Anton Paar

Microwave Digestion System with Pressurized Digestion Cavity

Multiwave 7101/7301/7501

Demanding Samples, Easy Digestions

The pressurized digestion cavity (PDC) is a high-pressure vessel for sample preparation for ICP-OES, ICP-MS, or AAS analysis. This concept, established by Anton Paar 40 years ago in the legendary High Pressure Asher, has been combined with advanced microwave heating technology to yield the Multiwave 7101/7301/7501 series.

A family of high-performance instruments for complete digestions of virtually any sample type without the need for method development or sample clustering.

The parallel digestion of a large number of samples leads to the performance and output that is required for an optimal workflow in the elemental analysis laboratory. Just fill your vessels with samples and acids and let the PDC system do the work.

Smooth sample processing

1. Weigh sample and reagents into a vial and cover it with a plug-on cap
2. Load your rack (up to 41 positions)
3. Place your rack into the liner and cover it with the drip cup
4. Safely insert the lightweight liner (<1 kg) into the PDC
5. Follow the software-guided procedure on your instrument

Multiwave 7301

The allrounder

You want to increase the analytical performance and maximize the efficiency of your laboratory? With Multiwave 7301, you can reduce manual workload, save reagents, improve detection limits, and avoid analytical errors and safety hazards for a wide range of samples – all at a minimum cost of ownership.

Unparalleled flexibility

- → Choose from a wide range of easily interchangeable vial volumes and materials: Digest up to 4 g of sample in large vials or up to 41 microsamples in one run
- → Digest easy and demanding samples in the same run, no sample clustering needed
- → Simplify or eliminate the need for method development as the pre-installed generic methods and standard methods can handle a large variety of different samples
- → Rely on a 2,000 Watt magnetron which can achieve heating rates of up to 70 °C/min

Ease of use

- → Seal your vials tool-free with simple plug-on caps, no threads or snaps
- → Operate the instrument with software guidance and semi-automated closing, opening, and cleaning procedures
- → Use a liner lift to remove the PTFE liner from the cavity

Economic operation

- → Minimize consumption of high-purity acids
- → Benefit from budget-friendly consumables
- → Save time with semi-automated workflows

Enjoy a compact, robust design

- → Save much-needed lab space with Multiwave 7301's integrated cooling system
- → The integrated color touchscreen controller gives you full control of all parameters and processes
- → A magnetic stirrer can optionally be incorporated to more easily perform digestion reactions

Safety

- → Stay protected from chemicals as each liner is safely handled because it is covered with a drip cup
- → After the digestion, a ventilation removes toxic fumes
- → A microwave trap in the lid prevents leakage of microwave radiation
- → The instruments have passed third-party safety certification resulting in the GS ("approved safety") mark

Connectivity and documentation

- → Control the instrument via PC, smartphone, or tablet from a distance with VNC
- → Stay up-to-date with your acid digestion's status, with the Multiwave 7301's Smart Light
- → Export run data as PDF, XLS, CSV or raw files via a USB storage device or local network or print them on a local office printer

FOOD · **PHARMA** · **ENVIRONMENTAL**

MINING · **PETRO** · **TESTING LABS**

CHEMICALS · **HEAVY INDUSTRY** · **RESEARCH AND DEVELOPMENT**

Multiwave 7101

The budget-friendly choice

Is price a key factor for you? Then Multiwave 7101 is the one for you. Get all of the basic benefits of a PDC system – maximum user safety, minimum effort – at an outstanding price-performance ratio.

- ✓ Use one smart system to digest most samples
- ✓ Enjoy easy handling and convenient digestions
- ✓ Rely on multiple backup safety systems
- ✓ Use your external cooler for additional savings

Multiwave 7501

Engineered to master any challenge

Do you perform aqua regia digestions or regularly use HCl as a reagent? Then Multiwave 7501 is your solution. With upgraded parts and enhanced automated cleaning procedures, it has improved corrosion resistance, so you can digest even the most demanding samples.

