Protein Ark
A CALIBRE SCIENTIFIC COMPANY

Proteus X-Spinner 20 Device

Introduction

Protein Arks Ultrafiltration Protein Concentrators have been specially designed to reduce run time and maximise protein recovery. X-Spinner 20 is suitable for sample volumes of 5 ml up to 20 ml. Samples of 10 ml are typically concentrated within 20 minutes to 50x with macromolecular recoveries in excess of 98%. Increased concentration can be achieved with longer run time – diafiltration buffer exchange also an option. Specially selected membranes used in X-Spinner 20 devices have a molecular weight cut off either 3,000, 10,000, 30,000 or 100,000 Daltons.

Protein Arks X-Spinner 20 ultrafiltration devices are unique. The tubular membrane orientation and reverse direction of the flow, provide optimum cross flow conditions even for particle laden solutions. The high force moves particles and solids away from the membrane to the bottom of the device. Macromolecules collect at the base below the membrane surface; there is no risk of the filtration process allowing the sample to dry out as the system is enclosed.

No centrifuge is needed as devices can be run with specially designed Pressure Caps (to be ordered separately – see below). Results have been shown to be superior against devices run through a centrifuge, increasing the concentration speed and concentration factor.

For Pressure Cap Instructions for Use please follow Option 1. Centrifuge can be used if desired – please follow Option 2 Instructions for Use should you wish to use a centrifuge.

Option 1: Pressure Cap Operation

X-Spinner 20 Concentrator use with Pressure Cap.

Equipment Required

1. X-Spinner 20 Device in tube ready to use. Pipettes for sample delivery and removal.
2. Pressure Caps + 10 ml Syringe (ordered separately under product code PAL-X-P20-4).
3. Safety goggles

Option 2: Centrifugal Operation

X- Spinner 20 Concentrators can be used in swing buckets or fixed angle rotors accepting standard 50 ml conical bottom tubes.

Equipment Required

1. X-Spinner 20 Device in tube ready to use. Pipettes for sample delivery and removal.

Storage Conditions

X-Spinner 20 should be stored in their box, at room temperature and kept out of direct sunlight.

Should you wish to reuse a device to keep the membrane wet by storing with 10 ml deionised water with 1% ethanol sealed inside the Tube until you are ready to use again. Devices must be kept at room temperature and kept out of direct sunlight.

Shelf Life

X-Spinner 20 has a nominal shelf life of 3 years.

OPTION 1: PRESSURE CAP INSTRUCTIONS FOR USE

Pre-Rinsing (Optional)

It is recommended to prerinse your devices with deionised water or Phosphate-Buffered Saline (PBS) solution before running through your protein samples. This will ensure the removal of Glycerine that may be present. *NOTE: Skip to Step 6 should you not require an initial pre-rinse step.*

Step 1. Remove the Red Lid from the 50 ml Tube (Fig 1) and open device.

Step 2. Place approximately 8 ml of deionised water or phosphate buffered saline into the outer section (Fig 2).

Step 3. Firmly twist on the Pressure Cap (Fig 3) and ensure the cap is on tightly to avoid any pressure loss (Fig 4). *Note: Pressure Cap must be twisted on straight*.

Fig 1.

Fig 2.

Fig 3.

Fig 4.

Step 4. Using a 10ml syringe (Fig 5), pump the one- way valve until tube is pressurised (Fig 6-7), taking of syringe out after each pump. Leave the device for 1 minute. *Important Note: Please wear safety goggles. Once you feel resistance on the syringe the tube is pressurised.* ***Do not*** *over pressurise the device.*

Fig 5.

Fig 6.

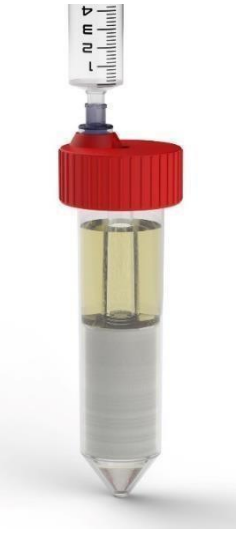

Fig 7.

Step 5. Carefully remove the Pressure Cap from the 50 ml Tube and open device. Discard the liquid if prerinsed first.

Step 6. Pipette up to 20 ml of the sample to be concentrated into the outer section (Fig 2).

Step 7. Once the sample has been added firmly twist on the Pressure Cap (Fig 3 avoid any pressure loss (Fig 4). *Note: Pressure Cap must be twisted on straight*.

Step 8. Repeat Steps 6-7 until all required devices have been made up.

