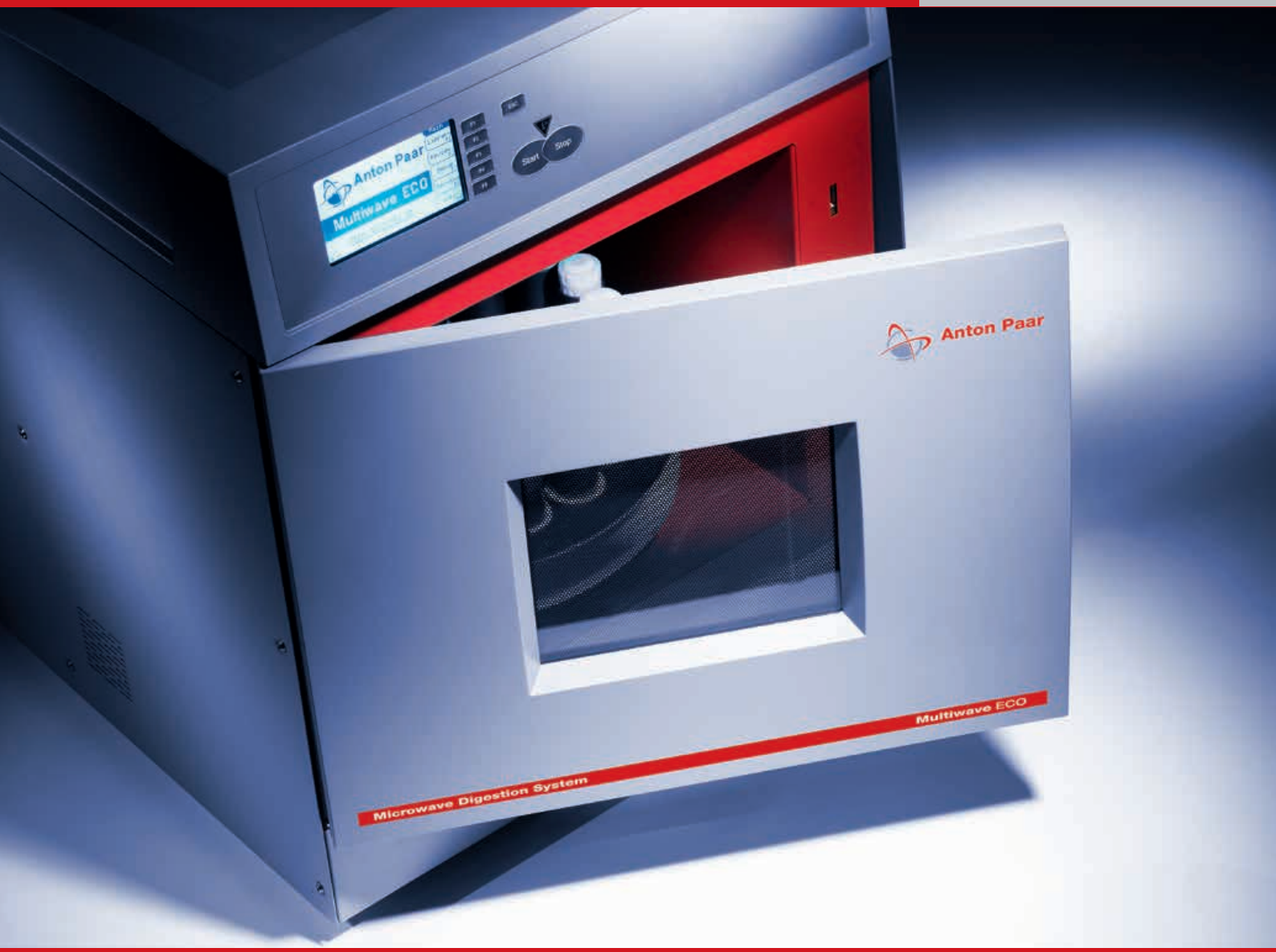
Multiwave ECO

Microwave Digestion System

::: Clear Solutions in Sample Preparation



Multiwave ECO
The Friendly Routine Digestion System

Anton Paar has been a leading supplier of sample preparation instruments for over 25 years. At the forefront of high-precision engineering, the company has always been fueled by a passion for innovation and its close-knit contact with the scientific community.

