

Applications

**Food
&
Animal Feed**

**Pharma
&
Cosmetics**

Environment

BERGHOF PRODUCTS + INSTRUMENTS GMBH

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BERGHOF PRODUCTS + INSTRUMENTS GMBH

speedwave® ENTRY
The efficient instrument

Stripped down to the essentials

Ideal solution for routine analysis in
research institutions, for training and at
universities.

- Cost efficient
- Safe
- User friendly



A unique combination – to your benefit

The high-performance plastic TFM™-PTFE stands out for its excellent chemical resistance and is able to resist service temperatures of up to 260°C. The extremely nonstick surface, combined with minimal micro-porosity and hydrophobic behavior ensures minimal cross-contamination and very easy cleaning. That's why we rely on this unique material when manufacturing our laboratory equipment. The production by our sister company Berghof Fluoroplastic Technology GmbH, which has been specializing in PTFE for more than 5 decades, guarantees very high material purity and quality. A unique combination!



→ TFM™-PTFE vessels with unique durability
→ Reproducible results

Minimum operating costs – guaranteed

HOW TO KEEP YOUR RUNNING EXPENSES IN CHECK

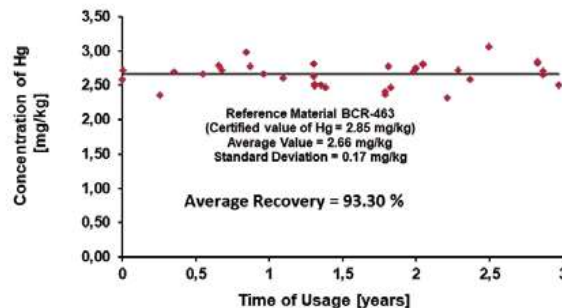


- Only at Berghof vessels are not subject to wear and tear
- That's why we are the only supplier on the market to include vessels in our warranty
- 5-year minimum durability of vessels
- 5-year extended warranty available

REPRODUCIBLE RESULTS

Our unique TFM™-PTFE vessels of our own production guarantee you

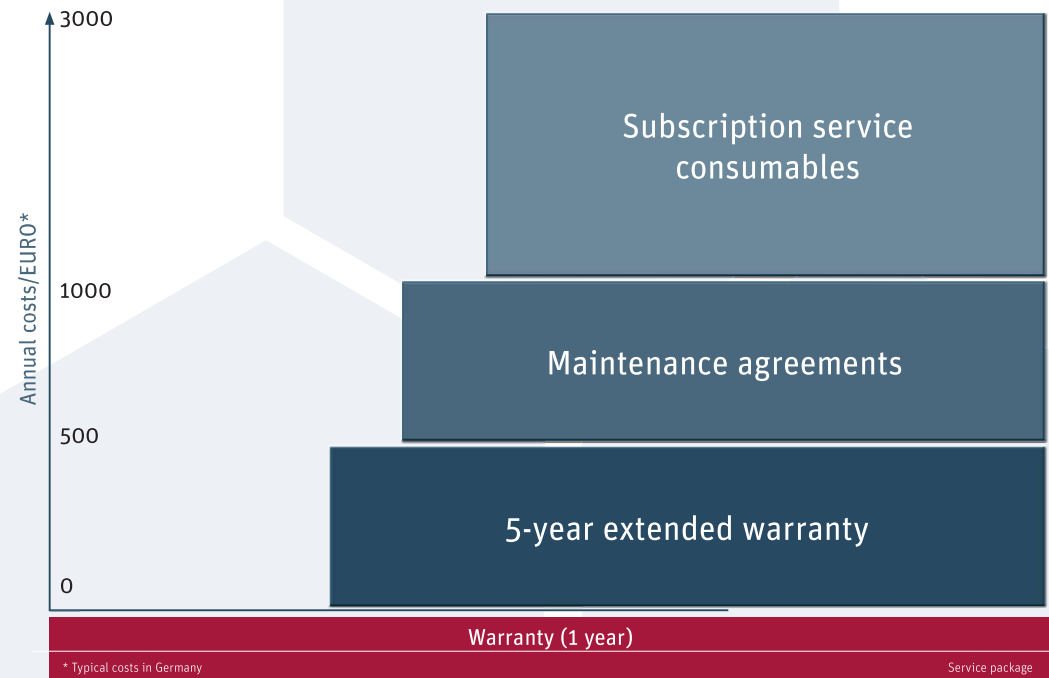
- Maximum quality and purity
- No cross-contamination – thanks to minimal surface porosity
- Easy and fast cleaning



