Spectra/Por®

# Standard Grade Regenerated Cellulose Dialysis Membrane (Spectra/Por® 1 - 5, 6 & 7)




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## Table of Contents


Introduction . . . . . 1
Membrane Composition . . . . . 1
Membrane Specifications . . . . . 2
Comparison of Spectra/Por Standard RC Membranes . . . . 3
Metal Content in Spectra/Por® 1-6 Membranes . . . . . 3
Membrane Selection . . . . . 4
Membrane Permeability Characterization . . . . . 4
MWCO Selection . . . . . 5
Chemical Compatibility . . . . . 5
Membrane Tubing “Flat Width” Selection . . . . . 6
Closure Selection . . . . . 6
Membrane Preparation . . . . . 7
Spectra/Por® 1-6 . . . . . 7
Spectra/Por® 7 . . . . . 8
Membrane Handling and Use . . . . . 8
Sample Recovery . . . . . 9
Membrane Storage and Shelf Life . . . . . 10
Membrane Sterilization . . . . . 10
Product Specifications and Ordering Information
Spectra/Por® 1-5 Standard RC Dry Dialysis Tubing . . . . 11
Spectra/Por® 1-5 Standard RC Dry Dialysis Trial Kits . . . 13
Spectra/Por® 6 Standard RC
Pre-wetted Dialysis Tubing & Trial Kits . . . . . 15
Spectra/Por® 7 Standard RC
Pre-treated Dialysis Tubing & Trial Kits . . . . . 18
Spectra/Por® RC Discs and Flat Sheets . . . . . 21
Spectra/Por® Ready-to-Use Dialysis Sacks . . . . . 22
Heavy Metals Cleaning Solution . . . . . 22




Spectra/Por® 1-7 Regenerated Cellulose Membranes

## Introduction

Spectra/Por® Standard Grade Regenerated Cellulose (RC) membrane is a versatile membrane available for laboratory dialysis. It carries no fixed charge and does not adsorb most solutes.

Unlike native cellulose, which is highly crystalline and rigid, regenerated cellulose is largely amorphous and swollen by water. However, it still contains small regions of crystallinity that lock (cross-link) the structural chains in place to maintain membrane integrity. Depending on the manufacturing conditions, these locking regions may be numerous. The areas between cross-links, swollen with water, act as pores permitting sufficiently small solute molecules to pass through the membrane.

Due to the amorphous, gel-like nature of regenerated cellulose, mechanical strain will also alter the porosity of the membrane.

## Membrane Composition and Specifications

Spectra/Por 1, 2, 3, 4, 5, 6 and 7 dialysis membranes are manufactured from natural cellulose reconstituted from cotton linters. These RC membranes carry no fixed charge and do not adsorb most solutes. Standard RC dialysis membranes are used for general laboratory dialysis functions, such as desalting, buffer exchange, or molecular separation.

These flexible, transparent membranes feature good chemi-

cal and pH resistance and high temperature tolerance.

Spectra/Por 1 through 6 contain trace levels of heavy metals and sulfides. Spectra/Por 7 membranes have been chemically treated to minimize the heavy metal and sulfur content, eliminating the need for special cleaning treatments.

During the manufacturing process, Spectra/Por 5 membrane is reinforced with a layer of porous paper to increase its wet strength for use in high shear or torque environments, resulting in a lower permeation rate compared to the other membranes.

## Membrane Specifications

**Standard Regenerated Cellulose (RC) Membrane**

| | |
|---|---|
| **Membrane Type:** | Symmetric Regenerated Cellulose Tubing |
| **Physical Properties:** | Transparent, flexible (Spectra/Por® 5 reinforced with porous paper layer) |
| **PH limits:** | 2-12 |
| **Suggested temperature:** | 60° C |
| **Organic Solvent Tolerance:** | Good |



