Centrifugal devices

Facilitate pure product with
> 90% recovery in minutes

cytiva

Centrifugal devices

- Accelerate sample processing: Concentrate and purify samples with starting volumes of < 50 µL to 60 mL.
- Maximize sample recovery: Obtain high flow rates and low non-specific protein and nucleic acid binding.
- Add versatility: Available in various membrane types including low-binding Bio-Inert™ (modified nylon), Supor™ (polyethersulfone), wwPTFE and Omega™ (modified polyethersulfone) ultrafiltration membranes are available in a variety of MWCOs.
- Prevent solution bypass: Membrane seals stop solution leakage, minimizing sample loss.
- Easy visual identification: Devices are color-coded for a wide variety of membranes, ranging from 1 kD to 0.45 µm.
- Reduce risk of protein aggregation using the unique vertical paddle in Microsep™ Advance and Macrosep™ Advance centrifugal devices.
- Easy sample recovery with large sample reservoirs.

Applications

Centrifugal devices can replace traditional separation techniques, such as column chromatography, preparative electrophoresis, alcohol or salt precipitation, dialysis, and gradient centrifugation, when performing the following:

- Protein or nucleic acid concentration
- Desalting
- Buffer exchange
- Deproteination of biological samples
- Fractionation of protein mixtures
- Separation of primers from PCR products
- Separation of labeled nucleic acids or proteins from unincorporated nucleotides
- Virus concentration or removal
- Clarification of cell lysates and tissue homogenates
- Nucleic acid isolation

How to choose the best centrifugal ultrafiltration device

Our centrifugal devices simplify many common nucleic acid and protein sample preparation procedures. These devices provide efficient concentration and salt removal of samples from 50 µL to 60 mL in minutes. Choose from membranes that have been developed to assure low non-specific biomolecule binding and provide > 90% recovery of target biomolecules.

Ultrafiltration method

Ultrafiltration is a membrane separation technique used to separate extremely small particles and dissolved molecules in fluids. The primary basis for separation is molecular size, although other factors such as molecule shape and charge can also play a role. Molecules larger than the membrane pores will be retained, but not bound, at the surface of the membrane (not in the polymer matrix as they are retained in microporous membranes) and concentrated during the ultrafiltration process.

Compared to non-membrane processes (chromatography, dialysis, solvent extraction, or centrifugation), ultrafiltration:

- Is gentler on the molecules being processed.
- Does not require an organic extraction which may denature labile proteins.
- Maintains ionic and pH conditions.
- Is fast and relatively inexpensive.
- Can be performed at low temperatures.
- Is efficient, can simultaneously concentrate and purify molecules.

The retention properties of ultrafiltration membranes are expressed as Molecular Weight Cut-off (MWCO) and measured in kilodaltons (kD). This value refers to the approximate molecular weight of a dilute globular solute (i.e., a typical protein) which is 90% retained by the membrane. However, a molecule's shape can have a direct effect on its retention by a membrane. For example, linear molecules like DNA may find their way through pores that will retain a globular species of the same molecular weight.

There are three generic applications for ultrafiltration:

1. **Concentration**. Ultrafiltration is a very convenient method for the concentration of dilute protein, DNA, orRNA samples. It does not shear DNA as large as 100 Kb or cause loss of enzymatic activity in proteins and is efficient with > 90% recovery.
2. **Desalting and buffer exchange (diafiltration)**. Ultrafiltration provides a convenient and efficient way to remove or exchange salts, remove detergents, separate free from bound molecules, remove low molecular weight components, or rapidly change the ionic or pH environment.
3. **Fractionation**. Ultrafiltration will not accomplish a sharp separation of two molecules with similar molecular weights. The molecules to be separated should differ by at least one order of magnitude (10X) in size for effective separation. Fractionation using ultrafiltration is effective in applications, such as the preparation of protein-free filtrates, the separation of unbound or unincorporated label from DNA and protein samples, and the purification of PCR products from synthesis reactions.

Device selection based on volume

Table 1. Device selection by volume

Device	Sample volume
Nanosep™ device	< 0.5 mL
Microsep Advance device	0.5 – 5.0 mL
Macrosep Advance device	5 – 20 mL
Jumbosep™ device	20 – 60 mL

Membrane selection based on application

- These membranes meet the challenges of a wide range of applications with superior performance and stability:
- Omega (modified polyethersulfone) ultrafiltration membrane for rapid concentrating and desalting.
- Bio-Inert (modified nylon), Supor (polyethersulfone), and wwPTFE microfiltration membranes for removing particulate (such as gel debris).
- Glass Fiber for nucleic acid binding.

DMSO compatibility

DMSO is a common solvent used in biologics work to ensure solubility of the biological sample. Our PES Supor membrane is recommended for biological and pharmaceutical research due to its fast flow rates and low protein binding properties. Typically, PES membranes are not compatible with DMSO.

