SpinMate

Ultrafiltration Concentrator User Guide

PRODUCT INFORMATION

Product Description

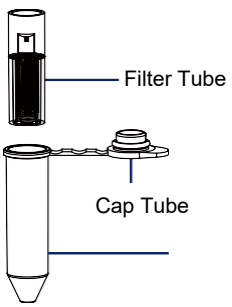
SpinMate Ultrafiltration Concentrators enable rapid and efficient concentration and purification of biological samples. They are currently available in three sizes:
0.5mL, 4mL, and 15mL. The unique vertical design and maximized filtration area provide fast sample processing and high sample recovery (typically >90% for dilute initial solutions), while maintaining a gentle concentration environment to preserve protein activity and longevity. The vertical design minimizes solute polarization and subsequent membrane fouling. A physical stop point in the filtration device prevents over-centrifugation, which can dry out the sample and cause sample loss. The 0.5mL Ultrafiltration Concentrators allows for efficient and stable recovery of concentrated samples via quick reverse spin operation. The Ultrafiltration Concentrators utilize a PES membrane, which has very low protein and nucleic acid binding.

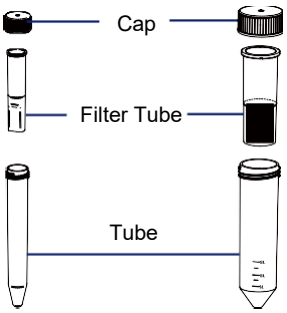
Product Features

- High retention accuracy, low protein adsorption, high recovery rate >90%
- Dual-sided vertical membrane design, prevents membrane clogging, ultra-low dead volume, high centrifugation efficiency
- Excellent biocompatibility and safety, minimal extractables, USP <87> certified
- Anti-dry lock design, avoids sample damage from over-centrifugation, ensures stable and reliable experimental results
- OEM customization available

Product Structure

The Ultrafiltration Concentrators includes a cap, filter device (inner tube), and collection tube (outer tube).





⊙ 0.5mL ⊙ 4mL ⊙15mL

Product Applications

Ultrafiltration：

- Concentration and desalting of proteins, nucleic acids
- Buffer exchange or desalting of chromatographic fractions
- Harvesting biomolecules from culture media
- Virus concentration or separation
- Rough separation of biomolecule mixtures
- Removal of debris and particles from cell lysates

Microfiltration：

- Separation of DNA from agarose gels
- Separation of proteins, oligonucleotides, and RNA from polyacryl-amide gels
- Sample clarification prior to HPLC analysis
- Filtration of biological samples
- Collection and washing of processed particles or beads

Technical Parameters Table

Filter Device	PC (Polycarbonate) / K-Resin (Styrene-Butadiene Copolymer)		
Membrane	PES (Polyethersulfone)		
Collection Tube	PP (Polypropylene)		
Cap and Liner	PP (Polypropylene)		
Operating Temperature	0-40°C		
pH Range	1-14		
Sterilization	Can be sterilized by flushing with 70% ethanol through the device before use		
Product Catalogue	0.5mL	4mL	15mL
Effective Filtration Area	0.9cm^2	3.5cm^2	7.2cm^2
Tube Size (Capped)	Length (Concentration mode: filter inserted into outer tube): 50.3mm Length (Reverse spin: filter inserted into outer tube): 46.8mm Diameter: 10.9mm	Total Length 122mm Diameter 17mm	Total Length 117mm Diameter 31mm
Filter Device Size	Length: 29.2mm Diameter: 9.4mm	Length: 67.5mm Diameter: 14.5mm	Length: 75mm Diameter: 28mm
Dead Volume	≤5μL	≤20μL	≤30μL
Lock Volume (Min. Vol.)	10-20μL	50-100μL	300μL
Max. RCF (Ultrafiltration)	14000xg	Swing Bucket: 4000xg Fixed Angle: 6000xg	Swing Bucket: 4000xg (3000xg for 100KD) Fixed Angle: 5000xg (3000xg for 100KD)
Max. RCF (Microfiltration)	/	10000g	6000g
Centrifuge Type	Fits centrifuges for standard 1.5/2mL conical tubes	Fits centrifuges for standard 15mL conical tubes	Fits centrifuges for standard 50mL conical tubes

