

Sartobind® Q and S, 4 and 8 mm Bed Height

Process-Scale Strong Ion Exchange Membrane Adsorbers

Benefits

- Designed for high speed flow-through polishing as well as bind and elute chromatography
- Recommended flow rate of 5 to 30 membrane volumes per minute
- Easy and simple handling (like a filter)
- Ten times higher dynamic binding capacity for adeno-, lenti- or other virus like particles (VLPs) compared to resins
- Reusable or disposable
- Q anion exchanger also available in validated gamma-sterile version



Product Information

The Sartobind Q and S capsules and cassettes with 4 | 8 mm bed height are membrane chromatography devices for large scale capturing and impurity removal at high flow rates. Sartobind strong anion (Q) and cation (S) ligands are covalently attached as a flexible hydrogel onto the stabilized reinforced cellulose. The membrane pore size of $>3\text{ }\mu\text{m}$ allows large proteins, bioparticles and viruses to enter the macroporous structure and achieve high binding capacity without size exclusion effects. In the capsules the membrane is rolled up to form a cylinder with a bed height of 4 | 8 mm around a central core. The cassettes contain two membrane stacks of 4 or 8 mm bed height with a central spacer inbetween.

The optimized design of the fluid channels reduces the void volume significantly, resulting in sharp breakthrough curves with minimal elution volumes (see application note: order no.: 85034-536-64). The recommended flow rate for devices with 4 mm bed height is 10 to 30 membrane volumes (MV) per minute and for 8 mm devices 5 MV/min. The internal support structures and the outer shell of the capsules are made from polypropylene and from acrylonitrile butadiene styrene (ABS) for the cassettes. The membrane geometry and the flow path is identical in all devices. Sartobind nano 1 or 3 mL is the recommended scale down model for the larger 4 or 8 mm devices. If sample amount is limited, Sartobind Q or S pico units with 0.08 mL bed volume (4 mm) are available. For buffer and conditions screening, additionally 96 well plates with a bed height of 0.8 mm can be used.

If capture or polishing needs to be run under sterile conditions, Sartobind Q cassettes are the devices of choice, as they can be delivered also gamma-irradiated and with validated sterility. Two applications that could especially benefit are virus purification processes that cannot be sterile filtered prior to filling due to the virus size, and continuous manufacturing operations that run over a prolonged period of time. Sterile Q cassettes fulfill all the same specifications as the non-sterile versions.

Applications

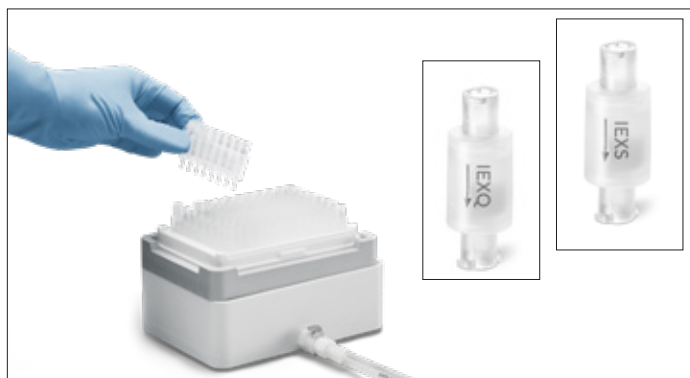
Target molecules to be purified: monoclonal antibodies, recombinant proteins, conjugated proteins, glycoproteins, antibody drug conjugates (ADCs), virus particles, virus like particles (VLPs)

