

## Alltech<sup>®</sup> Vacuum Manifold

Thank you for purchasing an Alltech<sup>®</sup> Vacuum Manifold! Our manifolds will help speed up your sample preparation by processing up to 24 samples simultaneously. This data sheet includes assembly and use information, as well as replacement part and accessory ordering information.

### Assembly Instructions

#### Collection Rack Assembly

1. Find the bottom plate. This is the smooth one with three small, threaded holes.
2. Thread the three support posts into place on the bottom plate.
3. Add other plates as needed for your collection vessels by sliding them over the support posts. Secure the plates at the desired height by snapping retaining clips to the grooves on the support posts, under each plate.

#### Manifold Assembly

1. Set the glass block on a flat, level surface near your vacuum source.
2. If you are pulling through wash solutions or other liquid waste, you can insert a waste container (with the 12-Port Manifold) or simply pull the liquid waste directly into the empty glass block. If you are collecting individual eluants, insert an assembled collection rack with collection vessels into the glass block.
3. If desired, attach red outlet needles to the outlet ports on the underside of the lid to direct sample flow into collection vessels.
4. Place the manifold lid on the glass block, making sure the lid is fully seated along its gasket on the block's rim.
5. Attach the vacuum valve to your vacuum source with 3/8" i.d. tubing. See Notice.
6. Attach the stopcocks to the inlet ports on top of the manifold lid, and attach your sample devices to the stopcocks. Open the stopcock valves.
7. Add your first solution to the sample devices and start the vacuum. See Warning.
8. Continue with successive SPE extraction steps.
9. Use the valve on the vacuum gauge to make small adjustments to the vacuum level, or to bleed the vacuum to facilitate changing collection vessels.
10. When the samples are finished, turn off the vacuum. If using stopcocks, be sure to close them all before removing sample devices from the lid. Then, bleed the system through the vacuum valve prior to removing the lid. This will help prevent splash or spillage of the collected eluants.

#### NOTICE

When pulling wash solutions or other liquid waste directly into the glass block, you may want to use a liquid trap in between the manifold and your vacuum source. Direct ingestion of liquids will damage most vacuum sources. Refer to your vacuum source's User Manual for more information. Turn to "Tips and Troubleshooting" for a sketch of a simple liquid trap.

#### WARNING

Do not allow the vacuum level to exceed 20" Hg. Always wear safety glasses and other appropriate safety equipment when working with equipment under vacuum.

#### Using the Vacuum Valve

The Vacuum Gauge and Valve come installed on the vacuum manifold glass block. The valve is the circular part in front of the gauge, and can be rotated by hand. It is only for fine adjustments of the vacuum strength. It cannot be used to significantly increase or reduce the vacuum strength. It primarily functions as a bleed valve to release the pressure in the system prior to removing the lid. Use 3/8" i.d. tubing to connect the valve to your vacuum source.

#### Changing the Vacuum Valve

If the Vacuum Gauge and Valve need to be replaced, you can remove the old one by holding the part that projects into the glass block steady, and rotating the outer part.

#### Tips and Troubleshooting

##### Finding Vacuum Leaks

If your flow rate is slow or the vacuum strength is weak, there may be a leak somewhere in the system.

- A. Are you using all the ports on the manifold lid? Any unused ports should be capped with yellow inlet caps or with closed stopcocks.
- B. Check all tubing connections.
- C. Are all the stopcocks and sample devices firmly inserted in the lid ports? Twisting each slightly will seat them more firmly.
- D. Inspect the manifold lid's connection to the glass block: Is the lid securely seated along its gasket on the glass block rim? Is the gasket worn or torn, requiring replacement? Is the glass block damaged along its rim, preventing full contact with the gasket?
- E. If using a liquid trap between the manifold and vacuum source, check all connections. Traps made of side-arm flasks with rubber stoppers may have leaks around the stopper or the tubing running through the stopper. PTFE sealing tape or Parafilm<sup>®</sup> can help seal such leaks.



- F. Is the lid warped? This can happen to older lids after prolonged use, especially with harsh solvents.
- G. Are there any cracks or other damage to the glass block, vacuum gauge, or lid?
- H. Is your vacuum source functioning properly?

### Proper Use of PTFE Needles

Unlike the polypropylene and stainless steel needles, PTFE needles are intended to provide an uninterrupted inert flow path through the manifold lid.