Ordering Information

Product Name	Product Code	Molecular Weight Cut-off (MWCO)	Starting Volume	Dead Volume
SpinMate Ultrafiltration Concentrator 15ml	PAL-P15-5-12 (12pc) PAL-P15-5-48 (48pc)	5kDa	15mL	≤30μL
	PAL-P15-10-12 (12pc) PAL-P15-10-48 (48pc)	10kDa		
	PAL-P15-30-12 (12pc) PAL-P15-30-48 (48pc)	30kDa		
	PAL-P15-50-12 (12pc) PAL-P15-50-48 (48pc)	50kDa		
	PAL-P15-100-12 (12pc) PAL-P15-100-48 (48pc)	100kDa		
SpinMate Ultrafiltration Concentrator 4ml	PAL-P4-5-40 (40pc)	5kDa	4mL	≤20μL
	PAL-P4-10-40 (40pc)	10kDa		
	PAL-P4-30-40 (40pc)	30kDa		
	PAL-P4-50-40 (40pc)	50kDa		
	PAL-P4-100-40 (40pc)	100kDa		
SpinMate Ultrafiltration Concentrator 0.5ml	PAL-P5-5-96 (96pc)	5kDa	0.5mL	≤5μL
	PAL-P5-10-96 (96pc)	10kDa		
	PAL-P5-30-96 (96pc)	30kDa		
	PAL-P5-50-96 (96pc)	50kDa		
	PAL-P5-100-96 (96pc)	100kDa		

PERFORMANCE OPERATING INSTRUCTIONS

Operating Instructions

›› *Pre-rinse:*

The PES ultrafiltration membrane of this Ultrafiltration Concentrators contains trace amounts of glycerol and preservatives. To avoid interference with analysis, remove them before use by filtering deionized water (add 4mL for 4mL tube, 15mL for 15mL tube, 0.5mL for 0.5mL tube) or buffer through the membrane and repeating. If further rinsing is needed, start with 0.05 mol/L NaOH and repeat the process. Once wetted, the Ultrafiltration Concentrators must be kept moist until use is complete.

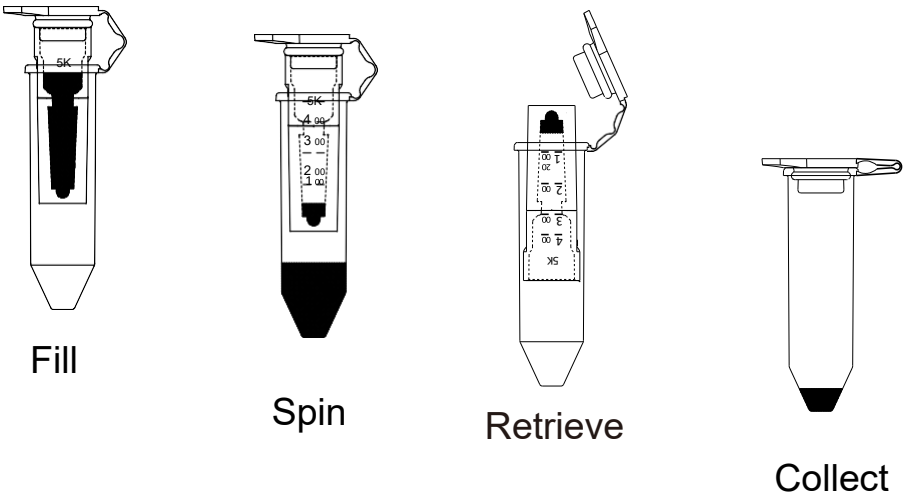


Figure 1. 0.5mL Ultrafiltration Concentrators Usage Method

›› *Instructions for 4mL and 15mL Ultrafiltration Concentrators:*

1. Remove the cap, transfer the sample into the sample reservoir (do not exceed 4.5 mL for 4mL tube, 15 mL for 15mL tube), and replace the cap to prevent evaporation during centrifugation.
2. Place the Ultrafiltration Concentrators into a centrifuge that accommodates 15/50mL conical tubes. Always balance the rotor using another Ultrafiltration Concentrators containing an equal volume of sample or balance solution.
3. Centrifuge at the recommended force for the required time. Ultrafiltration: Centrifuge the 4mL tube at 1000 to 6000xg, typically for 10 to 60 minutes, to reach the desired concentration volume; Centrifuge the 15mL tube at 1000 to 5000xg, typically for 10 to 60 minutes, to reach the desired concentration volume. Microfiltration: Centrifuge the 4mL MF tube at 2000 to 10000xg; Centrifuge the 15mL MF tube at 2000 to 6000xg. It is recommended to determine the spin time and g-force for each application.
4. To recover the concentrated solution, insert a pipette tip into the bottom of the filter device and aspirate while gently swaying the tip to ensure complete recovery. The filtrate can be saved in the collection tube.
   Note: For ideal recovery, remove the concentrated sample immediately after centrifugation.

›› *Instructions for 0.5mL Ultrafiltration Concentrators:*

1. Remove the cap, transfer no more than 0.5mL of sample into the filter device, and replace the cap to prevent evaporation during centrifugation.
2. Place the Ultrafiltration Concentrators into a centrifuge that accommodates standard 1.5mL or 2.0mL centrifuge tubes. Centrifuge at a force not exceeding 14,000xg for 10 to 30 minutes to achieve the desired concentration volume. It is recommended to determine the appropriate centrifugation time and force experimentally for each application. Note: Please balance the centrifuge carefully!
3. To recover the concentrated solution, place the filter tube upside down into a new collection tube, place it in the centrifuge with the retrieval cap facing the centre of the rotor, and ensure balance. Centrifuge at 1000xg for 1 to 2 minutes to transfer the concentrate from the filter device into the collection tube. Both the filtrate and the concentrate can be saved in their respective tubes.

