Sartobind STIC® PA, 4 mm bed height

Salt Tolerant Membrane Adsorbers
Anion Exchange

Benefits

- Binds negatively charged contaminants at high salt conditions of up to 20 mS/cm
- No dilution of CEX pools necessary
- Designed for single use flow-through operation
- Recommended flow rate of up to 30 membrane volumes/min
- Easy and simple handling (like a filter)

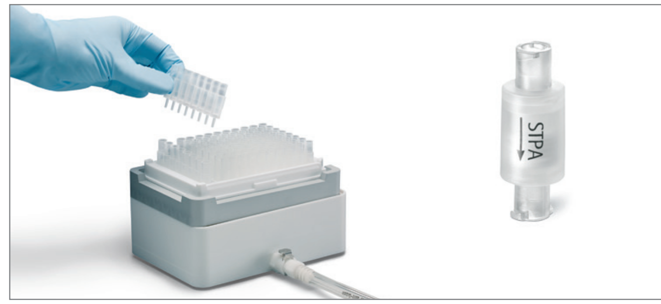
Product Information

Sartobind STIC is a membrane adsorber for Salt Tolerant Interaction Chromatography (STIC). With the primary amine (PA) ligand they bind negatively charged impurities such as DNA, host cell proteins (HCP), endotoxins and viruses at much higher salt concentrations than known from conventional Q matrices. Sartobind STIC PA membranes eliminate the need for feedstream dilution before flow-through polishing of recombinant proteins and monoclonal antibodies (mAbs). The single use product reduces validation costs, consumption of buffers, footprint and speeds up the process time as the recommended flow rate is 10 to 30 membrane volumes per minute. The Sartobind® capsules scale linearly within the 4 mm bed height family from the nano to the Jumbo 2.5 L and the 0.8 L cassette(s).

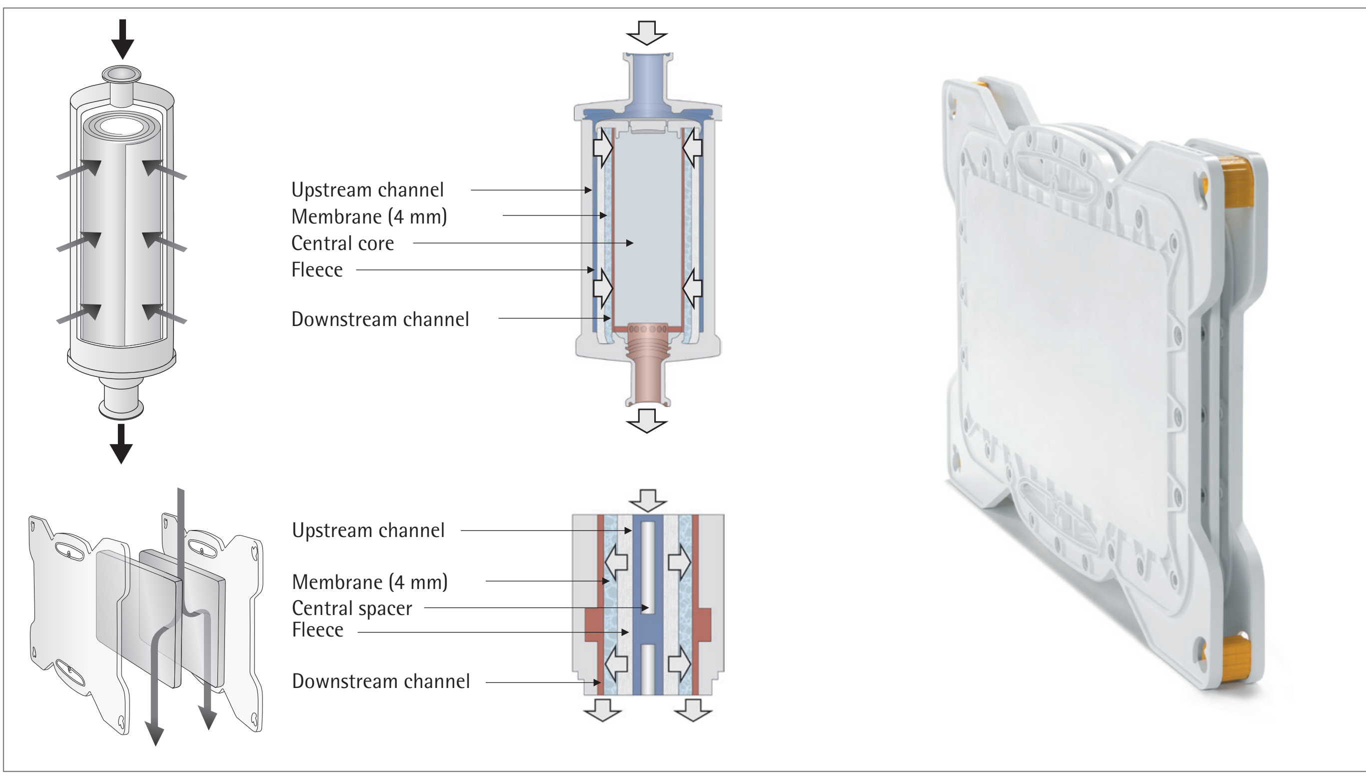
In the capsules the membrane is rolled up to form a cylinder with a bed height of 4 mm around a central core. The cassettes contain two membrane stacks of 4 or 8 mm bed height with a central spacer inbetween. The optimized design of the fluid channels reduces the void volume significantly resulting in higher safety at sample loading and lower buffer consumption. 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, bed height and the flow path is identical in all devices. Sartobind nano 1 ml is the recommended scale down model to start with. If sample amount is limited, Sartobind STIC PA pico units with 0.08 mL bed volume are available. For buffer and conditions screening, additionally 96 well plates with a bed height of 0.8 mm can be used.

