

Microwave reaction platform

Multiwave 5000



One system, endless possibilities

Superior trace elemental analysis begins with outstanding sample preparation. Even when using the best analytical equipment, sample preparation is the key factor to obtain reliable measurement values. Over 40 years of experience in sample preparation have been incorporated into the development of Multiwave 5000 to meet the needs of today's lab chemists. As the user-friendliest microwave system ever created, it saves labs time and money.

The microwave reaction platform that meets your needs
Thanks to the flexible platform concept you can configure Multiwave 5000 to be the best fit for your applications.

Multiwave 5000 provides: digestion of all kinds of samples (varying in difficulty or volume) | acid leaching | microwave solvent extraction | evaporation | microwave-induced oxygen combustion | UV digestion | sample drying | synthesis.

modern,
easy-to-navigate
user interface

easy
tool-free
vessel handling

method library
with >500 pre-installed programs

global
support network



YOUR SAMPLES MIGHT BE COMPLEX – MULTIWAVE 5000 IS NOT.

Multiwave 5000:

The user-friendliest microwave system

Time-savers: Hands-free door opener and optimized cooling

With the unique hands-free door opener you simply have to push lightly against the door. You can do it with your elbow – no need to set the vessels or rotor aside. The integrated forced-air cooling system with its unique air gap design cools the vessels within minutes after heating cycles. The optimized cooling ensures short process times and increased lifetime of key components.

Advanced vessel and sensor technology to achieve reliable digestion results

Comprehensive reaction control is guaranteed thanks to temperature control on each position and several control strategies for the simultaneous digestion of different sample types. SmartVent identifies venting events by detecting NOx gases, increasing the protection against corrosion.

SmartScreen: The simple way to start your method

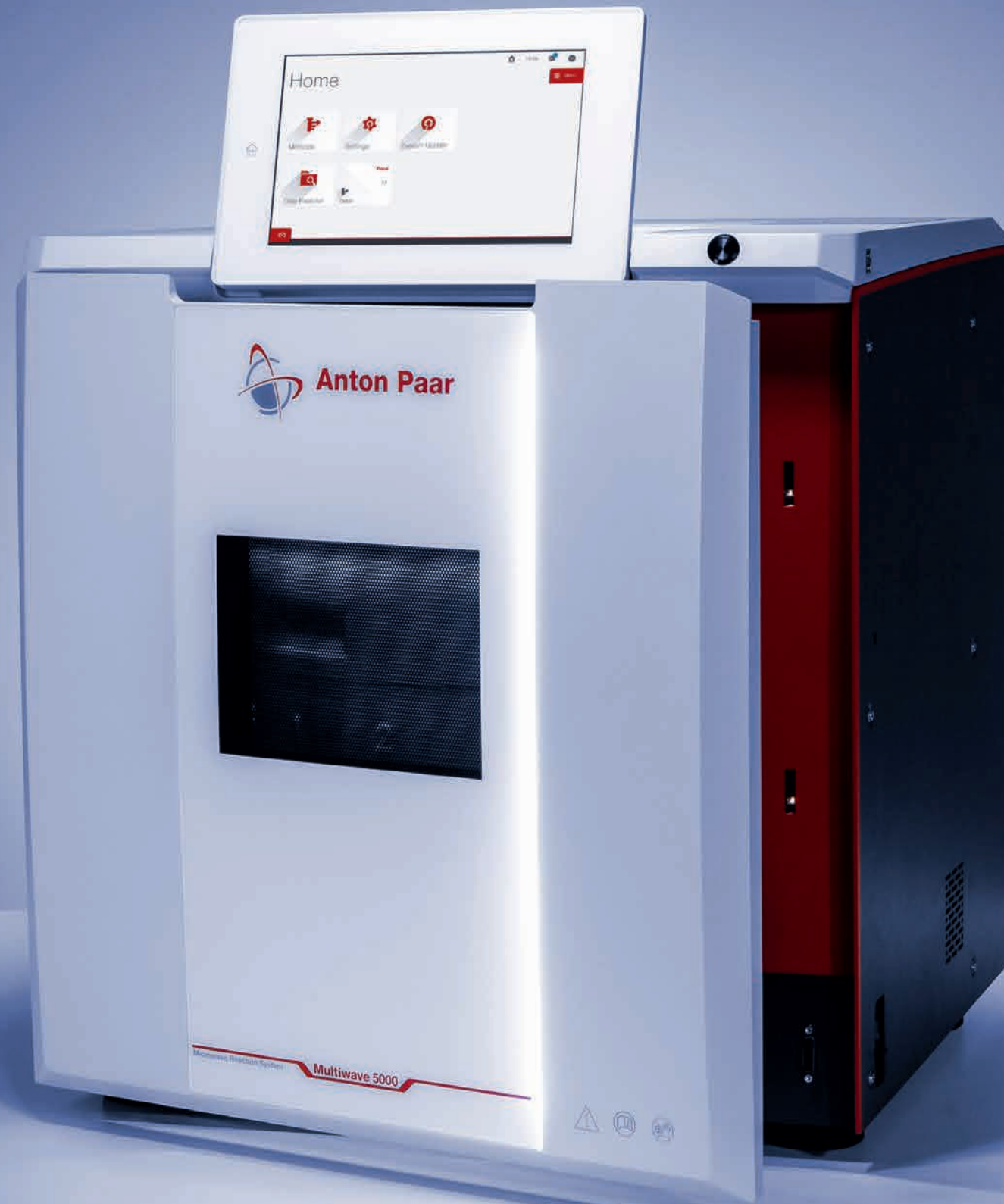
Configure the home screen according to your needs: define shortcuts to methods, menu links, or video manuals on your home screen and make Multiwave 5000 your own.

