



Sample Digestion Liner Technology

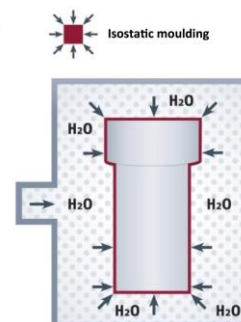
- Microwave Digestion
- Pressure Digestion
- High Pressure Reactors

Berghof PTFE technology improves safety and reduces costs

Microwave-assisted acid digestion and pressure digestion are well-established techniques in the preparation of solutions from solid samples for the spectroscopic analysis of trace elements. The Berghof range of microwave and pressure digestion systems and reactors benefit from the expertise provided by the Berghof Fluoroplastics Division. Reactor liners and reaction vessels are manufactured from isostatically moulded TFM™ PTFE which gives exceptional mechanical stability and resistance to chemical vapours. With a typical service life of between 3 – 5 years Berghof pressure vessels do not need regular replacement. They are not considered as consumable items – they are included in the equipment guarantee.

PTFE vessel manufacture

The PTFE sample reactor vessels and liners need to be able to withstand elevated temperatures and or pressures for extended periods of time. Berghof components are manufactured from TFM™ PTFE rather than just PTFE to avoid the possibility of vessel distortion at elevated temperatures. The Berghof manufacturing process uses isostatic moulding methods where force is uniformly applied to the mould from all directions simultaneously. The resulting components have minimal porosity and a better surface structure. In addition, their resistance to external forces is uniform in all directions so the components are much stronger than components made using other methods.



Benefits of TFM™ PTFE



TFM™ PTFE offers many benefits over conventional PTFE, including:

- Outstanding chemical resistance even to aggressive acids and alkalis
- Temperature resistance between -200° and +250° during continuous use
- Improved resistance to gas permeation through the material
- Smooth, anti-adhesive surface and hydrophobic properties make cleaning easier and minimise cross-contamination

Simple container construction

Berghof digestion systems are designed so that the reaction liquids only come into contact with TFM™ PTFE components. The microwave digestion sample vessels consist of only three components and can be opened and closed manually without the need for special tools. Simple liners with caps are available in different volumes for the Berghof range of pressure digestion systems operating up to 200 bar. Berghof high pressure reactors are completely lined with a stable TFM™ PTFE insert which is hermetically sealed and clings to the inside of the reactor wall like a skin. The reactor lid is also lined with an additional layer of PTFE, and the immersion tubes are encased in TFM™ PTFE. The stirrer can also be manufactured from TFM™ PTFE, ensuring that all parts of the reactor are protected from aggressive reagents.



Speedwave microwave digestion systems

Berghof Speedwave microwave digestion systems are designed to deliver first rate results for trace analysis. The '**Speedwave Entry**' system offers ease of use, safety and cost efficiency. It is ideal for digestions at moderate temperatures and pressure ranges in routine analysis, studies and training. Typical application areas include food and feed, environmental analysis, medicine, biology and agricultural. The '**Speedwave Xpert**' is a high performance microwave system for complex digestions of difficult sample material under elevated temperatures and pressures. The sophisticated microwave design combines high-quality materials and innovative sensor technology and guarantees a high level of safety. The **Speedwave Xpert** is used in environmental analysis, pharmaceutical analysis, materials, geology, energy, metals and the plastic industry.



DAB pressure digestion



The DAB series of pressure digestion systems for closed acid digestion offer a continuous digestion process which can run overnight, if required, for optimum efficiency. These systems are particularly useful for difficult samples, large sample masses, or in labs that value high levels of flexibility. Typical digestion times lie in the range of 2-4 hours. However, for difficult to digest samples such as SiC, the ability to extend digestion time for practically any desired period represents a significant benefit. In addition, the higher pressure range (up to 200 bar) compared to microwave units allows larger sample quantities (e.g., 2 g organic samples) to be digested. The **DAB-2** unit has a 50 ml TFM™ PTFE insert while the **DAB-3** has a 250 ml insert and a bayonet locking system. Both units can operate at temperatures up to 250° C using a heating block for 1, 2 or 4 samples. In addition there is an optional multiple crucible system for the simultaneous digestion of 3, 5, or 8 samples in a **DAB-3** pressure vessel

High pressure reactors

The Berghof **BR-Series** of high-pressure reactors are an indispensable tool in modern chemical synthesis. They offer a unique modular design with flexible combinations. In addition to the extensive selection of standard fittings, a choice of stirrers and other optional accessories is available. These include systems for gas or liquid sampling as well as liquid injection under operating pressure. Test reactors can be additionally equipped with cameras and interior lighting for material testing. Safe and reliable hermetic sealing of the reactors is provided through a conical flange lock and a PTFE O-ring. The reactor lid can be combined with various reactor vessels and inserts so that the capacity of the reactor can be optimised. In addition all inserts can be used as practical storage vessels for reaction solutions. Products range from a small-volume, high-pressure reactor of 25 ml to a pilot plant scale of 5.5 l.



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