Non-Specific Adsorption

The PES membrane has low biomolecule binding characteristics and excellent biological and chemical resistance. However, when purifying proteins at microgram or nanogram levels, adsorption to device components still requires special attention. Even though the materials used in this Ultrafiltration Concentrators are low-adsorption plastics, adsorption may still occur when concentrating or separating highly "sticky" proteins and biomolecules. Pre-treating the Ultrafiltration Concentrators can further reduce non-specific adsorption of the filter. The specific operations are as follows:

1. Fill the sample reservoir with 10% glycerol (add 4mL for 4mL tube, 15mL for 15mL tube, 0.5mL for 0.5mL tube).
2. Soak at room temperature overnight.
3. Fill the Ultrafiltration Concentrators with deionized water, let it stand for 1 to 2 minutes, then discard the liquid. Repeat 1 to 2 times.
4. Fill the sample reservoir with deionized water (add 4mL for 4mL tube, 15mL for 15mL tube, 0.5mL for 0.5mL tube) and centrifuge to pass the deionized water through the membrane. Repeat 1-2 times.

Desalting or Diafiltration

1. Concentrate the sample at least tenfold (e.g., 4mL to 0.4mL, 15mL to 1.5mL, 0.5mL to 0.05mL).
2. Reconstitute with exchange buffer and concentrate again by tenfold.
3. Repeat this procedure 3 to 5 times to remove 95 to 99% of the salt or buffer.

Precautions

1. 4mL/15mL/0.5mL Ultrafiltration Concentrators are non-sterile, disposable products. Do not use if damaged.
2. 4mL/15mL/0.5mL Ultrafiltration Concentrators are for research use only, not for in vitro diagnostic use.
3. To ensure sample compatibility, it is recommended to perform a preliminary experiment when first used, testing recovery and retention efficiency.
4. This Ultrafiltration Concentrators is not suitable for autoclaving. Sterilization by soaking in 70% ethanol for 30 minutes is recommended. Other sterilization methods carry uncontrollable risks.
5. This Ultrafiltration Concentrators should be used with a centrifuge rotor designed for conical bottom tubes (a conversion pad is needed for round bottom rotors) to avoid deformation of the tube bottom due to uneven force distribution.

Performance Parameters

›› *Filtration Speed*

Factors affecting filtration speed include sample concentration, starting volume, solute chemical properties, relative centrifugal force (RCF), centrifuge rotor angle, membrane type, effective filtration area, and temperature.

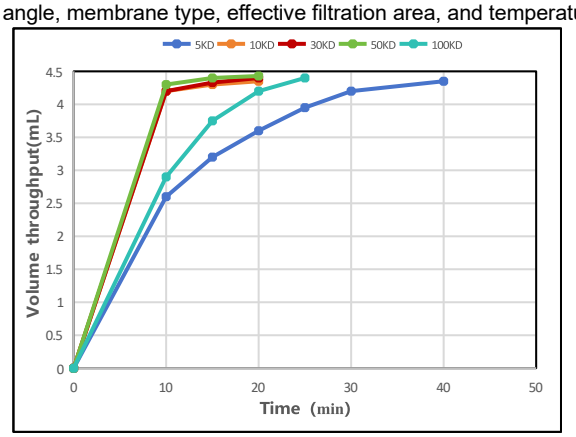


Figure 2. Filtrate Volume vs. Centrifugation Time for 4mL UF Tube (Swing Bucket Rotor)

Centrifugal force: 4000xg, 8°C, Starting volume 4.5mL.
UF samples: 5kDa with 0.25 mg/mL Cyt C, 10kDa with 1 mg/mL OVA, 30kDa and 50kDa with 1mg/mL BSA, 100kDa with 1mg/mL IgG.

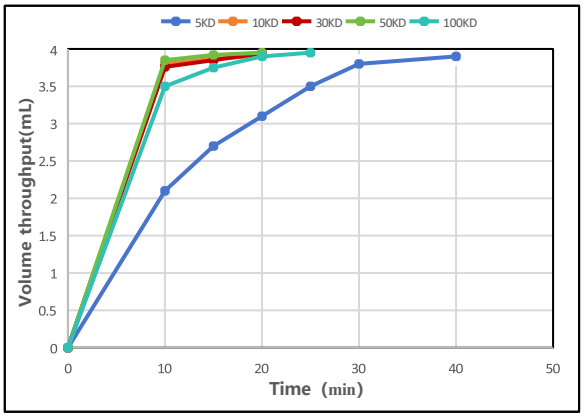


Figure 3. Filtrate Volume vs. Centrifugation Time for 4mL UF Tube (Fixed Angle Rotor)

Centrifugal force: 6000xg, 8°C, Starting volume 4mL.
UF samples: 5kDa with 0.25mg/mL Cyt C, 10kDa with 1mg/mL OVA, 30kDa and 50kDa with 1mg/mL BSA, 100kDa with 1mg/mL IgG.

