



General Chromatography

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SPE Introduction

How to Choose an SPE Product

1. Characterize the Sample

Factors such as the analyte's polarity relative to the matrix, the presence of charged functional groups, solubility, molecular weight, etc., determine how strong the analyte is retained by the packed bed.

2. Select a Retention Strategy

There are two basic methods for sample treatment:

- Select the packing bed to retain the desired analyte. The contaminants are washed off and the desired analyte is then eluted for analysis.
- Select the packing bed to retain the contaminants and the desired analyte passes directly through.

3. Select the Proper Packing Type

Select the proper packing type for the cleanest extract with the highest recovery.

- Reversed-phase packings are hydrophobic, silica-based materials that retain moderately polar to non-polar compounds from a polar matrix while washing off polar interferences. Or you can retain non-polar contaminants while the polar compounds pass through unretained.
- Normal-phase packings are hydrophilic, silica-based materials that retain polar compounds from a non-polar matrix while washing off non-polar interferences. Or you can retain polar contaminants while non-polar compounds pass through unretained.
- Ion-exchange resins retain charged compounds or remove ionic interferences.

4. Optimize Conditions for Best Results

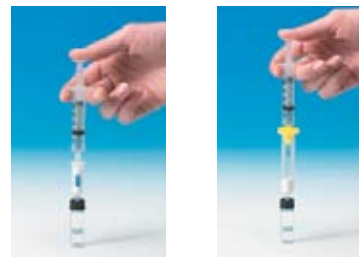
Select proper bed size and suitable conditioning, wash and elution solvents.

- Poor sample recovery often occurs when the packed bed dimensions are not optimized. An excessive bed weight results in incomplete elution while an insufficient bed weight results in incomplete retention.
- Consider the solvent strength relative to the packing material. The final conditioning solvent should be weak so it doesn't act as an eluting solvent. Buffers should be used to control ionization of potentially charged compounds.
- Wash solvents should remove weakly retained interferences without being strong enough to elute the analyte.
- Elution solvents should be strong enough to completely elute an analyte in a small volume (1–2mL).

Solid-Phase Processing Methods

By Syringe

Process individual samples via luer hub syringe. Connect syringe directly to SPE cartridges or to SPE columns via adapters found on page 316.



4915

By Vacuum Manifold

Process multiple samples on a vacuum manifold using SPE columns. Extend volume via reservoirs. Products found on pages 314–316.



6275

By Filter Flask

Process large volume samples by placing SPE tube with an online filtration system. See page 130.



5953

For Environmental Applications

Recommended SW-846 Cleanup Methods		
Analyte Group	EPA Method No.	Recommended SPE Sorbents
Aniline and Derivatives	3620	C18
Chlorinated Pesticides	3620	C18, Florisil®
Chlorinated Hydrocarbons	3620	C18, Phenyl
Haloethers	3620	C18, Florisil®
Nitroaromatics and Cyclic Ketones	3620	DVB, IC-RP
Nitrosamines	3610, 3620	C18
Organochlorine Pesticides	3620	C18, Florisil®
Organophosphorus Pesticides	3620	Florisil®, Carbograph
PCB's	3620, 3630	C18, SCX, Carbograph
Petroleum Waste	3611	Alumina
Phenols	3630	C18, Phenyl
Phthalate Esters	3610, 3620	C18, DVB
Polynuclear Aromatic Hydrocarbons	3630	C18, Phenyl

SPE Introduction

SPE Method Development

SPE method development typically contains four steps:

Step 1: Condition

The conditioning step is composed of two substeps; the first activates the sorbent ligands, the second equilibrates the sorbent bed.

Step 2: Load

In the load step, sample is applied to the SPE device. Matrix and flow rate are optimized to quantitatively retain target analytes.

Step 3: Wash

In the wash step, choose a solvent that elutes impurities but retains target analytes. Often the second conditioning solvent is a suitable wash solvent.

Step 4: Elute

The elution step ideally removes all target analytes with minimal solvent to maximize sensitivity. Sometimes this requires a combination of solvents to break both the primary and secondary interactions.



	General Method Development Procedures			
	Step 1—Condition	Step 2—Load	Step 3—Wash	Step 4—Elute
Reversed-Phase Extraction Procedure Mechanism: Bind moderately polar to non-polar compounds from a polar sample matrix	Methanol followed by water	Process sample at a flow rate of 1–5mL/min	Water or water: methanol (95:5)	Methanol or acetonitrile. May need to add strong acid or base to organic solvent to break secondary interactions.
Normal-Phase Extraction Procedure Mechanism: Bind polar compounds from a non-polar sample matrix	IPA followed by hexane	Process sample at a flow rate of 1–5mL/min	Hexane or hexane:IPA (98:2)	IPA, ethyl acetate, acetone, or hexane: IPA (50:50)
Ion-Exchange Extraction Procedure Mechanism: Bind charged (negative/anionic or positive/cationic) compounds	Methanol:water (50:50) followed by low ionic strength (0.1M) buffer	Apply slowly: less than or equal to 1mL/min ion exchange kinetics are slower than reversed- or normal-phase	Methanol:low ionic strength (0.1M) buffer (10:90)	High ionic strength (0.5M–1.0M) buffer or modify pH such that the analyte is uncharged. May need to add organic to break hydrophobic interactions.

Recommended Usage Guidelines*										
	Bed Size:	50mg	100mg	200mg	500mg	500mg	1000mg	2000mg	5000mg	10,000mg
	Sorbent Retention Capacity:	2.5mg	5mg	10mg	25mg	25mg	50mg	100mg	250mg	500mg
Condition Volume (4-bed volumes)		0.30mL	0.60mL	1.20mL	3.00mL	3.00mL	6.00mL	12.00mL	30.00mL	60.00mL
Wash Volume (6-bed volumes)		0.45mL	0.90mL	1.80mL	4.50mL	4.50mL	9.00mL	18.00mL	45.00mL	90.00mL
Minimum Elution Volume (3-bed volumes)		0.23mL	0.45mL	0.90mL	2.25mL	2.25mL	4.50mL	9.00mL	22.50mL	45.00mL

*Estimates only. Must optimize for each application.

tech tip

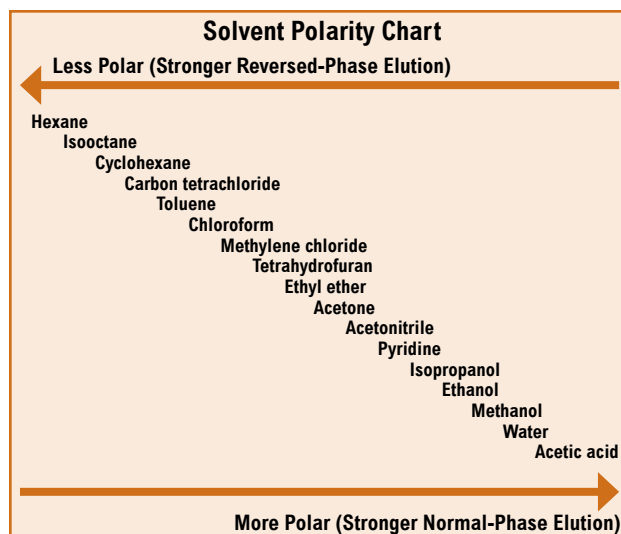
To calculate sorbent bed volume, use 150µL for every 100mg of sorbent.

tech tip

Retention capacity describes the total amount that an SPE sorbent will bind. This includes all compounds retained—analytes of interest as well as the contaminants.

tech tip

Minimum elution volume recommended in bed size chart above will offer best sensitivity, but more solvent may be required depending on application.



SPE Introduction

Grace Davison® has been making Davisil® silica for over a quarter century. It is the foundation for all our silica-based SPE products, including Alltech®, Vydac®, and GracePure™ brands. Having complete control over the entire media process ensures highly consistent performance, and uninterrupted supply.

Experts in Media Production

Using a consistent and pure silica base, and employing tightly controlled bonding techniques, insures predictable analyte-sorbent interactions. Both of these aspects also play equal importance in manufacturing a bonded phase with high and reproducible recoveries.

Highest Quality Control

Every part of our manufacturing process is carefully monitored. From silica production to final product, we perform multiple quality tests, and provide a comprehensive quality assurance certificate.



7377

Grace SPE Product Lines

Alltech® Extract-Clean™ Columns

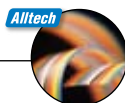


Format: SPE Columns

Sizes: 1.5, 4, 8, 15, 25, 75mL (the entire tube volume)

Summary: In production for over 25 years, with proven consistency, this is our most comprehensive SPE product line. It includes 30 media types in over 10 different bed weights. And with a complete offering of reversed, normal, and specialty medias exhibiting unique retention properties, you are sure to find the packing that delivers a cleaner, more concentrated sample. See pages 302–306.

Alltech® Maxi-Clean™ Cartridges



Format: SPE Cartridges

Sizes: 300, 600, 900mg (media amount, not device volume)

Summary: The Maxi-Clean™ line is offered in many of the same media as the Extract-Clean™ line, but slightly paired down, with over 20 chemistries available. This lure hub cartridge device is not as prevalent in the SPE industry, and while manual processing is most common, this format offers a number of other interesting processing options, including multimedia extractions. See page 307–310.

Vydac® Columns



Format: SPE Columns

Sizes: 1, 3mL (volume above the packing)

Summary: Ideal for extraction, concentration and cleanup of biological samples. This 300Å silica-based media has the same properties as the industry-leading Vydac® TP HPLC packing. Offered in C18 and C4, use for a variety of protein and peptide applications. See page 311 for details.

Alltech® Ultra-Clean™ Columns



Format: SPE Columns

Sizes: 4, 8mL (the entire tube volume)

Summary: Choose this ultra-low extractable version for very sensitive applications. Nine selected media are packed into highly inert fluorinated polypropylene tubes with PTFE frits. Less expensive than glass extraction devices, this durable format offers comparable inertness without the added concern of being easily broken. See pages 302–305.

Alltech® 96-Well Plates



Format: 96-Well Plates

Size: 2mL (the individual well volume)

Summary: Ideal for high-throughput SPE processing, this 8" x 12" standard format fits into traditional 96-well automated equipment. We offer six different medias in three bed weights packed in 2mL square wells. See page 311. Empty plates are also available on page 316.

GracePure™ Columns



Format: SPE Columns

Sizes: 1, 3, 6, 12, 20, 60mL (volume above the packing)

Summary: Our in-house capability to make everything from the silica particle to the finished good means we can deliver GracePure™ as the best value in SPE. With a concise offering of 11 sorbents in six bed weights, this high-quality SPE product line is a result of operational excellence that Grace Davison® is known for. See pages 312–313.

SPE Introduction

Device Options

Device Specifications		
Device	Housing	Frit Material
Extract-Clean™ Columns	Polypropylene	20µm Polyethylene
Ultra-Clean™ Columns	Treated Polypropylene	10µm PTFE
GracePure™ Columns	Polypropylene	20µm Polyethylene
Vydac® Columns	Polypropylene	Glass Fiber Filter Paper with Polyethylene Mesh Support
Maxi-Clean™ Cartridges	Polypropylene	20µm Polyethylene
96-Well SPE Plates	Polypropylene	20µm Polyethylene

Traditionally, differing nomenclature has been used to describe SPE column size. Sometimes columns are described in terms of full volume. Alternatively, the volume above the bed weight may also be used. Below is a cross-reference for your convenience.

Alltech®	GracePure™/Vydac®
1.5mL	1mL
4mL	3mL
8mL	6mL
15mL	12mL
25mL	20mL
75mL	60mL

SPE Columns

- Open top tubes with male luer bottom
- Process multiple samples with vacuum manifold or automated SPE instruments
- Process individual samples manually with use of adapter and syringe



SPE 96-Well Plates

- High throughput SPE devices
- 8" x 12" standard 96-well format
- 2mL square wells

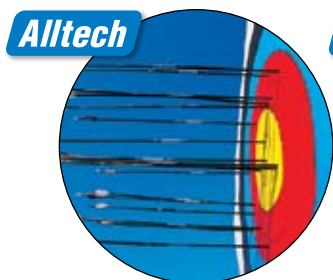
SPE Cartridges

- Female luer top and male luer bottom
- Process single cartridge by syringe or multiple cartridges by vacuum
- Stack for multi-step extractions

Alltech® SPE Sorbents

Alltech® SPE Sorbents are packed into three device types; columns, cartridges, and 96-well plates. See chart for availability.

Extract-Clean™ SPE Columns



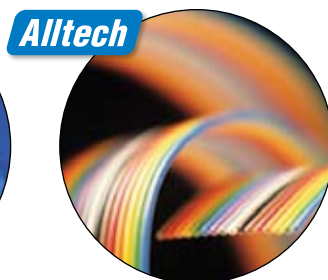
pages 302-306

Ultra-Clean™ Ultra-low Extractable SPE Columns



pages 302-305

Maxi-Clean™ SPE Cartridges



pages 307-310

96-Well Plates High Throughput SPE Processing



page 311

Reversed-Phases (Non-Polar) Sorbent Specifications

Packing	Base	% Carbon	End-capped	Average Particle Size	Pore Size	Features	Benefits	Extract-Clean™	Ultra-Clean™	Maxi-Clean™	96-Well
Prevail™ C18	Silica	11.0%	Yes	50µm	60Å	100% water wettable	Hydrophilic/hydrophobic retention. Phase remains active even when completely dry. Can omit preconditioning step.	x		x	x
Standard C18	Silica	6.0%	Yes	50µm	60Å	Low carbon load C18	General purpose phase.	x	x	x	x
High-Flow C18	Silica	8.0%	Yes	100µm	60Å	Large particle	Less flow resistance for faster flow rates of large volume sample.	x			
High-Capacity C18	Silica	17.0%	Yes	50µm	60Å	High carbon load	Maximum capacity phase.	x		x	
Large Pore C18	Silica	14.0%	Yes	50µm	150Å	Larger than average pore size	Ideal for compounds >1500MW.	x		x	
Octyl (C8)	Silica	4.5%	Yes	50µm	60Å	Less hydrophobic than C18	Less retention of highly hydrophobic compounds. Use when C18 is too retentive.	x	x	x	
Ethyl (C2)	Silica	5.5%	Yes	50µm	60Å	Short chain functional group is less hydrophobic than C8	Less retention of highly hydrophobic compounds. Use when C8 is too retentive.	x		x	
Phenyl (PH)	Silica	3.8%	Yes	50µm	60Å	Aromatic structure	Highly selective for aromatic compounds.	x		x	

Normal-Phases (Polar) Sorbent Specifications

Packing	Base	% Carbon	End-capped	Average Particle Size	Pore Size	Features	Benefits	Extract-Clean™	Ultra-Clean™	Maxi-Clean™	96-Well
Silica (SI)	Silica	—	—	50µm	60Å	Highly polar surface	Most common polar phase.	x	x	x	x
Aminopropyl (NH ₂)	Silica	5.0%	No	50µm	60Å	Polar phase with slight anion exchange properties	Ideal for carbohydrates or generally with analyses containing hydroxyl functional groups.	x		x	
Cyanopropyl (CN)	Silica	6.0%	Yes	50µm	60Å	Unique selectivity	Can be used in normal-phase or reversed-phase modes.	x	x	x	
Diol (2OH)	Silica	4.0%	No	50µm	60Å	Polar surface with minor hydrophobic retention	Wets easily and offers more reproducibility.	x		x	
Florisil® (FL)	Magnesium Silicate	—	—	75–150µm	60Å	Highly polar surface	Referenced in many EPA methods. Ideally suited for pesticides and metals.	x	x	x	
Florisil® PR (FL-PR)	Magnesium Silicate	—	—	75–150µm	60Å	Specifically tested for chlorinated pesticides	Ensures most inert batches suitable for highly active compounds.	x	x	x	
Alumina Acidic (AL-A)	Aluminum Oxide	—	—	130µm	100Å	Alumina washed with acid surface	Increase capacity for acidic compounds.	x		x	
Alumina Basic (AL-B)	Aluminum Oxide	—	—	130µm	100Å	Alumina washed with base surface	Increase capacity for basic compounds.	x		x	
Alumina Neutral (AL-N)	Aluminum Oxide	—	—	130µm	100Å	Alumina washed with neutral surface	Interacts with highly aromatic compounds and neutral hydroxyls.	x		x	

Alltech® SPE Sorbents

Specialty Packings Specifications									
Packing	Base	% Carbon	End-capped	Average Particle Size	Pore Size	Features	Benefits	Extract-Clean™	Ultra-Clean™
DVB	100% DVB	—	—	40µm	—	100% DVB	Greater capacity than C18 for general SPE. Also free vinyl surface groups make a suitable solid-phase synthesis support.	x	
Carbograph	Graphitized Carbon	—	—	38–125µm	—	Graphitized Carbon	Retains polar organics in aqueous matrices. Ideally suited for acid, base-neutral extraction of pesticides and herbicides.	x	x
Drug-Clean SB-C	Silica	—	—	50µm	60Å	Silica-based mixed mode C8/cation exchange	Ideal for drugs of abuse.	x	
Drug-Clean SB-A	Silica	—	—	50µm	60Å	Silica-based mixed mode C8/anion exchange	Ideal for drugs of abuse.	x	
Drug-Clean PB	Polymer	—	—	30µm	—	Polymer-based mixed mode C8/cation exchange	pH stable with no conditioning required. Extract acidic, neutral and basic drugs of abuse from single column.	x	
AFT	C18, Silica, and Alumina	6	—	50–130µm	—	Unique blend of reversed and normal phases.	Ideal for Aflatoxins.	x	

General Ion-Exchange Sorbent Specifications									
Packing	Base	Counter Ion	Particle Size	Functional Group	Exchange Capacity	Retains	Applications	Extract-Clean™	Ultra-Clean™
SCX	Styrene-DVB	Hydrogen	50µm	Benzene Sulfonic Acid	2.0meq/mL	Cations, (+) charged compounds	Remove/concentrate basic compounds.	x	x
SAX	Styrene-DVB	Acetate	50µm	Tetramethyl Ammonium	1.0meq/mL	Anions, (–) charged compounds	Remove/concentrate acidic compounds.	x	x

