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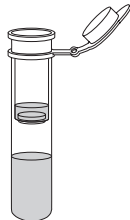
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# Ultrafree<sup>®</sup>-MC and -CL Centrifugal Filter Devices with microporous membranes

## Introduction

Ultrafree<sup>®</sup>-MC and -CL centrifugal devices are single-use, disposable filters used for removing particulates from aqueous biological solutions. These devices are available in two process volumes with a range of microporous membranes. The Ultrafree<sup>®</sup> product line includes:

| Device                                                                                                          | Process Volume               | Centrifuge Required                                                                         |
|-----------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------|
| <br>Ultrafree <sup>®</sup> -MC  | 0.05 to 0.5 mL (milliliters) | Standard microcentrifuge with fixed-angle rotor capable of holding 1.5 mL tubes             |
| <br>Ultrafree <sup>®</sup> -CL | 0.5 to 2 mL                  | Standard, variable-speed centrifuge with a fixed-angle rotor capable of holding 15 mL tubes |

A complete device consists of a filter cup and a filtrate collection tube with cap.

## Membrane Types

Ultrafree<sup>®</sup>-MC and -CL devices are available with polyvinylidene fluoride (PVDF) and polytetrafluoroethylene (PTFE) microporous membranes.

|                                                 |                                                                |
|-------------------------------------------------|----------------------------------------------------------------|
| Low-binding Durapore <sup>®</sup> PVDF membrane | Available in 0.1, 0.22, 0.45, 0.65, and 5.0 micron (µm) sizes. |
| PTFE membrane                                   | Available in 0.2 and 0.45 µm sizes.                            |

## Guidelines for Use

### Protein Binding

Many factors can influence nonspecific protein binding, including membrane material, solution pH, buffer strength, contact time, surface tension of the solution, solute concentration, and individual protein character. Durapore<sup>®</sup> PVDF membrane displays the lowest protein binding of any of the microfiltration membranes.

### Device Storage

Store at room temperature.

## Ultrafree<sup>®</sup> Device Chemical Compatibility

The information in the following table was developed from technical publications, materials suppliers, and laboratory tests, and is believed to be accurate and reliable. However, because variability in temperature, concentrations, exposure time, and other factors outside of our control may affect the use of the unit, no warranty is provided or implied with respect to such information. Agents not listed below should be tested with the Ultrafree<sup>®</sup> device prior to use.

**KEY:** R = Recommended R<sup>1</sup> = Test with 5.0 µm PVDF  
 NR = Not recommended R<sup>2</sup> = Not recommended with 5.0 µm PVDF  
 TST = Limited use: Testing is recommended

| Chemical                                | Membrane       |      |
|-----------------------------------------|----------------|------|
|                                         | PVDF           | PTFE |
| Acetic acid, glacial                    | R <sup>2</sup> | R    |
| Acetone                                 | NR             | R    |
| Acetonitrile                            | R              | R    |
| Aliphatic ethers                        | R              | R    |
| Ammonium hydroxide (6 N)                | R              | R    |
| Amyl acetate                            | TST            | TST  |
| Amyl alcohol                            | R <sup>1</sup> | R    |
| Benzene                                 | NR             | NR   |
| Benzyl alcohol (1%)                     | R              | R    |
| Boric acid                              | R              | R    |
| Brine (sea water)                       | R              | R    |
| Butyl alcohol                           | R <sup>1</sup> | R    |
| Carbon tetrachloride                    | R              | R    |
| Cellosolve <sup>®</sup> (ethyl) solvent | TST            | TST  |
| Chloroform                              | R <sup>2</sup> | R    |
| Cyclohexanone                           | NR             | R    |
| Dimethylacetamide                       | NR             | R    |
| Dimethylformamide                       | NR             | R    |
| Dimethyl sulfoxide                      | TST            | R    |
| Dioxane                                 | TST            | TST  |
| Ethers                                  | TST            | R    |
| Ethyl acetate                           | NR             | R    |
| Ethyl alcohol                           | R              | R    |
| Ethylene glycol                         | R              | R    |
| Formaldehyde                            | R              | R    |
| Freon <sup>®</sup> TF or PCA solvent    | R              | R    |
| Gasoline                                | R              | R    |
| Glycerine (glycerol)                    | R              | R    |
| Hexane                                  | R              | R    |
| Hydrochloric acid (6 N)                 | R <sup>2</sup> | R    |
| Hydrofluoric acid                       | R <sup>1</sup> | NR   |

