

# Vivaspin® Filtrate

## Analyte Isolation Redefined

### Product Information

Vivaspin® Filtrate ultrafilters for general laboratory use provide a reliable and efficient solution for separating macromolecules from low molecular weight analytes. They are particularly suitable for removing proteins and nanoparticles prior to small molecule assays in research, development, and clinical laboratories.

Centrifugal ultrafilters are essential laboratory tools, but they are usually optimized for concentration and buffer exchange applications where the retentate is of interest. The large vertically oriented and supported membranes in these units are generally unsuitable for filtering low molecular weight substances, which are likely to be retained by adsorption and trapping.



Equipped with small cellulose triacetate (CTA) or polyethersulfone (PES) membranes that are cast without a membrane support, Vivaspin® Filtrate allows optimal passage of small molecules into the filtrate for downstream assays and analysis.

In addition, unlike standard centrifugal ultrafiltration, the membrane in Vivaspin® Filtrate passes through the sample during centrifugation. This virtually eliminates membrane blocking and avoids the need to disassemble the ultrafilter for collection of the filtered sample.

## Features

### Tame Tough Samples

Avoid membrane blocking with effective ultrafiltration for high protein or particle loaded samples.

### More to Analyze

Ultra-thin membranes ensure highly efficient analyte passage without adsorption or trapping.

### Interference-Free

Reliable separation removes macromolecules that might otherwise interfere with downstream analysis.

### Label Friendly

A long outer surface with a consistent outer diameter allows barcoding in automated processes.

### Direct Sample Retrieval

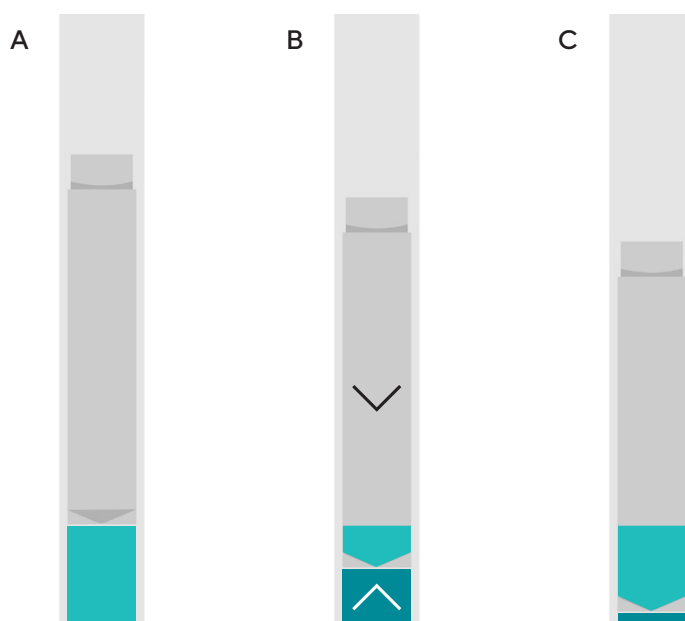
With no cap and no disassembly required, the entire filtered sample can be retrieved directly with a pipette.

## Applications

- Drug binding studies
- Hormone assays and analysis
- Isolation of serum metabolites
- Protein removal from blood samples
- Concentration of serum antibodies