Ion Chromatography Sorbent Specifications									
Packing	Base	Counter Ion	Particle Size	Molecular Exclusion Limit	Exchange Capacity	Retains	Applications	Extract-Clean™	Ultra-Clean™
IC-OH	Styrene-DVB	Hydroxide	50µm	1000 Daltons	1.0meq/mL	Anions	Exchanges anions for hydroxide. May be used to remove or concentrate anions from sample and to increase pH of acidic samples. Removes cations that form insoluble hydroxide salts.	x	x
IC-H	Styrene-DVB	Hydronium	50µm	1000 Daltons	2.0meq/mL	Cations	Exchanges cations for H ⁺ . May be used to remove or concentrate cations from sample and to reduce pH of basic samples.	x	x
IC-Ag	Styrene-DVB	Silver	50µm	1000 Daltons	2.0meq/mL	Chloride Iodide Bromide	Removes excess halides through formation of Ag-halide salts.	x	x
IC-Ba	Styrene-DVB	Barium	50µm	1000 Daltons	2.0meq/mL	Sulfate	Removes excess sulfate through formation of BaSO ₄ .	x	x
IC-Na	Styrene-DVB	Sodium	50µm	1000 Daltons	2.0meq/mL	Cations	Exchanges cations for Na ⁺ . May be used to remove or retain cations from sample without changing the pH of the sample.	x	x
IC-Chelate	Styrene-DVB	Sodium	50µm	1000 Daltons	0.4meq/mL	Polyvalent metal ions	Exchanges transition metals and divalent cations for Na ⁺ . May be used to remove or retain divalent cations and transition metals from sample.	x	x
IC-RP	Polystyrene	—	550µm	—	—	Hydrophobic components	Removes surfactants, organic acids, and other organic substances. Inorganic ions pass through.	x	x

Alltech® Extract-Clean™ and Ultra-Clean™ Columns

Reversed-Phase Sorbents



Extract-Clean™ Columns

- Available: Prevail™ C18, Standard C18, High-Flow C18, High-Capacity C18, Octyl (C8), Ethyl (C2), Phenyl (PH)
- General purpose SPE column with the most comprehensive sorbent offering



Ultra-Clean™ Columns

- Available: Standard C18, Octyl (C8)
- Low extractable version for highly sensitive applications—fluorinated polypropylene columns with PTFE frits



Reversed-Phases (Non-Polar) Sorbent Specifications							
Functional Group	Base	% Carbon	End-capped	Average Particle Size	Pore Size	Features	Benefits
Prevail™ C18	Silica	11.0%	Yes	50µm	60Å	100% water wettable	Hydrophilic/hydrophobic retention. Phase remains active even when completely dry. Can omit preconditioning step.
Standard C18	Silica	6.0%	Yes	50µm	60Å	Low carbon load C18	General purpose phase.
High-Flow C18	Silica	8.0%	Yes	100µm	60Å	Large particle	Less flow resistance for faster flow rates of large volume sample.
High-Capacity C18	Silica	17.0%	Yes	50µm	60Å	High carbon load	Maximum capacity phase.
Large Pore C18	Silica	14.0%	Yes	50µm	150Å	Larger than average pore size	Ideal for compounds >1500MW.
Octyl (C8)	Silica	4.5%	Yes	50µm	60Å	Less hydrophobic than C18	Less retention of highly hydrophobic compounds. Use when C18 is too retentive.
Ethyl (C2)	Silica	5.5%	Yes	50µm	60Å	Short chain functional group is less hydrophobic than C8	Less retention of highly hydrophobic compounds. Use when C8 is too retentive.
Phenyl (PH)	Silica	3.8%	Yes	50µm	60Å	Aromatic structure	Highly selective for aromatic compounds.

Alltech® Reversed-Phase Extract-Clean™ Columns

Bed Weight	Column Size	Qty.	Part No.
<i>Prevail™ C18</i>			
100mg	1.5mL	100	605001
130mg	4.0mL	50	605130
500mg	4.0mL	50	605250
500mg	8.0mL	30	605350
1000mg	8.0mL	30	605430
<i>Standard C18</i>			
50mg	1.5mL	100	204900
100mg	1.5mL	100	205000
200mg	4.0mL	50	205150
500mg	4.0mL	50	205250
500mg	8.0mL	30	205350
1000mg	8.0mL	30	205430
2000mg	8.0mL	30	205450
2000mg	15mL	30	205462
5000mg	25mL	20	225450
10,000mg	75mL	16	235410
<i>High-Flow C18</i>			
500mg	4.0mL	50	215250
1000mg	8.0mL	30	215430
<i>High-Capacity C18</i>			
50mg	1.5mL	100	255050
100mg	1.5mL	100	255100
200mg	4.0mL	50	255200
500mg	4.0mL	50	255300
500mg	8.0mL	30	255350
1000mg	8.0mL	30	255430
2000mg	15mL	30	255440
5000mg	25mL	20	255450
10,000mg	75mL	16	255460

Alltech® Reversed-Phase Extract-Clean™ Columns (continued)

Bed Weight	Column Size	Qty.	Part No.
<i>Octyl (C8)</i>			
100mg	1.5mL	100	206000
200mg	4.0mL	50	206150
500mg	4.0mL	50	206250
500mg	8.0mL	30	206350
<i>Ethyl (C2)</i>			
100mg	1.5mL	100	207300
200mg	4.0mL	50	207450
500mg	4.0mL	50	207550
10,000mg	75mL	16	207616
<i>Phenyl (PH)</i>			
50mg	1.5mL	100	232062
100mg	1.5mL	100	232000
200mg	4.0mL	50	232150
500mg	4.0mL	50	232300

Alltech® Reversed-Phase Ultra-Clean™ SPE Columns

Bed Weight	Column Size	Qty.	Part No.
<i>Standard C18</i>			
200mg	4.0mL	50	505150
500mg	8.0mL	30	505355
<i>Octyl (C8)</i>			
200mg	4.0mL	50	506151
500mg	4.0mL	50	506251
500mg	8.0mL	30	506351

more info

For SPE Applications, see pages 494–502.

Alltech® Extract-Clean™ and Ultra-Clean™ Columns

Normal-Phase Sorbents



Extract-Clean™ Columns

- Available: Silica (SI), Aminopropyl (NH₂), Cyanopropyl (CN), Diol (2OH), Florisil® (FL), Florisil®-PR (FL-PR), Alumina Acidic (AL-A), Alumina Acidic (AL-B), Alumina Neutral (AL-N)
- General purpose SPE column with the most comprehensive sorbent offering



Ultra-Clean™ Columns

- Available: Silica (SI), Aminopropyl (NH₂), Florisil® (FL), Florisil®-PR (FL-PR)
- Low extractable version for highly sensitive applications—fluorinated polypropylene columns with PTFE frits



Normal-Phases (Polar) Sorbent Specifications							
Functional Group	Base	% Carbon	End-capped	Average Particle Size	Pore Size	Features	Benefits
Silica (SI)	Silica	—	—	50µm	60Å	Highly polar surface	Most common polar phase.
Aminopropyl (NH ₂)	Silica	5.0%	No	50µm	60Å	Polar phase with slight anion exchange properties	Ideal for carbohydrates or generally with analyses containing hydroxyl functional groups.
Cyanopropyl (CN)	Silica	6.0%	Yes	50µm	60Å	Unique selectivity	Can be used in normal-phase or reversed-phase modes.
Diol (2OH)	Silica	4.0%	No	50µm	60Å	Polar surface with minor hydrophobic retention	
Florisil® (FL)	Magnesium Silicate	—	—	75–150µm	60Å	Highly polar surface	Referenced in many EPA methods. Ideally suited for pesticides and metals.
Florisil®-PR (FL-PR)	Magnesium Silicate	—	—	75–150µm	60Å	Specifically tested for chlorinated pesticides	Ensures most inert batches suitable for highly active compounds.
Alumina Acidic (AL-A)	Aluminum Oxide	—	—	130µm	100Å	Alumina washed with acid surface	Increase capacity for acidic compounds.
Alumina Basic (AL-B)	Aluminum Oxide	—	—	130µm	100Å	Alumina washed with base surface	Increase capacity for basic compounds.
Alumina Neutral (AL-N)	Aluminum Oxide	—	—	130µm	100Å	Alumina washed with neutral surface	Interacts with highly aromatic compounds and neutral hydroxyls.

Alltech® Normal-Phase Extract-Clean™ Columns

Bed Weight	Column Size	Qty.	Part No.
<i>Silica (SI)</i>			
50mg	1.5mL	100	209062
100mg	1.5mL	100	209000
200mg	4.0mL	50	209150
500mg	4.0mL	50	209250
500mg	8.0mL	30	209200
1000mg	8.0mL	30	209100
2000mg	8.0mL	30	209202
2000mg	15mL	30	209362
5000mg	25mL	20	22935
10,000mg	25mL	20	239300
10,000mg	75mL	16	239310
20,000mg	75mL	16	239322
30,000mg	75mL	16	239330
<i>Aminopropyl (NH₂)</i>			
100mg	1.5mL	100	211000
200mg	4.0mL	50	211025
500mg	4.0mL	50	211150
500mg	8.0mL	30	211256
1000mg	8.0mL	30	211153
<i>Cyanopropyl (CN)</i>			
100mg	1.5mL	100	209300
200mg	4.0mL	50	209450
500mg	4.0mL	50	209550
500mg	8.0mL	30	209650
<i>Diol (2OH)</i>			
100mg	1.5mL	100	208000
200mg	4.0mL	50	208150
500mg	4.0mL	50	208250
<i>Florisil® (FL)</i>			
100mg	1.5mL	100	204500
500mg	4.0mL	50	204650
1000mg	8.0mL	30	207930
2000mg	15mL	30	207962

Alltech® Normal-Phase Extract-Clean™ Columns (continued)

Bed Weight	Column Size	Qty.	Part No.
<i>Florisil® (FL) (continued)</i>			
5000mg	25mL	20	227950
10,000mg	75mL	16	237910
<i>Florisil®-PR (FL-PR)</i>			
500mg	4.0mL	50	250015
1000mg	8.0mL	30	250020
10,000mg	75mL	16	250910
<i>Alumina Acidic (AL-A)</i>			
100mg	1.5mL	100	228200
500mg	4.0mL	50	228350
<i>Alumina Basic (AL-B)</i>			
100mg	1.5mL	100	228000
500mg	4.0mL	50	228150
<i>Alumina Neutral (AL-N)</i>			
100mg	1.5mL	100	228400
500mg	4.0mL	50	228550
2000mg	15mL	30	22856

Alltech® Normal-Phase Ultra-Clean™ SPE Columns

Bed Weight	Column Size	Qty.	Part No.
<i>Silica (SI)</i>			
200mg	4.0mL	50	509150
500mg	8.0mL	30	509225
5000mg	25mL	20	509010
<i>Aminopropyl (NH₂)</i>			
200mg	4.0mL	50	511025
500mg	4.0mL	50	511150
<i>Florisil® (FL)</i>			
500mg	4.0mL	50	507851
1000mg	8.0mL	30	507930
<i>Florisil®-PR (FL-PR)</i>			
500mg	4.0mL	50	504651
1000mg	8.0mL	30	507900

Alltech® Extract-Clean™ and Ultra-Clean™ Columns

Ion-Exchange Sorbents



Extract-Clean™ Columns

- Available: SCX, SAX, IC-OH, IC-H, IC-Ag, IC-Ba, IC-Na, IC-Chelate, IC-RP
- General purpose SPE column with the most comprehensive sorbent offering



Ultra-Clean™ Columns

- Available: SCX, SAX
- Low extractable version for highly sensitive applications—fluorinated polypropylene columns with PTFE frits



Ion-Exchange Sorbent Specifications							
Packing	Base	Counter Ion	Particle Size	Functional Group	Exchange Capacity	Retains	Applications
SCX	Styrene-DVB	Hydrogen	50µm	Benzene Sulfonic Acid	2.0meq/mL	Cations, (+) charged compounds	Remove/concentrate basic compounds
SAX	Styrene-DVB	Acetate	50µm	Tetramethyl Ammonium	1.0meq/mL	Anions, (–) charged compounds	Remove/concentrate basic compounds

Ion Chromatography Sorbent Specifications							
Packing	Base	Counter Ion	Particle Size	Molecular Exclusion Limit	Exchange Capacity	Retains	Applications
IC-OH	Styrene-DVB	Hydroxide	50µm	1000 Daltons	1.0meq/mL	Anions	Exchanges anions for hydroxide. May be used to remove or concentrate anions from sample and to increase pH of acidic samples. Removes cations that form insoluble hydroxide salts.
IC-H	Styrene-DVB	Hydronium	50µm	1000 Daltons	2.0meq/mL	Cations	Exchanges cations for H ⁺ . May be used to remove or concentrate cations from sample and to reduce pH of basic samples.
IC-Ag	Styrene-DVB	Silver	50µm	1000 Daltons	2.0meq/mL	Chloride Iodide Bromide	Removes excess halides through formation of Ag-halide salts.
IC-Ba	Styrene-DVB	Barium	50µm	1000 Daltons	2.0meq/mL	Sulfate	Removes excess sulfate through formation of BaSO ₄ .
IC-Na	Styrene-DVB	Sodium	50µm	1000 Daltons	2.0meq/mL	Cations	Exchanges cations for Na ⁺ . May be used to remove or retain cations from sample without changing the pH of the sample.
IC-Chelate	Styrene-DVB	Sodium	50µm	1000 Daltons	0.4meq/mL	Polyvalent metal ions	Exchanges transition metals and divalent cations for Na ⁺ . May be used to remove or retain divalent cations and transition metals from sample.
IC-RP	Polystyrene	—	550µm	—	—	Hydrophobic components	Removes surfactants, organic acids, and other organic substances. Inorganic ions pass through.

General Ion-Exchange Extract-Clean™ Columns

Bed Weight	Column Size	Qty.	Part No.
SCX			
100mg	1.5mL	100	209800
200mg	4.0mL	50	209825
500mg	4.0mL	50	209950
1000mg	8.0mL	30	209930
SAX			
100mg	1.5mL	100	209600
200mg	4.0mL	50	209625
500mg	4.0mL	50	209750
1000mg	8.0mL	30	209850

General Ion-Exchange Ultra-Clean™ Columns

Bed Weight	Column Size	Qty.	Part No.
SCX			
200mg	4.0mL	50	509826
500mg	4.0mL	50	509951
SAX			
200mg	4.0mL	50	509626
500mg	4.0mL	50	509751

Ion Chromatography Extract-Clean™ Columns

Packing	Bed Weight	Column Size	Qty.	Part No.
IC-OH	0.5mL	4.0mL	50	40262
IC-OH	1.5mL	4.0mL	30	140254
IC-H	0.5mL	4.0mL	50	40264
IC-H	1.5mL	4.0mL	30	140256
IC-Ag	0.5mL	4.0mL	50	105050
IC-Ag	1.5mL	4.0mL	30	140258
IC-Ba	0.5mL	4.0mL	50	40268
IC-Ba	1.5mL	4.0mL	30	140261
IC-Na	0.5mL	4.0mL	50	40270
IC-Na	1.5mL	4.0mL	30	140263
IC-Chelate	0.5mL	4.0mL	50	40250
IC-Chelate	1.5mL	4.0mL	30	140265
IC-RP	0.5mL	4.0mL	50	40260
IC-RP	1.5mL	4.0mL	30	140252

more info

For SPE Applications, see pages 494–502.

Alltech® Extract-Clean™ and Ultra-Clean™ Columns

Specialty Sorbents



Extract-Clean™ Columns

- Available: DVB, Carbograph, AFT, Filter, Phase Separator, Drying
- General purpose SPE column with the most comprehensive sorbent offering



Ultra-Clean™ Columns

- Available: Carbograph
- Low extractable version for highly sensitive applications—fluorinated polypropylene columns with PTFE frits



Specialty Packings Specifications							
Packing	Base	% Carbon	End-capped	Average Particle Size	Pore Size	Features	Benefits
DVB	100% DVB	—	—	40µm	—	100% DVB	Greater capacity than C18 for general SPE. Also free vinyl surface groups make a suitable solid-phase synthesis support.
Carbograph	Graphitized Carbon	—	—	38–125µm	—	Graphitized carbon	Retains polar organics in aqueous matrices. Ideally suited for acid, base-neutral extraction of pesticides and herbicides.
AFT	C18, Silica, and Alumina	6	—	50–130µm	—	Unique blend of reversed and normal phases	Ideal for Aflatoxins.

DVB Extract-Clean™ Columns

- Greater sample capacity than C18
- 100% divinylbenzene reduces swelling
- 40µm average particle size

DVB Extract-Clean™ Columns

Bed Weight	Column Size	Qty.	Part No.
25mg	1.5mL	100	220025
50mg	1.5mL	100	220050
100mg	1.5mL	100	220100
500mg	4.0mL	50	220500

Carbograph Extract-Clean™ Columns

- Graphitized carbon retains polar organics in aqueous matrices
- Acid, base-neutral extraction of pesticides and herbicides
- 100m²/g surface area

Carbograph Extract-Clean™ Columns

Bed Weight	Column Size	Qty.	Part No.
150mg	4.0mL	50	210142
300mg	8.0mL	30	210101
500mg	8.0mL	30	210150
1000mg	15mL	20	210121

Carbograph Ultra-Clean™ Columns

Bed Weight	Column Size	Qty.	Part No.
150mg	4.0mL	50	510142
300mg	8.0mL	30	510101

AFT Extract-Clean™ Columns

This blend of C18 and Alumina materials offers unique selectivity for Mycotoxin removal. AFT Tubes are ideal for food and beverage analysis.

AFT Extract-Clean™ Columns

Bed Weight	Column Size	Qty.	Part No.
8.0mL	1000mg	100	229101

Phase Separator Extract-Clean™ Columns

Use for fast and simple separation of organic and aqueous mixed samples. The column contains a 20µm polyethylene frit and a hydrophobic silicone membrane that allows the hydrophobic phase to pass through, while the aqueous phase is retained in the upper chamber.