| Chemical                 | Membrane       |      |
|--------------------------|----------------|------|
|                          | PVDF           | PTFE |
| Hydrogen peroxide (3%)   | R              | R    |
| Hypo (photo)             | R              | R    |
| Isobutyl alcohol         | R              | R    |
| Isopropyl acetate        | NR             | R    |
| Isopropyl alcohol        | R <sup>1</sup> | R    |
| Kerosene                 | R              | R    |
| Methyl alcohol           | R              | R    |
| Methyl ethyl ketone      | NR             | R    |
| Methyl isobutyl ketone   | NR             | R    |
| Mineral spirits          | R              | R    |
| Nitric acid (6 N)        | TST            | R    |
| Nitrobenzene             | NR             | NR   |
| Ozone (10 ppm in water)  | R              | R    |
| Paraldehyde              | TST            | R    |
| Pentane                  | R              | R    |
| Perchloroethylene        | NR             | NR   |
| Petroleum based oils     | R              | R    |
| Petroleum ether          | R              | R    |
| Phenol (0.5%)            | R <sup>1</sup> | R    |
| Phenol (10%)             | R <sup>2</sup> | R    |
| Pyridine                 | NR             | NR   |
| Silicone oils            | R              | R    |
| Sodium hydroxide (conc.) | NR             | R    |
| Sulfuric acid (3 N)      | R              | R    |
| Tetrahydrofuran          | TST            | R    |
| Toluene                  | NR             | NR   |
| Trichloroethane          | NR             | NR   |
| Trichloroethylene        | NR             | NR   |
| Trifluoroacetic acid     | R <sup>1</sup> | R    |
| Xylene                   | NR             | NR   |

## How to Use the Ultrafree® Filter Devices

This section provides instructions for general use such as sample clarification.

1. Uncap the Ultrafree® device. Hold the device vertically with the filter cup opening facing up and pipette the sample into the filter cup.
2. Recap the device and insert it into the centrifuge fixed-angle rotor. Make sure that the rotor head is balanced.
3. Centrifuge the sample until required concentrate or filtrate volume is achieved.

| Device Type   | G-force    | Typical Spin Time |
|---------------|------------|-------------------|
| Ultrafree®-MC | 12,000 × g | 1 to 4 minutes    |
| Ultrafree®-CL | 5,000 × g  | 1 to 4 minutes    |

**NOTE:** G-force is not the same as RPM. Calculate g-force (relative centrifugal force or RCF) using this formula:

$$RCF = 1.118 \times 10^{-5} \times \text{radius} \times (\text{RPM})^2$$

radius = distance in centimeters from the center of rotation to base of the filtrate collection tube

## Specifications for Ultrafree®-MC Filter Devices

### Materials of Construction

|                          |                                                                 |
|--------------------------|-----------------------------------------------------------------|
| Filter cup               | PVDF (with PVDF membrane) or Polypropylene (with PTFE membrane) |
| Membrane                 | PVDF or PTFE                                                    |
| Filtrate collection tube | Polypropylene                                                   |

### Dimensions

|                                  |                                    |
|----------------------------------|------------------------------------|
| Filter cup                       | Length: 23 mm                      |
| Filtrate collection tube, capped | Length: 40 mm                      |
| Filter cup in tube, capped       | Length: 45 mm                      |
|                                  | Outer diameter (below ring): 11 mm |

### Capacity

|                          |        |
|--------------------------|--------|
| Filter cup               | 0.5 mL |
| Filtrate collection tube | 1.5 mL |
| Hold-up volume           | 5 µL   |

### Effective filtration area

0.2 cm<sup>2</sup>

### Maximum temperature

50 °C (122 °F)

