


# Pierce™ Protein Concentrators, PES

For 3K, 10K, 30K, 50K, and 100K MWCO: 100–500 µL

**Catalog Number** 88512, 88513, 88502, 88504, and 88503

**Doc. Part No.** 2162414 **Pub. No.** MAN0011811 **Rev.** B.0

 **WARNING!** Read the Safety Data Sheets (SDSs) and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. Safety Data Sheets (SDSs) are available from [thermofisher.com/support](https://www.thermofisher.com/support).

## Product description

The Thermo Scientific™ Pierce™ Protein Concentrators are disposable ultrafiltration centrifugal devices that provide reliable and consistent results for concentrating, diafiltrating, and buffer exchanging of biological samples such as proteins and nucleic acids. The 0.5 mL Concentrators have a built-in dead stop and contain a vertical low protein-binding, high-flux polyethersulfone (PES) membrane, which allows for processing of volumes between 100 µL and 500 µL. The PES membrane is available in 5 distinct molecular-weight cutoffs (MWCOs) of 3K, 10K, 30K, 50K, and 100K. The MWCOs are etched on the sides of the Concentrators for easy identification, and a clear window with graduations on the side of each device allows for visual determination of the retentate volume.

Typical protein recovery is > 90% for proteins that are ≥ 2-fold greater than the membrane MWCO. Sample concentration of 10- to 30-fold can typically be achieved in 10 minutes or less at 22°C for MWCOs ≥ 10K when centrifuging at 15,000 × g.

The 0.5 mL Concentrators are compatible with most bench-top microcentrifuges with fixed-angle rotors that accommodate 2.2 mL tubes.

## Contents and storage

**Table 1** Pierce™ Protein Concentrators

Product	Cat. No.	Capacity	Amount	Storage
Pierce™ Protein Concentrator, 3K MWCO <sup>[1]</sup>	88512	100–500 µL	25 per pkg	Room temperature
Pierce™ Protein Concentrator, 10K MWCO	88513			
Pierce™ Protein Concentrator, 30K MWCO	88502			
Pierce™ Protein Concentrator, 50K MWCO	88504			
Pierce™ Protein Concentrator, 100K MWCO	88503			

<sup>[1]</sup> Molecular weight cutoff

## Required materials not supplied

Unless otherwise indicated, all materials are available through [thermofisher.com](https://www.thermofisher.com). MLS: Fisher Scientific ([fisherscientific.com](https://www.fisherscientific.com)) or other major laboratory supplier.

Item	Source
Centrifuge with a fixed-angle rotor for 2.2 mL conical tubes, rated for up to 15,000 × g	MLS
Pipet for retentate recovery	MLS
<i>For desalting:</i> Exchange buffer	MLS

## Procedural guidelines

- The 0.5 mL Concentrators can be used effectively at a maximum centrifugal force of 15,000 × g.

- When centrifuging assembled Concentrator, always place the Concentrator in the rotor in the same orientation. For fixed-angle rotors, place the Concentrator in the rotor so that the printed window faces upwards/outwards.

- Ensure the Concentrators are properly balanced in the rotor before centrifugation. The counterbalance must be another Concentrator to ensure proper balance due to changing sample distribution during processing.
- For maximum protein recovery, samples should have a molecular weight two-fold greater than the MWCO of the Concentrator membrane. A slightly reduced recovery can occur with molecules that are < 2-fold the MWCO of the membrane. Recovery varies depending on the specific protein and starting concentration.  
Example: When using IgG (MW~150K) samples, use the 5K, 10K, 30K, or 50K MWCO Concentrators.
- The dead-stop volume for the 0.5 mL Concentrators is approximately 15  $\mu$ L.
- Precipitation can occur at high concentration factors for some proteins. The maximum concentration factor is dependent on the specific protein, starting concentration, and buffer system. Unless the stability of the protein has been determined, avoid concentrating to dead-stop.
- Do not allow the membrane to dry out following pre-rinsing. If the Concentrator is not used immediately, store it at 4°C with buffer or water covering the membrane surface.
- Do not autoclave the Concentrators. High temperatures will significantly increase the membrane MWCO. To sterilize, use a 70% ethanol solution.
- The membrane is compatible with buffers at pH 1 to 9.
- The membrane is compatible with desalting and buffer exchange. The salt content can be reduced by  $\geq$  98% with one exchange as salts show minimal or no retention when they pass through the membrane. Buffer components larger than standard salt can require additional buffer exchange steps.
- For shortest concentration time we recommend using centrifuge setting near or at the maximum *g*-force recommended for a particular device and MWCO. For greater control of the concentration factor, reduce the centrifugation speed.
- Centrifugal force, temperature, sample volume, concentration, and viscosity affect filtration rate. Optimize centrifugal time for each application. Depending on conditions, centrifugation time to achieve desired result can differ significantly. A 0.25 mg/mL protein sample will typically decrease in volume by ~12-fold in 5 minutes for the 10K and 30K MWCOs.