Phase Separator Extract-Clean™ Columns

Column Size	Qty.	Part No.
4.0mL	100	205289
8.0mL	100	205389
25mL	100	205589

Filter Columns

Filter columns are Extract-Clean™ reservoirs with two frits at the outlet end. They remove particulate matter down to 20µm from samples. Syringe adapters will connect filter columns to the tops of Extract-Clean™ columns.

Extract-Clean™ Filter Columns

Description	Qty.	Part No.
1.5mL Filter Columns	100	211101
4.0mL Filter Columns	50	211104
8.0mL Filter Columns	50	211108
75.0mL Filter Columns	50	210775

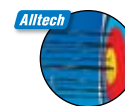
Drying Tubes

Packed with anhydrous sodium sulfate, use these to remove residual water from SPE extracts. They are suitable for pesticide analysis.

Drying Tubes

Bed Weight	Qty.	Part No.
Extract-Clean™ Column, 3g	100	219002

Alltech® Extract-Clean™ Columns



Specialty Columns

Drug-Clean PB Mixed-Mode SPE Columns

- Polymer based
- Extract acidic, basic, and neutral compounds from one column
- Stable from pH 1 to 14
- No conditioning steps required
- Faster flow rates than silica-based materials

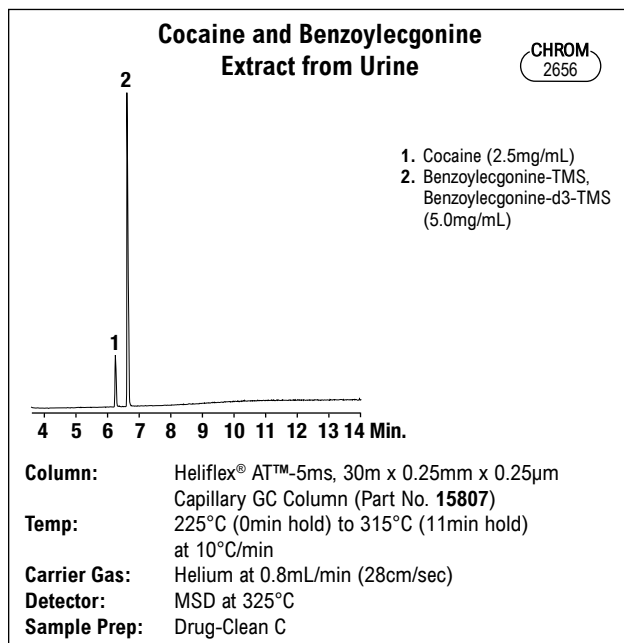
Drug-Clean PB has a C18/SCX cation function on a highly cross-linked styrene divinylbenzene base. The high sorbent capacity greatly reduces the amount of packing required for separation and makes this material ideal for use in 96-well plates—see page 311.

Each box of columns includes extraction methods for amphetamines, opiates, cocaine/benzoyllecgonine, phencyclidine, and carboxy-THC.

Drug-Clean PB Specifications	
Functional Group:	C18/Cation Function
Base:	30µm Styrene/DVB Polymer
Retention Mechanism:	Mixed-mode, reversed-phase, and ion-exchange

Drug-Clean PB SPE Columns

Bed Weight	Column Size	Qty.	Part No.
30mg	1.5mL	100	250120
30mg	4.0mL	50	250130
50mg	8.0mL	50	250140



Drug-Clean SB Mixed-Mode SPE Columns

- Silica based
- Efficient—higher recoveries with minimal impurities compared to single mode extractions
- Multi-functional—extract acidic, neutral, and basic compounds with a single SPE bed
- Reproducible—true copolymer is cleaner and more accurate than mixed beds

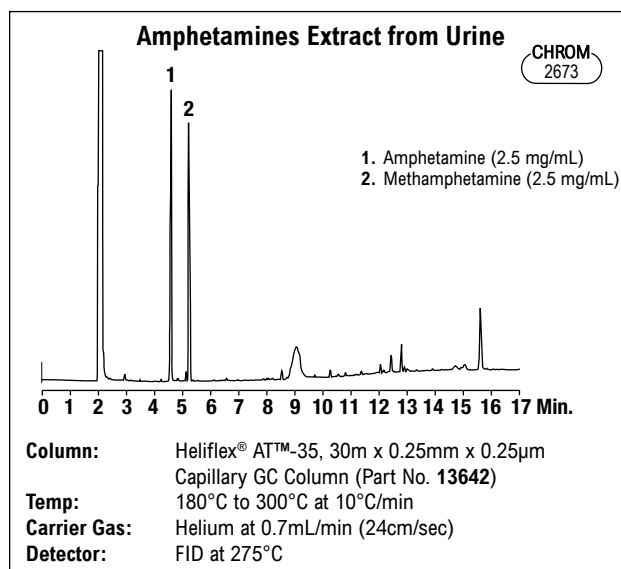
Drug-Clean C is a C8/SCX cation function. Retain neutral or amine containing compounds while carboxylate groups pass through. Drug-Clean A is a C8/SAX anion function. Retain neutral or carboxylate compounds while amine group retention is minimized.

Each box of columns includes extraction methods for the most popular NIDA drugs of abuse.

Drug-Clean SB Specifications	
Functional Group:	C8/Ion-Exchange
Base:	50µm irregular silica, 60Å
Retention Mechanism:	Mixed-mode, reversed-phase, and ion-exchange

Drug-Clean SB Columns

Bed Weight	Column Size	Qty.	Part No.
<i>Drug-Clean C (Mixed-Mode Cation) Columns</i>			
100mg	1.5mL	100/pk	207015
200mg	4.0mL	50/pk	207010
500mg	4.0mL	50/pk	207017
500mg	8.0mL	30/pk	207019
<i>Drug-Clean A (Mixed-Mode Anion) Columns</i>			
100mg	1.5mL	100/pk	207030
200mg	4.0mL	50/pk	207034



tech tip

Why is a “True Copolymer” better than a mixed bed?

By definition, a mixed-mode packing contains two different functional groups on the same sorbent. To minimize costs, two individual packings are sometimes blended together physically and packed in a tube. This gives the effect of a mixed-mode but in fact is a mixed-bed packing with batch-to-batch reproducibility dependent on the blending skills of the manufacturer. A true mixed-mode has the functional groups polymerized on the same silica base. This copolymer treatment assures a more predictable packing performance which means more reproducible results from tube to tube, batch to batch.

Alltech® Maxi-Clean™ Cartridges



Save Time and Maximize Sample Preparation Efficiency

Maxi-Clean™ cartridges have the same bed dimensions as 4mL SPE columns for easy method cross-over. Process a single cartridge by syringe or multiple cartridges by vacuum. Maxi-Clean™ cartridges allow you to stack different cartridges for multi-step extractions. Use top and bottom caps for easy transport of field samples. Here's 10 different ways these cartridges can be used to address difficult extractions and SPE protocols.

1. Bulk Preconditioning on a Vacuum Manifold

Save time and solvents by preconditioning Maxi-Clean™ Cartridges on a vacuum manifold. Double stack for even faster preparation.



6080

2. Direct Substitution into Methods Using Standard 4mL Columns

Maxi-Clean™ Cartridges have the same bed dimensions as traditional 4mL SPE columns, for easy substitution into established protocols.



6085

3. Stack Two Cartridges in Series for Complex Separations

Maxi-Clean™ Cartridges can be stacked to combine two phases into one extraction step for complex analyses. You can even elute each phase individually, if desired.



6082

4. Elute Anywhere

Use a syringe to elute your analyte anywhere—directly into an injection valve, or into other receiver vessels. You can even attach a needle and elute directly through a septa or 96-well sealing mat.



6083

5. Combine SPE with Filtration by Adding a Filter Tube or Syringe Filter in Series

The Maxi-Clean™ Cartridge's luer connections allow you to add a syringe filter or a fritted SPE tube to remove particulates before your sample enters the SPE bed.



6084

6. Easy to Transport and Store

Use top and bottom caps to transport or store a Maxi-Clean™ Super Cartridge containing your analyte, without risking contamination or dehydration.



6086

7. Process Individually or in Parallel

Do you only have a few samples to process? Process them with a syringe, instead of setting up a vacuum manifold. Do you have a lot of samples to process? Add an empty reservoir to process them simultaneously on your manifold.



6091



6087

8. Use In-line

The Maxi-Clean™ cartridge's luer connections allow you to use them in-line, to remove contaminants or act as a "guard" cartridge in low-pressure applications.



6088

9. Custom-fit to Your Sample Size

By changing reservoir sizes, you can customize a Maxi-Clean™ Cartridge to fit your sample size without changing the bed dimensions.



6089

10. Choose from 23 Chemistries

The Maxi-Clean™ line is offered in many of the same media as the Extract-Clean™ line, but slightly paired down, with over 20 chemistries available.



6090

Alltech® Maxi-Clean™ Cartridges

Reversed-Phase Cartridges

- Same bed dimensions as 4mL SPE columns for method cross-over
- Process a single cartridge by syringe or multiple cartridges by vacuum
- Stack different cartridges for multi-step extractions
- Use top and bottom caps for easy transport of field samples



Reversed-Phases (Non-Polar) Sorbent Specifications							
Packing	Base	% Carbon	End-capped	Average Particle Size	Pore Size	Features	Benefits
Prevail™ C18	Silica	11.0%	Yes	50µm	60Å	100% water wettable	Hydrophilic/hydrophobic retention. Phase remains active even when completely dry. Can omit preconditioning step.
Standard C18	Silica	6.0%	Yes	50µm	60Å	Low carbon load C18	General purpose phase.
High-Flow C18	Silica	8.0%	Yes	100µm	60Å	Large particle	Less flow resistance for faster flow rates of large volume sample.
High-Capacity C18	Silica	17.0%	Yes	50µm	60Å	High carbon load	Maximum capacity phase.
Large Pore C18	Silica	14.0%	Yes	50µm	150Å	Larger than average pore size	Ideal for compounds >1500MW.
Octyl (C8)	Silica	4.5%	Yes	50µm	60Å	Less hydrophobic than C18	Less retention of highly hydrophobic compounds. Use when C18 is too retentive.
Ethyl (C2)	Silica	5.5%	Yes	50µm	60Å	Short chain functional group is less hydrophobic than C8	Less retention of highly hydrophobic compounds. Use when C8 is too retentive.
Phenyl (PH)	Silica	3.8%	Yes	50µm	60Å	Aromatic structure	Highly selective for aromatic compounds.

Maxi-Clean™ Reversed-Phase Cartridges

Packing	Bed Weight	Qty.	Part No.
Prevail™ C18	300mg	50	605926
	500mg	50	605929
	900mg	50	605942
Standard C18	300mg	25	20924
	300mg	50	20926
	300mg	100	20928
	600mg	25	20932
	600mg	50	20934
	600mg	100	20936
	900mg	25	20940
	900mg	50	20942
	900mg	100	20944
High-Capacity C18	300mg	50	20945
Large Pore C18	300mg	100	22012
	600mg	100	22017
	900mg	100	220215
Octyl (C8)	300mg	50	20950
	600mg	50	20958
	900mg	50	20966
Ethyl (C2)	300mg	50	210064
Phenyl (PH)	300mg	25	22002
	300mg	50	22003
	300mg	100	22004

Maxi-Clean™ Drying Cartridges

Packing	Bed Weight	Qty.	Part No.
Sodium Sulfate	3g	100	219001

tech tip

What is a Maxi-Clean™ cartridge?

A Maxi-Clean™ cartridge is an alternative format for SPE. It uses the same high-quality packing materials as the Extract-Clean™ columns but has a polypropylene housing with both a female luer inlet and a male luer outlet tip. This allows use of positive pressure from a syringe or negative pressure from a vacuum manifold. 20µm polyethylene frits are placed at each end of the sorbent bed. The packing material is packed and compressed to improve or optimize flow characteristics.



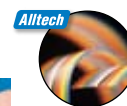
related products

Looking for vacuum manifolds?
See pages 314–315 for vacuum manifolds to process samples.

more info

For SPE Applications, see pages 494–502.

Alltech® Maxi-Clean™ Cartridges



Normal-Phase Cartridges

- Same bed dimensions as 4mL SPE columns for method cross-over
- Process a single cartridge by syringe or multiple cartridges by vacuum
- Stack different cartridges for multi-step extractions
- Use top and bottom caps for easy transport of field samples



Normal-Phases (Polar) Sorbent Specifications							
Packing	Base	% Carbon	End-capped	Average Particle Size	Pore Size	Features	Benefits
Silica (SI)	Silica	—	—	50µm	60Å	Highly polar surface	Most common polar phase.
Aminopropyl (NH ₂)	Silica	5.0%	No	50µm	60Å	Polar phase with slight anion exchange properties	Ideal for carbohydrates or generally with analyses containing hydroxyl functional groups.
Cyanopropyl (CN)	Silica	6.0%	Yes	50µm	60Å	Unique selectivity	Can be used in normal-phase or reversed-phase modes.
Diol (2OH)	Silica	4.0%	No	50µm	60Å	Polar surface with minor hydrophobic retention	Wets easily and offers more reproducibility.
Florisil® (FL)	Magnesium Silicate	—	—	75–150µm	60Å	Highly polar surface	Referenced in many EPA methods. Ideally suited for pesticides and metals.
Florisil®-PR (FL-PR)	Magnesium Silicate	—	—	75–150µm	60Å	Specifically tested for chlorinated pesticides	Ensures most inert batches suitable for highly active compounds.
Alumina Acidic (AL-A)	Aluminum Oxide	—	—	130µm	100Å	Alumina washed with acid surface	Increase capacity for acidic compounds.
Alumina Basic (AL-B)	Aluminum Oxide	—	—	130µm	100Å	Alumina washed with base surface	Increase capacity for basic compounds.
Alumina Neutral (AL-N)	Aluminum Oxide	—	—	130µm	100Å	Alumina washed with neutral surface	Interacts with highly aromatic compounds and neutral hydroxyls.

Maxi-Clean™ Normal-Phase Cartridges

Packing	Bed Weight	Qty.	Part No.
Silica (SI)	300mg	25	20972
	300mg	50	20974
	300mg	100	20976
	600mg	25	20980
	600mg	50	20982
	600mg	100	20984
	900mg	25	20988
	900mg	50	20990
	900mg	100	20992
Aminopropyl (NH ₂)	300mg	50	210044
	300mg	100	210046
	900mg	100	210047
Cyanopropyl (CN)	300mg	50	210034
	300mg	100	210036
Diol (2OH)	300mg	50	210084
	300mg	100	210086
Florisil® (FL)	300mg	50	210054
	300mg	100	210056
	900mg	50	210057
	900mg	100	210061
Florisil®-PR (FL-PR)	300mg	50	210074
	300mg	100	210076
	900mg	50	210079
	900mg	100	210075
Alumina Acidic (AL-A)	300mg	25	210094
	1800mg	25	210097
Alumina Basic (AL-B)	300mg	25	210093
	1800mg	25	210096
Alumina Neutral (AL-N)	300mg	25	210095
	1800mg	25	210098

related products

Looking for standard luer-hub syringes to process Maxi-Clean™ cartridges?
See page 347.



technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)
Email: contact.alltech@grace.com
Online: www.discoverysciences.com

Alltech® Maxi-Clean™ Cartridges



Ion-Exchange Cartridges

- Eliminate matrix interferences before ion analysis
- Seven chemistries solve a variety of specific problems

The most difficult part of many IC applications is eliminating interfering components from the sample matrix. These interferences may co-elute or mask peaks of interest, overload the column, or shorten the column life by binding irreversibly to the column packing. The Alltech® unique ion-exchange SPE cartridge eliminates many of these interferences^{1,2}.



Each metal-free polypropylene cartridge contains 0.5mL or 1.5mL of purified polystyrene resin, contained by 20µm polyethylene frits. The resin is functionalized to retain specific types of components from the sample.

4893

¹R. Saari-Nordhaus, J.M. Anderson, Jr., and I.K. Henderson, *Am. Lab.* August (1990) 19.

²I.K. Henderson, R. Saari-Nordhaus, and J.M. Anderson, Jr., *J. Chromatogr.* 546 (1991) 61.

Ion-Exchange Sorbent Specifications

Packing	Base	Counter Ion	Particle Size	Functional Group	Exchange Capacity	Retains	Applications
SCX	Styrene-DVB	Hydrogen	50µm	Benzene Sulfonic Acid	2.0meq/mL	Cations, (+) charged compounds	Remove/concentrate basic compounds.
SAX	Styrene-DVB	Acetate	50µm	Tetramethyl Ammonium	1.0meq/mL	Anions, (–) charged compounds	Remove/concentrate basic compounds.

