sartorius stedim biotech

Sartobind® Membrane Adsorbers
Chromatography as Easy as Filtration

turning science into solutions

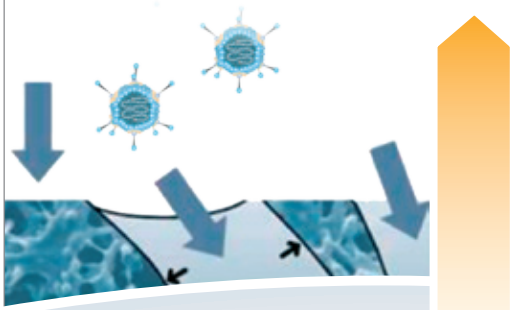
A Rising Star in Bioprocessing

The macroporous membrane structure and optimized design of the Sartobind membrane adsorbers enable efficient and ultra-rapid chromatographic purification. As a result, Sartobind is an economical solution for bioprocessing challenges and an asset for your purification platform.

High Binding Capacity

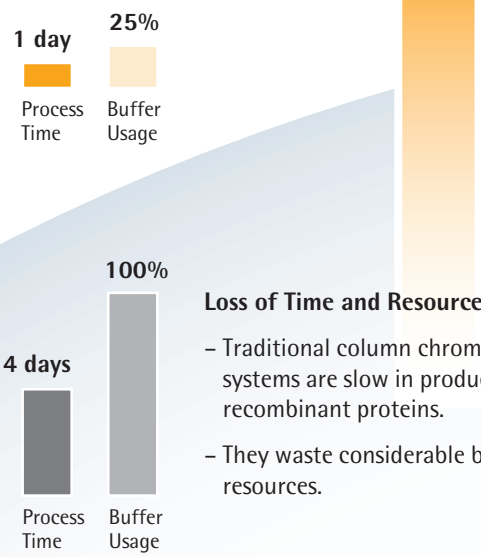
Sartobind membranes have a pore size of > 3 µm. This allows large proteins, bioparticles and viruses or virus like particles to enter the macro-porous membrane structure.

Consequently, Sartobind membrane adsorbers have a 10-times higher binding capacity for viruses, and about 200 times more polishing capacity than traditional chromatography columns.



Valuable Time and Resource Savings

- Sartobind processes recombinant proteins 4 times faster.
- A Sartobind membrane adsorber uses 75% less buffer, saving you timeand money.



Low Binding Capacity

Conventional column beads have a pore size < 100 nm. Small pores limit the access of large molecules to internal binding sites, resulting in a low binding capacity for large biomolecules, blood factors and viruses or virus-like particles. In addition, columns are operated at 10 to 30 times lower flow rates than are membrane adsorbers.

Loss of Time and Resources

- Traditional column chromatography systems are slow in producing recombinant proteins.
- They waste considerable buffer resources.

Discover the Favorable Performance and Economics of Sartobind Membrane Chromatography

Compact Footprint

Compared with a column or an ultra-centrifuge, a Sartobind capsule or cassette system is much more compact and easier to set up and use. As a result, it requires less lab space and can be conveniently and accurately scaled up.

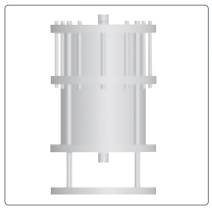
– Disposable or reusable

– No hardware investments

Large and Expensive Equipment

Chromatographic columns have a limited loading capacity for polishing and virus capture. Furthermore, they are large and have a high investment cost.

Likewise, expensive ultracentrifuges are difficult to scale and complex to operate.



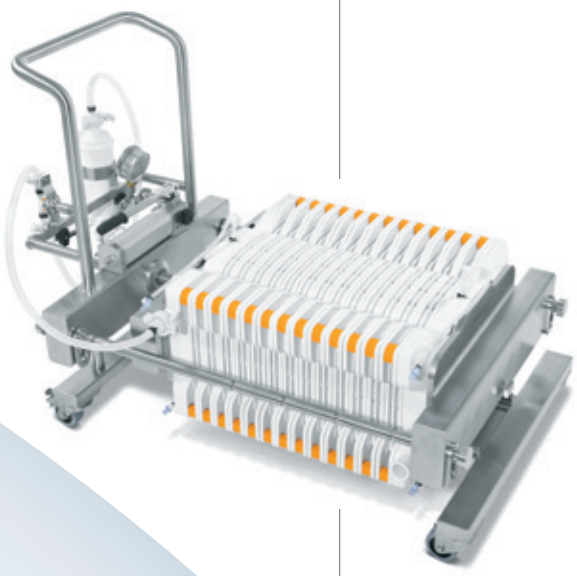
Size Limit Exceeded with Sartobind Cassettes

New design eliminates the 5 L size limitation for membrane adsorbers and offers simple pod-like modular system up to 100 L membrane volume.

γ-irradiated

Sterile Validated Q Anion Exchangers

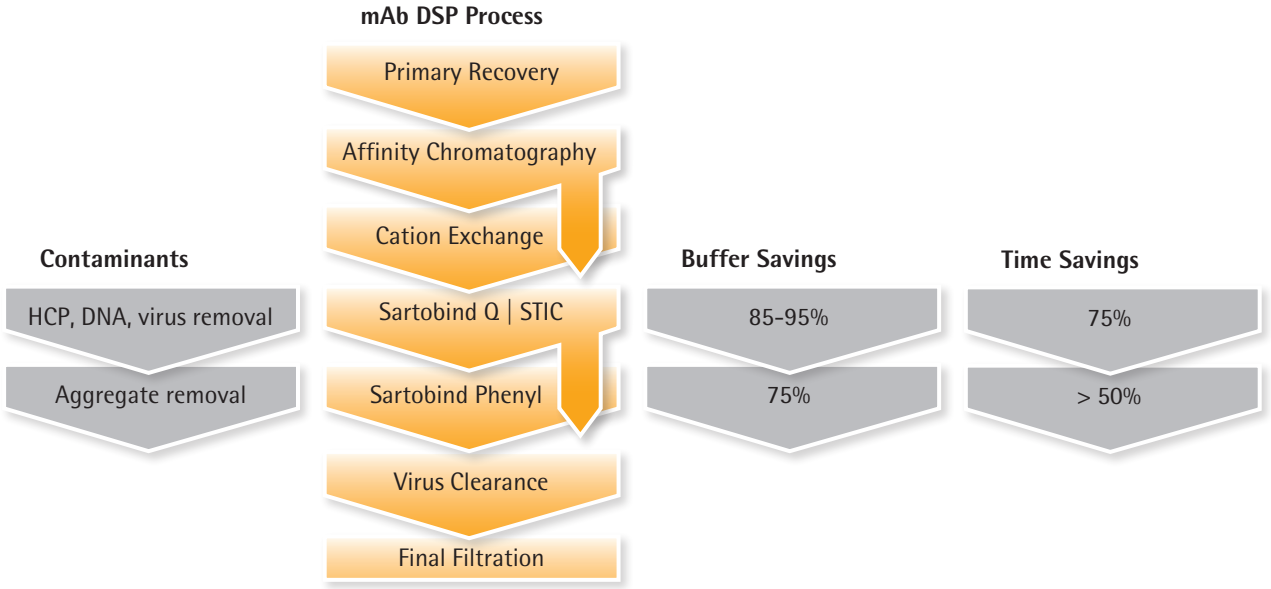
Virus purification processes that cannot be sterile filtered prior to filling due to virus size and continuous manufacturing could especially benefit.



