sartorius

Technical data and operating instructions

Vivacon® 2

For in vitro use only

85034-535-54

Vivacon® 2 ml – Introduction

Storage conditions | shelf life
Vivacon® ultrafiltration spin columns should be stored at room temperature. The devices should be used before the expiry date printed on the box.

Introduction
Vivacon® 2 concentrators are disposable ultrafiltration devices optimally suited for DNA concentration. For optimal performance with DNA samples, they are equipped with the patented regenerated cellulose membrane Hydrosart®.

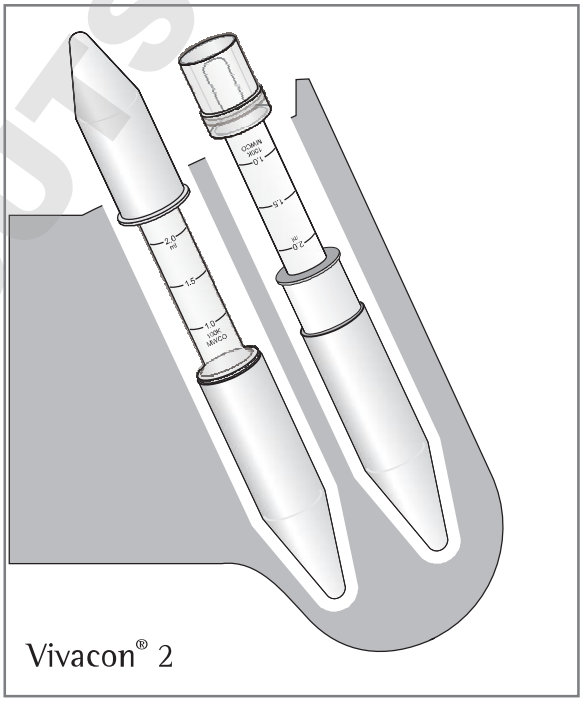
Vivacon® 2 is suitable for sample volumes of 100 µl to 2 ml. Vivacon® 2 can effectively be used in a fixed angle rotor accepting 15 ml centrifuge tubes.

Vivacon® 2 is specifically designed with low internal surface and membrane area and allows a re-spin collection of the concentrate, in order to achieve superior recoveries from very dilute samples.

Equipment required
Vivacon® 2

Centrifuge	Vivacon® 2
Rotor type	Fixed angle
Minimum rotor angle	25°
Rotor cavity	To fit 17 × 120 mm | 15 ml conical bottom tubes (recommended cavity depth 95 mm)

The backspin cap ridge must be below the top of the rotor cavity for correct support during centrifugation.


Vivacon® 2

Operation

1. When working with **DNA** samples, select a molecular weight cut off (MWCO) which retains the fragment size of double stranded DNA (ds DNA) as shown in Table 4. When working with **proteins**, select a MWCO at least 50% smaller than the molecular size of the protein of interest.

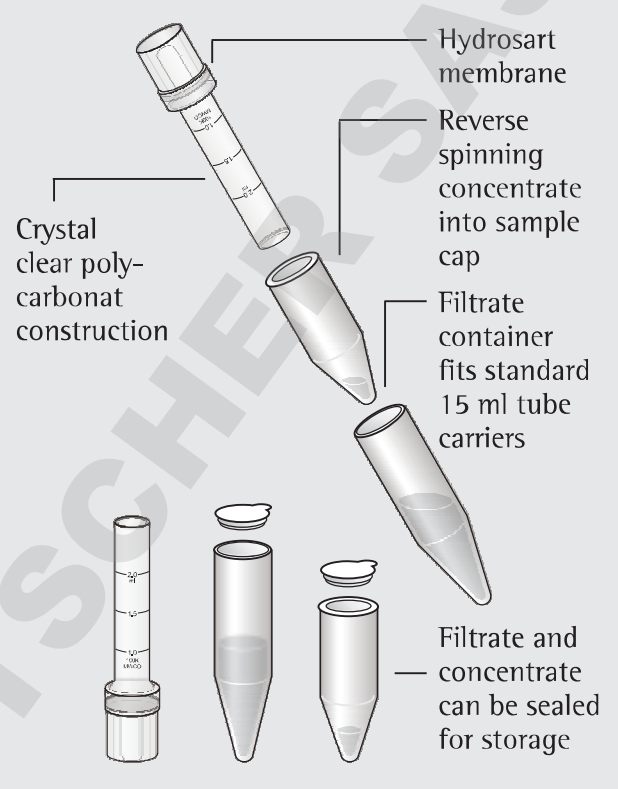
2. Fill concentrator with up to maximum volumes shown in Table 1. (Ensure lid is fully sealed).