Ion Chromatography Sorbent Specifications

Packing	Base	Counter Ion	Particle Size	Molecular Exclusion Limit	Exchange Capacity	Retains	Applications
IC-OH	Styrene-DVB	Hydroxide	50µm	1000 Daltons	1.0meq/mL	Anions	Exchanges anions for hydroxide. May be used to remove or concentrate anions from sample and to increase pH of acidic samples. Removes cations that form insoluble hydroxide salts.
IC-H	Styrene-DVB	Hydronium	50µm	1000 Daltons	2.0meq/mL	Cations	Exchanges cations for H ⁺ . May be used to remove or concentrate cations from sample and to reduce pH of basic samples.
IC-Ag	Styrene-DVB	Silver	50µm	1000 Daltons	2.0meq/mL	Chloride Iodide Bromide	Removes excess halides through formation of Ag-halide salts.
IC-Ba	Styrene-DVB	Barium	50µm	1000 Daltons	2.0meq/mL	Sulfate	Removes excess sulfate through formation of BaSO ₄ .
IC-Na	Styrene-DVB	Sodium	50µm	1000 Daltons	2.0meq/mL	Cations	Exchanges cations for Na ⁺ . May be used to remove or retain cations from sample without changing the pH of the sample.
IC-Chelate	Styrene-DVB	Sodium	50µm	1000 Daltons	0.4meq/mL	Polyvalent metal ions	Exchanges transition metals and divalent cations for Na ⁺ . May be used to remove or retain divalent cations and transition metals from sample.
IC-RP	Polystyrene	—	550µm	—	—	Hydrophobic components	Removes surfactants, organic acids, and other organic substances. Inorganic ions pass through.

solid phase extraction

General Ion-Exchange Maxi-Clean™ Cartridges

Packing	Bed Weight	Qty.	Part No.
SCX	600mg	25	21901
	600mg	50	21902
	600mg	100	21903
SAX	600mg	25	21906
	600mg	50	21907
	600mg	100	21908

Ion Chromatography Maxi-Clean™ Cartridges

Packing	Bed Weight	Qty.	Part No.
IC-OH	0.5mL	50	30262
IC-OH	1.5mL	25	30254
IC-H	0.5mL	50	30264
IC-H	1.5mL	25	30256
IC-Ag	0.5mL	50	30266
IC-Ag	1.5mL	25	30258
IC-Ba	0.5mL	50	30268
IC-Ba	1.5mL	25	30261
IC-Na	0.5mL	50	30270
IC-Na	1.5mL	25	30263
IC-Chelate	0.5mL	50	30250
IC-Chelate	1.5mL	25	30265
IC-RP	0.5mL	50	30260
IC-RP	1.5mL	25	30252
Mixed-Mode RP-OH	0.5mL	25	30259
Mixed-Mode RP-H	0.5mL	25	30267

Alltech® 96-Well Plates

- High-throughput SPE devices
- Standard 96-Well format
- Square 2mL wells



4888

Prevail™ C18 96-Well Plates

Bed Weight	Well Volume	Qty.	Part No.
25mg	2.0mL	1	8619193
50mg	2.0mL	1	8619192
100mg	2.0mL	1	8619191

Standard C18 96-Well Plates

Bed Weight	Well Volume	Qty.	Part No.
25mg	2.0mL	1	214996
50mg	2.0mL	1	204996
100mg	2.0mL	1	224996

Silica 96-Well Plates

Bed Weight	Well Volume	Qty.	Part No.
25mg	2.0mL	1	219096
50mg	2.0mL	1	209096
100mg	2.0mL	1	229096

SAX 96-Well Plates

Bed Weight	Well Volume	Qty.	Part No.
25mg	2.0mL	1	219696
50mg	2.0mL	1	209696
100mg	2.0mL	1	229696

SCX 96-Well Plates

Bed Weight	Well Volume	Qty.	Part No.
25mg	2.0mL	1	219896
50mg	2.0mL	1	209896
100mg	2.0mL	1	229896

Drug-Clean 96-Well Plate

Bed Weight	Qty.	Part No.
30mg per Well	ea	250150

related products

Looking for empty
96-Well plates?
Refer to page 316.

Vydac® SPE Columns

For Extraction, Concentration and Clean-up of Biological Samples

Vydac® SPE columns are disposable sample clean-up devices which complement Grace Vydac® HPLC columns. The media are the same high-quality silica bonded with the same chemistries used in Vydac® 300Å TP reversed-phase HPLC columns, giving Vydac® SPE columns similar selectivity and recovery.

Applications for Vydac® SPE columns:

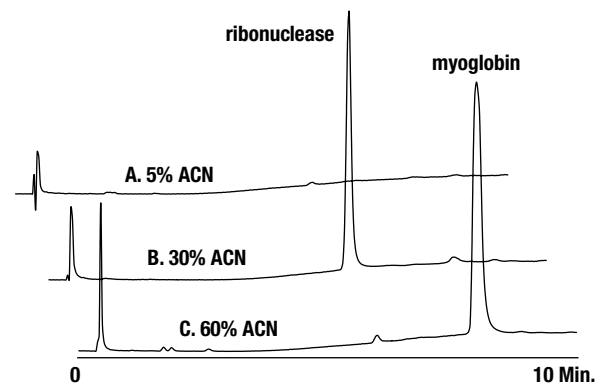
- Desalting of polypeptide solutions
- Concentration of proteins and peptides
- Removal of HF and cleavage products from cleavage solutions
- Removal of lipids and strongly bound proteins
- Improvement of HPLC resolution by prior removal of early and late eluting by-products or reagents
- Preparation of environmental and food samples

Vydac® SPE Columns

	Column Size	Pkg.	Part No.
C4, 13µm	1 mL	50	214SPE1000
	3 mL	50	214SPE3000
C18, 13µm	1 mL	50	218SPE1000
	3 mL	50	218SPE3000



Solid-Phase Extraction Example



Column: Vydac® 214TP5405, C4, 5µm, 4.6 x 50mm
Gradient: 15 to 70% ACN over 10min, with 0.1% TFA

A 3mL SPE column was conditioned with 1mL of ACN followed by 1mL of 5% ACN/0.1% TFA. Ribonuclease and myoglobin (100mg each) were then loaded in 30% ACN/0.1% TFA. The column was washed with 1mL of 5% ACN/0.1% TFA to remove weakly bound compounds, then 1mL of 30% ACN/0.1% TFA followed by 1mL of 60% ACN/0.1% TFA. HPLC analysis of the 5% ACN wash (A) revealed only a small amount of ribonuclease. Most of the ribonuclease eluted in the 30% ACN wash (B). The myoglobin eluted almost entirely in the 60% ACN wash (C).

GracePure™ SPE Sorbent Specifications

- Ideal for cost-conscious labs
- Concise offering of popular sorbents



GracePure™ SPE products have a concise offering of sorbents suitable for a variety of applications. Whether pharmaceutical or petrochemical, these products deliver the selectivity and high recovery you expect. Use this guide to help you choose the appropriate sorbent, bed size, and solvent volumes to ensure you have a cleaner, more concentrated sample at the end of your SPE process.

Reversed-Phase (Non-Polar) Sorbents Specifications									
Sorbent	Support	% Carbon	Endcapping	Surface Area	Particle Size	Pore Size	Feature	Benefit	Application Type
C18-Max	Silica	17.1%	Yes	518m ² /g	50µm	60Å	Polymerically bonded 17% carbon load	Highest binding capacity, best for complex samples or structurally diverse analytes.	Drugs and their metabolites in serum and plasma, pesticides
C18-Aq	Silica	12.5%	Yes	518m ² /g	50µm	60Å	Hydrophilic endcapping	Water-wettable C18 ideal for aqueous samples. Phase remains active even when completely dry.	Desalting proteins, pharmaceuticals, hormones, pesticides, organics in water
C18-Low	Silica	6.5%	Yes	518m ² /g	50µm	60Å	Least hydrophobic C18 phase	C18 phase that easily releases very hydrophobic compounds.	Surfactants, oils, antibiotics
C18-Fast	Silica	7.0%	Yes	518m ² /g	100µm	60Å	Large 100µm particle	Process large volume (>500mL) or viscous samples with fast flow rates.	Aniline, pesticides, haloethers, phthalate esters, EPA 3620, 3610
TMS	Silica	5.6%	No	518m ² /g	50µm	60Å	Low carbon load trimethyl silane phase	Least hydrophobic reversed-phase elutes non-polar compounds easily. Short carbon chain has little steric hindrance to uniformly cover silica surface.	Oils, dyes, surfactants

Normal-Phase (Polar) Sorbents Specifications									
Sorbent	Support	% Carbon	Endcapping	Surface Area	Particle Size	Pore Size	Feature	Benefit	Application Type
Silica	Silica	N/A	N/A	518m ² /g	50µm	60Å	Most polar phase	Able to differentiate between structurally similar compounds.	Aflatoxins, pesticides, steroids, structural isomers
Amino	Silica	4.3%	No	518m ² /g	50µm	60Å	Dual retention	Retains polar compounds, or can act as a weak anion exchanger. Easily releases strong acids when SAX binds too strongly.	Carbohydrates, dyes, lipids, mycotoxins, strong acids
Diol	Silica	N/A	No	518m ² /g	50µm	60Å	Reproducible polar bonded phase	Very polar phase that has the same benefits as silica, but wets easily and offers more reproducibility.	Alkaloids, lipids, oils, structural isomers
Florisil®	Magnesium Silicate	N/A	No		120µm	60Å	Alternates polar phase	Large particle size processes large sample sizes quickly.	Environmental

Ion-Exchange Sorbents Specifications							
Sorbent	Support	Exchange Capacity	Counter Ion	Particle Size	Feature	Benefit	Application Type
Anion-X	8% cross-linked styrene-divinylbenzene	1.5meq/g	Acetate form	50µm	Tetramethyl ammonium functional group on polymer base material	pH range from 1–14, with excellent exchange capacity.	Anionic compounds: organic acids, fatty acids
Cation-X	8% cross-linked styrene-divinylbenzene	2.4meq/g	Hydrogen form	50µm	Benzene sulfonic acid functional group on polymer base material	pH range from 1–14, with excellent exchange capacity.	Cationic compounds: amines, amino acids

GracePure™ SPE Columns

new



Quality Assurance Certificate

Base Material Properties

GracePure™ base silicas are characterized multiple ways to ensure that the starting point for every batch of media is consistent. Parameters that can directly affect SPE results are shown for lot-to-lot comparison.

Sorbent Characterization

Tight specifications promise clean and reproducible sorbent performance. An HPLC chromatogram offers a detailed look at selectivity that is not possible with recovery tests alone. Turbidity measurements after sorbent bonding confirm that fines were not created during the manufacturing process.

Component Tests

GC/FID shows that GracePure™ tubes are constructed from a highly inert grade of polypropylene to prevent extractable contamination. Polyethylene frits are thoroughly washed in organic solvent which also eliminates extractables.

Manufacturing Control

GracePure™ SPE products are packed and assembled using custom-designed, precision equipment. Every manufacturing batch is guaranteed to have less than 2% bed weight variation and uniform flow rates. A sophisticated visual inspection system only accepts product that meets our high standards for bed consistency and frit integrity.

Quality Assurance Certificate Solid Phase Extraction

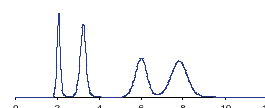
Sorbent Lot Number: 051200123
Finished Good Lot Number: 1234567
Part Number: 5138764
Description: GracePure™ C18-Low, 6.0mL/1000mg

Base Material Properties

Parameter	Value	Test
Surface Area	525m ² /gram	ASAP 2400 Analyzer
Pore Diameter	68Å	ASAP 2400 Analyzer
Pore Volume	0.8cm ³ /gram	ASAP 2400 Analyzer
Average Particle Size	53µ	Malvern Mastersizer-S

Sorbent Characterization

Parameter	Value	Test
Phase Type	Octadecyl	HPLC Test
Endcapped	Yes	LECO CHN-900 Analyzer
Carbon Load	6.5%	LECO CHN-900 Analyzer
Ion Exchange Capacity	N/Ameq/mL	Titration
Fines	0.72NTU	Micro 100 Turbidometer
Sorbent Purity	Pass	GC/FID Test
Surface Coverage	2.00_mol/m ²	Calculation Based on %C
pH	4.0	pH Meter



Column Dimension: 150mm x 4.6mm
Flow: 1.0mL/min
Temperature: 30°C
Mobile Phase: Acetonitrile:Water (40:60)
Detector: UV @ 254nm

Test Probe	Relative Retention	alpha
Uracil	Tol/Ph	4.00
Phenol	Tol/DET	1.30
Diethyltoluamide		
Toluene		

Manufacturing Components & Control Tests

Parameter	Value	Test
Tube Purity	Pass	GC/FID Test
Frit Purity	Pass	GC/FID Test
Visual Inspection	Pass	Cognex Vision System
Sorbent Weight	Pass	Mass Balance Scale
Flowrate	Pass	Pressure vs Airflow Measurement

Grace Davison Discovery Sciences

www.discoverysciences.com

GracePure™ Reversed-Phase SPE Columns

Sorbent	Bed Weight	Column Volume	Qty.	Part No.
C18-Max	50mg	1mL	100pk	5141484
	100mg	1mL	100pk	5138765
	500mg	3mL	50pk	5138766
	500mg	6mL	30pk	5138767
	1000mg	6mL	30pk	5138768
	2000mg	20mL	20pk	5141525
	5000mg	20mL	20pk	5141524
C18-Aq	50mg	1mL	100pk	5141486
	100mg	1mL	100pk	5138774
	500mg	3mL	50pk	5138775
	1000mg	6mL	30pk	5138776
	2000mg	12mL	30pk	5141482
	5000mg	20mL	20pk	5141523
	5000mg	20mL	30pk	5141489
C18-Low	100mg	1mL	100pk	5138760
	200mg	3mL	50pk	5138761
	500mg	3mL	50pk	5138762
	500mg	6mL	30pk	5138763
	1000mg	6mL	30pk	5138764
C18-Fast	5000mg	20mL	20pk	5141526
	500mg	3mL	50pk	5138758
	1000mg	6mL	30pk	5138759
	5000mg	20mL	20pk	5141527
TMS	50mg	1mL	100pk	5141485
	100mg	1mL	100pk	5138785
	500mg	3mL	50pk	5138786

GracePure™ Normal-Phase SPE Columns

Sorbent	Bed Weight	Column Volume	Qty.	Part No.
Silica	100mg	1mL	100pk	5138777
	200mg	3mL	50pk	5138778
	500mg	3mL	50pk	5138779
	5000mg	20mL	20pk	5138780
	500mg	6mL	30pk	5138781
	1000mg	6mL	30pk	5138782
	2000mg	12mL	30pk	5138783
Amino	10000mg	60mL	16pk	5138784
	500mg	3mL	50pk	5138752
	1000mg	6mL	30pk	5138753
Diol	100mg	1mL	100pk	5138771
	200mg	3mL	50pk	5138772
	500mg	3mL	50pk	5138773
Florisil®	500mg	3mL	50pk	5141522
	1000mg	6mL	30pk	5141520
	2000mg	12mL	30pk	5141521

GracePure™ Ion-Exchange SPE Columns

Sorbent	Bed Weight	Column Volume	Qty.	Part No.
Anion-X	100mg	1mL	100pk	5138754
	500mg	3mL	50pk	5138755
	1000mg	3mL	50pk	5141487
Cation-X	100mg	1mL	100pk	5138769
	500mg	3mL	50pk	5138770
	1000mg	3mL	50pk	5141488

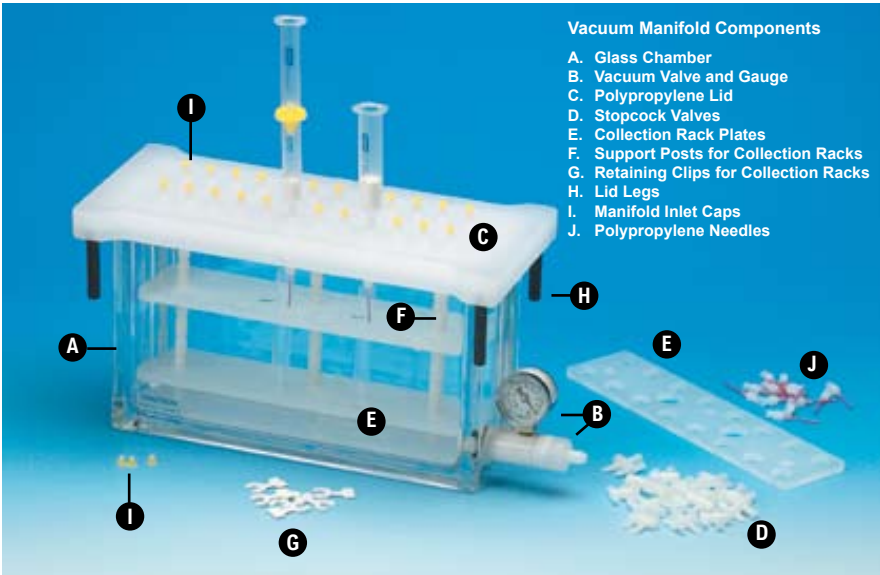
more info

For SPE Applications, see pages 494–502.

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

12-Port Manifold

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



24-Port Manifold

- Process up to 24 samples



12-Port Manifold and Accessories

Description	Qty.	Part No.
12-Port Vacuum Manifold**	ea	210351
<i>Replacement Parts</i>		
Lid, Gaskets, and 12 Stopcocks	ea	212001
Glass Chamber	ea	213212
Vacuum Gauge, Valve, and Glass Chamber	ea	212304
Collection Rack, 12-Port Size*	ea	212518
Gaskets, 12-Port Size	2	212112
One-Way Stopcocks	12	213112
Waste Container	2	210033

*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.
24-Port Vacuum Manifold	ea	210224
<i>Replacement Parts</i>		
Lid, Gaskets, and 24 Stopcocks	ea	211224
Glass Chamber	ea	210124
Vacuum Gauge, Valve, and Glass Chamber	ea	210324
Collection Rack, 24-Port Size†	ea	210424
Gaskets, 16- and 24-Port Size	2	210724
One-Way Stopcocks	24	211524

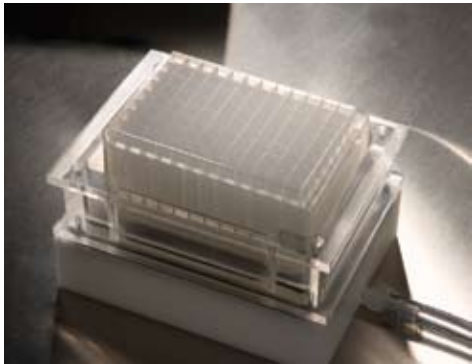
†16- and 24-Port Collection Racks include 3 support posts, bottom plate, dimple plate, 13- and 16mm plates, and 12 retaining clips.

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	8619194



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	212203
B. Retaining Clips for Collections Racks	12	212912
C. Female Luer Inlet	2	212002
Female Luer Inlet	24/pk	212302
D. Male Luer Outlet	2	212120
Male Luer Outlet	24/pk	212320
E. Caps for Lid Inlets	50	211234
F. Lid Legs, Black	4	410510
G. Collection Rack Posts	3	410410

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'	6465
3/16" i.d., 9/16" o.d.	10'	6467
1/4" i.d., 3/4" o.d.	10'	6469
3/8" i.d., 7/8" o.d.*	10'	6472

*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".

