VIVASCIENCE
sartorius group

ultrafiltration

Ultrafiltration Products

Contents

Major uses for ultrafiltration

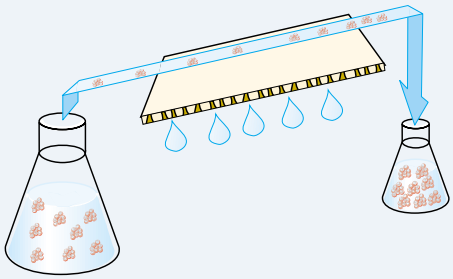
Ultrafiltration is a convective process that uses anisotropic semi-permeable membranes to separate macromolecular species and solvents primarily on the basis of size. It is particularly appropriate for the concentration of macromolecules and can also be used to purify molecular species or for solvent exchange. Ultrafiltration is a gentle, non denaturing method that is more efficient and flexible than alternative processes.

Typical applications for ultrafiltration

- Concentration/desalting of proteins, enzymes, DNA, monoclonal antibodies, immunoglobulins
- Free drug, hormone assays
- Removal of primers from PCR amplified DNA
- Removal of labelled amino acids and nucleotides
- HPLC sample preparation
- Deproteinization of samples
- Purification of antibiotics, hormones, drugs from biological fluids, fermentation broths
- Recovery of biomolecules from cell culture supernatants, lysates
- General purpose laboratory concentration and desalting of proteins, enzymes, cells, DNA, biomolecules, antibodies and immunoglobulins
- Mammalian cell harvesting
- Cell washing, virus purification, cell debris removal, depyrogenation

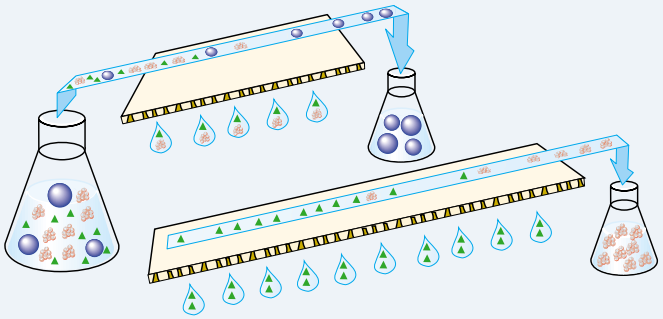
Solute concentration

Ultrafiltration membranes are used to increase the solute concentration of a desired biological species. The filtrate is cleared of macromolecules which are significantly larger than the retentive membrane pores. Microsolute is removed convectively with the solvent.



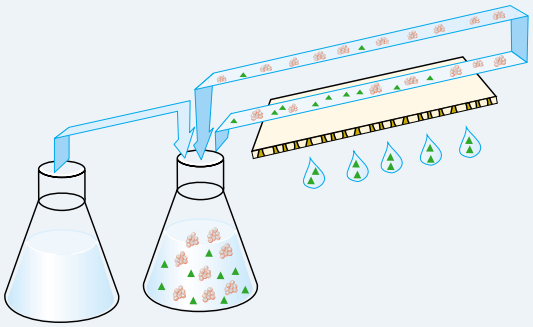
Solute fractionation or clarification

Ultrafiltration is a cost effective method for separating samples into size-graded components providing that macromolecular fractions differ in size by a 10x MW difference. During filtration, the permeating solute remains at its initial concentration whilst the retained macromolecules will be enriched.



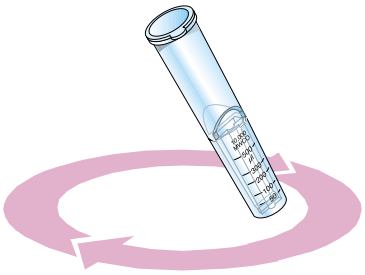
Solute desalting or purification

A solution may be purified from salts, non-aqueous solvents and generally from low molecular weight materials. Multiple solvent exchanges, will progressively purify macromolecules from contaminating solutes. Microsolutes are removed most efficiently by adding solvent to the solution being ultrafiltered at a rate equal to the speed of filtration. This is called diafiltration.



Process alternatives

Vivascience offers a comprehensive range of process alternatives for the filtration and concentration of biological samples. Below is a guide to selecting the most suitable filtration method, depending on sample volume, equipment available, filtration speed and process control desired.

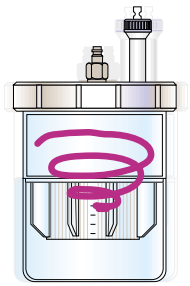


Centrifugal filtration

(100 µl to 100 ml starting volumes)
Centrifugation provides the vector to clear solvent and micro molecules through the ultrafiltration membrane and into a filtrate container positioned below. This is a gentle process that is characterised by quick set up and fast filtration speeds with most solutions. Vivascience offers ten alternative centrifugal devices covering volumes from 100 µl up to 100 ml.

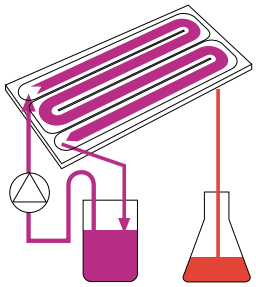
Pressure-fugation

(5 to 50 ml starting volumes)
Pressure-fugation is a unique Vivascience method that combines gas pressure with centrifugation. This is the fastest concentration method with process times typically 30 to 50% faster than centrifugation alone. Vivaspin 20 and Vivacell 70 can be run in this way.



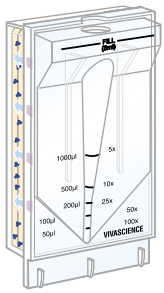
Gas pressure filtration

(5 to 250 ml starting volume)
Pressurised air or an inert gas is used to provide the filtration vector. Agitation is used to impede macromolecules from polarising on the membrane surface and reducing filtration speed. For fastest filtration, Vivacell products are used with an orbital laboratory shaker but they can also be used without agitation. Vivaspin 20, Vivacell 70, Vivacell 100 and Vivacell 250 can be run with gas pressure.



Tangential flow filtration

(100 ml to several litres starting volume)
The solution to be processed is pumped under pressure across an ultrafiltration membrane and then returned to the original reservoir. The solution is progressively concentrated or purified as solvent and micro-molecules pass through the membrane into a separate filtrate vessel. Vivaflow 50 and 200 are offered for this procedure.



Solvent absorption

(1 to 20 ml starting volume)
This technique uses an absorbent cellulose pad mounted behind the ultrafiltration membrane to draw solvents and micro solutes through the membrane. Retained macromolecules are concentrated into the bottom of the sample container. No additional equipment is required. Five Vivapore devices are offered for this procedure with maximum initial sample volumes ranging from 1 to 20 ml.

Membrane performance characteristics

Vivascience offers an extended range of membranes to cover the great majority of ultrafiltration requirements.
The following is a guide to selecting the most appropriate membranes according to their typical performance characteristics. Please note however, that membrane behaviour and ultimate performance, largely depends on the specific characteristics of the solution being processed. Vivascience recommends that users experiment with alternative membranes in order to optimise their process performance.

Polyethersulfone
This is a general purpose membrane that provides excellent performance with most solutions when retentate recovery is of primary importance. Polyethersulfone membranes exhibit no hydrophobic or hydrophillic interactions and are usually preferred for their low fouling characteristics, exceptional flux and broad pH range.

Cellulose triacetate
High hydrophilicity and very low non specific binding characterise this membrane. Cast without any membrane support that could trap or bind passing micro solutes, these membranes are preferred for sample cleaning and protein removal and when high recovery of the filtrate solution is of primary importance.

Regenerated cellulose
These Membranes are also highly hydrophillic and are often preferred for their higher protein recovery when processing some very dilute solutions. Resistance to autoclaving, ease of cleaning and extended chemical resistance also characterises this type of membrane.

Hydrosart®
Hydrosart demonstrates the same properties as regenerated cellulose, but with the added benefit of enhanced performance characteristics and extremely low protein binding, making it the membrane of choice for applications such as concentration and desalting of immunoglobulin fractions.

Membrane performance comparisons

Membrane	Relative solute flux* (ml/min/cm²)	Frequently preferred for:
Polyethersulfone pH range 1-14		
3,000 MWCO	0.05	Very high retention of peptides
5,000 MWCO	0.24	High retention of peptides, high relative flux
10,000 MWCO	0.41	Versatility, high flux, low adsorption
30,000 MWCO	0.41	Versatility, high flux
50,000 MWCO	0.45	Sharp molecular weight limit
100,000 MWCO	0.35	High retention of Immunoglobulins
Cellulose triacetate pH range 4-8		
5,000 MWCO	0.04	Peptide and protein removal
10,000 MWCO	0.11	Micro-partition, free/bound drug studies
20,000 MWCO	0.58	Sample cleaning, HPLC sample preparation
Regenerated cellulose pH range 3-11		
10,000 MWCO	0.18	High recovery of microgram quantities of protein
30,000 MWCO	0.58	Speed and recovery with immunoglobulins
100,000 MWCO	0.40	Protein fractionation
Hydrosart® pH range 1-14		
5,000 MWCO	0.14	High recovery of very dilute solutions
10,000 MWCO	0.27	High flux, high recovery, low adsorption
30,000 MWCO	0.48	High recovery of immunoglobulins

*0.25mg/ml BSA or IgG depending on MWCO at 4 bar pressure.

Membrane selection guide

Membrane selection guide (recommended MWCO)

Application	< 5,000	10,000	30,000	50,000	100,000	> 300,000
Bacteria					●	●
DNA fragments		●	●	●	●	
Enzymes	●	●				
Growth factors	●	●				
Immunoglobulins			●	●	●	
Nucleic Acids	●	●	●	●	●	
MAB			●	●	●	
Oligonucleotides	●					
Peptides	●					
Virus			●	●	●	
Yeast					●	●

For highest recovery, select a membrane MWCO which is at least half of the molecular weight of the solute to be retained

The advanced designs and low adsorption materials that characterise Vivascience products, offer a unique combination of faster processing speeds and higher recovery of the concentrated sample. Providing that the appropriate device size and membrane cut-off is selected, Vivascience products will typically yield recoveries of the concentrated sample in excess of 90% when the starting sample contains over 0.1 mg/ml of the solute of interest. Most of the loss is caused by non specific binding both to the membrane surface and to exposed binding sites on the plastic of the sample container:

Adsorption to the membrane
Depending on sample characteristics relative to the membrane type used, solute adsorption on the membrane surface is typically 2-10 µg/cm^2. This can increase to 20-100 µg/cm^2 when the filtrate is of interest and the solute must pass through the whole internal structure of the membrane. Typically a higher cut-off membrane will bind more than a low molecular weight alternative.

Adsorption to the sample container
Although every effort is made to minimise this phenomenon by the selection of low adsorption materials and tool production to optical standards, some solute will bind to the internal surface of the sample container. Whilst the relative adsorption will be proportionately less important than on the membrane, due to the higher total surface area, this can be the major source of yield loss.

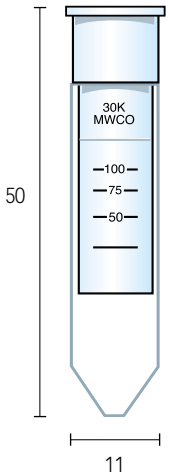
Process optimisation
When highest recoveries are most important, in particular when working with solute quantities in the microgram range, Vivascience recommends that users consider the following:

- Select the smallest device that suits the sample volume. Additionally, take advantage of the extra speed of Vivascience products by refilling a smaller device repeatedly.
- Select the lowest MWCO membrane that suits the application.
- When available, prefer swing bucket to fixed angle rotors. This reduces the surface area of the concentrator that will be exposed to the solution during centrifugation.
- Reduce pressure or centrifugal force to approximately half of the maximum recommended.
- Avoid over concentration. The smaller the final concentrate volume, the more difficult it is to achieve complete recovery. If feasible, after a first recovery, rinse the device with one or more drops of buffer and then recover again.
- Pretreat the device overnight with a passivation solution such as 5% SDS, Tween 20, or Triton X in distilled water. Then rinse thoroughly before use.

Vivaspin 500

100 µl to 600 µl samples
Vivaspin 500 µl centrifugal filter units offer a simple, one step procedure for sample preparation. They can effectively be used in either swing out or fixed angle rotors accepting 2.2 ml centrifuge tubes.

The patented vertical membrane design and thin channel filtration chamber (US 5,647,990), minimises membrane fouling and provides high speed concentrations, even with particle laden solutions.