Contaminant Removal

Buffer and Time Savings

In a downstream process for the production of monoclonal antibodies, the flow-through polishing steps by membrane chromatography have a huge impact on process time and buffer consumption[1,2] compared to oversized columns[3]. Savings of > 60% in cost of goods can be realized when utilizing membrane adsorbers in polishing processes[4].



[1] Zhou, J.X., Tressel, T., Membrane Chromatography as a Robust Purification System for Large-Scale Antibody Production, BioProcess Int. 09, 2005, 32–37

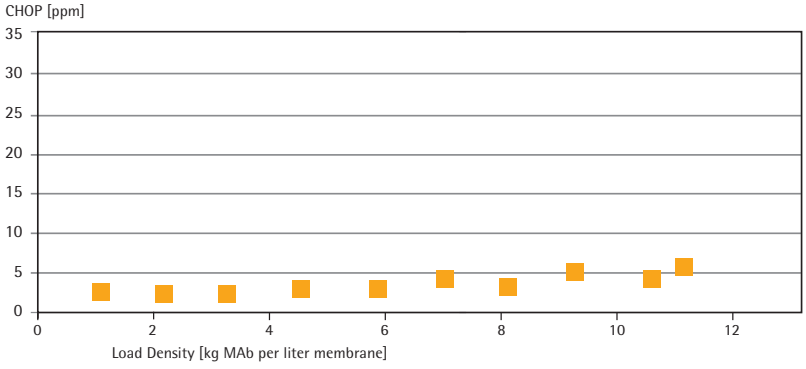
[2] Smith, M., A CMO's View on Platform Technologies, Presentation, 9th European Downstream Technology Forum 10-11 Sept. 2013, Sartorius College, Goettingen, Germany

[3] Knudsen, H., et al. Membrane Ion Exchange Chromatography for Process-Scale Antibody Purification, J. Chromatography A 907, 2001, 145–154

[4] Lim, J.A.C. et al. Economic Benefits of Single-Use Membrane Chromatography in Polishing, A Cost of Goods Model, BioProcess Int., 5(2), 2007, 48-58

Less Process Steps (No Dilution)

Sartobind STIC was developed for removing HCP at high salt conditions (up to 15 mS/cm). A dilution step after the cation exchange step of a typical mAb process is not necessary and can be skipped. No investment in holding tanks is needed.



Host cell protein removal from a mAb process: pH 7, 300 ppm HCP load, Sartobind STIC PA pico 0.08 mL, loading up to 10 kg mAb/L[1,2]

Application Notes:

[1] Host cell protein removal with Sartobind STIC PA pico, order no. 85032-541-30

[2] Host cell protein removal, A comparison between Sartobind STIC PA and Sartobind Q, order no. 85032-540-18

High Flow Rates Combined with High Loading Capacity

The use of conventional chromatography columns for flow-through (FT) anion exchange chromatography requires high flow rates. Optimized production columns need a certain diameter and bed height to achieve a large throughput and therefore have a large bed volume. That is the reason why columns are typically oversized.

The high flow rate of the membrane is combined with a large frontal surface and small bed height resulting in very high throughput while keeping the bed volume small. Typical process data show that in flow-through mode protein loading can be two orders of magnitutde higher with membrane adsorbers than with columns.

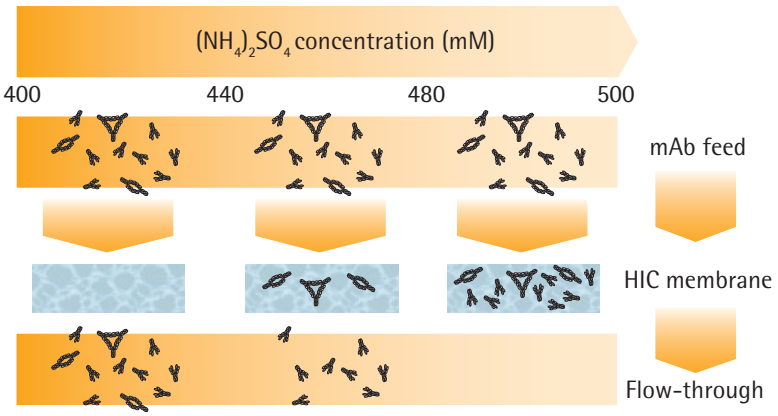
	Q Resin	**Q Membrane Adsorber**
Flow Rate	100-150 cm/h	450-600 cm/h
Protein loading (flow through)	50-100 g/l	> 3,000 g/m^2 or > 10.9 kg/l
Buffer used	100%	5%
Cleaning validation	Yes	No

Zhou, J.X., Tressel, T., Membrane Chromatography as a Robust Purification System for Large-Scale Antibody Production, BioProcess Int. 09, 2005, 32–37.

Boost Your mAb Process by Flow Through Aggregate Removal

The large pores of Sartobind Phenyl allow for better accessibility of large molecules to the phenyl groups. Smaller membrane volume and 75% less buffer consumption results in considerable cost savings.

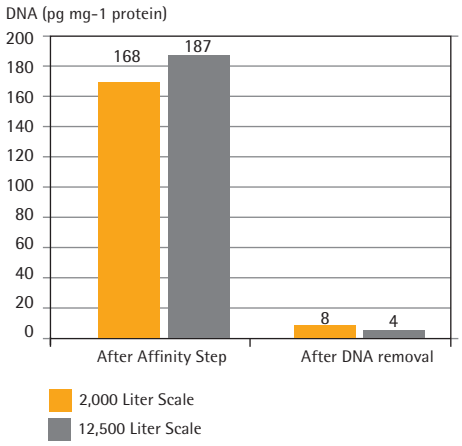
Hydrophobic interaction chromatography allows for aggregate removal using an ammonium sulphate concentration of 480 mM. The process stream contained 11.6% aggregates and 0.3% fragments before a Sartobind Phenyl step, which resulted in 100% monomeric mAb in the flow through. Retained aggregates began to elute at 230 mM ammonium sulphate concentration.