### Centrifuge rotor

Fixed-angle rotor capable of holding 1.5 mL centrifuge tubes

### Maximum g-force

12,000 × g

## Specifications for Ultrafree®-CL Filter Devices

### Materials of Construction

|                          |               |
|--------------------------|---------------|
| Filter cup               | Polypropylene |
| Membrane                 | PVDF or PTFE  |
| Filtrate collection tube | Polypropylene |

### Dimensions

|                                  |                                    |
|----------------------------------|------------------------------------|
| Filter cup                       | Length: 42 mm                      |
| Filtrate collection tube, capped | Length: 68 mm                      |
| Filter cup in tube, capped       | Length: 77 mm                      |
|                                  | Outer diameter (below ring): 16 mm |

### Capacity

|                          |        |
|--------------------------|--------|
| Filter cup               | 2.0 mL |
| Filtrate collection tube | 5 mL   |
| Hold-up volume           | 30 µL  |

### Effective filtration area

0.8 cm<sup>2</sup>

### Maximum temperature

50 °C (122 °F)

### Centrifuge rotor

Fixed-angle rotor capable of holding 15 mL centrifuge tubes

### Maximum g-force

5,000 × g

## Product Ordering Information

All Ultrafree® devices are preassembled with collection tubes and caps. See the Technical Assistance section for contact information.

## Ultrafree®-MC Filter Devices

| Durapore® PVDF Membrane        | Cap Color   | Catalogue No.                       | Qty/Pk           |
|--------------------------------|-------------|-------------------------------------|------------------|
| 0.1 µm pore size, non-sterile  | orange      | UFC30VV25<br>UFC30VV00              | 25<br>100        |
| 0.22 µm pore size, non-sterile | yellow      | UFC30GV25<br>UFC30GV00<br>UFC30GVNB | 25<br>100<br>250 |
| 0.22 µm pore size, sterile     |             | UFC30GV0S                           | 50 (5×10)        |
| 0.45 µm pore size, non-sterile | red         | UFC30HV25<br>UFC30HV00<br>UFC30HVN  | 25<br>100<br>250 |
| 0.65 µm pore size, non-sterile | purple      | UFC30DV25<br>UFC30DV00              | 25<br>100        |
| 0.65 µm pore size, sterile     |             | UFC30DV0S                           | 50 (5×10)        |
| 5.0 µm pore size, non-sterile  | dark green  | UFC30SV00                           | 100              |
| Hydrophilic PTFE Membrane      | Cap Color   | Catalogue No.                       | Qty/Pk           |
| 0.2 µm pore size, non-sterile  | yellow ring | UFC30LG25<br>UFC30LG00              | 25<br>100        |
| 0.45 µm pore size, non-sterile | red ring    | UFC30LH25<br>UFC30LH00              | 25<br>100        |
| Ultrafree® Collection Tubes    |             | UFC3000TB                           | 1000             |

## Ultrafree®-CL Filter Devices

| Durapore® PVDF Membrane        | Cap Color   | Catalogue No.          | Qty/Pk    |
|--------------------------------|-------------|------------------------|-----------|
| 0.1 µm pore size, non-sterile  | orange      | UFC40VV25<br>UFC40VV00 | 25<br>100 |
| 0.22 µm pore size, non-sterile | yellow      | UFC40GV25<br>UFC40GV00 | 25<br>100 |
| 0.22 µm pore size, sterile     |             | UFC40GV0S              | 50 (5×10) |
| 0.45 µm pore size, non-sterile | red         | UFC40HV25<br>UFC40HV00 | 25<br>100 |
| 0.65 µm pore size, non-sterile | purple      | UFC40DV25              | 25        |
| 5.0 µm pore size, non-sterile  | dark green  | UFC40SV25              | 25        |
| Hydrophilic PTFE Membrane      | Cap Color   | Catalogue No.          | Qty/Pk    |
| 0.2 µm pore size, non-sterile  | yellow ring | UFC40LG25              | 25        |
| 0.45 µm pore size, non-sterile | red ring    | UFC40LH25              | 25        |

## Notice

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