### ***(Optional)* Pre-rinse the sample**

The membranes within the 0.5 mL Concentrators contain trace amounts of glycerin and sodium azide. Use this part of the procedure if these trace additives are known to interfere with downstream analysis.

1. Add 500  $\mu$ L of buffer solution or purified water to the sample chamber.
2. Cap, then insert the Sample Chamber into a collection tube.

3. Place the Concentrator assembly into the rotor with a proper counterbalance, then centrifuge at 12,000  $\times$  g until > 400  $\mu$ L of filtrate is produced.

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**IMPORTANT!** The counterbalance must be another Concentrator (not a filled conical tube) to ensure proper balance because of changing sample distribution during centrifugation.

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4. Decant the filtrate and retentate to remove buffer or water.
5. Place the Concentrator back into the collection tube.

**Note:** Do not allow the membrane to dry as performance can be affected.

### **Concentrate the sample without desalting**

1. Place the sample into the Concentrator sample chamber.
2. Cap, then insert the Sample Chamber into a collection tube.
3. Place the Concentrator assembly into the rotor with a proper counterbalance, then centrifuge at 12,000  $\times$  g until the desired concentration factor is achieved.

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**IMPORTANT!** The counterbalance must be another Concentrator to ensure proper balance because of changing sample distribution during centrifugation.

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**Table 2** Recommended centrifugation times for concentrating protein solutions  $\geq$  0.1 mg/mL approximately 10- to 30-fold

Concentrator MWCO	Sample volume ( $\mu$ L)	Centrifugation time (minutes)
3K	500 $\mu$ L	30
10K		5
30K		5
50K		10
100K		10

**Note:** Reduce centrifugation time by half for 100  $\mu$ L sample volumes.

4. Use a pipet tip to gently aspirate the retentate from the bottom and center of the sample chamber.

### **Concentrate the sample with desalting**

1. Place sample into the Concentrator sample chamber.
2. Cap, then insert the Sample chamber into a collection tube.

- Place the Concentrator assembly into the rotor with a proper counterbalance, then centrifuge at  $12,000 \times g$  until the desired concentration factor is achieved.

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**IMPORTANT!** The counterbalance must be another Concentrator to ensure proper balance because of changing sample distribution during centrifugation.

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**Table 3** Recommended centrifugation times for concentrating protein solutions  $\geq 0.1$  mg/mL approximately 10- to 30-fold

Concentrator MWCO	Sample volume ( $\mu\text{L}$ )	Centrifugation time (minutes)
3K	500 $\mu\text{L}$	30
10K		5
30K		5
50K		10
100K		10

**Note:** Reduce centrifugation time by half for 100  $\mu\text{L}$  sample volumes.

- Dilute the sample to the original volume with Exchange Buffer.
- Repeat steps 3 and 4 until the desired solute removal has been achieved.

## Troubleshooting

Observation	Possible cause	Recommended action
Protein precipitation.	Concentration was too high.	Reduce concentration factor.
		Try a different buffer system to increase protein solubility.
Low protein recovery.	The protein MW < two-fold higher than MWCO.	Select a new Concentrator with a MWCO at least 2-fold lower than the protein MW.
	The membrane was damaged and there is protein in the filtrate.	Use a new Concentrator and do not touch the membrane with the pipet tip.
		Do not exceed the recommended centrifugal force.

## Chemical compatibility

The PES membranes used in the Pierce™ Protein Concentrators are compatible with most standard aqueous biological samples, buffers, and salts, according to the following table. Samples containing high levels of cell membranes, fats, or lipids can reduce performance and result in membrane blockage.