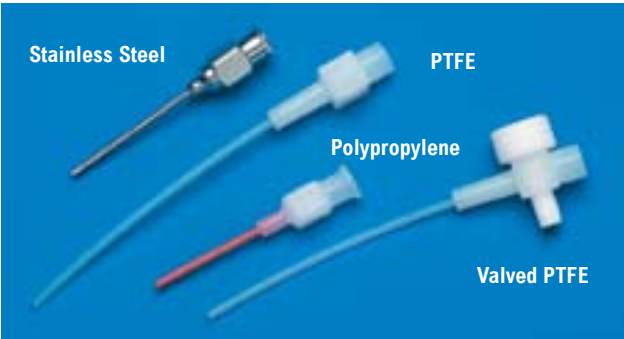


4878

Drying Attachments		
Description	Qty.	Part No.
12-Port Drying Attachment	1	212100
16-Port Drying Attachment	1	212117
24-Port Drying Attachment	1	212124

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	412410
PTFE Needles	500	412450
Valved PTFE Needles	25	411525
Valved PTFE Needles	50	411550
Stainless Steel Needles	12	212400
Stainless Steel Needles	16	210816
Stainless Steel Needles	24	210824
Polypropylene Needles	12	212412
Polypropylene Needles	16	210916
Polypropylene Needles	24	210924

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	210001
4.0mL	100	210104
8.0mL	100	210208
15.0mL	100	210315
25.0mL	100	210425
75.0mL	50	210575
<i>Ultra-Clean™ Empty Reservoirs, Treated Polypropylene</i>		
4.0mL	100	70216
8.0mL	100	70218
8.0mL	1000	70069
<i>Polyethylene Frits for Extract-Clean™ Reservoirs</i>		
For 1.5mL Reservoir	100	211401
For 4.0mL or EV Reservoir	100	211404
For 8.0mL Reservoir	100	211408
For 15.0mL Reservoir	100	211412
For 25.0mL Reservoir	100	211416
For 75.0mL Reservoir	100	211775
<i>PTFE Frits for Ultra-Clean™ Reservoirs</i>		
For 4.0mL Reservoir	100	211494
For 8.0mL Reservoir	100	211498

Empty 96-Well Plates

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



4888

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	210780

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	211015
Inlet Caps for 1.5mL	50	220000
Inlet Caps for 4.0mL	50	220301
Inlet Caps for 8.0mL	50	220600
Inlet Caps for 15.0mL	50	221200
Inlet Caps for 25.0mL	50	221006
Inlet Caps for 75.0mL	50	227503
Outlet Caps for Male Luers	50	220710

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	210705
Syringe Adapters for 25mL Columns	5	210707
Syringe Adapters for 75mL Columns	5	210709

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	211505
C18 (6%)	100g	211502
C18 (17%)	100g	211503
Large Pore C18 (14%)	100g	211542
C8	100g	211504
C2	100g	211506
Phenyl	100g	211522
<i>Normal-Phase Adsorbents</i>		
Silica	100g	211512
Aminopropyl	100g	211516
Diol	100g	211518
Florisil®	227g	5618
Florisil®-PR	227g	5615
Alumina-N	100g	211541
<i>Ion-Exchange</i>		
SCX (Cation Exchange)	100g	211520
SAX (Anion Exchange)	100g	211510
Carbograph 1 SPE 120/400 Mesh	25g	1769

Filtration Introduction

Filter Membrane Chemical Compatibility

C	=	Compatible
L	=	Limited Compatibility
N	=	Not Compatible
—	=	No Data Available

Filter Membrane Chemical Compatibility Chart				
Chemical	Nylon	PTFE	PVDF	Regenerated Cellulose
<i>Acids</i>				
Acetic, 25%	L	C	C	C
Acetic, Glacial	L	C	C	C
Formic, 25%	N	C	C	C
Hydrochloric, 25%	L	C	C	C
Hydrochloric, Concentrated	N	N	C	C
Sulfuric, 25%	N	C	C	C
Sulfuric, Concentrated	N	C	L	L
Nitric, 25%	N	C	L	C
Nitric, Concentrated	N	C	L	N
Phosphoric, 25%	N	C	C	C
Trichloroacetic, 10%	L	C	C	C
<i>Bases</i>				
Ammonium Hydroxide, 25%	C	C	L	—
Sodium Hydroxide, 3 Normal	C	C	C	—
<i>Alcohols</i>				
Amyl Alcohol	C	C	C	C
Benzyl Alcohol	C	C	C	C
Butyl Alcohol	C	C	C	C
Ethanol, 70%	C	C	C	C
Ethanol, 98%	C	C	C	C
Ethylene Glycol	C	C	C	C
Glycerine (Glycerol)	C	C	C	C
Isopropanol	C	C	C	C
Methanol, 98%	C	C	C	C
n-Propanol	C	C	C	C
Propylene Glycol	C	C	C	C
<i>Hydrocarbons</i>				
Benzene	C	C	C	C
Hexane, Xylene	C	C	C	C
Kerosene, Gasoline	C	C	C	C
Tetralin, Decalin	C	C	C	—
Toluene	C	C	C	C
<i>Halogenated Hydrocarbons</i>				
Carbon Tetrachloride	C	C	C	C
Chlorobenzene (Mono)	C	C	C	C
Chloroform	L	C	C	C
Freon	C	C	C	C
Methylene Chloride	L	C	C	C
Trichloroethane	C	C	C	C
Trichloroethylene	C	C	C	C

Filter Membrane Chemical Compatibility Chart				
Chemical	Nylon	PTFE	PVDF	Regenerated Cellulose
<i>Ketones</i>				
Acetone	C	C	N	C
Cyclohexanone	C	C	N	C
Isopropylacetone	C	C	N	—
Methyl Ethyl Ketone	C	C	L	C
Methyl Isobutyl Ketone (MIBK)	C	C	N	C
<i>Esters</i>				
2-Ethoxyethyl Acetate	L	L	L	C
Amyl Acetate	C	C	C	C
Benzyl Benzoate	C	C	—	C
Butyl Acetate	C	C	C	C
Ethyl Acetate	C	C	C	C
Isopropyl Myristate	C	C	—	C
Methyl Acetate	L	C	L	C
Propyl Acetate	L	N	C	C
Propylene Glycol Acetate	L	C	—	C
Methyl Cellosolve Acetate	C	C	C	C
Tricresyl Phosphate	—	C	—	C
<i>Oxides — Ethers</i>				
Acetonitrile (Methyl Cyanide)	C	C	C	C
Aniline	L	C	C	C
Diethyl Acetamide	C	C	C	C
Dimethyl Formamide	C	C	N	L
Dimethyl Sulfoxide (DMSO)	L	C	C	L
Dioxane	C	C	L	L
Ethyl Ether	C	C	C	C
Isopropyl Ether	C	C	N	—
Pyridine	C	C	L	C
<i>Solvents with Nitrogen</i>				
Tetrahydrofuran	C	C	L	L
Triethanolamine	C	C	C	C
<i>Miscellaneous</i>				
Formaldehyde Solution, 30%	C	C	C	L
Hydrogen Peroxide, 30%	N	C	C	C
Phenol, Aqueous, 10%	N	C	L	C
Silicone Oil and Mineral Oil	C	C	C	C

more info

This is only a guide. Users should verify compatibility under actual use conditions.

Filtration Introduction

Filter Device Selection

Consider the number of samples, the sample volume, and the filtering mechanism you prefer to use.

Syringe Filters

Filtration is achieved by pushing the sample through the membrane with a syringe or other luer-connection device. Syringe filters allow you to control the rate of flow, which can be critical with delicate samples. Syringe filters also allow you to filter into nearly any tube, vial, or column that represents the next step in your analysis.

Centrifuge Filter Tubes

Filtration is achieved by pulling the sample through the membrane with centrifugal force. This allows you to simultaneously filter as many samples as your centrifuge can hold, and captures your filtrate in a clean microtube.

Pre-Cut Membranes

Multiple diameters offer a wide range of sample capacities, up to multiple liters. You need a filtration apparatus, such as a filter funnel or other vacuum-driven filtration device.



6277

Device Capacities	
Description	Sample Volume
Syringe Filter Capacities	
4mm Syringe Filter	≤1mL
13mm Syringe Filter	≤5mL
17mm Syringe Filter	≤50mL
25mm Syringe Filter	≤50mL
30mm Syringe Filter	≤100mL
Centrifuge Filter Tube Capacities	
2mL Tubes	20µL to 500µL
50mL Tubes	1mL to 25mL
Pre-Cut Membrane Capacities	
13mm Pre-Cut Membranes	up to 20mL
25mm Pre-Cut Membranes	up to 100mL
47mm Pre-Cut Membranes	multi-liter

Membrane Selection

Choose a filter membrane based on the size and amount of particulate in the sample, the membrane's chemical compatibility with the sample matrix, and potential interactions (binding) between the membrane and the sample components. This table offers general guidelines on membrane characteristics and applications.

Membrane Selection Guide					
Membrane Type	Features	Common Uses	Hydrophilic	Solvent Resistance	Protein Binding
Nylon	Good chemical compatibility and very low extractables	General filtration sterilization, HPLC sample prep	Yes	Good	Medium
Polytetrafluoroethylene (PTFE)	Compatible with strong acids and aggressive solvents	Gas, air, and solvent filtration	No	High*	High
Polyvinylidene Fluoride (PVDF)	Good flow rate characteristics. Ideal for chromatography applications.	HPLC sample preparation and general filtration	Yes	High	Low
Regenerated Cellulose	Universal membrane with excellent chemical resistance and low extractables. Use for aqueous and organic samples.	HPLC sample prep general filtration	Yes	High	Very Low**

*Highest solvent resistance.

**Lowest protein binding.

related products
Looking for mobile inlet phase filters?
See pages 123–124.



5564

6265

Syringe Filters

Nylon and PVDF Syringe Filters

Nylon and PVDF syringe filters are available in a variety of diameters to address different sample sizes.

Syringe Filter Specifications				
Diameter	Max. Temp.	Max. Pressure	Hold-Up Volume	Typical Sample Volume
4mm	100°C	75psig	Less than 15µL	Up to 1mL
13mm	60°C	100psig	Less than 10µL	Up to 5mL
17mm	100°C	115psig	Less than 25µL	Up to 50mL
25mm	60°C	100psig	Less than 50µL	Up to 50mL
30mm	100°C	90psig	Less than 115µL	Up to 100mL



6735

Choose Nylon Membranes for General Filtration Needs

Nylon is hydrophilic and has generally good solvent resistance.

Nylon Syringe Filters

Diameter	Pore Size	Qty.	Part No.
4mm	0.2µm	100	2091
4mm	0.45µm	100	2092
13mm	0.2µm	100	2166
13mm	0.45µm	100	2167
17mm	0.2µm	100	62163
17mm	0.45µm	100	62177
25mm	0.2µm	100	2045
25mm	0.45µm	100	2047
30mm	0.2µm	100	62145
30mm	0.45µm	100	62147

related products

Looking for HPLC column prefilters?

See page 111.



Choose PVDF Membranes for HPLC Sample Preparation

PVDF is hydrophilic, highly solvent resistant, and low protein binding.

PVDF Syringe Filters

Diameter	Pore Size	Qty.	Part No.
4mm	0.2µm	100	2227
4mm	0.45µm	100	2228
13mm	0.2µm	100	2647
13mm	0.45µm	100	2648
17mm	0.2µm	100	62130
17mm	0.45µm	100	62209
25mm	0.2µm	100	2223
25mm	0.45µm	100	2224
30mm	0.2µm	100	62193
30mm	0.45µm	100	62195

related products

Need vials?

We offer a full selection of vials, caps, and septa for all chromatography needs. See pages 348–378.



related products

Need syringes?

See pages 336–347 for our offering of high-quality Hamilton®, VICI®, and SGE® syringes.



Syringe Filters

PTFE and Regenerated Cellulose Syringe Filters

PTFE and Regenerated Cellulose syringe filters are available in a variety of diameters to address different sample sizes.

Syringe Filter Specifications				
Diameter	Max. Temp.	Max. Pressure	Hold-Up Volume	Typical Sample Volume
4mm	100°C	75psig	Less than 15µL	Up to 1mL
13mm	60°C	100psig	Less than 10µL	Up to 5mL
17mm	100°C	115psig	Less than 25µL	Up to 50mL
25mm	60°C	100psig	Less than 50µL	Up to 50mL
30mm	100°C	90psig	Less than 115µL	Up to 100mL



Choose PTFE Membranes for Aggressive Filtration Needs Such as Gas and Solvent Filtration

PTFE is hydrophobic with exceptional solvent resistance.

PTFE Syringe Filters

Diameter	Pore Size	Qty.	Part No.
4mm	0.2µm	100	2394
4mm	0.45µm	100	2395
13mm	0.2µm	100	2164
13mm	0.45µm	100	2165
17mm	0.2µm	100	62118
17mm	0.45µm	100	62136
25mm	0.2µm	100	2089
25mm	0.45µm	100	2090
30mm	0.2µm	100	62189
30mm	0.45µm	100	62191

Choose Regenerated Cellulose Membranes for HPLC Sample Preparation and General Filtration Needs

Regenerated Cellulose is hydrophilic with exceptional solvent resistance and very low protein binding.

Regenerated Cellulose Syringe Filters

Diameter	Pore Size	Qty.	Part No.
4mm	0.2µm	100	656100
4mm	0.45µm	100	656102
17mm	0.2µm	100	62119
17mm	0.45µm	100	62125
30mm	0.2µm	100	62199
30mm	0.45µm	100	62167

related products

Need syringes?

See pages 336–347 for our offering of high-quality Hamilton®, VICI®, and SGE® syringes.



related products

Accessories for your system. Grace has an assortment of Accessories Quick Reference guides available for many popular instruments.

- Waters® Alliance® System Accessories – Request M202

- Agilent 1100 and 1200 System Accessories – Request M203

- Waters® Acquity® System Accessories – Request M204



2mL Centrifuge Filter Tubes

- For up to 850µL sample volume
- Economical alternative to brand name filter tubes
- Includes a glass support membrane

Quickly and easily remove particulates and clarify small sample volumes. Less than 5µL hold-up volume provides near quantitative volumetric recovery. Maximum G-Force: 10,000xG.



4817

Alltech® 2mL Filter Tubes

Membrane Type, Pore Size	Qty.	Part No.
<i>Cellulose Acetate</i>		
0.20µm	100	24126
0.45µm	100	24133
<i>Nylon</i>		
0.20µm	100	24137
0.45µm	100	24139
<i>PVDF (Hydrophobic)</i>		
0.20µm	100	24142
0.45µm	100	24144
<i>Regenerated Cellulose</i>		
0.20µm	100	24148
0.45µm	100	24150

50mL Centrifuge Filter Tubes

- For up to 25mL sample volume
- Use with fixed-angle rotor centrifuge
- All tubes include a glass support membrane

Alltech® 50mL Centrifuge Filter Tubes remove particulates from larger sample sizes with any centrifuge that holds 50mL conical tubes. They should only be used with a fixed-angle rotor centrifuge to prevent premature clogging of the membrane. Maximum operating temperature: 50°C. Maximum G-force: 2500xG.



4784

Alltech® 50mL Filter Tubes

Membrane Type, Pore Size	Qty.	Part No.
<i>Cellulose Acetate</i>		
0.20µm	50	24152
0.45µm	50	24154
<i>Nylon</i>		
0.20µm	50	24156
0.45µm	50	24158
<i>PVDF (Hydrophobic)</i>		
0.20µm	50	24160
0.45µm	50	24162

Forensic Spin Tubes

- 600µL capacity
- Extract biological fluids from cloth samples

The 1.4mm mesh filter basket acts as a sieve to retain cloth samples and pass fluids to the receiver tube. The spin tube includes a 600µL filter basket and a 2mL microcentrifuge receiver tube with attached cap.



4818

Forensic Spin Tubes

Description	Qty.	Part No.
Forensic Spin	100	2566
Forensic Spin	250	2567

Pre-Cut Filter Membranes

- Variety of pore sizes and membrane types
- Non-sterile



4777

Cellulose Acetate Membranes

Cellulose Acetate Membranes are hydrophilic and exhibit very low protein retention. Use for general biological filtration, sterilization, and filtration of aqueous solutions.

Nylon Membranes

Nylon Membranes are hydrophilic and resistant to many solvents. Use for filtration and clarification of aqueous or organic solutions.

PTFE Membranes

PTFE Membranes are hydrophobic and highly solvent resistant. Use for filtration of air, gases, and non-aqueous solutions. Pre-treat with methanol before using with aqueous solutions.

Cellulose Acetate Pre-Cut Membranes

Diameter	Pore Size	Qty.	Part No.
13mm	0.20µm	100	2125
13mm	0.45µm	100	2126
25mm	0.20µm	100	2128
25mm	0.45µm	100	2129
47mm	0.20µm	100	2133
47mm	0.45µm	100	2135

Nylon Pre-Cut Membranes

Diameter	Pore Size	Qty.	Part No.
13mm	0.20µm	100	2046
13mm	0.45µm	100	2044
25mm	0.20µm	100	2050
25mm	0.45µm	100	2048
47mm	0.20µm	100	2034
47mm	0.45µm	100	2024

PTFE Pre-Cut Membranes

Diameter	Pore Size	Qty.	Part No.
13mm	0.20µm	100	2013
13mm	0.45µm	100	2015
25mm	0.20µm	100	2023
25mm	0.45µm	100	2029
25mm	1.00µm	100	2056
47mm	0.20µm	100	2057
47mm	0.45µm	100	2058
47mm	1.00µm	100	2059



4777

more info

Need help selecting the correct membrane?

See pages 317–318 for membrane specifications and suggested use/applications.



6266

related product

Looking for solvent filtration apparatus?
See page 127.