Polishing

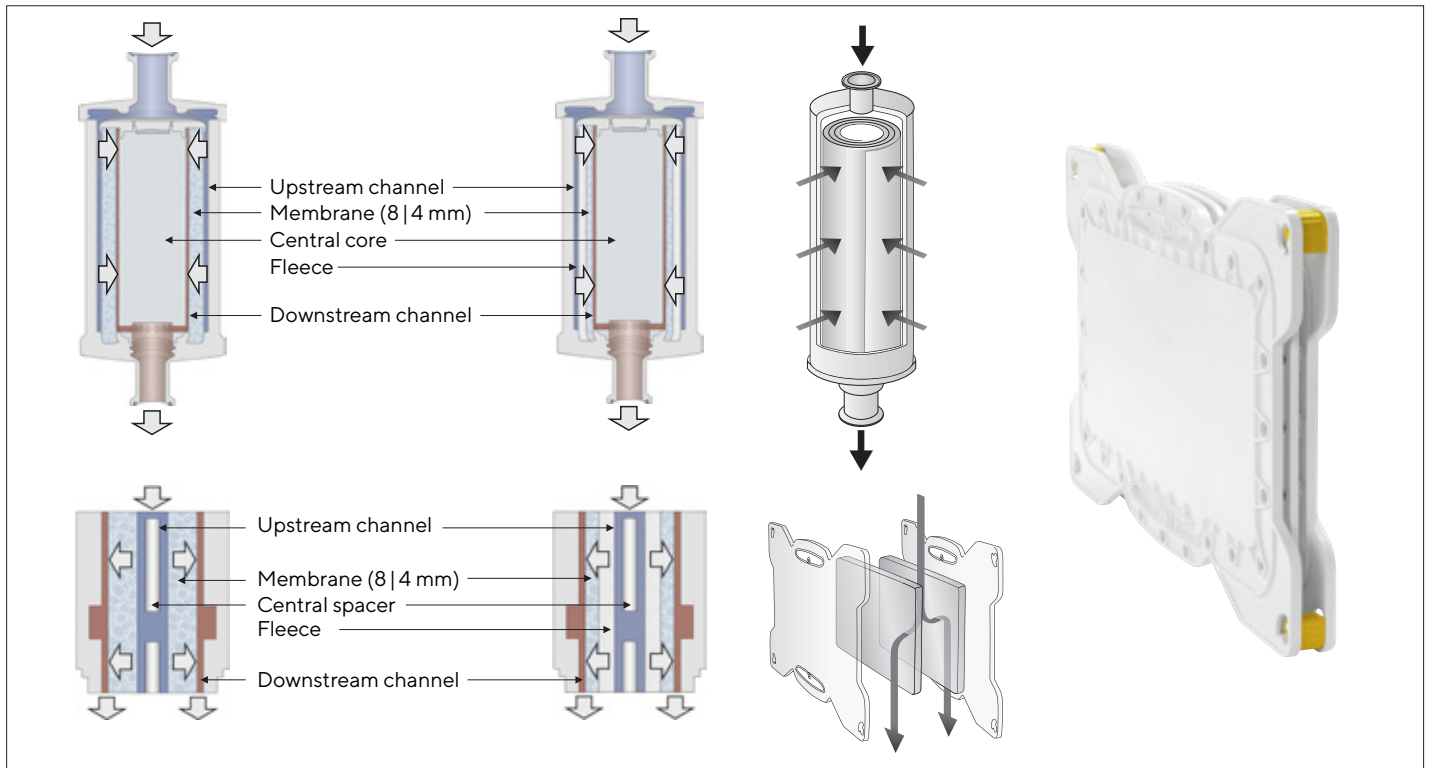
- Virus clearance $>6\text{ log}$
- DNA below detection limit
- Endotoxins $>5\text{ log}$
- Host cell proteins $>99\%$
- Leached ligand materials
- Aggregates

Capture

- Large proteins
- Viruses and virus like particles (VLP)
- Vaccines
- Proteins from large feed streams
- Q can be delivered in a sterile cassette version if terminal sterile filtration is not possible



96 well plates and pico devices for screening of conditions and initial tests



Cutaway view and flow path of a capsule (upper figures) and a cassette (lower figures).

Technical Data

Membrane materials	
Matrix	Stabilized reinforced cellulose
Membrane thickness membrane volume = membrane area	275 µm 1 mL = 36.4 cm ²
Nominal pore size	> 3 µm
Ion exchanger ligand Q	Strong anion Q: quaternary ammonium (R-CH ₂ -N ⁺ (CH ₃) ₃)
Ion exchanger ligand S	Strong cation S: sulfonic acid (R-CH ₂ -SO ₃ ⁻)

Capsule materials	
Outer cage, inner core, end caps, capsule housing, nonwoven, fleece	Polypropylene
O-ring in vent valve (except nano)	EPDM (ethylene propylene diene monomer)