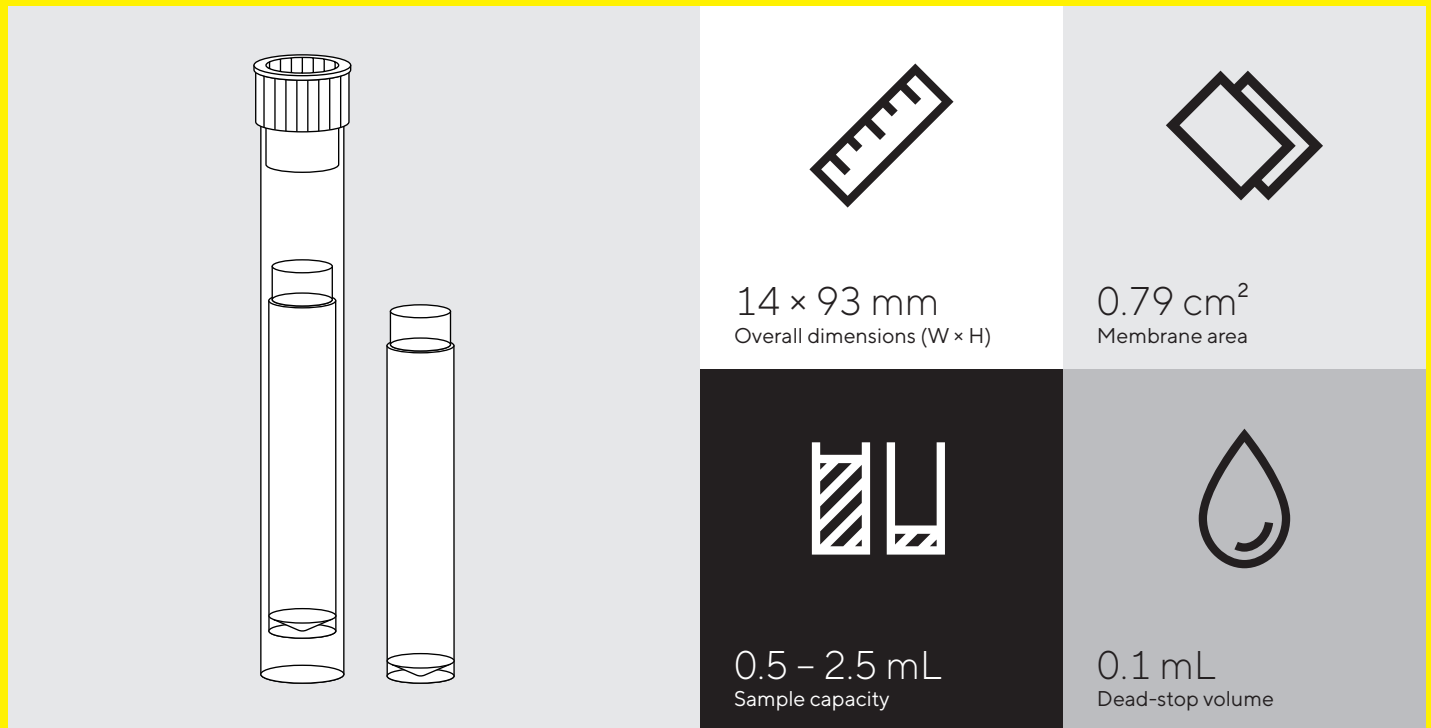
## Operating Principle

A filtrate tube with an integrated ultrafiltration membrane is floated on top of the sample (Figure 1A). Under centrifugal force, any particles in the sample are sedimented to the bottom of the outer tube, preventing the membrane from blocking. Meanwhile, the filtrate tube and membrane pass through the sample so that ultrafiltration occurs in the opposite direction to centrifugal force (counterflow ultrafiltration, Figure 1B). As the filtered sample is collected above the membrane, it can be retrieved directly with a pipette (Figure 1C).



**Figure 1.** Operating principle of Vivaspin® Filtrate. The direction of centrifugal force and counterflow ultrafiltration is indicated (black and white arrows, respectively).

## Technical Specifications



## Materials

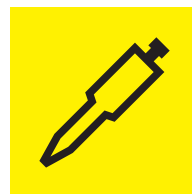
Centrifuge Tube	Polystyrene (PS)
Dust cap	Polyethylene (HDPE)
Filtrate Tube	Styrene acrylonitrile (SAN)
Membrane	Cellulose triacetate (CTA) Polyethersulfone (PES)
Packaging	Cardboard (PAP)

## Equipment Requirements



### Centrifuge

Swing bucket or fixed angle ( $\geq 25^\circ$ ) rotor.  
15 mL (17 mm  $\varnothing$ ) conical or flat bottom cavities.



### Pipette

Single channel (e.g. Picus® or Tacta®).  
Standard tips (e.g. Optifit or Safetyspace®).

