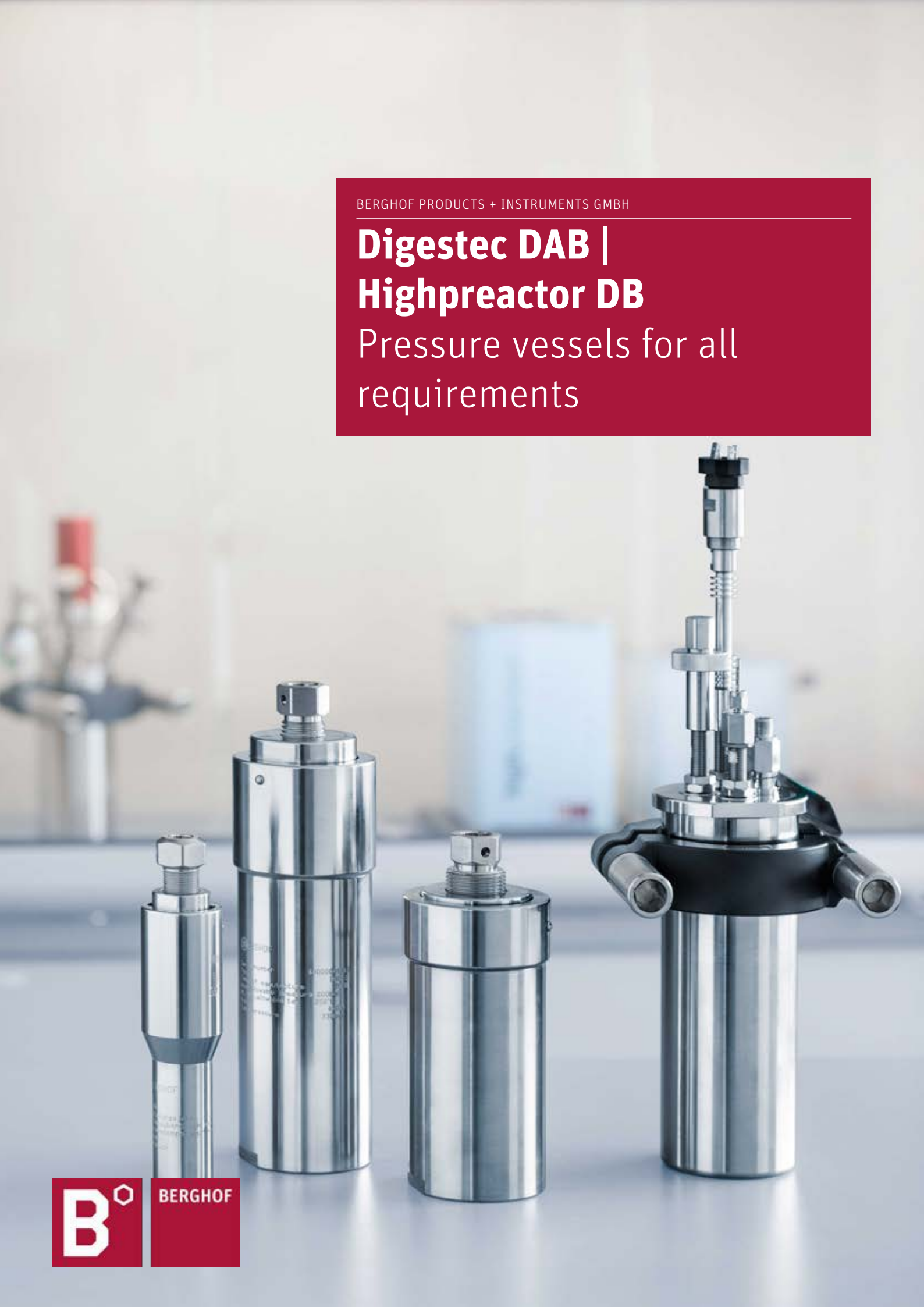
BERGHOF PRODUCTS + INSTRUMENTS GMBH

Digestec DAB | Highpreactor DB

Pressure vessels for all requirements



BERGHOF

digestec **DAB pressure vessels**
highpreactor **DB metal-free reactors**

The matching system for synthesis, material testing and difficult digestion tasks

