

Filtration



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FILTRATION

Proved and tested, durable, optimally resistant against acids, caustic solutions and other aggressive chemicals: our solutions for efficient and safe filtration.

PRODUCT TIPS



Page 217:
Cap for Scrubber Bottles



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HPLC Suction Filter



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Vacuum Filters

BOLA Filtration



Information about pore sizes – what do these indications mean?

Class	Indication	Pore size in μm
00	P 500	250 - 500 *
0	P 250	160 - 250 *
1	P 160	100 - 160 *
2	P 100	40 - 100
3	P 40	16 - 40
4	P 16	10 - 16
5	P 1,6	1 - 1,6

* not feasible with PTFE at the moment

What you should know about porous PTFE.

For the production of porous rods, tubes and tiles, PTFE particles are melted together.

The pore size can be determined both by the selection of the PTFE granules and the process parameters.

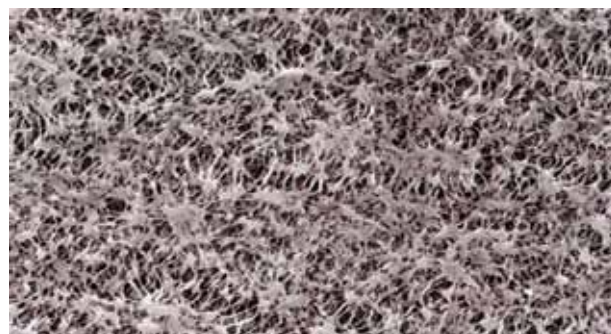
Due to the non-adhesive surface, filtering devices made of fluoroplastics (PTFE/PFA) are easy to clean and have a long durability.

Microporous PTFE has the same unique properties like "normal" PTFE:

- » non-adhesive / dirt-repellent
- » hydrophobic / water-repellent
- » non-wettable
- » no release of trace elements in the filtrate (no plasticisers)
- » almost universal chemical resistance to acids, bases and solvents
- » excellent temperature resistance between -200°C and $+260^{\circ}\text{C}$ (temporarily even $+300^{\circ}\text{C}$)
- » autoclavable

Typical applications – often asked.

Pore size	Application
50 μm	Filtration of coarse particles, distribution of gas in liquids
5 μm	Filtration of medium-sized particles, laboratory filtration, valve for packings (gas permeable, leak proof)
1 μm	Filtration of aqueous solvents, elimination of particles
0,45 μm	Prefiltration of aqueous solvents, HPLC solvents, protein solvents and alcohols, sterile filtration of air or other gases
0,2 μm	Ultracleaning of organic solvents and alcohols, sterile filtration of air or other gases
0,05 μm	Ultracleaning of solvents or gases (virus)



BOLA Scrubber Adaptors for Bottles

Material: PTFE Temperature resistance: from -200°C to +250°C Chemical resistance: +++ universal Vacuum: suitable autoclave: 121°

Product description:

Consisting of PTFE body with connecting nut and two lateral GL 18 threaded necks, a FEP inlet tube with a length of 300 mm and a gas distributor with finest bores. Easy in- and outlet of gas by means of hard-walled tubing (e.g. PTFE) which can be connected to the threaded necks by means of BOLA Laboratory Screw Joints (page 67). Elastic tubing can be connected by means of hose connectors (page 108). Inlet tube can be shortened individually.

The special feature: the body of the adaptor can be turned independently from the connecting nut. This means, that the completely assembled adaptor can be removed and fixed on another bottle without the risk of disarranging the tubing. Suitable for bottles of company Duran Group (formerly Schott, Mainz) with GL 45 and GLS 80 thread and a volume between 100 and 5000 ml.

FDA conform

	For bottle thread	Gas inlet tube mm	Width incl. threaded necks mm	Cat. No.:
A	GL 45	300	76	N 1660-14
B	GLS 80	300	76	N 1660-24

Special Request?
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BOLA INNOVATION

Scrubber Adaptors for Bottles

Usable for different bottle sizes since the 300mm FEP tube can be shortened individually. BOLA is offering two versions: suitable for bottle thread GL 45 or GLS80 (e.g. from Duran Group).



BOLA Scrubber Bottles Vitrum

Material:	Material:	Temperature resistance:	Chemical resistance:	Vacuum:	autoclave:
PTFE	Borosilicate glass 3.3	from -200°C to +250°C	+++ universell	suitable	121°

Product description:

Consisting of PTFE body with screw cap and two lateral GL 18 threaded necks, suitable bottle made of borosilicate glass as well as a FEP inlet tube and a gas distributor with finest bores. Easy in- and outlet of gas by means of hard-walled tubing (e. g. PTFE) which can be connected to the threaded necks with BOLA laboratory Screw Joints. Elastic tubing can be connected by means of hose connectors.