Spectra/Por® 1-7 Regenerated Cellulose Membranes

## Comparison of Spectra/Por Standard RC Membranes

| Spectra/Por® 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 6 - 8 kD | 12 - 14 kD | 3.5 kD | 12 - 14 kD | 12 - 14 kD | 1, 2, 3.5, 8, 10, 15, 25 & 50 kD | 1, 2, 3.5, 8, 10, 15, 25 & 50 kD |
| Standard Permeability | Higher Permeability or large FW | Standard Permeability | Standard Permeability | Re-inforced for weight | Pre-wetted for convenience | Pre-treated for heavy metals & sulfides |
| Tubing, Trial Kits, Discs & Sheets | Tubing, Trial Kits, Discs & Sheets | Tubing, Trial Kits, Discs & Sheets | Tubing, Trial Kits, Discs & Sheets | Tubing & Trial Kits | Tubing & Trial Kits | Tubing & Trial Kits |
| Dry with glycerin | Dry with glycerin | Dry with or without glycerin | Dry with glycerin | Dry without glycerin | Wet in 0.05% sodium azide | Wet in 0.05% sodium azide |

## Metal Content in Spectra/Por 1-6 Dialysis Membranes

The following are approximate concentration of heavy metal and sulfur found in the Spectra/Por 1 through 6 membranes.

| Element | Concentration | Mg | 50-100 ppm |
|---|---|---|---|
| Cd | <1 ppm | | |
| Cr | <1 ppm | Ni | 1-2 ppm |
| Cu | <1 ppm | Pb | 2-6 ppm |
| Fe | 20-60 ppm | Zn | 5-10 ppm |

## Membrane Selection

### Membrane Permeability Characterization

Dialysis membranes are universally characterized by the molecular weight cut off (MWCO). Spectrum determines the MWCO of a membrane by conducting a comprehensive dialysis test with a set of solutes of known molecular weight. The MWCO of the membrane is determined as the molecular weight of the smallest solute which is at least 90% retained during this test (the smallest solute for which the permeation is 10% or less).

Dialysis membrane may also be characterized by the rate at which a permeable species passes through the membrane. A rate test may be carried out by placing a solution of a permeable species on one side of a membrane and pure solvent on the other. If both the solution and the solvent are well stirred and the pure solvent is constantly changed (so that it never contains an appreciable concentration of solute), a first-order rate will be observed.

A very important variable in the rate of dialysis is the molecular weight of the solute. As the molecular weight of a permeable solute increases, the rate of dialysis decreases. At molecular weights far from the MWCO, the rate decrease is caused by the decrease of the diffusion rate with the increasing molecular weight. As the solute's molecular weight nears the MWCO, the rate will slow dramatically with further increases in molecular weight until the molecules become too large to pass through the membrane.



Spectra/Por® 1-7 Regenerated Cellulose Membranes

### MWCO Selection

The effective size of many solute molecules will be affected by the pH and ionic strength of the solution in which they are dissolved.

Therefore, the listed MWCO values should be used merely as typical and not absolute values. To establish the optimal MWCO for any application, it may be necessary to test several membranes. To maximize the rate of dialysis, the membrane with the largest MWCO which will not cause excess loss of the desired species should be used.

The selecting of MWCO is based on the molecular weight of the macro molecules that are going to be retained inside the membrane and the molecular weight of the micromolecule contaminants to be removed. For reasonably efficient separation by means of dialysis with Spectra/Por membranes, the ratio of the molecular weights of the two compounds to be separated should be at least 25. A rule of thumb is to choose a MWCO by selecting an MWCO value about half of the molecular weight of the macromolecules to be retained in order to achieve a minimum 90% retention.

### Chemical Compatibility

Spectra/Por® RC membranes have good chemical resistance. Variables in temperature, concentrations, durations of exposure and other factors may affect the use of the membrane. It is always advisable to test the membrane under your application conditions. These membranes are resistant to the following groups: halogenated hydrocar-

bons, alcohols, ketones, esters, oxides and solvents containing nitrogen. They are not recommended for use with >25% hydrochloric, nitric and perchloric acids; 96% sulfuric acid; 1N potassium hydroxide and 10% phenol. Refer to Spectrum's chemical compatibility table on our website for more information.