SmartLight: Visualize a run's status

Depending on the instrument's status, the color and mode of SmartLight changes according to whether the experiment is in progress, finished, or in standby. No need to dash from your desk to Multiwave 5000 to check if the run is finished – just take a look when passing by.

SmartLink: Get in touch with Multiwave 5000 and use your time efficiently

SmartLink connects Multiwave 5000 to your personal computer, notebook, tablet, or mobile phone to let you monitor and operate experiments remotely. Automated notifications keep you informed, whether you are in the lab or on the go.



Tool-free vessel handling

Opening and sealing Multiwave 5000's rotors, vessels, and sensors is quick and simple – just use your hands. The unique tool-free handling simplifies frequently repeated work steps and saves valuable time.

Utmost safety in all situations

When working at elevated temperatures and pressures safety is an important issue. To protect users and equipment, Multiwave 5000 is equipped with active and passive safety features: self checks, software interlocks, and a resealing safety door. Each instrument is tested individually.

Knowledge hub: Get all the information right on the instrument

All relevant information can be found on the instrument: instruction manuals, the large method library, or the application guide are just a few clicks away. If you have any questions while you are working, you can watch the video manual directly on the 10.1" instrument screen. This important information is updated together with software updates, which are available for free and communicated via push notifications.

For the pharmaceutical industry

Multiwave 5000 complies with national and international standards such as pharmacopeia, GMP, GAMP 5, and 21 CFR Part 11. With the specific pharma qualification package, documentation is integrated directly into your workflow.

Compact rotors: Digestions simplified

Anton Paar's compact rotors are robust, lightweight, and accommodate more samples on a smaller footprint. The HVT and SVT pressure vessels are the key to successful digestions for a wide variety of samples. Made for fast, safe, tool-free operation, they provide a new level of convenience for the sample preparation lab.

HVT vessels with SmartVent technology

SmartVent technology ensures reliable overpressure release of reaction gases

The pressure built up during the reaction is limited by the precise overpressure release mechanism.

Thanks to the release of those reaction gases the maximum temperature is not dependent on the applied sample amounts. This concept lets you digest large sample quantities and samples with different reaction behavior in one run.

- Only three parts that can be assembled easily without any tools
- Simple cleaning, a long lifetime, and low cost of consumables
- Available in volumes of 50 mL, 56 mL, and 80 mL
- Ideal for the digestion of various kinds of samples, including food and biological samples, waste water and sludge, soil and sediments, EPA procedures, environmental samples, agricultural samples, cosmetic and pharmaceutical samples
- Rotors with up to 41 positions – ideal for labs with high sample throughput
- Integrated cooling fins enable the fastest cooling and shortest process times while reducing material stress and increasing the lifetime of the vessel.

Internal temperature control and overpressure release

The internal temperature of each vessel, the most important reaction parameter, is controlled via contactless IR – a standard in Multiwave 5000.



SVT vessels with SmartVent technology

The advanced version of the HVT vessels offers the highest operating parameters and allows the digestion of difficult and demanding samples while maintaining the easy handling concept of the HVT vessels.

SmartVent technology allows the digestion of large sample quantities and samples with different reaction behavior in one run.

- Higher temperatures for complete digestions in a minimum of time
- Easy, tool-free assembly of only three parts make the use of high-performance digestion vessels more convenient and straightforward than ever before.
- Up to 20 samples in one single run with the Rotor 20SVT50 for the highest throughput
- Compact rotor design
- The robust design of the vessel and SmartTemp temperature measurement guarantee safe operation at the highest temperatures and pressures

SVT vessels are ideal for the digestion of various samples, including food, environmental and pharmaceutical applications but also more demanding samples such as ceramics, alloys, polymers, cosmetics, geological materials, petrochemicals, chemicals, and samples from refractories.