Cassette materials	
Outer cage, seal, nonwoven, fleece	ABS, silicone, polyethylene, stable to gamma irradiation

Operation	
Depyrogenation	1 N NaOH for 30 minutes at 20°C
Integrity testing	By the diffusion test method with Sartocheck® 4 Plus

Typical dynamic binding capacity at 10% breakthrough	
Q (bovine serum albumin, 20 mM Tris/HCl, pH 7.5)	29 mg/mL (0.8 mg/cm ²)
S (lysozyme, 10 mM potassium phosphate, pH 7.0)	25 mg/mL (0.7 mg/cm ²)


Ligand density	
Q	2 – 5 µeq/cm ²
STIC PA	18 – 22 µeq/cm ²
S	2 – 5 µeq/cm ²
Phenyl	3 µeq/cm ²

pH stabilities	Short term	Long term
Q	pH 1–14	pH 2–12
S	pH 3–14	pH 4–13

Gamma irradiated products	Gamma dose	Sterile validated
Sterile Sartobind Q cassettes 4 mm and 8 mm	≥ 25 kiloGrays (kGy) maximum dose: 50 kGy	Yes, minimum dose for sterility is 7–8 kGy
Gamma irradiated manifold	See above	No

Dimensions and Connections

Membrane volume 4 mm	1 mL	75 mL	200 mL	400 mL	600 mL	2,500 mL	800 mL
Membrane volume 8 mm	3 mL	150 mL	400 mL	800 mL	1,200 mL	5,000 mL	1,600 mL
Size	Nano	5"	10"	20"	30"	Jumbo	Cassette



Membrane area cm ² 4 mm	36.4	2,700	7,300	14,600	22,000	91,000	29,000*
Membrane area cm ² 8 mm	110	5,500	14,600	29,000	44,000	182,000	58,000*
Void volume mL MV** 4 mm	3.5 3.5	2.7 200	2.7 540	2.7 1,080	2.7 1,600	2.8 7,000	3.1 2500*
Void volume mL MV** 8 mm	1.3 4	1.3 200	1.4 540	1.4 1,080	1.3 1,600	1.4 7,000	1.8 2900*
Dimensions one device (height × diameter) mm	37 × 33 h × Ø	190 × 77 h × Ø	350 × 100 h × Ø	570 × 100 h × Ø	810 × 100 h × Ø	850 × 302 h × Ø	634 × 387 × 49 w × h × t
Connectors	Luer female	Sanitary ¾" 25 mm outer, 14 mm inner diameter	Sanitary 1½" 50.5 mm outer, 36 mm inner diameter	Sanitary 1½" 50.5 mm outer, 36 mm inner diameter	Sanitary 1½" 50.5 mm outer, 36 mm inner diameter	Sanitary 1½" 50.5 mm outer, 36 mm inner diameter	Sanitary 1½" 50.5 mm outer, 36 mm inner diameter via manifolds (accessory)
Hose barb version (height × diameter) mm	n.a.	203 × 77	n.a.	n.a.	n.a.	n.a.	n.a.
Approximate weight	10 g	400 g	760 g	1.3 kg	1.9 kg	16 kg 20 kg wet 23 kg filled	4.9 kg* 6.0 kg* wet

n.a. = not available, *Multiply with the number of used cassettes **MV = membrane volume (including the porosity of the membrane which is 80%)