➤ High-quality and budget-friendly

As a result of Anton Paar's 90 years of experience in smart engineering and consistent use of high-quality components, you can rely on Multiwave ECO for years of operation. Its attractive purchase price together with low costs for operation and consumables make Multiwave ECO an economic investment.

➤ Reliable service and application support

For the entire working life of your Multiwave ECO, specialists from Anton Paar offer quick and efficient service to reduce your downtimes to a minimum. With subsidiaries and sales partners worldwide, you are close to an experienced team providing application support and training.

Operation-friendly – Everything is possible

- A partly loaded rotor
- High sample amounts
- Micro-sample amounts
- Differing sample amounts
- A pressure-independent digestion temperature
- Use of hydrofluoric acid

Multiwave ECO represents a masterstroke of Anton Paar's engineering – it's the simplest and most convenient microwave digestion system on the market. Quick digestions in less than 30 minutes are possible due to the new ECO Heating and ECO Cooling concepts.

Simple handling:

- Tool-free vessel handling
- Three-part vessel system
- Lightweight rotor construction

Application-friendly
Routine Digestion of a …

Multiwave ECO is the digestion system of choice to ensure the quality of your food samples, to ensure contamination-free food or drinks and to confirm compliance with EPA methods. Multiwave ECO's ready-to-use application library contains eight generic methods for a wide range of samples. The library provides tested methods for digestion, leaching or drying of both small and large sample amounts of inorganic or organic matrices. When you are working on new applications, full application support for method creation is available from Anton Paar.

Multiwave ECO mainly focuses on routine acid digestion and acid leaching of the following samples:

Nevertheless, reliable acid digestion and acid leaching of other samples is also possible. To receive more infomation, contact your Anton Paar representative.

… Wide Range of Samples

➤ Can I completely digest soil, sediments and fly ash?

Routine acid digestion and leaching of environmental samples is easily performed using Multiwave ECO equipped with Rotor 16HVT50. The vessels are HF-resistant, enabling the use of hydrofluoric acid for a complete digestion of samples containing silicate.

➤ Can I ensure satisfying food digestion quality?

Food samples such as spinach leaves and oyster tissue are reliably digested using Multiwave ECO with Rotor 16HVT50. The innovative concept of the vessels' pressure-activated-venting technology facilitates high digestion temperatures and excellent digestion quality for organic samples.

➤ Can I digest according to EPA 3051a and EPA 3052?

Microwave-assisted acid digestion of e.g. sediments, sludge and oils in less than 30 minutes according to EPA 3051a and 3052 is performed using Multiwave ECO in combination with Rotor 16HVT50.

➤ Is it possible to digest alcoholic samples?

White wine, red wine and other alcoholic samples are perfectly digested using Multiwave ECO in combination with Rotor 16HVT50. The pressure-activated-venting technology allows for the controlled release of reaction gases during the digestion procedure, so various sample types can be processed in a single run.

➤ Can I achieve a high throughput of micro-samples?

Multiwave ECO combined with Rotor 64MG5 enables the digestion of 64 samples in microgram amounts in a single run. Cleaning is easy due to the disposable 5 mL glass vials.

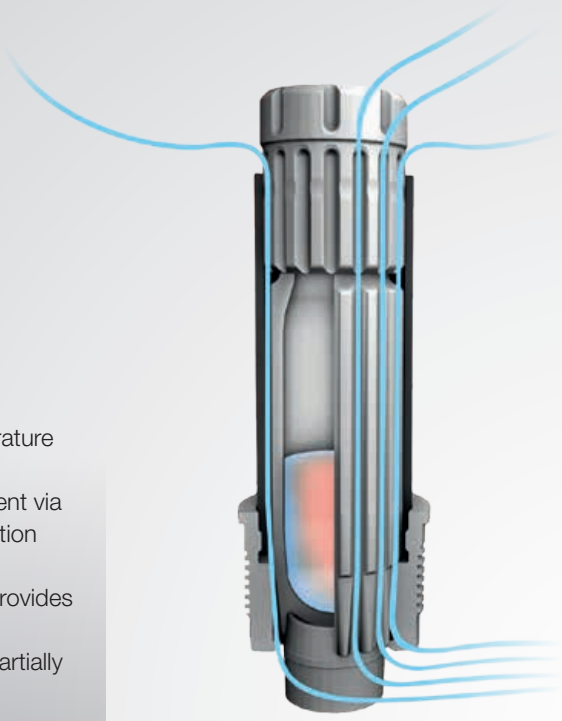
➤ Is it possible to dry samples before digestion?