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

Polishing
– DNA removal at up to 1.5 M NaCl
– DNA removal even in the presence of phosphate buffers (e.g. PBS)
– Host cell proteins up to 10 kg/L (product load/liter membrane)
– Endotoxins >4 log
– Viruses >4 log



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



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

Due to the high binding capacity the membrane can be loaded with 10 kg of mAb per liter membrane in flow-through mode to remove HCP e.g. from 303 ng per mg of mAb to below 6 ng/mg (see application note host cell protein removal with Sartobind STIC PA pico, order no.: 85032-542-30). This step was applied with undiluted cation exchange pools. Although binding of HCP to the ligand is reduced in the presence of polyanionic buffers such as phosphate or citrate, DNA is effectively bound. This feature allows even to remove DNA at binding conditions in the range of 5 mg DNA per mL Sartobind STIC at e.g. 50 mM phosphate (see application note: Effect of Phosphate on Protein and DNA Binding to Sartobind STIC PA, order no.: 85032-536-63).

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 STIC PA	Weak anion STIC PA: primary amine ($R\text{-}NH_2$)	

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	

Operation		
Depyrogenation	1 N NaOH for 30 minutes at 20°C	
Autoclaving	121°C for 30 minutes for one cycle | capsules only	
Integrity testing	By the diffusion test method with Sartocheck® 4 Plus	

Typical dynamic binding capacity at 10% breakthrough		
STIC PA (BSA, 20 mM Tris HCl, 150 mM NaCl, pH 7.5)	50 mg/mL (1.4 mg/cm^2)	
STIC PA (salmon sperm DNA, 20 mM Tris/HCl, 150 mM NaCl pH 7.2)	10.9 mg/mL (0.3 mg/cm^2)	

Ligand density		
STIC PA	18 – 22 µeq/cm^2	

pH stabilities	Short term	Long term
STIC PA	pH 2–12	not defined

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 × ∅	190 × 77 h × ∅	350 × 100 h × ∅	570 × 100 h × ∅	810 × 100 h × ∅	850 × 302 h × ∅	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 STIC PA Capsules

