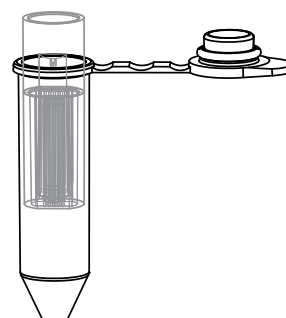
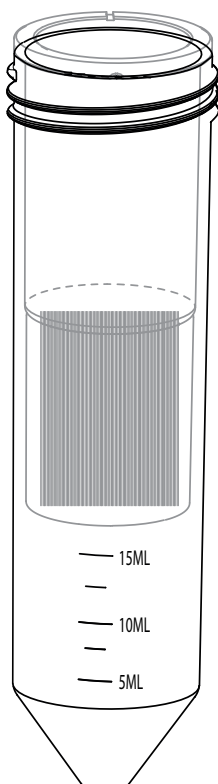
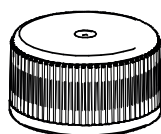
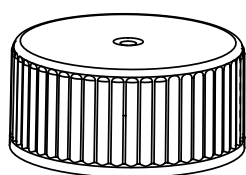




Manual

FastGene® UF Concentrators

FG-UFC05-10KD
FG-UFC05-30KD
FG-UFC05-100KD
FG-UFC4-10KD
FG-UFC4-30KD
FG-UFC4-100KD
FG-UFC15-10KD
FG-UFC15-30KD
FG-UFC15-100KD



1. General information

1.1 Product details

The FastGene® UF Concentrators are designed for rapid concentration, purification, and buffer exchange of proteins, nucleic acids, and other biomolecules.

Available in 0.5 mL, 4 mL, and 15 mL sample size tubes, with multiple molecular weight cut-offs (MWCO: 10 kDa, 30 kDa, 100 kDa), they ensure excellent sample recovery with minimal binding. The vertical dual-membrane design prevents clogging and enables fast flow rates, while the anti-dry lock system protects sensitive samples from over-centrifugation. With low-binding PES membranes, the FastGene® UF Concentrators deliver excellent biocompatibility and reproducibility for research applications.

1.2 Features

- Very high sample recovery rate (>90%)
- Minimal protein and nucleic acid adsorption
- Vertical design for fast, clog-free filtration/concentration
- Ultra-low dead volume for maximum yield
- Compatible with standard centrifuge rotors
- Safe, reliable materials

1.3 Applications

- Protein and nucleic acid concentration or desalting
- Buffer exchange
- Virus and exosome concentration
- Removal of contaminants from cell lysates
- Clarification of samples prior to chromatography or HPLC

1.4 Technical specifications

Parameter	0.5 mL UF Conc.	4 mL UF Conc.	15 mL UF Conc.
Centrifuge tube size	1.5/2 mL conical tubes	15 mL conical tubes	50 mL conical tubes
Membrane material	PES (polyethersulfone)		
Tube and cap material	PP (polypropylene)		
Filter Device Material	PC (polycarbonate) K-resin (Styrene-butadiene Copolymer)		
Dead volume	≤5 µL	≤20 µL	≤30 µL
Lock volume (min.)	10–20 µL	50–100 µL	~300 µL
Max. RCF (Fixed-angle rotor)	14,000 × g	6,000 × g	5,000 × g (3,000 × g for 100 kDa)
Max. RCF (Swing-out rotor)	14,000 × g	4,000 × g	4,000 × g (3,000 × g for 100 kDa)
Operating temp.	0–40 °C		
pH range	1–14		
Sterilization	Not autoclavable. Sterilize by flushing with 70% ethanol through the UF Concentrator.		