Supor microfiltration Microsep Advance and Macrosep Advance are compatible with up to 20% DMSO and can therefore be used in sample cleanup.

Choosing the correct MWCO

Once sample volume is determined, the next step is to select the appropriate MWCO for ultrafiltration or pore size for microfiltration. MWCOs are nominal ratings based on the ability to retain > 90% of a solute of a known molecular weight in kilodaltons.

Table 2 provides retention characteristics of different MWCO membranes for some solutes. For proteins, it is recommended that an MWCO be selected that is three to six times smaller than the molecular weight of the solute being retained. If flow rate is a consideration, choose a membrane with an MWCO at the lower end of this range (3X), if the main concern is retention, choose a tighter membrane (6X).

It is important to recognize that retention of a molecule by an ultrafiltration membrane is determined by a variety of factors, among which its molecular weight serves only as a general indicator.

Therefore, choosing the appropriate MWCO for a specific application requires consideration of a number of factors including molecular shape, electrical charge, sample concentration, sample composition, and operating conditions.

Different manufacturers use different molecules to define the MWCO of their membranes, so it's important to perform pilot experiments to verify membrane performance in a particular application.

Common variables that increase molecule passage

- Sample concentration less than 1 mg/mL.
- Linear versus globular molecules.
- High transmembrane pressure created by g-force in centrifugal concentrators. This is especially important in the case of linear molecules, for example DNA fragments.
- Decreasing the g-force can increase retention of molecules by a membrane.
- Buffer composition that favors breakup of molecules.
- pH and ionic conditions that change the molecule (i.e., conformational changes).

Common variables that decrease molecule passage

- Sample concentration higher than 1 mg/mL.
- Buffer conditions that permit molecules to aggregate.
- Presence of other molecules that increase sample concentration.
- Lower transmembrane pressure (in the case of centrifugal concentrators, lower g-force).
- Adsorption to the membrane or device.
- Low temperature (4°C versus 24°C).

Table 2. MWCO selection for protein applications

MWCO	Membrane nominal pore size*	Biomolecule size	Biomolecule molecular weight
1K**	–	–	3K – 10K
3K	–	–	10K – 30K
10K	–	–	30K – 90K
30K	–	–	90K – 300K
100K	10 nm	30 – 90 nm	300K – 900K
300K***	35 nm	> 90 nm	> 900K

* Nominal pore size as measured by electron microscopy
** Not available in Nanosep device
*** Not available in Microsep or Macrosep Advance device

MWCO selection for nucleic acid applications

MWCO	Base pairs (DS)	Nucleotides (SS)
1K*	5 – 16 bp	9 – 32 nt
3K	16 – 50 bp	32 – 95 nt
10K	50 – 145 bp	95 – 285 nt
30K	145 – 285 bp	285 – 950 nt
100K	475 – 1,450 bp	950 – 2,900 nt
300K**	> 1,450 bp	> 2,900 nt

* Not available in Nanosep device
** Not available in Microsep or Macrosep Advance devices

MWCO selection for virus applications

MWCO	Membrane nominal pore size*	Virus or particle diameter
100K	10 nm	30 – 90 nm
300K*	35 nm	> 90 nm

* Nominal pore size as measured by electron microscopy

Color-coding

Centrifugal devices are available in a range of MWCOs color-coded for easy identification.

Table 3. Color coding as per different MWCO centrifugal filters

MWCO/Pore Size	Color
1K	yellow
3K	gray
10K	blue
30K	red
50K	green
100K	clear
300K	orange
1,000K	purple
0.2 µm	aqua
0.45 µm	wildberry and clear

Nanosep, Nanosep MF and Nanosep NAB centrifugal devices

Simple, reliable processing samples of 50 to 500 µL

- Ensures rapid processing of samples.
- Typical recoveries are > 90%. Available with low protein binding Omega, Bio-Inert, and wwPTFE membranes.
- A wide range of MWCOs, color-coded for easy identification.
- Constructed of low-binding polypropylene.
- Ultrasonically welded seals prevent bypass or seal failure.
- Fits standard centrifuge rotors that accept 1.5 mL tubes.
- Silica-based quartz glass fiber media that allows efficient binding of DNA and RNA.

Applications

- Concentrate, purify and desalt oligonucleotides, DNA and RNA.
- Clean up labeling and PCR reactions.
- Concentrate and desalt proteins.
- Exchange buffer or remove salt of chromatography eluate and gradient fractions
- Isolate DNA from agarose gel slices.
- Separate oligonucleotides and RNA from acrylamide gels.
- Concentrate PCR products regardless of size with 100K device if primer removal is required.
- Prepare sample for analytical techniques (e.g., HPLC, LC/MS).
- Binding and purification of plasmid DNA, genomic DNA or total RNA.