To use them, slide them through the ports from the top, and connect your sample device to the inlet of the PTFE needle. This will prevent your sample from coming into contact with the manifold lid or its components in any way, contacting only the PTFE interior of the needle.

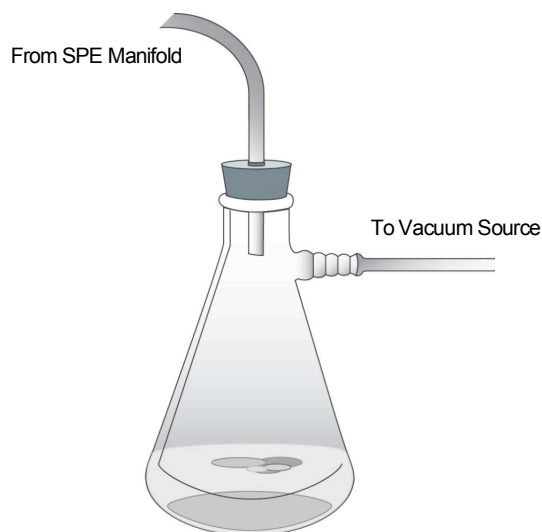
### Maintaining Flow When Samples Finish at Different Times

Many times, some samples will finish more quickly than others. Once the extraction solvent crosses through the SPE column into the collection vessel, it creates a "leak" that reduces the vacuum strength and consequently the flow for the remaining samples. To maintain the strongest possible flow for the remaining samples, close the stopcock valves on finished samples. If you are not using stopcocks, you can cap the tops of finished sample devices as they finish.

### Building a Liquid Trap

When pulling wash solutions or other liquid waste directly into the glass block, you may want to use a liquid trap in between the manifold and your vacuum source. Direct ingestion of liquids will damage most vacuum sources. A simple liquid trap consists of a side arm flask, a stopper with a hole in the middle, and two pieces of tubing. When putting together and using this apparatus follow all appropriate safety requirements and recognized best practices for use of vacuum and hazardous chemicals.

Attach one piece of tubing from your vacuum source to the side arm of the flask. Insert the second piece of tubing into the hole in the stopper (sealing tape or film will help ensure a good vacuum seal). Insert the stopper in the flask, and connect the tubing to the vacuum manifold (see **Figure 1**). Liquids drawn through the manifold will collect in the flask and will not be directly ingested into your vacuum source. Disconnect and empty the flask as necessary.



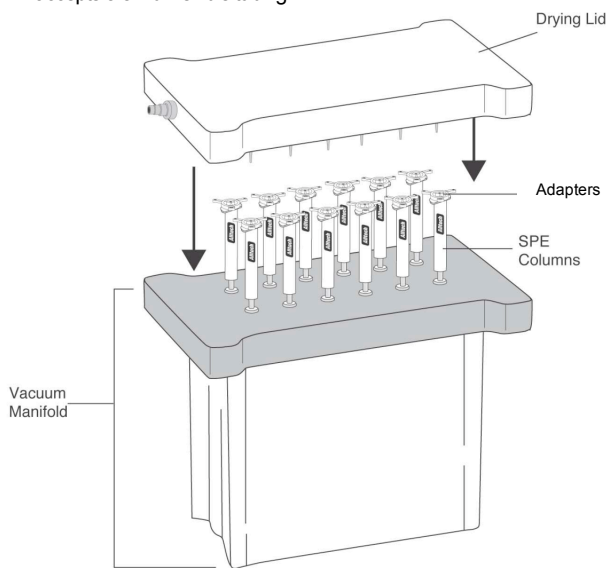
**Figure 1 - Liquid Trap**

### Safety Procedures and Practices

- A. For operations requiring the use of laboratory glassware, use approved safety glass such as Pyrex, Kimax, or a suitable equivalent is required. Whenever possible minimize the potential hazards involved in the use of glassware by using items made of less fragile materials such as metal or plastic beakers, tubing, and connectors whenever possible.
- B. Carefully inspect all glassware before use. Broken, cracked or chipped glassware should be discarded immediately.
- C. When an operation involves subjecting glassware to pressure, vacuum, or heat use only glassware rated for such uses. Do not use the glassware beyond its design limits.
- D. Protect against injury from implosion of glassware used under vacuum by the use of plastic mesh, plastic dip, tape etc., around the glass pieces which are particularly vulnerable. A shield placed in front of such apparatus during use can also be used to afford protection.
- E. Properly support apparatus consisting of multiple pieces of glassware so that the weight of the apparatus and its contents is borne by the supports without placing strain on glass tubing or connections.