Recommended Reagents for GC Derivatization

Chemically Modify Your Sample to Improve the Chromatography

Recommended Reagents for GC Derivatization			
Compound	Type of Derivative	ECD*	Possible Reagent Choices
Alcohols	Acetate		Acetic Anhydride/Pyridine
	TMS		Sil-Prep™, BSTFA/TMCS
	<i>t</i> -Butyl Dimethyl Silyl Ether		<i>t</i> -Butyl-DMCS/Imidazole, MTBSTFA
Aldehydes	Dimethyl Acetal		DMF/DMA
Amines	TMS		Sil-Prep™
	Acetate		Pyridine-Plus
Amine (Primary and Secondary)	Acetate		Acetic Anhydride/Pyridine
	TMS		MSHFBA
Amino Acids	TMS		BSTFA
	HFB-Isobutyl Ester		HFB-IBA Kit
	Trifluoroacetate	X	Trifluoroacetic Anhydride
Bile Acids	Acetate		Pyridine-Plus
Carbohydrates	Acetate		Acetic Anhydride/Pyridine
	TMS		Power Sil-Prep™
Catecholamines	Trifluoroacetate	X	<i>N</i> -(Trifluoroacetyl)imidazole
Drugs:			
Alkaloids	Heptafluorobutyrate	X	Heptafluorobutyric Anhydride
	TMS		MSTFA, Sil-Prep™
Antibiotics	TMS		Sil-Prep™, Power Sil-Prep™
Anticonvulsants	TMS		MSTFA, BSA/TMCS
Barbiturates	<i>N</i> -Methyl		Barb-Prep™
	Dimethyl Ketal		DMF/DMA
Cannabinoids	Trifluoroacetate	X	<i>N</i> -(Trifluoroacetyl)imidazole
	TMS		BSTFA, MSTFA
Estrogens	Acetate		Pyridine-Plus
Fatty Acids:			
C9 and Longer	Methyl Ester		Methanolic HCl, Meth-Prep™ I
Short Chain (Up to C8)	TMS		MSTFA
	Methyl Ester		Methanolic HCl, Meth-Prep™ I
Glycerides (mono and di)	Acetate		Acetic Anhydride/Pyridine
Glycerides (mono, di, and tri)	Methyl Ester		Sodium Methoxide/Methanol, Meth-Prep™ II
Glycolipids, Sphingolipids	Methyl Ester		Sodium Methoxide/Methanol, Meth-Prep™ II
Hydroxyamines	TMS		BSTFA
Hydroxy Groups (Primary/Secondary)	Heptafluorobutyrate	X	Heptafluorobutylimidazole
	Trifluoroacetate	X	<i>N</i> -(Trifluoroacetyl)imidazole
17-Ketosteroids	TMS		DMF-Sil-Prep™
Phenols	Heptafluorobutyrate	X	Heptafluorobutyric Anhydride
	TMS		BSTFA
	Methyl Esters		DMF/DMA
Polyols	TMS		Sil-Prep™, Power Sil-Prep™
Steroids	TMS		Sil-Prep™
	Acetate		Pyridine-Plus
	Trifluoroacetate	X	Trifluoroacetic Anhydride

*Derivatives suitable for use with Electron Capture Detector (ECD).

tech tip

When do you use derivatization?

When you need to:

1. Increase or decrease the volatility of the analytes to improve separation
2. Improve peak symmetry by reducing interaction of sample and column
3. Increase detector response (i.e., ECD)
4. Enhance thermal stability

technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)

Email: contact.alltech@grace.com

Online: www.discoverysciences.com

Ready-To-Use Silylation Mixes

Silylation replaces an active hydrogen atom (-OH, -NH₂, -NHR, -SH) with a silyl group. Generally, it reduces the polarity of the compound and decreases possibility of hydrogen bonding.



5421

Sil-Prep™ (HMDS:TMCS:pyridine) Reagents

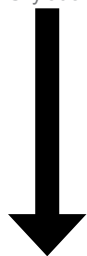
- General purpose reagent for making TMS derivatives

Sil-Prep™

Description	Qty.	Part No.
Sil-Prep™	10 x 1mL	18013

tech tip

Silylation Reagent Strength



HMDS
TMCS
Sil-Prep™
MSTFA
MSHFBA
BSA
BSTFA
TMSIM
BSTFA +1% TMCS
POWER Sil-Prep™

t-Butyldimethylchlorosilyl/Imidazole Reagents

- Derivatives of alcohols are more stable than TMS ethers to hydrolysis

t-Butyldimethylchlorosilyl/Imidazole

Description	Qty.	Part No.
<i>t</i> -BuDMCS/Imidazole	10 x 1mL	18028

POWER Sil-Prep™ (TMSIM:BSA:TMCS) Reagents

- Powerful reagent for sterically hindered groups

POWER Sil-Prep™

Description	Qty.	Part No.
POWER Sil-Prep™	10 x 1mL	18012

DMF Sil-Prep™ (HMDS:TMCS:DMF) Reagents

- Prevents enolization of keto groups

DMF Sil-Prep™

Description	Qty.	Part No.
DMF Sil-Prep™	10 x 1mL	18015

tech tip

What are the requirements for a good reagent?

It will:

1. Not cause any rearrangements or structural changes in the analyte
2. Produce a reaction that is 95–100% complete
3. Produce a stable derivative
4. Not contribute to loss of sample during the reaction
5. Produce a derivative that is inert to the column and connections
6. Not produce interfering byproducts

related product

Looking for a Safe and Easy Way to Open Ampoules?

Try the Ampule Cracker.
See page 380.



4958

Individual Silylation Reagents

BSA [*N,O*-bis(trimethylsilyl)acetamide]

- Powerful silylating reagent and solvent for polar compounds

BSA

Description	Qty.	Part No.
BSA	10mL	18056
BSA	25mL	18057
BSA	10 x 1mL	18034

BSTFA [*N,O*-bis(trimethylsilyl)trifluoroacetamide]

- More volatile reagent and byproducts compared to BSA
- Powerful silylating reagent; even more effective combined with TMCS as a catalyst

BSTFA

Description	Qty.	Part No.
BSTFA	10mL	18085
BSTFA	10 x 1mL	18040
BSTFA + 1% TMCS	10mL	18087
BSTFA + 1% TMCS	10 x 1mL	18089

CMDMCS

- Longer retention times than TMCS derivatives
- Enhanced ECD response

CMDMCS

Description	Qty.	Part No.
CMDMCS	5mL	18031

DMCS (Dimethylchlorosilane)

- DMS derivatives are more sensitive to hydrolysis than TMS derivatives

DMCS

Description	Qty.	Part No.
DMCS	3 x 10mL	18071

HMDS (Hexamethyldisilazane)

- Slow and inefficient used alone
- Very effective in combination with TMCS

HMDS

Description	Qty.	Part No.
HMDS	25mL	18069
HMDS	10 x 1mL	18003

MSHFBA [*N*-Methyl-*N*-trimethylsilylheptafluorobutyramide]

- Similar to MSTFA but does not produce harmful deposits in FID

MSHFBA

Description	Qty.	Part No.
MSHFBA	10mL	214610
MSHFBA	20 x 1mL	2146201

MSTFA

(*N*-Methyl-*N*-trimethylsilyltrifluoroacetamide)

- Ideal reagent for drug analysis because excess reagent and byproducts elute during solvent delay
- May be used directly on HCl salts of compounds

MSTFA

Description	Qty.	Part No.
MSTFA	10mL	18061
MSTFA	1 x 1mL	18038

MTBSTFA [*N*-(*tert*-butyldimethylsilyl)-*N*-methyltrifluoroacetamide]

- Derivatives more stable than common TMS derivatives
- Produces a distinct M-57 ion in GC/MS analysis
- Even more effective when combined with TBDMCS as a catalyst

MTBSTFA

Description	Qty.	Part No.
MTBSTFA	10 x 1mL	18097
MTBSTFA	10mL	18102
MTBSTFA + 1% TBDMCS	10 x 1mL	18155
MTBSTFA + 1% TBDMCS	10mL	18148

TMCS (Trimethylchlorosilane)

- Similar to HMDS when used alone
- Very effective as a catalyst to other reagents

TMCS

Description	Qty.	Part No.
TMCS	3 x 10mL	18091
TMCS	10 x 1mL	18084

TMSIM (*N*-Trimethylsilylimidazole)

- Preferentially silylates hydroxyl groups
- Best silylation reagent when water is present

TMSIM

Description	Qty.	Part No.
TMSIM	10 x 1mL	18050

Glass Conditioning Reagent

Glass-Prep™ (5% DMDCS in toluene)

- Deactivate any glass surface

Glass-Prep™

Description	Qty.	Part No.
Glass-Prep™	100mL	9700
Glass-Prep™	400mL	2233
DMDCS, Neat	10 x 5mL	18090

Alkylation (Esterification) Reagents

Alkylation replaces an acidic hydrogen (carboxylic acids, phenols) with an alkyl group. Alkyl esters are extremely stable and can be stored for long periods of time.

Meth-Prep™ I

- On-column derivatization
- Aqueous solution does not give solvent peak

Meth-Prep™ I is a 0.2N aqueous solution of (m-trifluoromethylphenyl) trimethylammonium hydroxide. When the reagent is mixed with fatty acids and then injected into a GC injector at 240°C, the methyl esters are formed along with the by-product, m-trifluoromethylphenyl dimethylamine. The reaction is clean, fast, and quantitative. Meth-Prep™ I, being in aqueous solution, does not give a solvent peak. This may be advantageous in some cases.

Meth-Prep™ I

Description	Qty.	Part No.
Meth-Prep™ I	10 x 1mL	18005

Instant Methanolic HCl Reagent Kit

- Acid catalyzed esterification of alcohols
- Reagent is generated before use and is stable for one week at room temperature

Instant Methanolic HCl Reagent Kit

Description	Qty.	Part No.
Instant Methanolic HCl Reagent Kit	ea	18053
Anhydrous Acetyl Chloride	5 x 2.8mL	18095
Anhydrous Methanol	10 x 5mL	18157



4801

related product

Looking for syringes to use with reagents?
See page 337–342.

Transesterification Reagents

Transesterification is the process of converting one type of ester into another. Most commonly this is a very large ester (i.e., triglycerides, steryl esters, wax esters, phospholipids) converted into a methyl ester that is more easily analyzed.

Meth-Prep™ II

- In one step forms fatty acid methyl esters from triglycerides at room temperature
- Requires no extraction before injecting into GC
- Faster than sodium methoxide reagents

Meth-Prep™ II is a 0.2N methanolic solution of m-trifluoromethylphenyl trimethylammonium hydroxide. This one-step reagent simplifies the transesterification of triglycerides to methyl esters. It is faster than sodium methoxide and the reaction occurs at room temperature. This quantitative reaction requires no extractions or additional treatment prior to gas chromatographic analysis.

Meth-Prep™ II

Description	Qty.	Part No.
Meth-Prep™ II	10 x 1mL	18007

Sodium Methoxide/Methanol

- Converts a wide range of large esters to fatty acid methyl esters

Sodium Methoxide/Methanol

Description	Qty.	Part No.
Sodium Methoxide/Methanol	10 x 5mL	18018
Sodium Methoxide/Methanol	25mL	218025

related product

Looking for amino acid derivatization kits?
See page 63.

technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)
Email: contact.alltech@grace.com
Online: www.discoverysciences.com

Acylation

Acylation reduces the polarity of amino, hydroxyl and thiol groups on multi-functional molecules such as carbohydrates and amino acids.

Acetic Anhydride/Pyridine

- Used for acetylation of alcoholic and phenolic hydroxyl groups; and primary and secondary amino groups

Acetic Anhydride/Pyridine

Description	Qty.	Part No.
Acetic Anhydride/Pyridine Kit	ea	18100
Acetic Anhydride	10 x 1mL	18103

Pyridine-Plus

- Much more powerful than acetic anhydride/pyridine
- Rapid reaction and fewer byproducts

Pyridine-Plus

Description	Qty.	Part No.
Pyridine-Plus Kit	ea	18105

Fluorinated Imidazoles

- No acidic byproducts compared to anhydride reagents

Fluorinated Imidazoles

Description	Qty.	Part No.
TFAI (<i>N</i> -Trifluoroacetylimidazole)	10 x 0.2g	18046
HFBI (<i>N</i> -Heptafluorobutyrylimidazole)	10 x 0.2g	18048

Perfluoroalkyl Anhydrides

- Produces derivatives suitable to electron capture detection

Perfluoroalkyl Anhydrides

Description	Qty.	Part No.
Trifluoroacetic Anhydride	5 x 1mL	18083
Pentafluoropropionic Anhydride	25g	65192
Pentafluoropropionic Anhydride	5 x 1mL	18116
Heptafluorobutyric Anhydride	25g	63163
Heptafluorobutyric Anhydride	5 x 1mL	18118



4758

related products

Looking for reaction vials to use with reagents? See page 375.

Specialty Reagents

Amino Acid Derivatization Kits

- Simple two-step procedure
- Three different reagents available: TFA, PFP, and HFB

Amino Acid Derivatization Kits

Description	Qty.	Part No.
TFA-IPA Derivatization Kit	ea	18092
PFP-IPA Derivatization Kit	ea	18093
HFB-IPA Derivatization Kit	ea	18094

Barb-Prep™

- On-column methylation of barbiturates
- No byproduct formation

Barb-Prep™

Description	Qty.	Part No.
Barb-Prep™	10 x 1mL	18009

DMF-DMA

- Novel reagent for derivatization of fatty acids, amino acids, amines, and barbiturates

DMF-DMA

Description	Qty.	Part No.
DMF-DMA	10 x 1mL	18051

LC Reagents

UV Enhancing

UV Enhancing

Description	Qty.	Part No.
<i>p</i> -Bromophenacyl Derivatization Kit	—	18036
<i>p</i> -Nitrobenzyloxyamine HCl (PNBA)	1g	510113

Fluorescence Enhancing

Fluorescence Enhancing

Description	Qty.	Part No.
<i>o</i> -Phthalaldehyde (OPA)	5g	35606

IPC™ Reagents

- Comparable to Waters® PIC® Reagents
- Preformulated at optimum concentration and pH
- Convenient—Simply dilute with HPLC grade solvents

“A” Series

- Used for chromatography of acidic compounds

“B” Series

- Used for chromatography of basic compounds

A Series and B Series

Description	Qty.	Part No.
IPC™ A, Tetrabutylammonium Phosphate	5 x 15mL	185101
IPC™ B5, Sodium Pentanesulfonate	5 x 25mL	185110
IPC™ B7, Sodium Heptanesulfonate	5 x 25mL	185103

“Low UV”* Series

- Suitable for use at wavelengths down to 200nm

Low UV Series

Description	Qty.	Part No.
Low UV IPC™ A, Tetrabutylammonium Sulfate	5 x 20mL	185149
Low UV IPC™ B5, Tetrabutylammonium Phosphate	5 x 20mL	184198
Low UV IPC™ B6, Tetrabutylammonium Phosphate	5 x 20mL	184199
Low UV IPC™ B7, Tetrabutylammonium Phosphate	5 x 20mL	184282
Low UV IPC™ B8, Tetrabutylammonium Phosphate	5 x 20mL	184283

*For use at wavelengths below 240nm.

Ion-Pair Salts

Grace offers high-purity ion-pairing salts for those wishing to formulate their own mobile phases.

- High purity for HPLC applications

Ion-Pair Salts

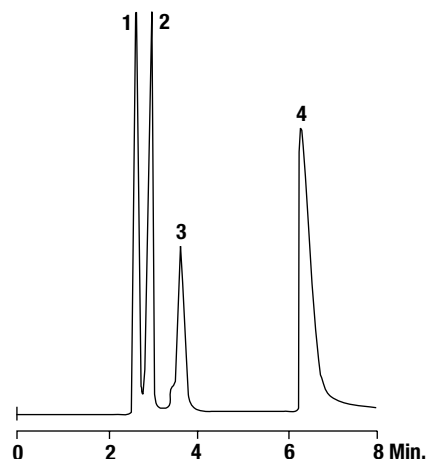
Description	Qty.	Part No.
1-Pentanesulfonate	25g	403125
1-Hexanesulfonate	25g	403126
1-Heptanesulfonate	25g	403127
1-Octanesulfonate	25g	403128
Tetrabutylammonium Phosphate, 0.5M, pH 7.5)	10mL	680502

Table 1—IPC™ Reagents

Grace	Waters
IPC™ A	PIC® A
IPC™ B5	PIC® B5
IPC™ B6	PIC® B6
IPC™ B7	PIC® B7
IPC™ B8	PIC® B8
Low UV IPC™ A	Low UV PIC® A
Low UV IPC™ B5	Low UV PIC® B5
Low UV IPC™ B6	Low UV PIC® B6
Low UV IPC™ B7	Low UV PIC® B7
Low UV IPC™ B8	Low UV PIC® B8

IPC™ B7 Reagent

CHROM
5870



1. Niacinamide
2. Riboflavin
3. Pyridoxine
4. Thiamine

Column: Adsorbosphere™ HS C18, 7µm, 4.6 x 250mm HPLC Column
Mobile Phase: Methanol:Water (50:50) both with IPC™ B7
Flow Rate: 1.0mL/min
Detector: UV at 254nm



related products

Looking for mobile phase storage bottles?
See page 125–127.