Specifications

Materials of construction

Nanosep devices

Filter media: Omega (modified polyethersulfone) ultrafiltration membrane

Nanosep MF devices

Filter media: Bio-Inert (modified nylon) and wwPTFE membranes

Nanosep NAB device

Filter media: Glass fiber

Sample reservoir, membrane support base, and filtrate receiver

Polypropylene

Effective filtration area

0.28 cm^2

Dimensions

Overall Length (fully assembled with cap): 4.5 cm

Capacities

Maximum sample volume:	500 µL
Final concentrate volume:	15 µL
Filtrate receiver volume:	500 µL
Hold-up volume:	< 5 µL

Operating temperature range

0 – 40°C

pH range

Nanosep devices:	2 – 14
Nanosep MF devices:	2 – 14

Maximum centrifugal force

14,000 × g

Centrifuge

Fits rotors that accept 1.5 mL tubes

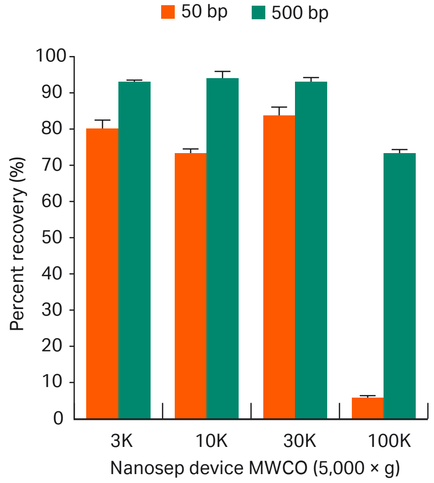
Sanitization

Provided non-sterile. May be sanitized by filtering 70% ethanol through the device prior to use.

Nanosep centrifugal filters

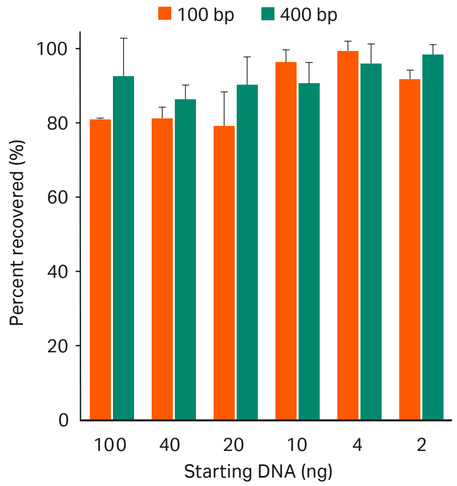
Performance

DNA recovery as a function of device MWCO



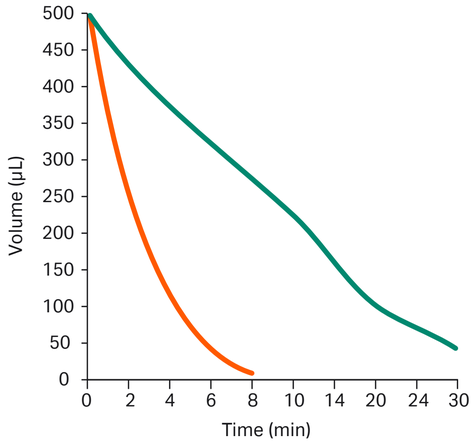
A 500 µL sample of a 100 µg/mL DNA fragment solution containing 50 and 500 bp double-stranded DNA fragments was centrifuged at 5,000 x g in Nanosep devices to a final volume of 50 µL. Recovered samples were quantified using absorbance at 260 nm. The 100K device was able to differentiate between the sizes of the DNA fragments.

DNA recovery



Nanosep 30K devices were used to filter dilute radioactive DNA fragments. In order to accurately quantitate DNA recovery from dilute samples, PCR products (100 and 400 bp) were dual labeled to low-specific activity with 32P-labeled dCTP and 32P-labeled dATP and prepared for filtration. After synthesis, unincorporated nucleotides, as well as termination products, were removed by ultrafiltration using a 30K Nanosep device. The resulting retentate was checked for size and quantitated using gel electrophoresis. Labeled DNA in quantities ranging from 100 ng all the way down to 2 ng per device was diluted to 500 µL using TE. The samples (in triplicate) were centrifuged at 5,000 × g for 10 minutes (spun to dryness) and recovered in two washes of 20 µL water. The resulting retentate was added to a counting vial containing scintillation solution and counted.

