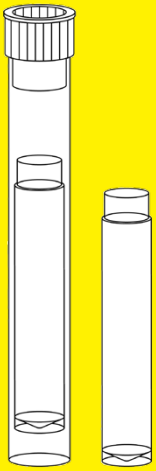
Instructions for Use

# Vivaspin® Filtrate

Centrifugal Ultrafiltration Devices for General Laboratory Use



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# Contents

# 1 About these Instructions

## 1.1 Scope

These instructions are part of the product. These instructions apply to the following versions of the product:

| Vivaspin® Filtrate | Quantity | Prod. no. |
|---|---|---|
| 5 kDa CTA | 12 | 13229----------E |
| 10 kDa CTA | 12 | 13239----------E |
| 20 kDa CTA | 12 | 13249----------E |
| 100 kDa PES | 12 | 13269---------GE |
| 300 kDa PES | 12 | 13279----------E |

## 1.2 Target Groups

The instructions are addressed to the following target groups. The target groups must possess the knowledge specified below.

| Target Group | Knowledge and Qualifications |
|---|---|
| Operator | The operator is familiar with the device and the associated work processes. The operator understands the hazards which may arise when working with the device, and knows how to prevent them. |

## 1.3 Symbols Used

### 1.3.1 Warnings in Operation Descriptions

**NOTICE**
Denotes a hazard that may result in property damage if it is **not** avoided.

### 1.3.2 Other Symbols

▶ Required action: Describes actions that must be carried out.
The actions in the sequence must be carried out in succession.

▷ Result: Describes the result of the actions carried out.

# 2 Safety Instructions

## 2.1 General Functions

The product is intended for the ultrafiltration of biological and aqueous solutions with small sample volumes, e.g. for protein removal.

The filtration process must be carried out in a centrifuge. For this purpose, the sample solution must be put into the product and the product must be inserted into a centrifuge. Due to the centrifugal forces, the particles or macromolecules that are sufficiently larger than the nominal pore size of the membrane are removed from the sample solution.

The product is supplied non-sterile. It is intended for single use and must be disposed of after one use.

The product is intended exclusively for use in accordance with these instructions. Any further use beyond this is considered improper.

### Operating Conditions for the Product

The product is intended for general laboratory use.

The product may only be used with the equipment and under the operating conditions described in the Technical Data section of these instructions.

## 2.2 Personnel Qualification

Persons without sufficient knowledge in the safe use of the device can injure themselves and others.

If a specific qualification is required for an activity: The target group is indicated. If no qualification is specified: The activity can be carried out by the target group "operator".

## 2.3 Significance of these Instructions

Failure to follow the instructions might have serious consequences, e.g. danger to individuals.

- ▶ Read the instructions carefully and completely. The instructions for action build on each other.
- ▶ Ensure that the information contained in these instructions is available to all individuals working with the product.

## 2.4 Functionality of the Product

A damaged product or worn parts can lead to malfunctions or cause hazards which are difficult to identify.

- ▶ Only operate the product when it is safe and in perfect working order.

# 3 Product Description

## 3.1 Product Overview

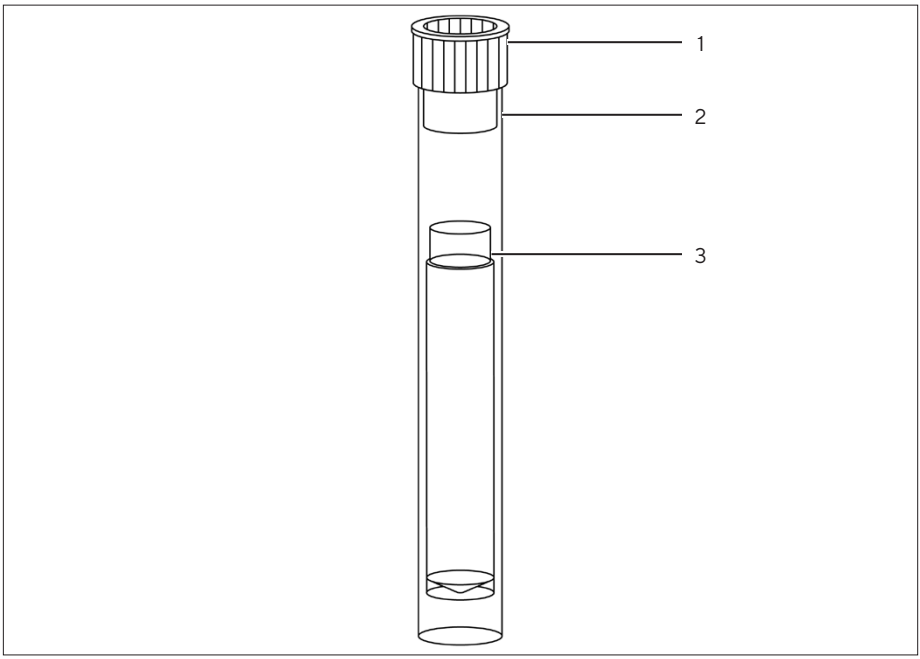


Fig. 1: Product overview (example)

| Pos. | Description |
|---|---|
| 1 | Dust cap |
| 2 | Centrifuge tube |
| 3 | Filtrate vessel with membrane |

