



## Vivapore 2, 5, 10/20 ml

Technical data and operating instructions.  
For in vitro use only.

## Vivascience Vivapore 2, 5, 10/20 ml

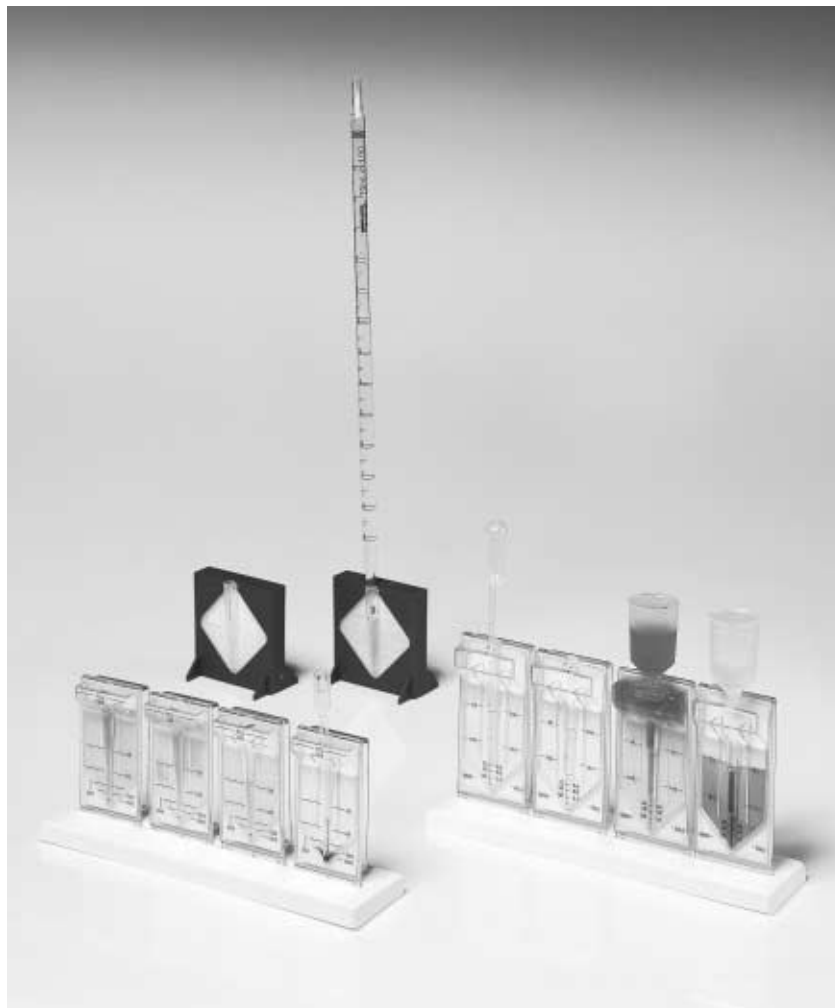
Vivapore Concentrators offer exceptional ease of use and flexibility for the concentration and/or purification of macromolecules from dilute solutions. Depending on configuration and reservoir volume of the Vivapore selected, starting volumes may vary from 0.5 to 20 ml and up to 750 X concentration may be achieved.

Membranes used in Vivapore devices are highly hydrophilic and have been specially formulated to provide low protein binding and high filtration speed without the need for pressure or vacuum.

The modified 7,500 MWCO polyethersulfone membrane is recommended for concentrating enzymes and proteins below 50,000 MW whilst the 30,000 MWCO cellulosic membrane is to be preferred for the recovery of larger macromolecules.

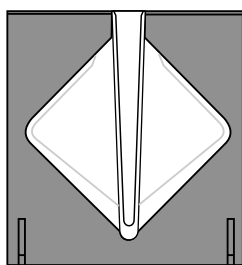
### Applications

- Improved band visualisation of dilute protein solutions following electrophoresis.
- Elisa strip test enhancement for initial protein concentrations below detection limits.
- Microscopical analysis of virus present in solution.
- Cell washing and harvesting.
- MAB purification and concentration.
- Detergent removal.