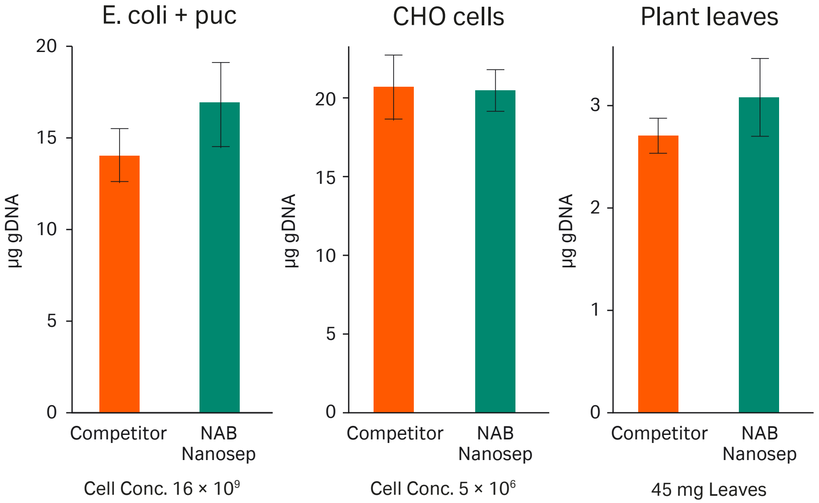
Centrifugal device spin times



Omega PES membrane (Nanosep 30K device)

Regenerated cellulose (competitor 30K device)

Genomic DNA recovery from bacterial, mammalian and plant cells



Purity (A_{260}/A_{280}) E. coli 1.77 ± .05, CHO 1.79 ± .06, Basil 1.84 ± .04

Genomic DNA isolated from freshly harvested E. coli cells, CHO cells and plant leaves compared to the competitor commercial product with commercial buffers for genomic DNA isolation.

Ordering information

Nanosep centrifugal devices with Omega membrane

Description	Pkg	Part number
3K, gray	24/pkg	OD003C33
3K, gray	100/pkg	OD003C34
3K, gray	500/pkg	OD003C35
10K, blue	24/pkg	OD010C33
10K, blue	100/pkg	OD010C34
10K, blue	500/pkg	OD010C35
30K, red	24/pkg	OD030C33
30K, red	100/pkg	OD030C34
30K, red	500/pkg	OD030C35
100K, clear	24/pkg	OD100C33
100K, clear	100/pkg	OD100C34
100K, clear	500/pkg	OD100C35
300K, orange	24/pkg	OD300C33
300K, orange	100/pkg	OD300C34
300K, orange	500/pkg	OD300C35

Nanosep MF centrifugal devices with Bio-Inert membrane

Description	Pkg	Part number
0.2 µm, aqua	24/pkg	ODM02C33
0.2 µm, aqua	100/pkg	ODM02C34
0.2 µm, aqua	500/pkg	ODM02C35
0.45 µm, wildberry	24/pkg	ODM45C33
0.45 µm, wildberry	100/pkg	ODM45C34
0.45 µm, wildberry	500/pkg	ODM45C35
Nanosep MF centrifugal devices with wwPTFE membrane		
0.2 µm	100/pkg	ODPTFE02C34
0.2 µm	500/pkg	ODPTFE02C35
0.45 µm, clear	100/pkg	ODPTFE04C34
0.45 µm, clear	500/pkg	ODPTFE04C35
Nanosep centrifugal devices for NAB with glass fiber membrane		
NAB, white	24/pkg*	ODNABC33
NAB, white	100/pkg*	ODNABC34

* Both pack sizes come with 2 additional filtrate tubes for each device

Microsep Advance centrifugal devices

Precise, quick recovery of microliter volumes of concentrate from starting volumes up to 5.0 mL

- High recovery. Achieve 50X concentration and > 90% recovery in minutes.
- Features deadstop to prevent samples from spinning to dryness.
- Versatile Omega membrane is available in a variety of MWCOs.
- Color-coded and laser etched for easy identification.

Applications

- Concentrate dilute protein samples.
- Exchange buffer and remove salt in samples.
- Remove proteins and particulate from samples for HPLC analysis of drugs, amino acids, and antibodies.
- Isolate low molecular weight compounds from fermentation broths for natural product screening.
- Recover biomolecules from cell culture supernatants or lysates.
- Clarify samples with gross particulate.
- Clean up of biological samples containing up to 20% DMSO (microfiltration only).

Specifications

Materials of concentration

Filter media:	Omega (modified polyethersulfone) and Supor (polyethersulfone) membranes
Sample reservoir, filtrate receiver, and cap:	Polypropylene
Paddle:	Polyethylene

Effective filtration area

3.3 cm^2

Dimensions

Diameter:	17 mm
Length:	12.0 cm

Operating temperature range

0 – 40 °C

Capacities

Maximum sample volume:	5.0 mL
Final concentrate volume:	65 µL (swinging bucket) 80 µL (45° angle rotor) 100 µL (34° angle rotor)
Filtrate receiver volume:	6.5 mL
Hold-up volume:	40 µL

pH range

2 – 14

Maximum centrifugal force

Ultrafiltration:	7,500 x g
Microfiltration:	14,000 x g

Centrifuge

Fits centrifuges that accept standard 17 x 100 mm tubes and is capable of 3,000 to 14,000 x g

Sanitization

Provided non-sterile. May be sanitized by filtering 70% ethanol through the device prior to use.