## 3.2 Product Symbols

| Symbol | Description |
|---|---|
| **Qty** | Quantity |
| REF | Catalogue number |
| LOT | Batch number |
|  | Use by |
|  | **Non**-sterile product |
|  | Do **not** re-use |
|  | Consult instructions for use |
|  | Temperature limits |

# 4 Process Preparation

## 4.1 Scope of Delivery

| Item | Quantity |
|---|---|
| Product, packed in a cardboard box, according to packaging unit | 12 |
| Instructions for Use | 1 |

## 4.2 Unpacking

**Procedure**

- ▶ **NOTICE** Risk of product malfunctions due to exceeding the usability! Check the usability of the product (see specification on packaging). Dispose of products for which the usability has been exceeded.
- ▶ Unpack the product.

# 5 Operation

## 5.1 Pre-Rinsing the Product

The membrane in the product may contain traces of glycerin. If this substance can interfere with the analysis of the sample: Rinse the membrane before filtration.

### Procedure

- ▶ Remove the dust cap.
- ▶ Slide out the filtrate vessel and place it with the open end downwards. Do **not** touch the membrane.
- ▶ Dip the filtrate vessel with the membrane facing downwards in buffer solution or deionized water for 5 minutes.
- ▶ Alternatively, use a pipette to apply a filling volume of buffer solution or deionized water into the centrifuge tube.
- ▶ Slide the filtrate vessel into the centrifuge tube with the membrane facing downwards.
- ▶ Wash the buffer solution or deionized water through the membrane with the help of a suitable centrifuge.
- ▶ Decant the buffer solution or deionized water from the centrifuge tube and filtrate vessel.
- ▶ If the pre-rinsed product is not used immediately: Cover the surface of the membrane with buffer solution or water, replace the dust cap to avoid evaporation and store the product in the refrigerator. The membrane must not dry out.

## 5.2 Sanitizing the Product

The product can be sanitized before use. The sanitizing method must be suitable for the product (see Chapter "8.6 Sanitizing Methods", page 20).

**Procedure**

- ▶ Remove the dust cap.
- ▶ Sanitize the product using the desired sanitizing method.
- ▶ Empty the product.

## 5.3 Performing Filtration

### 5.3.1 Applying the Sample

It is recommended that a pipette is used to apply the sample into the product. The pipette must be compatible with the product (see Chapter "8.4.2 Pipettes", page 19).

Please ensure that the molecular weight cut-off (MWCO) of the product is suitable for the size of the target molecule(s) to be removed or concentrated. In order to ensure maximum removal or recovery of the target molecule, it is recommended to select a MWCO that is at least 50% below the size of the target molecule.

**NOTICE**

**Risk of product malfunctions due to using unsuitable samples!**

- ▶ Do not apply samples containing organic solvents into the product.

**NOTICE**

**Risk of product malfunctions or damage to the centrifuge due to exceeding the maximum filling volume!**

- ▶ Do **not** exceed the maximum filling volume (see Chapter "8.5 Operating Conditions", page 20).

Procedure

- Check whether the MWCO of the product is suitable for the application.
- Remove and discard the dust cap.
- Slide out the filtrate vessel and place it with the open end downwards. Do **not** touch the membrane.
- Apply the sample into the centrifuge tube using a pipette. Comply with the maximum filling volume. For non-coagulated blood samples, pre-centrifuge the sample for 2 minutes without the filtrate vessel.
- Slide the filtrate vessel into the centrifuge tube with the membrane facing downwards and leave for 5 minutes so that the membrane is wetted by the sample.

### 5.3.2 Performing Filtration

Procedure

- Insert the product into the centrifuge. For samples containing lipids (e.g. milk), only use a fixed angle rotor.
- **NOTICE** Risk of product malfunctions or damage to the centrifuge. Comply with the approved centrifugation limit values (see Chapter “8.5 Operating Conditions”, page 20).
- Centrifuge the product in the centrifuge until the desired filtrate volume or concentration level is achieved. For concentrated protein samples (e.g. blood, serum), start the filtration at half the maximum RCF for 5 minutes.