Compact rotors: Digestions simplified



High-end Rotor 8N

For samples that are either very reactive or require extreme temperatures and pressures for complete digestion Anton Paar offers a unique, proven solution: Rotor 8N with either PTFE-TFM or quartz vessels. Rotor 8N is made for the simultaneous and wireless pressure and pressure increase rate measurement and temperature control of every vessel. It withstands temperatures up to 300 °C for extended periods of time at operation limits up to 80 bar. If spontaneous reactions occur, the microwave power is reduced immediately and, if required, the cooling airflow is intensified.



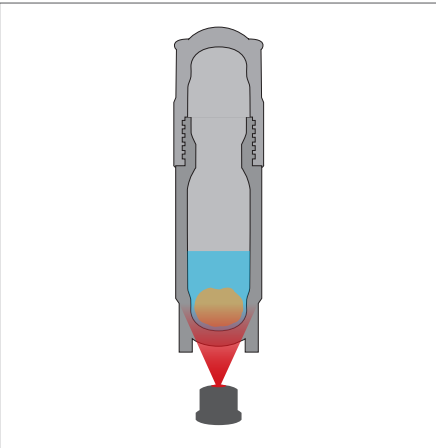
Microsamples Rotor 64MG5

Requiring only up to 20 mg of sample and approx. 1 mL of acid, the 64-position rotor is unique for the digestion of large numbers of microsamples, e.g. for biological materials.

| | Rotor 24HVT | Rotor 41HVT56 | Rotor 20SVT50 | Rotor 8 NXF/NXQ | Rotor 64MG5 |
|---------------------|---|---------------|--|------------------------------|--------------------------|
| Number of vessels | 24 | 41 | 20 | 8 | 64 |
| Volume | 50 mL / 80 mL | 56 mL | 50 mL | 80 mL / 100 mL | 5 mL |
| Material | PTFE-TFM | PTFE-TFM | PTFE-TFM | PTFE-TFM / Quartz | Glass |
| HF resistance | Yes | Yes | Yes | Yes (PTFE-TFM) / No (Quartz) | No |
| Temperature control | Internal T in all positions / SmartTemp | | SmartTemp | T in all positions | IR in 16 positions |
| Pressure control | SmartVent technology / SmartVent detection | | | p in all vessels | PTFE seal |
| Applications | Routine samples: biological and environmental samples, EPA procedures, food, cosmetic, and pharmaceutical samples | | Harder to digest samples: including polymers, ceramics, petroleum products, and alloys | Most difficult samples | Microsamples up to 20 mg |

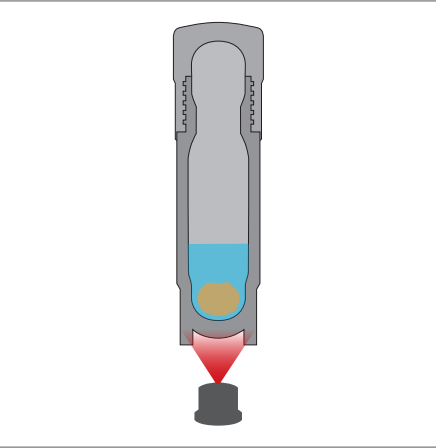
Multiwave 5000 can also be used with the digestion rotors Rotor 16MF100 and Rotor 16HF100 of Multiwave PRO.

Intelligent sensor technology



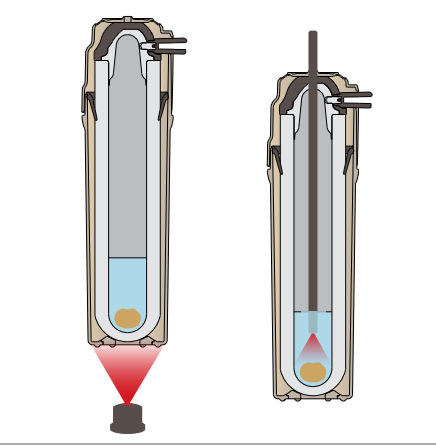
SmartTemp: Contactless measurement of the internal temperature

SmartTemp measures the internal temperature of each vessel with SmartVent technology directly and in real-time. Combining the fast temperature feedback of an internal temperature probe with the convenience of an infrared sensor, reaction control becomes easier and safer than ever, which is essential for hard-to-digest or exothermic samples.