Step 9. Using a 10 ml syringe (Fig 5), pump the one-way valve until tube is pressurised (Fig 6-7). Leave the device for approximately 10 minutes, depending on the sample solution volume and the MWCO. *Important Note: Please wear safety goggles. Once you feel resistance on the syringe the tube is pressurised.* ***Do not*** *over pressurise the device.*

Step 10. Carefully open Pressure Cap to release the pressure and remove the Cap. Remove the filtrate by placing a pipette down the centre of the device (Fig 8). Alternatively, the filtrate may be removed by placing the thin stem pipette through the hole in the pressure cap – be aware that using this method means the solution will continue to be concentrated until the pressure cap is removed.

Fig 8.

Fig 9.

Step 11. Repeat Step 9-10 until the desired concentration factor has been reached and all the filtrate has been removed from each device.

Step 12. Taking one device at a time, carefully pull the X-Spinner 20 Device out from the Tube and recover the concentrate from the bottom of the Tube using a pipette (Fig 9) and test accordingly.

Step 13. Should you wish to reuse the device store with 10ml Deionised Water + 1% Ethanol inside the tube to keep the membrane wet.

OPTION 2: CENTRIFUGAL INSTRUCITONS FOR USE

Pre-Rinsing (Optional)

It is recommended to prerinse your devices with deionised water or Phosphate-Buffered Saline (PBS) solution before running through your protein samples. This will ensure the removal of Glycerine that may be present. *NOTE: Skip to Step 5 should you not require an initial pre-rinse step*

Step 1. Remove the Red Lid from the 50 ml Tube (Fig 1) and open device.

Fig 1

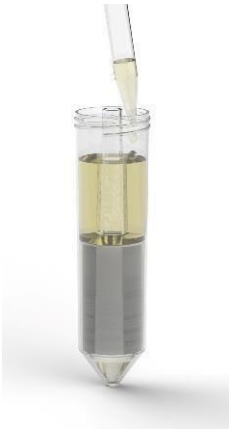

Fig 2

Fig 3

Step 2. Place approximately 8 ml of deionised water or phosphate buffered saline into the outer section (Fig 2). Carefully put the Red Lid back on tightly.

Step 3. Centrifugal spin at 2500-3500 rpm for 1 minute.

Step 4. Remove the Red Lid from the 50 ml Tube and open device. Discard the liquid if prerinsed first. Step 5. Pipette up to 20 ml of the sample to be concentrated into the outer section (Fig 2).

Step 6. Screw Red Lid back on tightly (Fig 3).

Step 7. Repeat Steps 5-6 until all required devices have been made up.

Step 8. Once sample has been added to all Tubes balance them on weighing scales to ensure the centrifuge works efficiently and without any safety issues.

Step 9. Place all the assembled Tubes into centrifuge and run at 2500-3500 rpm for approximately 5-15 minutes, depending on the sample solution volume and the MWCO.

Step 10. After the first spin is completed remove one device at a time from the centrifuge. Open Red Lid and remove the filtrate by placing a pipette down the centre of the device (Fig 4). Place the Red Lid back onto the device tightly once the filtrate has been removed completely.

Fig 4.

Fig 5.

Step 11. Repeat Step 8-10 until the desired concentration factor has been reached and all the filtrate has been removed from each device.

Step 12. Taking one device at a time, carefully pull the X-Spinner 20 Device out from the Tube and recover the concentrate from the bottom of the Tube using a pipette (Fig 5) and test accordingly.

Step 13. Should you wish to reuse the device store with 10ml Deionised Water + 1% Ethanol inside the tube to keep the membrane wet.

Frequently Asked Questions (FAQ):

How do I pressurize the device?

Screw the pressure cap on tightly to the device. Using the syringe, pump up to 7 times from the 10mL marker into the device to pressurise the concentrator.

How do I maintain pressure within the device during concentration?

As concentration of the solution occurs, the pressure in the device may gradually drop and require further pressurisation to maintain the speed of concentration. This can be achieved via additional pumps of the syringe into the device until resistance is felt.

How many times can the device be reused?

The pressure cap can be reused up to 100 times – we recommend cleaning the cap with deionised water (this depends on the buffer solution being concentrated). Regarding the X-Spinner 20, while this can be flushed and cleaned, we recommend using a fresh device for different solutions to avoid cross contamination.

What is the dead-stop volume of the device?

The dead-stop volume for X-Spinner 20 devices is 200µL.