BERGHOF PRODUCTS + INSTRUMENTS GMBH

Our philosophy

The philosophy of Berghof Products + Instruments GmbH can be summarized concisely: Adding value for our customers. In our product development stage, it is highly important to design reliable, easy-to-operate and safe instruments, which optimally satisfy the demands of our customers. Through our application expertise, we can create products as we ourselves and our customers want them: high-performance, safe and durable.

Berghof Products + Instruments GmbH
Pressure vessels

With over 50 years of experience, Berghof offers extensive expertise in the production of reactor systems and pressure vessels. The needs of the users are at the core of our work. Intensive dialogue with our customers lets us develop innovative products with a variety of application options.

Our highly trained representatives are pleased to assist with their equipment expertise. Our local agent can be located at **www.berghof-instruments.com/en/distributor-network**.

Berghof reactor technology

digestec **DAB** pressure vessels | **high**preactor **DB** metal-free reactors

DAB-2 | DAB-3 | DAB-3XXL	DB-300 | DB-500 | DB-700	DB-1000 | DB-1500 | DB-2000
Safe and efficient applications with pressure vessels between 25 mL and 420 mL	Non-corrosive pressure vessels with a maximum of safety between 310 mL and 800 mL	Non-corrosive pressure vessels with a maximum of safety between 1,000 mL and 1,800 mL
For syntheses, material testing and difficult digestion tasks	For syntheses, material testing and experiments with highly corrosive reagents	For syntheses, material testing and experiments with highly corrosive reagents
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digestec DAB pressure vessels

Technical specifications

digestec DAB-2 | DAB-3 | DAB-3 XXL				
		DAB-2	**DAB-3**	**DAB-3 XXL**
General information	**Material**	Stainless Steel 316Ti (1.4571) in combination with TFM™-PTFE		
	Temperature max.	250 °C	250 °C	250 °C
	Pressure max.	200 bar	200 bar	200 bar
Reactor vessel	**Outer diameter**	approx. 54 mm	approx. 98 mm	approx. 98 mm
	Total height	approx. 240 mm	approx. 250 mm	approx. 330 mm
TFM™-PTFE insert	**Volume**	approx. 25 mL / approx. 50 mL	approx. 150 mL / approx. 210 mL	approx. 420 mL
	Inner diameter	18 mm / 24 mm	44 mm / 53 mm	55 mm
	Inner height	108 mm / 108 mm	90 mm / 97 mm	176 mm
Armatures	**Standard armatures**	Rupture Disc	Rupture Disc	Rupture Disc
Heating systems (optional)	**Hot block**	✓	✓	✓

Product benefits

The Berghof pressure vessels **diges**tec **DAB-2**, **DAB-3** and **DAB-3 XXL** feature easy and user-friendly handling. Their robust design allows applications to pressures and temperatures of 200 bar and 250 °C respectively.

SAFE

Easy handling and maximum user safety

- Bayonet catch for easy and fast opening or closure
- Overpressure protection by rupture disc
- Controlled pressure relief during the opening operation
- Designed and produced in accordance with AD 2000 and pressure equipment directive 2014/68/EU

EFFICIENT

Cost-efficient use of DAB pressure vessels

- Long operating life due to the robust design
- High resistance to acids due to use of TFM™-PTFE inserts
- Low risk of contamination because of the easy cleaning process of the TFM™-PTFE inserts
- Heating system for up to 12 pressure vessels simultaneously (model dependent)

MODULAR CONSTRUCTION

Vessels made of stainless steel 316 Ti (1.4571) in combination with TFM™-PTFE inserts

- Easy inserting and removing of PTFE inserts
- Two PTFE vessel sizes for each pressure vessel of DAB-2 and DAB-3
- Special sizes of PTFE inserts according to customer needs by request

digestec **DAB pressure vessels**

Application overview

The pressure vessels **diges**tec **DAB-2**, **DAB-3** and **DAB-3 XXL** can be used in a variety of applications. The intuitive handling allows economic use as well as a simplification of the operating process when it comes to complex applications. The pressure vessels also offer a high safety standard, so that users with limited experience can operate them with minimal risk.