1.5 Order numbers

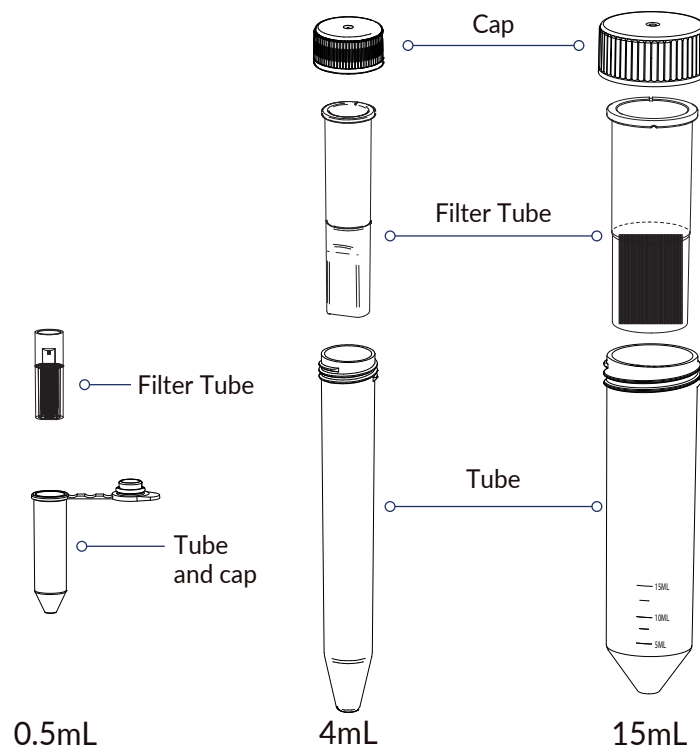
Cat. No.	Volume	MWCO	Cap Colour	Package Size (pc/box)
FG-UFC05-10KD	0.5 mL	10 kDa	○ transparent	96
FG-UFC05-30KD	0.5 mL	30 kDa	○ transparent	96
FG-UFC05-100KD	0.5 mL	100 kDa	○ transparent	96
FG-UFC4-10KD	4 mL	10 kDa	● yellow	40
FG-UFC4-30KD	4 mL	30 kDa	● green	40
FG-UFC4-100KD	4 mL	100 kDa	● pink	40
FG-UFC15-10KD	15 mL	10 kDa	● yellow	15
FG-UFC15-30KD	15 mL	30 kDa	● green	15
FG-UFC15-100KD	15 mL	100 kDa	● pink	15

2. Operation instructions

2.1 FastGene® UF Concentrator structure

Each concentrator consists of:

- Cap – prevents evaporation during centrifugation
- Filter tube (inner tube) – contains the PES ultrafiltration membrane
- Collection tube (outer tube) – collects filtrate



2.2 Pre-rinse procedure

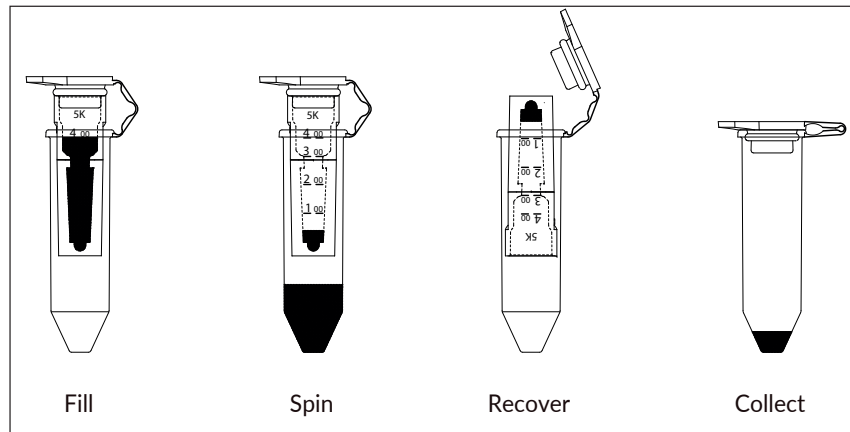
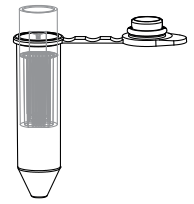
Before use, remove preservatives (glycerol traces) from the membrane:

1. Fill the filter tube with deionized water or buffer
 - 0.5 mL tube → 0.5 mL
 - 4 mL tube → 4 mL
 - 15 mL tube → 15 mL
2. Centrifuge and discard the filtrate.
3. Repeat once.
4. For highly sensitive experiments, an additional rinse with 0.05 M NaOH may be used.

Important: Once wetted, the filter should remain moist until use.

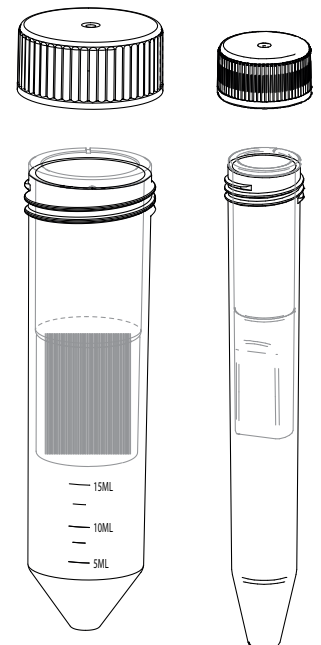
2.3 Operation of 0.5 mL UF Concentrators

1. Load ≤ 0.5 mL sample into the filter device and cap it.
2. Centrifuge at up to $14,000 \times g$ (10–30 min). Always balance the rotor.
3. For recovery: invert the inner tube into a new collection tube and centrifuge at $1,000 \times g$ for 1–2 min.
4. Collect both filtrate and concentrate if required.