Technical Specifications

Converse L, Time to Concentrate at 20°C				
Mode	Centrifuge		Pressure Cap	
Rotor	Swing Bucket		Pressure	
Start Volume	10ml		10ml	
	Time (min)	Solute Recovery	Time (min)	Solute Recovery
BSA 1.0 mg/ml (66 kDa)				
3 kDa PES	15	99%	10	99%
10 kDa PES	15	99%	10	99%
30 kDa PES	15	98%	10	98%
Converse S, Time to Concentrate at 20°C				
Mode	Centrifuge		Pressure Cap	
Rotor	Swing Bucket		Pressure	
Start Volume	4ml		4ml	
	Time (min)	Solute Recovery	Time (min)	Solute Recovery
BSA 1.0 mg/ml (66 kDa)				
3 kDa PES	15	99%	10	99%
10 kDa PES	15	99%	10	98%
30 kDa PES	15	98%	10	98%

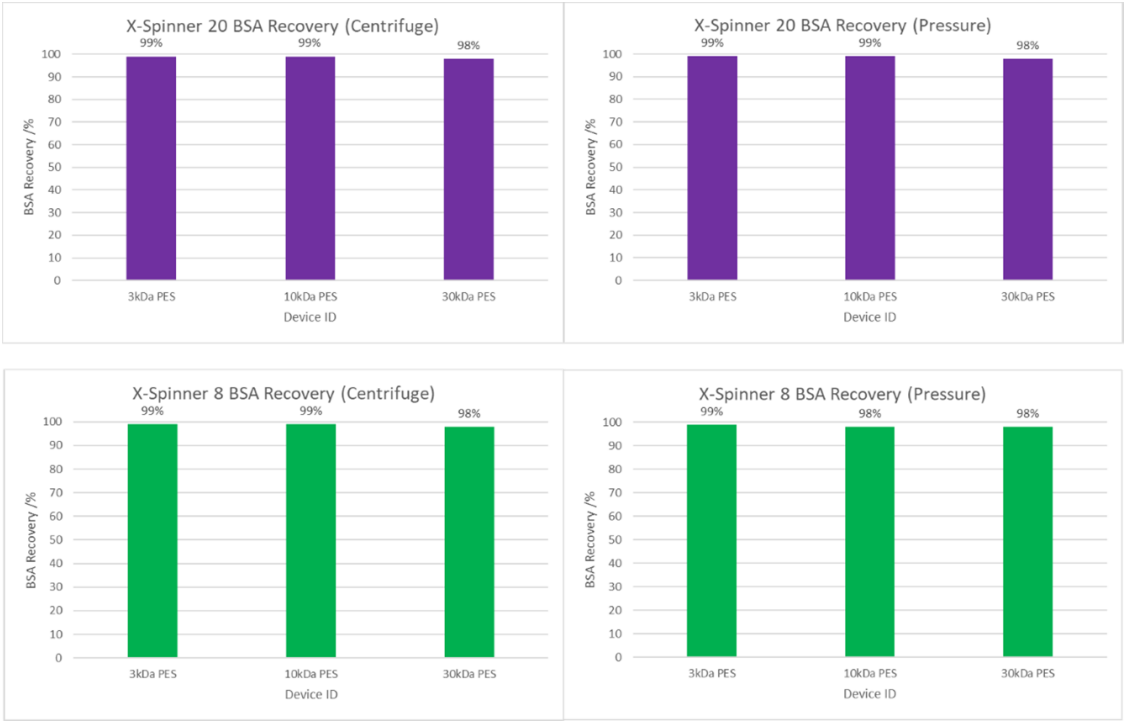

Figure 1: Protein recovery via centrifuge and pressure methods. Protein Ark's X-Spinner 8 and 20s offer on average 99% protein recovery following filtration.

Ordering Information

Product	Units	Order Code
Proteus X-Spinner 8 3kDa MWCO	6	PAL-X8-3-6
	24	PAL-X8-3-24
	96	PAL-X8-3-96
Proteus X-Spinner 8 10kDa MWCO	6	PAL-X8-10-6
	24	PAL-X8-10-24
	96	PAL-X8-10-96
Proteus X-Spinner 8 30kDa MWCO	6	PAL-X8-30-6
	24	PAL-X8-30-24
	96	PAL-X8-30-96
Proteus X-Spinner 8 100kDa MWCO	6	PAL-X8-100-6
	24	PAL-X8-100-24
	96	PAL-X8-100-96
Proteus X-Spinner 20 3kDa	6	PAL-X20-3-6
	24	PAL-X20-3-24
	96	PAL-X20-3-96
Proteus X-Spinner 20 10kDa	6	PAL-X20-10-6
	24	PAL-X20-10-24
	96	PAL-X20-10-96
Proteus X-Spinner 20 30kDa	6	PAL-X20-30-6
	24	PAL-X20-30-24
	96	PAL-X20-30-96
Proteus X-Spinner 20 100kDa	6	PAL-X20-100-6
	24	PAL-X20-100-24
	96	PAL-X20-100-96