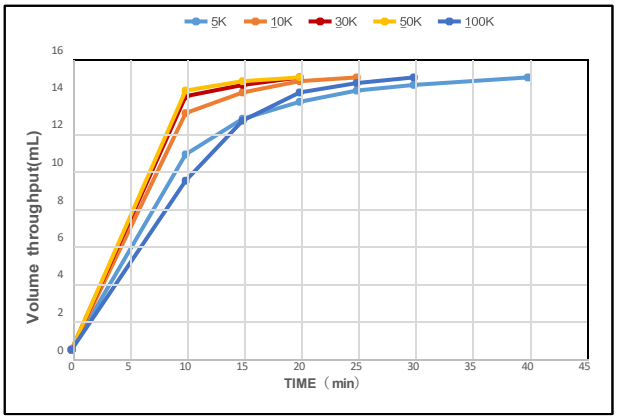


Figure 4. Filtrate Volume vs. Centrifugation Time for 15mL UF Tube (Swing Bucket Rotor)

Centrifugal force: 4000xg, 8°C, Starting volume 15mL.
UF samples: 5kDa with 0.25 mg/mL Cyt C, 10kDa with 1 mg/mL OVA, 30kDa and 50kDa with 1mg/mL BSA, 100kDa with 1mg/mL IgG.

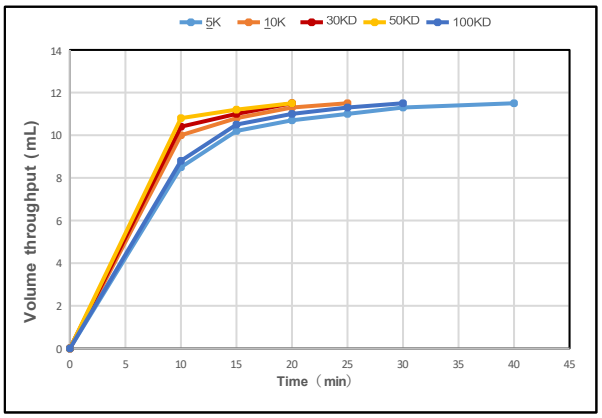
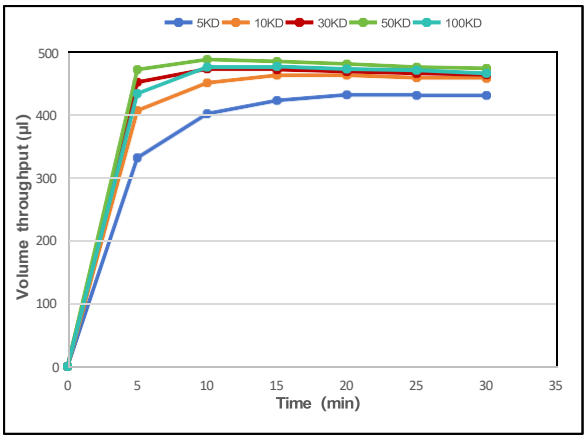


Figure 5. Filtrate Volume vs. Centrifugation Time for 15mL UF Tube (Fixed Angle Rotor)

Centrifugal force: 5000xg, 8°C, Starting volume 12mL.
UF samples: 5kDa with 0.25mg/mL Cyt C, 10kDa with 1mg/mL OVA, 30kDa and 50kDa with 1mg/mL BSA, 100kDa with 1mg/mL IgG.

Performance Parameters



Centrifugal force: 14,000xg, Room Temperature, Starting volume 0.5mL. **UF samples:** 5kDa: 0.25mg/mL Cyt C; 10kDa: 1mg/mL OVA; 30kDa and 5 0kDa: 1mg/mL BSA; 100kDa: 1mg/mL IgG, n=8.

Figure 6. Filtrate Volume vs. Centrifugation Time for 0.5mL UF Tube

Retention Rate

The retention capability of the 4mL/15mL/0.5mL Ultrafiltration Concentrators membrane is described by the Molecular Weight Cut-off (MWCO). Solutes with molecular weights close to the MWCO may only be partially retained. For optimal retention characteristics, use a membrane with an MWCO at least three times smaller than the solute molecular weight.

Protein Concentration	Protein Molecular Weight	UF Tube Model	Retention Rate (%)	Centrifugation Time (min)	
				15/4mL	0.5mL
Cyt C(0.25mg/mL)	12,400	5kDa	>95	20-30	15-20
OVA(1mg/mL)	45,000	10kDa	>95	15-30	10-15
BSA(1mg/mL)	67,000	30kDa	>95	15-20	<10
BSA(1mg/mL)	67,000	50kDa	>90	15-20	<10
1gG(1mg/mL)	156,000	100kDa	>90	20-30	<10

Note: "15/4mL data for swing bucket and fixed angle rotors, 0.5mL for fixed angle rotor only, and can perform reverse spin to collect concentrated sample."