Technical specifications	Vivaspin 500
Concentrator capacity	
Swing bucket rotor	600 µl
Fixed angle rotor	600 µl
Dimensions	
Total length	50 mm
Width	11 mm
Active membrane area	0.5 cm^2
Hold-up volume, membrane and support	< 5 µl
Dead stop volume	5 µl
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polypropylene
Concentrator cap	Polycarbonate
Membrane	Polyethersulfone

Vivaspin 500

Equipment required	Vivaspin 500
Centrifuge	
Rotor type	Fixed angle
Minimum rotor angle	40˚
Rotor cavity	To fit 2.2 ml (11 mm) conical bottom tubes
Maximum speed	15,000 g
Concentrate recovery	
Pipette type	Fixed or variable volume
Recommended tip	Thin gel loader type

Typical performance	Time to concentrate 30x min. at 20˚C and solute recovery %	
Rotor	Fixed angle	
Centrifugal force	12,000 g	
Start volume	500 µl	
	Min.	Rec.
Aprotinin 0.25mg/ml (6,500 MW)		
3,000 MWCO PES	30	96 %
BSA 1.0 mg/ml (66,000 MW)		
5,000 MWCO PES	15	96 %
10,000 MWCO PES	5	96 %
30,000 MWCO PES	5	95 %
IgG 0.25 mg/ml (160,000 MW)		
30,000 MWCO PES	10	96 %
50,000 MWCO PES	10	96 %
100,000 MWCO PES	10	96 %

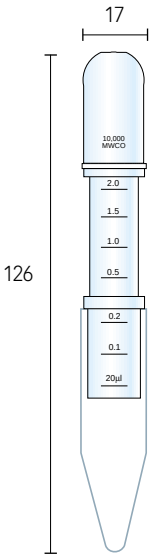
Ordering information		
Vivaspin 500 Polyethersulfone	Pack size	Prod. no.
3,000 MWCO	25	VS0191
3,000 MWCO	100	VS0192
5,000 MWCO	25	VS0111
5,000 MWCO	100	VS0112
10,000 MWCO	25	VS0101
10,000 MWCO	100	VS0102
30,000 MWCO	25	VS0121
30,000 MWCO	100	VS0122
50,000 MWCO	25	VS0131
50,000 MWCO	100	VS0132
100,000 MWCO	25	VS0141
100,000 MWCO	100	VS0142
300,000 MWCO	25	VS0151
300,000 MWCO	100	VS0152
1,000,000 MWCO	25	VS0161
1,000,000 MWCO	100	VS0162
0.2 µm	25	VS0171
0.2 µm	100	VS0172
Starter pack (5 of each 5 k, 10 k, 30 k, 50 k, 100 k)	25	VS01S1

0.4 - 2 ml samples

The Vivaspin 2 bridges the gap between the 500 µl and 4 ml centrifugal concentrators. This device combines the speed of the classic Vivaspin products with low internal surface and membrane area for superior recoveries from very dilute solutions.

Available with a choice of PES, Cellulose Triacetate, Regenerated Cellulose and Hydrosart® membranes, Vivaspin 2 offers the highest flexibility for process optimisation.

Also unique to the Vivaspin 2, is the choice of directly pipetting the concentrate from the dead stop pocket built into the bottom of the concentrator, or alternatively reverse spinning into the concentrate recovery cap which can then be sealed for storage. Both methods result in near total concentrate recoveries.



Technical specifications	Vivaspin 2
Concentrator capacity	
Swing bucket rotor	3 ml
Fixed angle rotor	2 ml
Dimensions	
Total length	126 mm
Width	17 mm
Active membrane area	1.2 cm^2
Hold-up volume of membrane	<10 µl
Dead stop volume	8 µl
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polycarbonate
Concentrator cap	Polycarbonate
Membrane	PES, CTA, RC, HY

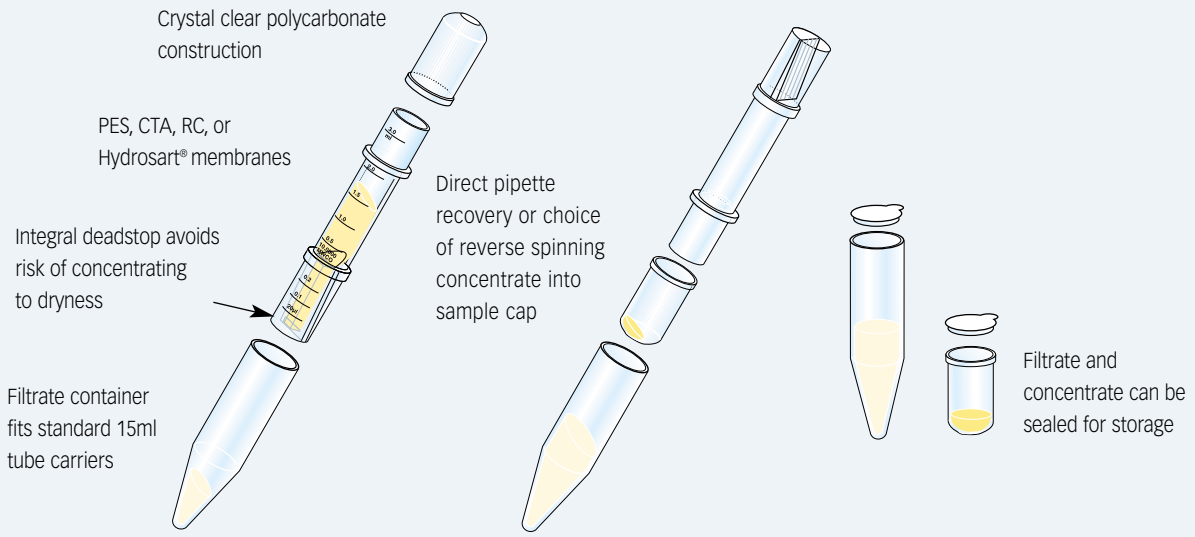
Vivaspin 2

Equipment required	Vivaspin 2	
Centrifuge		
Rotor type	Swing bucket	Fixed angle
Minimum rotor angle	-	25°
Rotor cavity	To fit 15 ml (17 mm) conical bottom tubes	To fit 15 ml (17 mm) conical bottom tubes
Maximum speed	4,000 g	12,000 g*
Concentrate recovery		
Pipette type	Fixed or variable volume	Fixed or variable volume
Recommended tip	Thin gel loader type	Thin gel loader type

* Please note, devices with membrane MWCO >100,000 kDa need to be processed at lower g forces. See data sheets for details.

Typical performance	Time to concentrate 30x min. at 20˚C and solute recovery %	
Rotor	Fixed angle	
Centrifugal force	5,000 g	
Start volume	2 ml	
	Min.	Rec.
Aprotinin 0.25mg/ml (6,500 MW)		
3,000 MWCO PES	50	96 %
BSA 1.0 mg/ml (66,000 MW)		
5,000 MWCO PES	12	98 %
5,000 MWCO CTA	50	96 %
5,000 MWCO Hydrosart	22	98 %
10,000 MWCO PES	8	98 %
10,000 MWCO RC	14	98 %
10,000 MWCO CTA	10	96 %
10,000 MWCO Hydrosart	12	98 %
20,000 MWCO CTA	5	96 %
30,000 MWCO PES	8	97 %
30,000 MWCO RC	5	98 %
30,000 MWCO Hydrosart	5	97 %
IgG 0.25 mg/ml (160,000 MW)		
20,000 MWCO CTA	6	97 %
30,000 MWCO PES	10	96 %
30,000 MWCO RC	9	97 %
50,000 MWCO PES	10	96 %
100,000 MWCO PES	8	95 %
100,000 MWCO RC	4	96 %

Vivaspin 2



Ordering information					
Vivaspin 2 Polyethersulfone	Pack size	Prod. no.	Vivaspin 2 Cellulose triacetate	Pack size	Prod. no.
3,000 MWCO	25	VS0291	5,000 MWCO	25	VS02U1
3,000 MWCO	100	VS0292	5,000 MWCO	100	VS02U2
5,000 MWCO	25	VS0211	10,000 MWCO	25	VS02V1
5,000 MWCO	100	VS0212	10,000 MWCO	100	VS02V2
10,000 MWCO	25	VS0201	20,000 MWCO	25	VS02X1
10,000 MWCO	100	VS0202	20,000 MWCO	100	VS02X2
30,000 MWCO	25	VS0221	Vivaspin 2 Regenerated cellulose		
30,000 MWCO	100	VS0222	10,000 MWCO	25	VS02K1
50,000 MWCO	25	VS0231	10,000 MWCO	100	VS02K2
50,000 MWCO	100	VS0232	30,000 MWCO	25	VS02L1
100,000 MWCO	25	VS0241	30,000 MWCO	100	VS02L2
100,000 MWCO	100	VS0242	100,000 MWCO	25	VS02M1
300,000 MWCO	25	VS0251	100,000 MWCO	100	VS02M2
300,000 MWCO	100	VS0252	Vivaspin 2 Hydrosart		
1,000,000 MWCO	25	VS0261	5,000 MWCO	25	VS02H11
1,000,000 MWCO	100	VS0262	5,000 MWCO	100	VS02H12
0.2 µm	25	VS0271	10,000 MWCO	25	VS02H01
0.2 µm	100	VS0272	10,000 MWCO	100	VS02H02
Starter pack	25	VS02S1	30,000 MWCO	25	VS02H21
(5 of each 5 k, 10 k, 30 k, 50 k, 100 k)			30,000 MWCO	100	VS02H22

Ordering Tips

- Choose a membrane pore size at least 50% smaller than the size of the molecule to be retained.
- Usually choose Polyethersulfone membranes for fastest concentrations.
- Usually choose Cellulose Triacetate for Protein Removal/Ultrafiltrate recovery.
- Usually choose Hydrosart® membranes for highest recovery with Ig fractions.

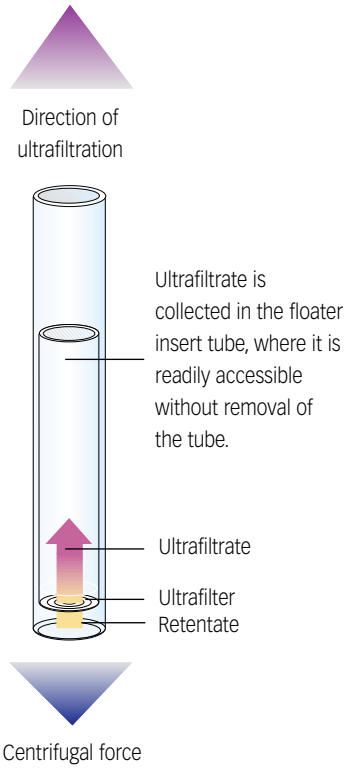
Centrisart I

0.5 - 2.5 ml samples

Centrisart I is a ready to use unit for small volume centrifugal ultrafiltration to separate proteins from low molecular weight substances in biological samples.
Centrisart I features a unique design, ultrafiltration in the opposite direction to the centrifugal force.
This is so effective in preventing premature blockage of the filter that even whole blood samples can be deproteinized. The ultrafiltrate is collected in the floater insert tube, where it is readily accessible without removing the tube.

Typical applications include:

- drug binding studies
- determination of metabolites in serum
- protein removal from blood samples
- cleaning of liposomes
- virus removal



Technical specifications	Centrisart I
Concentrator capacity	
Swing bucket rotor	2.5 ml
Fixed angle rotor	2.5 ml
Dimensions	
Total length	93 mm
Width	14 mm
Active membrane area	0.79 cm^2
Hold-up volume of membrane	< 5 µl
Dead stop volume	100 µl
Materials of construction	
Centrifuge tube	Polystyrene
Floater tube	Cellulose propionate
Cap	Polyethylene
Membrane	CTA, PES

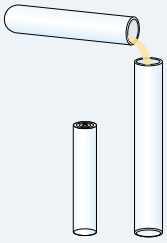
Centrisart I

Equipment required	Vivaspin 2	
Centrifuge		
Rotor type	Swing bucket	Fixed angle
Minimum rotor angle	-	25°
Rotor cavity	To fit 15 ml (17 mm) conical bottom tubes	To fit 15 ml (17 mm) conical bottom tubes
Maximum speed	2,500 g	2,000 g
Concentrate recovery		
Pipette type	Fixed or variable volume	Fixed or variable volume
Recommended tip	Thin gel loader type	Thin gel loader type

Typical performance	Time to filter 50% of sample volume	Time to filter 90% of sample volume	Passage of sample species
BSA 1.0 mg/ml (66,000 MW)			
5,000 MWCO	300 min	N/A	0%
10,000 MWCO	35 min	80 min	2%
20,000 MWCO	9 min	20 min	2%
IgG 0.25 mg/ml (160,000 MW)			
100,000 MWCO	13 min	35 min	3%
Blue Dextran 0.1 mg/ml (2,000,000 MW)			
300,000 MWCO	9 min	25 min	28%

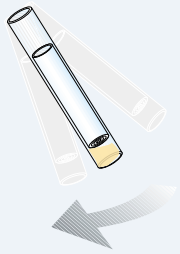
*2.5 ml samples were loaded into each device.
The devices were centrifuged at 2,000 g until the required filtrate volumes had been reached.

Easy-to-use

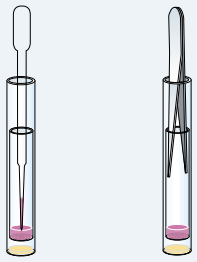


Remove interior tube, pour in sample

Replace interior tube



Centrifuge



Pipette out the filtrate…

…or use forceps to remove the interior tube to access the concentrate

Centrisart I

Ordering information	Pack size	Prod. no.
5,000 MWCO CTA	12	13229-E
10,000 MWCO CTA	12	13239-E
20,000 MWCO CTA	12	13249-E
100,000 MWCO PES	12	13269-E
300,000 MWCO PES	12	13279-E
Starter pack (3 units each of 5k, 10k, 20k, 100k)	12	13209-E

References

P. Nebinger and M. Koel
Determination of acyclovir by ultrafiltration and high-performance liquid chromatography.
J. Chromatography 619, 342-344 (1993)

F. da Fonseca-Wollheim, K.-G. Heinze, K. Lomsky and H. Schreiner
Serum ultrafiltration for the elimination
of endogenous interfering substances in creatinine determination.
J.Clin.Chem.Clin.Biochem.
26, 523-525 (1988)

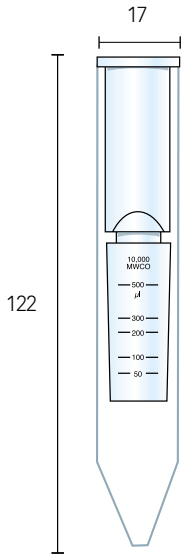
R. H. Christenson, S. D. Studenberg, S. Beck-Davis and F. A. Sedor
Digoxin-like immunoreactivity eliminated from serum by centrifugal ultrafiltration before fluorescence polarization immunoassay of digoxin.
Clinical Chemistry 33, 606-608 (1987)

Vivaspin 4

1 - 4 ml samples
Vivaspin 4 ml concentrators are disposable ultrafiltration devices for the concentration of biological samples. Maximum initial sample volumes range from 1 ml to 4 ml. They can be effectively used in either swing bucket or fixed angle rotors accepting 15 ml centrifuge tubes.