Service offerings keep operating costs under control

OUR SERVICE – YOUR BENEFIT:

- Warranty (1 year, basic instrument and vessels)
- Maintenance agreements avoid down-times
- Extended warranty reduce repair costs
- Consumables subscription control costs on consumables



Easy, safe and efficient

Perfect for routine analysis, study and training

Corrosion-resistant oven coating



Exhaust unit connection

- The additional exhaust unit ensures that the samples cool down faster
- Maximum sample throughput possible

InSight

- Illuminated oven chamber
- During the complete digestion process, you can have an eye on the rotor and the samples

Filter IR radiation

QuickStart

- Intuitive operating software
- Only requires two key presses to start
- Pool of pre-installed applications, including the latest DIN and EPA standards
- Temperature program for individual configuration



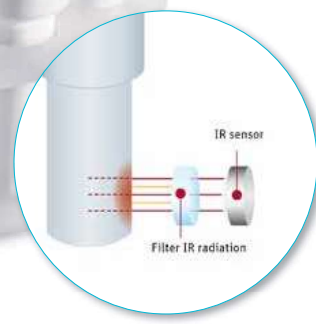
Vessels made of TFM™-PTFE

- Easy to use thanks to only three components
- Manual Opening and closing without tools
- Outstanding quality digestion vessels made of isostatically molded TFM™-PTFE with improved surface structure and minimum porosity
- Only Berghof extends warranty to vessels



Integrated Gas sampling system

- Safe interception and removal of released gases



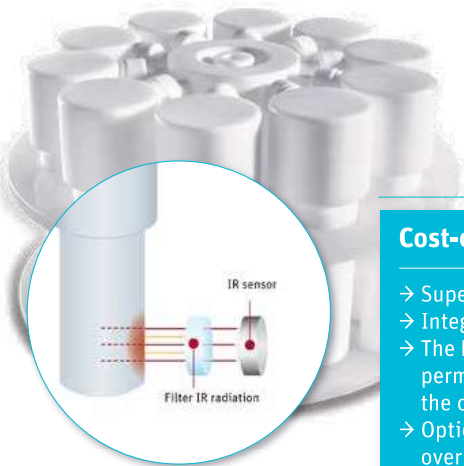
speedwave® DIRC

- Optical measurement of sample temperature, no reference vessels necessary
- Touch-free measurement of thermal radiation in the mid infrared range, in which the materials TFM™-PTFE and quartz cannot absorb radiation
- Filtering out infrared radiation emitted from the surface of the pressure vessels leads to exceptionally precise measurement results
- Reliable reaction monitoring by temperature detection in real time

speedwave® ENTRY

STRIPPED DOWN TO THE ESSENTIALS

The Speedwave® Entry shows its strengths in application areas where cost efficiency is a key issue. Therefore, it is often used in routine analysis for standardized digestions in research institutions, for training and at universities.



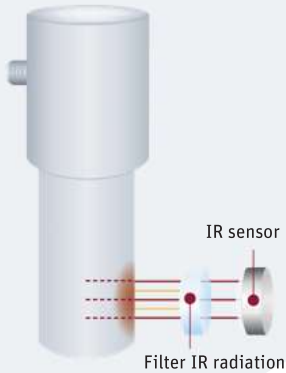
Cost-efficient

- Superior durability of TFM™ PTFE pressure vessels
- Integrated gas sampling system
- The Durability of the instrument is prolonged by permanent ventilation and removal of all vapors from the oven chamber
- Optical temperature monitoring protects vessels from overheating
- External ventilation system (recommended for HF und HCl)
- Corrosion-resistant oven coating

speedwave® ENTRY vessels

PATENT-PROTECTED SENSOR TECHNOLOGY

The patented optical measuring method Speedwave® Dirc provides for direct and non-contact real-time measurement of the sample temperature in the digestion vessel. We monitor the temperature inside the vessels by using infrared radiation. In contrast to other suppliers, we do not use a reference vessel to monitor the sample temperature. Instead, we permanently check all vessels in real time reading out the maximum sample temperature.