### Using Drying Lid Attachments

Our Drying Lid Attachments for vacuum manifolds will direct a flow of air or nitrogen into the collection vessels to dry eluants prior to further analysis. In addition, the drying lid can be connected, via syringe adapters, to Extract-Clean™ SPE Columns to dry the packed beds before final elution (see **Figure 2**). Drying lids come complete with gasket, brass hose barb, male luer outlets on the underside of the lid, stopcocks, and support legs. The hose barb accepts 3/8" i.d. flexible tubing.



**Figure 2 - Using the Drying Lid with SPE Columns**

### Adding Extra Sample Volume to Your SPE Devices

To increase the sample volume capacity, insert Syringe Adapters into the top of Alltech® Extract-Clean™ SPE columns and then connect an empty SPE reservoir. These versatile adapters will also accept 1/8" o.d. tubing to draw your sample through the SPE column directly.

## Replacement Parts and Accessories

VACUUM MANIFOLDS		
	Qty	Part No.
12-Port Vacuum Manifold	ea	<b>210351</b>
16-Port Vacuum Manifold	ea	<b>210016</b>
24-Port Vacuum Manifold	ea	<b>210224</b>

OPTIONAL ACCESSORIES		
	Qty	Part No.
PTFE Needles	100	<b>412410</b>
PTFE Needles	500	<b>412450</b>
Valved PTFE Needles	25	<b>411525</b>
Valved PTFE Needles	50	<b>411550</b>
Stainless Steel Needles	12	<b>212400</b>
Stainless Steel Needles	16	<b>210816</b>
Stainless Steel Needles	24	<b>210824</b>
12-Port Drying Lid Attachment	1	<b>212100</b>
16-Port Drying Lid Attachment	1	<b>212117</b>
24-Port Drying Lid Attachment	1	<b>212124</b>
3/8" i.d., 7/8" o.d. Tubing for use with Vacuum Valve	10ft	<b>6472</b>
Syringe Adapters for 1.5, 4, & 8mL Extract-Clean™ SPE Columns	15	<b>210705</b>
Syringe Adapters for 15 & 25mL Extract-Clean™ SPE Columns	5	<b>210707</b>
Syringe Adapters for 75mL Extract-Clean™ SPE Columns	5	<b>210709</b>

REPLACEMENT PARTS				
	12-Port Part No.	16-Port Part No.	24-Port Part No.	Part No. for All Sizes
Glass Chamber	<b>213212</b>	<b>210116</b>	<b>210124</b>	—
Vacuum Gauge and Valve	—	—	—	<b>212203</b>
Polypropylene Lid, Gasket, & Stopcocks	<b>212001</b>	<b>210216</b>	<b>211224</b>	—
Complete Collection Rack	<b>212518</b>	<b>210416</b>	<b>210424</b>	—
Support Posts Only	—	—	—	<b>410410</b> , 3/pk
Retaining Clips Only	—	—	—	<b>212912</b> , 12/pk
Lid Legs	—	—	—	<b>410510</b> , 4/pk
Inlet Caps	—	—	—	<b>211234</b> , 50/pk
Polypropylene Needles	<b>212412</b> , 12/pk	<b>210916</b> , 16/pk	<b>210924</b> , 24/pk	—
Waste Container	<b>210033</b> , 2/pk	—	—	—
Male Luer Outlets, Polypropylene	—	—	—	<b>212120</b> , 2/pk <b>212320</b> , 24/pk
Female Luer Inlets, Polypropylene	—	—	—	<b>212002</b> , 2/pk <b>212302</b> , 24/pk
Gasket	<b>212112</b> , 2/pk	<b>210724</b> , 2/pk	<b>210724</b> , 2/pk	—
Stopcocks	<b>213112</b> , 12/pk	<b>211521</b> , 16/pk	<b>211524</b> , 24/pk	—

## Warranty

Seller warrants that the Vacuum Manifold (the "Product") shall meet Seller's specifications for the Product in effect on the date of shipment (the "Specifications"). Seller also warrants that it will convey good title to the Products. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, NOT INCLUDED HEREIN INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Buyer assumes all risk and liability for results obtained by the use of the Products.

Neither Buyer nor Seller shall be liable to the other for special, indirect, punitive, consequential or any similar damages, even if such party has been advised of the possibility of such damages. Buyer's exclusive and sole remedy for any claim shall be, at Seller's option, a refund or credit of the amount of the price paid for the Products in respect of which damages are claimed, or, where applicable, cure of the defect or replacement of non-conforming Products with Products that meet the Specifications.

