



**sartorius stedim**  
biotech

**Technical data and operating instructions**

# Vivacon<sup>®</sup> 500

For in vitro use only



85034-538-74

## Vivacon® 500 µl – 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® concentrators are disposable ultrafiltration devices optimally suited for DNA and protein concentration. For optimal performance with DNA and protein samples, they are equipped with the patented regenerated cellulose membrane Hydrosart®.

Vivacon® 500 can be used in a benchtop fixed angle rotor, accepting 1.5 | 2.2 ml centrifuge tubes.

### Equipment required for Vivacon® 500

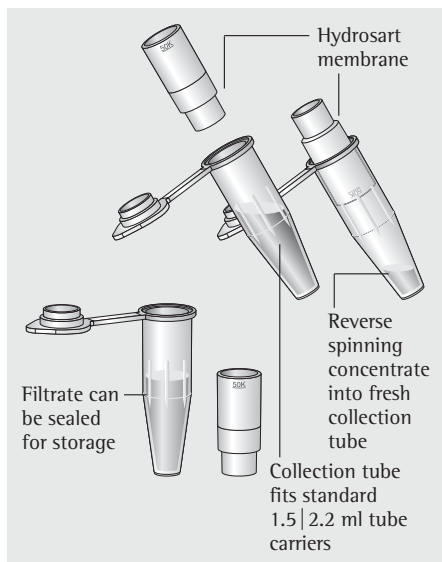
#### Centrifuge

Rotor type	Fixed angle
Minimum rotor angle	40°
Rotor cavity	To fit 1.5   2.2 ml/11 mm conical bottom tubes

## 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 5. 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 or 4 for guide to concentration times), remove assembly and recover sample by reverse spinning the concentrate into a fresh collection tube. 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 (or pulse for 20–30 seconds). The concentrate recovery cap can be sealed for storage.

### Vivacon® 500 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 microsolite is sufficiently reduced. Typically 3X wash cycles will remove 99% of initial salt concentration.

## Technical Specifications

**Table 1: Technical Specifications**

### Concentrator capacity

Fixed angle rotor	0.5 ml
-------------------	--------

### Dimensions

Total length (Concentration)	45 mm
---------------------------------	-------

Total length (Back-spin)	47.5 mm
--------------------------	---------

Width	12.4 mm
-------	---------

Active membrane area	0.32 cm <sup>2</sup>
----------------------	----------------------

Hold-up volume	< 5 µl
----------------	--------

Dead stop volume	5 µl (40° rotor)
------------------	------------------

### Materials of construction

Body	Polycarbonate
------	---------------

Filtrate vessel	Polypropylene
-----------------	---------------

Membrane	Hydrosart®
----------	------------

O-ring	Silicone
--------	----------

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

Membrane cut off	For DNA	For protein
2 kDa MWCO	7,500	14,000
10 kDa MWCO	5,000	14,000
30 kDa MWCO	5,000	14,000
50 kDa MWCO	5,000	14,000
100 kDa MWCO	3,000	8,000

## 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 6.

### 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  $\frac{1}{2}$  to  $\frac{1}{3}$  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 3 and 4. For the correlation between MWCO and nucleotide cut-off (bp), see Table 5.

## Performance Characteristics

**Table 3: Performance Characteristics Vivacon® 500 for DNA**

Start volume 0.5 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	60 min	93%	7,500
10,000 MWCO	30	25 min	94%	5,000
30,000 MWCO	50	18 min	88%	5,000
50,000 MWCO	300	18 min	91%	5,000
100,000 MWCO	600	10 min	87%	3,000

**Table 4: Performance Characteristics Vivacon® 500 for proteins**

Start volume 0.5 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	30 min	95%	14,000
10,000 MWCO	0.25 mg/ml cytochrome c	15 min	92%	14,000
30,000 MWCO	1.0 mg/ml BSA	10 min	95%	14,000
50,000 MWCO	1.0 mg/ml BSA	10 min	92%	14,000
100,000 MWCO	1.0 mg/ml bovine IgG	11 min	90%	8,000

**Table 5: 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

**Table 6: Chemical Compatibility (2hr contact time)**

<b>Compatible pH range</b>	<b>pH 1-9</b>
Acetic Acid (25.0%)	OK
Acetone (10.0%)	NO
Acetonitrile (10.0%)	NO
Ammonium Hydroxide (5.0%)	OK
Benzene (100%)	NO
Chloroform (1%)	OK
Dimethyl Formamide (10.0%)	NO
Dimethyl Sulfoxide (5.0%)	NO
Ethanol (70.0%)	OK
Ethyl Acetate (100%)	NO
Formaldehyde (30%)	OK
Formic Acid (5.0%)	OK
Glycerine (70%)	OK
Guanidine HCl (6 M)	OK
Hydrocarbons, aromatic	NO
Hydrocarbons, chlorinated	NO
Hydrochloric Acid (1 M)	OK
Isopropanol (70%)	OK
Lactic Acid (5.0%)	OK
Mercaptoethanol (1.0 M)	OK
Methanol (60%)	OK

<b>Compatible pH range</b>	<b>pH 1–9</b>
Nitric Acid (10.0%)	NO
Phenol (1%)	OK
Phosphate Buffer (1.0 M)	OK
Sodium Dodecylsulfate (0.1 M)	OK
Sodium Hydroxide (1.0 M)	NO
Sodium Hypochlorite (200 ppm)	NO
Sodium Nitrate (1.0%)	OK
Tetrahydrofuran (5.0%)	NO
Toluene (1.0%)	NO
Trifluoroacetic Acid (10%)	OK
Tween 20 (0.1%)	OK
Triton X-100 (0.1%)	OK
Urea (8 M)	OK

OK = Acceptable      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® 500 for protein concentration due to faster concentration achieved with a vertical membrane design for protein applications.

– Sample runs to dryness.

Spinning for much longer than the recommended spin times can allow samples to go to dryness. To recover the sample, add 10 µl of water or buffer to the device, vortex gently for up to 1 min and then recovery as normal.

## Ordering Information

<b>Vivacon® 500</b>	<b>Pack size</b>	<b>Prod. No.</b>
2,000 MWCO	25	VN01H91
2,000 MWCO	100	VN01H92
10,000 MWCO	25	VN01H01
10,000 MWCO	100	VN01H02
30,000 MWCO	25	VN01H21
30,000 MWCO	100	VN01H22
50,000 MWCO	25	VN01H31
50,000 MWCO	100	VN01H32
100,000 MWCO	25	VN01H41
100,000 MWCO	100	VN01H42





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

Phone +49.551.308.0  
Fax +49.551.308.3289  
[www.sartorius-stedim.com](http://www.sartorius-stedim.com)

Copyright by  
Sartorius Stedim Biotech GmbH,  
Goettingen, Germany.  
All rights reserved. No part  
of this publication may  
be reprinted or translated in  
any form or by any means  
without the prior written  
permission of Sartorius Stedim  
Biotech GmbH.

The status of the information,  
specifications and illustrations  
in this manual is indicated  
by the date given below.  
Sartorius Stedim Biotech GmbH  
reserves the right to make  
changes to the technology,  
features, specifications and  
design of the equipment  
without notice.

Status:  
September 2009,  
Sartorius Stedim Biotech GmbH,  
Goettingen, Germany