

ЦЕНТРИФУЖНЫЕ ФИЛЬТРЫ AMICON ULTRA-0.5



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Amicon® Ultra-0.5 Centrifugal Filter Devices

for volumes up to 500 µL

For research use only;
not for use in diagnostic procedures.



Introduction

Amicon® Ultra-0.5 centrifugal filter devices provide fast ultrafiltration, with the capability for high concentration factors and easy concentrate recovery from dilute and complex sample matrices. The vertical design and available membrane surface area provide fast sample processing, high sample recovery (typically greater than 90% of dilute starting solution), and the capability for 30-fold concentration. Typical processing time is 10 to 30 minutes depending on Molecular Weight Cut off (MWCO). Solute polarization and subsequent fouling of the membrane are minimized by the vertical design, and a physical deadstop in the filter device prevents spinning to dryness and potential sample loss. Efficient recovery of the concentrated sample (retained species) is achieved by a convenient reverse spin step after collecting the filtrate. Amicon® Ultra-0.5 devices are supplied non-sterile and are for single use only.

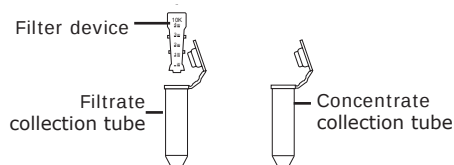
The Amicon® Ultra-0.5 product line includes 5 different cutoffs (Molecular Weight Cut Off, MWCO). These devices are for research use only and not for use in diagnostic procedures.

- Amicon® Ultra 3K device — 3,000 MWCO
- Amicon® Ultra 10K device — 10,000 MWCO
- Amicon® Ultra 30K device — 30,000 MWCO
- Amicon® Ultra 50K device — 50,000 MWCO
- Amicon® Ultra 100K device — 100,000 MWCO

Applications

- Concentration of biological samples containing antigens, antibodies, enzymes, nucleic acids (DNA/RNA samples, either single- or double-stranded), microorganisms, column eluates, and purified samples
- Purification of macromolecular components found in tissue culture extracts and cell lysates; removal of primer, linkers, or molecular labels from a reaction mix, and protein removal prior to HPLC
- Desalting, buffer exchange, or diafiltration

Materials Supplied



The Amicon® Ultra-0.5 device is supplied with two microcentrifuge tubes. During operation, one tube is used to collect filtrate, the other to recover the concentrated sample.

Required Equipment

Centrifuge with fixed angle rotor that can accommodate 1.5 mL microcentrifuge tubes

CAUTION: To avoid damage to the device during centrifugation, check clearance before spinning.

Suitability

Preliminary recovery and retention studies are suggested to ensure suitability for intended use. See the “How to Quantify Recoveries” section.

Device Storage

Store at room temperature.

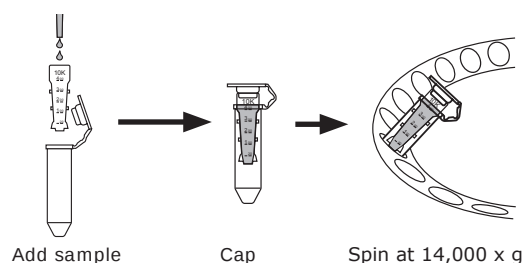
Prerinsing

The ultrafiltration membranes in Amicon® Ultra-0.5 devices contain trace amounts of glycerine. If this material interferes with analysis, pre-rinse the device with buffer or Milli-Q® water. If interference continues, rinse with 0.1 N NaOH followed by a second spin of buffer or Milli-Q® water.

CAUTION: Do not allow the membrane in Amicon® Ultra filter devices to dry out once wet. If you are not using the device immediately after pre-rinsing, leave fluid on the membrane until the device is used.