Gas Standards

- Portable, lightweight, and easy-to-use disposable cylinders
- Each standard comes with a certificate of analysis



6346
MicroMAT™-10
10L Disposable Cylinder



6347
MicroMAT™-14
14L Disposable Cylinder



6675
MicroMAT™-58
58L Disposable Cylinder

Single Component Gas Standards

Single Component Mixtures

Analyte/Concentration	Balance	Cylinder Size	Part No.
<i>Acetylene</i>			
1%	Helium	MicroMAT™-10	G0413
1%	Nitrogen	MicroMAT™-10	G0423
<i>Argon</i>			
99.995%	—	MicroMAT™-14	M7003
<i>Carbon Dioxide</i>			
99.80%	—	MicroMAT™-14	M7006
100ppm	Helium	MicroMAT™-10	G1211
1000ppm	Helium	MicroMAT™-10	G1212
1%	Helium	MicroMAT™-10	G1213
10%	Helium	MicroMAT™-10	G1214
<i>Carbon Monoxide</i>			
1000ppm	Helium	MicroMAT™-10	24047
10%	Helium	MicroMAT™-10	24054
<i>Ethane</i>			
99.00%	—	MicroMAT™-14	M7012
<i>Ethylene</i>			
100ppm	Helium	MicroMAT™-10	G0311
100ppm	Helium	MicroMAT™-14	M7030
1000ppm	Helium	MicroMAT™-10	G0312
1000ppm	Nitrogen	MicroMAT™-14	24022
8-10ppm	Air	MicroMAT™-14	24096
<i>Helium</i>			
99.995%	—	MicroMAT™-14	M7005
<i>Hydrogen</i>			
99.99%	—	MicroMAT™-14	M7004
100ppm	Nitrogen	MicroMAT™-14	M7125
1000ppm	Nitrogen	MicroMAT™-10	G1522
1%	Nitrogen	MicroMAT™-10	G1523
<i>Nitrogen</i>			
99.998%	—	MicroMAT™-14	M7002

Single Component Mixtures

Analyte/Concentration	Balance	Cylinder Size	Part No.
<i>Nitrous Oxide</i>			
98.00%	—	MicroMAT™-14	M7009
0.1ppm	Nitrogen	MicroMAT™-14	24042
1.0ppm	Nitrogen	MicroMAT™-14	24044
100ppm	Nitrogen	MicroMAT™-10	G1721
1000ppm	Nitrogen	MicroMAT™-10	G1722
<i>Methane</i>			
99.00%	—	MicroMAT™-14	M7011
100ppm	Helium	MicroMAT™-10	G0111
1000ppm	Helium	MicroMAT™-10	G0112
1%	Helium	MicroMAT™-10	G0113
10%	Helium	MicroMAT™-14	24066
100ppm	Nitrogen	MicroMAT™-14	M7029
1%	Nitrogen	MicroMAT™-10	G0123
10%	Nitrogen	MicroMAT™-14	24067
10ppm	Air	MicroMAT™-14	19781
<i>Oxygen</i>			
99.5%	—	MicroMAT™-14	M7001
100ppm	Helium	MicroMAT™-14	M7121
1%	Helium	MicroMAT™-10	G1613
1%	Nitrogen	MicroMAT™-10	G1623
2%	Nitrogen	MicroMAT™-14	24094
6%	Nitrogen	MicroMAT™-14	24095
10%	Nitrogen	MicroMAT™-10	G1624
<i>Propane</i>			
99.00%	—	MicroMAT™-14	M7014
<i>Vinyl Chloride (NIST Traceable)</i>			
10ppm	Nitrogen	MicroMAT™-14	G2001
1000ppm	Nitrogen	MicroMAT™-14	G2004

Multi-Component Gas Mixtures

Multi-Component Gas Mixtures

Description	Concentration	Cylinder Size	Part No.
<i>BTEX in Nitrogen</i>			
Benzene, Ethylbenzene, Toluene, Xylene	1ppm (mix)	MicroMAT™-58	24076
	10ppm (mix)	MicroMAT™-58	24099
	100ppm (mix)	MicroMAT™-58	24115
<i>C₂ to C₄ Alkyne in Nitrogen</i>			
Acetylene, 1-Butyne, 2-Butyne, Propyne	15ppm each	MicroMAT™-10	19797
<i>C₁ to C₄ Hydrocarbons in Nitrogen</i>			
Methane, Ethane, Ethylene, Acetylene, Propane, Propylene, Propyne, <i>n</i> -Butane	15ppm each	MicroMAT™-14	24130
<i>C₄ Hydrocarbons in Nitrogen</i>			
<i>n</i> -Butane, Isobutane, 2-Butene (<i>cis</i> and <i>trans</i>), 1-Butene, Isobutylene, 1,3-Butadiene, Ethyl Acetylene	15ppm each	MicroMAT™-14	24132
<i>2-Olefin Mixture in Nitrogen</i>			
2-Butene (<i>cis</i> and <i>trans</i>), 2-Pentene (<i>cis</i> and <i>trans</i>), 2-Hexene (<i>cis</i> and <i>trans</i>)	15ppm each	MicroMAT™-14	19775
<i>C₂ to C₆ Olefin Mixture in Helium</i>			
Ethylene, Propylene, 1-Butene, 1-Pentene, 1-Hexene	100ppm each	MicroMAT™-14	19784
	1000ppm each	MicroMAT™-14	M7020
<i>C₂ to C₆ Olefin Mixture in Nitrogen</i>			
Ethylene, Propylene, 1-Butene, 1-Pentene, 1-Hexene	1000ppm each	MicroMAT™-14	M7019
<i>C₁ to C₆ n-Paraffin Mixture in Helium</i>			
Methane, Ethane, Propane, Butane, Pentane, Hexane	100ppm each	MicroMAT™-14	19782
	1000ppm each	MicroMAT™-14	M7018
<i>C₁ to C₆ n-Paraffin Mixture in Nitrogen</i>			
Methane, Ethane, Propane, Butane, Pentane, Hexane	15ppm each	MicroMAT™-14	19772
	100ppm each	MicroMAT™-14	19783
	1000ppm each	MicroMAT™-14	M7017
<i>Branched Paraffin Mixture in Nitrogen</i>			
Isobutane, 2-Methylbutane, 2,2-Dimethylpropane, 2-Methylpentane, 3-Methylpentane, 2,2-Dimethylbutane	15ppm each	MicroMAT™-14	19774
<i>CO and CO₂ in Nitrogen</i>			
Carbon Monoxide, Carbon Dioxide	25ppm (CO), 1000ppm (CO ₂)	MicroMAT™-14	24136
<i>CO, CO₂, Methane, Ethane, Ethylene, Acetylene in Nitrogen</i>			
	1% each	MicroMAT™-14	M7035
<i>CO, CO₂, Methane, H₂, O₂ in Nitrogen</i>			
	1% each	MicroMAT™-14	M7036
<i>CO, CO₂, CH₄, H₂, O₂, N₂ in Helium</i>			
Carbon Monoxide, Carbon Dioxide, Methane, Hydrogen, Oxygen, Nitrogen	5% (CO), 5% (CO ₂), 4% (CH ₄), 4% (H ₂), 5% (O ₂), 5% (N ₂)	MicroMAT™-14	19792
<i>CO, CO₂, O₂ in Nitrogen</i>			
Carbon Monoxide, Carbon Dioxide, Oxygen	7% (CO), 15% (CO ₂), 3% (O ₂)	MicroMAT™-14	M7041
<i>CO, CO₂, CH₄, O₂ in Nitrogen</i>			
Carbon Monoxide Carbon Dioxide, Methane, Oxygen	7% (CO), 15% (CO ₂), 4.5% (CH ₄), 7% (O ₂)	MicroMAT™-14	19791
<i>CO, CO₂, H₂, O₂ in Nitrogen</i>			
	0.5% each	MicroMAT™-14	24138
	0.5% each (CO, CO ₂ , O ₂), 5% H ₂	MicroMAT™-14	M7037
<i>CO₂, O₂ in Nitrogen</i>			
	1% each	MicroMAT™-14	24029
	1% (CO ₂), 2% (O ₂)	MicroMAT™-14	M7040
	2% (CO ₂), 24% (O ₂)	MicroMAT™-14	24034

Special Gas Standards

Reactive Gas Standards

Reactive Gas Standards

Description	Concentration	Cylinder Size	Part No.
Hydrogen Sulfide in Nitrogen	10ppm	MicroMAT™-58	24102
	95ppm	MicroMAT™-58	24105
Nitric Oxide in Nitrogen	20-30ppm	MicroMAT™-58	24107

Natural Gas Standards

- Certificate of analysis
- Shelf life one year

Natural Gas Standards Concentrations

	GPA	Calorimetric	High Ethane	Helium-Enriched
Helium	0.50	—	—	2.00
Nitrogen	5.00	2.50	9.00	1.60
Carbon Dioxide	1.00	3.00	0.50	0.20
Ethane	9.00	3.50	12.50	3.00
Propane	6.00	1.00	7.00	1.70
Isobutane	3.00	0.40	3.00	1.00
n-Butane	3.00	0.40	3.00	1.00
Isopentane	1.00	0.15	0.50	0.30
n-Pentane	1.00	0.15	0.50	0.30
Neopentane	—	0.10	—	—
n-Hexane	—	0.05	—	—
n-Heptane	—	0.02	—	—
Methane	Balance	Balance	Balance	Balance

Natural Gas Standards

Description	Concentration	Cylinder Size	Part No.
Natural Gas GPA Standard	See above	MicroMAT™-14	24100
Natural Gas Calorimetric Standard	See above	MicroMAT™-14	24116
Natural Gas High Ethane Standard	See above	MicroMAT™-14	24128
Natural Gas Helium-Enriched Standard	See above	MicroMAT™-14	24131

related product

Looking for GASTIGHT™ syringes?

See pages 339–340.



5156

Hardware for Using Gas Cylinders

MicroMAT™-10 Syringe Adapter

- Maximum pressure 120psig



5386

MicroMAT™-10 Syringe Adapter

MicroMAT™-10 Syringe Adapter

Description	Cylinder Size	Part No.
Aerosol Syringe Adapter	MicroMAT™-10	8048
Replacement Septa, 12/pk	—	75801

MicroMAT™-14 Syringe Adapter

- Maximum pressure 240psig
- May be used with any 1/8" NPT (F) outlet



5385

MicroMAT™-14 Syringe Adapter

MicroMAT™-14 Syringe Adapter

Description	Cylinder Size	Part No.
Syringe Adapter	MicroMAT™-14	8810
Replacement Septa, 10/pk	—	8812

MicroMAT™-58 Regulator

- Stainless steel with hose barb outlet
- Push button on/off control
- Preset 0.3SLPM flow rate



6674

MicroMAT™-58 Regulator

MicroMAT™-58 Regulator

Description	Cylinder Size	Part No.
0–30psig, C-10 Valve	MicroMAT™-58	37201

Fatty Acid and Methyl Ester Standards

- Quality certificate supplied with every standard and mix

Fatty Acid and Methyl Ester Standards

Carbon #	Description	Free Fatty Acids		Fatty Acid Methyl Esters	
		Qty.	Part No.	Qty.	Part No.
11:0	Undecanoic Acid (Undecylic)	0.5g	622110	0.5g	623110
12:0	Dodecanoic Acid (Lauric)	1g	622120	1g	623120
13:0	Tridecanoic Acid (Tridecylic)	1g	622130	1g	623130
14:0	Tetradecanoic Acid (Myristic)	1g	623140	1g	623140
15:0	Pentadecanoic Acid (Pentadecylic)	0.5g	622150	0.5g	623150
16:0	Hexadecanoic Acid (Palmitic)	1g	622160	1g	623160
16:1	<i>cis</i> -9-Hexadecenoic Acid (Palmitoleic)	0.1g	6221610	0.1g	6231610
17:0	Heptadecanoic Acid (Margaric)	1g	622170	1g	623170
18:0	Octadecanoic Acid (Stearic)	1g	622180	1g	623180
18:1	<i>cis</i> -9-Octadecenoic Acid (Oleic)	1g	6221810	1g	6231810
18:1	<i>trans</i> -9-Octadecenoic Acid (Elaidic)	1g	6221811	0.5g	6231811
18:1	<i>cis</i> -11-Octadecenoic Acid (<i>cis</i> -Vaccenic)	—	—	0.1g	62318101
18:1	<i>trans</i> -11-Octadecenoic Acid (<i>trans</i> -Vaccenic)	—	—	0.1g	62318121
18:2	<i>cis</i> , <i>cis</i> -9,12-Octadecadienoic Acid (Linoleic)	1g	6221820	1g	6231820
18:2	<i>trans</i> , <i>trans</i> -9,12-Octadecadienoic Acid (Linoelaidic)	0.1g	6221821	0.1g	6231821
18:3	All <i>cis</i> -9,12,15-Octadecatrienoic Acid (Linolenic)	0.1g	62218300	0.1g	6231830
18:3	All <i>cis</i> -6,9,12-Octadecatrienoic Acid (γ -Linolenic)	0.1g	62218301	0.1g	6231831
20:0	Eicosanoic Acid (Arachidic)	1g	6220200	1g	623200
20:1	<i>cis</i> -11-Eicosenoic Acid	0.1g	6220201	0.1g	623201
20:4	All <i>cis</i> -5,8,11,14-Eicosatetraenoic Acid (Arachidonic)	0.1g	6220204	0.1g	623204
20:5	All <i>cis</i> -5,8,11,14,17-Eicosapentaenoic Acid	10mg	6220205	10mg	623205
22:0	Docosanoic Acid (Behenic)	1g	6220220	1g	623220
22:5	All <i>cis</i> -7,10,13,16,19-Docosapentaenoic Acid	10mg	6220225	10mg	6232250
23:0	Tricosanoic Acid	0.1g	6220230	0.1g	623230
24:0	Tetracosanoic Acid (Lignoceric)	0.1g	6220240	0.1g	623240

Fatty Acid Methyl Ester Mixes

Description	Components	Qty.	Part No.
K101	C8:0, C10:0, C12:0, C14:0, C16:0, C18:0, C20:0	100mg	625001
K103	C12:0, C14:0, C14:1, C16:0, C16:1 <i>cis</i>	50mg	625002
K1000	C13:0, C15:0, C17:0, C19:0, C21:0	50mg	625003
K104	C14:0, C16:0, C18:0, C20:0, C22:0, C24:0	100mg	625004
K110	C16:0, C16:1 <i>cis</i> , C16:1 <i>trans</i> , C18:0, C18:1 <i>cis</i> -9, C18:1 <i>trans</i> -9, C18:2 <i>cis</i> , <i>cis</i> , C18:2 <i>trans</i> , <i>trans</i>	100mg	625005
K108	C16:0, C18:0, C18:1 <i>cis</i> -9, C18:2 <i>cis</i> , <i>cis</i> , C18:3 all <i>cis</i>	50mg	625006
K2000	C18:0, C18:1 <i>cis</i> -9, C18:2 <i>cis</i> , <i>cis</i> , C18:3 all <i>cis</i> , C20:4 all <i>cis</i>	50mg	625007
K3000	C18:2 <i>cis</i> , <i>cis</i> , C18:3 all <i>cis</i> , C20:4 all <i>cis</i> , C22:6 all <i>cis</i>	50mg	625008
K4000	C20:0, C20:1 <i>cis</i> , C20:2 <i>cis</i> , <i>cis</i> , C20:3 all <i>cis</i> , C20:4 all <i>cis</i>	50mg	625009
K107	C20:0, C20:1 <i>cis</i> , C22:0, C22:1 <i>cis</i> , C24:0, C24:1 <i>cis</i>	50mg	625010
K5000 Mix A	C6:0, C8:0, C10:0, C12:0	100mg in 5mL	625017
K5000 Mix B	C12:0, C14:0, C16:0, C18:0	100mg in 5mL	625018
L207	C18:0, C18:1 <i>cis</i> -9, C20:0, C22:0, C22:1 <i>cis</i> , C24:0, C24:1 <i>cis</i>	50mg	625021
L205	C18:0, C18:1 <i>cis</i> -9, C18:2 <i>cis</i> , <i>cis</i> , C18:3 all <i>cis</i> , C20:4 all <i>cis</i>	100mg	625022
L209	C20:0, C20:1 <i>cis</i> , C20:4 all <i>cis</i> , C22:1 <i>cis</i> , C22:6 all <i>cis</i>	25mg	625023
AOCS Mix 1	C16:0, C18:0, C18:1 <i>cis</i> -9, C18:2 <i>cis</i> , <i>cis</i> , C18:3 all <i>cis</i> , C20:0	50mg	625024
AOCS Mix 3	C16:0, C18:0, C18:1 <i>cis</i> -9, C18:2 <i>cis</i> , <i>cis</i> , C18:3 all <i>cis</i> , C20:0, C22:0, C22:1 <i>cis</i> , C24:0	50mg	625026
AOCS Mix 3A	C16:0, C18:0, C18:1 <i>cis</i> -9, C18:2 <i>cis</i> , <i>cis</i> , C18:3 all <i>cis</i> , C20:0, C20:1 <i>cis</i> , C22:0, C22:1 <i>cis</i> , C24:0	25mg	625027
AOCS Mix 5	C8:0, C10:0, C12:0, C14:0, C16:0, C18:0, C18:1 <i>cis</i> -9, C18:2 <i>cis</i> , <i>cis</i>	50mg	625029
AOCS Mix 6	C14:0, C16:0, C16:1 <i>cis</i> , C18:0, C18:1 <i>cis</i> -9, C18:2 <i>cis</i> , <i>cis</i> , C18:3 all <i>cis</i>	50mg	625030

Hydrocarbons and Miscellaneous Standards and Kits

- Quality certificate supplied with every standard and mix

Use Standards and Mixes with complete confidence in purity and quality. Don't waste your valuable lab time to verify the standards you need. To satisfy your documentation needs, Grace supplies a purity certificate for every standard and mix.