### Membrane Tubing "Flat Width" Selection

The selection of the tubing flat width depends on the size of the sample volume and the dialysis reservoir. The smaller tubing (which has a higher surface area to volume ratio) will dialyze more quickly, and larger tubing will dialyze more slowly due to the longer diffusion distances involved. For easy handling of the membrane tubing, the suggested total length including closures and head space should be approximately 10 to 15 cm. The "Volume/Length" ratio (ml/cm) is provided on our website.

## Closure Selection

It is recommended to select a closure width of 4 to 10 mm longer than the flat width of the membrane tubing. This will allow the closure to seal the tubing securely when the sample solution is being filled inside.

Closures are available in two types of material: polypropylene (Spectra/Por) or nylon (Universal).

### Spectra/Por® Closures (polypropylene)

The following Spectra/Por Closures are only for use with RC membranes.



Spectra/Por® 1-7 Regenerated Cellulose Membranes

- **Standard Closure:** Aids in sample buoyancy when applied to the top of the membrane tubing.
- **Weighted Closure:** Contains an embedded stainless steel weight to keep membrane in vertical floating position when applied to bottom of membrane tubing.
- **Magnetic Weighted Closure**: Contains an embedded magnetic stir bar, eliminating the need for a magnetic stir bar when the magnetic weighted closure is applied at the bottom of the membrane tubing.

### Universal Closures (nylon)

*Nylon closures may be used for all types of membrane tubing.* These Universal closures sink on their own and allow the membrane tubing to float vertically with a head space. Universal Closures are not autoclavable.

## Membrane Preparation

### Spectra/Por 1-6

For most applications, the membrane can be soaked in distilled water at room temperature for 30 minutes to remove the preservative (glycerine or sodium azide). Then, rinse the membrane thoroughly in distilled water.

If the presence of heavy metals is anticipated to cause interferences, the membranes can be treated with Spectrum Heavy Metals Cleaning Solution. This cleaning process takes less than 10 minutes to complete. The Heavy Metals Cleaning solution is a chelating rinse which strips the heavy metals from the membrane.

Spectra/Por 7

Spectra/Por 7 membrane has been chemically treated to minimize the content of heavy metals and sulfide contaminants; therefore, it is only necessary to soak the membrane in a large volume of deionized or distilled water for 30 minutes to remove the sodium azide preservant agent. Then, rinse thoroughly with running deionized or distilled water.

## Membrane Handling and Use

The following is a general protocol for typical dialysis. There are many variables that should be considered before starting dialysis; including solute concentrations, sample and dialysate volumes, solvents, chemical compatibility, temperature, etc. Therefore, some application-specific changes to the following dialysis procedure may be necessary.

1. Fill a Spectra/Por Dialysis Reservoir with a large volume of appropriate dialysate (buffer). The dialysate volume should be ≥ 100X the sample volume. (Example: dialyze 10 ml sample in 1 L dialysate.)
2. Cut dialysis tubing into an appropriate length. Allow 10-20% extra tubing length for air head space to insure sample buoyancy above rotating stir bar. Prepare the tubing according to the directions for use (see page 7-8).
3. Open the first Closure and clamp onto the dialysis tubing 3-5 cm from the bottom.
4. Load the sample through the open end of the dialysis tubing. Clamp the second Closure at least 5 cm from the top end of the dialysis tubing while allowing enough head space for buoyancy.
5. Place the dialysis sample in appropriate dialysis buffer.
6. Drop an appropriate-sized magnetic stir-bar into the dialysis reservoir. Place the dialysis reservoir on a stir-plate and adjust the stir speed to rotate the sample without pulling it down into the vortex.
7. Typically, dialysis is allowed to continue overnight. The dialysate (buffer) may be changed several times during dialysis, making sure to allow 2-4 hours of dialysis after the last dialysate change.

   **Note:** Samples with higher contaminant concentrations, may need to dialyze for a longer duration with more frequent changes of dialysate solution.

## Sample Recovery

Hold the portion of the tubing that extends above the top closure, open the top closure and then pipette or pour out the sample into a container.