IR sensor: Internal temperature control for HVT vessels

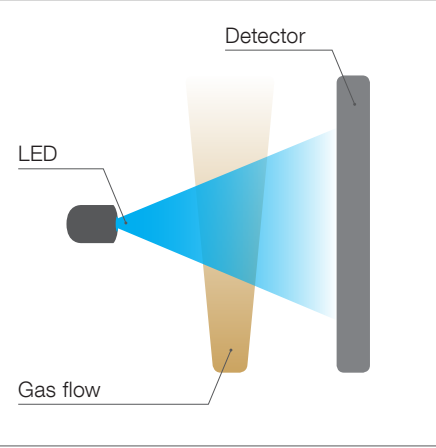
For precise control of digestion processes in each HVT vessel, Multiwave 5000 provides the internal temperature via IR sensor from the bottom, so the digestion runs can be controlled based on different temperature models and control strategies. The hottest sample, the coldest sample, or the average temperature of all samples can be used as references.



Temperature control in closed vessels

An infrared sensor measures the temperature at the base of each reaction vessel for a safe and reliable digestion process. If the temperature rises too high, Multiwave 5000 automatically reduces the microwave power so the temperature does not exceed the preset limit of the chosen method.

Internal probes for temperature measurement in a reference vessel are available for Rotor 8 and Rotor 16.



SmartVent: Venting detection

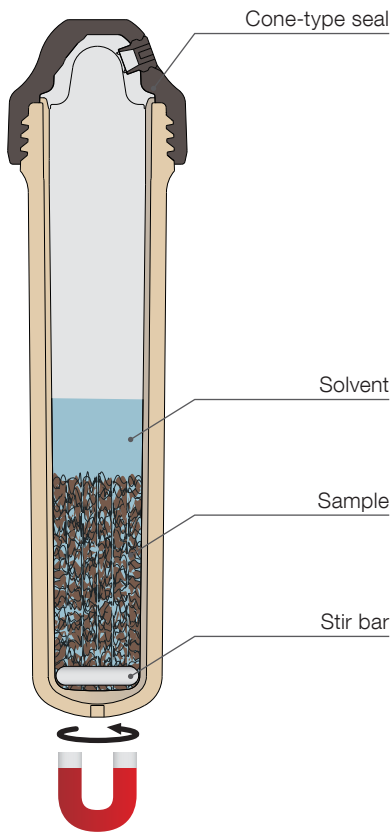
SmartVent indirectly controls the pressure and identifies venting events in vessels via the detection of NOx gases. This function is part of the comprehensive safety concept of Multiwave 5000 and increases the protection against corrosion.

Special solutions

Some samples require special treatment. The Multiwave 5000 platform system provides many options for other sample preparation methods in addition to acid digestion. They all benefit from microwave heating technology to become faster, safer, cleaner, and more cost-efficient than their classical, conventionally heated alternatives.

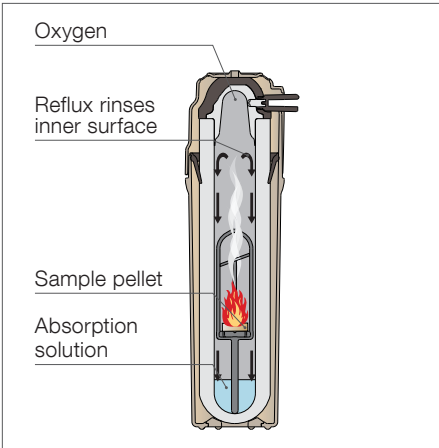
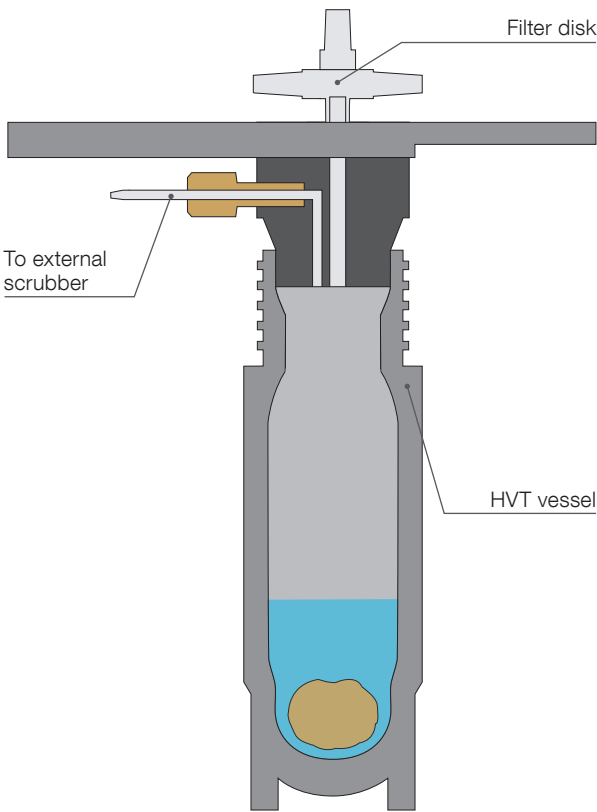
Microwave-assisted extraction