**Table 4** Concentrator chemical compatibility

Acids and Bases	Rating <sup>[1]</sup>	Organics	Rating <sup>[1]</sup>	Miscellaneous	Rating <sup>[1]</sup>
Acetic acid (25%)	A	Acetone	NR	Ammonium sulfate (saturated)	A
Formic acid (5%)	A	Acetonitrile	NR	Glycerine (70%)	A
Hydrochloric acid (1 M)	A	Benzene (100%)	NR	Guanidine HCl (6M)	A
Lactic acid (5%)	A	Chloroform (1%)	NR	Imidazole (300 mM)	A
Nitric acid (10%)	A	Dimethyl sulfoxide(5%)	A	Phosphate buffer (1.0 M)	A
Sodium hydroxide (2.5 M)	NR	Ethanol (70%)	A	Polyethylene glycol (10%)	A
Sulfamic acid (5%)	A	Ethyl Acetate (100%)	NR	Sodium carbonate (20%)	A
Trifluoroacetic acid (10%)	A	Formaldehyde (30%)	A	Sodium deoxycholate (5%)	A
		Hydrocarbons (aromatic)	NR	Sodium dodecylsulfate (0.1 M)	A
		Hydrocarbons (chlorinated)	NR	Sodium hypochlorite (200 ppm)	A
		Isopropanol (70%)	A	Sodium nitrate (1%)	A
		Mercaptoethanol (1.0 M)	NR	Tween™ 20-100 (0.1%)	A
		Pyridine (100%)	NR	Triton™ X-100 (0.1%)	A
		Tetrahydrofuran (5%)	NR	Urea (8 M)	A
		Toluene (1%)	NR		

<sup>[1]</sup> A = Acceptable, NR = Not Recommended

**Note:** Concentrations listed are provided as guidelines and do not necessarily represent maximum tolerances. Some compatible chemicals might modify the apparent molecular weight of molecules in the sample and/or the MWCO rating of the membrane.

## Related products

Product	Cat. No.	Capacity	Amount
Slide-A-Lyzer™ G2 Dialysis Cassettes, 2K MWCO	87717	0.5 mL	10 per pkg
Slide-A-Lyzer™ G2 Dialysis Cassettes, 3.5K MWCO	87722	0.5 mL	10 per pkg
Slide-A-Lyzer™ Dialysis Cassettes, 2K MWCO	66205	0.5 mL	10 per pkg
Slide-A-Lyzer™ Dialysis Cassettes, 3.5K MWCO	66333	0.5 mL	10 per pkg
Pierce™ Protein Concentrator, PES, 3K MWCO	88514	2–6 mL	10 per pkg
	88515	2–6 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 10K MWCO	88516	2–6 mL	10 per pkg
	88517	2–6 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 30K MWCO	88521	2–6 mL	10 per pkg
	88522	2–6 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 50K MWCO	88538	2–6 mL	10 per pkg
	88539	2–6 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 100K MWCO	88523	2–6 mL	10 per pkg
	88524	2–6 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 3K MWCO	88525	5–20 mL	10 per pkg
	88526	5–20 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 10K MWCO	88527	5–20 mL	10 per pkg
	88528	5–20 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 30K MWCO	88529	5–20 mL	10 per pkg
	88531	5–20 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 50K MWCO	88540	5–20 mL	10 per pkg
	88541	5–20 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 100K MWCO	88532	5–20 mL	10 per pkg
	88533	5–20 mL	24 per pkg
Pierce™ Protein Concentrator, PES, 5K MWCO	88534	20–100 mL	4 per pkg
Pierce™ Protein Concentrator, PES, 10K MWCO	88535	20–100 mL	4 per pkg
Pierce™ Protein Concentrator, PES, 30K MWCO	88536	20–100 mL	4 per pkg
Pierce™ Protein Concentrator, PES, 50K MWCO	88542	20–100 mL	4 per pkg
Pierce™ Protein Concentrator, PES, 100K MWCO	88537	20–100 mL	4 per pkg
Pierce™ BCA Protein Assay Kit	23225	—	—

## Limited product warranty

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Revision	Date	Description
B.0	17 January 2019	Rebranding of document.

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