Sample Preparation on TOP

TOPwave

Sample Preparation

analytikjena

An Endress+Hauser Company

TOPwave

TOPwave is the answer to the demand for one of the best systems for microwave-assisted pressure digestion. It provides a wide range of applications, ranging from routine laboratory applications through to special applications under extreme conditions.

Topwave

- An extremely versatile digestion system
- Meets all the requirements of modern digestion technology
- Ensures maximum operational safety thanks to the Self Check System (SCS)
- Intelligent design for straightforward operation and safety
- High sample throughput
- Documents all digestion parameters of each sample
- Features intuitive operation
- Minimum number of consumables
- Customers benefit from the experience of the experts at Analytik Jena

TOPwave

Sample Preparation on TOP

Maximum Performance Through Innovation

Sample preparation systems using microwave-assisted pressure digestion do not simply convince by functionality. High sample throughput is essential prerequisite – convenient handling and absolute operating safety are the key.

Utilizing time, guaranteeing safety, delivering quality.
TOPwave sets the standard in its field. Its patented sensor concept and intelligent design enable reaction control and operating safety at the highest level.

Effective sample preparation is achieved by facilitating high sample throughput through short cycle times and high capacities. Another crucial factor is safety. Working under exceptional conditions requires an absolutely reliable system and an experienced partner. Our application experts are dedicated to developing analysis methods to meet your demands. Sample preparation and analysis are viewed as related rather than as isolated entities. Both processes are perfectly coordinated to complement each other to guarantee accurate results and efficient laboratory operations.

The synthesis of technology and design

The innovative design of TOPwave forms the interface to convenience and function. The round furnace chamber enables uniform distribution of microwave power to achieve accurate sample digestion. The pressure-resistant furnace with an electrically locked swiveling lid is equipped with an integrated exhaust system to prevent reaction gases from escaping. Its robust design ensures a long service life and a constant output. PFA-coated stainless steel protects against corrosion. Vessels made of chemically inert material provide protection from contamination and ensure flexible handling.

Innovative ease of use

What makes TOPwave so special is its top-loading concept. The swiveling lid allows the vessels to be loaded from above thus providing optimal operator comfort. Sensors and vessels are optimally matched: An unique contactless sensor technology monitors the temperature and pressure in all vessels, providing individual readings for both values. Our proactive approach guarantees greater operator comfort in day-to-day laboratory operations.

Top safety standards

TOPwave not only offers intelligent functionality, it also complies with highest safety standards. Controlling the reaction parameters is essential in particular in the case of reactive samples.
Practical: The sensors monitor the sample temperature and the internal pressure of each individual vessel in real time.
Clever: The SMART reaction control continually checks the reaction conditions and adjusts the microwave power accordingly.
Prepared: The vessels are fitted with rupture discs and reliably vent the overpressure to the integrated gas collecting system.

Digestion Vessels – Straightforward, Safe, Efficient

Versatile: We have the suitable vessel for every digestion procedure.
Robust: They are made of high-quality fluoropolymer, allowing the processing of all common digestion chemicals and the reduction of the number of individual parts.
Practical: Our vessels can be opened and closed without the need for tools. Fewer consumables, longer service life – lower follow-up costs.

Different standard vessels are available as well as high pressure vessels for particularly demanding applications. A special rotor for high sample throughput is designed for routine applications involving the analysis of clinical, food and environmental samples. Liner systems also expand the field of applications of existing vessel types. For special applications: Quartz liner and vessels with a ceramic pressure jacket.

An accessory fuming unit guarantees quick concentration down to a minimum residual volume – without loss of analyte. This excludes cross contamination between the vessels.

Vessel type	Volume [mL]	Working pressure [bar]	Test pressure [bar]	Max. Temp. [°C] (continous)	Max. Temp. [°C] (short term)	Vessel per rotor	Option for
PM 40	40	40	55	210	230	24	–
PM 60	60	40	60	210	230	12	–
PL 100	100	40	55	210	230	12	–
CX 100	100	100	150	250	300	8	–
QX 20	20	100	150	250	260	12	PM 60
QX 22	20	100	150	250	260	12	PL 100
Multi vessel	10	100	150	230	260	8 x 3	PL 100, CX 100






Quality Ensured by Innovative Control Systems

Sensor concept

Completely contactless, but remarkably effective – power output control is based on a unique sensor concept. The disadvantages of classic sensor systems are effectively overcome, such as the use of immersion sensors. The benefits are clear: no contamination, no bothersome cables, no leakages, no corrosion on the sensors and no cost-intensive consumables. In contrast to systems with only a single reference vessel, you can individually control your samples to obtain safe and accurate sample digestion.

Optical temperature control with RTM

Remote Temperature Monitoring (RTM) allows you to focus on the essential. An infrared thermometer is used for contactless control of the sample temperature. This process uses an infrared range in which the vessel materials are transparent to enable direct detection of the sample by the thermometer. Only the actual internal temperature is measured. The thermal radiation emitted from the vessel surface is filtered out. No need to worry anymore about contamination, leakages and wear – with RTM, immersion sensors are no longer necessary. Only reliability matters: With the new technology it is no longer necessary to convert the surface temperature to the internal temperature.

