available today.

WinWave ... Performance Through Windows®-Based Software

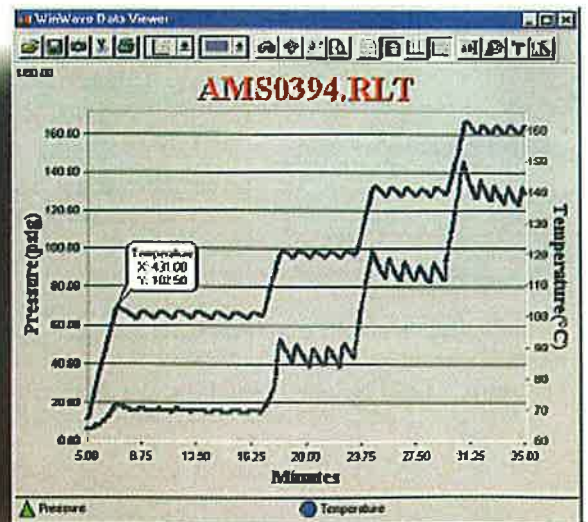
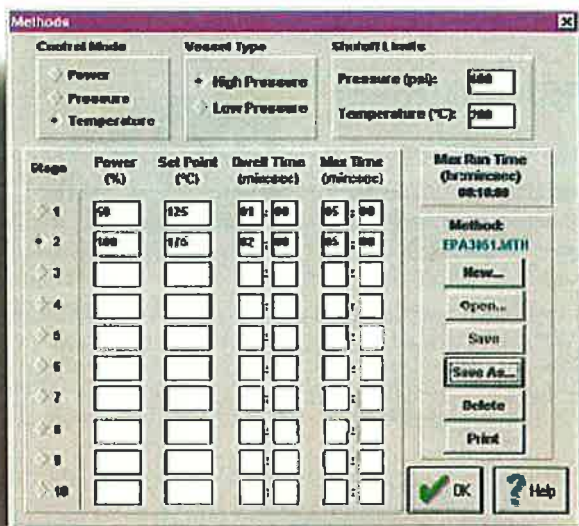
WinWave is a Windows® -based software and computer interface package that allows the operator to control and monitor the operation of the Microwave Digestion System from a personal computer. The program allows for easy computer keyboard entry of pressure, temperature, time, and other parameters. WinWave software capabilities include monitoring and controlling pressure and temperature. In addition, the package offers real-time graphing/data acquisition, and display for method development or exporting data to other software packages. With proper configuration, WinWave can control multiple Microwave Digestion Systems. Easy-to-use menu driven setup functions also include data report printout capability and an online applications library for fast setup of specific methods.



Here are just a few of the features WinWave provides:

- Remote control of up to four* Microwave Digestion Systems for safest, most convenient operation.
- Computer keyboard entry of all programming and sample information.
- Easy-to-use menu-driven setup of program and stage conditions.
- Programming of up to 10 temperature and pressure stages.
- High-resolution, real-time graph of control vessel pressures and temperatures.
- Option to run digestion methods immediately or store them for later execution.
- Option to print out or export acquired data.
- On-line applications library, including USEPA SW-846-C Methods 3015, 3051, 3052, and NPDES Methods.
- On-line help with applications library.

*With proper computer configuration.



Microwave Digestion System - Model UNI 8300

General Specifications

Oven Dimensions

13.5" Hx22.5" Wx18" D
34.3cmHx57.2cmWx
45.72cmD

Oven Weight

60 lbs
23.7 kg

Oven Cavity

All internal seams are sealed
All interior and exterior
surfaces are corrosion
resistant

Microwave Wattage Output

Model UNI 8300: 950watts
(USEPA).

Power Requirements

100 ($\pm 10\%$) VAC, 50/60Hz, 15 amps
120 ($\pm 10\%$) VAC, 50/60Hz, 15 amps
220 ($\pm 10\%$) VAC, 50Hz, 10 amps
230 ($\pm 10\%$) VAC, 50Hz, 10 amps
240 ($\pm 10\%$) VAC, 50Hz, 10 amps

Magnetron Microwave

Output frequency: 2450 MHz

Inlet/Outlet Ports

For temperature and/or
pressure control systems

Communications

Standard RS-232-C
WinWave software

Safety

Operates only with the door closed
and two safety interlocks engaged
Multiple design features to assure
superior vessel safety
Pressure sensor safety override
shutdown

Exhaust Module

Constant flow rate of 100 cubic
ft/min
Program-controlled for automatic
start and STOP
Modular design separates exhaust
module from oven for safety, ease
of maintenance, and ease of
location in confined laboratories

Pressure Control

Waterless monitoring system-no
valves to turn or water lines to
rinse. No metal contamination of
Control vessel
Monitors pressure for feedback
control

Temperature Control

Real-time measurement and control
of temperature from 0°-250°C using
accurate fiber-optic control inside
sealed digestion vessels.