NEW

The special feature: The body of the distributor can be turned independently from the screw cap. This means, that the completely assembled distributor can be removed and fixed on another bottle without the risk of disarranging the tubing.

FDA conform

	Capacity ml	For bottle thread	Necks GL	Total height mm	Cat.No.:
A	500	GL 45	2 x 18	207	N 1662-14
	1.000	GL 45	2 x 18	256	N 1662-24
B	500	GLS 80	2 x 18	186	N 1662-34
	1.000	GLS 80	2 x 18	256	N 1662-44



BOLA Gas Distributors

Material:	Temperature resistance:	Chemical resistance:
PTFE	from -200°C to +250°C	+++ universal

Product description:

With finest bores (4 x 0,4 mm) for steady sparkling of the flowing gas, only low pressure is necessary. Suitable for scrubber bottles and columns (page 168) with M 8x1 thread and for gas inlet tubes (page 219).

FDA conform

O.D. mm	Height mm	Receiver M	Suitable for Cat. No.:	Cat. No.:
28	24	8 x 1	A 117-.. / A 118-..	N 1501-16



BOLA Gas Frits

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal
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Product description:

Microporous PTFE with pore size 3 µm for steady sparkling of the flowing gas. Suitable for scrubber bottles and columns (page 168) with M 8x1 thread and for gas inlet tubes (page 219).

FDA conform

O.D. mm	Length mm	Receiver	Suitable for Cat. No.:	Cat. No.:
15	15	M 6 x 1		N 1503-28
25	26	M 8 x 1	A 117-.. / A 118-..	N 1503-32
15	15	Ø 5 mm		N 1503-36
25	26	Ø 7 mm		N 1503-40



BOLA Gas Inlet Tubes

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal
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Product description:

For constructing a gas washing equipment. Tube with inner diameter 5 mm, one side with hose connector dia. 9 mm for connecting tubing, other side with thread M 8x1 for connecting a gas frit or a gas distributor.

FDA conform

Length mm	Cat. No.:
200	N 1502-02
400	N 1502-04
600	N 1502-06



BOLA Pressure Pre-Filters

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Pressure: 20 bar	autoclave: 121°
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Product description:

For direct fine filtration in front of HPLC columns. For filtering membranes (available optionally – page 224) with a diameter of 13 mm and a thickness between 0,2 µm, filtration surface of 132 mm² for filtration with nearly no dead volume. The membrane can be exchanged by hand. Connection threads on both sides UNF 1/4" 28 G, suitable flanged tubing can be found on page 202.

FDA conform

For tubing I.D. mm	For filtering membrane with dia. mm	Cat. No.:
(1/32") 0,8	13	F 780-08
(1/16") 1,6	13	F 780-16



Example

BESTSELLER**BOLA Flow Filters**

Material:	Temperature resistance:	Chemical resistance:	Vacuum:	autoclave:
PTFE	from -200°C to +160°C	+++ universal	suitable	121°

Product description:

Suitable for overpressure or vacuum, usable for example as added filter or as large-area in-line apparatus in a line system. Suitable for temperatures up to +160°C. The optionally available filtering membranes (page 224) can be exchanged easily. Tubing can be connected to GL threads by means of the included laboratory screw joints.

The filters are produced without plasticisers and have an almost universal chemical resistance. They do not release any trace elements into the filtrate. Due to the non-adhesive surface, they are easy to clean and can be reused.

FDA conform

For membrane dia. mm	Filtration surface cm ²	Connecting thread GL	For tubing O.D. mm	Cat. No.:
25	3,1	14	3,2 and 6,0	N 1670-08
47	13,8	18	6,0 and 8,0	N 1670-16
90	52,0	25	8,0 and 10,0	N 1670-24

Flow rate:

Flow capacity under vacuum of 100 kPa (1000 mbar) using a PTFE filtering membrane with a thickness of 0,2 mm:

For membrane dia. mm	Pore size µm	Product	Flow ml/min.
25	1,00	water	96
25	1,00	air	12.800
25	0,45	water	11
25	0,45	air	4.600
47	1,00	water	212
47	1,00	air	48.000
47	0,45	water	50
47	0,45	air	28.000
90	1,00	water	648
90	1,00	air	56.400
90	0,45	water	264
90	0,45	air	36.000



BOLA Vacuum Filters

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal
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Product description:

Filtration unit made of PTFE, multi-stage hose connector with integrated lock screw for connecting vacuum tubing with I.D. 6 mm or 8 mm, PTFE supporting disc to fit optionally available filtering discs (page 224). Collecting vessel made of PFA, filling vessel with lid for protection against contaminations also made of PFA. The filters are produced without plasticisers and have an almost universal chemical resistance. They do not release any trace elements into the filtrate. Due to the non-adhesive surface, they are easy to clean and can be reused.

