

Vivascience Vivaspin 500 µl

Vivaspin Concentrators are disposable ultrafiltration devices for the concentration of biological samples. Maximum initial sample volume is 600 µl. It can effectively be used in either swing bucket or fixed angle rotors accepting 2.2 ml centrifuge tubes. The VS500 uses a PES (Polyethersulfone) membrane.

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.

Equipment Required

1. Centrifuge with swing bucket or fixed angle (minimum 25°) rotor.

Device	Carrier Required
Vivaspin 500	2.2 ml / 11 mm Ø

2. Pipettes for sample delivery and removal. For maximum recovery a thin gel loader type is recommended.

Operation

1. Select the most appropriate membrane for your sample. For maximum recovery select a MWCO at least 50 % smaller than the molecular size of the species of interest.
2. Fill concentrator with up to maximum volumes shown in table 1. (Ensure lid is fully seated).
3. Insert assembled concentrator into centrifuge (when fixed angle rotors are used, angle concentrator so that the printed window faces upwards/outwards).

Equipment required	Vivaspin 500
Centrifuge	
Rotor type	Swing bucket or Fixed angle
Minimum rotor angle	40°
Rotor cavity	To fit 2.2 ml (11 mm) conical bottom tubes
Minimum effective speed	3,000 g
Recommended speed	12,000 g
Maximum speed	15,000 g
Concentrate recovery	
Pipette type	Fixed or variable volume
Recommended tip	Thin gel loader type

Table 1: 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

4. Centrifuge at speeds recommended in table 2, taking care not to exceed the maximum g force indicated by membrane type and MWCO.
5. Once the desired concentration is achieved, (see tables 3 for guide to concentration times), remove assembly and recover sample from the bottom of the concentrate pocket with a pipette. The filtrate tube can be sealed for storage.

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 microsolutes is sufficiently reduced. Typically 3 wash cycles will remove 99 % of initial salt content.

Table 2: Recommended Spin Speed (x g)			
Device	VS500		
Membrane	min	typical	max
5 - 50,000 PES	3,000	12,000	15,000
100,000 PES	3,000	12,000	15,000

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. Prerinsing

Membranes fitted to Vivaspin concentrators contain trace amounts of Glycerine and Sodium azide.

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.

3. Sterilisation of Polyethersulfone Membranes

Vivaspin devices should not be autoclaved as high temperatures will substantially increase membrane MWCO. To sterilise, use a 70 % ethanol solution or sterilising gas mixture.

Table 3: Typical performance VS500	Time to concentrate 30x min. at 20°C	Concentrate recovery %
Start Volume	500 µl	500 µl
Centrifugal force	12,000 g	12,000 g
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 %