## Shipments

All shipments are made F.O.B. Deerfield, IL.

[www.discoverysciences.com](http://www.discoverysciences.com)

Grace Davison Discovery Sciences • 2051 Waukegan Road • Deerfield, IL 60015  
Telephone: 847.948.8600 • Fax: 847.948.1078 • E-mail: [DiscoverySciences@grace.com](mailto:DiscoverySciences@grace.com)

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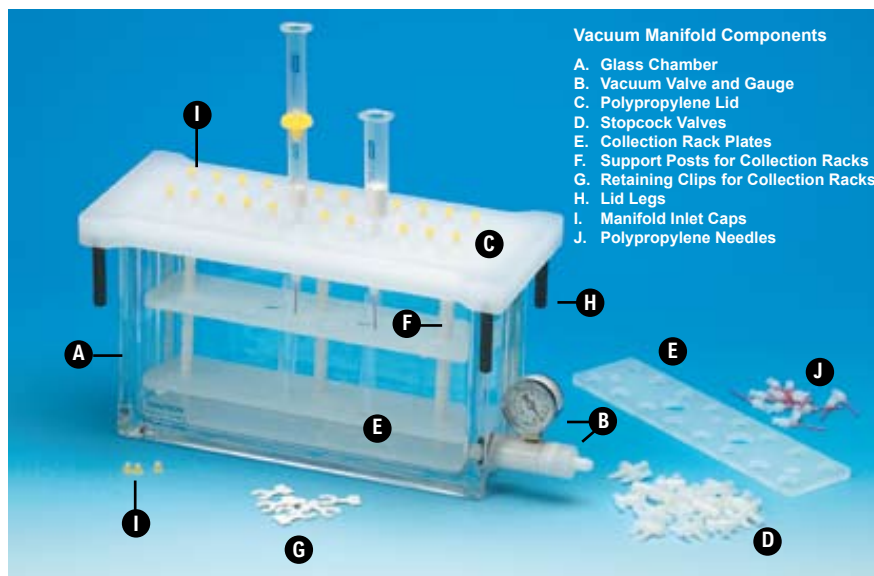
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**GRACE**

# SPE Tube Vacuum Manifolds

- 12-, 16-, and 24-port manifolds
- Glass chamber for visual monitoring
- Accepts standard male luer devices

Vacuum manifolds process multiple samples simultaneously, saving time and effort. Manifold systems come complete with the components listed below. Stainless steel or PTFE needles are available separately.



Vacuum Manifold Components

- A. Glass Chamber
- B. Vacuum Valve and Gauge
- C. Polypropylene Lid
- D. Stopcock Valves
- E. Collection Rack Plates
- F. Support Posts for Collection Racks
- G. Retaining Clips for Collection Racks
- H. Lid Legs
- I. Manifold Inlet Caps
- J. Polypropylene Needles

6278

## 12-Port Manifold

- For up to 12 samples
- Also includes one waste container



4869

## 24-Port Manifold

- Process up to 24 samples



4871

### 12-Port Manifold and Accessories

Description	Qty.	Part No.
<b>12-Port Vacuum Manifold**</b>	ea	<b>210351</b>
<i>Replacement Parts</i>		
Lid, Gaskets, and 12 Stopcocks	ea	<b>212001</b>
Vacuum Gauge, Valve, and Glass Chamber	ea	<b>212304</b>
Collection Rack, 12-Port Size*	ea	<b>212518</b>
Gaskets, 12-Port Size	2	<b>212112</b>
One-Way Stopcocks	12	<b>213112</b>
Waste Container	2	<b>210033</b>

\*12-Port Collection Rack includes 3 support posts, bottom plate, 13- and 16mm plates, autosampler vial plate, volumetric plate, and 12 retaining clips.

\*\*Includes waste container.

### 24-Port Manifold and Accessories

Description	Qty.	Part No.
<b>24-Port Vacuum Manifold</b>	ea	<b>210224</b>
<i>Replacement Parts</i>		
Lid, Gaskets, and 24 Stopcocks	ea	<b>211224</b>
Vacuum Gauge, Valve, and Glass Chamber	ea	<b>210324</b>
Collection Rack, 24-Port Size†	ea	<b>210424</b>
Gaskets, 16- and 24-Port Size	2	<b>210724</b>
One-Way Stopcocks	24	<b>211524</b>

†16- and 24-Port Collection Racks include 3 support posts, bottom plate, dimple plate, 13- and 16mm plates, and 12 retaining clips.