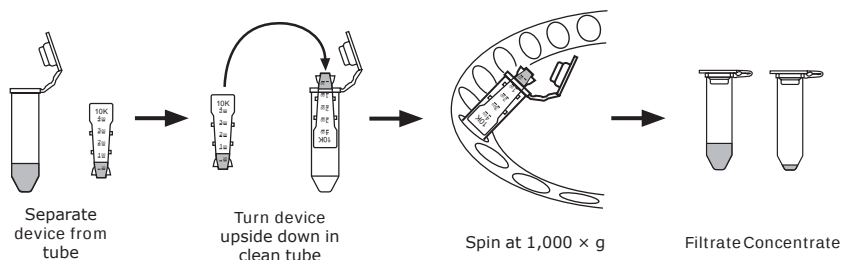
How to Use Amicon® Ultra-0.5 Centrifugal Filter Devices

1. Orient membrane panel facing up.
2. Insert the Amicon® Ultra-0.5 device into one of the provided microcentrifuge tubes.
3. Add up to 500 µL of sample to the Amicon® Ultra filter device and cap it.
4. Place capped filter device into the centrifuge rotor, aligning the cap strap toward the center of the rotor; counterbalance with a similar device.
5. Spin the device at $14,000 \times g$ for approximately 10–30 minutes depending on the MWCO of the device used. Refer to Figure 1 and Table 2 for typical spin times.



6. Remove the assembled device from the centrifuge and separate the Amicon® Ultra filter device from the microcentrifuge tube.
7. To recover the concentrated solute, place the Amicon® Ultra filter device upside down in a clean microcentrifuge tube. Place in centrifuge, aligning open cap towards the center of the rotor; counterbalance with a similar device. Spin for 2 minutes at $1,000 \times g$ to transfer the concentrated sample from the device to the tube. The ultrafiltrate can be stored in the centrifuge tube.

NOTE: For optimal recovery, perform the reverse spin immediately.

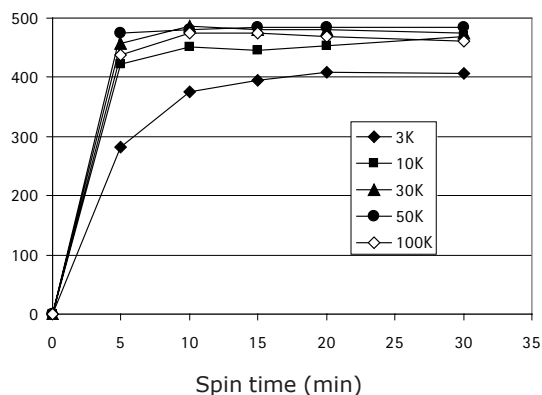


Performance - Protein Concentration

Flow Rate

Factors affecting flow rate include sample concentration, starting volume, chemical nature of solute, relative centrifugal force, centrifuge rotor angle, membrane type, and temperature. Figure 1 and Table 2 can be used to estimate the time required to achieve a given volume of filtrate or concentrate for a variety of protein markers. A typical spin time for a 500 μL sample is approximately 10 to 30 minutes (depending on device nominal molecular weight limit). While most of the sample is filtered in the first 5 to 10 minutes of centrifugation, the lowest concentrate volume (15–20 μL) is reached after spinning for 10 to 30 minutes.

Figure 1. Typical Filtrate Volume vs. Spin Time



Spin conditions: 40° fixed angle rotor, 14,000 $\times g$, room temperature, 500 μL starting volume. Protein markers used: Cytochrome c for 3K and 10K, BSA for 30K and 50K, and IgG for 100K, n=8.

Table 2. Typical Concentrate Volume / Concentration Factor vs. Spin Time

Spin Time (min)	3K device		10K device		30K device		50K device		100K device	
	Conc. Volume (μL)	Conc. Factor (x)	Conc. Volume (μL)	Conc. Factor (x)	Conc. Volume (μL)	Conc. Factor (x)	Conc. Volume (μL)	Conc. Factor (x)	Conc. Volume (μL)	Conc. Factor (x)
5	215	2	74	7	42	12	28	18	58	9
10	114	4	42	12	23	22	20	25	19	26
15	80	6	27	18	19	27	17	30	15	33
20	62	8	20	25	17	30	15	33	13	36
30	48	10	17	30	15	32	15	36	11	41

Spin conditions: 40° fixed angle rotor, 14,000 $\times g$, room temperature, 500 μL starting volume. Protein markers used: Cytochrome c for 3K and 10K, BSA for 30K and 50K, and IgG for 100K, n=12. Shaded volumes were used for the calculation of protein recovery in Table 4.

Chemical Compatibility

Amicon® Ultra centrifugal devices are intended for use with biological fluids and aqueous solutions. Before use, check the sample for chemical compatibility with the device.