Vessel Modules



Moderate pressure module: 12
patented digestion vessels with
maximum operating conditions of
200psi and 200°C, vessel rack,
collection reservoir, vent tubes,
and safety disks



High pressure module: 10 patent-
pending digestion vessels with
maximum operating condition of
collection reservoir, vent tubes,
and safety disks

Principal Applications:

USEPA SW-846-C Methods 3015, 3051, and 3052
NPDES methods
CLP methods
Inorganic samples, e.g., sediment
Multiple, large volume aqueous samples
Environmental and wastewater
paint chips

Oil and Polymers
Ceramics
Metallurgical, mining, and metals
Biological and medical
Geological
Food and animal
Industrial
Baby wipes

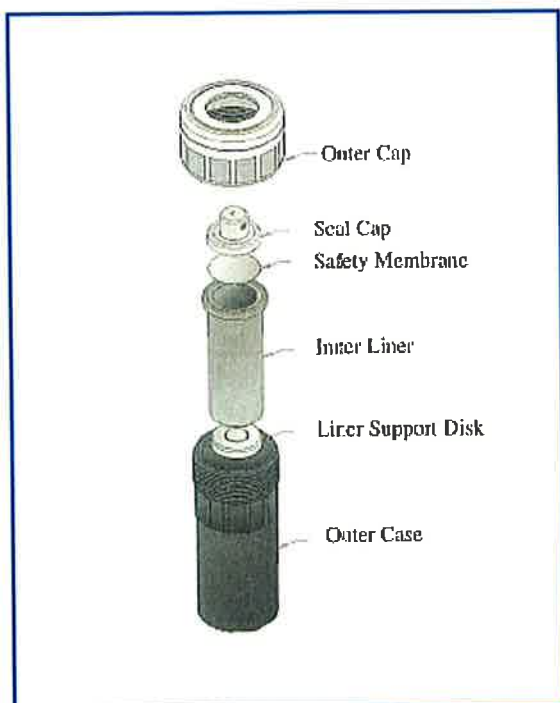
Uniflex' s line of microwave digestion vessels features a unique, patented design for superior performance. Three vessel sets are available to meet a wide range of sample preparation requirements: a single-wall ventable vessel for paint chips and lead wipe applications; a moderate pressure vessel (up to 200 psi and 200 °C) for most USEPA and routine methods; and a high pressure vessel (600 psi and 200°C) for USEPA 3052 for lager organic samples.

Moderate Pressure Vessel

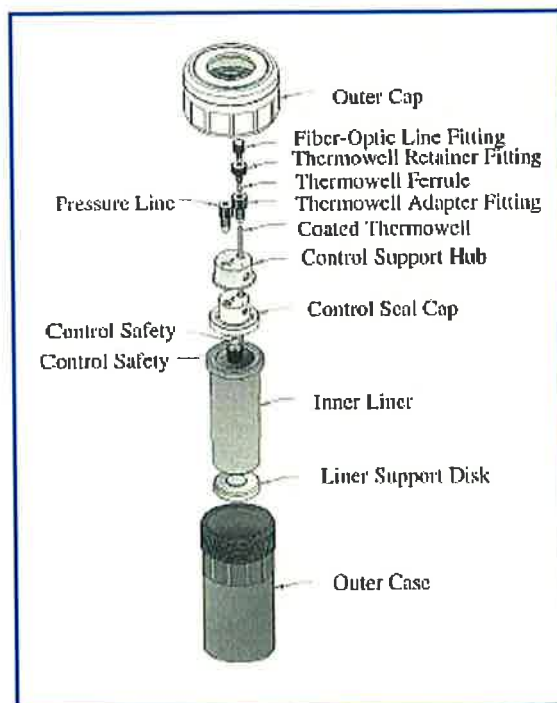
- Double-wall design for safety and maximum thermal stability.
- Operational pressures of 200 psi and temperatures up to 200°C.
- Inner liner and seal are molded PFA Teflon for acid resistance and microwave transparency.
- Requires less heating energy than other vessels.

- Full diameter safety membrane totally covers the inner opening, which isolates samples, prevents cross-contamination, and minimizes cleanup.
- Outer cap is hand-tightened.
- Recessed lip allows easy, drip-free sample pouring.
- Translucent vessel body allows operator to visually check on digestion progress.
- Critical orifice vent release membrane system.
- Fewer fittings and potential failure points than other industry designs.
- Samples may be removed from the microwave cavity at the end of the run to improve throughput.

The outer vessel casing is molded from an Ultem®-1000 microwave nonabsorbing polyetherimide resin, for safe exposure to a wide range of acid reagents at high temperatures. The vessel inner liner is molded PFA Teflon for acid resistance and microwave transparency. It retains all internal pressure without contacting the outer casing, and a thermal air gap is created between the liner and outer casing. This reduces the temperature of the outer casing and minimizes the risk of burns when handling completed samples. Vessel seal caps are a molded, one-piece design that eliminates the potential for component separation at high pressures. A vent port is located perpendicular to the seal cap, safely directing any potential acid vapors to central collection reservoir.