Microwave-assisted extraction is the perfect alternative to conventional extraction methods such as Soxhlet or ASE which are quite slow and tedious. With microwave extraction, reaction times are reduced from hours to only a few minutes. As less solvent is used, microwave-assisted extraction is a cost-effective way to improve the performance and throughput of your HPLC-based or GC-based analysis routines. Multiwave 5000 is suitable for extractions of PCBs, PAHs, and hydrocarbons from environmental and food samples, derivatization reactions prior to analysis, and polymer extractions. It is compliant with US-EPA and ASTM methods.



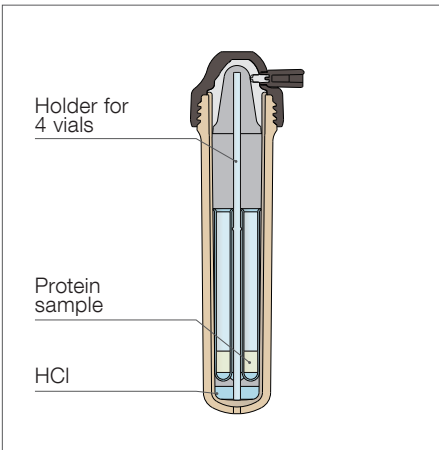
Microwave-assisted evaporation

The new 24EVAP accessory is a supplement to Rotor 24HVT50, Rotor 24HVT80, and Rotor 41HVT56. It facilitates, simplifies, and accelerates the microwave-assisted evaporation of acids and concentration of aqueous sample solutions. Since the same vessel can be used for the digestion as well as for the prior or subsequent evaporation there is no need for transferring digestion solutions with the risk of contamination. For a variety of samples, automatic endpoint determination makes reducing your sample volume convenient and reliable. The external scrubber neutralizes the acid vapors with a washing efficiency of more than 95 %.



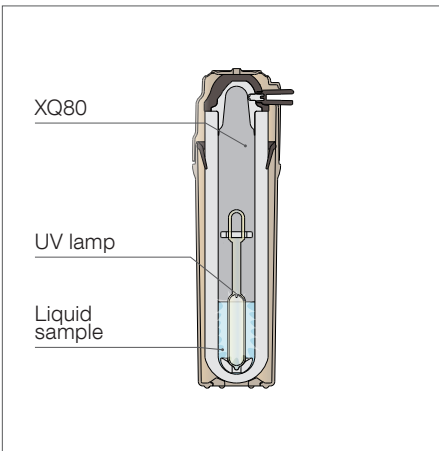
Microwave-induced oxygen combustion (MIC)

This unique, clean, and quick method for up to 8 samples at the same time is suitable for all combustible solids (wood, paper, coal, food, or polymers). Halogens or metals are trapped in a low concentration absorption solution which can be measured without dilution.



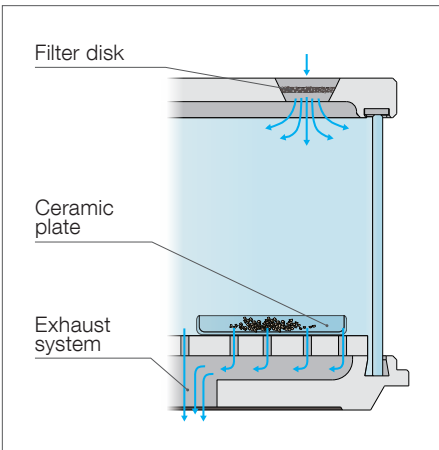
Microwave-assisted protein hydrolysis

Multiwave 5000 enables the protein hydrolysis of milligrams to grams in less than one hour with precise temperature control during the reaction. It is possible to apply inert gas.



UV digestion

Unique microwave-powered UV lamps produce radicals which digest the sample. The resulting low-concentration solution can be measured without dilution. The method is suitable for ultra-trace analysis with low analytical blank levels of e.g. seawater, effluents, sewage, body fluids, or beverages.



Microwave drying

Rotor 1DRY efficiently dries samples four times faster than conventional methods and provides samples without carbonization or contamination. Humidity and unwanted odors are removed via the exhaust system.

