

Corning® Spin-X® UF 6 and 20 mL Concentrators

CORNING

Technical Data and Operating Instructions

For *in vitro* use only.



Introduction

Corning® Spin-X® UF concentrators are disposable, single use only ultrafiltration devices with polyethersulfone membranes (PES) for the concentration and/or purification of biological samples. Spin-X UF 6 concentrators are suitable for sample volumes of 2 to 6 mL and the Spin-X UF 20 concentrators can handle samples up to 20 mL. Both products feature twin vertical membranes for unparalleled speed.

The innovative design, ease of use, speed and exceptional concentrate recoveries are the main features of the concentrators.

Storage Conditions and Shelf Life

Spin-X UF concentrators should be stored at room temperature. The devices should be used before the expiration date printed on the box.

Chemical Compatibility

Spin-X UF concentrators are designed for use with biological fluids and aqueous solutions. For chemical compatibility details, refer to Table 4 (page 6).

Centrifugal Operation

Spin-X UF concentrators can be used in swing bucket or fixed angle rotors accepting standard conical bottom tubes. In a single spin, solutions can be concentrated in excess of 100-fold. Samples are typically concentrated in 10 to 30 minutes with macromolecular recoveries in excess of 95%.

The longitudinal membrane orientation and thin channel concentration chamber provide optimum cross flow conditions even for particle laden solutions; the centrifugal force pulling particles and solids away from the membrane to the bottom of the device. Macromolecules collect in an impermeable concentrate pocket integrally molded below the membrane surface, thereby eliminating the risk of filtration to dryness.

Required Equipment

1. Centrifuge with swing bucket or fixed angle rotor (minimum 25°).

Device	Carrier Required
Spin-X UF 6	To fit 15 mL (17 mm diameter) conical bottom tubes
Spin-X UF 20	To fit 50 mL (30 mm diameter) conical bottom tubes

2. Pasteur or standard pipets for sample addition. Pipettors with gel loading tips are recommended for sample removal from the concentrate pocket.

Rotor Compatibility

Please note: Spin-X UF 20 (30 mm x 116 mm) is designed to fit into rotors that can accommodate Corning 50 mL conical bottom tubes, e.g., Beckman Allegra 25R with TS-5.1-500 swing-out rotor with BUC 5 buckets and 368327 adaptors; Beckman TA-10.250 25° fixed angle rotor with 356966 adaptors; Heraeus Multifuge 3 S-R with (Heraeus/Sorvall) 75006445 swing out rotor with 75006441 buckets and adaptors for Corning 50 mL conical bottom tubes.

These devices are not designed to fit into rotors that only accept round bottom 29 mm x 10⁵ mm tubes, e.g., Sorvall SS34 or Beckman JA 20.

Operation

1. Select the most appropriate membrane cut-off for your sample. For maximum recovery select a molecular weight cut off (MWCO) at least 50% smaller than the molecular size of the species of interest.
2. Fill concentrator with up to maximum volumes shown in Table 1 (page 4). Ensure screw closure is fully seated.
3. Insert assembled concentrator into centrifuge (when fixed angle rotors are used, angle concentrator so that the printed window faces upwards/outwards).
4. Centrifuge at speeds recommended in Table 2 (page 5), taking care not to exceed the maximum g force indicated by membrane type and MWCO.
5. Once the desired concentration is achieved, (see Tables 3a and 3b, page 5) for guide to concentration times), remove assembly and recover sample from the bottom of the concentrate pocket with a pipet.

Desalting/Buffer Exchange

1. Concentrate sample to desired level.
2. Empty filtrate container.
3. Refill concentrator with an appropriate solvent.
4. Concentrate the sample again and repeat the process until the concentration of the contaminating micro-solute is sufficiently reduced. Typically, 3 wash cycles will remove 99% of initial salt content.

Removing the Spin-X® UF Body from the Filtrate Tube

The sleeve (seen from the end) is oval in cross section (Figure 1). The tube is round in cross section to give a tight fit to the sleeve. To release the tube from the sleeve, you must pinch the tube — to press it into an oval shape — before removing it with a twisting action.

Helpful Hints

1. Flow Rate

Filtration rate is affected by several parameters, including MWCO, porosity, sample concentration, viscosity, centrifugal force and temperature. Expect significantly longer spin times for starting solutions with over 5% solids. When operating at 4°C, flow rates are approximately 1.5 times slower than at 25°C. Viscous solutions such as 50% glycerin will take up to 5 times longer to concentrate than samples in a predominantly buffer solution.

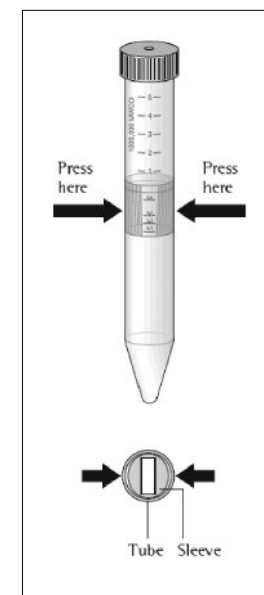


Figure 1.

2. Prerinsing

Membranes fitted to Spin-X® UF concentrators contain trace amounts of glycerin and sodium azide. Should these interfere with analysis they can be removed by rinsing fill volume of buffer solution or deionized water through the concentrator. Decant filtrate and concentrate before processing sample solution. If you do not want to use the pre-rinsed device immediately, store it in the refrigerator with buffer or water covering the membrane surface. Please do not allow the membrane to dry out.

