

**Millipore®**

**User Guide**

# 1225 Sampling Manifold



**MERCK**

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## Introduction

The 1225 Sampling Manifold is a vacuum filtration device that allows rapid filtration of up to 12 samples simultaneously within a single unit. It is approximately 20.3 centimeters (cm) wide × 19.4 cm high [8 inches (in.) × 7 5/8 in.] excluding valves and connectors. It weighs approximately 2.9 kilograms (kg) [6.4 pounds (lb)].

This manual describes how to set up, use, maintain, and troubleshoot the 1225 Sampling Manifold.

It contains:

- Set up and operating instructions
- Maintenance and troubleshooting procedures
- Technical information

## Intended Audience

This manual is written for 1225 Sampling Manifold users who want to conduct rapid vacuum filtration on several samples simultaneously.

## Style Conventions

NOTE, **CAUTION**, and **WARNING** sections are used for the following reasons:

**NOTE:** Provides related, but incidental, information about the current subject.

**CAUTION:** Warns the user about possible harm to inanimate objects, such as the destruction of data or equipment.

**WARNING:** Warns the user about possible bodily harm.

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## Uses for the 1225 Sampling Manifold

The 1225 Sampling Manifold is an inexpensive and easy-to-use alternative to a cell harvester that can be used to develop and run cell- and particulate-based assays. It can filter a variety of precipitates, including trichloroacetic acid (TCA), and different filter types can be evaluated simultaneously in the same assay.

The 1225 Sampling Manifold can be set up to collect the material that the filter retains (retentate) or the material that goes through the filter (filtrate), depending on the assay, pore size of the filter, and the total particulate load.

If the filtrate is not required for the assay, it can be drained into a trap flask or into the manifold chamber, dispose of according to all applicable international, federal, state, and local regulations. (The manifold chamber can serve two functions: collection vessel and/or vacuum chamber.)

The manifold uses 24 millimeter (mm) or 25 mm filters. Extension barrels can be added to the manifold to filter up to 50 milliliters (mL) of solution. This maximizes the amount of material the filters can capture. See the "Loading the Filters onto the Screens" section of this document for instructions on installing the filters.

For information about how to operate the 1225 Sampling Manifold, see the *How to Use the Manifold* section of this document.

## Materials Required but Not Supplied

The components in the following sections are not included with the 1225 Sampling Manifold. The first section lists parts that can be ordered at [SigmaAldrich.com/products](https://www.sigmaaldrich.com/products). The second section lists parts that the user needs to supply. All of these parts may not be needed; it depends on the assay and laboratory requirements.

### Parts That Can Be Ordered

Product ordering information can be found starting on Page 11 of this document for the following items:

- 25 mm diameter filters
- Millex® FG<sub>50</sub> filter (use when draining filtrate into a trap flask)
- Sample cup extension barrels (for filtering up to 50 mL of solution)
- Hose connector (type depends on user configuration)
- Additional 1225 Sampling Manifolds (for filtering more than 12 samples)
- 1/2 in. (12.7 mm) wide Teflon® tape
- Filter forceps or soft-nosed tweezers (for handling filters and screens)
- Trap flask (for collecting waste filtrate)

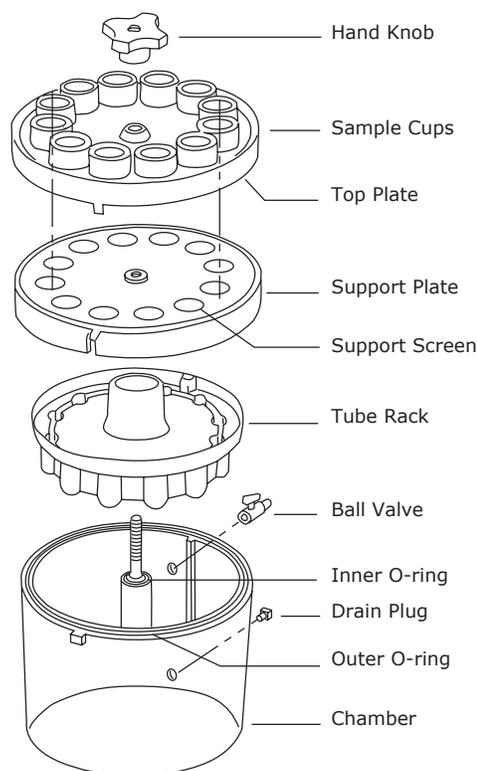
- Vacuum hoses (the number of hoses required depends on the number of manifolds being used simultaneously)
- Vacuum/pressure pump