Percentage Recovery

Percentage recovery for Protein Ark SpinMates was measured using the following proteins:

SpinMate Molecular Weight	Test Protein
5kDa	α-Chymotrypsinogen + Cytochrome c (0.5mL) DNA Binding Protein (4mL, 15mL)
10kDa	BSA (0.5mL, 4mL, 15mL)
30kDa	BSA (0.5mL, 4mL, 15mL)
50kDa	IgG Antibody (0.5mL, 4mL, 15mL)
100kDa	Thyroglobulin (0.5mL, 4mL, 15mL)

Recovery observed is detailed below:

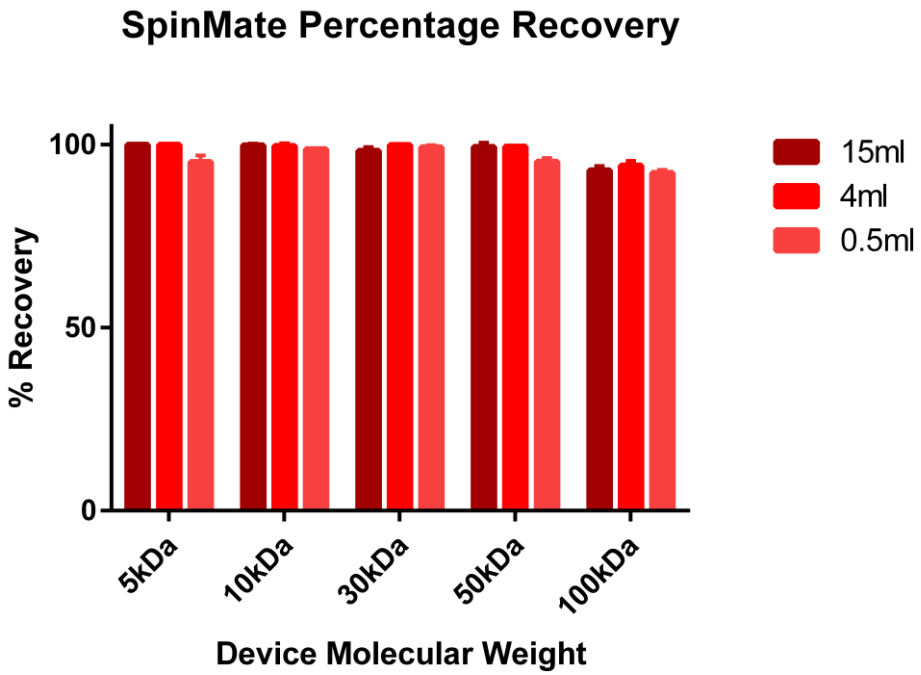


Figure 7: Percentage recovery in SpinMate devices of a variety of proteins. Recovery in all devices was >90%, displaying excellent protein recovery.

Chemical Compatibility

The Ultrafiltration Concentrators are suitable for biological liquids and aqueous solutions. Please check the chemical compatibility of the sample with the device before use.

Chemical Compatibility of Ultrafiltration Centrifugal Tubes

Acid	Concentration
Sulfamic Acid	≤3%
Formic Acid	≤5%
Acetic Acid	≤25%
Hydrochloric Acid	≤1M
Sulfuric Acid	≤3%
Nitric Acid	≤10%
Lactic Acid	≤5%
Phosphoric Acid	≤30%
Trifluoroacetic Acid	≤10%
Trichloroacetic Acid	≤10%

Alcohol	Concentration
Methanol	≤60%
Ethanol	≤70%
Isopropyl Alcohol	≤70%
n-Butyl Alcohol	≤70%

Base	Concentration
Sodium Hydroxide	≤0.5 M (4mL/15mL sizes)
Sodium Hydroxide	≤0.1 M (0.5mL size)
Ammonium Hydroxide	≤10%

Organic Solvent	Concentration
Benzene	Not Recommended
Acetone	Not Recommended
Acetonitrile	≤10%
Toluene	Not Recommended
Formaldehyde	≤5%
DMSO	≤5%
Ethyl Acetate	Not Recommended
Pyridine	Not Recommended
Chloroform	Not Recommended
Carbon Tetrachloride	Not Recommended
Tetrahydrofuran	Not Recommended

Other Reagents	Concentration
Phenol	＜1%
Glycerol	≤70%
DTT	≤0.1M
Diethyl Pyrocarbonate	≤0.2%
PEG	≤10%
Phosphate Buffer (pH8.2)	≤1M
Ammonium Sulphate	Saturated
Imidazole	≤500mM
Urea	≤8M
β-Mercaptoethanol	≤0.01M
Tris Buffer (pH 8.2)	≤1M
Sodium Carbonate	≤20%
Guanidine Hydrochloride	≤6M

Quality Standards

The development and production processes of this product comply with ISO9001 management system requirements.

Quality Assurance Guidelines

Non-Animal Origin Statement

Based on current information obtained from suppliers, all components of this product are materials of non-animal origin.