Ebert, S., Fischer-Frühholz, S., Efficient Aggregate Removal from Impure Pharmaceutical Active Antibodies, BioProcess Int., Vol. 9,(2), 2011, 36-42

Contaminant Removal

DNA Below Detection Limit



Sartobind Q was successfully implemented in process scale manufacturing of 2,000 liter and 12,500 liter batches to clear DNA below detection limit.

Walter, J.K., Strategies and Considerations for Advanced Economy in Downstream Processing of Biopharmaceutical Proteins, in: Bioseparation and Bioprocessing; G. Subramanian, (Ed.), Processing, Quality and Characterization, Economics, Safety and Hygiene, Wiley VCH, vol. II,1998, 447-460

DNA removal is the perfect application of membrane chromatography in flow-throughmode. The dynamic binding capacity of Sartobind Q is ten times higher than conventional AEX resins and operation window is large.

Application Note:

DNA Removal using Sartobind Q in mAb Purification, order no. 85030-511-29

... and endotoxins

Application Note: Endotoxin Removal, order no. 85030-531-53

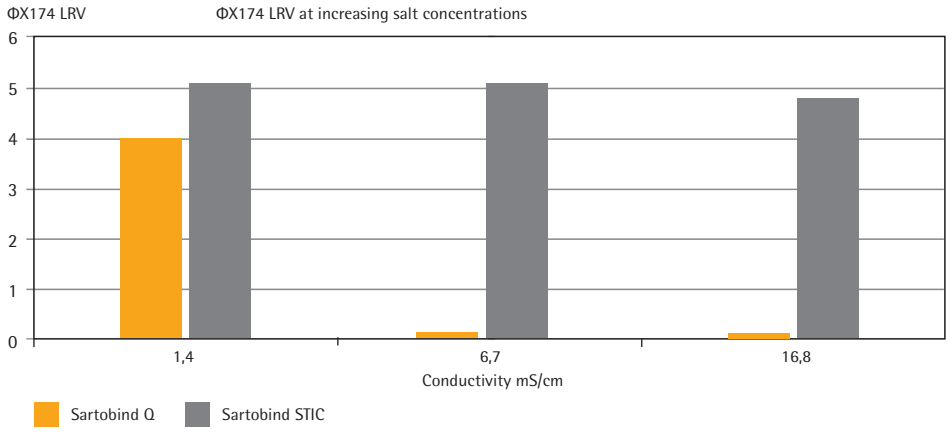
Salt tolerant anion exchanger Sartobind STIC works at higher conductivity as effective as Sartobind Q[1]. When choosing polyanionic buffers such as phosphate, the DNA removal works even independent of pH without binding the target protein[2].

Application Notes:

[1]DNA Binding on Sartobind STIC compared to Sartobind Q, order no. 85032-538-43
[2]Effect of Phosphate on Binding to Sartobind STIC PA, order no. 85032-536-63

More Product Safety with Q and STIC AEX Membranes

Virus	LRV of virus spiked sample	
	500 ml	50 ml
MVM	4.41 ± 0.37	≥ 6.77 ± 0.24
Reo-3	≥ 7.53 ± 0.29	≥ 7.28 ± 0.30
MuLV	6.29 ± 0.32	≥ 5.57 ± 0.25
PrV	≥ 5.76 ± 0.23	≥ 5.67 ± 0.17



Anion exchange removes HCP and DNA and is also an effective virus removal step as part of an orthogonal viral clearance technology platform. Under process conditons, 5 – 7 LRV can be achieved (example shown with Sartobind Q).

Application Note:

Virus Purification and Removal, order no. 85030-522-22

Salt tolerant Sartobind STIC® membrane, also removes viruses but can do so at higher conductivities than Sartobind Q. As shown here with phage PhiX174, a 5 LRV can be achieved at a higher conductivity than with a standard anion exchanger such as Sartobind Q.

Device used:

MA15 (total surface area: 15 cm^2, frontal surface area 5 cm^2, Total column volume 0.41 mL, 3 membrane layers),

Loading buffer:

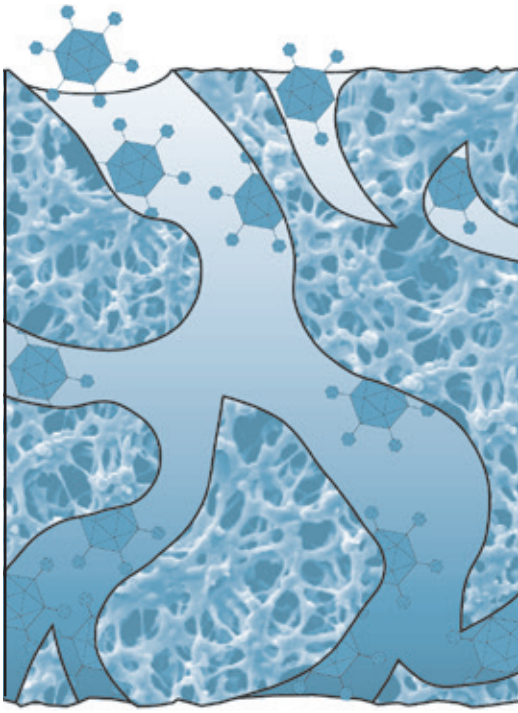
20 mM Tris pH 7.5, Flowrate: 10 ml/min (~24 BV/min), Bacteriophage concentration: 2×10^7 pfu/mL PhiX 174, LRV determined by infectivity assay

Capture

VLP | Virus Purifcation for Pandemic Vaccines: Get 10 to 100 Times more Binding Capacity

The large pores of Sartobind allow for convective flow and no size exclusion effect. To achieve similar throughput, a traditional column and media combination will require a bed volume > 10 times more bed volume than that of a membrane adsorber. The binding capacity of adenovirus type 5 for example is up to 1×10^{13} VP/mL on Sartobind Q[1]. Sartobind SC (Sulfated Cellulose) displays ~10 times higher capacity for influenza than conventional resins[2]. Other virus types exhibit even a larger binding capacity potential* – depending on the size of the virus | VLP. An optimized membrane adsorber step can also improve process economy through shorter processing times, less buffer, and smaller footprint. Virus purification processes that cannot be sterile filtered prior to filling due to the virus size could especially benefit from using sterile validated Q cassettes. This applies to continuous manufacturing operations that run over a prolonged period of time also.