2.4 Operation of 4 mL and 15 mL UF Concentrators

1. Load sample:
 - 4 mL tube $\rightarrow$ max. 4.5 mL
 - 15 mL tube $\rightarrow$ max. 15 mL
2. Place into centrifuge compatible with 15/50 mL conical tubes.
3. Centrifuge according to MWCO:
 - 4 mL: $1,000\text{--}6,000 \times g$ (max $3,000 \times g$ for 100 kDa)
 - 15 mL: $1,000\text{--}5,000 \times g$ (max $3,000 \times g$ for 100 kDa)
 - Typical spin time: 10–30 min.
4. Recover concentrate with a pipette from the filter bottom.



2.5 Performance

Retention:

- Defined by MWCO (10 kDa, 30 kDa, 100 kDa).
- Molecules close to MWCO may be only partially retained.
- Recommendation: Choose an MWCO $\sim 2\text{-}3\times$ smaller than the molecular weight of the target.

Recovery:

- Typical recovery: $>90\%$ for proteins and nucleic acids.

Table 1: Ultrafiltration performance of protein solutions (1 mg/mL) at recommended centrifugal forces (see 1.4 Technical specifications). Recovery values represent average performance for FastGene® UF Concentrators under standard laboratory conditions.

Protein	Molecular Weight (Da)	UF Conc. MWCO	Retention Rate	Centrifugation Time (min) 15 mL / 4 mL Tubes	Centrifugation Time (min) 0.5 mL Tubes
Ovalbumin (OVA)	45 000	10 kDa	$> 95 \%$	15 – 30	10 – 15
Bovine Serum Albumin (BSA)	67 000	30 kDa	$> 95 \%$	15 – 20	< 10
Immunoglobulin G (IgG)	156 000	100 kDa	$> 90 \%$	20 – 30	< 10

2.6 FastGene® UF Concentrator - MWCO selection guide

Table 2: MWCO selection guide. Choosing the correct MWCO (Molecular Weight Cut-Off) is essential for optimal recovery and concentration efficiency. Use smaller MWCO filters for smaller proteins and larger MWCO filters for high-molecular-weight biomolecules such as antibodies, viruses, or exosomes.

MWCO Filter Membrane	Recommended Protein Molecular Weight Range	Centrifugation Time (min) 0.5 mL Tubes	Centrifugation Time (min) 4 mL Tubes	Centrifugation Time (min) 15 mL Tubes
10 kDa	$\sim 20 - 60$ kDa	10 – 15 min	15 – 30 min	15 – 30 min
30 kDa	$\sim 60 - 120$ kDa	< 10 min	15 – 20 min	15 – 20 min
100 kDa	≥ 150 kDa (large proteins, antibodies, viruses, exosomes)	< 10 min	20 – 30 min	20 – 30 min

2.7 Chemical compatibility

FastGene® UF Concentrators are appropriate for biological liquids and aqueous solution. Please verify the chemical compatibility of the specific sample with the UF Concentrators before use to prevent device failure.

Table 3: Chemical compaibility of FastGene® UF Concentrator tubes.

Category	Chemical / Reagent	Maximum Concentration
Acids	Sulfamic acid	≤3 %
	Formic acid	≤5 %
	Acetic acid	≤25 %
	Hydrochloric acid	≤1 M
	Sulfuric acid	≤3 %
	Nitric acid	≤10 %
	Lactic acid	≤5 %
	Phosphoric acid	≤30 %
	Trifluoroacetic acid	≤10 %
	Trichloroacetic acid	≤10 %
Bases	Sodium hydroxide (4 mL / 15 mL tubes)	≤0.5 M
	Sodium hydroxide (0.5 mL tubes)	≤0.1 M
	Ammonium hydroxide	≤10 %
Alcohols	Methanol	≤60 %
	Ethanol	≤70 %
	Isopropanol	≤70 %
	n-Butanol	≤70 %

Category	Chemical / Reagent	Maximum Concentration
Organic solvents	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	Phenol	< 1 %
	Glycerol	≤70 %
	DTT	≤0.1 M
	DEPC (Diethyl pyrocarbonate)	≤0.2 %
	PEG (Polyethylene glycol)	≤10 %
	Phosphate buffer (pH 8.2)	≤1 M
	Ammonium sulfate	Saturated
	Imidazole	≤500 mM
	Urea	≤8 M
	β-Mercaptoethanol	≤0.01 M
	Tris buffer (pH 8.2)	≤1 M
	Sodium carbonate	≤20 %
	Guanidine hydrochloride	≤6 M

2.8 Non-specific adsorption

- PES membranes have very low binding.
- Hydrophobic proteins may adsorb; this can be reduced by pre-blocking with 10% glycerol overnight, followed by rinsing.