Biosafety

All constituent materials have passed the USP <87> in vitro cytotoxicity test.

Batch Release Criteria

Product batches are tested and released according to the principles of the quality assurance system.

Integrity Test

Each ultrafiltration centrifugal inner filter device undergoes a pressure hold test for seal integrity.

APPENDIX

Notes on Standard Operation of Ultrafiltration Concentrators

1. The filter membrane of the Ultrafiltration Concentrators contains trace amounts of preservatives such as glycerol. Pre-cleaning with purified water or buffer is recommended before use.
2. Once the filter membrane of the Ultrafiltration Concentrators is wetted, it needs to be kept moist.
3. Each model and specification of the Ultrafiltration Concentrators has a recommended centrifugal force range. It is recommended not to exceed the maximum recommended centrifugal force during use, as exceeding it will significantly increase the risk of sample passage through the membrane and leakage.
4. When collecting the concentrated sample, select a suitable pipette (the tip should be able to reach the bottom of the inner filter device). First, gently pipette to mix the concentrate, then insert the pipette tip to the bottom of the inner filter device to aspirate the concentrate completely.
5. If processing needs to be completed within a relatively long time, it is recommended to centrifuge close to the maximum recommended force. For higher recovery rates, appropriately reduce the centrifugal force, and the final concentration volume should not be too small (excessively small volumes significantly reduce recovery rates).
6. Do not exceed the recommended maximum sample loading volume per run for the ultrafiltration centrifugal tube. Exceeding the limit risks sample spillage during centrifugation, thereby reducing the recovery rate.
7. Avoid excessively long single centrifugation times to prevent low sample recovery due to over-centrifugation
8. Selecting the appropriate MWCO model is also an important factor in ensuring sample recovery rate. Choose smaller size (specification) UF tubes for small volume samples and larger size UF tubes for large volume samples.

SpinMate Ultrafiltration Concentrators FAQ

›› *Part I: Product Knowledge*

Q: What are the uses of SpinMate Ultrafiltration Concentrators?

A: SpinMate Ultrafiltration Concentrators can be used for concentration, desalting, or buffer exchange of biological samples (proteins, nucleic acids, viruses, etc.).

Q: What specifications are available for SpinMate Ultrafiltration Concentrators?

A: SpinMate Ultrafiltration Concentrators are offered in three sample volume specifications: 0.5mL, 4mL & 15mL. Each specification includes five nominal molecular weight cut-offs (MWCO): 5kDa, 10kDa, 30kDa, 50kDa, 100kDa. For processing larger volume samples, please consult technical support.

Q: What is the membrane material of SpinMate Ultrafiltration Concentrators?

A: The membrane material of SpinMate Ultrafiltration Concentrators is PES (Polyethersulfone).

Q: What is the chemical compatibility of SpinMate Ultrafiltration Concentrators?

A: SpinMate Ultrafiltration Concentrators are suitable for general aqueous solutions or biological samples. For the chemical compatibility of specific samples, please refer to the chemical compatibility table in this manual.

Q: Can I reuse the Ultrafiltration Concentrators?

A: All Ultrafiltration Concentrators are disposable and reuse is not recommended.

Q: What is the tolerable pH range for the Ultrafiltration Concentrators?

A: For the PES ultrafiltration membrane, the recommended pH range in the instructions is 1-14. For specific acid/base types and concentrations, please refer to the chemical compatibility table in the instructions.

›› *Part II: Product Selection*

Q: How do I choose the appropriate SpinMate device for protein concentration?

A: Generally, we recommend selecting an Ultrafiltration Concentrators with a nominal MWCO 1/3 – 1/2 of the target protein's molecular weight.

Q: If using ultrafiltration to separate two proteins, how much should their sizes differ?

A: Based on our experience, we recommend the molecular weights of the two proteins differ by an order of magnitude (10 times).

Q: Can SpinMate Ultrafiltration Concentrators be used for virus concentration?

A: Yes. For lentivirus, we recommend SpinMate 100kDa MWCO; for adenovirus, SpinMate 50kDa MWCO is recommended.

Q: Can SpinMate Ultrafiltration Concentrators be used for nanoparticle purification and concentration?

A: Yes. Although we lack internal data to support this application, many customers use SpinMate Ultrafiltration Concentrators for nanoparticle concentration and purification with good results. Please refer to the chart on the right for the membrane pore size range corresponding to the nominal MWCO of SpinMate ultrafiltration concentrators:

Nanoparticle Diameter (DIA)	Recommended MWCO
1.5nm < DIA < 3 nm	3,000
3nm < DIA < 5 nm	10,000
5nm < DIA < 7 nm	30,000
7nm < DIA < 10 nm	50,000
10 nm < DIA	100,000

Q: Can SpinMate Ultrafiltration Concentrators be used for exosome purification and concentration?

A: Yes. SpinMate Ultrafiltration Concentrators with 50-100kDa is recommended.