### User-Supplied Parts:

- 15 to 16 mL test tubes, 125 mm × 15–16 mm diameter (each manifold can hold up to 12 test tubes)
- Biodegradable detergent
- 3/8-inch (10 mm) wrench

## Diagram of the 1225 Sampling Manifold

The following diagram is an exploded view of the manifold. It illustrates how the components fit together when the manifold is assembled:



## How to Set Up the Manifold

This section describes the steps for setting up the manifold to filter up to 12 samples:

1. Unpack and wash the manifold parts.
2. Attach the ball valve and drain plug to the chamber.
3. Load the test tube rack, if needed.
4. Load the support plate.
5. Load the filters.
6. Load the top plate and prepare it.
7. Determine the waste filtration method.

**CAUTION:** Follow the steps in the order shown to ensure proper filtration results.

## Unpacking and Washing the Manifold Parts

Follow these instructions to remove any material that may have settled on the manifold surface from packaging or shipping:

1. Remove the manifold and components from the package. (See the "Diagram of the 1225 Sampling Manifold" section to confirm receipt of all the parts.)

2. Use hot water and biodegradable detergent to thoroughly wash each part.

**CAUTION:** Do not use abrasive cleansers or steel wool, because they scratch the manifold surface.

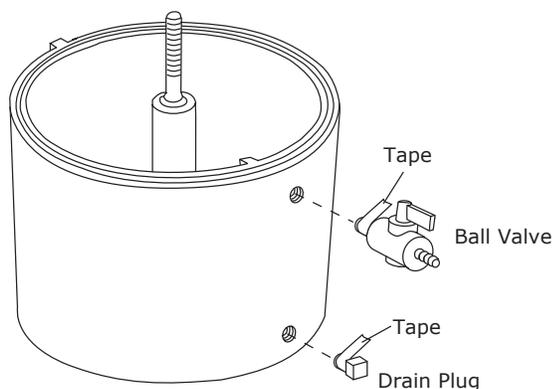
3. Rinse them with Milli-Q® grade water and allow them to air dry.

**CAUTION:** Do not wipe the parts dry, because fibers and cloth particles can contaminate the filtrate.

4. Continue to "Attaching the Ball Valve and Drain Plug to the Chamber."

## Attaching the Ball Valve and Drain Plug to the Chamber

1. Locate the ball valve, drain plug, and Teflon® tape. Wrap Teflon® tape a few times around the threads of the ball valve and drain plug to ensure a tight seal, as shown:
2. Screw the ball valve into the upper chamber hole by hand.



**CAUTION:** Do not overtighten the ball valve as it may damage the seal.

3. Screw the drain plug into the lower chamber hole with three full turns using a 3/8 inch (10 mm) wrench.
4. Continue to the next section, "Loading the Test Tube Rack."

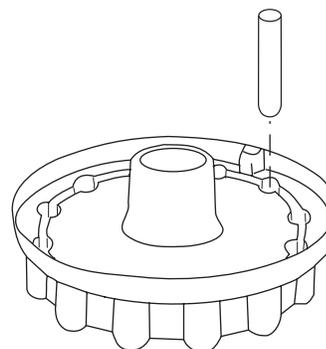
**NOTE:** The next sections describe how to set up the manifold. This only has to be done once unless assay or laboratory requirements change. See the "How to Use the Manifold" section of this document for operating instructions.

## Loading the Test Tube Rack

The tube rack holds up to 12 test tubes which be used to collect no more than 15 mL of the filtrate for further testing. Use 15 mL test tubes to keep the filtrate from overflowing into the chamber.

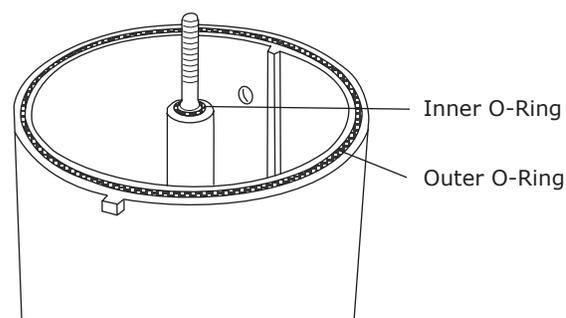
**NOTE:** If collecting waste of more than 15 mL (with or without extension barrel(s)), run in the "Draining the Waste Filtrate into the Chamber" mode and do not load the test tube rack. See "Preparing the Top Plate & Determining the Waste Filtrate Method."