DMSO compatibility

MCPM02C67, MCPM02C68, MCPM45C67, and MCPM45C68 are compatible with samples containing up to 20% DMSO.

Microsep Advance centrifugal filters

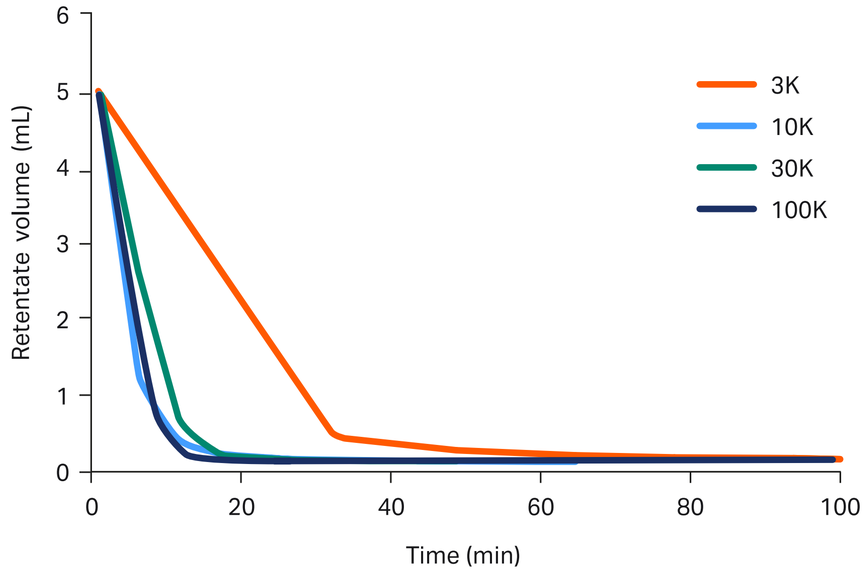
Performance

Rotor selection determines final concentrate volume

Table 4. Rotor selection and final concentrate volume for Microsep Advance devices

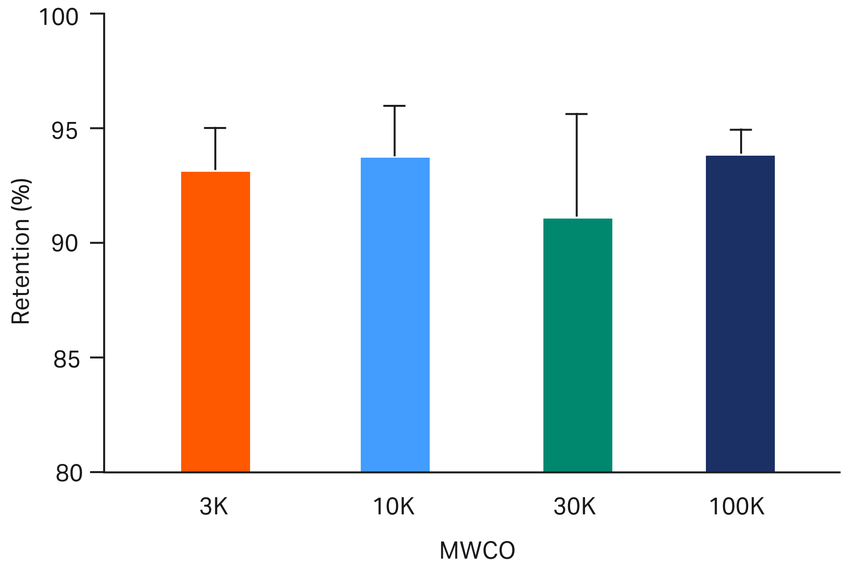
Rotor angle	Swinging bucket	45° Fixed angle	34° Fixed angle
Deadstop volume	65 µL	80 µL	100 µL

Microsep Advance centrifugal devices: Reduced spin time



Protein solutions were processed in each of the Microsep Advance devices.
Average time is plotted against mL of remaining product to be filtered using a 34° fixed angle rotor at 5,000 g.
Solutions are 3K: Cytochrome C, 250 µg/mL; 10K: BSA, 1 mg/mL; 30K: IgG, 1 mg/mL; and 100K: Thyroglobulin, 1 mg/mL.