›› *Part III: Experimental Operation*

Q: What kind of centrifuge rotor should I use with SpinMate Ultrafiltration Concentrators, and what is the maximum centrifugal force?

A: Please refer to the following table for specific parameters:

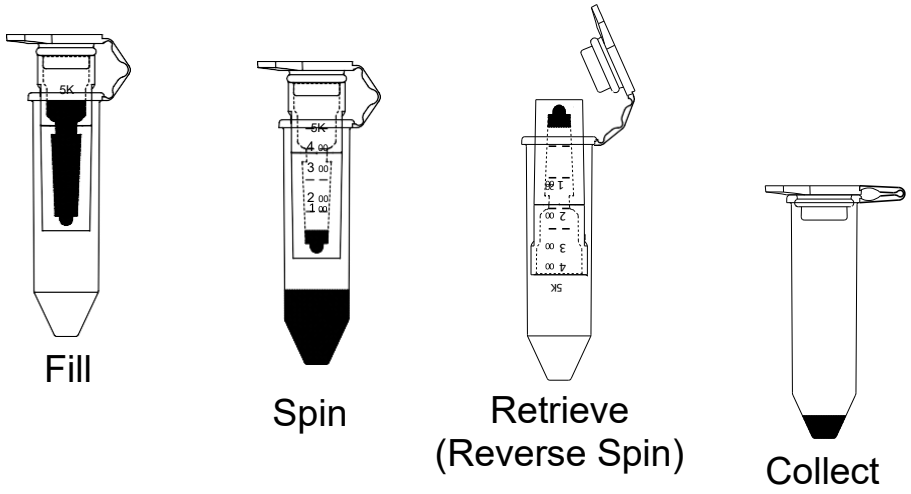
Centrifuge Rotor Type		Standard 1.5/2mL Tubes (0.5mL UF Tube)	Standard 15mL Conical Tubes (4mL UF Tube)	Standard 50mL Conical Tubes (15mL UF Tube)
RCF and Rotor	Swing Bucket Rotor	N/A	4000g	3000xg for 100kDa, 4000xg for other MWCOs
	Fixed Angle Rotor	14,000xg (UF), 1000xg (Reverse Spin)	6000g	3000xg for 100kDa, 5000xg for other MWCOs
Concentration Factor	Final Volume	10-13µL (via Reverse Spin)	100-150µL	400-500µL
	Concentration Factor	40-50x	30-40x	30-40x
Protein/Bead Centrifugation Time (approx.)	5kDa	20min	30min	40min
	10kDa	15min	15min	20min
	30kDa	10min	10min	15min
	50kDa	10min	10min	15min
	100kDa	10min	10min	15min

Q: How is the processed sample collected?

A: Two methods: Pipette transfer and Reverse Spin.

(1) For 15mL and 4mL Ultrafiltration Concentrators, the processed sample can be collected directly using a pipette.

(2) For 0.5mL Ultrafiltration Concentrators, the processed sample can be collected by reverse spin: Invert the filter device (inner tube) containing the concentrated sample into a new collection tube, then centrifuge at low speed (1,000xg) to transfer the sample into the new collection tube (steps shown in the figure below).



Q: Will the sample in the SpinMate Ultrafiltration Concentrators dry out if centrifuged too long?

A: No, because SpinMate has a dead volume design, some solution will always remain in the filter device.

Q: Can SpinMate Ultrafiltration Concentrators be sterilized with alcohol?

A: SpinMate devices are compatible with 70% ethanol. However, we have not tested specific sterilization methods and therefore cannot provide further reference information.

Q: Can SpinMate ultrafiltration devices be autoclaved?

A: No.

Q: Does Membrane Solutions provide endotoxin-free ultrafiltration devices?

A: The ultrafiltration devices we provide are not endotoxin-free. Even sterile devices may contain pyrogens.

Q: Are SpinMate Ultrafiltration Concentrators RNase-free?

A: We do not guarantee that the Ultrafiltration Concentrators are RNase-free. It is recommended that you treat them with 0.1% DEPC soaked at 37°C for 2 hours to completely inactivate RNases. Residual DEPC can be removed by washing with ultrapure water.

Q: The manual recommends centrifugation at room temperature. Considering protein stability, can I centrifuge at 4°C?

A: Yes, but low temperature increases the viscosity of protein samples, leading to slower flow rates. It is recommended to extend the centrifugation time to 1.5 times the original duration.

Q: How to perform endotoxin removal treatment on the ultrafiltration centrifugal tubes?

A: The Ultrafiltration Concentrators we provide have not undergone endotoxin removal treatment. Furthermore, since endotoxins often exist as polymers with sizes ranging from 10-1000kDa, they cannot be removed during the ultrafiltration process.

›› *Part IV: Result Analysis*

Q: Are there any precautions when using SpinMate Ultrafiltration Concentrators to remove detergents?

A: Due to their unique properties, when the concentration is above the Critical Micelle Concentration (CMC), detergent molecules aggregate to form micelles, changing their molecular conformation. This may affect the efficiency of detergent removal.