1. Place up to 12 test tubes into the test tube rack starting at the **1** position, as shown:



**NOTE:** The test tube rack positions are numbered **1–12** for sample identification.

2. Hold the test tube rack containing the test tubes over the chamber. Align the slot on the rack with the slot on the inside wall of the chamber.
3. Lower the rack into the chamber until it rests on the bottom. Make sure that the chamber has an inner and outer O-ring, as shown:

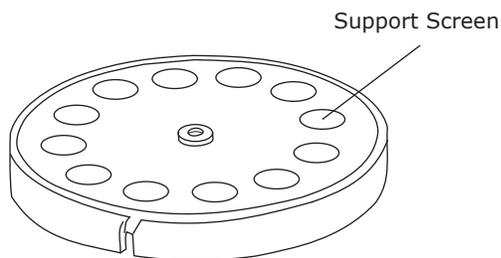


**NOTE:** The chamber comes installed with an inner and outer O-ring. If the O-rings are missing, visit the tech service page on our web site at [SigmaAldrich.com/techservice](http://SigmaAldrich.com/techservice).

4. Continue to the next section, "Loading the Support Plate onto the Chamber."

## Loading the Support Plate onto the Chamber

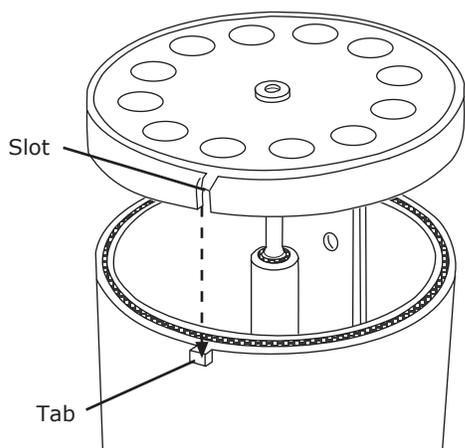
1. Verify that each position to be used on the support plate has a support screen in place.



**NOTE:** The support plate comes installed with the screens intact. If screens are missing, visit the tech service page on our web site at [SigmaAldrich.com/techservice](http://SigmaAldrich.com/techservice).

2. Hold the support plate over the chamber with the support screens facing up. Align the slot on the support plate with the tab on the outside wall of the chamber. Then lower the plate into the chamber until it rests on the chamber inner O-ring.
3. Continue to the next section, "Loading the Filters onto the Screens."

5.



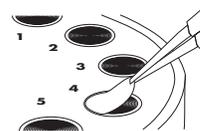
## Loading the Filters onto the Screens

The choice of filter depends on the assay and total particulate load. Based on the assay, select the appropriate filter. See the "Product Ordering" section of this document for a complete listing of filter types and catalogue numbers.

The filters, regardless of pore size, must be 24 mm or 25 mm in diameter. If a different diameter filter is used, the 1225 Sampling Manifold may leak and the system may not achieve a good vacuum.

**CAUTION:** Wear gloves when handling the filters; oils and proteins from skin can contaminate the filters. It is recommended to use filter forceps or soft-nosed tweezers to avoid all hand contact when picking up the filters. Do not use the colored filter protection disc as the filter.

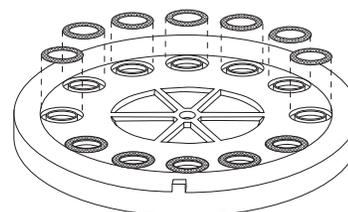
1. Remove a filter from its package using filter forceps or soft-nosed tweezers.
2. Place the filter in a container of deionized water to wet it completely.
3. Remove the filter from the water using the forceps or soft-nosed tweezers and center it on a support screen. Make sure that the filter completely covers the screen.
4. Repeat steps 1–3 for the number of samples to be filtered. (The screen numbers correspond to the test tube rack numbers.)
5. Continue to the next section, "Loading the Top Plate."



