



## User Guide

# Centriprep® Centrifugal Filter Devices

Centriprep® 3K and 50K devices for research use only and for use in diagnostic procedures.



## Introduction

Centriprep® centrifugal filter devices are disposable ultrafiltration devices used for purifying, concentrating, dialyzing, and filtering biological samples in the 0–12 mL volume range. These ready-to-use ultrafiltration devices are designed for operation in both centrifuges that have a maximum 3000 rpm centrifuge speed. They can also be used without a centrifuge. The Centriprep® device consists of a sample reservoir with a built-in cup, a filter collector containing a fine ultrafilter (Ultracel®) regenerated cellulose membrane, and an on-rod cap for sample isolation.

The Centriprep® device design allows filtration and fine particle sedimentation to occur at the same time without clogging the membrane. With a Centriprep® 50K device, a 10 mL sample can be concentrated to 0.5 mL in just 20 minutes and concentrations of smaller volume samples may take a high concentration factor and a high recovery of the membrane's flow characteristics, and generate the same recovery of retained macromolecules when compared to both in-vitro and in-vivo procedures that demonstrate a high volume of 0.5–0.5 mL.

The Centriprep® product line includes built-in membrane weight capacity (MWC) as:

- Centriprep® 3K device — 3000 MWC (30 mL membrane support)
- Centriprep® 50K device — 5000 MWC (50 mL membrane support)
- Centriprep® 50K device — 5000 MWC (50 mL membrane support)
- Centriprep® 50K device — 5000 MWC (50 mL membrane support)

**NOTE:** Centriprep® 3K and 50K devices are the only Centriprep® devices intended for in-vitro diagnostic use. For information on these devices, go to [www.millipore.com/centrifugal\\_filters](http://www.millipore.com/centrifugal_filters).

## Applications

### Centriprep® 3K centrifugal filter devices

- Concentrating and dialyzing oligonucleotides, peptides, growth factors, and small proteins.

### Centriprep® 50K, 30K, and 50K centrifugal filter devices

- Concentrating and dialyzing column fluids and protein, buffer containing proteins, enzymes, and antibodies.
- Recovering biomolecules from cell culture supernatants, tissues, extracts, or other biological samples.
- Purifying low-molecular-weight components (e.g., amino acids) and antibodies from physiological fluids, cell culture media, or fermentation broths.

## Centriprep® Device Components



## Required Equipment

Centriprep® devices require the variable speed centrifuge with either a swinging-bucket or fixed-angle rotor and carrier that can properly accommodate 60 mL centrifuge tubes. The centrifuge must be capable of 1000–3,000  $\times$  g for a listing of compatible centrifuges and rotors, see [www.millipore.com/centrifugal\\_filters](http://www.millipore.com/centrifugal_filters).

## Limitations

With fixed-angle rotors, polarization control may be adversely affected at low  $\times$  g-force below 1000  $\times$  g. Operating an average centrifuge with a low concentration, filtered flow may be reduced, which may allow some of the sample to be lost and prevent the following listed benefits from being realized. Leakage or damage to the device.

Device	Maximum Centrifugal Force
Centriprep® 3K	3,000 $\times$ g
Centriprep® 50K	3,000 $\times$ g

## Device Storage and Shelf Life

The best results occur with Centriprep® devices at 15–20 °C. Performance may be adversely affected if the device is stored at extreme temperatures (i.e., below 0 °C or above 60 °C). Shelf life is shown below from date of manufacture.

## Rinsing Before Use

The appearance of Centriprep® centrifugal filter devices contain trace amounts of glycerol. If this interferes with analysis, fill the device with approximately 10 mL of distilled or deionized water and centrifuge until the first equilibration point is reached. Remove filtrate and concentrate. Repeat as necessary until no more interference is noted. Once each measurement must be kept well to ensure full recovery.

## Membrane and Device Appearance

- Occasionally an unused Centriprep® device may have a few drops of moisture on the filter collector or sample reservoir. This is due to condensation of moisture in the membrane and does not affect performance.
- After centrifugation, a small amount of filtrate (approximately 0.5 mL) may remain in the trap between the membrane and the membrane support of the Centriprep® device. This is normal and does not affect device operation or performance.
- The Ultracel® membrane used in the Centriprep® centrifugal filter devices may appear slightly wrinkled after spinning.

## Centrifugal Filter Device Reset

Centriprep® devices are intended for single-use only. Attempts to clean the device may damage the membrane surface or the seal, possibly compromising the seal integrity and thereby affecting performance.

## Principle of Operation

To begin operation, the sample container's built-in cap is loosened and the filter collector is removed. Sample is added, then the filter collector is carefully reinserted back into the sample container following standard aseptic techniques, sealing the device. The assembled centrifugal filter device is centrifuged at 1,000–3,000  $\times$  g, depending on the membrane MWC used.

Inserting the filter collector into the sample reservoir creates a slight hydrostatic pressure differential that exerts an upward buoyancy force on the membrane at the filter collector bottom. By force, the hydrostatic pressure may delay the upward movement in the small reservoir ultrafiltration. Centrifugation overcomes this pressure, forcing low molecular weight molecules and solvent through the membrane into the filter collector. Solvent and molecular weight above the membrane (MWC) remains in the sample container. Concentrated components remain in the sample reservoir. Ultrafiltration occurs in the device opposite the centrifuge force vector.



The pressure differential created by the solvent solution level is important to centrifugal filter device operation. During centrifugation, the sample solution membrane falls on the filter membrane top. In the process, the filter collector falls to the bottom and stays in the bottom of the sample container, preventing maximum filtrate collection. Eventually an equilibrium is reached above the neutral arm at equal heights. Filtrate then stops, since the hydrostatic pressure differential is zero.

If further concentration is required, degas the filtrate before spinning the device for a second time. Depending on stabilizing the pressure differential between the sample membrane and the filter membrane, allowing filtration to resume. Filtrate resumes until a new equilibrium point is reached. Note that the pressure differential is constantly changing during operation at the neutral arm position.

Centriprep® centrifugal filter devices are designed to maintain high flow rates by minimizing volume build-up on the membrane during operation. Centrifugal force concentrates materials to the away from the membrane to the sample reservoir bottom. Because the Centriprep® membrane "floats" above the collection bowl, the full surface of the membrane is used at all times, and flow is unrestricted. This is particularly beneficial when working with suspensions, which can easily clog the membrane.

# Millipore Centriplus User Guide

**S Ashworth**



## **Millipore Centriplus User Guide:**

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