Moderate Pressure Standard Vessel



Moderate Pressure Control Vessel

High Pressure Vessel

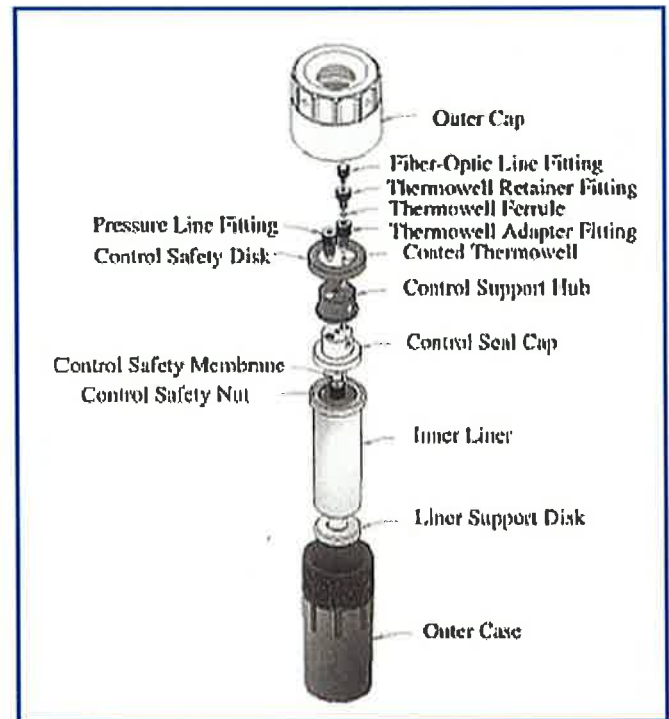
- Double-wall design for safety and maximum thermal stability.
- Operational pressures of 600 psi and temperatures up to 200°C.
- Inner liner is molded PFA Teflon for acid resistance and microwave transparency.
- Requires less heating energy than other vessels.
- Recessed lip allows easy, drip-free sample pouring.
- Translucent vessel body allows operator to visually check on digestion progress.
- Critical orifice vent release membrane system.
- Secondary pressure relief safety disk that allows the safe release of pressure in the event of an exothermic reaction.
- Heavy outer cap and casement for increased strength.
- Key-fitted ring wrenches to positively seal vessel and to prevent hand strain.
- Fewer fittings and potential failure points than other industry designs.
- Samples may be removed from the microwave cavity at the end of the run to improve throughput. A quick-connect valve is used to remove pressure from the pressure transducer.



High Pressure Standard Vessel

Pressure and Temperature Control

- UNIFLX' s patent-pending pressure control system has a waterless, contamination-free design, preventing acids and trace elements from contaminating the control vessel and eliminating cleanup after each digestion run.
- One control vessel can handle both temperature and pressure, or two control vessels can be used—one for temperature and one for pressure.
- Does not require transducer line backflushing or valves to be turned after each digestion.
- Automatically adjusts microwave power requirements to control reagent temperatures.
- The system's monofilament infrared (IR) fiber-optic temperature probe has microwave transparent construction to eliminate all signal interferences common with thermocouple and RTD sensors. It is more durable than multi-strand-coated probes from other manufacturers.



High pressure control Vessel

Product specifications

Design Specifications

Ventable Vessel

- Unique venting design for large organic samples and lead wipe method
- For use with nonvolatile elements
- 125 ml, total volume
- Atmospheric to approximately 100 psi

Moderate Pressure Vessel

- Inner liner is molded PFA Teflon with a minimum wall thickness of **0.20"**
- Double-walled design
- Full diameter safety membrane isolates the sample from the seal cap to eliminate cross-contamination and minimize cleanup after sample preparation
- Translucent inner liner and transparent outer casement allow sample viewing.

- Recessed-lip prevents drips
- Includes a wrench strap for improved static pressure sealing and reduced hand strain

Hi Pressure Vessel

- Inner liner is molded PFA Teflon with minimum wall thickness of 0.20"
- Double-walled design
- Translucent inner liner and transparent outer casement allow sample viewing
- Recessed-lip inner liner prevents drips
- Patent-pending secondary pressure release system

- Uses the same inner liner as moderate pressure vessels
- Includes set of polymer wrenches for improved static pressure sealing and reduced hand strain
- Secured vent tube design

Safety Features

- Moderate and high pressure vessels
- Double-walled vessel design
- Critical orifice vent release membrane (allows safe venting of exothermic reactions)
- Secondary vent release-high pressure only

General Specifications

	Ventable Vessel	Moderate Pressure Vessel	High Pressure Vessel
Volume	120 mL	85 mL	85 mL
Max. Pressure	Adjustable up to 100 psi	200 psi	600 psi
Max. Operating Temp.	200°C (not measured)	200 °C	200 °C
#Per Rack	12	12	10



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