## Top Plate

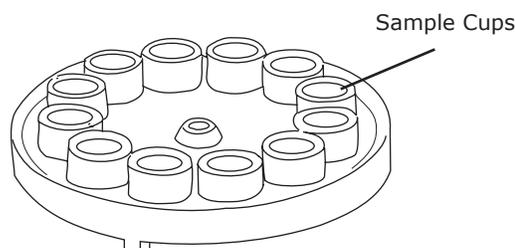
### Loading the Top Plate

1. Turn the top plate so that the sample cups are facing down. Verify that each of the 12 holes is encircled by an O-ring. If O-rings are missing, see "Maintaining the Manifold" section for instructions on how to replace them.

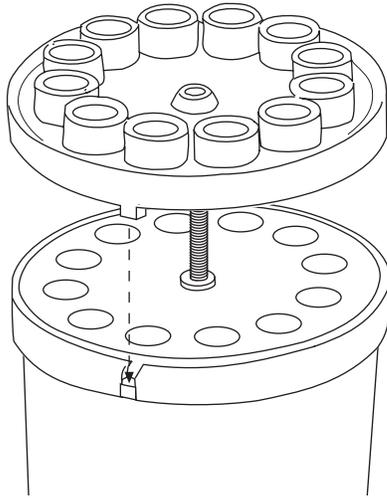


**CAUTION:** Do not operate the manifold without the O-rings in place because the manifold will leak and the system will not achieve a good vacuum.

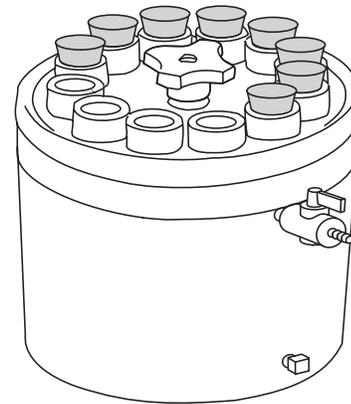
2. Turn the top plate so that the O-rings are on the bottom and the sample cups are facing up.



3. Hold the top plate over the chamber. Align the tab on the top plate with the slot on the side of the support plate. Slip the top plate over the threaded bolt in the middle of the manifold until it rests on the support plate.



2. Put stoppers in all the unused sample cups to ensure that the solution filters properly. For example, if test tubes are loaded in test tube rack numbers 1–4 and filters are placed on screen numbers 1–4, insert stoppers in sample cup numbers 5–12.

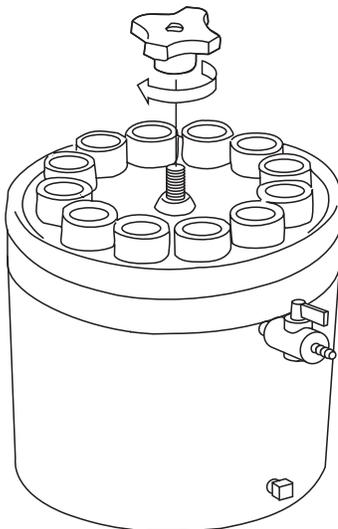


4. Continue to the next section, "Preparing the Top Plate."

#### Preparing the Top Plate

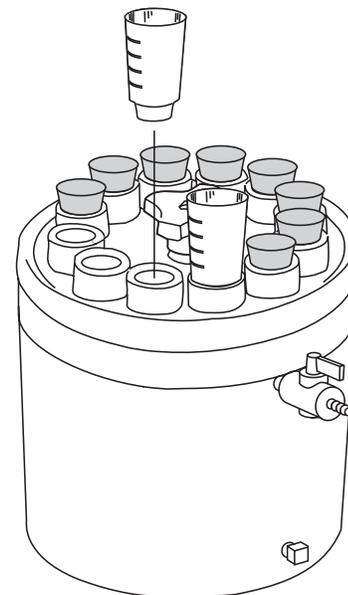
1. Slip the hand wheel nut onto the threaded bolt in the center of the top plate. Hand-tighten the nut clockwise. When it is tight, give it a 1/4 turn.

**CAUTION:** Over tightening may damage the O-rings.



**NOTE:** Make sure that the ball valve and drain plug have been installed on the manifold. If not, review the "Attaching the Ball Valve and Drain Plug to the Chamber" section before continuing.