The patented vertical membrane design and thin channel filtration chamber (US 5,647,990) minimises membrane fouling and provides high speed concentrations, even with particle laden solutions.

Vivaspin 4 is available with the high flux polyethersulfone membrane range which is recommended for most solutions.



Technical specifications	Vivaspin 4
Concentrator capacity	
Swing bucket rotor	4 ml
Fixed angle rotor	4 ml
Dimensions	
Total length	122 mm
Width	17 mm
Active membrane area	2.0 cm^2
Hold-up volume of membrane	<10 µl
Dead stop volume	20 µl
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polypropylene
Concentrator cap	Polycarbonate
Membrane	Polyethersulfone

Vivaspin 4

Equipment required	Vivaspin 4	
Centrifuge		
Rotor type	Swing bucket	Fixed angle
Minimum rotor angle	-	25°
Rotor cavity	To fit 15 ml (17 mm) conical bottom tubes	To fit 15 ml (17 mm) conical bottom tubes
Maximum speed	4,000 g	10,000 g*
Concentrate recovery		
Pipette type	Fixed or variable volume	Fixed or variable volume
Recommended tip	Thin gel loader type	Thin gel loader type

* Please note, devices with membrane MWCO >100,000 kDa need to be processed at lower g forces. See data sheets for details.

Typical performance	Time to concentrate 30x min. at 20˚C and solute recovery %	
Rotor	Fixed angle	
Centrifugal force	5,000 g	
Start volume	4 ml	
	Min.	Rec.
BSA 1.0 mg/ml (66,000 MW)		
5,000 MWCO PES	15	96%
10,000 MWCO PES	10	96%
30,000 MWCO PES	10	95%
IgG 0.25 mg/ml (160,000 MW)		
30,000 MWCO PES	10	95%
50,000 MWCO PES	10	95%
100,000 MWCO PES	10	95%

Ordering information		
Vivaspin 4 Polyethersulfone	Pack size	Prod. no.
5,000 MWCO	25	VS0413
5,000 MWCO	100	VS0414
10,000 MWCO	25	VS0403
10,000 MWCO	100	VS0404
30,000 MWCO	25	VS0423
30,000 MWCO	100	VS0424
50,000 MWCO	25	VS0433
50,000 MWCO	100	VS0434
100,000 MWCO	25	VS0443
100,000 MWCO	100	VS0444
0.2 µm	25	VS0473
0.2 µm	100	VS0474
Starter pack (5 of each 5 k, 10 k, 30 k, 50 k, 100 k)	25	VS04S3

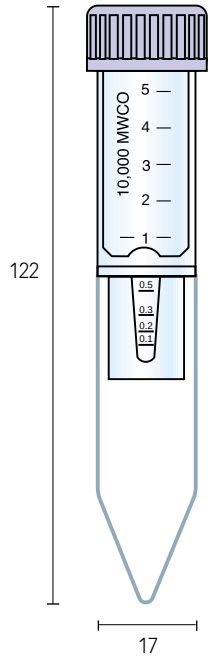
Vivaspin 6

2 - 6 ml samples

Vivaspin 6 ml concentrators have been developed to offer increased volume flexibility and performance.

Vivaspin 6 can process an impressive 6 ml in either swing bucket or fixed angle rotors accepting standard 15 ml conical bottom test tubes.

The Vivaspin 6 features twin vertical membranes for unparalleled filtration speeds and 100x plus concentrations. Remaining volume is easy to read off the printed scale on the side of the concentrator and the modified dead stop pocket further simplifies direct pipette recovery of the final concentrate.



Technical specifications	Vivaspin 6
Concentrator capacity	
Swing bucket rotor	6 ml
Fixed angle rotor	6 ml
Dimensions	
Total length	122 mm
Width	17 mm
Active membrane area	2.5 cm^2
Hold-up volume of membrane	<10 µl
Dead stop volume	30 µl
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polycarbonate
Concentrator cap	Polypropylene
Membrane	Polyethersulfone

Vivaspin 6

Equipment required	Vivaspin 6	
Centrifuge		
Rotor type	Swing bucket	Fixed angle
Minimum rotor angle	-	25°
Rotor cavity	To fit 15 ml (17 mm) conical bottom tubes	To fit 15 ml (17 mm) conical bottom tubes
Maximum speed	4,000 g	10,000 g*
Concentrate recovery		
Pipette type	Fixed or variable volume	Fixed or variable volume
Recommended tip	Thin gel loader type	Thin gel loader type

* Please note, devices with membrane MWCO >100,000 kDa need to be processed at lower g forces. See data sheets for details.

Typical performance	Time to concentrate 30x min. at 20˚C and solute recovery %			
Rotor	Swing bucket		25˚ Fixed angle	
Centrifugal force	3,000 g		7,500 g	
Start volume	6 ml		6 ml	
	Min.	Rec.	Min.	Rec.
Cytochrome c 0.25 mg/ml (12,400 MW)				
5,000 MWCO PES	-	-	90	97 %
BSA 1.0 mg/ml (66,000 MW)				
5,000 MWCO PES	20	98 %	12	98 %
10,000 MWCO PES	13	98 %	10	98 %
30,000 MWCO PES	12	98 %	9	97 %
IgG 0.25 mg/ml (160,000 MW)				
30,000 MWCO PES	18	96 %	15	95 %
50,000 MWCO PES	17	96 %	14	95 %
100,000 MWCO PES	15	91 %	12	91 %
Latex beads 0.004 % in DMEM +10 % FCS (0.055 µm)				
300,000 MWCO PES	-	-	25	99 %
Latex beads 0.004 % in DMEM +10 % FCS (0.24 µm)				
1,000,000 MWCO PES	-	-	4	99 %
Yeast 1.0 mg/ml (S. Cerevisiae)				
0.2 µm PES	4	97 %	3	97 %

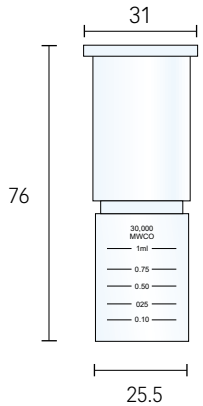
Ordering information					
Vivaspin 6 Polyethersulfone					
	Pack size	Prod. no.		Pack size	Prod. no.
5,000 MWCO	25	VS0611	100,000 MWCO	100	VS0642
5,000 MWCO	100	VS0612	300,000 MWCO	25	VS0651
10,000 MWCO	25	VS0601	300,000 MWCO	100	VS0652
10,000 MWCO	100	VS0602	1,000,000 MWCO	25	VS0661
30,000 MWCO	25	VS0621	1,000,000 MWCO	100	VS0662
30,000 MWCO	100	VS0622	0.2 µm	25	VS0671
50,000 MWCO	25	VS0631	0.2 µm	100	VS0672
50,000 MWCO	100	VS0632	Starter pack	25	VS06S1
100,000 MWCO	25	VS0641	(5 of each 5 k, 10 k, 30 k, 50 k, 100 k)		

Vivaspin 15

2 - 15 ml samples

The Vivaspin 15 concentrator is a disposable ultrafiltration device for use in swing bucket centrifuges accommodating 50 ml tubes. Vivaspin 15 is used for the concentration of biological samples in the 2 - 15 ml range. The innovative design (US Patent no. 5,647,990, second patent pending), simplicity, speed and exceptional concentrate recoveries are the main features of the concentrator.

In a single spin, 15 ml solutions can be concentrated up to 300x. Samples can be typically concentrated in 10-30 minutes with macromolecular recoveries in excess of 95%. The longitudinal membrane location and adjacent thin channel, provide optimum cross flow conditions even for particle laden solutions, the centrifugal force pulling particles and solids away from the membrane to the bottom of the device. Macromolecules collect in an impermeable 50 µl concentrate pocket integrally moulded below the membrane surface, thereby eliminating the risk of filtration to dryness.



Technical specifications	Vivaspin 15
Concentrator capacity	
Swing bucket rotor	15 ml
Fixed angle rotor	8 ml
Dimensions	
Total length	76 mm
Width	25.5 mm
Active membrane area	4 cm^2
Hold up volume of membrane	<20 µl
Dead stop volume	50 µl
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polypropylene
Concentrator cap	Polycarbonate
Membrane	Polyethersulfone

Vivaspin 15

Equipment required	Vivaspin 15	
Centrifuge		
Rotor type	Swing bucket	Fixed angle
Minimum rotor angle	-	25°
Rotor cavity	To fit 15 ml (17 mm) conical bottom tubes	To fit 15 ml (17 mm) conical bottom tubes
Maximum speed	3,000 g*	3,000 g
Concentrate recovery		
Pipette type	Fixed or variable volume	Fixed or variable volume
Recommended tip	Thin gel loader type	Thin gel loader type

* Please note, devices with membrane MWCO >100,000 kDa need to be processed at lower g forces. See data sheets for details.

Typical performance	Time to concentrate 30x min. at 20˚C and solute recovery %	
Rotor	Fixed angle	
Centrifugal force	2,000 g	
Start volume	15 ml	
	Min.	Rec.
BSA 1 mg/ml (66,000 MW)		
5,000 MWCO	40	97%
10,000 MWCO	25	97%
30,000 MWCO	25	96%
50,000 MWCO	25	96%
100,000 MWCO	15	70%
Cytochrome c 0.25 mg/ml (12,400 MW)		
5,000 MWCO	55	97%
10,000 MWCO	45	95%
30,000 MWCO	45	59%
50,000 MWCO	45	40%
100,000 MWCO	20	16%
IgG 0.25 mg/ml (160,000 MW)		
30,000 MWCO	30	94%
50,000 MWCO	30	94%
100,000 MWCO	30	90%
Yeast 1.0 mg/ml (S. Cerevisiae)		
100,000 MWCO	15	98%
0.2 µm PES	7	95%

Ordering information - Requires 50 ml centrifuge tubes

Vivaspin 15 Polyethersulfone	Pack size	Prod.no.
5,000 MWCO	10	VS1511
5,000 MWCO	40	VS1512
10,000 MWCO	10	VS1501
10,000 MWCO	40	VS1502
30,000 MWCO	10	VS1521
30,000 MWCO	40	VS1522
50,000 MWCO	10	VS1531
50,000 MWCO	40	VS1532

	Pack size	Prod.no.
100,000 MWCO	10	VS1541
100,000 MWCO	40	VS1542
0.2 µm	10	VS1571
0.2 µm	40	VS1572
Starter pack (2 of each 5 k, 10 k, 30 k, 50 k, 100 k)	10	VS15S1
Accessories		
Conical bottom 50 ml tubes and lids	100	VSA001

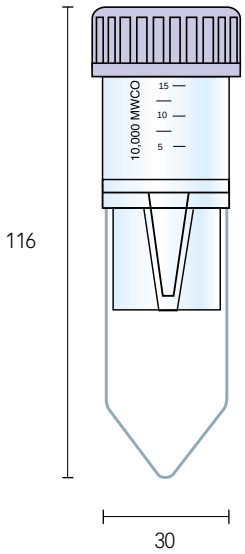
Vivaspin 15R

New

2 - 15 ml samples

Vivaspin 15R is the latest member of the Vivaspin product family with all the unique features of Vivascience concentrators including a patented vertical membrane and a dead stop. Vivaspin 15R is targeting the volume segment 2 to 15 ml with a modified regenerated cellulose membrane; Hydrosart®. This membrane is ideal where extremely high recovery with very low adsorption is needed, for example in applications such as desalting and concentration of Ig fractions.