## Typical Performance

Typical process time and protein passage for 2.5 mL starting volume at 20 °C with a starting sample concentration of 1 mg/mL, 0.25 mg/mL or 0.1 mg/mL for BSA, IgG or blue dextran, respectively.

Membrane	Protein	MW	Time to Filter 50%	Time to Filter 90%	Passage
5 kDa CTA	BSA	66 kDa	300 min	-	0%
10 kDa CTA	BSA	66 kDa	35 min	80 min	2%
20 kDa CTA	BSA	66 kDa	9 min	20 min	2%
100 kDa PES	IgG	150 kDa	13 min	35 min	3%
300 kDa PES	Blue dextran	2,000 kDa	9 min	25 min	28%

## Ordering Information

Description	Package Contents	Order No.
Vivaspin® Filtrate, 5 kDa MWCO CTA	12 units 1 quick start guide	13229-----E
Vivaspin® Filtrate, 10 kDa MWCO CTA	12 units 1 quick start guide	13239-----E
Vivaspin® Filtrate, 20 kDa MWCO CTA	12 units 1 quick start guide	13249-----E
Vivaspin® Filtrate, 100 kDa MWCO PES	12 units 1 quick start guide	13269-----GE
Vivaspin® Filtrate, 300 kDa MWCO PES	12 units 1 quick start guide	13279-----E

## Selected Publications


1. J. E. Blair, B. Coakley, A. C. Santelli, J. G. Hentz and N. L. Wengenack (2006). Serologic testing for symptomatic coccidioidomycosis in immunocompetent and immunosuppressed hosts. *Mycopathologia* 162, 317-324
2. C. Hofer, H. van Randenborgh, A. Lehmer, R. Hartung and J. Breul (2004). Transcutaneous IL-2 uptake mediated by Transfersomes depends on concentration and fractionated application. *Cytokine* 25, 141-146
3. R. Hönow, A. Simon and A. Hesse (2002). Interference-free sample preparation for the determination of plasma oxalate analyzed by HPLC-ER: preliminary results from calcium oxalate stone-formers and non-stone-formers. *Clin. Chim. Acta.* 318, 19-24
4. S. Zhou, J. W. Paxton, M. D. Tingle and P. Kestell (2001). Determination of unbound concentration of the novel anti-tumour agent 5,6-dimethylxanthenone-4-acetic acid in human plasma by ultrafiltration followed by high-performance liquid chromatography with fluorimetric detection. *J. Chromatogr. B Biomed. Sci. Appl.* 757, 359-363
5. C. Hofer, R. Hartung, R. Göbel, P. Deering, A. Lehmer and J. Breul (2000). New ultradeformable drug carriers for potential transdermal application of interleukin-2 and interferon-alpha: theoretic and practical aspects. *World J. Surg.* 24, 1187-1189
6. J. Bergquist, O. Andersen and A. Westman (2000). Rapid method to characterize mutations in transthyretin in cerebrospinal fluid from familial amyloidotic polyneuropathy patients by use of matrix-assisted laser desorption/ionization time-of-flight mass spectrometry. *Clin. Chem.* 46, 1293-1300
7. C. Hofer, R. Göbel, P. Deering, A. Lehmer and J. Breul (1999). Formulation of interleukin-2 and interferon-alpha containing ultradeformable carriers for potential transdermal application. *Anticancer Res.* 19, 1505-1507
8. P. Nebinger and Koel (1993). Determination of acyclovir by ultrafiltration and high-performance liquid chromatography. *J. Chromatography* 619, 342-344
9. F. da Fonseca-Wollheim, K.-G. Heinze, K. Lomsky and H. Schreiner (1988). Serum ultrafiltration for the elimination of endogenous interfering substances in creatinine determination. *J. Clin. Chem. Clin. Biochem.* 26, 523-525
10. R. H. Christenson, S. D. Studenberg, S. Beck-Davis and F. A. Sedor (1987). Digoxin-like immunoreactivity eliminated from serum by centrifugal ultrafiltration before fluorescence polarization immunoassay of digoxin. *Clin. Chem.* 33, 606-608

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