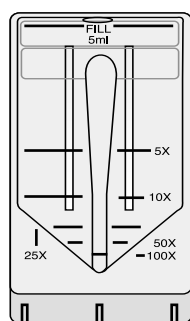


**Generic classes of target molecules include:**  
Immunoglobulins, Antigens, Hormones, Enzymes, Viruses, Pyrogens

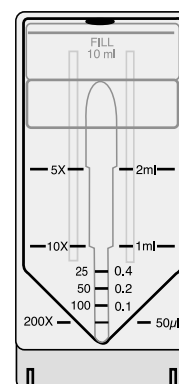
**Sample solutions include:**  
Urine, Serum, Perfusion Solutions, Amniotic Fluid, Milk, Cerebro-Spinal Fluid, Saliva, Water, Chromatography eluates



**Vivapore 2**



**Vivapore 5**

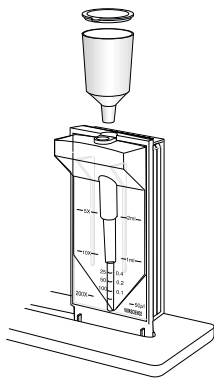


**Vivapore 10/20**

## Operation

### 1. Concentrating macromolecules

- Insert Vivapore 5 or 10/20 into stand. Vivapore 2 is self supporting.
- Pipette sample through aperture at the top of the device. Device can be left unattended until desired concentration is achieved. Solvent and micromolecules are pulled through the membrane by a high capacity absorbent, a dead stop feature prevents the sample from concentrating to dryness.
- Once the desired volume is achieved, the concentrate is withdrawn using a Pasteur, thin plastic or gel loader type pipette. The sample is now ready for further analysis.



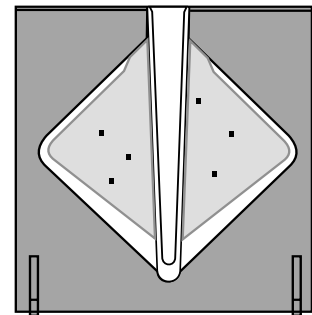
### 2. 20ml capacity expansion for the VP10/20

Sample capacity of the VP10/20 can be increased to 20 ml by use of the ancillary reservoir. First pipette 10 ml into the Vivapore, then lock the ancillary reservoir to the top opening and add up to an additional 10 ml of sample.

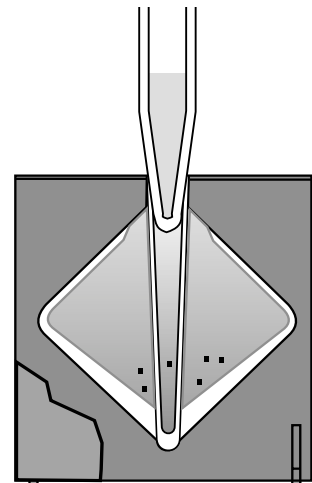
### 3. Desalting with either Vivapore 2 or Vivapore 10/20

Reservoir expansion or desalting by constant volume diafiltration. Both the VP10/20 and VP2 offer a unique ancillary reservoir feature that allows reservoir expansion or one step purification and concentration of protein samples. In this procedure, new buffer solution replaces the original solvent at a rate equal to the speed of filtration. With a fresh buffer solution volume five times greater than the sample in the concentrator, 99 % of salts will be removed.