3. Insert an extension barrel in each of the sample cups being used to filter more than 15 mL solutions. The extension barrel enables the filtration of up to 50 mL of solution. Continue to the next section, "Determining the Waste Filtrate Method."



## Waste Filtrate Methods

### Determine Waste Filtration Method

There are two ways to collect the waste filtrate. It can be drained into:

- Trap flask
- Manifold chamber

The most common method is using a trap flask. The following sections provide steps on both methods; choose the appropriate one.

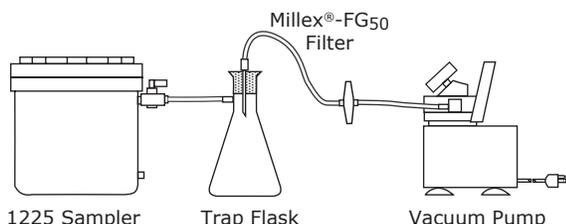
### Draining the Waste Filtrate into a Trap Flask

1. Connect one end of the hose that came with the manifold to the ball valve on the chamber. Connect the other end of the hose to the side-arm of the trap flask.
2. Insert a vented stopper into the opening of the trap flask and connect one end of a second hose to a stiff piece of tubing (not supplied), inserted through the hole of the stopper.
3. Attach a Millex®-FG<sub>50</sub> filter to the open end of the second hose.

**CAUTION:** To protect the vacuum source, use a Millex®-FG<sub>50</sub> filter every time the filtrate is drained into a trap flask. If the Millex®-FG<sub>50</sub> filter is not used and the trap flask overflows, liquid may get into the vacuum source and damage it.

If the filter is not contaminated, it can be reused several times before being replaced.

4. Attach another hose to the open end of the Millex®-FG<sub>50</sub> filter. Attach the open end of the hose to the vacuum/pressure pump. The assembly should look like this:



If the assembly does not look like the diagram, repeat steps 1–4 before continuing.

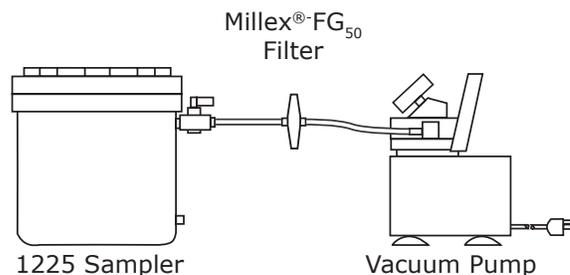
5. Turn to “How to Use the Manifold” for operating instructions to filter one through 12 samples.

### Draining the Waste Filtrate into the Manifold Chamber

1. Load the filters onto the screens as described in the “Loading the Filters onto the Screens” section of this document.

**CAUTION:** Do not load the test tube tray; the filtrate will collect in the chamber.

2. Attach one end of the hose to the ball valve on the chamber and the other end of the hose to the vacuum/pressure pump. Install a Millex®-FG<sub>50</sub> filter in-line between the manifold and pump. The assembly should look like this:

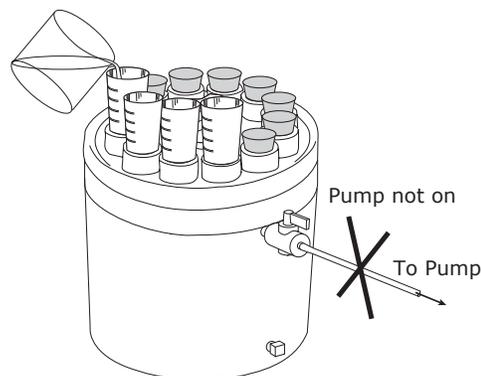


If the assembly does not look like the diagram, repeat steps 1 and 2 before continuing.

3. Turn to the “How to Use the Manifold” section for operating instructions to filter from one through 12 samples.

## How to Use the Manifold

Once the manifold is set up, follow these steps to filter the solution:



1. Pour the solution into the sample cups or extension barrels, as shown:

**CAUTION:** Do not turn on the vacuum pump yet. If collecting the sample filtrate, do not fill the solution to the rim of the cups since it may overflow the sample filtrate containers.
2. Check each cup or barrel to make sure the wells are not draining. If the O-rings are damaged, the wells will drain quickly. If this happens, loosen the hand wheel nut and remove the top plate. There will be fluid between the top plate and the support plate if the O-ring seals are not holding. See the “Troubleshooting the Manifold” section for possible solutions.
3. Make sure all stoppers are securely placed in unused sample cups. Close the ball valve. Then set the vacuum pump to 20 inches of mercury (inHg) [677 millibar (mbar)]. When the vacuum pump reaches 20 inHg (677 mbar), open the ball valve.