Spectra/Por® 1-7 Regenerated Cellulose Membranes

## Membrane Storage and Shelf Life

Since the useful life of dialysis membranes can be affected by storage conditions, it is important to store under optimal conditions.

Dry membrane (Spectra/Por 1-5) should be stored in original packaging at ambient conditions protected from moisture and extreme temperatures or in a polyethylene bag at 4-8 °C. Properly stored dry membrane has a shelf life of 5 years.

Wet membrane (Spectra/Por 6 and 7) and dry membrane (Spectra/Por 1-5) that has been wetted for storage should be stored at 4-8 °C in a solution of 0.05% sodium azide, 1% sodium benzoate or 1% formaldehyde. This preservative solution should be changed at least every 6 months. Properly stored wet membrane has a shelf life of 3 years.

## Membrane Sterilization

The common method of membrane sterilization is exposure to ethylene oxide (EtO) gas. Alternative sterilization methods are either irradiation or steam autoclaving. However, Spectrum does not recommend boiling or steam autoclaving Regenerated Cellulose membranes, since temperatures greater than 60° C will change the structure of membrane by decreasing the permeability after sterilization. Membranes may be autoclaved at 121° C for no more than 15 minutes (cycle should be kept as short as possible) immersed in distilled water. However, it is essential that



Spectra/Por® 1-7 Regenerated Cellulose Membranes

steam autoclaved RC membranes should be recharacterized to compensate for any change in permeation characteristics or MWCO.

### Spectra/Por 1 - 5 Standard RC Dry Dialysis Tubing

Product Specifications:

| Membrane Type | Purpose | MWCO | 14 Flat Widths (mm) |
|---|---|---|---|
| Spectra/Por 1 | Basic dialysis | 6-8 kD | 10, 23, 32, 40, 50, 100, 120 |
| Spectra/Por 2 | Higher permeability | 12-14 kD | 10, 25, 45, 105, 120 |
| Spectra/Por 3 | Basic dialysis | 3.5 kD | 18, 45, 54 |
| Spectra/Por 4 | Basic dialysis | 12-14 kD | 10, 25, 32, 45, 75 |
| Spectra/Por 5 | Reinforced for weight | 12-14 kD | 75, 140 |

| | |
|---|---|
| Properties: | Hydrophilic, symmetric porosity |
| Quantity: | 15 or 30 m roll (depending on Type and Flat Width) |
| Packaging: | Dry with Glycerin (soak in water) |
| | or |
| | Dry without Glycerin (no soaking required) |
| Shelf Life: | 5 years from date manufactured |

**Ordering Information:** Spectra/Por 1 - 5 Standard RC Dry Dialysis Tubing

| | MWCO | Glycerin (yes/no) | Flat Width (mm) | Dia (mm) | Volume/ Length (ml/cm) | Length (m) | Part No. |
|---|---|---|---|---|---|---|---|
| Spectra/Por 1 | 6-8 kD | yes | 10 | 6.4 | 0.32 | 15 | 132645 |
| | | yes | 23 | 14.6 | 1.7 | 30 | 132650 |
| | | yes | 32 | 20.4 | 3.3 | 30 | 132655 |
| | | yes | 40 | 25.5 | 5.1 | 30 | 132660 |
| | | yes | 50 | 32 | 7.9 | 30 | 132665 |
| | | yes | 100 | 64 | 32 | 15 | 132670 |
| | | yes | 120 | 76 | 46 | 15 | 132675 |
| Spectra/Por 2 | 12-14 kD | yes | 10 | 6.4 | 0.32 | 15 | 132676 |
| | | yes | 25 | 16 | 2 | 15 | 132678 |
| | | yes | 45 | 29 | 6.4 | 15 | 132680 |
| | | yes | 105 | 67 | 34 | 15 | 132682 |
| | | yes | 120 | 76 | 46 | 15 | 132684 |
| Spectra/Por 3 | 3.5 kD | yes | 18 | 11.5 | 1.1 | 15 | 132720 |
| | | no | 45 | 29 | 6.4 | 15 | 132724 |
| | | no | 54 | 34 | 9.3 | 15 | 132725 |
| Spectra/Por 4 | 12-14 kD | yes | 10 | 6.4 | 0.32 | 30 | 132697 |
| | | yes | 25 | 16 | 2 | 30 | 132700 |
| | | yes | 32 | 20.4 | 3.3 | 30 | 132703 |
| | | yes | 45 | 29 | 6.4 | 30 | 132706 |
| | | yes | 75 | 48 | 18 | 15 | 132709 |
| Spectra/Por 5 | 12-14 kD | no | 75 | 48 | 18 | 15 | 132754 |
| | | no | 140 | 89 | 62 | 15 | 132757 |