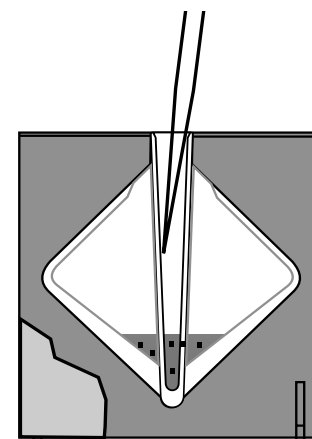
- Pipette up to 2 ml of sample to be purified through aperture at the top of the device.
- Firmly seat a 10 ml plastic pipette or the ancillary reservoir on the conical entry port of the concentrator. Fill with up to 5 times the volume in the concentrator using deionized water or fresh buffer solution. Device can be left unattended whilst the new buffer replaces the solvent in the original solution. Once buffer in the pipette is exhausted, the remaining solution will continue to concentrate to the level desired.
- Collect purified and concentrated sample with a pasteur or long gel loader type pipette.



A



B



C

## **Operating Tips**

### **Improving speed of concentration**

Speed of filtration is affected by several parameters including temperature, pH and protein concentration. Whilst Vivapore concentrators will provide rapid filtration in most environments, the following suggestions may be helpful in optimising speed.

Filtration speed will increase proportionally to ambient temperature. Should you require faster concentration, place the concentrator near a source of heat.

An acid sample with a pH of less than 5 will take longer to concentrate than a neutral sample. Adjustment to a physiological pH will result in faster filtration.

Suspended particles will tend to foul the filter element and slow filtration speed. Prefiltration with a syringe filter will clarify the sample and result in faster filtration speed and improved analytical results following concentration.

Initial protein concentration levels will have a significant effect on concentration speed. Whilst a highly dilute sample will concentrate rapidly, once macromolecule concentration exceeds 2 % the speed of filtration will rapidly decrease. Concentrations above 5 % are not practical with Vivapore concentrators. (For high levels of macromolecular concentration, use Vivaspin centrifugal concentrators.)

### **Recovering dry samples**

Vivapore concentrators have an impermeable concentrate pocket (dead stop) which impedes concentration to dryness. However, if the concentrate inadvertently remains too long in the concentrator, the remaining solvent will eventually evaporate and the sample may go to dryness. Should this occur, proteins may be returned to solution by pipetting approximately 100 µl of buffer in and out of the concentrate pocket several times.

## **Storage**

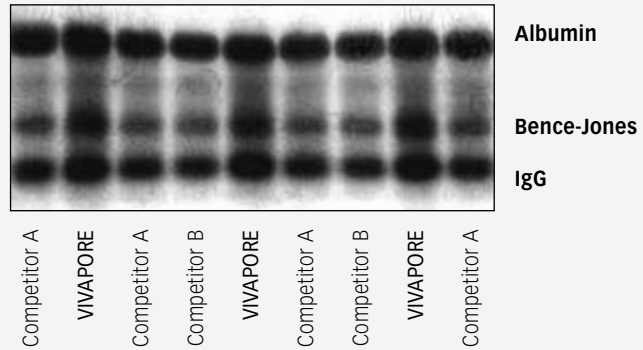
Vivapore devices should be stored in a dry environment at 4 to 30° C.

## **Disposal**

Used units may be incinerated or autoclaved, the stands are reusable for further concentrations.

**Competitive Comparisons**

The electrophoresis plate to the right was obtained by running 5 µl aliquots from samples of a pathological urine concentrated 50 times using Vivapore and two competitive concentrators. The plate clearly shows the higher recovery obtainable using Vivapore.

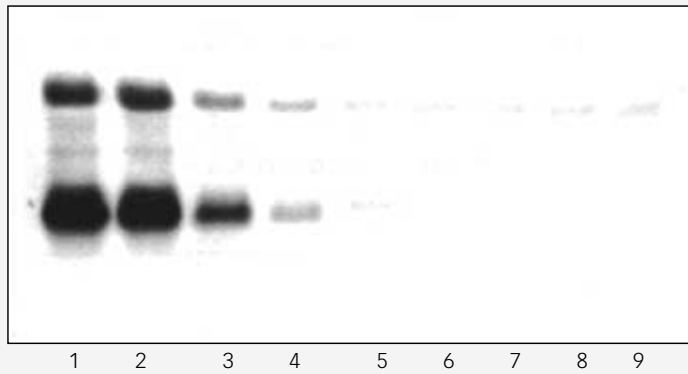


**Bence-Jones Protein Recovery**

The electrophoresis plate below was obtained by running 3 µl aliquots from repeated dilutions of a urine containing Bence-Jones (free light chains) protein with a normal (healthy) urine. The table details the concentration of Bence-Jones proteins in the urines tested.