Microsep Advance centrifugal devices: Retention efficiency



Protein solutions were processed in each of the Microsep Advance devices. Average percent retention using 34° fixed angle rotor at 5,000 g is displayed for each MWCO. Solutions were 3K: Cytochrome C, 250 µg/mL; 10K: BSA, 1 mg/mL; 30K: IgG, 1 mg/mL; and 100K: thyroglobulin, 1 mg/mL.

Ordering information

Microsep Advance centrifugal devices with Omega membrane		
Description	**Pkg**	**Part number**
1K, yellow	24/pkg	MCP001C41
1K, yellow	100/pkg	MCP001C46
3K, gray	24/pkg	MCP003C41
3K, gray	100/pkg	MCP003C46
10K, blue	24/pkg	MCP010C41
10K, blue	100/pkg	MCP010C46
30K, red	24/pkg	MCP030C41
30K, red 1	00/pkg	MCP030C46
100K, clear	24/pkg	MCP100C41
100K, clear	100/pkg	MCP100C46
Microsep Advance centrifugal devices with Supor membrane		
0.2 µm, aqua	24/pkg	MCPM02C67
0.2 µm, aqua	100/pkg	MCPM02C68
0.45 µm, wildberry	24/pkg	MCPM45C67
0.45 µm, wildberry	100/pkg	MCPM45C68

Macrosep Advance centrifugal devices

Quickly concentrates up to 20 mL of biological sample without valuable sample loss

- Rapidly concentrates 20 mL sample volumes to 0.5 mL.
- Provides high recoveries, typically > 90%.
- Low protein-binding Omega membrane and polypropylene housing minimize losses due to non-specific binding.
- Versatile Omega membrane is available in a variety of MWCOs.
- Built-in deadstop prevents spinning to dryness.
- Color-coded for easy identification.

Applications

- Concentrate and desalt proteins.
- Exchange buffer or remove salt of chromatography eluates and gradient fractions.
- Recover proteins or other molecules from cell culture supernatants.
- Remove particulate from aqueous solutions.
- Clean up of biological samples containing up to 20% DMSO (microfiltration only).

Specifications

Materials of concentration

Filter media:	Omega (modified polyethersulfone) and Supor (polyethersulfone) membranes
Sample reservoir, filtrate receiver, and cap:	Polypropylene
Paddle:	Polyethylene

Effective filtration area

7.2 cm^2

Dimensions

Diameter:	50 mm
Length:	12.0 cm

Operating temperature range

0 – 40 °C

Capacities

Maximum sample volume:	20 mL
Final concentrate volume:	As low as 450 µL, depending on rotor used
Filtrate receiver volume:	22 mL
Hold-up volume:	80 µL

pH range

2 – 14

Maximum centrifugal force

Ultrafiltration:	5 000 x g
Microfiltration:	14 000 x g

Centrifuge

Fits centrifuges that accept standard 50 mL conical end tubes

Sanitization

Provided non-sterile. May be sanitized by filtering 70% ethanol through the device prior to use.

DMSO compatibility

MAPM02C67, MAPM02C68, MAPM45C67 and MAPM45C68 are compatible with samples containing up to 20% DMSO

Macrosep Advance centrifugal filters

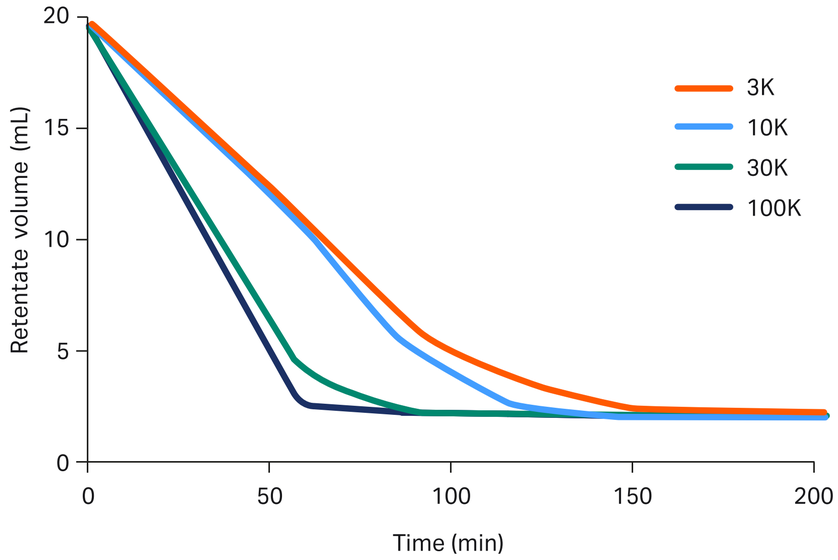
Performance

Rotor selection determines final concentrate volume

Table 5. Rotor selection and final concentrate volume for Miacrosep Advance devices