### 5.3.3 Removing the Sample

**Procedure**

- If the filtration or concentration is complete: Remove the product from the centrifuge.
- **NOTICE** Risk of reduced sample volume due to diffusion. Remove the sample from the filtrate vessel with a pipette as soon as possible after performing filtration.
- If the concentrate is required: Remove the filtrate vessel from the centrifuge tube using opened forceps. Use a pipette to remove the concentrate from the centrifuge tube.
- If the membrane was pre-rinsed before filtration: Decant the filtrate and concentrate.

# 6 Storage

## 6.1 Storing the Product

If the product has been unpacked and the membrane has been pre-rinsed: The membrane must be protected against drying out. For this purpose, the membrane must be stored in a moist and cool condition.

### NOTICE

**Risk of damage to the product due to improper storage!**

- ▶ Comply with the storage specifications.

Procedure

- ▶ If the product is packaged: Store the product in the packaging.
- ▶ If the product has been unpacked and membrane has been pre-rinsed:
  - ▶ Remove the dust cap.
  - ▶ Cover the membrane with buffer solution or water.
  - ▶ Replace the dust cap.
- ▶ Store the product according to the ambient conditions (see Chapter “8.3 Ambient Conditions“, page 19).

# 7 Disposal

## 7.1 Decontaminating the Product

If the product has come into contact with hazardous substances: Steps must be taken to ensure proper decontamination and declaration. The operator of the product is responsible for adhering to local government regulations on the proper decontamination and declaration for transport and disposal.

### Procedure

▶ If the product has come into contact with hazardous substances: Decontaminate the product.

## 7.2 Disposing of the Product

The product must be disposed of properly. The packaging is made of environmentally friendly materials that can be used as secondary raw materials.

### Requirements

The product must be decontaminated.

### Procedure

▶ Dispose of the product in accordance with local government regulations.
▶ Dispose of the packaging in accordance with local government regulations.

# 8 Technical Specifications

## 8.1 Dimensions

| | Unit | Value |
|---|---|---|
| Dimensions | | |
| Length × Diameter | mm | 93 × 14 |
| Active membrane surface | $cm^2$ | 0.79 |
| Weight | g | 10 |

## 8.2 Materials

| | Materials |
|---|---|
| Filtrate vessel | Styrene Acrylonitrile (SAN) |
| Centrifuge tube | Polystyrene (PS) |
| Dust cap | Polyethylene (PE) |
| Membrane | Cellulose Triacetate (CTA) or Polyethersulfone (PES) |

## 8.3 Ambient Conditions

| | Unit | Value |
|---|---|---|
| Storage temperature | | |
| When packed | °C | +15 – +30 |
| When unpacked, with membrane kept moist | °C | +2 – +8 |

## 8.4 Equipment Required

### 8.4.1 Centrifuges

| | Unit | Value |
|---|---|---|
| Swing bucket rotor or fixed angle rotor | | |
| Minimum rotor angle for fixed angle rotor | | 25° |
| Rotor accepting centrifuge tubes with the following features | | |
| Volume | mL | 15 |
| Diameter | mm | 17 |
| Base | | Conical or flat |

### 8.4.2 Pipettes

| |
|---|
| Pasteur pipette, variable volume or fixed volume pipette for sample application and concentrate or filtrate retrieval. |

## 8.5 Operating Conditions

| | Unit | Value |
|---|---|---|
| Filtration Volumes | | |
| Filling volume, minimum | mL | 0.5 |
| Filling volume, maximum | mL | 2.5 |
| Membrane hold-up volume, minimum | µL | <5 |
| Dead stop volume[1] | µL | 100 |
| Relative Centrifugal Force, maximum | | |
| Centrifuge with swing bucket rotor | *g* | 2,500 |
| Centrifuge with fixed angle rotor | *g* | 2,000 |

[1]The dead stop volume may vary depending on the type and concentration of the sample, operating temperature and | or centrifuge rotor

## 8.6 Sanitizing Methods

| |
|---|
| Rinsing with 70% ethanol or with sanitizing gas mixture, e.g. ethylene oxide |
| **Not** suitable for autoclaving |

## 8.7 Typical Performance Characteristics

| **2.5 mL start volume in centrifuge at 2,000 *g*** | **Time to filter 50 % of sample volume** | **Time to filter 90 % of sample volume** | **Passage of sample species** |
|---|---|---|---|
| BSA 1.0 mg/ml (66 kDa) | | | |
| 5 kDa MWCO CTA | 300 min | - | 0 % |
| 10 kDa MWCO CTA | 35 min | 80 min | 2 % |
| 30 kDa MWCO CTA | 9 min | 20 min | 2 % |
| Blue dextran 0.1 mg/ml (2,000 kDa) | | | |
| 300 kDa MWCO PES | 9 min | 25 min | 28 % |

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Masculine or feminine forms are used to facilitate legibility in these instructions and always simultaneously denote all genders.



Last updated:

02 | 2023



KS | Publication No.: SE-6002-e230201