Microwave drying with Multiwave ECO and Rotor 1DRY takes a quarter of the time required by conventional methods, providing samples without carbonization or contamination. Humidity and bad smells are drawn off by the integrated exhaust unit.

Mutliwave ECO is the routine digestion system of Anton Paar's product portfolio. If you are looking for a versatile solution for your more demanding samples, choose **Multiwave PRO** - the master of sample preparation. For samples which require harsh digestion conditions (up to 320 °C at 130 bar), the **HPA-S** high-pressure asher can be utilized.

Friendly Technology

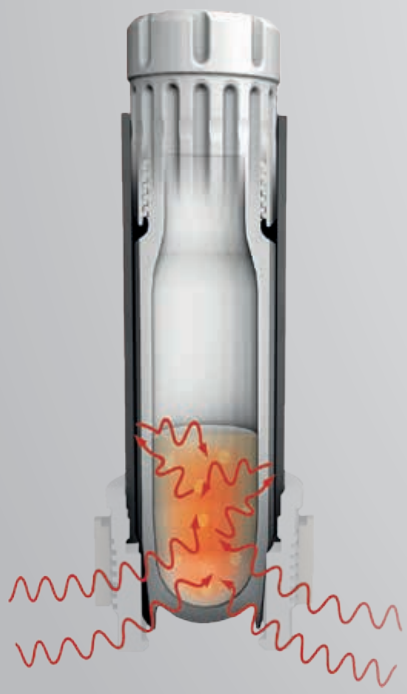
Behind the scenes of Multiwave ECO the unique ECO Heating, ECO Holding and ECO Cooling concepts ensure safe operation, high-quality digestion and minimal process times.



ECO Heating

Heating

- Unpulsed microwave power output over the whole power range for efficient reaction control
- Optimized placement of the magnetron for low trajectory of microwave introduction
- Sample region of vessels freely accessible to microwaves
- PTFE-coated Al tubes reflect the microwaves for a locally concentrated and homogeneous field around the sample
- Temperatures up to 250 °C in routine mode
- Heating according to EPA 3051 and 3052 (i.e. acid digestion or extraction)



ECO Holding

Temperature control

- Non-invasive, precise temperature control via IR sensor
- Simplified method development via temperature-controlled digestion runs
- Robust temperature model provides internal vessel temperatures
- Sophisticated algorithm for partially loaded rotors

Pressure control

- Precise pressure control via innovative pressure-activated-venting concept
- Venting pressure of 20 bar independent of reaction temperature
- Reaction temperature can be maintained on a constant high level
- Samples with different reaction behavior are safely digested in the same run
- Sample weights of up to 2 g per vessel
- Larger (organic) sample amounts than in closed vessels

ECO Cooling

Cooling

- Integrated exhaust and cooling system
- "Cooling fins" bring cool air closer to the hot vessel, facilitating rapid cooling
- PTFE-coated Al tubes accelerate heat transfer
- Cooling times from 200 °C to 70 °C in less than 15 minutes
- No handling of hot and pressurized vessels
- Low-intensity cooling during a run avoids overheating and reduces thermal stress of vessel and rotor components, increasing their lifetime
- Safe exhaust of acid fumes/reagent vapors

Rotor Specifications

Multiwave ECO can be equipped with two digestion rotors and one drying rotor, which simplifies your choice.

Rotor 16HVT50

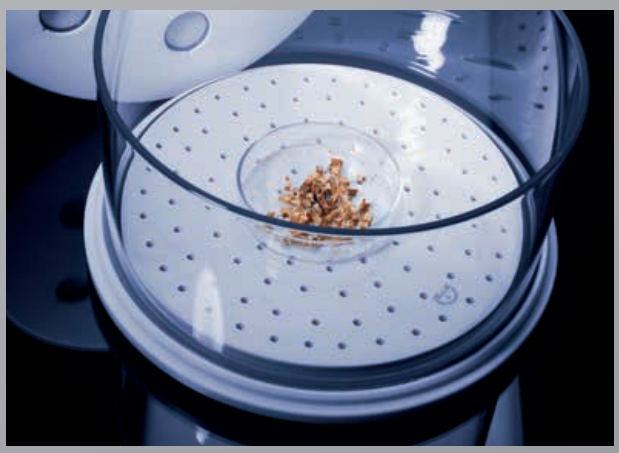
The lightweight rotor 16HVT50 provides all the advantages of the newly designed system.