Ordering Information

Sartobind Q Capsules

Order number	Description	Quantity	Bed height [mm]	Protein binding capacity [g]	Recommended flow rate [L/min]	Maximum pressure [MPa] (bar/psig)
96IEXQ42DN-11	Sartobind Q nano 1 mL, 4 mm, Luer female connectors, 2 Luer male PEEK adapters to UNF 10-32 female, manual, certificate	1	4	0.029	0,02	0.4 (4/58)
96IEXQ42DN-11-A	Sartobind Q nano 1 mL, 4 mm, Luer female connectors, 2 Luer male PEEK adapters to UNF 10-32 female, manual, certificate	4	4	0.029	0,02	0.4 (4/58)
96IEXQ42D9MOO-A	Sartobind Q 75 mL, 4 mm, hose barb connectors, manual, certificate	4	4	2.16	1.5	0.4 (4/58)
96IEXQ42D9MFF-A	Sartobind Q 75 mL, 4 mm, ¾" sanitary clamp, manual, certificate	4	4	2.16	1.5	0.4 (4/58)
96IEXQ42D1GSS	Sartobind Q 200 mL, 4 mm, 1½" sanitary clamp, manual, certificate	1	4	5.8	4	0.4 (4/58)
96IEXQ42D2HSS	Sartobind Q 400 mL, 4 mm, 1½" sanitary clamp, manual, certificate	1	4	11.7	8	0.4 (4/58)
96IEXQ42D3KSS	Sartobind Q 600 mL, 4 mm, 1½" sanitary clamp, manual, certificate	1	4	17.6	12	0.4 (4/58)
96IEXQ42D3NSS	Sartobind Q Jumbo 2.5 L, 4 mm, 1½" sanitary clamp, 2 protective caps, manual, autoclaving instructions, certificate	1	4	73	50	0.3 (3/43.5)
96IEXQ42EUC11-A	Sartobind Q nano 3 mL, 8 mm, Luer female connectors, 2 Luer male PEEK adapters to UNF 10-32 female, manual, certificate	4	8	0.088	0.015	0.4 (4/58)
96IEXQ42E9BFF	Sartobind Q 150 mL, 8 mm, ¾" sanitary clamp, manual, certificate	1	8	4.35	0.75	0.4 (4/58)
96IEXQ42E1HSS	Sartobind Q 400 mL, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	11.6	2	0.4 (4/58)
96IEXQ42E2LSS	Sartobind Q 800 mL, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	23.3	4	0.4 (4/58)
96IEXQ42E3FSS	Sartobind Q 1.2 L, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	35	6	0.4 (4/58)
96IEXQ42E3ESS	Sartobind Q Jumbo 5 L, 8 mm, 1½" sanitary clamp, 2 protective caps, 15 membrane discs 30 mm, manual, autoclaving instructions, certificate	1	8	145	25	0.3 (3/43.5)
98IEXQ42D-L	Sartobind Q Cassette 0.8 L, 4 mm, 1½" sanitary clamp via manifold set (accessory), manual, certificate	1	4	23.2	16	0.2 (2/29)
98IEXQ42E-P	Sartobind Q Cassette 1.6 L, 8 mm, 1½" sanitary clamp via manifold set (accessory), manual, certificate	1	8	46.4	8	0.2 (2/29)
98IEXQ42DGL	Sartobind Q Cassette 0.8 L, 4 mm, sterile by gamma irradiation at ≥ 25 kGy, max. 50 kGy, 1½" sanitary clamp via gamma manifold set (accessory), manual, certificate	1	4	23.2	16	0.2 (2 29)

98IEXQ42EGP	Sartobind Q Cassette 1.6 L, 8 mm, sterile by gamma irradiation at ≥ 25 kGy, max. 50 kGy, 1½" sanitary clamp via gamma manifold set (accessory), manual, certificate	1	8	46.4	8	0.2 (2 29)
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Sartobind S Capsules