Order number	Description	Quantity	Bed height [mm]	Protein binding capacity [g]	Recom-mended flow rate [L/min]	Maximum pressure [MPa] (bar/psig)
96STPA42DN-11--A	Sartobind STIC PA nano 1 mL, 4 mm, Luer female connectors, 2 Luer male PEEK adapters to UNF 10-32 female, manual, certificate	4	4	0.05	0.02	0.4 (4/58)
96STPA42D9MFF--A	Sartobind STIC PA 75 mL, 4 mm, 3/4" sanitary clamp, manual, certificate	4	4	3.8	1.5	0.4 (4/58)
96STPA42D1GSS	Sartobind STIC PA 200 mL, 4 mm, 1 1/2" sanitary clamp, manual, certificate	1	4	10.2	4	0.4 (4/58)
96STPA42D2HSS	Sartobind STIC PA 400 mL, 4 mm, 1 1/2" sanitary clamp, manual, certificate	1	4	20.4	8	0.4 (4/58)
96STPA42D3KSS	Sartobind STIC PA 600 mL, 4 mm, 1 1/2" sanitary clamp, manual, certificate	1	4	30	12	0.4 (4/58)
96STPA42D3NSS	Sartobind STIC PA Jumbo 2.5 L, 4 mm, 1 1/2" sanitary clamp, manual, autoclaving instructions, certificate	1	4	127	50	0.3 (3/43.5)
98STPA42D-L	Sartobind STIC PA Cassette 0.8 L, 4 mm, 1 1/2" sanitary clamp via manifold set (accessory), manual, certificate	1	4	40.6	16	0.2 (2/29)

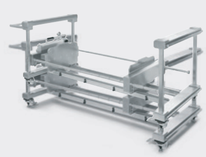
Related products

Order number	Description	Quantity
99STPA42GC-----V	Sartobind STIC PA 96-well plate	2
99STPA42GC-----D	Sartobind STIC PA 96-well plate	10
92STPA42DD-11--D	Sartobind STIC PA pico 0.08 mL	10
92MU0142DD-11--D	Sartobind Selection Kit pico 0.08 mL, Q, S and STIC PA	3

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 ¾", 25 mm, polyoxymethylene	2
5ZALB-0002		Distribution adapter for 3 × 200 to 1,200 mL (10 – 30") capsules, 1 × 2", 3 × 1½", sanitary, stainless steel	1
7ZAL-V0013		Reducing adapter 1½" (50.5 mm) to ¾" (25 mm), sanitary	1
7ZAL-V0010		Reducing adapter 2" (64 mm) to 1½" (50.5 mm), sanitary	1
9ZGL--0102		Trolley for Jumbo 2.5 or 5 L, stainless steel	1
16290		Sartocheck® 3 Plus Integrity Tester	1
26288---FT		Sartocheck® 4 Plus Filter Integrity Tester	1

Order number		Description	Quantity
29Z-S00001		Manifold set for Sartoclear® | Sartobind®, 1½" sanitary clamp	2
2ZGL--0005		Pilot filter holder for Sartoclear® | Sartobind®	1
2ZGL--0006		Process filter holder for Sartoclear® | Sartobind®	1
2ZGL--0007		Double process filter holder for Sartoclear® | Sartobind®	1
2ZGL--0008		Drip pan for Pilot Filter holder	1
2ZGL--0015		Drip pan for Process and double Process Filter Holder	1

Sartorius Stedim Biotech GmbH
August-Spindler-Strasse 11
37079 Goettingen, Germany

Phone +49.551.308.0
Fax +49.551.308.3289
www.sartorius-stedim.com

USA Toll-Free +1.800.368.7178
Argentina +54.11.4721.0505
Brazil +55.11.4362.8900
Mexico +52.55.5562.1102
UK +44.1372.737159
France +33.442.845600
Italy +39.055.63.40.41
Spain +34.913.586.098
Russian Federation +7.812.327.53.27
Japan +81.3.4331.4300
China +86.21.6878.2300

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