- Ultimate recovery at low Adsorption (95-98%)
- Extremely short concentration time (30x in 15 min.)
- Convenient application protocol with easy handling
- Easy scale-up to Vivaflow 200 with Hydrosart® membrane for volumes up to 5 litres
- Very small hold up volume (< 20 µl)



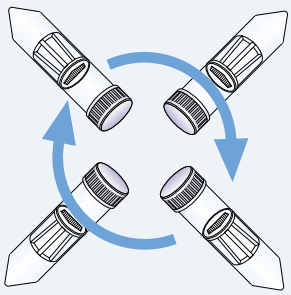
Technical specifications	Vivaspin 15R
Concentrator capacity	
Swing bucket rotor	15 ml
Fixed angle rotor	12.5 ml
Dimensions	
Total length	116 mm
Width	30 mm
Active membrane area	3.9 cm^2
Hold up volume membrane	< 20 µl
Dead stop volume	30 µl
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polypropylene
Concentrator cap	Polycarbonate
Membrane	Hydrosart

Vivaspin 15R

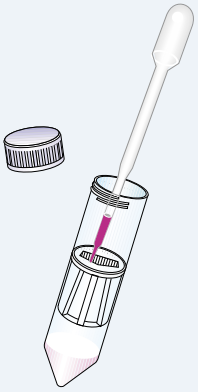
Equipment required	Vivaspin 15R	
Centrifuge		
Rotor type	Swing bucket	Fixed angle
Minimum rotor angle	-	25°
Rotor cavity	To fit 50 ml (30 mm) conical bottom tubes	To fit 50 ml (30 mm) conical bottom tubes
Maximum speed	3,000 g	6,000 g
Concentrate recovery		
Pipette type	Fixed or variable volume	Fixed or variable volume
Recommended tip	Thin gel loader type	Thin gel loader type

Typical performance	Time to concentrate 30x min. at 20˚C and solute recovery %			
Rotor	Swing bucket		25˚ Fixed angle	
Centrifugal force	3,000 g		6,000 g	
Start volume	15 ml		12.5 ml	
	Min.	Rec.	Min.	Rec.
Aprotinin 0.1 mg/ml* (6,500 MW)				
5,000 MWCO	47	95 %	45	95 %
Cytochrome c 0.25 mg/ml* (12,400 MW)				
5,000 MWCO	45	96 %	45	96 %
10,000 MWCO	25	94 %	18	94 %
α-chymotrypsin 0.25 mg/ml* (25,000 MW)				
5,000 MWCO	50	98 %	45	98 %
10,000 MWCO	25	98 %	18	98 %
Ovalbumin 1.0 mg/ml* (45,000 MW)				
10,000 MWCO	20	98 %	14	98 %
30,000 MWCO	15	94 %	12	94 %
BSA 1.0 mg/ml* (66,000 MW)				
30,000 MWCO	18	98 %	15	98 %
IgG 0.1 mg/ml*in DMEM (160,000 MW)				
30,000 MWCO	30	98 %	25	96 %

* proteins other than IgG made up in 50 mM potassium phosphate, 150 mM sodium chloride, pH 7.4



Spin



Recover

Ordering information		
Vivaspin 15R Hydrosart	Pack size	Prod. no.
5,000 MWCO	12	VS15RH11
5,000 MWCO	48	VS15RH12
10,000 MWCO	12	VS15RH01
10,000 MWCO	48	VS15RH02
30,000 MWCO	12	VS15RH21
30,000 MWCO	48	VS15RH22

Vivaspin 20

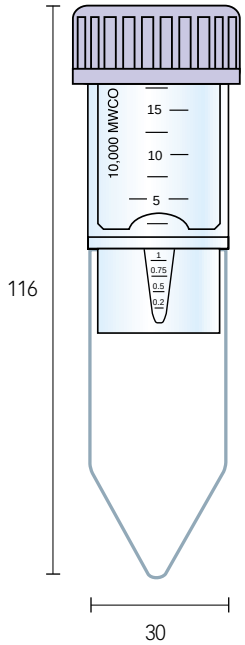
5 - 20 ml samples

Vivaspin 20 ml centrifugal concentrators have been developed to offer increased volume flexibility and performance.

Vivaspin 20 handles up to 20 ml in swing bucket centrifuges and 14 ml in 25˚ fixed angle rotors accepting 50 ml centrifuge tubes.

Featuring twin vertical membranes for unparalleled filtration speeds the Vivaspin 20 can achieve 100x plus concentrations.

Remaining volume is easy to read off the printed scale on the side of the concentrator and the modified dead stop pocket further simplifies direct pipette recovery of the final concentrate.

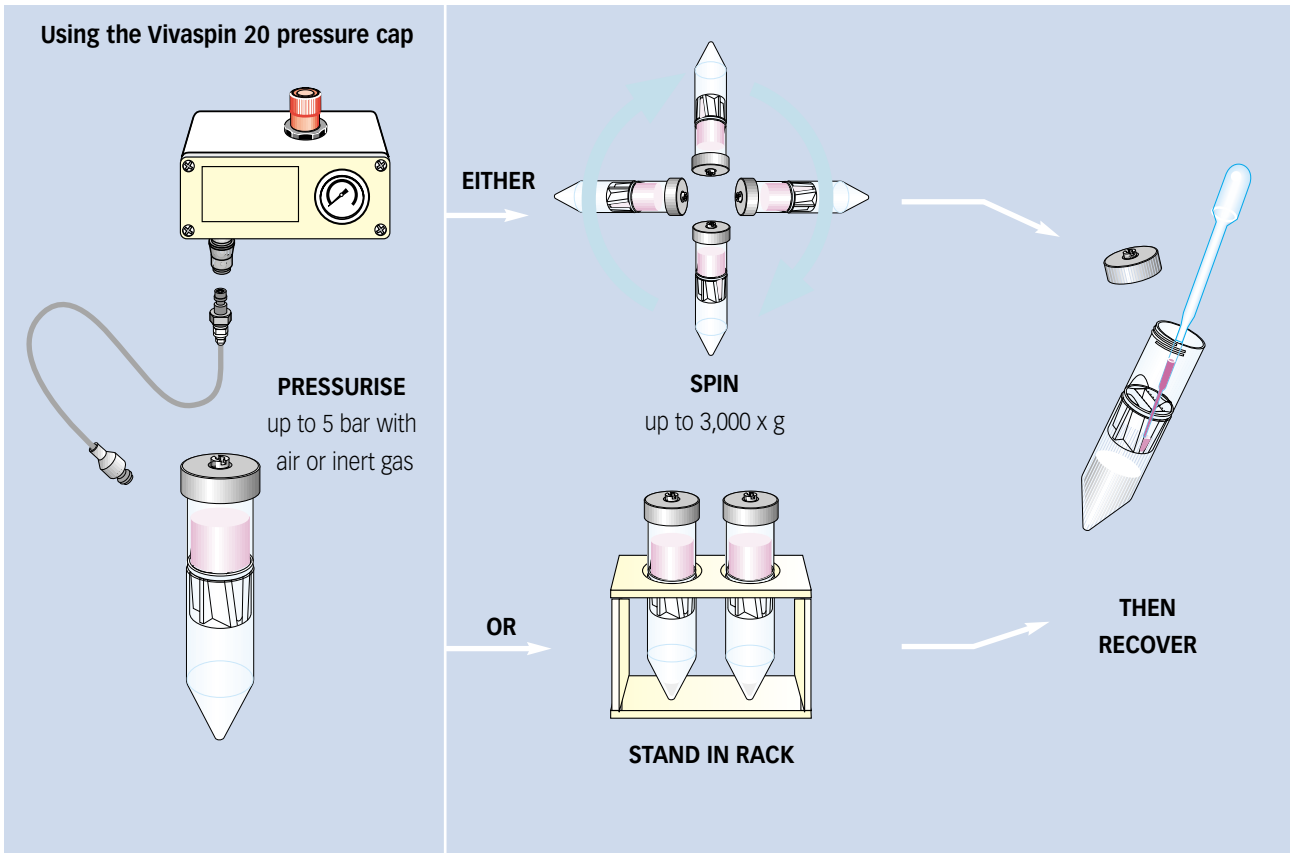


Technical specifications	Vivaspin 20
Concentrator capacity	
Swing bucket rotor	20 ml
Fixed angle rotor	14 ml
With pressure head	15 ml
Dimensions	
Total length	116 mm
	125 mm with pressure head
Width	30 mm
Active membrane area	6.0 cm^2
Hold up volume of membrane	< 20 µl
Dead stop volume	50 µl
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polycarbonate
Concentrator cap	Polypropylene
Pressure head	Acetal/aluminium
Membrane	Polyethersulfone

Vivaspin 20

More process flexibility
Vivaspin 20 is available with unique accessories and operating methods that are designed to provide more process flexibility and further time saving.

Gas pressure filtration
When an appropriate centrifuge is unavailable, or for single sample processing, Vivaspin 20 can be filled with up to 15 ml and then pressurised for bench top concentration. For even faster processing, gas pressure can be combined with centrifugal force. "pressure-fugation" is particularly suitable for difficult or viscous samples such as serum, or when using a low process temperature which reduces filtration speed, and generally when minimum process time is essential.

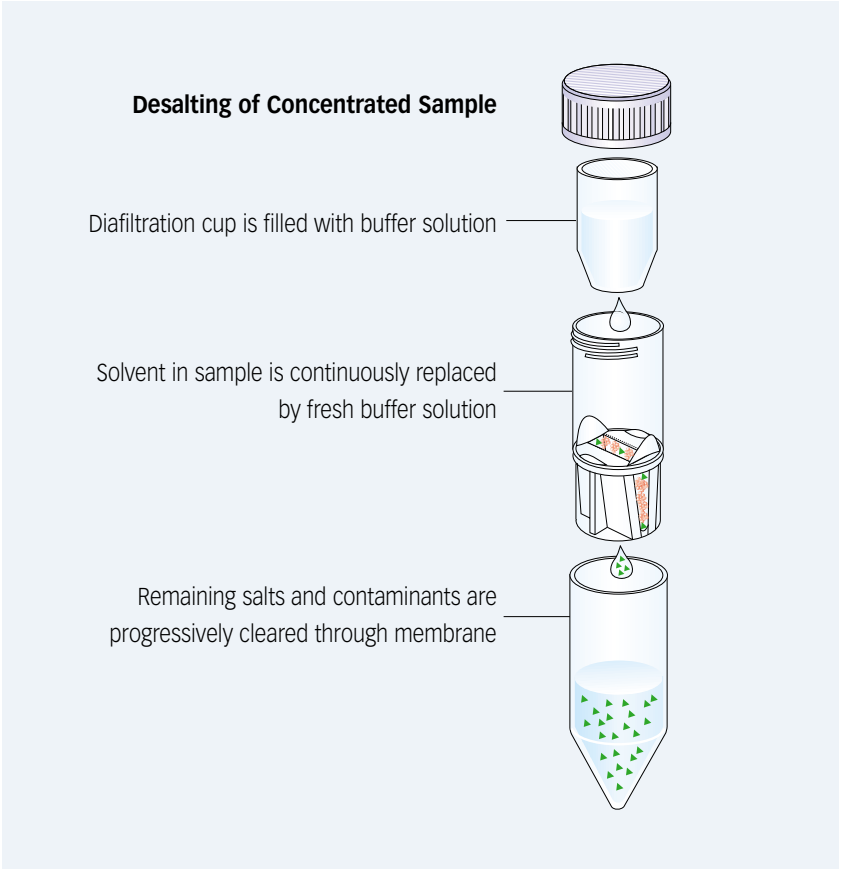


Vivaspin 20

One step desalting

In this procedure following concentration, a diafiltration cup is filled with buffer and then spun one time to achieve 98% salt removal. This compares to the need for two spins to achieve the same result with the traditional refill and re-spin procedure.

The improved performance is due to the constant washing action of the buffer solution in the diafiltration cup as it replaces solvent and salts as they pass through the ultrafiltration membrane.



Equipment required	Vivaspin 20	
Centrifuge		
Rotor type	Swing bucket	Fixed angle
Minimum rotor angle	-	25°
Rotor cavity	To fit 50 ml (30 mm) conical bottom tubes	To fit 50 ml (30 mm) conical bottom tubes
Maximum speed	5,000 g*	8,000 g*
Optional pressure accessories		
Air pressure controller (APC) complete with pressure gauge, regulator, over-pressure safety valve, female connector to Vivascience pressure products and 1m extension line (4 mm pneumatic tubing) with male and female connectors and 1 m of 6 mm inlet tubing		Prod no. VCA002
Charge valve		Prod no. VCA005
VS20 pressure head		Prod. no.VCA200
Concentrate recovery		
Pipette type	Fixed or variable volume	Fixed or variable volume
Recommended tip	Thin gel loader type	Thin gel loader type

* Please note, devices with membrane MWCO >100,000 kDa need to be processed at lower g forces. See data sheets for details.