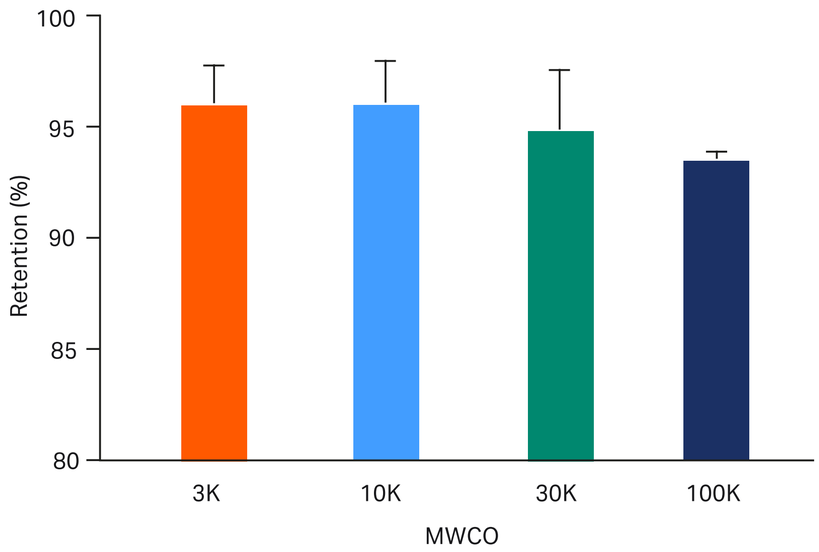
Rotor angle	Swinging bucket	45º Fixed angle	34º Fixed angle
Deadstop volume	450 µL	1.2 – 1.5 mL	1.5 mL

Microsep Advance centrifugal devices: Reduced spin time



Protein solutions were processed in each of the Macrosep Advance devices. Average time is plotted against mL of remaining product to be filtered using a swinging bucket rotor at 5,000 g. Solutions are 3K: Protamine Sulfate, 0.1% in 1X PBS; 10K: Cytochrome C, 0.025% in 1X PBS; 30K: IgG, 0.1% in 1X PBS; and 100K: Apoferritin, 0.1% in 1X PBS.

Microsep Advance centrifugal devices: Retention efficiency



Proteins solutions were processed in each of the Macrosep Advance devices. Average percent retention using a swinging bucket rotor at 5,000 g is displayed for each MWCO. Solutions were 3K: Protamine Sulfate, 0.1% 1X PBS; 10K: Cytochrome C, 0.025% in 1X PBS; 30K: IgG, 0.1% in 1X PBS; and 100K: Apoferritin, 0.1% in 1X PBS.

Ordering information

Macrosep Advance centrifugal devices with Omega membrane		
Description	**Pkg**	**Part number**
1K, yellow	6/pkg	MAP001C36
1K, yellow	24/pkg	MAP001C37
1K, yellow	100/pkg	MAP001C38
3K, gray	6/pkg	MAP003C36
3K, gray	24/pkg	MAP003C37
3K, gray	100/pkg	MAP003C38
10K, blue	6/pkg	MAP010C36
10K, blue	24/pkg	MAP010C37
10K, blue	100/pkg	MAP010C38
30K, red	6/pkg	MAP030C36
30K, red	24/pkg	MAP030C37
30K, red	100/pkg	MAP030C38
100K, clear	6/pkg	MAP100C36
100K, clear	24/pkg	MAP100C37
100K, clear	100/pkg	MAP100C38
Macrosep Advance centrifugal devices with Supor membrane		
0.2 µm, aqua	24/pkg	MAPM02C67
0.2 µm, aqua	100/pkg	MAPM02C68
0.45 µm, wildberry	24/pkg	MAPM45C67
0.45 µm, wildberry	100/pkg	MAPM45C68

Jumbosep centrifugal devices

Convenient and reliable concentration, purification, and diafiltration of 15 to 60 mL biological samples

- Concentrates 60 mL sample volumes to 5 mL in 30 min.
- Provides high recoveries, typically > 90%.
- Low protein-binding Omega membrane and polysulfone housing minimize losses due to non-specific binding.
- Versatile Omega membrane is available in a variety of MWCOs, color-coded for easy identification.
- Built-in deadstop prevents spinning to dryness.
- Unique sealing mechanism prevents retentate leakage and filtrate contamination.
- Economical. Sample reservoir and filtrate receiver can be sanitized and reused.