2.9 Desalting / Diafiltration

1. Concentrate sample 10×.
2. Dilute with exchange buffer.
3. Repeat 3–5 cycles to remove 95–99% salts.

2.10 Precautions

- For research use only (not diagnostic).
- Do not exceed maximum loading volume.
- Avoid prolonged centrifugation to reduce recovery loss.
- Always balance tubes properly in centrifuge.
- Do not autoclave.
- Check chemical compatibility before use.

3. FAQs

What are FastGene® UF Concentrators used for?

They are used for concentration, desalting, and buffer exchange of biomolecules such as proteins, nucleic acids, and viruses. They can also be used to clarify samples or remove small contaminants.

What sizes and MWCOs are available?

FastGene® UF Concentrators are offered in three sizes – 0.5 mL, 4 mL, and 15 mL – each in three molecular weight cut-offs (MWCO): 10 kDa, 30 kDa, and 100 kDa.

What membrane material is used?

All FastGene® UF Concentrators use a low-binding PES (Polyethersulfone) membrane, ideal for proteins and nucleic acids.

What pH range can they handle?

The PES membrane is compatible with pH 1–14, covering most biological and chemical applications.

Can I reuse the concentrators?

All FastGene® UF Concentrators are single-use, non-sterile devices. Reuse may reduce performance and risk contamination. Reuse is not recommended.

Can they be sterilized?

Do not autoclave. For cleaning or limited sterilization, you may rinse with 70 % ethanol for 30 minutes before use. Always let ethanol evaporate completely.

Are the concentrators RNase- or endotoxin-free?

They are not certified RNase-free or endotoxin-free. If required, rinse with 0.1 % DEPC solution at 37 °C for 2 h and then wash thoroughly with ultrapure water.

Can I use them at 4 °C?

Yes. Centrifugation at 4 °C is possible, but viscosity increases at low temperature, so extend the spin time by about 1.5 ×.

How do I collect the concentrated sample?

- 0.5 mL tubes: Use the reverse-spin method – invert the filter into a clean collection tube and centrifuge at 1,000 × g for 1–2 min.
- 4 mL and 15 mL tubes: Collect the concentrate directly with a pipette.

How can I improve protein recovery or avoid loss?

- Choose an MWCO about one-third of the target protein's molecular weight.
- Avoid excessive centrifugal force or long spin times.
- If the sample is viscous or prone to sticking, pre-block the membrane with 10 % glycerol overnight and rinse before use.

My protein precipitated during concentration – what should I do?

Precipitation can occur when concentrating too quickly or too far.

Try:

- Reducing centrifugal force (to 30–50 % of the recommendation).
- Switching to a larger MWCO (e.g., 30 kDa instead of 10 kDa).
- Gently mixing the sample between spins.

Why is my target protein missing after centrifugation?

Possible causes:

- The MWCO chosen is too large (target passed through).
- Centrifugal force too high or rotor not calibrated.
- Protein precipitated during spin. Check filtrate and concentrate; if protein is in filtrate, use a smaller MWCO.

Can these devices remove detergents or endotoxins?

- Detergents: Only partially; efficiency drops above the CMC value.
- Endotoxins: No, as endotoxins are often >10 kDa and not removed effectively by ultrafiltration.

Can FastGene® UF Concentrators be used for virus or nanoparticle concentration?

Yes.

- Lentivirus: Use 100 kDa MWCO.
- Adenovirus: Use 30 kDa MWCO.

They are also suitable for nanoparticle and exosome concentration (recommended 30–100 kDa).

What centrifuge settings should I use?

Use swing-bucket or fixed-angle rotors compatible with standard conical tubes. Always balance your samples.

Parameter	0.5 mL UF Conc.	4 mL UF Conc.	15 mL UF Conc.
Max. RCF (Fixed-angle rotor)	14,000 × g	6,000 × g	5,000 × g (3,000 × g for 100 kDa)
Max. RCF (Swing-out rotor)	14,000 × g	4,000 × g	4,000 × g (3,000 × g for 100 kDa)

Do samples dry out during centrifugation?

No. The FastGene® UF Concentrators feature a dead-volume design that prevents complete drying and protects your sample.

Are the devices chemically compatible with organic solvents or strong reagents?

They are intended for aqueous and biological solutions.

Check the chemical compatibility table before using acids, bases, or solvents.

How can I reduce non-specific adsorption of my protein to the membrane?

FastGene® UF Concentrators use low-binding PES membranes, but some hydrophobic or non-polar proteins may still show slight adsorption. To minimize this effect:

- Pre-block the membrane before use (for example, with 10 % glycerol or a similar blocking solution), then rinse with buffer or water.
- Avoid excessive membrane surface area when working with very small sample volumes.

If adsorption persists, please contact FastGene® Technical Support for detailed pre-treatment instructions.