FDA conform

For membrane dia. mm	Filtration surface cm ²	Capacity of filling /collecting vessel ml	O.D. mm	Total height mm	Cat. No.:
47	13,8	240	86	250	N 1650-08
47	13,8	500	100	290	N 1650-16
90	55,4	1.000	130	370	N 1650-24

Flow rate:

Flow capacity for water under vacuum of 100 kPa (1000 mbar) using a PTFE filtering membrane with a thickness of 0,2 mm:

For membrane dia. mm	Pore size µm	Flow ml/min.
47	1,00	510
47	0,45	148
47	0,20	57
90	1,00	1.638
90	0,45	369
90	0,20	121



SUITABLE: page 224
Dimensionally coordinated
filtering membranes

BOLA Vacuum Filter Funnels

Material: PTFE	Material: PFA	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Transparency: transparent	autoclave: 121°
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Product description:

Filtration unit made of PTFE with cone size 29 for connection to a vessel (must be suitable for vacuum) with socket size 29. Multi-stage hose connector with integrated lock screw for vacuum tubing with I.D. 6 and 8 mm, filtration surface 13,8 cm², easily exchangeable filtering membrane dia. 47 mm (optionally available – page 224). Filling vessel made of PFA with PTFE lid for protection against contaminations.

FDA conform

Capacity of filling vessel ml	O.D. mm	Total height mm	Cat. No.:
125	62	188	N 1658-08

Flow rate:

Flow capacity for water under vacuum of 100 kPa (1000 mbar) using a PTFE filtering membrane with a diameter of 47 mm and a thickness of 0,2 mm:

Pore size µm	Flow ml/min.
1,00	500
0,45	115
0,20	32



BOLA Filter Adaptors for Syringes

Material:	Temperature resistance:	Chemical resistance:	Pressure:	autoclave:
PTFE	from -200°C to +250°C	+++ universal	2 bar	121°

Product description:

Adaptors can be screwed together into multi-stage filters (prefilter, main filter). The low weight of only 14 g or 44 g allows easy exchange of the optionally available filtering membranes (page 224).

FDA conform

For membrane dia. mm	Filtration surface cm ²	O.D. mm	Total height mm	Cat. No.:
13	0,78	21	35	N 1666-08
25	3,80	34	40	N 1666-16

Flow rate:

Flow capacity for water under vacuum of 150 kPa (1500 mbar) using a PTFE filtering membrane with a thickness of 0,2 mm:

For membrane dia. mm	Pore size µm	Flow ml/min.
13	1,00	25
13	0,45	10
25	1,00	155
25	0,45	35



Example

BOLA Three-Stage Flow Filter

Material:	Temperature resistance:	Chemical resistance:	Vacuum:	autoclave:
PFA	from -200°C to +160°C	+++ universal	suitable	121°

Product description:

Filter made of PFA with connecting nut made of glass-fibre reinforced ETFE. Suitable for vacuum and overpressure up to max. 150 kPa (1.500 mbar) and for temperatures up to max. +160°C. Multi-stage filtrations with up to 3 different filtering membranes are possible.

Easy exchange of the optionally available filtering membrane (page 224). Couplings for connecting tubing (page 136) with O.D. 6,35 mm (1/4") are included.

FDA conform

For membrane dia. mm	For tubing O.D. mm	Filtration surface cm ²	O.D. mm	Cat. No.:
47	(1/4") 6,35	3 x 14,1	62	N 1682-08

Flow rate:

Flow capacity under vacuum of 100 kPa (1000 mbar) using a PTFE filtering membrane with a diameter of 47 mm and a thickness of 0,2 mm:

Pore size µm	Product	Flow ml/min.
1,00	water	90
0,45	water	10
1,00	air	27.000
0,45	air	13.200



BOLA Single-Stage Flow Filter

Material: PFA	Temperature resistance: from -200°C to +160°C	Chemical resistance: +++ universal	Vacuum: suitable	autoclave: 121°
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Product description:

Filter made of PFA with connecting nut made of glass-fibre reinforced ETFE. Suitable for vacuum and overpressure up to max. 150 kPa (1.500 mbar) and for temperatures up to max. +160°C. Easy exchange of the optionally available filtering membrane (page 224). Couplings for connecting tubing (page 134) with O.D. 6,35 mm (1/4") are included.