Spectra/Por® 1-7 Regenerated Cellulose Membranes

## Spectra/Por 1 - 5 Standard RC Dry Dialysis Trial Kits

Product Specifications:

| Membrane Type | Purpose | MWCO | 14 Flat Widths (mm) |
|---|---|---|---|
| Spectra/Por 1 | Basic dialysis | 6-8 kD | 10, 23, 32, 40, 50, 100, 120 |
| Spectra/Por 2 | Higher permeability | 12-14 kD | 10, 25, 45, 105, 120 |
| Spectra/Por 3 | Basic dialysis | 3.5 kD | 18, 45, 54 |
| Spectra/Por 4 | Basic dialysis | 12-14 kD | 32, 45, 75 |
| Spectra/Por 5 | Reinforced for weight | 12-14 kD | 75, 140 |

Properties: Hydrophilic, symmetric porosity

Quantity: 1 m/kit or 5 m/kit

Packaging: Dry with Glycerin (soak in water)
or
Dry without Glycerin (no soaking required)

Shelf Life: 5 years from date manufactured

Kit Includes: 1m or 5m of Spectra/Por 1, 2, 3, 4 or 5 dialysis tubing
1 Standard Spectra/Por Closure (for buoyance)
1 weighted Spectra/Por Closure (for orientation)

**Ordering Information:** Spectra/Por 1 - 5 Standard RC Dry Dialysis Trial Kits

| | MWCO | Glycerin (yes/no) | Flat Width (mm) | Dia (mm) | Volume/ Length (ml/cm) | Trial Kit 1 meter length | Trial Kit 5 meter length |
|---|---|---|---|---|---|---|---|
| Spectra/Por 1 | 6-8 kD | yes | 10 | 6.4 | 0.32 | 132645T1 | 132645T |
| | | yes | 23 | 14.6 | 1.7 | 132650T1 | 132650T |
| | | yes | 32 | 20.4 | 3.3 | 132655T1 | 132655T |
| | | yes | 40 | 25.5 | 5.1 | 132660T1 | 132660T |
| | | yes | 50 | 32 | 7.9 | 132665T1 | 132665T |
| | | yes | 100 | 64 | 32 | 132670T1 | 132670T |
| | | yes | 120 | 76 | 46 | 132675T1 | 132675T |
| Spectra/Por 2 | 12-14 kD | yes | 10 | 6.4 | 0.32 | 132676T1 | 132676T |
| | | yes | 25 | 16 | 2 | 132678T1 | 132678T |
| | | yes | 45 | 29 | 6.4 | 132680T1 | 132680T |
| | | yes | 105 | 67 | 34 | 132682T1 | 132682T |
| | | yes | 120 | 76 | 46 | 132684T1 | 132684T |
| Spectra/Por 3 | 3.5 kD | yes | 18 | 11.5 | 1.1 | 132720T1 | 132720T |
| | | no | 45 | 29 | 6.4 | 132724T1 | 132724T |
| | | no | 54 | 34 | 9.3 | 132725T1 | 132725T |
| Spectra/Por 4 | 12-14 kD | yes | 32 | 20.4 | 3.3 | 132703T1 | 132703T |
| | | yes | 75 | 48 | 18 | 132709T1 | 132709T |
| Spectra/Por 5 | 12-14 kD | no | 75 | 48 | 18 | 132754T1 | 132754T |
| | | no | 140 | 89 | 62 | 132757T1 | 132757T |