Applications

Replaces dialysis, chemical precipitation, and lyophilization when:

- Concentrating and desalting proteins.
- Exchanging buffer or removing salt of chromatography eluates and gradient fractions
- Separating biomolecules from cell culture supernatants.
- Concentrating or removing viruses.
- Performing crude fractionation of dilute protein mixtures
- Removing debris and particulates from cell lysates

Specifications

Materials of concentration

Filter media:	Omega (modified polyethersulfone) membrane
Sample reservoir and filtrate receiver:	Polysulfone
Sample reservoir cap:	Polyethylene
Insert without membrane:	High density polyethylene
Filtrate receiver cap and insert release:	Polypropylene

Effective filtration area

15.2 cm^2

Dimensions

Outside diameter:	6 cm
Overall height (fully assembled with cap)	11.3 cm

Capacities

Maximum sample volume:	60 mL
Final concentrate volume:	3.5 – 4 mL
Maximum filtrate receiver volume:	60 mL
Hold-up volume:	0.2 mL

Operating temperature range

0 – 40 °C

pH range

2 – 14

Centrifuge

Swinging bucket rotor is required that accepts flat-bottomed 250 mL bottles and is capable of spinning at up to 3,000 x g.

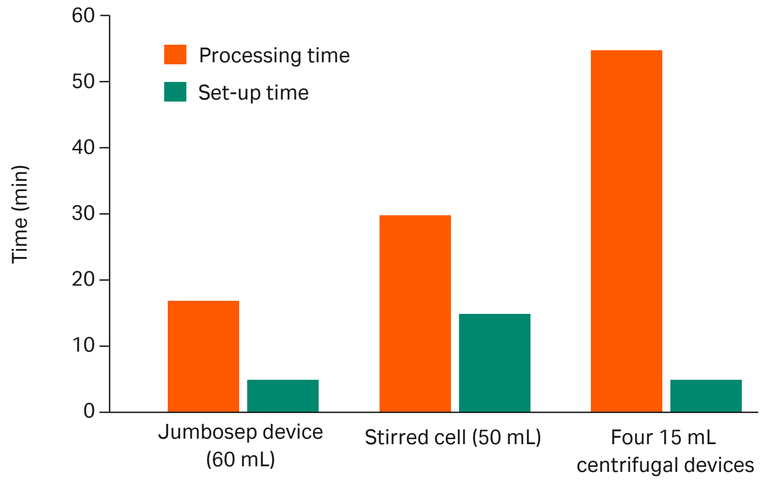
Sanitization

Provided non-sterile. The entire device, including the filter media, may be sanitized by filtering 70% ethanol through it prior to use.

Jumbosep centrifugal filters

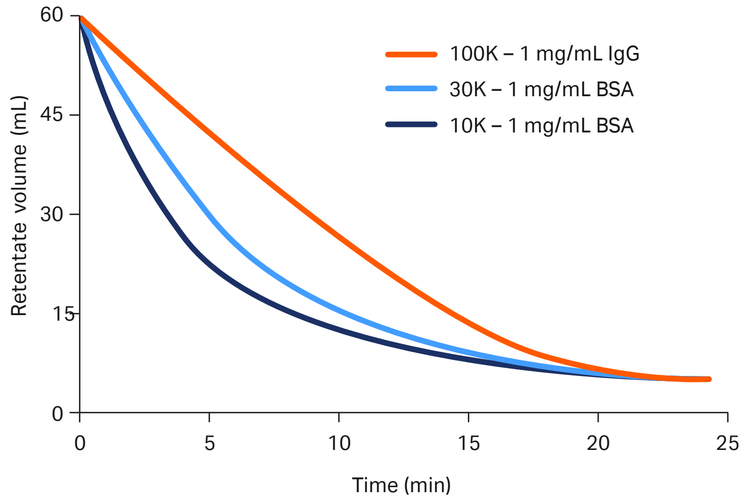
Performance

Jumbosep device reduces processing time over other devices



1 mg/mL BSA solution was processed in each of the above devices until a 15-fold concentration was achieved.

Concentration time



Concentrate dilute protein samples in less than 30 min with 10, 30, and 100K Jumbosep devices.

Ordering information

The generic starter kit includes four holders, cups, and caps. Membrane inserts sold separately. Starter kits include four holders, cups, caps, and membrane inserts.

Jumbosep centrifugal device starter kits

Description	Pkg	Part number
Generic starter kit, (no membrane inserts)	4/pkg	FD000K65
3K starter kit, gray	4/pkg	FD003K65
10K starter kit, blue	4/pkg	FD010K65
30K starter kit, red	4/pkg	FD030K65
100K starter kit, clear	4/pkg	FD100K65
300K starter kit, orange	4/pkg	FD300K65
Jumbosep centrifugal device membrane inserts		
3K membrane insert, gray	12/pkg	OD003C65
10K membrane insert, blue	12/pkg	OD010C65
30K membrane insert, red	12/pkg	OD030C65
100K membrane insert, clear	12/pkg	OD100C65
300K membrane insert, orange	12/pkg	OD300C65
Accessories and replacement parts		
Filtrate receiver and cap	12/pkg	FD001X65
Sample reservoir and cap	12/pkg	FD002X65
Insert release	24/pkg	FD003X65

Related products available from Cytiva

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