**CAUTION:** If the sample is not filtering properly, see the “Troubleshooting the Manifold” section for possible solutions.

4. After the samples have filtered, close the ball valve and shut off the vacuum.
5. Disconnect the hose. If using a trap flask, disconnecting the hose prevents the flask from being knocked over while the manifold is being disassembled.
6. Unscrew the hand wheel nut and remove the top plate. Remove the filters using forceps or soft-nosed tweezers and conduct the assay procedure, if appropriate. Otherwise discard the filters. Then remove the support plate.
7. Collect the sample filtrate and conduct the assay procedure, if appropriate. Otherwise, dispose of according to all applicable international, federal, state, and local regulations.
8. Turn to the next section for maintenance instructions.

## Maintaining the Manifold

This section contains maintenance instructions for the 1225 Sampling Manifold. It includes details on:

- Sanitizing the manifold
- Autoclaving the manifold
- Replacing the support screens
- Replacing the O-rings

## Parts Replaced After Autoclaving the Manifold

Cycle	Parts Replaced	Results
1	4 support screens 4 filter O-rings 0 chamber outer O-ring	Vacuum reestablished to 20 inHg (677 mbar) after parts replaced.
2	7 support screens 12 O-rings 0 chamber outer O-ring	Vacuum reestablished to 20 inHg (677 mbar) after parts replaced.
3	3 support screens 12 O-rings 1 chamber outer O-ring	Vacuum reestablished to 19 inHg (643 mbar) after parts replaced.
4	5 support screens 12 O-rings 0 chamber outer O-ring	Vacuum reestablished to 19 inHg (643 mbar) after parts replaced; chamber outer O-ring rotated and wells 1, 2, 11 and 12 lost vacuum and were stopped.
5	2 support screens 12 O-rings 1 chamber outer O-ring	Vacuum reestablished to 18 inHg (610 mbar) after parts replaced; wells 1, 2, 11 and 12 working again.
10	11 support screens 1 filter O-ring 0 chamber outer O-ring	Vacuum reestablished to 18 inHg (610 mbar) after parts replaced.
20	0 support screens 0 filter O-rings 0 chamber O-rings	No observable problems
25	1 support screen 0 filter O-ring 0 chamber O-ring	Vacuum reestablished to 20 inHg (677 mbar) after parts replaced. There was spray on the chamber wall around test tubes 7-10 and volume in those test tubes was less than normal.

**NOTE:** To order additional support screens and O-rings, see the “Product Ordering” section for catalogue numbers.

## Sanitizing the Manifold

If the manifold is not being used to filter contagious solutions or solutions that may contaminate future assays, it can be sanitized in a sanitizing dishwasher. However, if assay and laboratory requirements are more stringent, the manifold may be autoclaved.

## Autoclaving the Manifold

**CAUTION:** Autoclaving will degrade some parts of the 1225 Sampling Manifold.

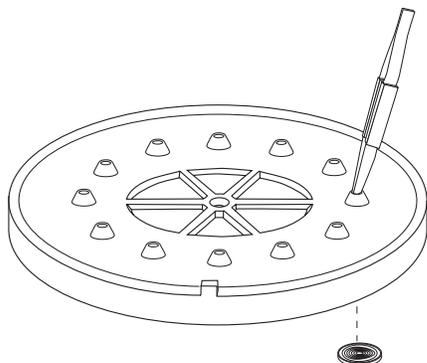
This section contains the results of an Autoclave Stability Study that was conducted on the 1225 Sampling Manifold. The manifold was subjected to 25 hard goods autoclave cycles at 120 °C for 20 minutes per cycle and tested with a normal vacuum pump pressure of 20 inHg (677 mbar). The only components affected by the autoclaving were support screens, filter O-rings, and the manifold chamber outer O-ring.

The following chart describes how many of these components had to be replaced after selected autoclave cycles. Use this chart as a guideline only. Results may vary depending on the autoclave.