SURVEY OF VESSEL TYPES

	DAP-60K	DAQ-10
Volume	60 ml	10 ml
Operating pressure	40 bar	75 bar
Operating temperature	230° C	230° C
Rotor	10 vessels	24 vessels

Reproducible & efficient

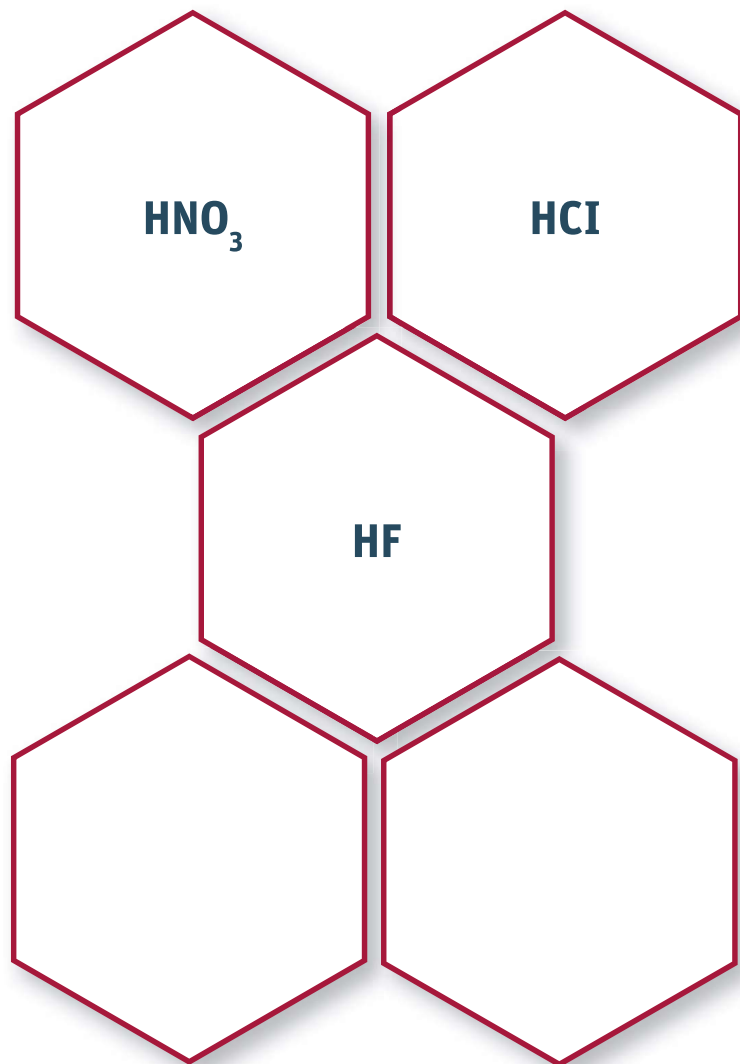
- No cross-contamination thanks to minimal porosity of the vessel surface
- Real-time monitoring of all sample temperatures
- Above average long durability of the vessels (more than 10,000 digestions)



Variable

- Intelligent vessel concepts for a wide range of applications:
- DAP-60K vessels are made entirely of TFM™-PTFE featuring high chemical resistance to all mineral acids and high mechanical strength
- DAQ quartz glass inserts enable the digestion of small sample volumes

Applications



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LABORATORY INSTRUMENTS

Acid purification

High purity acids permanently available

Producing your own high-purity acids or recycling them

→ This means that high-purity acids are available cost-effectively at any time



GETTING OUT OF THE COST TRAP

On the one hand, modern analytical laboratories have to perform high-quality analyses in the ultratrace range, but on the other hand they also have to minimize the costs for chemicals and consumables. The Berghof subboiling apparatus produces quality and pays for itself quickly. As a user, you benefit from absolutely pure acids at the lowest possible operating costs.