Optical pressure control with RPM

No direct contact, no direct connection – but still enabling continuous communication. The patented pressure measuring method Remote Pressure Monitoring (RPM) works with a new type of technology. A glass ring on which the internal pressure acts is used as a sensor element. Increases in pressure are reflected by changes to the optical characteristic of the glass. The sensor element located in the screw cap of the digestion vessel records these changes and shows the pressure individually for each sample.

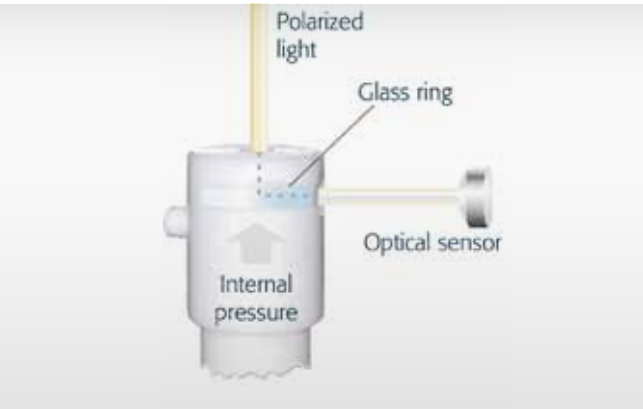
SMART reaction control

SMART actively assists you in your daily routine operations or when working under extreme conditions. All data collected during sample digestion including the number of vessels is used for controlling the power output to ensure controlled sample heating. SMART thus enables reproducible reaction conditions to guarantee that sample digestion meets a consistently high quality. Furthermore, an immediate adjustment of the microwave power is assured in response to spontaneous exothermic reactions.

Self Check System (SCS)

The Self Check System enables safe and maintenance-free operation, allowing you to fully focus on your work. The SCS combines all control functions in perfect harmony. Sensors monitor the electrically locked safety cover as well as the electronics and the magnetron. The SCS proactively prevents the occurrence of dangerous operating states, for example, by using the SMART algorithm. A safety shut-off device also provides that the operator and device are protected in the event an operational malfunction occurs.

Measurement principle RTM

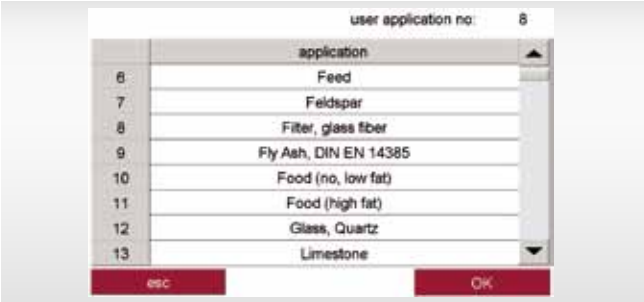


Measurement principle RPM

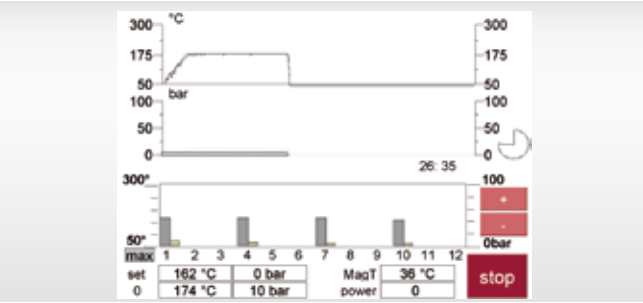
Precise Control of Sample Preparation

Reach the correct result with perfect navigation – the separate control unit controls all the system processes. The intuitive software offers various functions to suit your needs: A choice between seven pre-installed languages, different standard applications, individually adaptable user programs and also quick access to favorites.

It shows the sample reaction conditions during the entire digestion. Archiving takes place either via the internal memory, the USB or network interface. Long-range convenience: You can easily control and observe the digestion from your workplace PC by means of network connection.



Program selection



Display of all parameters in real time

Analytik Jena – the technology leader in spectrometry

Optical Spectrometry

novAA® Series
Classical line source AAS with Dual Optics and Deuterium background correction.

contrAA® Series
High-Resolution Continuum Source AAS with simultaneous background correction for fast sequential and simultaneous multi-element analysis.

ZEEnit Series
Line source AAS with Deuterium and Zeeman background correction with third generation magnetic field control.

PlasmaQuant® PQ 9000 Series
High-Resolution Array ICP-OES with Dual View PLUS views of a vertical plasma providing unique robustness and sensitivity.

Mass Spectrometry

PlasmaQuant® MS series
Bench-top ICP-MS with patented ion optics for unmatched sensitivity and robust plasma performance with only half the argon gas.

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TOPwave®
Microwave digestion system with contactless pressure and temperature monitoring for all samples.

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Pictures: Analytik Jena AG
Subjects to changes in design and scope of delivery as well as further technical development!

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