3. Insert assembled concentrator into centrifuge.

4. Centrifuge at speeds recommended in Table 2, taking care not to exceed the maximum g force indicated by the MWCO.

5. Once the desired concentration is achieved, (see Table 3 for guide to concentration times), remove assembly and recover sample by reverse spinning the concentrate into the recovery cap. In this procedure remove filtrate tube, invert the concentrator body, insert concentrate recovery cap into filtrate tube and then spin at up to 2,500 g for 2 minutes. The concentrate recovery cap can be sealed for storage.

Vivacon® 2 Reverse Spinning



Desalting | Buffer Exchange

1. Concentrate sample to desired level.

2. Empty filtrate container.

3. Refill concentrator with an appropriate solvent.

4. Concentrate the sample again and repeat the process until the concentration of contaminating microsolute is sufficiently reduced. Typically 3X wash cycles will remove 99% of initial salt concentration.

Technical Specifications

Table 1: Technical Specifications

Concentrator capacity	**Vivacon® 2**
Fixed angle rotor	2.0 ml
Dimensions	
Total length (Concentration)	125 mm
Total length (Back-spin)	115 mm
Width	16 mm
Active membrane area	0.95 cm^2
Hold-up volume	10 µl
Dead stop volume	55 µl (25° rotor)
Materials of construction	
Body	Polycarbonate
Filtrate vessel	Polypropylene
Back spin vial	Polypropylene
Concentrator cap	Polypropylene
Membrane 2kDa – 100 kDa 125 kDa	 Hydrosart® Cellulose Acetate (CA)
O-ring	Silicone

Table 2: Recommended Spin Speed in Fixed Angle Rotor (x g)

Device	**Vivacon® 2**	
Membrane cut off	**For DNA**	**For proteins**
2 kDa MWCO	7,500	7,500
10 kDa MWCO	5,000	5,000
30 kDa MWCO	2,500	5,000
50 kDa MWCO	2,500	5,000
100 kDa MWCO	2,500	5,000
125 kDa MWCO	2,500*	5,000

* Spin speed 2,500 × g for DNA samples > 900 bp when using a 125 kDa MWCO. For DNA samples >650 bp, spin at 1,000 × g.

Usage Tips

1. Flow Rate
Filtration rate is affected by several parameters, including MWCO, porosity, sample concentration, viscosity, centrifugal force and temperature. Expect significantly longer spin times for starting solutions with over 5% solids. When operating at 4°C, flow rates are approximately 1.5 times slower than at 25°C. Viscous solutions such as 50% glycerine will take up to 5 times longer to concentrate than samples in a predominantly buffer solution.

2. Pre-rinsing
Membranes fitted to Vivacon® concentrators contain trace amounts of glycerine. Should these interfere with analysis, they can be removed by rinsing fill volume of buffer solution or deionised water through the concentrator. Decant filtrate and concentrate before processing sample solution. If you do not want to use the pre-rinsed device immediately, store it in the refrigerator with buffer or water covering the membrane surface. Please do not allow the membrane to dry out.

3. Sterilisation of Vivacon® Devices
Vivacon® devices should not be autoclaved as high temperatures will substantially increase membrane MWCO. To sterilise, use a 70% ethanol solution or sterilising gas mixture.

4. Chemical Compatibility
Vivacon® concentrators are designed for use with biological fluids and aqueous solutions.

For chemical compatibility details, please refer to Table 5.

5. Retention and Recovery
The membranes used in Vivacon® are characterized by a molecular weight cut off (MWCO). For proteins, it corresponds to their ability to retain 90% of a molecule with this nominal molecular weight. For achieving better recovery, use a MWCO which is 1 to 2 of the species weight you need to concentrate.

For nucleic acid applications, strand length is the most useful parameter for selecting the Vivacon® device appropriate for a specific application. However, other parameters including DNA concentration, the magnitude of the driving force (g-force) and the salt concentration all act in concert to affect DNA recovery. For characteristic recoveries and concentration times, see Table 3a and 3b. For the correlation between MWCO and nucleotide cut-off (bp), see Table 4.

Performance Characteristics

Table 3a: Performance Characteristics Vivacon® 2 for DNA
Start volume 2 ml, sample concentration 50 ng/ml

	Sample size (bp)	Time to concentrate up to 30x [min.] at 20°C	Concentrate recovery %	g-force (xg)
2,000 MWCO	10	120 min	92%	7,500
10,000 MWCO	30	60 min	94%	5,000
30,000 MWCO	50	60 min	95%	2,500
50,000 MWCO	300	45 min	96%	2,500
100,000 MWCO	600	30 min	93%	2,500
125,000 MWCO	650	30 min	88%	2,500
125,000 MWCO	900	30 min	89%	2,500

Table 3b: Performance Characteristics Vivacon® 2 PCR Grade for Proteins
Start volume 2 ml, sample and concentration of proteins as specified in table