No. of vessels	16
Vessels / material	HVT50 / PTFE-TFM
Volume	50 mL
Filling volume	3 mL to 25 mL
Operating parameters	250 °C @ 20 bar (290 psi)
Max. design specification	310 °C/35 bar (508 psi)
Sample amounts	≤2 g
Pressure-activated venting	Yes
Resistance to hydrofluoric acid	Yes

Rotor 64MG5

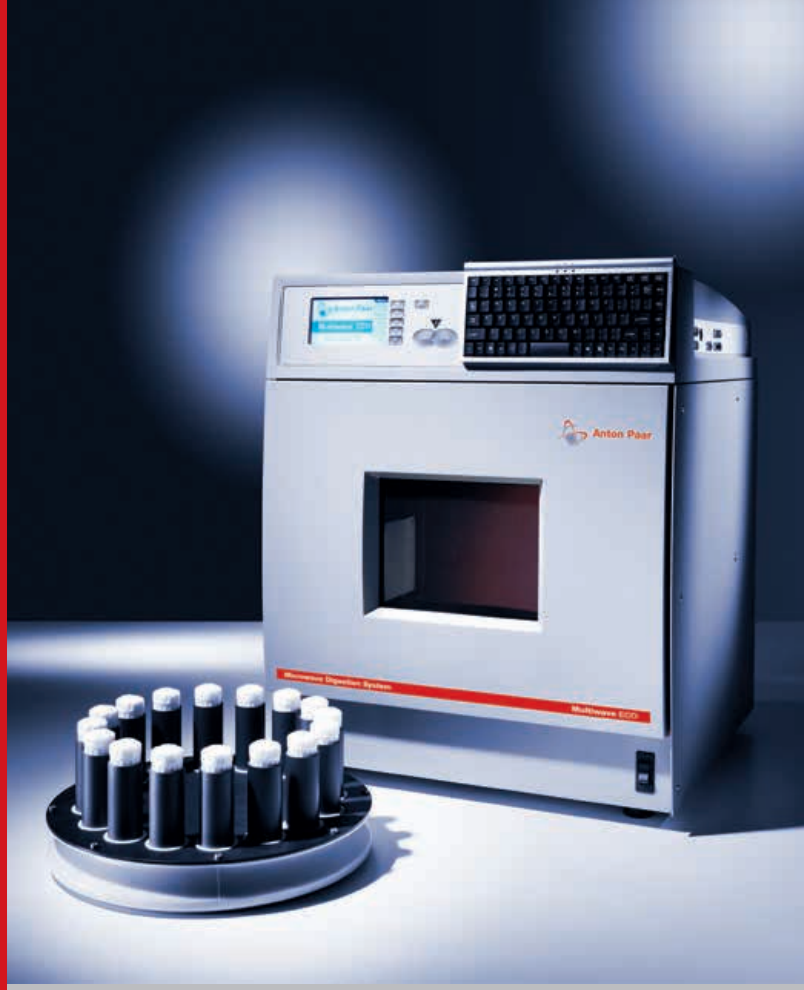
The 64-position rotor is the right choice for sample amounts lower than 20 mg and high sample throughput.

No. of vessels	64
Vessels / material	MG5 / borosilicate glass, PTFE seal
Volume	5 mL
Filling volume	0.3 mL to 1.5 mL
Operating parameters	200 °C @ 20 bar (290 psi)
Max. design specification	310 °C/33 bar (479 psi)
Sample amounts	1 mg to 20 mg
Pressure-activated venting	No
Resistance to hydrofluoric acid	No



Rotor 1DRY

The rotor 1DRY can be utilized for fast and efficient microwave drying prior to digestion. The exhaust unit of Multiwave ECO removes humidity and unwanted odors.



Fotos: Croce & Wir

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Instruments for:
Density and concentration measurement

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X-ray structure analysis

Refractometry

Polarimetry

Petroleum testing

High-precision temperature measurement

Specifications subject to change without notice.

02/13 D45IP001EN-B