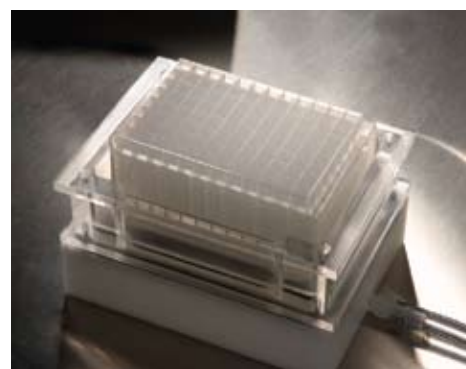
solid phase extraction

# 96-Well Plate Vacuum Manifold

Process standard 2mL 96 Deep Well Plates via vacuum source. Collect directly into a microplate. Also accommodates 48 4mL SPE columns or 24 6mL SPE columns with appropriate plate adapters.

### 96-Well Plate Vacuum Manifold

Description	Qty.	Part No.
96-Well Plate Vacuum Manifold	ea	<b>8619194</b>



7435



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info@obrnutafaza.hr

# Manifold Accessories

## Replacement Parts for All Size Manifolds

Manifolds come complete with all necessary gauges and accessories. Individual replacement parts may be sold separately.



5951

### Replacement Parts for All Size Manifolds

Description	Qty.	Part No.
A. Vacuum Gauge and Valve	ea	<b>212203</b>
B. Retaining Clips for Collections Racks	12	<b>212912</b>
C. Female Luer Inlet	2	<b>212002</b>
Female Luer Inlet	24/pk	<b>212302</b>
D. Male Luer Outlet	2	<b>212120</b>
Male Luer Outlet	24/pk	<b>212320</b>
E. Caps for Lid Inlets	50	<b>211234</b>
F. Lid Legs, Black	4	<b>410510</b>
G. Collection Rack Posts	3	<b>410410</b>

## Tygon® Tubing

Tygon® vacuum tubing is heavy walled and flexible. It withstands 29.9" Hg at 75°F (24°C). It is nontoxic, nonoxidizing, and transparent.



3849

### Tygon® Vacuum Tubing

Description	Qty.	Part No.
1/8" i.d., 3/8" o.d.	50'	<b>6465</b>
3/16" i.d., 9/16" o.d.	10'	<b>6467</b>
1/4" i.d., 3/4" o.d.	10'	<b>6469</b>
3/8" i.d., 7/8" o.d.*	10'	<b>6472</b>

\*Use with Vacuum Gauge and Valve displayed above.

## Drying Attachments

Use these special drying lids to direct a gas flow into collection tubes to dry eluents. Barb is 1/4".



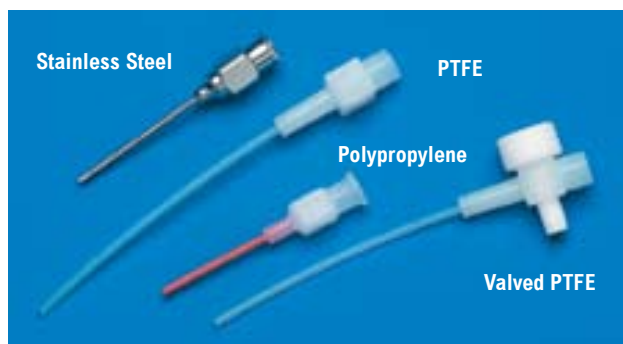
4878

### Drying Attachments

Description	Qty.	Part No.
12-Port Drying Attachment	1	<b>212100</b>
16-Port Drying Attachment	1	<b>212117</b>
24-Port Drying Attachment	1	<b>212124</b>

## Manifold Needles

PTFE needles are disposable, fit many different manifold types, and eliminate cross contamination by extending into the collection tube. They also provide a complete PTFE fluid path for samples to virtually eliminate extractables. Stainless steel and polypropylene needles are also available.



