INSTRUCTIONS

Slide-A-Lyzer™ G2 Dialysis Cassette

Thermo Scientific™ Slide-A-Lyzer™ G2 Dialysis Cassette Product Numbers and Descriptions

	Membrane Molecular-Weight Cutoff (MWCO)					
Cassette Size	**2K**	**3.5K**	**7K**	**10K**	**10K***	**20K**
0.5mL (0.25-0.75mL), 10-pk	87717	87722	87727	87729	88250	87734
3mL (1-3mL), 10-pk	87718	87723	87728	87730	88251	87735
15mL (5-15mL), 8-pk	87719	87724	NA	87731	88252	87736
30mL (10-30mL), 6-pk	87720	87725	NA	87732	88253	87737
70mL (25-70mL), 6-pk	87721	87726	NA	87733	88254	87738

*Gamma-irradiated cassettes.

Introduction

The Thermo Scientific Slide-A-Lyzer G2 Dialysis Cassette is a convenient means to process samples for low molecular weight contaminant removal, buffer exchange, desalting and concentration. Sample loading and removal are easily accomplished by using a serological pipette or hypodermic needle (optional) attached to a syringe. The built-in air chamber at the top of the unit provides sample buoyancy and vertical orientation of the cassette during dialysis. The cassette membrane is composed of low-binding regenerated cellulose for maximum sample recovery while maintaining maximum sample purity. Cassettes are manufactured using clean-room conditions to ensure units are contaminant-free.

Important Product Information

- For loading and retrieving the sample from the dialysis cassette, use the device listed in the table below or a syringe with an attached needle.

Cassette Size	Loading/Removal Device	Source
0.5mL	200µL gel-loading tip	Fisher Brand # 02707139
3mL	1mL pipette	Fisher Brand # 13-676-10B
15, 30 and 70mL	10mL pipette	Fisher Brand # 13-678-11E

- Over-filling the cassette will result in sample loss. Do not exceed the indicated volume for the cassette.
- Determine the appropriate sample volume. If the sample density is ≥ 1.150g/mL, such as protein in saturated 4.1M $(NH_4)_2SO_4$, 45% sucrose or 8M guanidine, use ≤ 50% of the maximum sample volume indicated for the specific cassette, which allows for the influx of water during dialysis and ensures the cassette does not overly swell. Performing serial dialysis using buffers with decreasing concentration of solutes (salt) will prevent the osmotic pressure from swelling the membrane (e.g., dialyze a 5M NaCl sample against a buffer with 0.5M NaCl). If the cassette swells, use a syringe to remove the sample and do not open the cap or some sample could be lost.

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Procedure for using a Pipette with the G2 Dialysis Cassette

A. Hydrate Membrane

1. Remove the cassette from its protective pouch. To prevent membrane contamination, handle the cassette by the plastic frame only. Do not touch the membrane with ungloved hands. The cassette may be placed upright on its bottom end on a flat surface.
2. Immerse the cassette in dialysis buffer for 2 minutes (Figure 1). It may be necessary to hold the cassette under the surface for the hydration step as the air inside the cassette may cause it to float sideways.

   Note: Hydration increases membrane flexibility and allows it to adjust more readily to the sample loading and removal of excess air.
3. Remove cassette from buffer. To remove excess buffer, gently tap the cassette on a paper towel. Turn the cassette upside down and tap again. Do not blot the membrane.

Figure 1. Hydrate the membrane.

B. Add Sample

Note: When removing excess air by hand, the minimum sample volume required for the 3, 15, 30 and 70mL cassette is approximately ½ of the cassette's maximum volume. For the 0.5mL cassette, the minimum sample volume is > 350µL.

1. Open the cassette by gently twisting the cap counter-clockwise until it stops (~45º angle) and then gently pulling out the cap (Figure 2).
2. Using appropriate device (refer to the Important Product Information Section) add the sample to the cassette, slowly withdrawing the pipette while dispensing. Do not overload the cassette (Figure 3).

   Note: To load the cassette, insert pipette fully into the device and slowly remove pipette while filling. Repeat as needed.
3. Remove the excess air in the cassette by simultaneously pressing the membrane gently on both sides using your gloved thumb and forefinger and inserting the cap (Figure 4).
4. Insert cap and lock by gently twisting it clockwise (Figure 5).

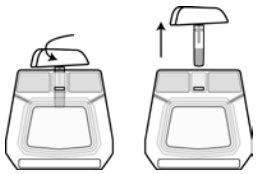

Figure 2. Open the cassette.

Figure 3. Add sample.

Figure 4. Remove most of the air.

C. Dialyze Sample

1. Float cassette vertically in the dialysis buffer and stir gently to avoid creating a vortex that might pull the cassette down in contact with the stir bar.
2. Dialyze for an amount of time sufficient to remove low molecular weight compounds for the specific downstream application. A typical dialysis procedure is as follows: dialyze for 2 hours at room temperature or 4ºC; change the dialysis buffer and dialyze for another 2 hours; change the dialysis buffer and dialyze overnight. Use the dialysis buffer at a total of at least 300 times the volume of the sample during the course of the dialysis procedure.

Figure 5. Lock the cap.

D. Remove Sample

Note: If the cassette is swollen recover the sample using a syringe and as described in the Procedure for using a Syringe with the G2 Dialysis Cassette, Section D. Opening a swollen cassette will cause the sample to rise into the loading port and a portion may be lost.

1. Remove cassette from buffer. To remove excess buffer, gently tap the cassette on a paper towel. Turn the cassette upside-down and tap again. Do not blot the membrane.
2. Open the cassette by gently turning the cap counter-clockwise until it stops (~45º angle) and then gently pulling out the cap (Figure 2).
3. Using an appropriate sized serological pipette, retrieve the sample by slowly aspirating while inserting pipette toward bottom of the cassette (Figure 6).