Spectra/Por® 1-7 Regenerated Cellulose Membranes

## Spectra/Por 6 Standard RC Pre-wetted Dialysis Tubing & Trial Kits

### Product Specifications:

| | |
|---|---|
| 8 MWCO's: | 1 kD, 2 kD, 3.5 kD, 8 kD, 10 kD, 15 kD, 25 kD & 50 kD |
| 12 Flat Widths: | 8 mm, 12 mm, 18 mm, 24 mm, 28 mm, 32 mm, 34 mm, 40 mm, 45 mm, 50 mm & 54 mm |
| Properties: | Hydrophilic, symmetric porosity |
| Quantity: | Tubing - 10 meters/roll |
| | Trial Kits - 1 meter/roll |
| Packaging: | Wet in 0.05% sodium azide |
| Kit Includes: | 1 meter of Spectra/Por 6 Dialysis Tubing |
| | 1 Standard Spectra/Por Closure (for buoyancy) |
| | 1 Weighted Spectra/Por Closure (for orientation) |
| | 5 Tubing Opening Picks |
| Shelf Life: | 3 years from date manufactured |

**Ordering Information:**

Spectra/Por 6 Standard RC Pre-wetted Dialysis Tubing & Trial Kits

| MWCO | Flat Width (mm) | Diameter (mm) | Volume/ Length (ml/cm) | Tubing 10 m/length | Trial Kit 1 m/length |
|---|---|---|---|---|---|
| 1 kD | 18 | 11.5 | 1.1 | 132636 | 132636T |
| | 38 | 24 | 4.6 | 132638 | 132638T |
| | 45 | 29 | 6.4 | 132640 | 132640T |
| 2 kD | 18 | 11.5 | 1.1 | 132620 | 132620T |
| | 38 | 24 | 4.6 | 132625 | 132625T |
| | 45 | 29 | 6.4 | 132633 | 132633T |
| 3.5 kD | | 11.5 | 1.1 | 132590 | 132590T |
| | 45 | 29 | 6.4 | 132592 | 132592T |
| | 54 | 34 | 9.3 | 132594 | 132594T |
| 8 kD | 8 | 5.1 | 0.2 | 128056 | - |
| | 12 | 7.5 | 0.45 | 132579 | 132579T |
| | 18 | 11.5 | 1.1 | 128058 | - |
| | 24 | 15 | 1.8 | 132580 | 132580T |
| | 32 | 20.4 | 3.3 | 132582 | 132582T |
| | 40 | 25.5 | 5.1 | 132584 | 132584T |
| | 50 | 32 | 7.9 | 132586 | 132586T |
| 10 kD | 8 | 5.1 | 0.2 | 128106 | - |
| | 12 | 7.5 | 0.45 | 132570 | 132570T |



Spectra/Por® 1-7 Regenerated Cellulose Membranes

**Ordering Information:**

Spectra/Por 6 Standard RC Pre-wetted Dialysis Tubing & Trial Kits

| MWCO | Flat Width (mm) | Diameter (mm) | Volume/ Length (ml/cm) | Tubing 10 m/length | Trial Kit 1 m/length |
|---|---|---|---|---|---|
| 10 kD | 18 | 11.5 | 1.1 | 128118 | - |
| | 24 | 15 | 1.8 | 132572 | 132572T |
| | 32 | 20.4 | 3.3 | 132574 | 132574T |
| | 45 | 29 | 6.4 | 132576 | 132576T |
| 15 kD | 8 | 5.1 | 0.2 | 128156 | - |
| | 12 | 7.5 | 0.45 | 132560 | 132560T |
| | 18 | 11.5 | 1.1 | 128158 | - |
| | 24 | 15 | 1.8 | 132562 | 132562T |
| | 32 | 20.4 | 3.3 | 132564 | 132564T |
| | 45 | 29 | 6.4 | 132566 | 132566T |
| 25 kD | 8 | 5.1 | 0.2 | 128206 | - |
| | 12 | 7.5 | 0.45 | 132550 | 132550T |
| | 18 | 11.5 | 1.1 | 128218 | - |
| | 24 | 15 | 1.8 | 128224 | - |
| | 28 | 18 | 2.5 | 132552 | 132552T |
| | 34 | 22 | 3.7 | 132554 | 132554T |
| 50 kD | 10 | 6.4 | 0.32 | 132539 | 132539T |
| | 12 | 7.5 | 0.45 | 132540 | 132540T |
| | 28 | 18 | 2.5 | 132542 | 132542T |
| | 34 | 22 | 3.7 | 132544 | 132544T |