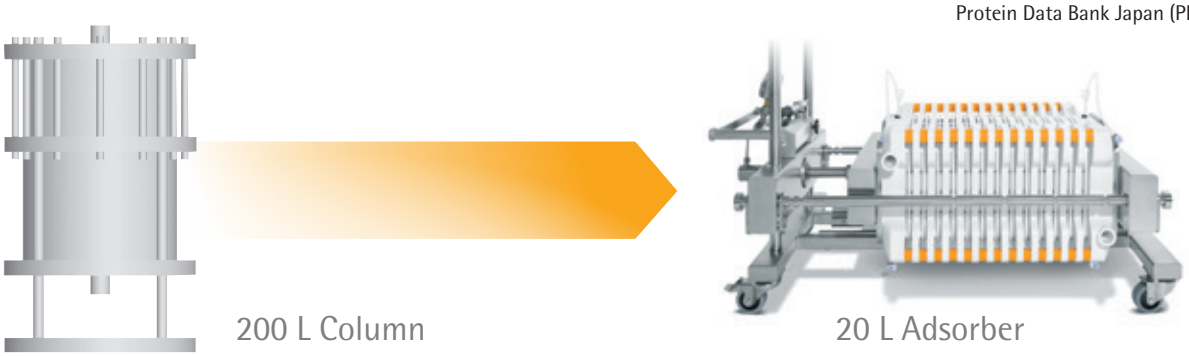
- Adenovirus type 5
- Lentivirus
- Norovirus
- Influenza
- Vaccinia | VLP
- Adenoassociated virus (AAV)
- Baculovirus
- Foot–and–mouth diesease virus
- Pseudorabies virus
- Bovine herpesvirus
- Rotavirus like particles
- Yellow fever virus
- Parvovirus
- Bacteriophages
- Plasmid DNA
- Hepatitis A virus



[1] Brochure: Adeno and Lentivirus Purification and Concentration Kits, order no. 85030-530-78

[2] Article: Fortuna, R, Taft, F., Villain, L., Wolff, M.W., Reichl, U., Optimization of cell culture-derived influenza A virus particles purification using sulfated cellulose membrane adsorbers, Eng. Life Sci. 18, 2018, 29-39

* Literature can be retrieved via Sartobind App www. sartorius-stedim.com/apps
Source for thumbnails •:
Protein Data Bank Japan (PDBj)



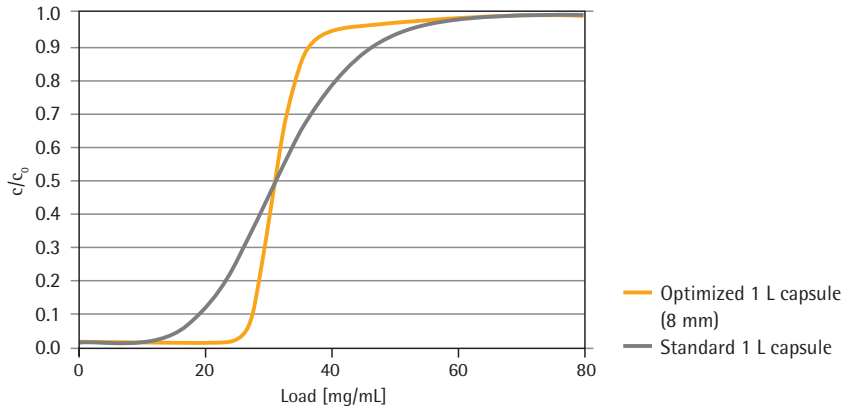
200 L Column

20 L Adsorber

Capture

48% More Dyamic Binding Capacity in Void Volume Optimized Design

Void Volume Optimization is a Key to buffer savings, higher dynamic binding capacity and peak resolution. Compared to non-optimized design, this construction increases the dynamic binding capacity by >30% for 8 mm and >15% for 4 mm devices.
The void volume is reduced by >60% for 8 mm and >40% for 4 mm devices, achieving more buffer saving.

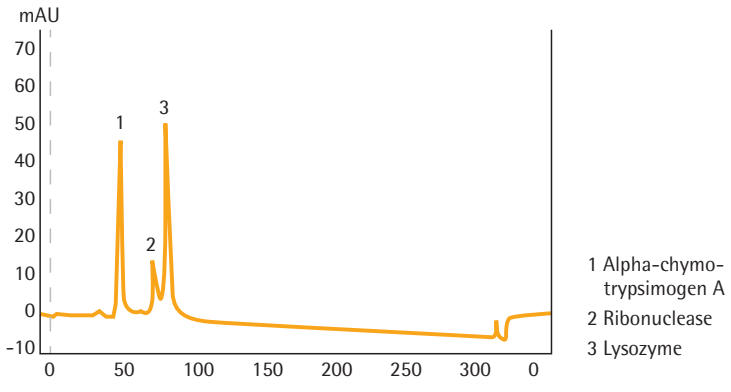


Comparison of Binding Capacity: Standard vs. Void-Volume-Optimized Capsule

As a result of the minimized void volume, the dynamic binding capacity of the Sartobind 8 mm capsules is increased by 48% at 10% breakthrough when loading with a 2 g/L bovine serum albumin (BSA) solution in 20 mM Tris/HCl pH 7.4. The equilibration was performed using 20 MV of equilibration buffer. The flow rate was 5 MV/min. A video about the optimization can be found at:

www.sartorius.com/membrane-chromatography

	Standard	Optimized
Membrane volume Sartobind Q	1 L	1 L
Void volume (by acetone breakthrough)	3.8 L	1.4 L
Dynamic binding capacity 10% BSA	18.2 mg/mL	26.9 mg/mL
Dynamic binding capacity 100% BSA	32 mg/mL	32.2 mg/mL
Back pressure at 5 MV/min	0.1 MPa	0.1 MPa



Improved Resolution

The efficient design also provides for sharp elution peaks and excellent resolution. The small peak | pool volume makes Sartobind membrane adsorbers applicable for bind and elute processes.

500 µL of a 1–1.5 mg/mL protein 1.2 and 3 solution were loaded on a S nano 3 mL. Equilibration buffer 20 mM sodium acetate pH 5.0, gradient elution by 2 M NaCl in equilitbration buffer

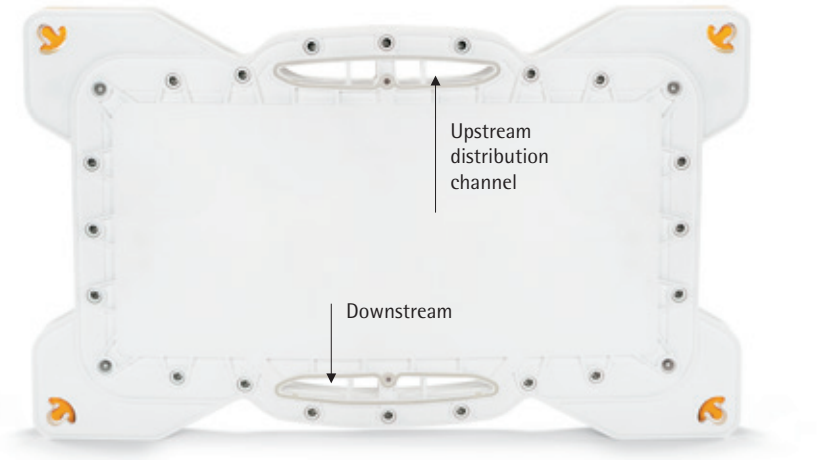
Size Limit Exceeded with Sartobind Cassettes

Full flexibility in Pilot and Process Scale

New design eliminates the 5 L size limitation for membrane adsorbers and offers simple pod-like modular system up to 100 L membrane volume.