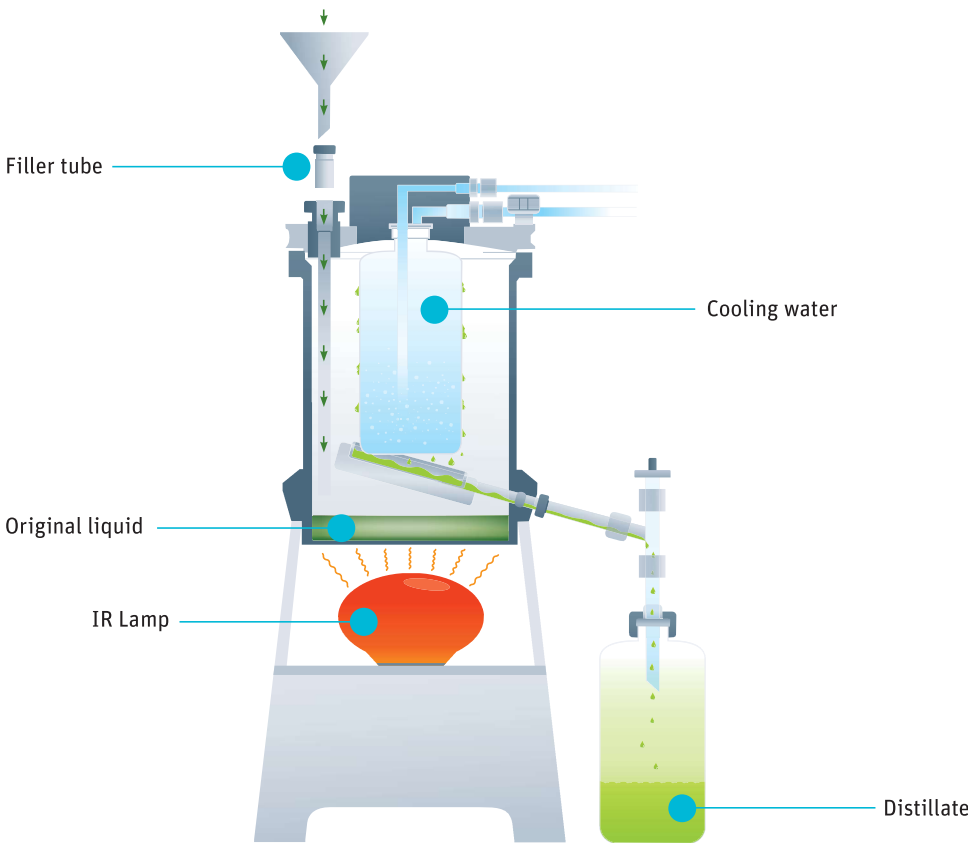
SUBBOILING-PRINCIPLE:

The subboiling apparatus is used to produce high-purity acids for ultratrace analysis. Via infrared heating, it distills the acid at temperatures of 10-20°C below the boiling point very carefully. This prevents the formation of droplets and aerosols and ensures a uniquely efficient purification.

→ Fields of application: HNO₃ , HCL , HF und H₂O

→ Distillation volumes: **Less is more** – lower distillation volumes mean higher purity of the acid yielded.

In 24 h, approximately 1.2 L HNO₃, 1.1 L HCL , 1.0 L HF or 1.8 L H₂O are gained.



Distillacid

PURITY LEVELS



Unmatched purity

- Starting from p.a. qualities, high-purity acids with contaminations in the sub-ppb range are obtained
- **Multiple-Subboiling**
Leads to even purer acids at sup-ppt level
- **Cost-effective**
The system pays for itself within one year
- **High durability**
The system consists solely of high-purity materials such as TFM™-PTFE, PTFE and PP

Concentrations in ng/g (=ppb)		Concentrations in ng/g (=ppb)	
Ag	<0,05	In	<0,05
AL	0,2	K	0,6
As	<0,05	Li	<0,05
Au	<0,05	Mg	0,08
Ba	<0,05	Mn	<0,0 5
Be	0,1	Mo	<0,05
Bi	<0,05	Na	0,6
Ca	0,1	Ni	0,3
Cd	<0,05	Pb	<0,05
Co	<0,05	Sb	<0,05
Cr	<0,05	Sn	<0,05
Cu	<0,05	Sr	<0,05
Fe	0,25	Ti	0,1
Ga	<0,05	V	<0,05
Ge	0,4	Za	<0,05

Services

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Technical Support – Service

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Pharmaceutical package

The combination of 21 CFR Part 11 compliant software and IQ/OQ package enables end-to-end traceability and documentation of the Speedwave® Xpert application.

This guarantees that Speedwave® Xpert complies with internationally applicable regulations when used in the pharmaceutical industry, especially those of the FDA and GLP/GMP or GAMP.



Pharma Software

Optional 21 CFR Part 11 compliant software for the Speedwave® Xpert. The software includes user management, password protection, audit trail, documentation, and export and print functions.



IQ/OQ-Packages

We offer an IQ/OQ package for the Speedwave® Xpert. This qualification package guarantees that the Speedwave® Xpert meets the legal and safety requirements.

MAINTENANCE AGREEMENTS

Berghof laboratory instruments stand for reliability and quality. To ensure their long-term efficient use and minimize downtimes, we offer you maintenance agreements with attractive conditions and flexible terms. We adapt the scope of service as well as the duration to your individual requirements.



EXTENDED WARRANTY

Durability and highest quality – Berghof microwaves convince users with an above-average durability. With Berghof extending warranty to instruments and digestion vessels, you as a customer also receive this additional security in writing, including legal claims for subsequent performance.



CONSUMABLES SUBSCRIPTION

The unique Berghof offering– to make sure you always have operating costs under control

- Up to 5-year warranty for basic instruments and vessels
- Consumables-subscription covering all typical consumables