## Spectra/Por 7 Standard RC
## Pre-treated Dialysis Tubing & Trial Kits

### Product Specifications:

| | |
|---|---|
| 8 MWCO's: | 1 kD, 2 kD, 3.5 kD, 8 kD, 10 kD, 15 kD, 25 kD & 50 kD |
| 12 Flat Widths: | 8 mm, 12 mm, 18 mm, 24 mm, 32 mm, |
| | 34 mm, 40 mm, 45 mm, 50 mm & 54 mm |
| Properties: | Hydrophilic, symmetric porosity |
| Quantity: | Tubing - 5 meters/roll |
| | Trial Kits - 1 meter/roll |
| Packaging: | Wet in 0.05% sodium azide |
| Kit Includes: | 1 meter of Spectra/Por 7 Dialysis Tubing |
| | 1 Standard Spectra/Por Closure (for buoyancy) |
| | 1 Weighted Spectra/Por Closure (for orientation) |
| | 5 Tubing Opening Picks |
| Shelf Life: | 3 years from date manufactured |



Spectra/Por® 1-7 Regenerated Cellulose Membranes

**Ordering Information:**

Spectra/Por 7 Standard RC Pre-treated Dialysis Tubing & Trial Kits

| MWCO | Flat Width (mm) | Diameter (mm) | Volume/ Length (ml/cm) | Tubing 5 m/length | Trial Kit 1 m/length |
|---|---|---|---|---|---|
| 1 kD | 18 | 11.5 | 1.1 | 132103 | 132103T |
| | 38 | 24 | 4.6 | 132104 | 132104T |
| | 45 | 29 | 6.4 | 132105 | 132105T |
| 2 kD | 18 | 11.5 | 1.1 | 132107 | 132107T |
| | 38 | 24 | 4.6 | 132108 | 132108T |
| | 45 | 29 | 6.4 | 132109 | 132109T |
| 3.5 kD | 18 | 11.5 | 1.1 | 132110 | 132110T |
| | 45 | 29 | 6.4 | 132111 | 132111T |
| | 54 | 34 | 9.3 | 132112 | 132112T |
| 8 kD | 8 | 5.1 | 0.2 | 128356 | - |
| | 12 | 7.5 | 0.45 | 132113 | 132113T |
| | 18 | 11.5 | 1.1 | 128358 | - |
| | 24 | 15 | 1.8 | 132114 | 132114T |
| | 32 | 20.4 | 3.3 | 132115 | 132115T |
| | 40 | 25.5 | 5.1 | 132116 | 132116T |
| | 50 | 32 | 7.9 | 132131 | 132131T |
| 10 kD | 8 | 5.1 | 0.2 | 128406 | - |
| | 12 | 7.5 | 0.45 | 132117 | 132117T |

**Ordering Information:**

Spectra/Por 7 Standard RC Pre-treated Dialysis Tubing & Trial Kits (cont.)

