User Guide

Centricon® Plus-70 Centrifugal Filter

For concentration and purification of biological samples

UFC700308 UFC701008
UFC703008 UFC710008

Product Overview

The Centricon® Plus-70 centrifugal filter is a disposable, single-use device designed for rapid processing of aqueous biological solutions in volumes ranging from 15 to 70 mL. It is compatible with swinging-bucket centrifuges only. The Centricon® Plus-70 device can concentrate most 70 mL solutions down to 350 µL in 15–40 minutes.

Usage Guidelines

For best results be sure to follow the guidelines below.

Flow Rate

Flow rate is affected by several parameters, including the membrane nominal molecular weight limit (NMWL), solute molecular weight and concentration, viscosity, centrifugal force, and temperature. For maximum recovery, select a device with a NMWL approximately three times lower than the molecular weight of your target molecule. Expect longer spin times for starting solutions with over 5% solids. Flow rates at 4 °C are typically 1.5 times slower than those at 25 °C. Viscous solutions, such as 50% glycerine, will take up to five times longer to concentrate than very dilute solutions.

Prerinsing

Centricon® Plus membranes contain trace amounts of glycerine, used as a humectant. To remove glycerine, fill device with 70 mL of buffer solution or Milli-Q® water and spin for 5 minutes. To remove all water and buffer, a recovery spin is required.

Do not allow the membrane in filter device to dry out once wet. If the device is not being used immediately after prerinsing, leave fluid on the membrane until the device is used.

Desalting or Buffer Exchange

Concentrate a 70 mL sample to 350 µL. Discard filtrate and reconstitute the sample back to 70 mL by adding the required volume of buffer. Concentrate again to 350 µL. Repeat this process until the concentration of the contaminating solutes is reduced. Typically, one wash cycle will remove > 95% of the initial salt content; two cycles will remove > 99.9% of the salt.

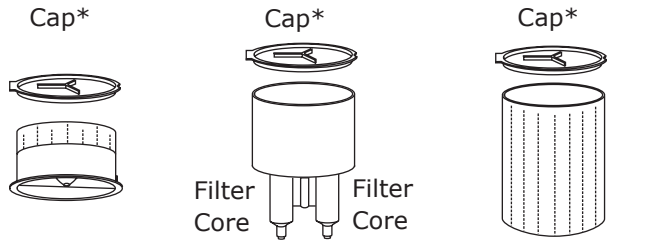
Sanitization

To sanitize the device, rinse the desired components with a 70% ethanol solution.

Chemical Compatibility

Use only with biological fluids and aqueous solutions. See your laboratory products catalogue for more information.

Centricon® Plus-70 Components



* Cap fits the Concentrate Collection Cup, Sample Filter Cup and Filtrate Collection Cup, as shown.

DOWNLOAD DUTSCHER SAS

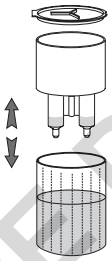
Sample Concentration

1. Add solution to sample filter cup (to a maximum of 70 mL); seal with supplied cap. Place sample filter cup into filtrate collection cup.
2. Place Centricon® Plus-70 assembly in centrifuge bucket.

   CAUTION: Before proceeding, check centrifuge clearance by manually moving bucket to its full-swing position. Counterbalance centrifuge with a second bucket containing a second Centricon® Plus-70 device and an equal volume of sample or water.
3. Spin at up to 3,500 × g until desired concentration is achieved. A typical spin time is 15–40 minutes, depending on solute type and concentration. See accompanying flow rate charts for details.

   NOTE: If the centrifuge vibrates excessively, stop and rebalance it.
4. After the concentration step, remove Centricon® Plus-70 device from centrifuge and separate sample filter cup from filtrate collection cup. If retaining the filtrate, cap filtrate collection cup and store as appropriate.

   NOTE: When pouring solution out of the filtrate collection cup, ensure that the ribs inside the cup do not obstruct the flow of liquid.

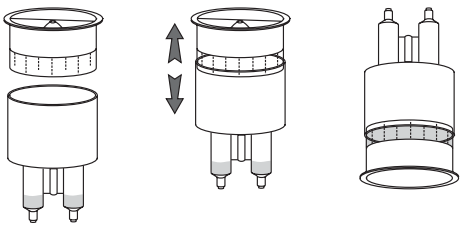


Concentrate Recovery

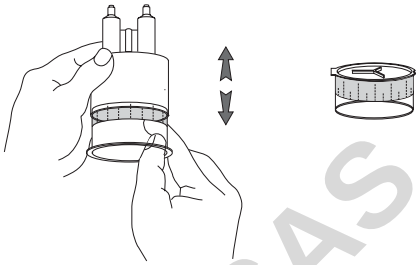
If the amount of concentrate remaining in the sample filter cup is above the top of the filter cores, decant to a suitable container before proceeding. Be sure to combine this concentrate with the concentrate removed in step 4 below.

1. Turn the concentrate cup upside down and place on top of the sample filter cup.
2. Carefully invert device, place in centrifuge, and counterbalance with a similar device. Spin at no more than 1,000 × g for up to 2 minutes.

