

# Vivascience Vivaspin 15R

## Storage conditions / shelf life

Vivaspin ultrafiltration spin columns should be stored at room temperature.

## Introduction

Vivaspin concentrators are disposable ultrafiltration devices for the concentration and/or purification of biological samples. Vivaspin 15R is suitable for sample volumes of 3- 15 ml.

The innovative design, ease of use, speed and exceptional concentrate recoveries are the main features of the concentrators.

## Centrifugal Operation

Vivaspin concentrators can be used in swing bucket or fixed angle rotors accepting standard conical bottom tubes. In a single spin, solutions can be concentrated in excess of 100 X.

Samples are typically concentrated in 10 to 30 minutes with macromolecular recoveries in excess of 95 %. The longitudinal membrane orientation and thin channel concentration chamber, provide optimum cross flow conditions even for particle laden solutions; the centrifugal force pulling particles and solids away from the membrane to the bottom of the device. Macromolecules collect in an impermeable concentrate pocket integrally moulded below the membrane surface, thereby eliminating the risk of filtration to dryness.

## Equipment Required

1. Centrifuge with swing bucket or fixed angle rotor (minimum 25°).
2. Pasteur or fixed volume pipettes for sample delivery and removal.

| Device       | Carrier Required |
|--------------|------------------|
| Vivaspin 15R | 50 ml / 30 mm Ø  |

| Equipment required   | Vivaspin 15R                              |
|----------------------|---|
| Centrifuge           |   |
| Rotor type           | Swing bucket or Fixed angle               |
| Minimum rotor angle  | 25°                                       |
| Rotor cavity         | To fit 50 ml (30 mm) conical bottom tubes |
| Concentrate recovery |   |
| Pipette type         | Fixed or variable volume                  |
| Recommended tip      | Thin gel loader type                      |

## Rotor compatibility

**Please note:** Vivaspin 15R (30 mm x 116 mm) is designed to fit into rotors that can accommodate Falcon 50 ml conical bottom tubes, e.g. Beckman Allegra 25R with TS-5.1-500 swing-out rotor with BUC 5 buckets and 368327 adaptors; Beckman TA-10.250 25° fixed angle rotor with 356966 adaptors; Heraeus Multifuge 3 S-R with (Heraeus / Sorvall) 75006445 swing out rotor with 75006441 buckets and adaptors for Falcon 50 ml conical bottom tubes.

These devices are not designed to fit into rotors that only accept round bottom 29 mm x 105 mm tubes, e.g. Sorvall SS34 Beckmann JA 20. If your rotor accepts only 29 mm x 105 mm round bottom tubes, please use the Vivaspin 15, which can be used in either round bottom or conical centrifuge tubes.

## Operation

1. Select the most appropriate membrane cut-off 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 the maximum volumes shown in table 1. (Ensure screw closure is fully seated)
3. Insert assembled concentrator into centrifuge (when fixed angle rotors are used, angle concentrator so that the top and window faces upwards/outwards).
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 table 3 for guide to concentration times), remove assembly and recover sample from the bottom of the concentrate pocket with a pipette.

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

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| Table 1: Technical specifications | Vivaspin 15R        |
|-----------------------------------|---------------------|
| Concentrator capacity             |                     |
| Swing bucket rotor                | 15 ml               |
| Fixed angle rotor                 | 12.5 ml             |
| Dimensions                        |                     |
| Total length                      | 116 mm              |
| Width                             | 30 mm               |
| Active membrane area              | 3.9 cm <sup>2</sup> |
| Hold up volume membrane           | < 20 µl             |
| Dead stop volume                  | 30 µl               |
| Materials of construction         |                     |
| Body                              | Polycarbonate       |
| Filtrate vessel                   | Polypropylene       |
| Concentrator cap                  | Polycarbonate       |
| Membrane                          | Hydrosart           |

| Table 2: Recommended Spin Speed (xg) |              |             |
|--------------------------------------|--------------|-------------|
| Vivaspin15R                          |              |             |
| Membrane                             | Swing Bucket | Fixed Angle |
| 2 - 30,000 MWCO Hydrosart            | 6,000        | 3,000       |

| Table 3: Typical performance           | Time to concentrate 30x min. at 20°C and solute recovery % |      |                 |      |
|--|--|------|-----------------|------|
| Rotor                                  | Swing bucket   |      | 25° Fixed angle |      |
|  | Min.   | Rec. | Min.            | Rec. |
| Start volume                           | 15 ml  |      | 12.5 ml         |      |
| Insulin chain A 0.1 mg/ml* (2,500 MW)  |  |      |                 |      |
| 2,000 MWCO                             | 70   | 96 % | 60              | 96 % |
| Aprotinin 0.1 mg/ml* (6,500 MW)        |  |      |                 |      |
| 5,000 MWCO                             | 47   | 95 % | 45              | 95 % |
| Cytochrome c 0.25 mg/ml* (12,400 MW)   |  |      |                 |      |
| 5,000 MWCO                             | 45   | 96 % | 45              | 96 % |
| 10,000 MWCO                            | 25   | 94 % | 18              | 94 % |
| α-chymotrypsin 0.25 mg/ml* (25,000 MW) |  |      |                 |      |
| 5,000 MWCO                             | 50   | 98 % | 45              | 98 % |
| 10,000 MWCO                            | 25   | 98 % | 18              | 98 % |
| Ovalbumin 1.0 mg/ml* (45,000 MW)       |  |      |                 |      |
| 10,000 MWCO                            | 20   | 98 % | 14              | 98 % |
| 30,000 MWCO                            | 15   | 94 % | 12              | 94 % |
| BSA 1.0 mg/ml* (66,000 MW)             |  |      |                 |      |
| 30,000 MWCO                            | 18   | 98 % | 15              | 98 % |
| IgG 0.1 mg/ml*in DMEM (160,000 MW)     |  |      |                 |      |
| 30,000 MWCO                            | 30   | 98 % | 25              | 96 % |

\* proteins other than IgG made up in 50 mM potassium sulphate, 150 mM sodium chloride, pH 7.4

## 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 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

To sterilise, use a 70 % ethanol solution or sterilising gas mixture.

### 4. Chemical Compatibility

Vivaspin concentrators are designed for use with biological fluids and aqueous solutions.