Vivaspin 20

Typical performance	Time to concentrate 30x min. at 20˚C and solute recovery %							
Mode	Centrifuge		Centrifuge		Bench top		Press-fuge	
Rotor	Swing bucket		25˚ Fixed angle		Pressure		Swing bucket	
Centrifugal speed/pressure	3,000 g		6,000 g		4 bar		3,000 g + 4 bar	
Start volume	20 ml		14 ml		10 ml		10 ml	
	Min.	Rec.	Min.	Rec.	Min.	Rec.	Min.	Rec.
Cytochrome c 0.25 mg/ml (12,400 MW)								
3,000 MWCO PES	110	97 %	180	96 %	60	96 %	-	-
BSA 1.0 mg/ml (66,000 MW)								
5,000 MWCO PES	23	99 %	29	99 %	50	98 %	14	98 %
10,000 MWCO PES	16	98 %	17	98 %	32	97 %	8	97 %
30,000 MWCO PES	13	98 %	15	98 %	32	97 %	8	97 %
IgG 0.25 mg/ml (160,000 MW)								
30,000 MWCO PES	27	97 %	20	95 %	46	94 %	13	97 %
50,000 MWCO PES	27	96 %	22	95 %	46	93 %	13	96 %
100,000 MWCO PES	25	91 %	20	90 %	42	88 %	12	94 %
Latex beads 0.004 % in DMEM +10 % FCS (0.055 µm)								
300,000 MWCO PES	20	99 %	35	99 %	10	99 %	-	-
Latex beads 0.004 % in DMEM +10 % FCS (0.24 µm)								
1,000,000 MWCO PES	4	99 %	12	99 %	4	99 %	-	-
Yeast 1.0 mg/ml (S. Cerevisiae)								
0.2 µm PES	15	95 %	5	95 %	20	95 %	2	95 %

Ordering information		
Vivaspin 20 Polyethersulfone	Pack size	Prod. no.
3,000 MWCO	12	VS2091
3,000 MWCO	48	VS2092
5,000 MWCO	12	VS2011
5,000 MWCO	48	VS2012
10,000 MWCO	12	VS2001
10,000 MWCO	48	VS2002
30,000 MWCO	12	VS2021
30,000 MWCO	48	VS2022
50,000 MWCO	12	VS2031
50,000 MWCO	48	VS2032
100,000 MWCO	12	VS2041
100,000 MWCO	48	VS2042
300,000 MWCO	12	VS2051
300,000 MWCO	48	VS2052
1,000,000 MWCO	12	VS2061
1,000,000 MWCO	48	VS2062
0.2 µm	12	VS2071
0.2 µm	48	VS2072
Starter pack (2 of each 5 k, 10 k, 30 k, 50 k, 100 k, 0.2 µm)	12	VS20S1
Vivaspin 20 accessories		
Air pressure controller (APC)	1	VCA002
Charge valve for pressure head	1	VCA005
Diafiltration cups	12	VSA005
Female connector	1	VCA010
Male connector	1	VCA011
4 mm OD pneumatic tube (3 m)	1	VCA012
Vivaspin 20 pressure head	1	VCA200

Vivacell 70

10 - 70 ml samples

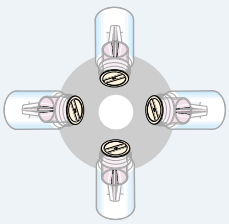
Vivacell 70 combines the ease of use of centrifugal devices with the flexibility and control provided by pressurised ultrafiltration cells. Vivacell 70 is inexpensive, quick and easy to assemble, requires no tubing connections or stirring mechanisms and can be adapted to equipment availability or to specific user preferences.

For convenience, simply spin in a large capacity centrifuge (rotors accepting 250 ml bottles). For highest speeds particularly with difficult samples, pressurise the device with air or inert gas before centrifuging.

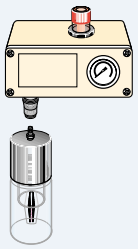
For more process control or for single samples, combine gas pressure with a gentle orbital shake, or you can even pressurise and then leave standing on a bench top or in a refrigerator for highest simplicity with minimum equipment requirements.

The longitudinal membrane inhibits fouling, whilst the built-in dead stop will hinder further concentration when residual volume drops below 150 µl.

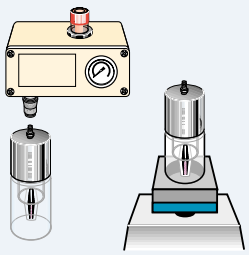
Centrifuge
- Process convenience
- Low shear, no foaming
- Less visual control



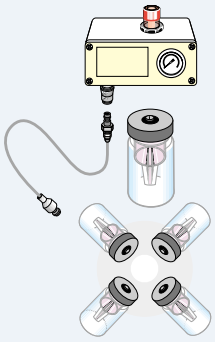
Pressurise
- Simplicity and highest process control
- Ideal for refrigerated use
- Slower concentrations



Pressure-shake
- Speed and process control
- Ideal for single samples
- If left unattended can concentrate to dryness

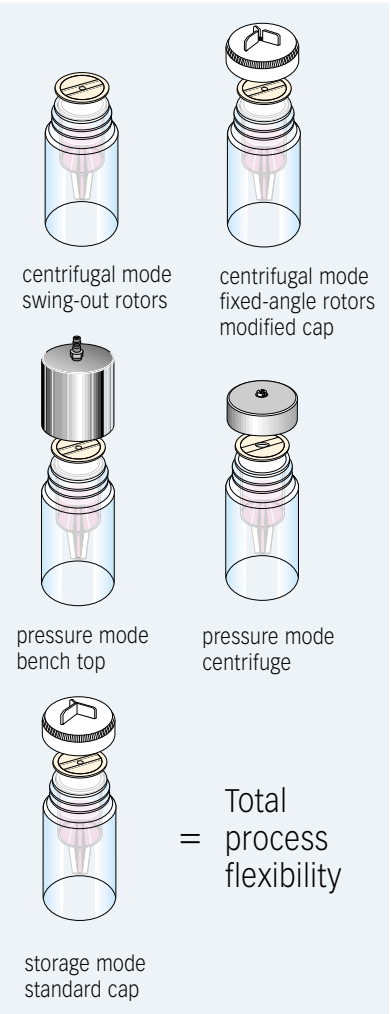


Pressure-fuge
- Fastest processing
- Ideal with low MWCO or with difficult solutions
- Less visual control



Vivacell 70

Technical specifications	Vivacell 70
Concentrator capacity	
Swing bucket rotor	70 ml
Fixed angle rotor	50 ml
With pressure head	70 ml
With pressure-fuge head	50 ml
Dimensions	
Total length	119 mm standard centrifugal 185 mm with pressure head 125 mm with pressure fuge head
Width	62 mm
Active membrane area	20 cm^2
Hold up volume of membrane	<200 µl
Dead stop volume	150 µl
Operating requirements	
Rotor type	Swing bucket or fixed angle
Minimum rotor angle	25 °
Rotor cavity	To fit 250 ml (62 mm) centrifuge bottles
Maximum speed	1,000 g
Maximum pressure	5 bar (75 psi)
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polycarbonate
Concentrator cap	Santoprene
Pressure head/pressure fuge head	Acetal
Membrane	Polyethersulfone



Typical performance	Time to concentrate 30x min at 20˚C				
50ml Start volume	In centrifuge 1,000 g		As pressure cell 4 bar (60 psi) pressure		Solute
	No pressure	3 bar pressure	No agitation	Orbital shake	recovery %
BSA 1.0 mg/ml (66,000 MW)					
5,000 MWCO PES	37	18	50	25	96 %
10,000 MWCO PES	25	15	45	20	96 %
30,000 MWCO PES	22	13	45	20	93 %
IgG 0.25 mg/ml (160,000 MW)					
50,000 MWCO PES	25	15	85	20	94 %
100,000 MWCO PES	15	11	90	18	90 %

Vivacell 70

Ordering information		
Vivacell 70 Polyethersulfone - concentrator bodies with polycarbonate filtrate bottles	Pack size	Prod. no.
5,000 MWCO	2	VS6011
10,000 MWCO	2	VS6001
30,000 MWCO	2	VS6021
50,000 MWCO	2	VS6031
100,000 MWCO	2	VS6041
0.2 µm	2	VS6071
Vivacell 70 Polyethersulfone - concentrator body only		
5,000 MWCO	10	VS6012
10,000 MWCO	10	VS6002
30,000 MWCO	10	VS6022
50,000 MWCO	10	VS6032
100,000 MWCO	10	VS6042
0.2 µm	10	VS6072
Vivacell 70 accessories		
Air pressure controller (APC) complete with pressure gauge, regulator, over-pressure safety valve, female connector to Vivascience pressure products and 1 m extension line (4 mm pneumatic tubing) with male and female connectors and 1 m of 6 mm inlet tubing	1	VCA002
250 ml centrifuge bottle - standard caps	4	VSA003
Modified caps for use in fixed angle rotors with 250 ml centrifuge bottles	2	VCA004
Charge valve for pressure-fuge head	1	VCA005
Replacement seals for pressure-fuge head (VCA701)	10	VCA007
Female connector	1	VCA010
Male connector	1	VCA011
4 mm pneumatic tubing (3 m)	1	VCA012
Vivacell 70 pressure head with reservoir and filtrate bottle (bench top use)	1	VCA700
Vivacell 70 pressure-fuge head (for use in centrifuge)	2	VCA701

Vivacell 100

New

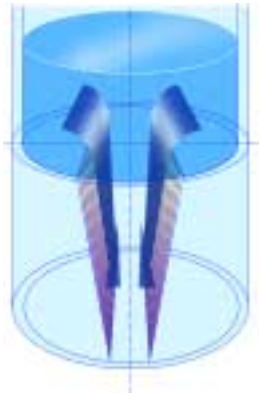
20 - 100 ml Samples

Vivacell 100 is the latest member of the Vivacell family and bridges the volume range between the Vivacell 70 and the Vivacell 250.

The patented vertical membrane design allows highest performance and unmatched flexibility.

Vivacell 100 is a unique and innovative concentrator for volumes from 20 ml to 100 ml, which utilizes pressure, centrifuge or pressure-shake to rapidly concentrate even samples with very high particle loading.

Vivacell 100 is designed for centrifugal concentration of samples up to 100 ml which makes it the largest centrifugal unit available. At the same time, the new construction design allows for maximum centrifugal force of 4,000x g to be used for even faster concentration.

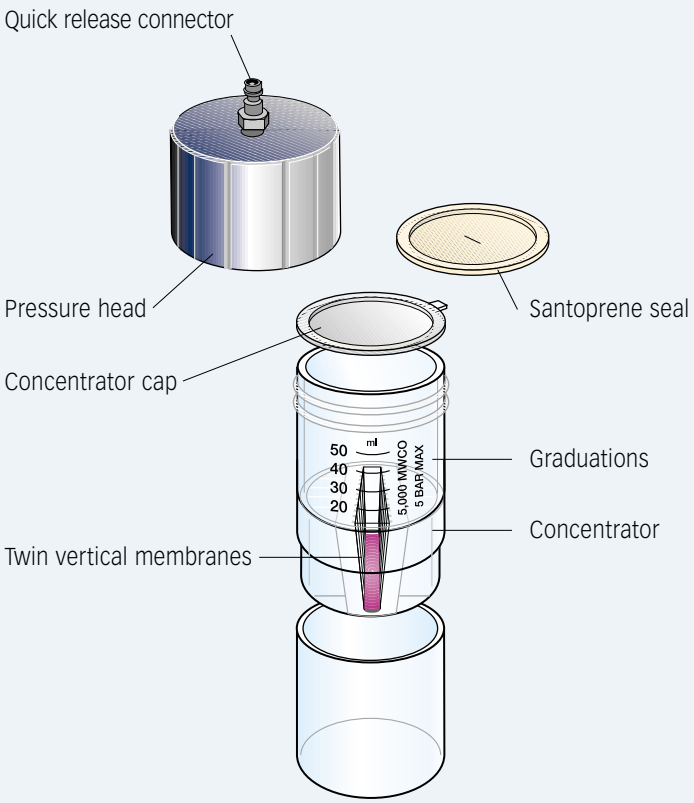


Vivacell 100 utilizes:

- Pressure
- Centrifuge
- Pressure-shake

Technical specifications	Vivacell 100
Concentrator capacity	
Swing bucket rotor	90 ml
With pressure head	98 ml
Dimensions	
Total length	123 mm centrifugal 197 mm with pressure head
Width	62 mm
Active membrane area	23.5 cm^2
Hold up volume of membrane	<250 µl
Dead stop volume	350 µl
Operating requirements	
Rotor type	Swing bucket
Rotor cavity	To fit 250 ml (62 mm) centrifuge bottles (maximum cavity depth 105 mm)
Maximum speed	2,000 g
Maximum pressure	5 bar (75 psi)
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polycarbonate
Concentrator cap	Santoprene
Pressure head	Acetal
Membrane	Polyethersulfone

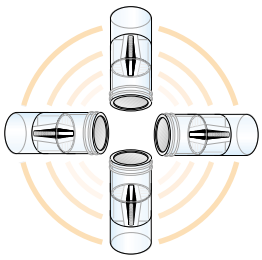
Vivacell 100



Filtrate container fits standard 250 ml rotors

Like the smaller Vivacell 70 unit, Vivacell 100, when used as a centrifugal device, fits into swing bucket rotors accepting 250 ml bottles.

Vivacell 100 units can also be used for single or extremely sensitive samples in the pressurized mode only and left on the bench or placed on a laboratory shaker for faster concentration. It can also be kept in a pressurized mode in the refrigerator. Handling is made easy by use of quick connectors. In whichever mode Vivacell 100 is used, the vertical membrane design inhibits membrane fouling while the built-in dead stop impedes concentration to dryness and loss of sample.

