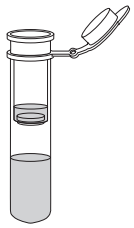
User Guide

Ultrafree®-MC and -CL Centrifugal Filter Devices

with microporous membranes

Introduction

Ultrafree®-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® product line includes:

Device	Process Volume	Centrifuge Required
Ultrafree®-MC 	0.05 to 0.5 mL (milliliters)	Standard microcentrifuge with fixed-angle rotor capable of holding 1.5 mL tubes
Ultrafree®-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®-MC and -CL devices are available with polyvinylidene fluoride (PVDF) and polytetrafluoroethylene (PTFE) microporous membranes.

Low-binding Durapore® 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® PVDF membrane displays the lowest protein binding of any of the microfiltration membranes.

Device Storage

Store at room temperature.

Ultrafree® 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® device prior to use.

KEY: **R** = Recommended **R**[1] = Test with 5.0 µm PVDF
NR = Not recommended **R**[2] = Not recommended with 5.0 µm PVDF
TST = Limited use: Testing is recommended

	Membrane	
Chemical	PVDF	PTFE
Acetic acid, glacial	R[2]	R
Acetone	NR	R
Acetonitrile	R	R
Aliphatic ethers	R	R
Ammonium hydroxide (6 N)	R	R
Amyl acetate	TST	TST
Amyl alcohol	R[1]	R
Benzene	NR	NR
Benzyl alcohol (1%)	R	R
Boric acid	R	R
Brine (sea water)	R	R
Butyl alcohol	R[1]	R
Carbon tetrachloride	R	R
Cellosolve® (ethyl) solvent	TST	TST
Chloroform	R[2]	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® TF or PCA solvent	R	R
Gasoline	R	R
Glycerine (glycerol)	R	R
Hexane	R	R
Hydrochloric acid (6 N)	R[2]	R
Hydrofluoric acid	R[1]	NR

	Membrane	
Chemical	PVDF	PTFE
Hydrogen peroxide (3%)	R	R
Hypo (photo)	R	R
Isobutyl alcohol	R	R
Isopropyl acetate	NR	R
Isopropyl alcohol	R[1]	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[1]	R
Phenol (10%)	R[2]	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[1]	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:

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

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^2
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^2
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. You can purchase these products on-line at www.millipore.com/products.

Ultrafree®-MC Filter Devices

Durapore® PVDF Membrane	Cap Color	Catalogue No.	Qty/Pk
0.1 µm pore size, non-sterile	orange	UFC30VV25	25
		UFC30VV00	100
0.22 µm pore size, non-sterile	yellow	UFC30GV25	25
		UFC30GV00	100
		UFC30GVNB	250
0.22 µm pore size, sterile		UFC30GV0S	50 (5×10)
0.45 µm pore size, non-sterile	red	UFC30HV25	25
		UFC30HV00	100
		UFC30HVNB	250
0.65 µm pore size, non-sterile	purple	UFC30DV25	25
		UFC30DV00	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	25
		UFC30LG00	100
0.45 µm pore size, non-sterile	red ring	UFC30LH25	25
		UFC30LH00	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	25
		UFC40VV00	100
0.22 µm pore size, non-sterile	yellow	UFC40GV25	25
		UFC40GV00	100
0.22 µm pore size, sterile		UFC40GV0S	50 (5×10)
0.45 µm pore size, non-sterile	red	UFC40HV25	25
		UFC40HV00	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

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