APPLICATIONS

Most common applications of the DAB reactors are:

- Syntheses of micro- and mesoporous materials like zeolites
- Syntheses such as solvo- and hydrothermal syntheses as well as crystallisation
- Material testing, for example aging tests of elastomers in coolants or blow-by-mixtures
- Digestions of soil samples, graphite or diamonds including digestion of inhomogeneous samples or large sample amounts

CUSTOMER TESTIMONIAL

TU Darmstadt, Chemical Technology II:

„Noteworthy are the easy handling and the high robustness of the reactors as well as their wide range of applications for different substance classes. The pressure vessel can be opened and closed easily.“ (Prof. Dr. Marcus Rose)

TU Dresden, Simmchen Group:

„The Teflon inserts are easy to clean and very resistant. The easy handling gives us a good feeling, even if syntheses are operated by less experienced students. Results are reproducible, cleaning is very easy and handling is safe.“ (Sandra Heckel)

SIMMCHEN GROUP

simmchenresearch.wordpress.com

Accessories

For an effective operation of the pressure vessels **diges**tec **DAB-2**, **DAB-3** and **DAB-3 XXL**, Berghof offers comprehensive accessories. These include mounting tools, various types of heating systems as well as controllers and sample holders.

ACCESSORIES

Accessories for efficient use of the DAB pressure vessels:

- Mounting tool for easy opening and closure of the DAB pressure vessels, consisting of torque and mounting base plate
- Sample holders for material and corrosion testing: available in various standard designs as well as in customized designs according to customer needs

HEATING

The different heating systems available for the DAB pressure vessels include:

- DAH heating block with up to twelve positions for DAB-2 and DAB-3 pressure vessels
- BHM electric heating jacket for DAB-3 XXL pressure vessels

CONTROL UNITS

For monitoring of the application process

- BTC-1000 temperature controller with intuitive to use touch display
- BTC-3000 temperature controller with clear-structured control panel, more detailed control of temperature ramp and easy to operate programming function

highpreactor **DB metal-free reactors**

Technical specifications

highpreactor **DB-300 | DB-500 | DB-700**				
		DB-300	**DB-500**	**DB-700**
General information	**Material**	Stainless Steel 316Ti (1.4571)		
	Temperature max.	230 °C	230 °C	230 °C
	Pressure max.	200 bar	200 bar	200 bar
	Vessel weight	approx. 4 kg	approx. 6 kg	approx. 8,5 kg
TFM™-PTFE insert (integrated)	**Volume**	ca. 310 mL	ca. 500 mL	ca. 800 mL
	Inner Diameter	62.5 mm	62.5 mm	62.5 mm
	Inner Height	98 mm	165 mm	261 mm
Armatures	**Standard Armatures**	Rupture Disc, Dip Tube, Valve/Tool, Pressure Sensor		
	Pressure Measurement	digital		
Heating Systems (optional)	**Electrical (Hot Plate)**	✓	-	-
	Electrical (Heating Jacket)	✓	✓	✓
	Via Fluid (Double Jacket)	✓	✓	✓
Stirring	**Via Hot Plate**	✓	-	-