4874

### Manifold Needles

Description	Qty.	Part No.
PTFE Needles	100	<b>412410</b>
PTFE Needles	500	<b>412450</b>
Valved PTFE Needles	25	<b>411525</b>
Valved PTFE Needles	50	<b>411550</b>
Stainless Steel Needles	12	<b>212400</b>
Stainless Steel Needles	16	<b>210816</b>
Stainless Steel Needles	24	<b>210824</b>
Polypropylene Needles	12	<b>212412</b>
Polypropylene Needles	16	<b>210916</b>
Polypropylene Needles	24	<b>210924</b>

## Reservoirs and Frits

Select empty reservoirs and loose frits to pack your own custom SPE columns.



6288

### Bulk Reservoirs and Frits

Description	Qty.	Part No.
<i>Extract-Clean™ Empty Reservoirs, Polypropylene</i>		
1.5mL	100	<b>210001</b>
4.0mL	100	<b>210104</b>
8.0mL	100	<b>210208</b>
15.0mL	100	<b>210315</b>
25.0mL	100	<b>210425</b>
75.0mL	50	<b>210575</b>
<i>Ultra-Clean™ Empty Reservoirs, Treated Polypropylene</i>		
4.0mL	100	<b>70216</b>
8.0mL	100	<b>70218</b>
8.0mL	1000	<b>70069</b>
<i>Polyethylene Frits for Extract-Clean™ Reservoirs</i>		
For 1.5mL Reservoir	100	<b>211401</b>
For 4.0mL or EV Reservoir	100	<b>211404</b>
For 8.0mL Reservoir	100	<b>211408</b>
For 15.0mL Reservoir	100	<b>211412</b>
For 25.0mL Reservoir	100	<b>211416</b>
For 75.0mL Reservoir	100	<b>211775</b>
<i>PTFE Frits for Ultra-Clean™ Reservoirs</i>		
For 4.0mL Reservoir	100	<b>211494</b>
For 8.0mL Reservoir	100	<b>211498</b>

## Empty 96-Well Plates

- Square, 2mL wells
- All-polypropylene construction
- Use to pack your own custom SPE plates



4688

Standard 96-well plate footprint (8x12 wells)

### 96-Well Plates

Bed Weight	Qty.	Part No.
Empty plate with bottom frit installed, top frit supplied	1	<b>210780</b>

## Adapters and Caps

- Inlet caps fit SPE devices as indicated
- Outlet caps fit any column or cartridge with a male luer tip



5952

### Caps

Description	Qty.	Part No.
Inlet Caps for Maxi-Clean™ Cartridges	50	<b>211015</b>
Inlet Caps for 1.5mL	50	<b>220000</b>
Inlet Caps for 4.0mL	50	<b>220301</b>
Inlet Caps for 8.0mL	50	<b>220600</b>
Inlet Caps for 15.0mL	50	<b>221200</b>
Inlet Caps for 25.0mL	50	<b>221006</b>
Inlet Caps for 75.0mL	50	<b>227503</b>
Outlet Caps for Male Luers	50	<b>220710</b>

Syringe Adapters fit the tops of SPE columns allowing attachment of any male luer device. This lets you process an Extract-Clean™ column with a syringe or add an empty reservoir to increase sample volume capacity.

### Syringe Adapters

Description	Qty.	Part No.
Syringe Adapters for 1.5, 4.0, and 8.0mL Columns	15	<b>210705</b>
Syringe Adapters for 25mL Columns	5	<b>210707</b>
Syringe Adapters for 75mL Columns	5	<b>210709</b>

## Bulk SPE Packings

The same high-quality material we use to manufacture our Extract-Clean™ and Maxi-Clean™ SPE products.



4900

### Bulk SPE Packings

Description	Qty.	Part No.
<i>Reversed-Phase Adsorbents</i>		
Prevail™ C18 (11%)	100g	<b>211505</b>
C18 (6%)	100g	<b>211502</b>
C18 (17%)	100g	<b>211503</b>
Large Pore C18 (14%)	100g	<b>211542</b>
C8	100g	<b>211504</b>
C2	100g	<b>211506</b>
Phenyl	100g	<b>211522</b>
<i>Normal-Phase Adsorbents</i>		
Silica	100g	<b>211512</b>
Aminopropyl	100g	<b>211516</b>
Diol	100g	<b>211518</b>
Florisil®	227g	<b>5618</b>
Florisil®-PR	227g	<b>5615</b>
Alumina-N	100g	<b>211541</b>
<i>Ion-Exchange</i>		
SCX (Cation Exchange)	100g	<b>211520</b>
SAX (Anion Exchange)	100g	<b>211510</b>
Carbograph 1 SPE 120/400 Mesh	25g	<b>1769</b>