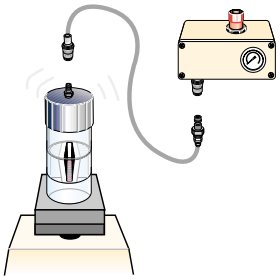


Centrifuge

- Process convenience
- Low shear, no foaming
- Less visual control

Pressure

- Simplicity and highest process control
- Ideal for refrigerated use
- Slower concentrations



Pressure-shake

- Speed and process control
- Ideal for single samples

Vivacell 100

Typical performance	Time to concentrate 30x min. at 20˚ C			
90 ml start volume	In centrifuge 2,000 g	As pressure cell 4 bar (60 psi) pressure		Solute
	swing out rotor	No agitation	Orbital shake	recovery %
BSA 1.0 mg/ml (66,000 MW)				
5,000 MWCO PES	22	75	25	96 %
10,000 MWCO PES	16	60	20	96 %
30,000 MWCO PES	16	60	20	94 %
IgG 0.25 mg/ml (160,000 MW)				
50,000 MWCO PES	20	70	30	94 %
100,000 MWCO PES	20	85	30	90 %
Latex beads 0.004 % in DMEM + 10 % FCS (0.055 µm)				
300,000 MWCO PES	35	-	120	99 %
Latex beads 0.004 % in DMEM + 10 % FCS (0.24 µm)				
1,000,000 MWCO† PES	4	5	4	99 %

†2,000 g in centrifuge, 2 bar (29 psi) pressure

Ordering information					
Vivacell 100 Polyethersulfone					
With Polypropylene concentrator cap	Pack size	Prod. no.	Accessories	Pack size	Prod. no.
5,000 MWCO	2	VC1011	Air pressure controller (APC) complete with pressure gauge, regulator, over-pressure safety valve, female connector, 1 m extension line (4 mm pressure tubing) with male and female connectors and 1 m of 6 mm inlet tubing	1	VCA002
5,000 MWCO	10	VC1012			
10,000 MWCO	2	VC1001			
10,000 MWCO	10	VC1002			
30,000 MWCO	2	VC1021			
30,000 MWCO	10	VC1022			
50,000 MWCO	2	VC1031			
50,000 MWCO	10	VC1032	Plastic pipettes	100	VPA005
100,000 MWCO	2	VC1041	Female connector	1	VCA010
100,000 MWCO	10	VC1042	Male connector	1	VCA011
300,000 MWCO	2	VC1051	4 mm pressure tubing (3 m)	1	VCA012
300,000 MWCO	10	VC1052	Santoprene replacement seals	10	VCA014
1,000,000 MWCO	2	VC1061	Vivacell 100 pressure head with replacement seals (5)	1	VCA800
1,000,000 MWCO	10	VC1062			
0.2 µm	2	VC1071			
0.2 µm	10	VC1072			

New features

50 - 250 ml samples

The Vivacell 250 is a totally new concept for the concentration of larger biological samples. This product offers numerous advantages when compared to stirred cells.

- One size handles a volume range from under 50 ml to 250 ml.
- Use free standing on a bench top or in a refrigerator for maximum simplicity, or use on laboratory shaker for fastest concentrations.
- The unique conical dead stop built into the bottom of the membrane insert allows concentrations to under 1 ml.
- The gentle vortex action controls membrane polarisation whilst greatly reducing the shear effects typical of stirring mechanisms.
- Set up or membrane replacement takes just a few seconds. Quick connect fittings and simple screw closure further enhance ease of use.

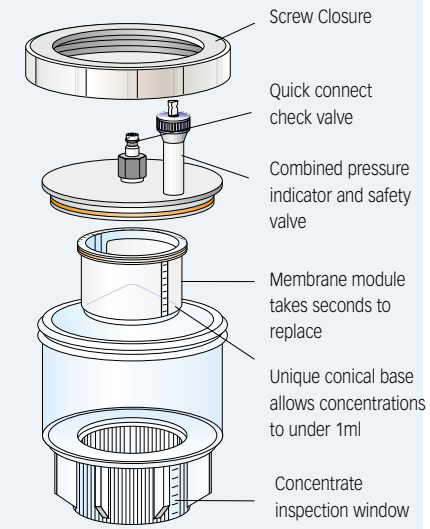
Unique membrane module takes seconds to replace. Concentrate can be easily monitored through the graduated inspection window.

Technical specifications	Vivacell 250
Concentrator capacity	250 ml
Max pressure	4 bar (60 psi)
Dimensions	
Width	116 mm
Height (incl. pressure indicator)	235 mm
Active membrane area	40 cm^2
Hold-up vol. memb. & support	<200 µl
Dead stop volume	600 µl
Materials of construction	
Screw closure	Acetal
Pressure head	Acetal
Quick release connector	Acetal
Concentrator body/sleeve	Polycarbonate
Filtrate container	Polycarbonate

Vivacell 250

Typical performance	Time to concentrate 20x min. at 20˚C 4 bar pressure					
	100 ml start volume			250 ml start volume		
	Orbital shake	Free standing	Solute recovery %	Orbital shake	Free standing	Solute recovery %
BSA 1.0 mg/ml (66,000 MW)						
5,000 MWCO PES	19	70	98 %	40	140	99 %
10,000 MWCO PES	12	45	97 %	28	100	98 %
30,000 MWCO PES	12	45	96 %	28	100	98 %
γ Globulins 0.25 mg/ml (160,000 MW)						
30,000 MWCO PES	25	120	96 %	55	240	98 %
50,000 MWCO PES	25	120	94 %	55	240	98 %
100,000 MWCO PES	25	120	96 %	58	240	98 %

Ordering information		
Vivacell 250	Pack size	Prod. no.
Vivacell 250 complete with pressure head, pressure indicator/over-pressure release valve, quick release connection to APC, 2 sample reservoirs, filtrate container & insert tool	1	VCA250
Vivacell 250 Polyethersulfone inserts		
5,000 MWCO	5	VC2511
10,000 MWCO	5	VC2501
30,000 MWCO	5	VC2521
50,000 MWCO	5	VC2531
100,000 MWCO	5	VC2541
0.2 µm	5	VC2571
Starter kit (1 of each 5 k, 10 k, 30 k, 50 k, 100 k)	5	VC25S1
Accessories		
Air pressure controller (APC) complete with pressure gauge, regulator, over-pressure safety valve, female connector to Vivascience pressure products and 1 m extension line (4 mm pneumatic tubing) with male and female connector and 1 m of 6 mm inlet tubing	1	VCA002
Replacement pressure indicator/over pressure relief valve	1	VCA008
Vivacell 250 maintenance kit (includes one sample reservoir and filtrate container, and “O” ring seals for pressure head)	1	VCA009
Female connector	1	VCA010
Male connector	1	VCA011
4 mm OD pressure tubing (3 m)	1	VCA012
Replacement pressure head & screw closure	1	VCA015



New design

100 ml to 5 litres and more

The novel Vivaflow 50 system (patents pending) provides a standard of ease of use, performance, flexibility and economy which is unrivalled by any laboratory or pilot scale filtration system on the market.

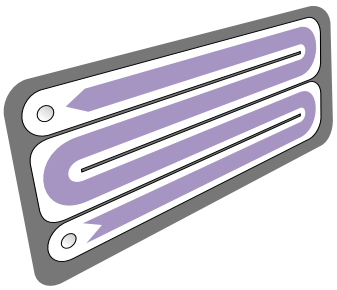
Unique features

- Thin channel flip-flow recirculation path provides high cross flow velocities with minimum pump requirements.
- No need for pressure holders.
- Crystal clear for simple control of remaining hold up and membrane status.
- Unique Interlocking modules with series connectors for easy scale up.
- Disposable.

Unique performance

- A single 50 cm^2 module will typically reduce 500 ml to less than 15 ml in under 50 minutes.
- Less than 10 ml minimum system recirculation for highest concentrations.
- Less than 500 µl non recoverable hold up volume.
- Near total recoveries achievable with a single 10 ml rinse.

Unique "flip-flow" thin channel flow path results in high turbulence and linear velocity for exceptional flux even at high concentrations

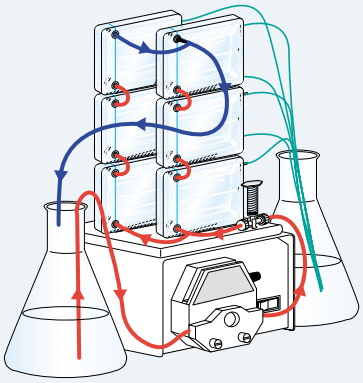


Vivaflow 50

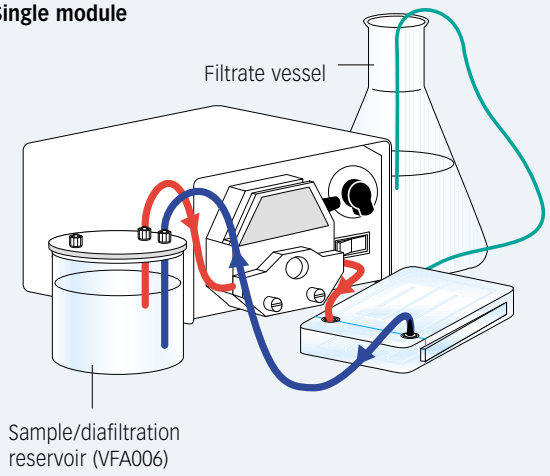
Technical specifications	Vivaflow 50		
Dimensions		Materials of construction	
Overall L/H/W	107/84/25 mm	Main housing	Polycarbonate
Channel W/H	15 mm/0.3 mm	Flow channel	TPX (PMP)
Active membrane area	50 cm^2	Membrane support	TPX (PMP)
Hold up volume (module)	1.5 ml	Seals and O rings	Silicone
Minimum recirculation volume	<10 ml	Pressure indicator	Polypropylene, SS spring,
Non recoverable hold-up	<0.5 ml	Flow restrictor	Polypropylene
Operating conditions		Fittings	Nylon
Pump flow	200-400 ml/min	Tubing	PVC (medical grade)
Maximum pressure	3 bar (45 psi)		
Maximum temperature	60˚ C		

Typical Performance	Time to concentrate 20x min. at 3 bar inlet pressure, 20˚ C			
	Single device	Three devices	Solute recovery %	
	250 ml start volume	1 L start volume	Direct	10 ml rinse
BSA 1.0 mg/ml (66,000 MW)				
5,000 MWCO PES	34	49	96 %	> 99 %
10,000 MWCO PES	22	32	94 %	> 99 %
10,000 MWCO RC	38	55	96 %	> 99 %
30,000 MWCO PES	22	32	92 %	99 %
30,000 MWCO RC	13	21	96 %	99 %
50,000 MWCO PES	20	29	92 %	98 %
γ Globulins 1.0 mg/ml (160,000 MW)				
100,000 MWCO PES	43	62	92 %	98 %
100,000 MWCO RC	40	58	92 %	98 %
Yeast 1.0 mg/ml (S.Cerevisiae)				
0.2 µm PES	33	47	92 %	98 %

Multiple modules



Single module



Vivaflow 50

Ordering information		
Vivaflow 50 modules include filtrate tube, size 16 peristaltic tubing, flow restrictor and fittings	Pack size	Prod. no.
3,000 MWCO PES	2	VF05P9
5,000 MWCO PES	2	VF05P1
10,000 MWCO PES	2	VF05P0
30,000 MWCO PES	2	VF05P2
50,000 MWCO PES	2	VF05P3
100,000 MWCO PES	2	VF05P4
0.2 µm PES	2	VF05P7
10,000 MWCO RC	2	VF05C0
30,000 MWCO RC	2	VF05C2
100,000 MWCO RC	2	VF05C4
Vivaflow 50 complete system comprises:		
Pump (240 V), Easy load pump head (size 16), tubing, 500 ml sample/diafiltration reservoir, module stand, pressure indicator, T connectors, series interconnectors	1	VFS502
Pump (115 V), Easy load pump head (size 16), tubing, 500 ml sample/diafiltration reservoir, module stand, pressure indicator, T connectors, series interconnectors	1	VFS504
Vivaflow 50 PVC tubing and fittings		
Size 16 PVC pump tubing (3 metres, 3.2 x 1.6 mm)		VFA004
Flow restrictor set (2 x 0.4, 0.6, 0.8 mm)		VFA009
T connectors for running 2 stacks (2 pieces)		VFA030
Series interconnectors (6 pieces)		VFA031
Female luer fittings (10 pieces)		VFA032
VF50 tubing Kit (2 x 1 m size 16 PVC tubing with inlet fittings, 2 x 50 cm size 16 PVC tubing with 0.6 mm flow restrictors, 1 x series interconnector)		VFA034
Flow restrictor 0.6 mm (6 pieces)		VFA035
VivaFlow 50 accessories		
Masterflex economy drive variable speed peristaltic pump (240V)		VFP001
Masterflex economy drive variable speed peristaltic pump (115V)		VFP002
500 ml sample and/or diafiltration reservoir		VFA006
Masterflex standard pump head - size 16		VFA010
Masterflex easy load pump head - size 16		VFA012
Vivaflow 50 stand		VFA016
Pressure indicator (1-3 bar)		VFA020

New membranes

0.5 to 5 litres and more
Concentrate 250 ml to under 20 ml in just a few minutes or concentrate one litre 50 times in less than 30 minutes. Alternatively, use two Vivaflow 200's in parallel and concentrate 5 litres in under 75 minutes.

Near total sample recoveries can be expected with most solutions.

The economical standard package comes complete with tubing, pressure indicator, flow restrictor and high pressure pump tubing. All you need is a peristaltic pump capable of handling 6.4 mm OD (size 16) tubing. Should your pump head require larger tubing, link your own peristaltic tube up to the standard product, using the interconnector provided.