Q: Why did my protein precipitate during concentration?

A: Protein precipitation can be caused by too rapid concentration or over-concentration. We recommend that the final concentration of the protein after concentration does not exceed 20mg/mL. For proteins sensitive to concentration speed and prone to precipitation, we suggest the following improvements:

1) Reduce the centrifugal force to 30%-50% of the recommended force.
2) Switch to the next larger MWCO device (e.g., if 10kDa was originally selected, try 30kDa).
3) During concentration, remove the Ultrafiltration Concentrators and pipette the sample up and down several times.

Q: After concentration, I found no target protein in the concentrate. What could be the reason?

A: First, the minimum starting protein concentration for SpinMate Ultrafiltration Concentrators is 25μg/mL. Please ensure your sample's starting concentration is greater than this. Second, if the problem persists, please do not discard your sample filtrate for further analysis:

1) If your sample is in the filtrate, then check:
   - Did you choose the appropriate MWCO ultrafiltration centrifugal tube (MWCO <= 1/2 or 1/3 of the target protein molecular weight)?
   - Was the centrifugal force within the maximum range? If you used rpm, convert it to the corresponding RCF based on the centrifugal radius.
   - Has the centrifuge been calibrated recently?
   - Is this your first attempt with this protein? If you can ensure the UF tube works for other proteins, then it might be due to your target protein. Sometimes, protein characteristics (conformational differences) can affect concentration efficiency. Try selecting a smaller MWCO UF tube (e.g., if 30kDa was originally selected, try 10kDa).
2) If your sample is not in the filtrate either:
   - Was your starting protein concentration greater than 25μg/mL?
   - What method did you use to determine the sample concentration? Is it reliable?
   - Did your target protein precipitate? If so, please refer to the FAQ above regarding protein precipitation for specific solutions.

Q: I found interference when analysing the concentrated protein. What could be the cause?

A: The ultrafiltration membrane in SpinMate Ultrafiltration Concentrators contains trace amounts of glycerol. If this material interferes with the analysis, pre-rinse with buffer or ultrapure water. If interference persists, rinse with 0.1mol/L NaOH, then rinse again with buffer or ultrapure water and spin dry.

Q: Sometimes I can't even spin water through the UF tube. What could be the reason?

A: The ultrafiltration membrane in SpinMate Ultrafiltration Concentrators contains trace amounts of glycerol. If this happens, first rinse with 0.1mol/L NaOH and then centrifuge. Finally, rinse again with buffer or ultrapure water and spin dry. The cleaned membrane should be used immediately. If not used temporarily, keep it moist to avoid re-drying.

Q: I suspect non-specific adsorption between the target protein and the membrane during concentration using the UF tube. How can I

A: **improve this?**

The UF tube uses PES membrane material, which has low protein adsorption. However, for some hydrophobic or non-polar proteins, non-specific adsorption to the membrane may be enhanced. For this situation, customers can try blocking the UF tube before the experiment. For detailed steps, please contact technical support. It is also recommended to reduce the membrane area to minimize non-specific adsorption.

SpinMate Ultrafiltration Concentrators Selection Guide

SpinMate Ultrafiltration Concentrators should be selected based on starting sample volume, target protein molecular weight or particle size, concentration factor, centrifugation parameters, etc. The table below provides some reference suggestions for selecting the most appropriate MWCO UF tube.

Parameter		≤0.5mL	≤4mL	≤15mL
Protein Molecular Weight（MW）	10k ＜ MW ＜ 20k	5kDa	5kDa	5kDa
	20k ＜ MW ＜ 60k	10kDa	10kDa	10kDa
	60k ＜ MW ＜ 100k	30kDa	30kDa	30kDa
	100k ＜ MW ＜ 200k	50kDa	50kDa	50kDa
	200k ＜ MW	100kDa	100kDa	100KD
Nanospheres Diameter（DIA）	3nm ＜ DIA ＜ 5nm	5kDa	5kDa	5kDa
	5nm ＜ DIA ＜ 7nm	10kDa	10kDa	10KD
	7nm ＜ DIA ＜ 10nm	30kDa	30kDa	30kDa
	10nm ＜ DIA ＜15nm	50kDa	50kDa	50kDa
	15nm ＜ DIA	100kDa	100kDa	100kDa
Centrifugal Force and Centrifuge Rotor	Swing Bucket Rotor RCF	N/A	4000g	3000xg (100kDa), 4000xg (others)
	Fixed Angle Rotor RCF	14000xg (UF), 1000xg (Reverse)	6000g	3000xg (100kDa), 5000xg (others)
Cycle of Concentration	Final Volume	10-13μL (Reverse)	100-150μL	400-500μL
	Concentration Factor	40-50x	30-40x	30-40x
Approx. Time (min)	5kDa	20min	30min	40min
	10kDa	15min	15min	20min
	30kDa	10min	10min	15min
	50kDa	10min	10min	15min
	100kDa	10min	10min	15min

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