Order number	Description	Quantity	Bed height [mm]	Protein binding capacity [g]	Recommended flow rate [L/min]	Maximum pressure [MPa] (bar/psig)
96IEXS42DN-11	Sartobind S nano 1 mL, 4 mm, Luer female connectors, 2 Luer male PEEK adapters to UNF 10-32 female, manual, certificate	1	4	0.025	0.02	0.4 (4/58)
96IEXS42DN-11-A	Sartobind S nano 1 mL, 4 mm, Luer female connectors, 2 Luer male PEEK adapters to UNF 10-32 female, manual, certificate	4	4	0.025	0.02	0.4 (4/58)
96IEXS42D9MOO-A	Sartobind S 75 mL, 4 mm, hose barb connectors, manual, certificate	4	4	1.89	1.5	0.4 (4/58)
96IEXS42D9MFF-A	Sartobind S 75 mL, 4 mm, ¾" sanitary clamp, manual, certificate	4	4	1.89	1.5	0.4 (4/58)
96IEXS42D1GSS	Sartobind S 200 mL, 4 mm, 1½" sanitary clamp, manual, certificate	1	4	5.1	4	0.4 (4/58)
96IEXS42D2HSS	Sartobind S 400 mL, 4 mm, 1½" sanitary clamp, manual, certificate	1	4	10.2	8	0.4 (4/58)
96IEXS42D3KSS	Sartobind S 600 mL, 4 mm, 1½" sanitary clamp, manual, certificate	1	4	15.4	12	0.4 (4/58)
96IEXS42EUC11-A	Sartobind S nano 3 mL, 8 mm, Luer female connectors, 2 Luer male PEEK adapters to UNF 10-32 female, manual, certificate	4	8	0.077	0.015	0.4 (4/58)
96IEXS42E9BFF	Sartobind S 150 mL, 8 mm ¾" sanitary clamp, manual, certificate	1	8	3.9	0.75	0.4 (4/58)
96IEXS42E1HSS	Sartobind S 400 mL, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	10.2	2	0.4 (4/58)
96IEXS42E2LSS	Sartobind S 800 mL, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	20	4	0.4 (4/58)
96IEXS42E3FSS	Sartobind S 1.2 L, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	31	6	0.4 (4/58)
96IEXS42E3ESS	Sartobind S 5 L, 8 mm, 1½" sanitary clamp, manual, certificate	1	8	127	25	0.3 (3/43.5)
98IEXS42D-L	Sartobind S Cassette 0.8 L, 4 mm, 1½" sanitary clamp via manifold set (accessory), manual, certificate	1	4	20.3	16	0.2 (2/29)
98IEXS42E-P	Sartobind S Cassette 1.6 L, 8 mm, 1½" sanitary clamp via manifold set (accessory), manual, certificate	1	8	40.6	8	0.2 (2/29)

Related products

Sartobind Q





Order number	Description	Quantity
99IEXQ42GC--V	Sartobind Q 96-well plate	2
99IEXQ42GC--D	Sartobind Q 96-well plate	10
92IEXQ42DD-11-D	Sartobind Q pico 0.08 mL	10
92MU0142DD-11	Sartobind Selection Kit pico 0.08 mL, Q, S and STIC PA	one each of Q, S and STIC PA






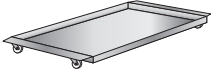
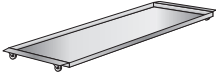
Sartobind S

Order number	Description	Quantity
99IEXS42GC--V	Sartobind S 96-well plate	2
99IEXS42GC--D	Sartobind S 96-well plate	10
92IEXS42DD-11-D	Sartobind S pico 0.08 mL	10
92MU0142DD-11	Sartobind Selection Kit pico 0.08 mL, Q, S and STIC PA	one each of Q, S and STIC PA

Sartobind 96-well plate. Data sheet: order no.: 85032-543-28
Sartobind pico 0.08 mL. Data sheet: order no.: 85032-541-71

Accessories

Order number		Description	Quantity
1ZA-0004		Adapter Luer male to UNF 10-32 female, PEEK	1
1ZAOGV0003		Adapter UNF 10-32 female to sanitary 3/4", 25 mm, polyoxymethylene	2
5ZALB-0002		Distribution adapter for 3 x 200 to 1,200 mL (10-30") capsules, 1 x 2", 3 x 1 1/2", sanitary, stainless steel	1
7ZAL-V0013		Reducing adapter 1 1/2" (50.5 mm) to 3/4" (25 mm), sanitary	1
7ZAL-V0010		Reducing adapter 2" (64 mm) to 1 1/2" (50.5 mm), sanitary	1
9ZGL-0102		Trolley for Jumbo 2.5 or 5 L, stainless steel	1
26787-FT-P		Sartocheck® 5 Plus Filter Integrity Tester	1

Order number		Description	Quantity
29Z-S00001		Manifold set, 1½" sanitary clamp, inlet and outlet adapter plate	2
29Z-S00003		Gamma irradiated manifold set, 1½" sanitary clamp, inlet and outlet adapter plate, ≥ 25 kGy, max.50 kGy	2
2ZGL-0005		Pilot Filter Holder	1
2ZGL-0006		Process filter holder	1
2ZGL-0007		Double process filter	1
2ZGL-0008		Drip pan for Pilot Filter holder	1
2ZGL-0015		Drip pan for Process and double Process Filter Holder	1

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