   CAUTION: Higher spin force can result in sample loss.



3. Remove the concentrate cup containing the concentrated sample from the sample filter cup. Keep the filter cup inverted during this process.



4. Remove the sample with a pipette or cap the concentrate cup and store sample for later use.

   NOTE: Samples with high starting protein concentration may be subject to recovery losses due to protein crystallization (protein dependent). This results from the high throughput and concentration factors offered by Centricon® Plus-70 devices.

Specifications

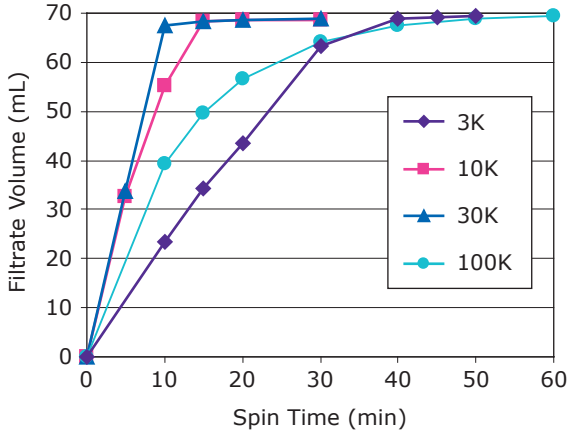
Maximum volume capacity	70 mL
Minimum final concentrate volume	350 µL
Maximum centrifugal force	3,500 × g for concentration spin 1,000 × g for recovery spin
Active membrane surface area	19.0 cm^2 (2.95 in^2)
Hold-up volume of membrane and support	75 µL
Dimensions	
Diameter	60 mm (2.36 in.)
Length	121 mm (4.76 in.)
Rotor type	Swinging-bucket capable of handling 250 mL bottles. Do not use a fixed angle rotor.
Materials of construction	
Filtrate Collection Cup	Polypropylene
Sample Filter Cup	Polypropylene
Concentrate Cup	Polypropylene
Cap	Polypropylene
Membrane	Ultracel® regenerated cellulose

DOMINIQUE DUTSCHER SAS

Device Performance

Typical Flow Rates

Typical Filtrate Volume vs. Spin Time for Centricon® Plus-70 Devices



Spin conditions:
3,500 × g, room temperature, 70 mL starting volume.

Protein markers used:
Cytochrome c for 3K and 10K, BSA for 30K, and IgG for 100K.

Typical Concentrate Volume vs. Spin Time

	Concentrate volume (mL)			
Spin time (min)	3K Device	10K Device	30K Device	100K Device
5	–	36.0	34.2	–
10	43.4	12.1	1.8	30.6
15	33.8	0.4	0.3	20.2
20	25.6	0.3	0.3	13.4
30	5.9	0.2	0.3	5.8
40	0.4	–	–	2.5
45	0.3	–	–	1.1
50	0.2	–	–	0.4

Spin conditions:
3,500 × g, room temperature, 70 mL starting volume.

Protein markers used:
Cytochrome c for 3K and 10K, BSA for 30K, and IgG for 100K.

Typical Concentrate Recovery

Marker/ Concentration	Device NMWL	Spin Time (min)	Concentrate Volume (mL)	Concentration Factor (x)	Concentrate Recovery (%)
Cytochrome c (0.25 mg/mL)	3K	40	0.4	182	87
Cytochrome c (0.25 mg/mL)	10K	15	0.4	162	93
BSA (1 mg/mL)	30K	15	0.3	207	94
IgG (1 mg/mL)	100K	20	7.4	10	91

Spin conditions:
3,500 × g, room temperature, 70 mL starting volume.

Ordering Information

Purchase products online at SigmaAldrich.com/products.

Centricon® Plus-70 Centrifugal Filters

Description, NMWL in Kilodaltons (K)	Qty/pk	Cat. No.
Centricon® Plus-70 device, 3K	8	UFC700308
Centricon® Plus-70 device, 10K	8	UFC701008
Centricon® Plus-70 device, 30K	8	UFC703008
Centricon® Plus-70 device, 100K	8	UFC710008

Notice

We provide information and advice to our customers on application technologies and regulatory matters to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose.

The information in this document is subject to change without notice and should not be construed as a commitment by the manufacturing or selling entity, or an affiliate. We assume no responsibility for any errors that may appear in this document.

Contact Information

For the location of the office nearest you, go to SigmaAldrich.com/offices.

Technical Assistance

Visit the tech service page on our web site at SigmaAldrich.com/techservice.

Standard Warranty

The applicable warranty for the products listed in this publication may be found at SigmaAldrich.com/terms.

DOMINIQUE DUTSCHER SAS

Merck, Millipore, Centricon, Milli-Q, Ultracel, and Sigma-Aldrich are trademarks of Merck KGaA, Darmstadt, Germany or its affiliates. All other trademarks are the property of their respective owners. Detailed information on trademarks is available via publicly accessible resources.
© 2021 Merck KGaA, Darmstadt, Germany and/or its affiliates. All Rights Reserved.

The life science business of Merck operates as MilliporeSigma in the U.S. and Canada.