FDA conform

For membrane dia. mm	For tubing O.D. mm	Filtration surface cm ²	O.D. mm	Cat. No.:
47	(1/4") 6,35	14,1	62	N 1678-08

Flow rate:

Flow capacity under vacuum of 100 kPa (1000 mbar) using a PTFE filtering membrane with a diameter of 47 mm and a thickness of 0,2 mm:

Pore size µm	Product	Flow ml/min.
1,00	water	272
0,45	water	47
1,00	air	21.000
0,45	air	7.000



BOLA Suction Filters

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	autoclave: 121°
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Product description:

Consisting of a receiver made of PTFE with female thread UNF 1/4" 28 G and an easily exchangeable frit made of porous PTFE (Cat. No. F 766-...). Ideal prefilters in front of pump systems for protecting gaskets, pistons or column packings against premature wearing due to contaminations. Suitable flanged tubing can be found on page 202.

FDA conform

Pore size µm	For tubing I.D. mm	Dia. of filter mm	Length of filter cm	Cat. No.:
2	(1/32") 0,8	14	25	F 765-08
2	(1/16") 1,6	14	25	F 765-16
10	(1/32") 0,8	14	25	F 765-48
10	(1/16") 1,6	14	25	F 765-56



BOLA Frits for Suction Filters

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	autoclave: 121°
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Product description:

Replacement frits made of porous PTFE, suitable for suction filters (Cat. No. F 765-... on page 223).

FDA conform

Pore size µm	Dia. of filter mm	Length of filter cm	Cat. No.:
2	14	20	F 766-08
10	14	20	F 766-48



BOLA Filtering Membranes

Material: PTFE Temperature resistance: from -200°C to +250°C Chemical resistance: +++ universal

Product description:

Thickness 0,2 mm, packing unit: 10 pieces (see page 86 for further sizes)

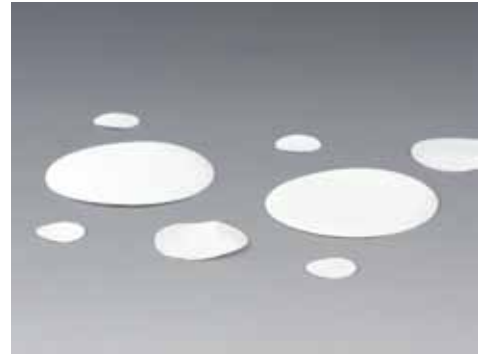
FDA conform

Pore size µm	Dia. of membrane mm	Filtration surface mm ²	Cat. No.:
0,05	13	132	N 1690-08
0,05	25	490	N 1690-28
0,05	47	1.735	N 1690-48
0,20	47	1.735	N 1690-52
0,45	47	1.735	N 1690-56
1,0	47	1.735	N 1690-60
5,0	47	1.735	N 1690-64

Flow rate:

Flow capacity under vacuum of 100 kPa (1000 mbar) using a PTFE filtering membrane with a diameter of 47 mm and a thickness of 0,2 mm:

Pore size µm	Product	Flow ml/min.
0,20	water	35
0,20	air	740
0,45	water	164
0,45	air	2.300
1,00	water	510
1,00	air	5.330
5,00	water	860
5,00	air	92.300



BOLA Filtering Discs

Material: PTFE Temperature resistance: from -200°C to +250°C Chemical resistance: +++ universal

Product description:

Made of microporous PTFE, thickness 1 mm, packing unit: 10 pieces

FDA conform

Pore size µm	Dia. of membrane mm	Filtration surface mm ²	Cat. No.:
7	47	1.735	N 1564-10



BOLA Filtering Tiles

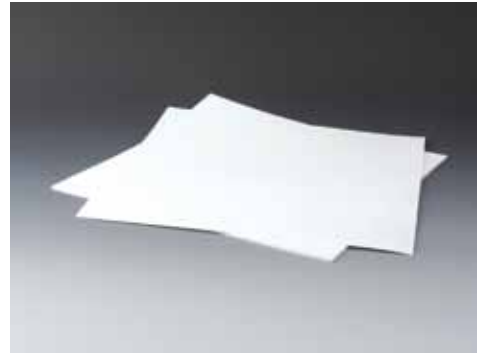
Material: **PTFE** Temperature resistance: **from -200°C to +250°C** Chemical resistance: **+++ universal**

Product description:

Made of microporous PTFE, standard tiles with dimensions of 320 x 320 mm for cutting or stamping.

FDA conform

Pore size µm	Thickness mm	Cat. No.:
5	1	N 1610-10
10	1	N 1616-10
10	2	N 1616-20
10	3	N 1616-30



BOLA Filtering Rods

Material: **PTFE** Temperature resistance: **from -200°C to +250°C** Chemical resistance: **+++ universal**

Product description:

Made of microporous PTFE for further treatment and processing. Diameter and length are nominal dimensions and can contain a machining tolerance.

FDA conform

Pore size µm	Dia. of rod mm	Length mm	Cat. No.:
5	28	100	N 1505-28
5	32	120	N 1505-32
10	28	100	N 1510-28
50	28	100	N 1520-28