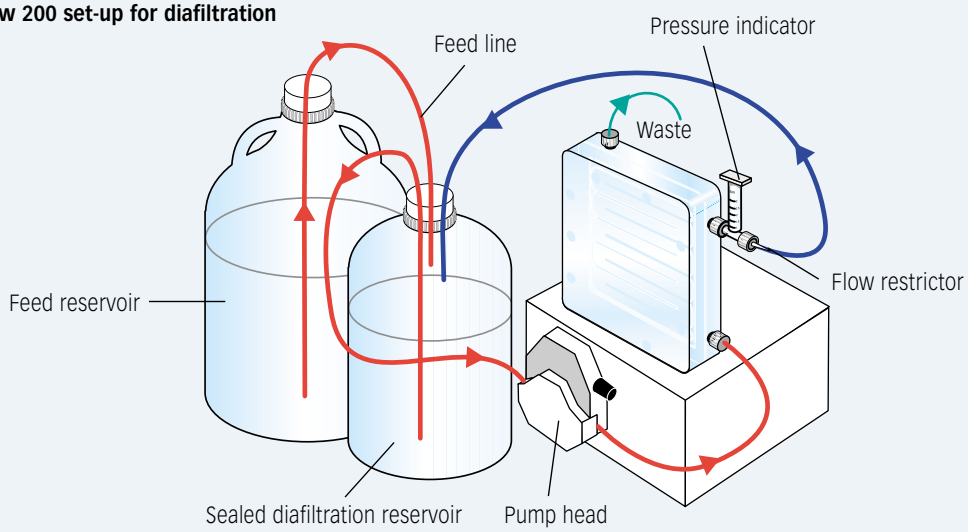
Two modules in parallel will concentrate 5 litres in under 75 minutes

Technical specifications	Vivaflow 200
Dimensions	
Overall L/H/W	126/138/38 mm
Channel W/H	10 mm/0.4 mm
Active membrane area	200 cm^2
Hold up volume (module)	5.3 ml
Min. recirculation volume	< 20 ml
Non recoverable hold-up	< 2 ml
Materials of construction	
Main housing	Acrylic
Flow channel	Acrylic
Membrane support	Polypropylene
Seals and O rings	Silicone
Pressure indicator	Polypropylene, SS spring
Flow restrictor	Polypropylene
Fittings	Nylon
Tubing	PVC (medical grade)
Operating conditions	
Pump flow	200-400 ml/min
Maximum pressure	4 bar (60 psi)
Maximum temperature	60 ˚C

Vivaflow 200

Typical performance	Time to concentrate 20x min. at 3 bar inlet pressure, 20˚ C			
	1 litre start volume	Average flux ml/min	Recovery % direct	25 ml rinse
BSA 1.0 mg/ml (66,000 MW)				
5,000 MWCO PES	29	33	98 %	> 99 %
5,000 MWCO Hydrosart	70	14	98 %	> 99 %
10,000 MWCO PES	23	41	96 %	> 99 %
10,000 MWCO RC	42	23	97 %	> 99 %
10,000 MWCO Hydrosart	35	27	98 %	> 99 %
30,000 MWCO PES	25	38	96 %	99 %
30,000 MWCO RC	22	43	96 %	99 %
30,000 MWCO Hydrosart	20	48	96 %	> 99 %
50,000 MWCO PES	22	43	96 %	98 %
γ Globulins 1.0 mg/ml (average 160,000 MW)				
100,000 MWCO PES	54	18	96 %	99 %
100,000 MWCO RC	45	21	96 %	99 %
Yeast 1.0 mg/ml (S. Cerevisiae)				
0.2 µm PES	11	86	92 %	98 %
Dilute solute concentration, start volume 1 litre at 3 bar, 10,000 MWCO PES				
BSA 0.001 mg/ml	18	52	90 %	98 %
BSA 0.01 mg/ml	20	47	92 %	98 %
BSA 0.1 mg/ml	21	45	94 %	99 %
Start volume 5 litres (two VF200 in parallel at 3 bar) 10,000 MWCO PES				
BSA 1.0 mg/ml (66,000 MW)	67	70	97 %	> 99 %

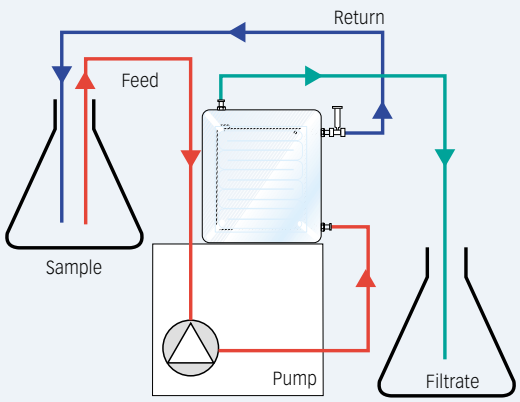
Vivaflow 200 set-up for diafiltration



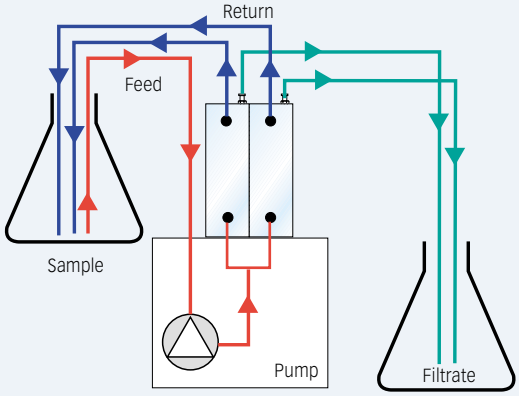
Vivaflow 200

Ordering information		
Vivaflow 200 modules include pressure indicator, flow restrictor and size 16 pvc peristaltic tubing and fittings	Pack size	Prod. no.
5,000 MWCO PES	1	VF20P1
10,000 MWCO PES	1	VF20P0
30,000 MWCO PES	1	VF20P2
50,000 MWCO PES	1	VF20P3
100,000 MWCO PES	1	VF20P4
0.2 µm PES	1	VF20P7
10,000 MWCO RC	1	VF20C0
30,000 MWCO RC	1	VF20C2
100,000 MWCO RC	1	VF20C4
5,000 MWCO Hydrosart	1	VF20H1
10,000 MWCO Hydrosart	1	VF20H0
30,000 MWCO Hydrosart	1	VF20H2
Vivaflow 200 complete system comprises:		
Pump (240 V), Easy load pump head (size 16), tubing, 500 ml sample/diafiltration reservoir	1	VFS202
Pump (115 V), Easy load pump head (size 16), tubing, 500 ml sample/diafiltration reservoir	1	VFS204
Vivaflow 200 accessories		
Masterflex economy drive variable speed peristaltic pump (240V)		VFP001
Masterflex economy drive variable speed peristaltic pump (115V)		VFP002
500 ml sample and/or diafiltration reservoir		VFA006
Masterflex standard pump head - size 16		VFA010
Masterflex standard pump head - size 15		VFA011
Masterflex easy load pump head - size 16		VFA012
Masterflex easy load pump head - size 15		VFA013
Vivaflow 200 tubing and fittings		
Size 15 pvc pump tubing and Luer fittings (3 m, 4.8 x 2.6 mm))		VFA003
Size 16 pvc pump tubing and Luer fittings (3 m, 3.2 x 1.6 mm))		VFA004
Y connector (size 15 to 2 x size 16)		VFA005
Flow restrictor set (2 x 0.4, 0.6, 0.8 mm)		VFA009
Female luer fittings size 16 (10 pieces)		VFA032
Flow restrictors 0.6 mm (6 pieces)		VFA035
Female luer fittings size 15 (10 pieces)		VFA036

Operation - Single Module



Operation - Two Modules



Vivapore Solvent Absorption Concentrators

0.5 ml - 20 ml samples

With no need for additional equipment, pressure or vacuum, solvent absorption is the most economic and user friendly concentration technique available to the clinician and research scientist.

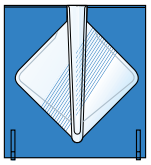
Just fill the unit with the solution to be concentrated, wait for the desired concentration level to be achieved and then pipette the concentrated sample from the bottom of the reservoir.

Vivapore is ideal for general purpose laboratory concentration or purification prior to further analysis. It is particularly suited for labile solutions that can denature with alternative shear or pressure inducing methods or that require processing in a cold room environment.

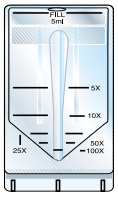
Vivapore concentrators extend the solvent absorption technique to a totally new level of performance, application potential and ease of use.

Technical specifications	Vivapore 2	Vivapore 5	Vivapore 10/20
Membrane material	Modified PES or regenerated cellulose		
Membrane MWCO	7,500 PES, 30,000 RC		
Membrane surface area	15 cm^2	20 cm^2	28 cm^2
Reservoir material	TPX, (PMP)	SAN	SAN
Volume range	0.5-2.5 ml/15 ml*	1-5 ml	2-10 ml / 20 ml*
Minimum concentrate volume	20 µl	50 µl	50 µl
Vivapore overall dimensions			
Width (mm)	66	42	46
Height (mm)	68	82	100

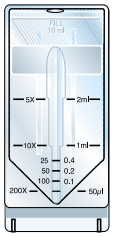
* with additional reservoir



Vivapore 2



Vivapore 5



Vivapore 10/20

Vivapore Solvent Absorption Concentrators

Typical performance								
	Time to concentrate (10x min.)				Concentrate recovery %			
Product	VP2	VP5	VP10/20	VP10/20*	VP2	VP5	VP10/20	VP10/20*
Start volume	2 ml	5 ml	10 ml	20 ml	2 ml	5 ml	10 ml	20 ml
Cytochrome c (12,600 MW)	0.25 mg/ml	0.25 mg/ml	0.25 mg/ml	0.1 mg/ml	0.25 mg/ml	0.25 mg/ml	0.25 mg/ml	0.1 mg/ml
7,500 MWCO PES	35	35	75	150	90 %	90 %	90 %	92 %
30,000 MWCO RC	30	25	50	105	18 %	18 %	18 %	20 %
BSA (66,000 MW)								
7,500 MWCO PES	25	30	55	115	90 %	92 %	92 %	92 %
30,000 MWCO RC	20	25	40	80	90 %	90 %	90 %	94 %
IgG (160,000 MW)								
7,500 MWCO PES	35	40	70	160	76 %	75 %	77 %	78 %
30,000 MWCO RC	25	35	35	80	80 %	82 %	85 %	90 %
	Time to concentrate 50x (min.)				Concentrate recovery %			
Cytochrome c (12,600 MW)								
7,500 MWCO PES	65	70	160	-	91 %	88 %	90 %	-
30,000 MWCO RC	55	60	95	-	16 %	16 %	16 %	-
BSA (66,000 MW)								
7,500 MWCO PES	45	50	105	218	90 %	90 %	92 %	94 %
30,000 MWCO RC	40	45	60	120	89 %	88 %	88 %	90 %
IgG (160,000 MW)								
7,500 MWCO PES	50	65	140	290	53 %	65 %	74 %	70 %
30,000 MWCO RC	45	60	65	135	60 %	70 %	82 %	88 %

* with additional reservoir

Ordering information					
Vivapore 2	Pack size	Prod. no.	Vivapore 10/20	Pack size	Prod. no.
Expandable to 15 ml with pipette reservoir			Includes stand and recovery pipettes		
7,500 MWCO PES	30	VP0201	7,500 MWCO PES	4	VP2003
30,000 MWCO RC	30	VP0271	7,500 MWCO PES	30	VP2001
Vivapore 5			30,000 MWCO RC	4	VP2073
Includes stand and recovery pipettes			30,000 MWCO RC	30	VP2071
7,500 MWCO PES	4	VP0503	Requires stand		
7,500 MWCO PES	30	VP0501	7,500 MWCO PES	100	VP2002
30,000 MWCO RC	4	VP0573	30,000 MWCO RC	100	VP2072
30,000 MWCO RC	30	VP0571	Vivapore accessories		
Requires stand			Disposable stands for 4 units	6	VPA002
7,500 MWCO PES	100	VP0502	Pipette reservoir (Vivapore 2)	50	VPA004
30,000 MWCO RC	100	VP0572	Plastic recovery pipettes (Vivapore 10/20)	100	VPA005
			10 ml expansion reservoir (Vivapore 10/20)	10	VPA006
			Plastic recovery pipettes (Vivapore 5)	100	VPA007
			10 position acrylic stand	1	VPA010

Vivapore Q5 & Q10

New

5 ml & 10 ml Samples

Vivapore Q5 & Q10 concentrators offer fast and convenient means to concentrate multiple clinical or research samples for analysis by electrophoresis or immunofixation. No set-up, minimal hands-on time, no pressure, vacuum or centrifuge required. Just add the sample, wait to concentrate, and remove the enriched material. Absorbent pulls solvent and microsolute through the ultrafilter, concentrating the sample. An absolute deadstop pocket at the bottom of each cell prevents filtration to dryness. Typical performance is 100x concentration in 65 to 100 minutes.