	Sample	Time to concentrate up to 30x [min.] at 20°C	Concentrate recovery %	g-force (xg)
2,000 MWCO	0.25 mg/ml cytochrome c	120 min	95%	7,500
10,000 MWCO	0.25 mg/ml cytochrome c	90 min	96%	5,000
30,000 MWCO	1.0 mg/ml BSA	40 min	96%	5,000
50,000 MWCO	1.0 mg/ml BSA	30 min	94%	5,000
100,000 MWCO	1.0 mg/ml bovine IgG	30 min	92%	5,000
125,000 MWCO	1.0 mg/ml bovine IgG	27 min	81%	5,000

Table 4: Conversion Table for Hydrosart® MWCO to Nucleotide Cut-off

Membrane	MWCO	Double-Stranded Nucleotide Cut-off (bp)
Hydrosart®	2 kDa	> 10
Hydrosart®	10 kDa	> 30
Hydrosart®	30 kDa	> 50
Hydrosart®	50 kDa	> 300
Hydrosart®	100 kDa	> 600
Cellulose Acetate	125 kDa	> 650

Table 5: Chemical Compatibility (2hr contact time)

	Hydrosart®	Cellulose Acetate
Compatible pH range	pH 1-9	pH 4-8
Acetic Acid (25.0%)	OK	NO
Acetone (10.0%)	NO	NO
Acetonitrile (10.0%)	NO	NO
Ammonium Hydroxide (5.0%)	OK	OK
Benzene (100%)	NO	NO
Chloroform (1%)	OK	OK
Dimethyl Formamide (10.0%)	NO	NO
Dimethyl Sulfoxide (5.0%)	NO	NO
Ethanol (70.0%)	OK	OK
Ethyl Acetate (100%)	NO	NO
Formaldehyde (30%)	OK	OK
Formic Acid (5.0%)	OK	?
Glycerine (70%)	OK	OK
Guanidine HCl (6 M)	OK	?
Hydrocarbons, aromatic	NO	NO
Hydrocarbons, chlorinated	NO	NO
Hydrochloric Acid (1 M)	OK	NO
Isopropanol (70%)	OK	OK
Lactic Acid (5.0%)	OK	NO
Mercaptoethanol (1.0 M)	OK	NO
Methanol (60%)	OK	OK
Nitric Acid (10.0%)	NO	NO
Phenol (1%)	OK	OK
Phosphate Buffer (1.0 M)	OK	OK
Sodium Dodecylsulfate (0.1 M)	OK	OK
Sodium Hydroxide (1.0 M)	NO	NO
Sodium Hypochlorite (200 ppm)	NO	NO
Sodium Nitrate (1.0%)	OK	?
Tetrahydrofuran (5.0%)	NO	NO
Toluene (1.0%)	NO	NO
Trifluoroacetic Acid (10%)	OK	NO
Tween 20 (0.1%)	OK	OK
Triton X-100 (0.1%)	OK	OK
Urea (8 M)	OK	?

OK = Acceptable ? = Questionable NO = Not recommended

FAQ

– DNA recovery is lower than expected
If the DNA sample contains a high salt concentration, dilute the sample.
Run the device at the recommended g-force.

– Can proteins be concentrated with Vivacon®?
Proteins can be concentrated with Vivacon®, using the guidelines on page 5 to choose the correct MWCO. However, we recommend Vivaspin® 2 for protein concentration due to faster concentration achieved with a vertical membrane design for protein applications.

– DNA recovery too low.
Spinning the sample at 1000 × g may result in higher DNA recoveries, when working close to the membrane cut off limits, e.g. with a 650 bp DNA sample with a 125 kDa membrane.

– No DNA signal visible after PCR reaction.
Using membrane cut offs smaller than 125 kDa can in some cases lead to concentration of PCR inhibitors along with the sample DNA. Use the 125 kDa membrane cut off and spin your samples at 2000 × g for optimal DNA recovery and sequencing results.
Additionally, 1-2 washes with buffer may be needed to remove the inhibitors.

Ordering Information

Vivacon® 2	Qty. per box	Prod. No.
2,000 MWCO	25	VN02H91
2,000 MWCO	100	VN02H92
2,000 MWCO	500	VN02H93
10,000 MWCO	25	VN02H01
10,000 MWCO	100	VN02H02
10,000 MWCO	500	VN02H03
30,000 MWCO	25	VN02H21
30,000 MWCO	100	VN02H22
30,000 MWCO	500	VN02H23
50,000 MWCO	25	VN02H31
50,000 MWCO	100	VN02H32
50,000 MWCO	500	VN02H33
100,000 MWCO	25	VN02H41
100,000 MWCO	100	VN02H42
100,000 MWCO	500	VN02H43
125,000 MWCO	25	VN02H81
125,000 MWCO	100	VN02H82
125,000 MWCO	500	VN02H83

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