- ✓ Heavy-duty device
- ✓ Ultimate corrosion resistance
- ✓ Software-guided cleaning protocols
- ✓ Extended maintenance plan for heavy use

FOOD

AGRICULTURE

ACADEMIA

ENVIRONMENTAL

PLATINUM GROUP METALS

MINING

STEELS AND ALLOYS

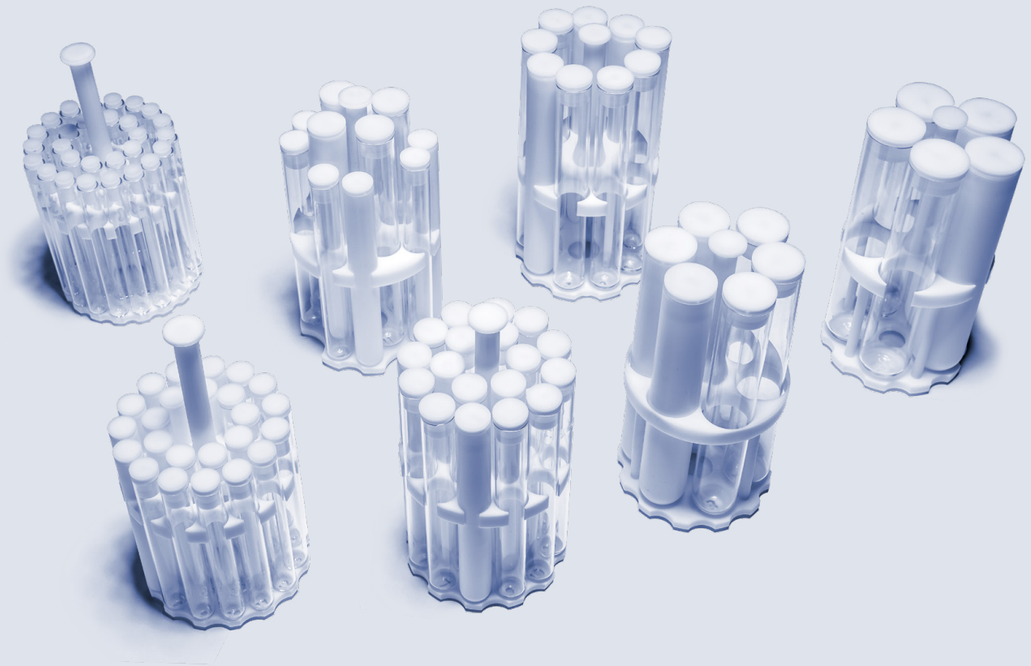
Acid Digestion Applications

Workflow simplified
In the Pressurized Digestion Cavity (PDC), different samples and different acid mixtures can be efficiently processed in the same run. This eliminates the need for extensive method development or grouping of similar samples. In the pressure-sealed vials, foaming and bubbling are suppressed, eliminating cross-contamination.

Challenge accepted
Multiwave 7101/7301/7501 offer the highest temperature and pressure specifications: up to 300 °C and 199 bar. This ensures complete digestions, even of the most demanding samples. The lowest levels of residual carbon and reduced acid amount reduce the chemical strain on spectroscopic instruments. This means lower cost of ownership, for the digestion and also for the analyzer.

Standards exceeded
Multiwave 7101/7301/7501 have all common standard methods implemented in their software. The powerful system enables rapid heating, as required in EPA 3051 A (175 °C in 5.5 minutes), using less than 55 % of its installed power.

Requirements fulfilled
Many industries are moving towards lower detection limits and regulated environments. Multiwave 7101/7301/7501 offers efficient digestion, with the lowest reagent volumes to minimize blank levels and dilution factors. At the same time, high sample weights of up to 4 g and ultrapure quartz vials help to push the limit of detection. The instrument is supplied with 21 CFR Part 11 compliant software. The optionally available comprehensive Pharma Qualification documentation ensures qualification of these instruments within one working day.



Flexibility and Productivity

A wide range of reaction vial sizes and materials provides the best match for your samples in terms of sample type and weight, reaction chemistry, elements of interest, and required sample throughput.

High-purity quartz is the material of choice for trace analysis, offering low blank values, long life, and low memory effects. It is easy to clean and the preferred choice for the digestion of organic materials: food, petrochemicals, plastics, pharmaceutical, biological, and medical samples.

PTFE-TFM vials are also made from high-purity material. They are chosen for applications where hydrofluoric acid is required, such as geochemistry, mining, materials science, and environmental analysis.