The level at which Bence-Jones proteins indicate a pathological condition is 0.06 mg/ml (Damacco). As can be seen below, Vivapore is clearly able to recover and allow visualisation of at least 0.008 mg/ml Bence-Jone proteins well below that required by the clinician.

Ref. Damacco, Waldstrom, Acta Medica Scandinavica (1968) 184 403-409



Lane No.	Bence-Jones protein before concentrating
1	0.543
2	0.271
3	0.136
4	0.034
5	0.017
6	0.008
7	0.004
8	0.002
9	normal urine

<b>Table 2: Technical specifications</b>	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 <sup>2</sup>	20 cm <sup>2</sup>	28 cm <sup>2</sup>
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

<b>Table 3: Typical performance</b>								
Product	Time to concentrate (10x min.)				Concentrate recovery %			
	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 %
Cytochrome c (12,600 MW)	Time to concentrate 50x (min.)				Concentrate recovery %			
	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

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

## Vivascience ultrafiltration product range at a glance

Product	Sample volume	Mode	Membranes available
Vivaspin 500	100 µl - 600 µl	Centrifugal	Polyethersulfone
Vivaspin 2	0.4 ml - 2 ml	Centrifugal	Polyethersulfone, Cellulose Triacetate Regenerated Cellulose, Hydrosart®
Centrisart	0.5 ml - 2.5 ml	Centrifugal	Polyethersulfone, Cellulose Triacetate
Vivaspin 4	1 ml - 4 ml	Centrifugal	Polyethersulfone
Vivaspin 6	2 ml - 6 ml	Centrifugal	Polyethersulfone
Vivaspin 15	2 ml - 15 ml	Centrifugal	Polyethersulfone
Vivaspin 15R	2 ml - 15 ml	Centrifugal	Hydrosart®
Vivaspin 20	5 ml - 20 ml	Centrifugal Gas pressure	Polyethersulfone
Vivacell 70	10 ml - 70 ml	Centrifugal Gas pressure	Polyethersulfone
Vivacell 100	20 ml - 100 ml	Centrifugal Gas pressure	Polyethersulfone
Vivacell 250	50 ml - 250 ml	Gas pressure	Polyethersulfone
Vivaflow 50	100 ml - > 5 l	Tangential flow	Polyethersulfone, Regenerated Cellulose
Vivaflow 200	500 ml - > 5 l	Tangential flow	Polyethersulfone, Regenerated Cellulose, Hydrosart®
Vivapore 2	0.5 ml - 2.5 ml/15 ml	Solvent absorption	Polyethersulfone, Regenerated Cellulose
Vivapore 5	1 ml - 5 ml	Solvent absorption	Polyethersulfone, Regenerated Cellulose
Vivapore 10/20	2 ml - 10 ml/20 ml	Solvent absorption	Polyethersulfone, Regenerated Cellulose
Vivapore Q5	0.5 ml - 5 ml	Solvent absorption	Polyethersulfone
Vivapore Q10	1 ml - 10 ml	Solvent absorption	Polyethersulfone



### New Vivasure kits and devices now available

The development of the innovative Vivasure range continues with the launch of new protein purification kits and devices. Vivasure spin columns are currently available with metal chelate, Protein A, Epoxy and ion exchange membrane chemistries in many different formats.

Contact us for more details or visit [www.vivascience.com](http://www.vivascience.com)

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