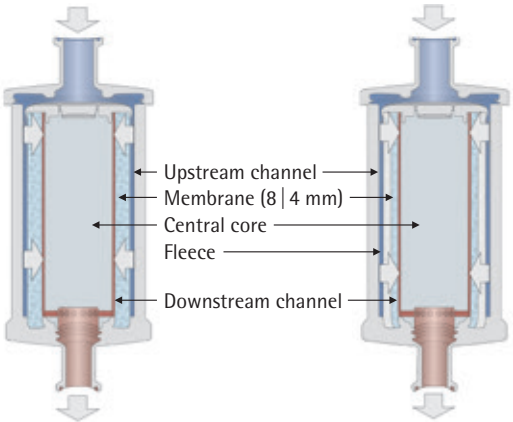
Membrane adsorbers have been limited by size to 5 L membrane volume for almost a decade ignoring the needs for bind and elute chromatography. As capture of large proteins such as blood factors, conjugated proteins or viruses and virus like particles plays an increasing role, a new modular size was needed.

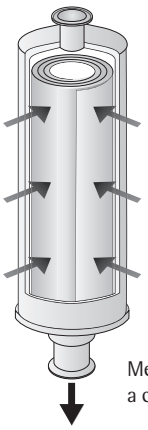
The new cassette size is derived from the Sartobind void volume optimized capsules.



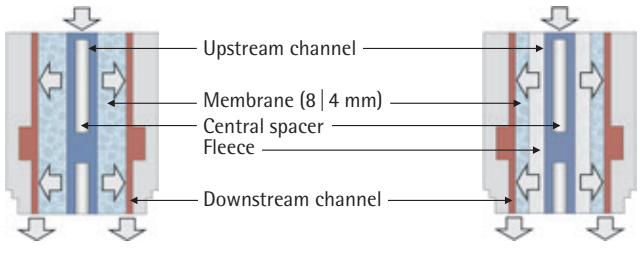
Comparison of Capsule und Cassette Design

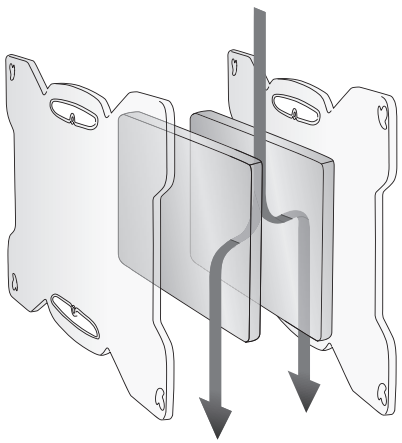
The direct comparison of capsule (left cutaway) and cassette (right) shows same construction principles, bed height and flow scheme.





Membrane rolled up to form a cylinder in the capsule.





Membrane stacks in the cassette.

Chromatography as Easy as Filtration

The membrane adsorbers are ready to use. There is no packing, cleaning or revalidation necessary. And usage is as simple as using a filter.

After developing the process with plates, picos and nanos you go straight to pilot and production scale by increasing process volume and capsule size. Scale-up with Sartobind is a no-brainer.

2 Screening of Conditions with Sartobind 96-Well Plates or pico

1 Ligand Selection

Single-use	Re-use	High salt condition	Ligand and binding capacity	For Polishing	For Capture
Anion exchange					
•	•	–	Q, quaternary ammonium 29 mg/mL (BSA)	DNA, host cell proteins, viruses, endotoxins	Large proteins (e.g. FVIII), viruses, VLP
Anion exchange					
•	–	•	STIC PA, Primary Amine 50 mg/mL (BSA at 17 mS/cm)	DNA, host cell proteins, viruses, endotoxins	–
Cation exchange					
•	•	–	S, sulfonic acid 26 mg/mL (lysozyme)	Host cell proteins, aggregates	Large proteins, viruses, VLP
Hydrophobic interaction					
•	•	•	Phenyl, hydrophobic interaction 15 mg/mL (IgG)	Aggregates, detergents	Large proteins , conjugated proteins, viruses, VLP

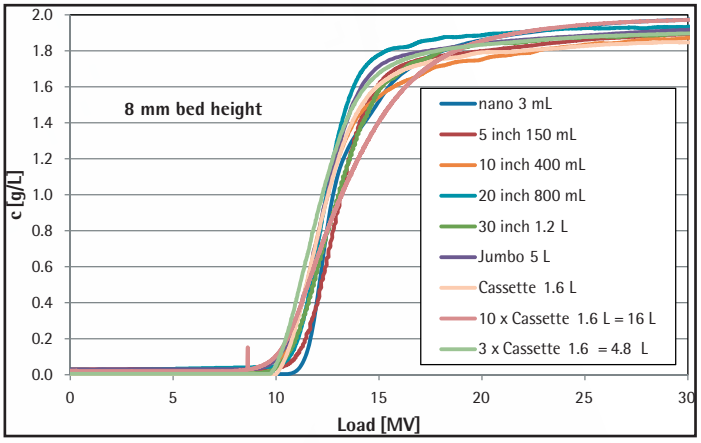
• Applicable – Not applicable

3 Determination of Binding Capacity with Sartobind nano

4 Scale-Up

Each capsule size is available as a 4 or 8 mm version. The scale-up is most simple if you stay within one bed height. Just increase load with membrane volume. The performance keeps the same (example: Q 8 mm capsules and cassettes).

Cassettes can be scaled up to 20.8 L (13 × 1.6 L cassettes) in a Pilot Filter Holder or up to ~100 L in Process Filter Holders (see accessories). Pressure flow relation and shape of breakthrough curves are identical compared to the smaller capsule sizes.



Frequently Asked Questions

What type of device should I start with in the lab?

The nano is the most recommended device to start with. If you have very limited sample quantity you may also start with Sartobind pico. At a 0.08 mL bed volume, it requires only a minimum sample quantity for binding studies. For screening binding conditions, 96-well plates can be used.