highpreactor **DB-1000 | DB-1500 | DB-2000**

		DB-1000	DB-1500	DB-2000
General information	**Material**	Stainless Steel 316Ti (1.4571)		
	Temperature max.	230 °C	230 °C	230 °C
	Pressure max.	200 bar	200 bar	200 bar
	Vessel weight	approx. 10.5 kg	approx. 13 kg	approx. 16 kg
TFM™-PTFE insert (integrated)	**Volume**	approx. 1,000 mL	approx. 1,460 mL	approx. 1,880 mL
	Inner Diameter	84 mm	84 mm	84 mm
	Inner Height	182.5 mm	264 mm	340 mm
Armatures	**Standard Armatures**	Rupture Disc, Dip Tube, Valve/Tool, Pressure Sensor		
	Pressure Measurement	digital		
Heating Systems (optional)	**Electrical (Hot Plate)**	-	-	-
	Electrical (Heating Jacket)	✓	✓	✓
	Via Fluid (Double Jacket)	✓	✓	✓
Stirring	**Via Hot Plate**	-	-	-

highpreactor **DB metal-free reactors**

Product benefits

The **high**preactor **DB** metal-free reactors have a unique design. Due to their complete lining of high-quality PTFE, they are an ideal choice for experiments with highly corrosive reagents, as there is no metal contact, neither in the liquid nor in the gas phase. Due to temperature sensor and pressure sensor, maximum reaction control is guaranteed.

CORROSION RESISTANT

No metal contact in liquid phase or gas phase due to complete PTFE lining

- PTFE inserts, PTFE lining of the lid including ports
- The dip tube for the temperature sensor is coated with PFA
- Pressure sensor made of ceramics with FFKM seal

SAFE

The following components allow a maximum user safety:

- Easy to use closure system
- Pressure sensor for pressure monitoring
- Overpressure protection using rupture disc
- Designed and produced in accordance with AD 2000 and pressure equipment directive 2014/68/EU

APPLICATION-ORIENTED

Heating concepts in accordance with customer needs

- Heating via electric heating jacket
- Heating and cooling via double jacket
- Heating and stirring via hot plate (only available for **high**preactor **DB-300**)

FLEXIBLE

Multiply deployments due to the modular construction system

- One lid size for the vessels of series DB-300, DB-500 and DB-700
- One lid size for the vessels of series DB-1000, DB-1500 and DB-2000

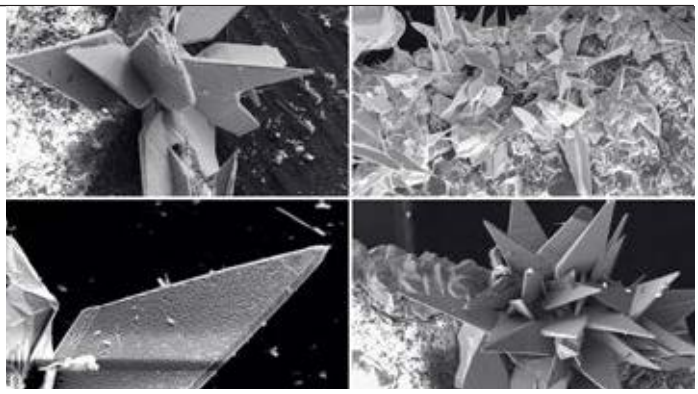
Applications & accessoiries

The high resistance against corrosive materials as well as sample temperature measurement open up a wide spectrum of application for the **high**preactor **DB** metal-free reactors. Various accessories, such as heating systems and control units, guarantee the user accurate monitoring and control of experiments.

APPLICATIONS

The most common applications of the DB reactors include:

- Syntheses of micro- and mesoporous materials like zeolites
- Syntheses such as solvo- and hydrothermal syntheses as well as crystallisations
- Material testing, for example aging tests of elastomers in coolants or blow-by-mixtures
- Customized applications such as experiments with highly corrosive reagents



ACCESSORIES

Berghof offers the following accessories for the **high**preactor **DB** metal-free reactors:

Heating systems:

- BTM double jacket for liquid heating and cooling
- BHM heating jacket for electric heating

Control units:

- BTC-1000 temperature controller with intuitive to use touch display
- BTC-3000 temperature controller with clear-structured control panel and easy to operate programming function, including monitoring of the inner reactor pressure

Further accessories:

- Sample holders for material and corrosion testing customized for user applications

Berghof Products + Instruments GmbH

Product brochures

Your local contact:

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