3. Sterilization of Polyethersulfone Membranes

Polyethersulfone membranes should not be autoclaved as high temperatures will substantially increase membrane MWCO. To sterilize, use a 70% ethanol solution or sterilizing gas mixture.

Technical Specifications

Table 1. Technical Properties

	Spin-X UF 6	Spin-X UF 20
Concentrator Capacity		
Swing bucket rotor	6 mL	20 mL
Fixed angle rotor	6 mL	14 mL
Dimensions		
Total length	122 mm	116 mm
Width	17 mm	30 mm
Active membrane area	2.5 cm ²	6.0 cm ²
Hold up volume of membrane	<10 µL	<20 µL
Dead stop volume*	30 µL	50 µL

Materials of Construction

Body	Polycarbonate	Polycarbonate
Filtrate vessel	Polycarbonate	Polycarbonate
Concentrator cap	Polypropylene	Polypropylene
Membrane	Polyethersulfone	Polyethersulfone

*Dead stop volume as designed in molding tool. This volume may vary depending on sample, sample concentration, operation temperature and centrifuge rotor.

Table 2. Maximum Recommended Spin Force (xg)

	Swing Bucket	Fixed Angle
Spin-X® UF 6		
5,000 to 50,000 MWCO PES	4,000 xg	10,000 xg
100,000 MWCO PES	4,000 xg	6,000 xg
Spin-X UF 20		
5,000 to 50,000 MWCO PES	5,000 xg	8,000 xg
100,000 MWCO PES	3,000 xg	6,000 xg

Table 3a. Performance Characteristics Spin-X UF 6

(Time to concentrate up to 30x [min.] at 20°C and solute recovery %)

Rotor	Swing Bucket		25° Fixed Angle	
	6 mL		6 mL	
Start Volume	Min.	Rec.	Min.	Rec.
BSA 1.0 mg/mL (66,000 MW)				
5,000 MWCO PES	20	98%	12	98%
10,000 MWCO PES	13	98%	10	98%
30,000 MWCO PES	12	98%	9	97%
IgG 0.25 mg/mL (160,000 MW)				
30,000 MWCO PES	18	96%	15	95%
50,000 MWCO PES	17	96%	14	95%
100,000 MWCO PES	15	91%	12	91%

Table 3b. Performance Characteristics Spin-X UF 20

(Time to concentrate up to 30x [min.] at 20°C and solute recovery %)

Rotor	Swing Bucket		25° Fixed Angle	
	20 mL		14 mL	
Start Volume	Min.	Rec.	Min.	Rec.
BSA 1.0 mg/mL (66,000 MW)				
5,000 MWCO PES	23	99%	29	99%
10,000 MWCO PES	16	98%	17	98%
30,000 MWCO PES	13	98%	15	98%
IgG 0.25 mg/mL (160,000 MW)				
30,000 MWCO PES	27	97%	20	95%
50,000 MWCO PES	27	96%	22	95%
100,000 MWCO PES	25	91%	20	90%

Table 4. Chemical Compatibility

(2 hour contact time, compatible pH range pH 1-9)

Acetic Acid (25.0%)	1	Lactic Acid (5.0%)	1
Acetone (10.0%)	3	Mercaptoethanol (10 mM)	1
Acetonitrile (10.0%)	3	Methanol (60%)	2
Ammonium Hydroxide (5.0%)	2	Nitric Acid (10.0%)	1
Ammonium Sulphate (saturated)	1	Phenol (1.0%)	2
Benzene (100%)	3	Phosphate Buffer (1.0M)	1
n-Butanol (70%)	1	Polyethylene Glycol (10%)	1
Chloroform (1.0%)	3	Pyridine (100%)	2
Dimethyl Formamide (10.0%)	2	Sodium Carbonate (20%)	2
Dimethyl Sulfoxide (5.0%)	1	Sodium Deoxycholate (5.0%)	1
Ethanol (70.0%)	1	Sodium Dodecylsulfate (0.1M)	1
Ethyl Acetate (100%)	3	Sodium Hydroxide	3
Formaldehyde (30%)	1	Sodium Hypochlorite (200 ppm)	2
Formic Acid (5.0%)	1	Sodium Nitrate (1.0%)	1
Glycerine (70%)	1	Sulfamic Acid (5.0%)	1
Guanidine HCl (6M)	1	Tetrahydrofuran (5.0%)	3
Hydrocarbons, aromatic	3	Toluene (1.0%)	3
Hydrocarbons, chlorinated	3	Trifluoroacetic Acid (10%)	1
Hydrochloric Acid (1M)	1	Tween 20 (0.1%)	1
Imidazole (500 mM)	1	Triton X-100 (0.1%)	1
Isopropanol (70%)	1	Urea (8 M)	1

* 1 = acceptable, 2 = questionable, testing advised, 3 = not recommended.

Corning® Spin-X® UF Concentrators Ordering Information

Cat. No.	Description	Capacity	Membrane	Pack Size
431482	Spin-X UF 6	6 mL	5,000 MWCO	25
431483	Spin-X UF 6	6 mL	10,000 MWCO	25
431484	Spin-X UF 6	6 mL	30,000 MWCO	25
431485	Spin-X UF 6	6 mL	50,000 MWCO	25
431486	Spin-X UF 6	6 mL	100,000 MWCO	25
431487	Spin-X UF 20	20 mL	5,000 MWCO	12
431488	Spin-X UF 20	20 mL	10,000 MWCO	12
431489	Spin-X UF 20	20 mL	30,000 MWCO	12
431490	Spin-X UF 20	20 mL	50,000 MWCO	12
431491	Spin-X UF 20	20 mL	100,000 MWCO	12

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