



Photos: Croce & Wir



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Instruments for:
Density & concentration
measurement

Rheometry & viscometry

Sample Preparation

Microwave synthesis

Colloid science

X-ray structure analysis

Refractometry

Polarimetry

High-precision temperature
measurement

Subject to change
without notice

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Anton Paar

Sample Preparation

Product Range

... Clear Solutions in Sample Preparation



Multiwave 3000

Extremely Versatile



The Multiwave 3000 is a modular platform for microwave-assisted sample preparation. The compatibility of system accessories and a high degree of flexibility meet individual analytical and economic conditions. Sophisticated sensor and vessel technologies solve even the most demanding tasks.

Features

- ▶ 1400 Watt microwave power, unpulsed controllable
- ▶ Decomposition of up to 48 samples simultaneously
- ▶ Integrated high-performance cooling system
- ▶ Certified safety system
- ▶ Simultaneous measurement of pressure and temperature
- ▶ Infrared temperature measurement of all vessels
- ▶ Comprehensive application library

Applications

- ▶ Acid digestion and leaching
- ▶ Solvent extraction
- ▶ Oxygen combustion
- ▶ UV-assisted digestion
- ▶ Protein hydrolysis
- ▶ Evaporation and drying

Multiwave 3000

Doing Both



The Multiwave 3000 is the perfect system for both inorganic and organic sample preparation. Rotor 16SOLV has been designed for extremely fast, safe and easy microwave-assisted extractions, replacing slow and tedious classical extraction methods.

Optimized temperature- and pressure controlled closed vessel procedures provide perfect extractions within 15 to 30 minutes and improve both performance and throughput of HPLC- or GC-based analysis.

The Multiwave 3000 can be upgraded to a dual-use configuration for digestion and extraction by simply interchanging the screw caps.

Benefits

- ▶ Significant reduction in extraction times
- ▶ Solvent consumption reduced to a minimum
- ▶ Meets requirements of US-EPA and ASTM methods
- ▶ Extractions of up to 16 samples simultaneously
- ▶ Passive heating elements for use with non-polar solvents
- ▶ Magnetic stirrer for improved recoveries

Multiwave 3000

Abundantly Clear

Highest sample throughput

Digestion rotors with up to 48 vessels eliminate the bottleneck in sample preparation while being fast and easy to operate without compromising safety.



Simple operation and a comprehensive library of applications make the Multiwave 3000 a powerful tool for sample preparation.

Integrated cooling

The reaction vessels can be operated at maximum operating pressure and maximum temperature simultaneously. The integrated vessel cooling prevents overheating and ensures a higher sample throughput due to short cooling times.

Vessels	MF50	MF100
Liner material	PFA	PTFE-TFM
Pressure jacket	PEEK	PEEK
Vessel volume	50 mL	100 mL
Controlled pressure ¹⁾	20 bar (290 psi)	20 bar (290 psi)
Max. pressure ²⁾	30 bar (435 psi)	70 bar (1000 psi)
Test pressure ³⁾	140 bar (2000 psi)	140 bar (2000 psi)
Max. temperature	200 °C	200 °C
HF resistant	Yes	Yes
Typical applications	Water, effluents, sewage sludge, plant material, soil, sediment, US-EPA procedures, biological material	

¹⁾ via pressure sensor

²⁾ opening pressure of the safety disk

³⁾ certified test pressure for 1 minute



Highest decomposition quality

Operating pressures and temperatures up to 80 bar and 300 °C result in matrix-free solutions without contamination or loss of analytes, even for samples which are difficult to decompose or react violently.

Everything under control

Information about reaction parameters is delivered by installation-free pressure and temperature sensors from a reference vessel.

Continuous pressure monitoring of all eight sample vessels allows for safe and precise reaction control, even with critical samples.

An external IR sensor monitors the temperature of all reaction vessels at the base of each vessel.

HF100	XF100	XQ80
PTFE-TFM	PTFE-TFM	n/a
Ceramic	Ceramic	Quartz
100 mL	100 mL	80 mL
40 bar (580 psi)	60 bar (870 psi)	80 bar (1160 psi)
70 bar (1000 psi)	120 bar (1740 psi)	120 bar (1740 psi)
140 bar (2000 psi)	140 bar (2000 psi)	140 bar (2000 psi)
240 °C	260 °C	300 °C
Yes	Yes	No
Food samples, contaminated soil, metals, alloys, geological material, glass, quartz	Mixed waste, semiconductors, ceramics, ores, ashes, slag, refractories	Fatty foodstuffs, plastics, fibers, oil, fat, coal, pharmaceuticals, chemicals

Multiwave 3000

Much More



Oxygen combustion

Improved analytical options and sample throughput for the subsequent analysis of volatile compounds like halogens and a number of metals.

UV digestion

Microwave-energized UV lamps provide complete digestion of organic matrix components for the ultra-trace analysis of liquid samples which require minimum amounts of reagents and low analytical blanks.

Hydrolysis

Protein hydrolysis in liquid or gas phase can be performed from milligram to gram scale in less than one hour, even under inert gas atmosphere.

Evaporation

Acids or silicates are removed under clean room conditions without changing the reaction vessel. Reagent vapors are washed and neutralized by an external scrubber.

Drying

Samples are dried prior to digestion quickly and efficiently. Vapors and unwanted odors are removed via the integrated exhaust unit.

HPA-S

Unrivaled Performance



The High Pressure Asher HPA-S is the reference instrument for wet chemical pressure decomposition. The instrument is TÜV certified and can prepare even the most difficult samples for reliable AAS, ICP-AES, ICP-MS and voltammetric analysis.

The HPA-S enables the maximum decomposition parameters and the largest sample weight in hermetically sealed reaction vessels made of quartz glass or glassy carbon. Uniform heating and exact temperature control guarantee the highest level of reproducibility.

Features

- Decomposition pressure up to 130 bar
- Decomposition temperature up to 320 °C
- Unlimited decomposition times



Reaction vessels

Volume	Material	Number
15 ml	Quartz	14 or 21
50 ml	Quartz	7
90 ml	Quartz	5
20 ml	Glassy carbon	6