**NOTE: After cycle five,** the tester added silicone grease to the O-rings after each cycle and 10 mL of water to each well after each cycle.

## Replacing Damaged Support Screens

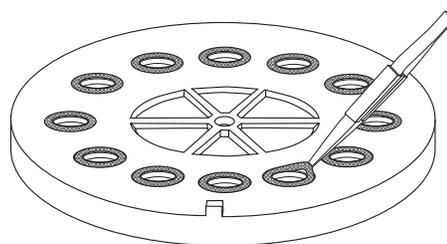
1. Put on laboratory gloves. Turn the support plate upside down and locate the support screen holes.
2. Insert a forceps prong into the hole that has the screen that needs replacing. Then push the screen with the prong until it pops out of position, as shown:



3. Discard the damaged screen. Turn the support plate right-side up again with the screens facing up.
4. Remove a new support screen from its package. Center the new screen on the empty hole. Press on the center of the support screen until it snaps into position.
5. Repeat steps 1–4 for every support screen that needs replacing.

## Replacing the O-Rings

1. Put on laboratory gloves. Turn the top plate upside down and locate the damaged O-ring.
2. Peel off the O-ring, starting from one edge, as shown:



3. Discard the damaged O-ring. Put on laboratory gloves and remove a new O-ring from its package. Wrap it around the empty top plate hole.
4. Repeat steps 1–3 for every O-ring that needs to be replaced.

## Troubleshooting the Manifold

This chart helps diagnose and solve problems that may be encountered. If you are unsure of what the problem is or how to solve it, visit the tech service page on our web site at [SigmaAldrich.com/techservice](http://SigmaAldrich.com/techservice).

Problem	Possible Cause	Solution
No fluid transfer	Ball valve is closed.	Open the valve.
	Clamp on the hose is loose.	Tighten the clamp.
	Unused position not plugged.	Plug stoppers into all the unused positions.
	Sample solution too viscous or particulate load too high.	Dilute the sample solution. Use a filter with a larger pore size.
No vacuum pressure or filtration	Filter O-rings are not sealing properly.	Replace filter O-rings on any positions that filter slowly.
	Vacuum system is not functioning properly.	Replace any cracked or damaged filter O-rings. Turn the vacuum pump on and make sure it is functioning properly. Check tubing connections for leaks.
Sample cups or extension barrels drain when filled with solution	O-rings are damaged or misplaced.	Make sure O-rings are evenly seated around top plate holes. Apply a small amount of silicone lubricant to the O-rings to create a better seal. <b>CAUTION:</b> Do not use silicone lubricant without validating how it reacts with the assay. Silicone lubricants may contaminate some assays. Replace the O-rings.
No filtration	The colored filter protection disc was installed, rather than the white filter disc.	Install the white filter disc.
	Vacuum valve not open.	Open the valve.
No retentate	Chosen filter has too large a pore size.	Use a filter with a smaller pore size.
	Sample not fully precipitated.	Increase TCA concentration; chill TCA.
Hose came off during filtration	Hose clamp not used or loose.	Use a hose clamp and make sure it is tight.

## Specifications

Item	Description
<b>Chamber</b>	Glass-filled polypropylene with 316 stainless steel bolt
<b>Dimensions</b>	20.3 cm (8 in.) diameter × 19.4 cm (7 5/8 in.) high excluding valves and connectors
<b>Ball Valve</b>	Glass-filled polypropylene
<b>Drain plug</b>	Polyethylene, high density
<b>O-rings</b>	Silicone
<b>Sample cup capacity</b>	15 mL each, 50 mL with accessory extension barrel
<b>Test tube rack and support screens</b>	Polypropylene
<b>Hand wheel nut</b>	Glass-filled polypropylene with brass insert
<b>Hoses</b>	Latex, 6.4 mm (1/4 in.) I.D.
<b>Shipping weight</b>	2.9 kg (6.4 lb)
<b>Filter size</b>	24 mm or 25 mm diameter discs
<b>Filter area</b>	2.7 cm <sup>2</sup> per filter (net usable area)

**Chemical compatibility:** The chamber and plates are acid- and base-resistant (including TCA).

## Product Ordering

Purchase products online at [SigmaAldrich.com/products](https://SigmaAldrich.com/products).