Borosilicate glass vials are low-cost consumables used as disposable containers, eliminating the need and cost of cleaning. They are used in high-throughput laboratories for higher detection limits where the inherent impurities of the material (e.g. B, Na, K, Al, Mg) do not affect the analytical results: agricultural and environmental analysis, metals, and alloys.

Hermetically sealed quartz vessels are the preferred choice for the analysis of highly volatile elements such as osmium.

The optional magnetic stirrer in Multiwave 7301 and Multiwave 7501, with their PTFE or glass-coated stir bars, ensures smooth digestion of floating samples or heavy materials such as metal powders that form solid layers on the bottom of the vessel.

	Rack 41	**Rack 28**	**Rack 24**	**Rack 20**	**Rack 18**	**Rack 9**	**Rack 6**	**Rack 5**
	↓	↓	↓	↓	↓	↓	↓	↓
Vial volume [mL]	4.5	7	8	13	18	30	55	80
Max filling volume [mL]	2.5	4	5	7	10	20	35	50
Max sample weight [g]	0.1	0.2	0.2	0.6	1.0	2.0	3.0	4.0
Quartz vials	✓	×	✓	✓	✓	✓	✓	✓
PTFE-TFM vials	✓	✓	✓	✓	✓	✓	✓	✓
Borosilicate glass vials (disposable)	✓	✓	✓	✓	✓	✓	✓	✓
Sealed quartz vessels	×	×	×	×	✓	×	✓	×

Support and Education

From helping you find the right microwave digestion system to giving you all the background information and education you need, we're committed to outstanding service and support – whenever you need it.

Demos and webinars
We regularly offer free online webinars and demos. Recordings of our previous webinars are available in our library. Interested in an exclusive live demonstration? Then get in touch.

Contact our experts
We have over 4,500 employees worldwide, a global network of Anton Paar subsidiaries, and over 30 responsible distribution partners – so one of our microwave digestion experts is always just a call away and happy to help.

Free microwave digestion textbook
Get your copy of "A Chemist's Guide to Sample Preparation", your ultimate resource for all sample preparation needs. It describes the basics, benefits, and various technical approaches to successful acid digestions as well as troubleshooting of common issues in the sample preparation field.

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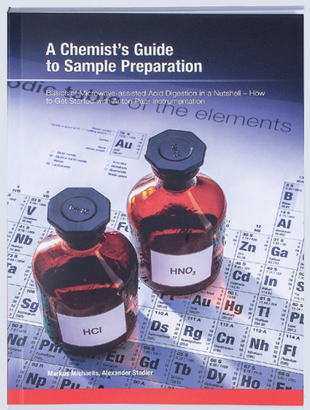

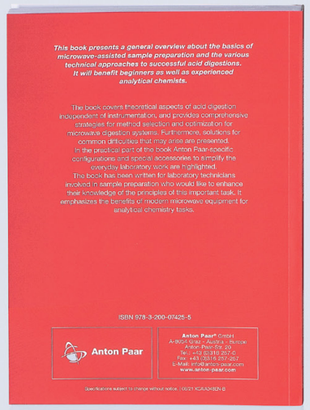

	Multiwave 7101	Multiwave 7301	Multiwave 7501
	↓	↓	↓
Specifications			
Maximum temperature	300 °C	300 °C	300 °C
Maximum pressure	199 bar	199 bar	199 bar
Installed power	2,000 W	2,000 W	2,000 W
Maximum power delivered	1,500 W	1,700 W	1,700 W
HCl/Aqua regia digestions	✓*	✓*	✓
Cooler	External	Internal	Internal
Stirring option	-	✓	✓
Liner lift	✓	✓	✓
Smart light	-	✓	✓
VNC	✓	✓	✓
Pharma Qualification Package	✓	✓	✓
Automatic cleaning routines	✓	✓	✓
* In sealed vessels.			
Instrument dimensions			
Weight	115 kg	117 kg	118 kg
Dimensions (width x depth x height)	497 mm x 742 mm x 470 mm (19.5 in x 29.2 in x 18.5 in)	497 mm x 742 mm x 470 mm (19.5 in x 29.2 in x 18.5 in)	615 mm x 760 mm x 470 mm (24.2 in x 29.9 in x 18.5 in)

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