Technical specifications	Vivapore Q5	Vivapore Q10
Membrane material	PES	PES
Membrane MWCO	7,500	7,500
Membrane surface area	23 cm^2	23 cm^2
Reservoir material	SAN	SAN
Volume range	0.5-5 ml	1-10 ml
Minimum concentrate volume	50 µl	50 µl
Overall dimensions		
Length (mm)	147	147
Width (mm)	70	70
Height (mm)	94	94

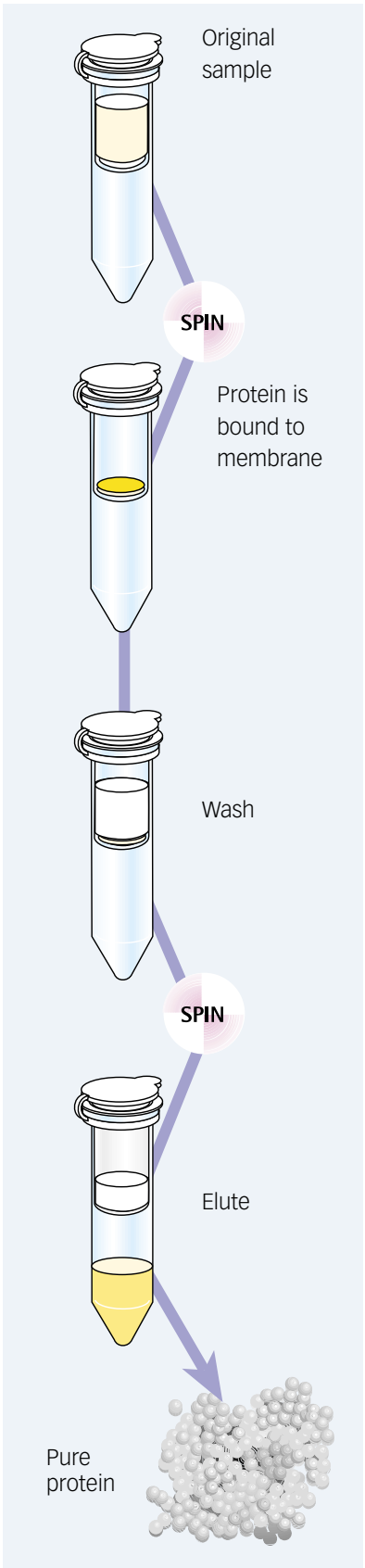
Vivapore Q5 & Q10

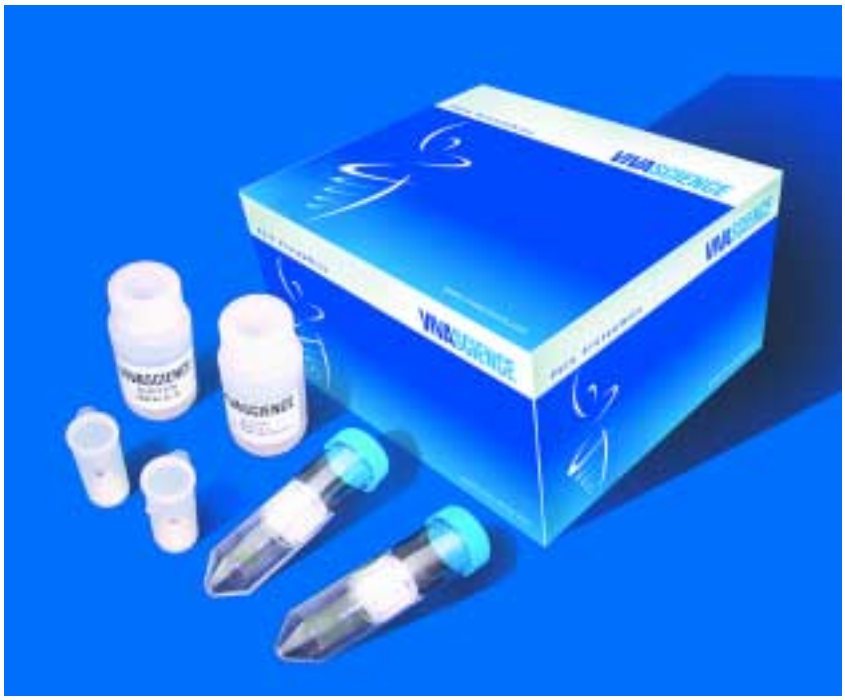
Typical performance				
	Time to concentrate 10x min. at 20˚ C		Concentrate recovery %	
Product	Vivapore Q5	Vivapore Q10	Vivapore Q5	Vivapore Q10
Start volume	5 ml	10 ml	5 ml	10 ml
BSA (66,000 MW)				
7,500 MWCO PES	30	100	86%	82%
IgG (160,000 MW)				
7,500 MWCO PES	35	110	70%	71%
	Time to concentrate 50x min. at 20˚ C		Concentrate recovery %	
BSA (66,000 MW)				
7,500 MWCO PES	41	210	81%	77%
IgG (160,000 MW)				
7,500 MWCO PES	55	130	64%	61%

Ordering information		
Vivapore Q5 - 5 units, provides 40 tests, includes 40 plastic pipettes	Pack size	Prod. no.
7,500 MWCO PES	5	VPQ0502
Vivapore Q10 - 5 units, provides 40 tests, includes 40 plastic pipettes		
7,500 MWCO PES	5	VPQ1002

Vivapure - the next step in protein purification

New





Protein purification in less than 30 minutes

The separation of pure proteins from complex mixtures is a key process in biomedical research and other biological disciplines. Vivascience is offering Vivapure spin columns based on an innovative and powerful membrane adsorber technology for the purification of proteins. Vivapure purification protocols allow the isolation of pure protein in less than 30 minutes.

New chemistries

Vivapure spin columns are available with a variety of different membrane adsorber chemistries.

Vivapure ion exchange spin columns come in either strong or weak cation or anion charged membrane matrices.
With these ion exchange membrane devices, protein binding, elution, and concentration is made almost as simple as filtration.

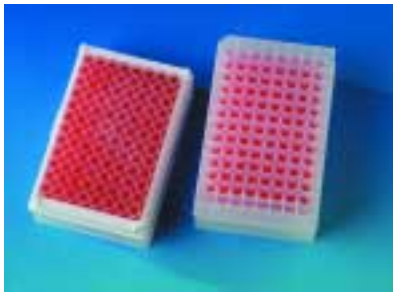
There are three sizes of Vivapure devices and different capacities.

A. Vivapure Mega - 75 ml
Binding capacity: High - H

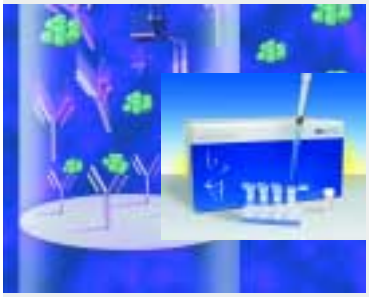
B. Vivapure Maxi - 19/20 ml
Binding capacities:
High - H, Medium - M

C. Vivapure Mini - 400/500 µl
Binding capacities:
High - H, Medium - M, Low - L

Vivapure membrane adsorbers are also available as Vivawell 96-well and Vivawell 8-strip devices for increased throughput and robotic applications.



Vivapure Metal Chelate Mini spin columns
Twelve spin columns for the purification of proteins with poly-histidine tags. Purification is achieved by binding the poly-histidine tag to a metal chelate membrane. The spin columns allow the free choice of metal ion to be immobilized and are ideally suited for optimizing purification protocols.



Vivapure Epoxy Protein Coupling Kit
Kit including 12 spin columns, buffers, filtration and ultrafiltration devices for binding a given protein to an Epoxy membrane.
The resulting customized affinity matrix allows for fast and very specific protein purification.

Vivapure Protein A Mini spin columns
Comprises 24 spin columns for the quick and convenient purification of small amounts of antibodies, e.g. for screening of antibodies.
The specific purification is easily achieved by the selective binding of the antibody to Protein A.

Vivapure DNA Removal Kit
Kit including 12 Mini or 6 Maxi spin columns, buffers and filtration devices for the removal of highly viscous DNA from protein samples or cell lysates.

Vivapure Anti-HSA Kit
Kit including 5 ml Anti-HSA affinity resin, clarification spin columns and buffers. The Vivapure Anti-HSA Kit utilizes unique antibody fragments for specific, fast and reproducible depletion of high abundant human albumin from serum and plasma samples. The resolution of 2D-PAGE is significantly improved by this simple 20-minute, spin column-based protocol.

Vivapure Ordering Codes

Ion Exchange membrane type

C = Carboxyl groups,
weak cation exchanger

D = Diethylamine groups,
weak anion exchanger

Q = Quaternary ammonium groups,
strong anion exchanger

S = Sulfonic acid groups,
strong cation exchanger

Cat Number	Description	Spin Columns	Centrifuge Tubes
Kits available			
Vivapure Mini Ion Exchange Spin Columns (up to 0.5 ml)			
VS-IX01ST16	Vivapure Mini H starter kit (4 of each ion exchange class)	16	32
VS-IX01CL24	Vivapure C Mini L	24	48
VS-IX01CM24	Vivapure C Mini M	24	48
VS-IX01CH24	Vivapure C Mini H	24	48
VS-IX01DL24	Vivapure D Mini L	24	48
VS-IX01DM24	Vivapure D Mini M	24	48
VS-IX01DH24	Vivapure D Mini H	24	48
VS-IX01QL24	Vivapure Q Mini L	24	48
VS-IX01QM24	Vivapure Q Mini M	24	48
VS-IX01QH24	Vivapure Q Mini H	24	48
VS-IX01SL24	Vivapure S Mini L	24	48
VS-IX01SM24	Vivapure S Mini M	24	48
VS-IX01SH24	Vivapure S Mini H	24	48
Vivapure Maxi Ion Exchange Spin Columns (up to 20 ml)			
VS-IX20CM08	Vivapure C Maxi M	8	16
VS-IX20CH08	Vivapure C Maxi H	8	16
VS-IX20DM08	Vivapure D Maxi M	8	16
VS-IX20DH08	Vivapure D Maxi H	8	16
VS-IX20QM08	Vivapure Q Maxi M	8	16
VS-IX20QH08	Vivapure Q Maxi H	8	16
VS-IX20SM08	Vivapure S Maxi M	8	16
VS-IX20SH08	Vivapure S Maxi H	8	16
Vivapure Mega Ion Exchange (up to 75 ml)			
VS-IX75CH02	Vivapure C Mega H	2	2
VS-IX75DH02	Vivapure D Mega H	2	2
VS-IX75QH02	Vivapure Q Mega H	2	2
VS-IX75SH02	Vivapure S Mega H	2	2

Vivapure Ordering Codes

Cat Number	Description	Spin Columns	Centrifuge Tubes
Kits available			
Vivapure Mega Accessories & Accessories for Air Pressure Mode			
VS-IXA01	Vivapure Mega pressure cap with 2 santoprene seals		1 unit
VS-IXA02	Santoprene seals for Vivapure Mega		1 unit
VSA003	250 ml centrifuge bottles with standard lids		4 units
VCA002	Air Pressure Controller (APC)		1 unit
VCA010	Female coupling		1 unit
VCA011	Male coupling		1 unit
VCA012	4 mm outer diameter pressure tubing (3 m)		1 unit
Vivapure Affinity Chromatography Spin Columns (up to 05 ml, 19 ml, 75 ml)			
VS-PA01PA24	Protein A Mini Spin Columns	24	72
VS-MC01MC12	Metal Chelate Mini Spin Columns	12	36
VS-MC01MH04	Metal Chelate Maxi Spin Columns	4	16
VS-MC01MH02	Metal Chelate Mega Spin Columns	2	2
Vivapure Kits			
VS-IX01QHGP	Acidic Protein Purification Kit Q Mini H	8	32
VS-IX01SHGP	Basic Protein Purification Kit S Mini H	8	32
VS-IX20QHGP	Acidic Protein Purification Kit Q Maxi H	4	16
VS-IX20SHGP	Basic Protein Purification Kit S Maxi H	4	16
VS-IX01DMDR	DNA Removal Kit D Mini M	12	36
VS-IX20DMDR	DNA Removal Kit D Maxi M	6	18
VS-PC01EPPC	Epoxy Protein Coupling Kit	12	36
Vivaclear Clarification Spin Columns and Kit Accessories			
VK01P042	Vivaclear Mini 0.8 µm PES	100	100
Vivawell Plates & 8-Strip (IEX, Metal Chelate)			Pack size
VW96IC02	Vivawell 96 Well Plate C		2
VW96ID02	Vivawell 96 Well Plate D		2
VW96IS02	Vivawell 96 Well Plate S		2
VW96IQ02	Vivawell 96 Well Plate Q		2
VW96MC02	Vivawell 96 Well Plate MC (Metal Chelate)		2
VW08IC02	Vivawell 8-Strip C		2
VW08ID02	Vivawell 8-Strip D		2
VW08IS02	Vivawell 8-Strip S		2
VW08IQ02	Vivawell 8-Strip Q		2
VW08MC02	Vivawell 8-Strip MC (Metal Chelate)		2
Vivapure Anti-HSA Kit for Human Albumin Depletion			
VS-SP08HAR	Vivapure Anti-HSA Kit	12	5 ml Resin

Sartolab RF/BT Disposable PES Vacuum Filtration Units

Sartolab vacuum filtration units
In today's tissue culture laboratory, speed, convenience, sterility assurance and cost effectiveness are the key requirements for busy end users and buyers.

Vivascience Sartolab Receiver Flask (RF) and Bottle Top (BT) disposable vacuum filter systems are the product of choice for filtration of tissue culture media, serum, buffers, antibiotics, vitamin solutions and other aqueous biologicals.

Sartolab RF and BT filter units offer high quality Sartorius PES membranes, combining highest flow-rates and throughput with extremely low protein binding and extractables. Not only is this high performance membrane unique to Vivascience Sartolab products, it is also offered standardly as a 90 mm membrane in all of our 500 ml and 1000 ml bottle top and receiver flask units; guaranteeing faster, higher throughput filtration more cost effectively.

For further information about Sartolab RF/BT cell culture products, visit our website at www.vivascience.com

Ready-to-use and easy handling
Pre-sterilized filter units, require only connection to a vacuum source. User-friendly design eliminates mistakes in usage.

Single-unit packaging
Receiver flasks are removable and can be closed for storage with the sterile caps supplied with the units. Bottle tops will fit any 45 mm diameter sterile storage bottle.

Flexible
Sterile filtration of cell culture media, buffers, additives and other aqueous biologicals.

PES Membrane of choice for cell culture
PES membranes combine extremely high flow rates and throughput with low non-specific binding.

Free of cytotoxic effects
Sartolab units are free of cytotoxic effects, they pass all USP and cytotoxicity tests.

Highest flow rates
The PES membrane in all units and a 90 mm filter diameter in 500 ml and 1000 ml units increase the speed and throughput of filtration.