Table 5. Chemical Compatibility of Amicon® Ultra Filter Devices

Acids		Concentration	
Acetic acid	≤ 50%*	Phosphoric acid	≤ 30%
Formic acid	≤ 5%*	Sulfamic acid	≤ 3%
Hydrochloric acid	≤ 1.0 M	Sulfuric acid	≤ 3%
Lactic acid	≤ 50%	Trichloroacetic acid (TCA)	≤ 10%*
Nitric acid	≤ 10%	Trifluoroacetic acid (TFA)	≤ 30%*
Alkalis			
Ammonium hydroxide	≤ 10%	Sodium hydroxide	≤ 0.5 M
Alcohols			
n-Butanol	≤ 70%	Isopropanol	≤ 70%
Ethanol	≤ 70%	Methanol	≤ 60%
Detergents			
Alconox® detergent	≤ 1%	Triton® X-100 surfactant	≤ 0.1%
CHAPS detergent	≤ 0.1%	Tween® 20 surfactant	≤ 0.1%
Lubrol® PX detergent	≤ 0.1%		
Nonidet™ P-40 surfactant	≤ 2%		
Sodium deoxycholate	≤ 5%		
Sodium dodecyl sulfate (SDS)	≤ 0.1%		
Tergazyme® detergent	≤ 1%		
Organic solvents			
Acetone	Not Recommended	Ethyl acetate	Not Recommended
Acetonitrile	≤ 20%	Formaldehyde	≤ 5%
Benzene	Not Recommended	Pyridine	Not Recommended
Carbon tetrachloride	Not Recommended	Tetrahydrofuran	Not Recommended
Chloroform	Not Recommended	Toluene	Not Recommended
Dimethyl sulfoxide (DMSO)	≤ 5%*		

Specifications

Maximum initial sample volume	500 µL
Typical final concentrate volume	15–20 µL
Recommended relative centrifugal force	14,000 × g for concentration spin 1,000 × g for reverse spin
Maximum relative centrifugal force	15,000 × g
Active membrane area	1 cm²
Hold-up volume	< 5 µL

Dimensions

Filter device and tube

Length (concentration mode; device in tube): 49.9 mm (1.96 in.)

Length (reverse spin; device upside down in tube): 47.4 mm (1.87 in.)

Tube (cap closed) Diameter: 10.8 mm (0.43 in.) Length: 42.1 mm (1.66 in.)

Filter device Diameter: 9.4 mm (0.37 in.) Length: 29.5 mm (1.16 in.)

Materials of Construction

Filter device	Copolymer styrene/butadiene
Membrane	Ultracel® low binding regenerated cellulose
Collection tubes	Polypropylene

Product Ordering Information

This section lists the catalogue numbers for Amicon® Ultra Ultrafiltration Devices.

MWCO	Qty / pk	Amicon® Ultra-0.5 device	Amicon® Ultra-2 device	Amicon® Ultra-4 device	Amicon® Ultra-15 device
3K	8	UFC500308	UFC200324	UFC800308	UFC900308
	24	UFC500324		UFC800324	UFC900324
	96	UFC500396		UFC800396	UFC900396
	500	UFC5003BK			
10K	8	UFC501008	UFC201024	UFC801008	UFC901008
	24	UFC501024		UFC801024	UFC901024
	96	UFC501096		UFC801096	UFC901096
	500	UFC5010BK			
10K IVD*	8			UFC801008D	UFC901008D
	24			UFC801024D	UFC901024D
	96			UFC801096D	UFC901096D
30K	8	UFC503008	UFC203024	UFC803008	UFC903008
	24	UFC503024		UFC803024	UFC903024
	96	UFC503096		UFC803096	UFC903096
	500	UFC5030BK			
50K	8	UFC505008	UFC205024	UFC805008	UFC905008
	24	UFC505024		UFC805024	UFC905024
	96	UFC505096		UFC805096	UFC905096
	500	UFC5050BK			
100K	8	UFC510008	UFC210024	UFC810008	UFC910008
	24	UFC510024		UFC810024	UFC910024
	96	UFC510096		UFC810096	UFC910096
	500	UFC5100BK			
* Amicon® Ultra-4 and -15 10K devices are for in vitro diagnostic (IVD) use. All other devices are for research use only.					

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