How do I choose between a 4 mm and a 8 mm bed height?

8 mm bed height is recommended for bind and elute applications, in which the high dynamic binding capactiy for large molecules can be best employed. However, for rapid contaminant removal – especially when the process volume is large – and the binding capacity is less a concern as for flow-through polishing, Sartobind 4 mm is an excellent choice.

How is the membrane stacked?

For the capsules the membranes are rolled up, forming the membrane bed. The plates, the pico and the cassettes have flat stacked membranes.

What is the direction of flow?

While the fluid enters at the top, it flows from the upstream to the downstream through the membrane channel.

Can I test the integrity of the adsorbers before and after using them?

Yes. A diffusion test for this purpose is described in the manual.

Can the devices be autoclaved?

Yes, the ion exchange capsules can be autoclaved once at 121°C for 30 minutes. The cassettes cannot be autoclaved, but Q cassettes can be delivered also gamma-irradiated with validated sterility.

Can I reuse Sartobind devices?

Yes, you can. The membrane type Q has been reused for 1,000 cycles while the HIC has already been reused successfully for 200 cycles.

How do I decide whether I shall reuse the membrane?

Whether it makes sense for you to reuse them can be determined by cost-benefit calculations, which take the validation and cleaning costs of reuse into account.

Are the cassettes also void volume optimized?

They follow the same rules as optimized capsules and have the equal void volume (1.8 membrane volume (MV) 8 mm, 3.1 MV 4 mm).

Is there a small scale down cassette?

This is not necessary as the cassettes do scale to the smaller capsule size. Also the comparability can be checked with 3 cassettes to the Jumbo size directly. Furthermore they fulfill the USP extractables requirements after cleaning in place.

How many cassettes can be run in a holder?

In the Pilot Filter Holder 13 cassettes can be run, which is 20.8 L membrane volume. Optionally in the Processes Filter holder 50 liters and in the Double Process Filter Holder 100 L.

I have a filter holder from a different brand. Can I use the Sartobind Cassettes with it?

Please get in touch with your local Sartorius Service to check if your holder fits.

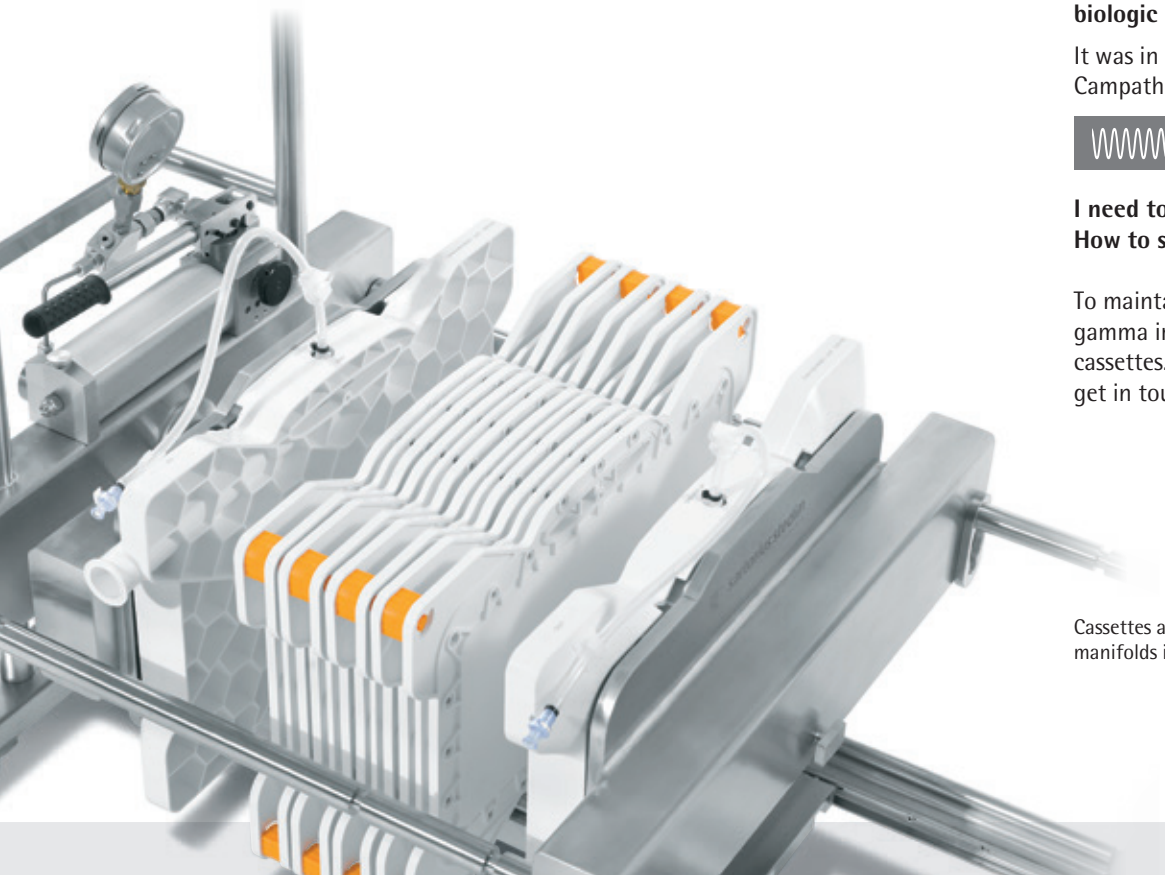
When was the first approval of a biologic produced using Sartobind?

It was in 2001 for the monoclonal antibody Campath 1-H for DNA removal.

WWWW γ-irradiated

I need to run a sterile process. How to set this up?

To maintain sterility you have to use the gamma irradiated manifold with the sterile cassettes. For pre-assembled sterile packs get in touch with us.