### 1225 Sampling Manifold

Standard Part	Cat. No.
1225 Sampling Manifold	XX2702550
Hand knob	YY2214257
Top plate	5162
Support plate	5163
Filter sealing O-rings, silicone (30/pk)	XX2702509
Support screens, 25 mm, polypropylene (30/pk)	XX2702510
Ball valve, glass-filled polypropylene	XX11000PP
Tubing, 6.4 mm (1/4 in.) I.D. × 58 cm (23 in.), latex	XX2504755

### 1225 Sampling Manifold Accessories

Accessory Part	Cat. No.
Vacuum trap flask (1 L side arm)	XX1514705
Aldrich® Essentials test tube without rim, 15 mm × 125 mm (50/pk)	Z741004
Corning® culture tube 16 mm × 125 mm, non-sterile (500/pk)	CLS430157
Corning® culture tube 16 mm × 125 mm, sterile (500/pk)	CLS430172
Chamber accessory set: 3 Chamber inner O-rings 3 Chamber outer O-rings 3 Drain plugs	XX2702552
Sample cup extension barrel (12/pk)	XX2702555
Filter forceps, stainless, blunt end (3/pk)	XX6200006P
Vacuum tubing, 4.8 mm (3/16 in.) I.D. x137 cm (4.5 ft), silicone	XX7100004
Teflon® tape, roll, 12.7 mm (1/2 in.) × 660 cm (260 in.)	TP0001326
Chemical Duty Vacuum/Pressure Pump, 115 volts (V), 60 hertz (Hz)	WP6111560
Chemical Duty Vacuum/Pressure Pump, 220 V, 50 Hz	WP6122050
Millex®-FG <sub>50</sub> Filter Unit (10/pk)	SLFG05010

## 25 mm Membrane Filter Catalogue Numbers

The following charts list the types of 25 mm membrane filters that can be used with the 1225 Sampling Manifold and their corresponding pore sizes. The filter and pore size chosen depend on assay and laboratory requirements.

**NOTE:** For a description of the filters, visit [SigmaAldrich.com/products](https://SigmaAldrich.com/products).

### Glass Fiber Filters (pure borosilicate, binderless), 100/pk

Pore Size	Cat. No.
Type B/1.0 µm, hydrophilic glass fiber	APFB02500
Type C/1.2 µm, hydrophilic glass fiber	APFC02500
Type D/2.7 µm, hydrophilic glass fiber	APFD02500
Type F/0.7 µm, hydrophilic glass fiber	APFF02500

### MF-Millipore® Mixed Cellulose Esters (MCE) Filters, 100/pk

Pore Size	Cat. No.
0.22 µm, hydrophilic MCE	GSWP02500
0.45 µm, hydrophilic MCE	HAWP02500
0.65 µm, hydrophilic MCE	DAWP02500
0.8 µm, hydrophilic MCE	AAWP02500
1.2 µm, hydrophilic MCE	RAWP02500
3.0 µm, hydrophilic MCE	SSWP02500
5.0 µm, hydrophilic MCE	SMWP02500
8.0 µm, hydrophilic MCE	SCWP02500

### Immobilon® Triton®-free, MCE Filters, 100/pk

Pore Size	Cat. No.
0.45 µm, hydrophobic MCE	HATF02500

### Durapore® Membrane Filters, 100/pk

Pore Size	Cat. No.
0.10 µm, hydrophilic PVDF	VVLP02500
0.22 µm, hydrophilic PVDF	GVWP02500
0.45 µm, hydrophilic PVDF	HVLP02500
0.65 µm, hydrophilic PVDF	DVPP02500
5.0 µm, hydrophilic PVDF	SVLP02500

### Isopore™ Track-Etched, Polycarbonate (PC) Filters, 100/pk

Pore Size	Cat. No.
0.3 µm, hydrophilic PC	GTPP02500
0.4 µm, hydrophilic PC	HTTP02500
0.6 µm, hydrophilic PC	DTTP02500
0.8 µm, hydrophilic PC	ATTP02500
1.2 µm, hydrophilic PC	RTTP02500
2.0 µm, hydrophilic PC	TTTP02500
3.0 µm, hydrophilic PC	TSTP02500
5.0 µm, hydrophilic PC	TMTP02500
10.0 µm, hydrophilic PC	TCTP02500

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