| MWCO | Flat Width (mm) | Diameter (mm) | Volume/ Length (ml/cm) | Tubing 5 m/length | Trial Kit 1 m/length |
|---|---|---|---|---|---|
| 10 kD | 18 | 11.5 | 1.1 | 128418 | - |
| | 24 | 15 | 1.8 | 132118 | 132118T |
| | 32 | 20.4 | 3.3 | 132119 | 132119T |
| | 45 | 29 | 6.4 | 132120 | 132120T |
| 15 kD | 8 | 5.1 | 0.2 | 128456 | - |
| | 12 | 7.5 | 0.45 | 132121 | 132121T |
| | 18 | 11.5 | 1.1 | 128458 | - |
| | 24 | 15 | 1.8 | 132122 | 132122T |
| | 32 | 20.4 | 3.3 | 132123 | 132123T |
| | 45 | 29 | 6.4 | 132124 | 132124T |
| 25 kD | 8 | 5.1 | 0.2 | 128506 | - |
| | 12 | 7.5 | 0.45 | 132125 | 132125T |
| | 18 | 11.5 | 1.1 | 128518 | - |
| | 24 | 15 | 1.8 | 128524 | - |
| | 28 | 18 | 2.5 | 132126 | 132126T |
| | 34 | 22 | 3.7 | 132127 | 132127T |
| 50 kD | 12 | 7.5 | 0.45 | 132128 | 132128T |
| | 28 | 18 | 2.5 | 132129 | 132129T |
| | 34 | 22 | 3.7 | 132130 | 132130T |



Spectra/Por® 1-7 Regenerated Cellulose Membranes

## Spectra/Por RC Dialysis Membrane Discs and Flat Sheets

- Precut membrane discs are packaged 50 per pack
- Flat sheet membranes are packaged 25 per pack
- Membrane supplied dry with glycerol as a humectant

**Ordering Information:**

Spectra/Por 1 - 4 Standard RC Dialysis Membrane Discs

| | MWCO | Disc Diameter 33 mm | 47 mm | 100 mm | Qty |
|---|---|---|---|---|---|
| Spectra/Por 1 | 6-8 kD | 132478 | 132476 | 132474 | 50 discs |
| Spectra/Por 2 | 12-14 kD | 132482 | 132480 | 132477 | |
| Spectra/Por 3 | 3.5 kD | 132488 | 132486 | 132484 | |
| Spectra/Por 4 | 12-14 kD | 132498 | 132496 | 132494 | |

**Ordering Information:**

Spectra/Por 1 - 4 Standard RC Dialysis Membrane Flat Sheets

| | MWCO | Size (mm) | Qty | Part No. |
|---|---|---|---|---|
| Spectra/Por 1 | 6-8 kD | 240 x 240 | 25 sheets | 132677 |
| Spectra/Por 2 | 12-14 kD | 200 x 200 | | 132686 |
| Spectra/Por 3 | 3.5 kD | 108 x 108 | | 132723 |
| Spectra/Por 4 | 12-14 kD | 150 x 150 | | 132712 |

## Spectra/Por Ready-to-Use Dialysis Sacks

Spectra/Por Ready-to-Use Dialysis Sacks feature regenerated cellulose tubing sealed at one end with a closure and open at the other. These sacks have a funnel attached to the top for easy sample filling. Supplied in a 0.05% sodium azide preservant, sacks should be rinsed prior to use. Each Dialysis Sack is 60 cm in length for volumes of 50 to 400 ml. Supplied 10/package in three MWCO choices

**Ordering Information:**

Spectra/Por 1 - 4 Standard RC Ready-to-Use Dialysis Sacks

| | MWCO | Flat Width (mm) | Dia (mm) | Volume/ Length (ml/cm) | Volume (ml) | Qty | Part No. |
|---|---|---|---|---|---|---|---|
| Spectra/Por 1 | 6-8 kD | 50 | 32 | 7.9 | 80-400 | 10 sacks | 132666 |
| Spectra/Por 2 | 12-14 kD | 45 | 29 | 6.4 | 80-320 | | 132681 |
| Spectra/Por 3 | 3.5 kD | 54 | 34 | 9.3 | 90-450 | | 132726 |
| Spectra/Por 4 | 12-14 kD | 45 | 29 | 6.4 | 80-320 | | 132707 |

## Heavy Metals Cleaning Solution

Spectra/Por 1, 2, 3, 4, 5, and 6 membranes contain traces of heavy metals. For ultracritical work, chelate wash the membranes with Heavy Metals Cleaning solution before use.

| Product No. | Description |
|---|---|
| 132908 | Heavy Metals Cleaning Kit, 8 oz. |



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