Cassettes are assembled between two manifolds in the Pilot Filter Holder

Technical Data

Membrane	
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 STIC PA	Weak anion STIC PA: primary amine ($R-NH_2$)
Ion exchanger ligand S	Strong cation S: sulfonic acid ($R-CH_2-SO_3^-$)
Hydrophobic interaction ligand	HIC: Phenyl ($R-NH-C_6H_5$)

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
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	
Q (bovine serum albumin, 20 mM Tris/HCl, pH 7.5)	29 mg/mL (0.8 mg/cm^2)
STIC PA (BSA, 20 mM Tris HC, 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)
S (lysozyme, 10 mM potassium phosphate, pH 7.0)	25 mg/mL (0.7 mg/cm^2)
Phenyl (polyclonal bovine IgG, 50 mM potassium phosphat, 0.9 M $(NH_4)_2SO_4$, pH 7.5)	14.6 mg/mL (0.4 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
STIC PA	pH 2 – 14	not defined
S	pH 3 – 14	pH 4 – 13
Phenyl	pH 2 – 14	pH 3 – 13

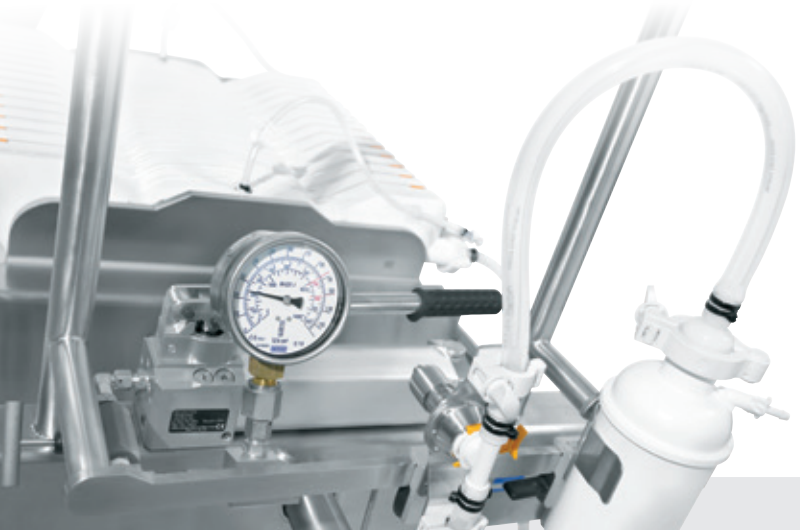
Gamma irradiated products	**Gamma dose**	**Sterile validated**
Sterile Sartobind Q cassettes 4 mm and 8 mm	≥ 25 kiloGrays (kGy) maximum dose: 50 kGy	Yes, minimum dose for sterility is 7 – 8 kGy
Gamma irraditated manifold	See above	No

Technical Data

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	37 × 33 h × ∅	190 × 77 h × ∅	350 × 100 h × ∅	570 × 100 h × ∅	810 × 100 h × ∅	850 × 302 h × ∅	634 × 387 × 49 w × h × d
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%)



Sartobind Cassettes in Pilot Filter Holder clamped at 25 kilonewton, pressure sensor (accessory) and a Sartopore® 2 0.45 µm 10" capsule for prefiltration

Ordering Information

96-Well Plates and Accessories

Order number	Description	Quantity
99IEXQ42GC-----V	Sartobind Q 96-well plate, 2 units	2 (24 × 8-strips)
99IEXQ42GC-----D	Sartobind Q 96-well plate, 10 units	10 (120 × 8-strips)
99STPA42GC-----V	Sartobind STIC PA 96-well plate, 2 units	2 (24 × 8-strips)
99STPA42GC-----D	Sartobind STIC PA 96-well plate, 10 units	10 (120 × 8-strips)
99IEXS42GC-----V	Sartobind S 96-well plate, 2 units	2 (24 × 8-strips)
99IEXS42GC-----D	Sartobind S 96-well plate, 10 units	10 (120 × 8-strips)
99HICP42GC-----V	Sartobind Phenyl 96-well plate, 2 units	2 (24 × 8-strips)
99HICP42GC-----D	Sartobind Phenyl 96-well plate, 10 units	10 (120 × 8-strips)
VW96VAC01	Vac96 vacuum manifold	1
VW96VAA02	Vac96 liquid trap and reservoir	1
VW96VAA04	96 deep well collection plate 2 ml (square wells)	25
VW96VAA05	Replacement seal for Vac96 vacuum manifold	1
VW08VAC01	Vac8 vacuum manifold	1
VW08VAA02	Vac8 liquid trap and reservoir	1
VW08VAA03	8-well collection strips 1.2 ml (round wells)	125
VW08VAA04	Replacement seal for Vac8 vacuum manifold	1
16612	Vacuum pump, 98%, 220 V, 50 Hz	1
16615	Vacuum pump, 98%, 110 V, 60 Hz	1

Sartobind pico 4 mm bed height

Order number	Description	Quantity
92IEXQ42DD-11--D	Sartobind Q pico 0.08 mL	10
92STPA42DD-11--D	Sartobind STIC PA pico 0.08 mL	10
92IEXS42DD-11--D	Sartobind S pico 0.08 mL	10
92HICP42DD-11--D	Sartobind Phenyl 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

96 well plates used in a liquid handling system

Sartobind Q

Order number	Description	Quantity	Bed height [mm]	Description adapter inlet and outlet	Protein binding capacity [g]	Recom-mended flow rate [L/min]	Maximum pressure [MPa] (bar/psig)
96IEXQ42DN-11	Sartobind Q nano 1 mL	1	4	Female Luer	0.029	0,02	0.4 (4/58)
96IEXQ42DN-11--A	Sartobind Q nano 1 mL	4	4	Female Luer	0.029	0,02	0.4 (4/58)
96IEXQ42D9MOO--A	Sartobind Q 75 mL	4	4	Hose barb, 203 × 77 mm	2.16	1.5	0.4 (4/58)
96IEXQ42D9MFF--A	Sartobind Q 75 mL	4	4	Sanitary ¾", 25 mm	2.16	1.5	0.4 (4/58)
96IEXQ42D1GSS	Sartobind Q 200 mL	1	4	Sanitary 1½", 50.5 mm	5.8	4	0.4 (4/58)
96IEXQ42D2HSS	Sartobind Q 400 mL	1	4	Sanitary 1½", 50.5 mm	11.7	8	0.4 (4/58)
96IEXQ42D3KSS	Sartobind Q 600 mL	1	4	Sanitary 1½", 50.5 mm	17.6	12	0.4 (4/58)
96IEXQ42D3NSS	Sartobind Q Jumbo 2.5	1	4	Sanitary 1½", 50.5 mm	73	50	0.3 (3/43.5)
96IEXQ42EUC11--A	Sartobind Q nano 3 mL	4	8	Female Luer	0.088	0.015	0.4 (4/58)
96IEXQ42E9BFF	Sartobind Q 150 mL	1	8	Sanitary ¾", 25 mm	4.4	0.75	0.4 (4/58)
96IEXQ42E1HSS	Sartobind Q 400 mL	1	8	Sanitary 1½", 50.5 mm	11.6	2	0.4 (4/58)
96IEXQ42E2LSS	Sartobind Q 800 mL	1	8	Sanitary 1½", 50.5 mm	23.3	4	0.4 (4/58)
96IEXQ42E3FSS	Sartobind Q 1.2 L	1	8	Sanitary 1½", 50.5 mm	35	6	0.4 (4/58)
96IEXQ42E3ESS	Sartobind Q Jumbo 5 L	1	8	Sanitary 1½", 50.5 mm	145	25	0.3 (3/43.5)
98IEXQ42D-L	Sartobind Q Cassette 0.8 L	1	4	Via manifold accessory: Sanitary 1½", 50.5 mm	23.2	16	0.2 (2/29)
98IEXQ42DGL	Sartobind Q Cassette 0.8 L, sterile	1	4	Via gamma manifold accessory: Sanitary 1½", 50.5 mm	23.2	16	0.2 (2/29)
98IEXQ42E-P	Sartobind Q Cassette 1.6 L	1	8	Via manifold accessory: Sanitary 1½", 50.5 mm	46.4	8	0.2 (2/29)
98IEXQ42EGP	Sartobind Q Cassette 1.6 L, sterile	1	8	Via gamma manifold accessory: Sanitary 1½", 50.5 mm	46.4	8	0.2 (2/29)