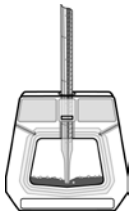

Figure 6. Remove the sample.

Procedure for using a Syringe with the G2 Dialysis Cassette

A. Hydrate Membrane

1. Remove the cassette from its protective pouch. To prevent membrane contamination, handle the cassette by the plastic frame only. Do not touch the membrane with ungloved hands. The cassette may be placed upright on the bottom end on a flat surface.
2. Immerse cassette in dialysis buffer for 2 minutes to hydrate membrane (Figure 1). It may be necessary to hold the cassette under the surface for the hydration step as the air inside the cassette may cause it to float sideways.

   Note: Hydration increases membrane flexibility and allows it to adjust more readily to the sample loading and removal of excess air.
3. Remove cassette from buffer. To remove excess buffer, gently tap the cassette on a paper towel. Turn the cassette upside down and tap again. Do not blot the membrane.

Figure 1. Hydrate the membrane.

Figure 2. Needle is positioned too far inside the cassette.

B. Add Sample

Note: The minimum sample volume for the 3, 15, 30 and 70mL cassette is approximately > ⅓ of the cassette's maximum volume or leakage can occur. For the 0.5mL cassette, the minimum sample volume is ≥ 250µL.

Caution: To avoid injury from the needle, do not remove the needle's plastic sheath until ready to use. The cassette is designed for 18 gauge, 1-inch beveled needles (21-gauge, 1-inch beveled needles also may be used).

1. Fill the syringe with the sample, leaving a small amount of air in the syringe.
2. Penetrate the gasket through a syringe port at the cassette's corner. Overextending the needle into the sample chamber may puncture the membrane (Figure 2). Slowly extend the needle minimally into the cavity so that the open end of the needle is barely visible (Figure 3).

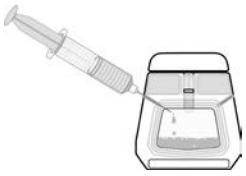

Figure 3. Add sample.

3. Inject approximately half of the sample. For samples with high protein concentrations (e.g., 10 mg/mL), avoid foaming by filling the cassette slowly.
4. Withdraw some air from the cassette by pulling back on the syringe piston and then inject remaining sample.
5. With the needle inserted into the cassette cavity, withdraw remaining air to compress the membrane windows so the sample contacts the greatest possible membrane surface area. Use caution to prevent the needle from contacting the membrane. A small amount of air left inside the cassette will not significantly affect dialysis efficiency.
6. Remove needle from the cassette while retaining air in the syringe. The gasket will reseal and the membrane cavity will contain minimal or no air. Place a mark on the cassette corner with a permanent marker to note which needle port was used.

C. Dialyze Sample

1. Float cassette vertically in the dialysis buffer and stir gently to avoid creating a vortex that might pull the cassette down in contact with the stir bar.
2. Dialyze for an amount of time sufficient to remove low molecular-weight compounds for the specific downstream application. A typical dialysis procedure is as follows: dialyze for 2 hours at room temperature or 4ºC; change the dialysis buffer and dialyze for another 2 hours; change the dialysis buffer and dialyze overnight. Use the dialysis buffer at a total of at least 300 times the sample volume throughout the course of the dialysis procedure.

Figure 4. Add air to the cassette.

D. Recover Sample

Note: Avoid penetrating guide ports more than once to prevent gasket coring and subsequent sample loss.

1. Penetrate gasket with the needle through an unused syringe guide port and slowly inject air into the sample chamber to maximum allowed sample volume to separate membranes, which prevents membrane needle puncture. (Figure 4).
2. With the needle in place, turn the unit so that needle is at the bottom. Allow sample to collect near the port and withdraw sample into the syringe (Figure 5).

Figure 5. Remove the sample.

Troubleshooting

Problem	Possible Cause	Solution
Difficulty removing air	Membrane not hydrated	Immerse cassette in dialysis solution for 2 minutes before adding sample
Sample leaked from the cassette	Hole in the membrane	Before adding sample, test the membrane for holes using purified water
	Needle inserted too deep and punctured the membrane during sample loading, air removal or sample removal	Insert only the bevel portion of the needle into the cassette
Filled cassette does not float in dialysis solution	Recommended cassette capacity was exceeded (see Important Product Information Section)	Reduce sample volume to < 60% of the cassette's total volume
		Allow filled cassette to remain in dialysis solution without stirring until sample partially equilibrates and cassette rises to the surface

Additional Information Available on Our Website

A. Slide-A-Lyzer Dialysis Membrane chemical compatibility and membrane specifications

B. Tech Tips

- Tech Tip #20: Dialysis: an overview
- Tech Tip #14: Perform labeling and other reactions in Slide-A-Lyzer Dialysis Cassettes
- Tech Tip #43: Protein stability and storage
- Tech Tip #19: Remove detergent from protein samples

Related Thermo Scientific Products

Many	**Slide-A-Lyzer Cassettes, Mini Devices and Flasks** *www.thermoscientific.com/DialysisProducts*
Many	**Zeba™ Desalting Spin Columns** *www.thermoscientific.com/DesaltingProducts*
Many	**Pierce™ Protein Concentrators** *www.thermoscientific.com/Concentrators*
Many	**Pierce Detergent Removal Spin Columns and Kits** *www.thermoscientific.com/DetergentRemoval*
Many	**Protease and Phosphatase Inhibitor Cocktails and Tablets** *www.thermoscientific.com/ProteaseandPhosphataseInhibitors*

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