Sartobind nano

Sartobind S

Order number	Description	Quantity	Bed height [mm]	Description adapter inlet and outlet	Protein binding capacity [g]	Recommended flow rate [L/min]	Maximum pressure [MPa] (bar/psig)
96IEXS42DN-11	Sartobind S nano 1 mL	1	4	Female Luer	0.025	0.02	0.4 (4/58)
96IEXS42DN-11--A	Sartobind S nano 1 mL	4	4	Female Luer	0.025	0.02	0.4 (4/58)
96IEXS42D9MOO--A	Sartobind S 75 mL	4	4	Hose barb, 203 × 77 mm	1.89	1.5	0.4 (4/58)
96IEXS42D9MFF--A	Sartobind S 75 mL	4	4	Sanitary ¾", 25 mm	1.89	1.5	0.4 (4/58)
96IEXS42D1GSS	Sartobind S 200 mL	1	4	Sanitary 1½", 50.5 mm	5.1	4	0.4 (4/58)
96IEXS42D2HSS	Sartobind S 400 mL	1	4	Sanitary 1½", 50.5 mm	10.2	8	0.4 (4/58)
96IEXS42D3KSS	Sartobind S 600 mL	1	4	Sanitary 1½", 50.5 mm	15.4	12	0.4 (4/58)
96IEXS42EUC11--A	Sartobind S nano 3 mL	4	8	Female Luer	0.077	0.015	0.4 (4/58)
96IEXS42E9BFF	Sartobind S 150 mL	1	8	Sanitary ¾", 25 mm	3.9	0.75	0.4 (4/58)
96IEXS42E1HSS	Sartobind S 400 mL	1	8	Sanitary 1½", 50.5 mm	10.2	2	0.4 (4/58)
96IEXS42E2LSS	Sartobind S 800 mL	1	8	Sanitary 1½", 50.5 mm	20	4	0.4 (4/58)
96IEXS42E3FSS	Sartobind S 1.2 L	1	8	Sanitary 1½", 50.5 mm	31	6	0.4 (4/58)
96IEXS42E3ESS	Sartobind S Jumbo 5 L	1	8	Sanitary 1½", 50.5 mm	127	25	0.3 (3/43.5)
98IEXS42D-L	Sartobind S Cassette 0.8 L	1	4	Via manifold accessory: Sanitary 1½", 50.5 mm	20.3	16	0.2 (2/29)
98IEXS42E-P	Sartobind S Cassette 1.6 L	1	8	Via manifold accessory: Sanitary 1½", 50.5 mm	40.6	8	0.2 (2/29)

Sartobind STIC PA

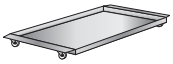
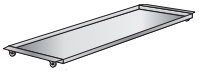
Order number	Description	Quantity	Bed height [mm]	Description adapter inlet and outlet	Protein binding capacity [g]	Recommended flow rate [L/min]	Maximum pressure [MPa] (bar/psig)
96STPA42DN-11--A	Sartobind STIC PA nano 1 mL	4	4	Female Luer	0.05	0.02	0.4 (4/58)
96STPA42D9MFF--A	Sartobind STIC PA 75 mL	4	4	Sanitary ¾", 25 mm	3.8	1.5	0.4 (4/58)
96STPA42D1GSS	Sartobind STIC PA 200 mL	1	4	Sanitary 1½", 50.5 mm	10.2	4	0.4 (4/58)
96STPA42D2HSS	Sartobind STIC PA 400 mL	1	4	Sanitary 1½", 50.5 mm	20.4	8	0.4 (4/58)
96STPA42D3KSS	Sartobind STIC PA 600 mL	1	4	Sanitary 1½", 50.5 mm	30	12	0.4 (4/58)
96STPA42D3NSS	Sartobind STIC PA Jumbo 2.5 L	1	4	Sanitary 1½", 50.5 mm	127	50	0.3 (3/43.5)
98STPA42D-L	Sartobind STIC PA Cassette 0.8 L	1	4	Via manifold accessory: Sanitary 1½", 50.5 mm	40.6	16	0.2 (2/29)

Sartobind Phenyl

Order number	Description	Quantity	Bed height [mm]	Description adapter inlet and outlet	Protein binding capacity [g]	Recom-mended flow rate [L/min]	Maximum pressure [MPa] (bar/psig)
96HICP42EUC11--A	Sartobind Phenyl 3 mL	4	8	Female Luer	0.044	0.015	0.4 (4/58)
96HICP42E9BFF	Sartobind Phenyl 150 mL	1	8	Sanitary ¾", 25 mm	2.2	0.75	0.4 (4/58)
96HICP42E1HSS	Sartobind Phenyl 400 mL	1	8	Sanitary 1½", 50.5 mm	5.8	2	0.4 (4/58)
96HICP42E2LSS	Sartobind Phenyl 800 mL	1	8	Sanitary 1½", 50.5 mm	11.6	4	0.4 (4/58)
96HICP42E3FSS	Sartobind Phenyl 1.2 L	1	8	Sanitary 1½", 50.5 mm	17.6	6	0.4 (4/58)
96HICP42E3ESS	Sartobind Phenyl 5 L	1	8	Sanitary 1½", 50.5 mm	72.8	25	0.3 (3/43.5)
98HICP42E-P	Sartobind Phenyl Cassette 1.6 L	1	8	Via manifold accessory: Sanitary 1½", 50.5 mm	23.2	8	0.2 (2/29) 4.9 kg

Sartobind Jumbo

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
5ZGI--0001		Holder for 1 × 200 to 1,200 mL (10 – 30") capsule, stainless steel, 3 legs	1
5ZALB-0002		Distribution adapter for 3 × 200 to 1,200 mL capsules (10 – 30"), 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
26288---FT		Sartocheck® 4 Plus Filter Integrity Tester	1
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 holder	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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