Organic Acid Standards

Description	Qty.	Part No.
Oxalic Acid, 1000ppm	125mL	37033
Maleic Acid, 1000ppm	125mL	37037
Malic Acid, 1000ppm	125mL	37039
Succinic Acid, 1000ppm	125mL	37043
Formic Acid, 1000ppm	125mL	37045
Acetic Acid, 1000ppm	125mL	37047
Citric Acid, 1000ppm	125mL	37049
Tartaric Acid, 1000ppm	125mL	37051
Lactic Acid, 1000ppm	125mL	37053
Abietic Acid, 1000ppm	125mL	37055
Methane Sulfonic Acid, 1000ppm	125mL	37057

n-Paraffin Mixtures

Description	Qty.	Part No.
<i>Neat Mixtures (No Solvent—Equal Weights of Components)</i>		
C5, C6, C7, C8	2mL	628001
C7, C8, C9, C10	2mL	628002
C9, C10, C11, C12	2mL	628003
C11, C12, C13, C14	2mL	628004
C12, C14, C16, C18	2mL	628005
<i>Mixtures (In 5mL Hexane—Equal Weight of Components)</i>		
C16, C18, C20, C22	0.5g	628006
C20, C22, C24, C26	0.1g	628007
C24, C26, C28, C30	50mg	628008
C28, C30, C32, C34	50mg	628009
C32, C34, C36, C38	50mg	628010

Hydrocarbons (n-Paraffins)

Carbon No.	Description	Qty.	Part No.
C5	<i>n</i> -Pentane	1g	620050
C6	<i>n</i> -Hexane	1g	620060
C7	<i>n</i> -Heptane	1g	620070
C8	<i>n</i> -Octane	1g	620080
C9	<i>n</i> -Nonane	1g	620090
C10	<i>n</i> -Decane	1g	620100
C11	<i>n</i> -Hendecane	1g	620110
C12	<i>n</i> -Dodecane	1g	620120
C13	<i>n</i> -Tridecane	1g	620130
C14	<i>n</i> -Tetradecane	1g	620140
C15	<i>n</i> -Pentadecane	1g	620150
C16	<i>n</i> -Hexadecane	1g	620160
C17	<i>n</i> -Heptadecane	1g	620170
C18	<i>n</i> -Octadecane	1g	620180
C19	<i>n</i> -Nonadecane	1g	620190
C20	<i>n</i> -Eicosane	1g	620200
C21	<i>n</i> -Heneicosane	1g	620210
C22	<i>n</i> -Docosane	1g	620220
C23	<i>n</i> -Tricosane	1g	620230
C24	<i>n</i> -Tetracosane	1g	620240
C25	<i>n</i> -Pentacosane	0.1g	620250
C26	<i>n</i> -Hexacosane	0.1g	620260
C27	<i>n</i> -Heptacosane	0.1g	620270
C28	<i>n</i> -Octacosane	1g	620280
C29	<i>n</i> -Nonacosane	0.1g	620290
C30	<i>n</i> -triacontane	0.1g	620300
C32	<i>n</i> -Dotriacontane	0.1g	620320
C34	<i>n</i> -Tetratriacontane	0.1g	620340
C36	<i>n</i> -Hexatriacontane	0.1g	620360
C38	<i>n</i> -Octatriacontane	0.1g	620380
C40	<i>n</i> -Tetracontane	0.1g	620400
C44	<i>n</i> -Tetratetracontane	0.1g	620440

Aromatic Hydrocarbon Mix

Description	Qty.	Part No.
BETX Mix	2g	629001
Contains equal amounts of benzene, toluene, ethylbenzene, <i>o</i> -xylene, <i>m</i> -xylene, and <i>p</i> -xylene.		

Standards Kits

Description	Kit Contains 100mg Each Component	Part No.
<i>Free Fatty Acid Kits</i>		
Short Chain	C2, C3, C4, C5, C6, C7, C8	18600
Even Carbon	C10, C12, C14, C16, C18, C20, C22	186021
Odd Carbon	C9, C11, C13, C15, C17, C19, C21, C23	18608
<i>Fatty Acid Ester Kits</i>		
Methyl Esters, Even Carbon	C10, C12, C14, C16, C18, C20, C22	18603
Methyl Esters, Odd Carbon	C9, C11, C13, C15, C17, C19, C21	18609
Ethyl Esters, Even Carbon	C6, C8, C10, C12, C14, C16, C18, C20, C22, C24	18610
Ethyl Esters, Odd Carbon	C7, C9, C11, C13, C15, C17, C19, C21, C23	18611
<i>Hydrocarbon Kits</i>		
Saturated, Even Carbon	C10, C12, C14, C16, C18, C20, C22, C24, C28, C32, C36	18484
Saturated, Odd Carbon	C9, C11, C13, C15, C17, C19, C21, C23, C25	18485

Alltech® IC Standards

- High purity for sensitive applications
- Prepared from NIST standard reference materials
- Certified by two independent methods
- Detailed Certificate of Analysis included



3493

Certified Anion and Cation Standards

Anion Standards (125mL)

Description	1000ppm Part No.	200ppm Part No.
Bromate	37058	—
Bromide	37005	37006
Chlorate	37034	—
Chloride	37009	37010
Chlorite	37038	—
Chromate	37042	—
Fluoride	37011	37012
Iodide	37013	—
Nitrate	37019	37020
Nitrate-N	37234	—
Nitrite	37021	37022
Nitrite-N	37235	—
Perchlorate	37048	—
Phosphate	37023	37024
Phosphate-P	37236	—
Sulfate	37031	37032
Thiocyanate	37046	—

Cation Standards (125mL)

Description	1000ppm Part No.	200ppm Part No.
Ammonium	37001	37002
Ammonium-N	37233	—
Calcium	37007	37008
Lithium	37015	37016
Magnesium	37017	37018
Potassium	37025	37026
Sodium	37029	37030

Certified Organic Anion Standards

Organic Anion Standards (125mL)

Description	1000ppm Part No.
Acetate	37052
Citrate	37091
Formate	37050
Glycolate	37054
Lactate	37093
Malate	37095
Maleate	37099
Methanesulfonate	37221
Nitrilotriacetate (NTA)	37228
Oxalate	37056
Propionate	37229
Succinate	37223
Tartrate	37224

Certified Organic Acid Standards

Organic Acid Standards (125mL)

Description	1000ppm Part No.
Oxalic Acid	37033
Maleic Acid	37037
Malic Acid	37039
Succinic Acid	37043
Formic Acid	37045
Acetic Acid	37047
Citric Acid	37049
Tartaric Acid	37051
Lactic Acid	37053
Abietic Acid	37055
Methanesulfonic Acid	37057

Certified Amine Standards

Amine Standards (125mL)

Description	1000ppm Part No.
Ethanolamine	37225
Diethanolamine	37226
Triethanolamine	37227
Monomethylamine	37230
Dimethylamine	37231
Trimethylamine	37232

Alltech® IC Standards

best
value

Certified Multi-Standard Kits

- Cost-effective ways to purchase multiple single-ion standards

Multi-Standard Kits

Description	Part No.
<i>Anion Kits</i>	
200ppm Kit: Contains 125mL ea of 200ppm Certified Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , and SO ₄	37035
1000ppm Kit: Contains 125mL ea of 1000ppm Certified Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , and SO ₄	37036
Anion and Oxyhalide Kit: (EPA 300.1Part B) Contains 125mL ea of 200ppm certified Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , and SO ₄ , ClO ₂ , ClO ₃ , BrO ₃	37085
<i>Cation Kits</i>	
200ppm Kit: Contains 125mL ea of 200ppm Certified Li, Na, NH ₄ , K, Mg, and Ca	37040
1000ppm Kit: Contains 125mL ea of 1000ppm Certified Li, Na, NH ₄ , K, Mg, and Ca	37041

Certified Multi-Component Mixtures

- Multiple ions in a single mixture

Multi-Component Mixtures (125mL)

Description	Part No.
<i>Anion Mixtures</i>	
Mix A: 125mL Mixture Contains: F(10ppm), Cl(20ppm), O ₂ (20ppm), Br(20ppm), NO ₃ (20ppm), PO ₄ (30ppm), SO ₄ (30ppm)	26910200
Mix 1: 125mL Mixture Contains: F(1ppm), Cl(5ppm), NO ₂ (5ppm), Br(5ppm), NO ₃ (5ppm), PO ₄ (5ppm), SO ₄ (5ppm)	269106
Mix 2: 125mL Mixture Contains: F(1ppm), Cl(10ppm), NO ₂ (10ppm), Br(10ppm), NO ₃ (10ppm), PO ₄ (10ppm), SO ₄ (10ppm)	269107
Mix 3: 125mL Mixture Contains: F(10ppm), Cl(20ppm), NO ₂ (20ppm), Br(20ppm), NO ₃ (20ppm), PO ₄ (20ppm), SO ₄ (20ppm)	269108
Mix 4: 125mL Mixture Contains: F(20ppm), Cl(40ppm), NO ₂ (40ppm), Br(40ppm), NO ₃ (40ppm), PO ₄ (40ppm), SO ₄ (40ppm)	269109
Mix 5: 125mL Mixture Contains: F(25ppm), Cl(50ppm), NO ₂ (50ppm), Br(50ppm), NO ₃ (50ppm), PO ₄ (50ppm), SO ₄ (50ppm)	269110
Mix 6: 125mL Mixture Contains: Cl(1000ppm), Br(1000ppm), NO ₃ (1000ppm), PO ₄ (1000ppm), SO ₄ (1000ppm)	269111
Mix 7: 125mL Mixture Contains: Cl(15ppm), Br(15ppm), NO ₃ (15ppm), PO ₄ (15ppm), SO ₄ (5ppm)	269112
Mix 8: 125mL Mixture Contains: F(25ppm), Cl(50ppm), SO ₄ (100ppm)	269113
<i>Cation Mixtures</i>	
Mix A: 125mL Mixture Contains: Li(0.5ppm), Na(3ppm), NH ₄ (3ppm), K(6ppm)	26910300
Mix B: 125mL Mixture Contains: Li(0.2ppm), Na(1.5ppm), NH ₄ (1.5ppm), K(2.5ppm), Mg(2.0ppm), Ca(2.0ppm)	26910400

EZ-LUTE™ Buffer Concentrates

- Simplify mobile phase preparation
- For anion, cation, and organic acid analyses
- Dilution instructions included



6561

EZ-LUTE™ Buffers for accurate concentrations every time.

EZ-LUTE™ Buffer Concentrates*

Description	Part No.
<i>Non-suppressed Buffers, 12 x 25mL</i>	
4mM Phthalic Acid	470217
4mM Phthalic Acid, pH 4.5	470216
4mM p-Hydroxybenzoic Acid	470212
5mM p-Hydroxybenzoic Acid	470215
7mM p-Hydroxybenzoic Acid	470214
5mM LiOH/Benzoate	470213
3mM Methanesulfonic Acid	470211
<i>Suppressor-based Buffers, 1 x 100mL</i>	
1.7mM Bicarbonate/1.8mM Carbonate	470119
2.8mM Bicarbonate/2.2mM Carbonate	470201
2.1mM Bicarbonate/1.6mM Carbonate	470203
0.85mM Bicarbonate/0.9mM Carbonate	470208
0.7mM Bicarbonate/1.2mM Carbonate	470122
3.6mM Carbonate	470123
500mM Bicarbonate	470209
500mM Carbonate	470210

*Concentration after dilution.

more info

Custom Standards Available

If you need it, we can make it, whether a single ion or a complex mixture. Request a quote for part number **C2690**, in any volume from 125mL to 1-liter. Fast delivery!

Syringe Selection Guide

Syringe Selection Guide			
Manufacturer	Type	Description	Page #
<i>Hamilton® Syringes</i>			
	Series 600	General purpose, 2.5µL to 5µL	338
	Series 700	General purpose, 5µL to 500µL	338
	Series 900	Economical syringe with reinforced plunger, 5µL to 10µL	338
	Series 800	General purpose with reinforced plunger, 5µL to 250µL	339
	Series 1000	Gas and liquid tight, 1mL to 100mL	339
	Series 7000	Plunger-in-needle, 0.5µL to 5µL	339
	Series 1700	Gas and liquid tight, 10µL to 500µL	340
	Series 1800	Gas and liquid tight with reinforced plunger, 10µL to 250µL	340
	Super Gas	Gas tight, large volume acrylic, 500mL to 2000mL	340
	SampleLock™	1000 and 1700 Series syringes with twist valve to lock sample in	341
	Autosampler	700 and 1700 Series syringes compatible with many popular autosamplers	341
<i>VICI®-Precision Syringes</i>			
	Series A	Gas tight with a twist valve for sample storage, 100µL to 10mL	343
	Series A-2	Gas tight with a push-button valve for sample storage, 25µL to 10mL	343
<i>SGE® Syringes</i>			
	Standard	General purpose, 5µL and 10µL	344
	Plunger Protection	General purpose with reinforced plunger, 5µL and 10µL	344
	Superflex™	General purpose with flexible plunger, 5µL and 10µL	344
	Factory Calibrated	NIST and NBS traceable, 5µL to 500µL	344
	Guided Plunger	Extended barrel and reinforced plunger, 5µL and 10µL	344
	Gas Tight	Gas and liquid tight, 10µL to 100mL	345
	Autosampler	Syringes compatible with many popular autosamplers	345
	Microvolume	Plunger-in-needle, gas and liquid tight, 0.5µL to 5µL	346
	On-Column	On-column capillary GC injection, 0.5µL to 10µL	346
<i>Popper Syringes</i>			
	Standard Glass	General purpose, 2mL to 50mL	347

tech tips

Tips for Syringe Use and Care

Cleaning Needles—If your syringe needle becomes clogged, do not force liquid or compressed air through the syringe. Excessive pressure can cause the glass barrel of the syringe to split. To properly clean the needle, remove the plunger from the syringe. Use cleaning wires to dislodge any foreign material or residue build-up, and rinse the syringe thoroughly with deionized water or acetone. Grace offers a variety of syringe care products to help you maintain the performance of your syringe on page 347.

Sterilizing Syringes—Chemical sterilizers are the best means for sterilizing your syringe. Be sure to thoroughly rinse your syringe after sterilization to remove all traces of the chemical solution. In general, autoclaving your syringe is not recommended. Stainless steel expands faster than the glass upon heating. Heating a syringe with a cemented, stainless steel needle may cause the glass barrel to split. Heating a syringe with cemented steel hubs may result in adhesive deterioration and leakage.

Syringe Lubrication—A clean syringe does not require any lubricating grease. Grease may cause a variety problems such as sample cross contamination, seizing of the plunger in the barrel, and barrel damage or breakage.



Hamilton® Selection Guide

Syringe Terminations

N—Cemented (fixed) Needle, up to 250µL

N and LTN syringes have needles cemented into the glass syringe barrel. Do not heat to more than 50°C, do not autoclave, do not use with halogenated solvents such as methylene chloride. Choose a cemented needle if you want reproducible injections at an economical price.



4790

LTN—Cemented (fixed) Needle with Luer Tip, 500µL and larger



4792

LT—Luer Tip

Ground glass male luer tip accepts most hypodermic needles. Use Kel-F® hubs and connectors for a tight, leak-free seal. Choose LT syringes if you want an autoclavable syringe with easy, fast needle replacement.



4791

KH—Knurled Hub

Metal knurled hub with removable needle, exclusive to 7000 Series syringes. It creates a leak-free seal between the barrel and the needle and can be tightened to compensate for wear. Autoclavable when disassembled.



4793

RN—Removable Needle

Choose removable needles to easily replace bent or clogged needles or use different types of needles with the same syringe barrel. Autoclavable when disassembled.



4794

TLL—PTFE Luer Lock

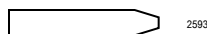
Male luer taper with nickel-plated brass hub that accepts and locks luer hub needles and connectors. Autoclavable when disassembled. Choose TLL syringes for fast needle replacement with a locking needle connection.



4795

Point Styles

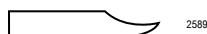
Point Style AS:



2593

Special conical needle designed to withstand the demands of multiple injections; exclusively used on autosampler syringes.

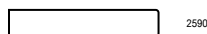
Point Style 2:



2589

Beveled non-coring needle recommended for septum penetration; only needle gauges 26s–22 are recommended for optimum GC septum penetration.

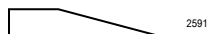
Point Style 3:



2590

Blunt needle for use with HPLC injection valves and for sample pipetting.

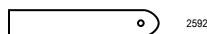
Point Style 4:



2591

10–12° beveled needle recommended for life science applications.

Point Style 5:



2592

Conical needle with side port for penetration of septa, thin-gauged vinyls and plastics without coring; minimizes septum damage.

Syringe Solution Reference Chart

Hamilton has designed many unique syringes to address specific problems. Use the chart below to select the right syringe for the job.

Syringe Problems and Solutions		
Problem	Syringe Solution	Hamilton® Series
Bending Plungers	Use reinforced plunger syringes	600, 800, 900, 1800
	Use a Chaney adapter or syringe guide	700, 800, 900, 1000, 1700, 1800, 7000
Breaking Syringe Barrels	Use replaceable barrel syringes	800, 1000, 1700, 1800, 7000
Bending Needles	Use removable needle syringes	600, 700, 800, 900, 1000, 1700, 1800, 7000
Syringe Balance	Use syringe with handles	800, 900, 1800
Plungers Pulling or Blowing-out of Syringe Barrel	Use pull or blow-out prevention syringes	800, 1800
Plungers Slide Too Easily	Use adjustable plunger drag syringes	800, 1800

Hamilton® Syringes

700 Series MICROLITER™ Syringes

General Purpose Syringe, 5μL to 500μL

- Plungers are not interchangeable or replaceable
- Accurate to 1% of the syringe volume



4801

Hamilton® 700 Series Syringes

Model	Volume	Gauge	Pt. Style	Repl. Needle	Qty.	Part No.
<i>Cemented Needle Syringes (N), 2" Needle Length</i>						
75	5μL	26s	2	None	ea	87900
	5μL	26s	3	None	ea	87919
701	10μL	26s	2	None	ea	80300
	10μL	26s	3	None	ea	803830
	10μL	26s	5	None	ea	80339
	25μL	22s	2	None	ea	80400
702	25μL	22s	3	None	ea	80465
	25μL	22s	5	None	ea	80439
705	50μL	22s	2	None	ea	80500
	50μL	22s	3	None	ea	80565
	50μL	22s	5	None	ea	80539
710	100μL	22s	2	None	ea	80600
	100μL	22s	3	None	ea	80665
	100μL	22s	5	None	ea	80639
725	250μL	22s	2	None	ea	80700
	250μL	22s	3	None	ea	80765
	250μL	22s	5	None	ea	80739
750	500μL	22	2	None	ea	80800
	500μL	22	3	None	ea	80865
	500μL	22	5	None	ea	80839
<i>Removable Needle Syringes (RN), 2" Needle Length</i>						
75	5μL	26s	2	7758-02	ea	87930
701	10μL	26s	2	7758-02	ea	803300
702	25μL	22s	2	7758-03	ea	80430
705	50μL	22s	2	7758-03	ea	80530
710	100μL	22s	2	7758-03	ea	80630
725	250μL	22s	2	7779-03	ea	80730
750	500μL	22	2	7779-01	ea	808301
<i>Luer Tip Syringes (LT)</i>						
701	10μL	—	—	*	ea	80301
702	25μL	—	—	*	ea	80401
705	50μL	—	—	*	ea	80501
710	100μL	—	—	*	ea	80601
725	250μL	—	—	*	ea	80701
750	500μL	—	—	*	ea	808011

For Rheodyne®, Valco® VISF-2, Beckman®/Altex and SSI, 2" Needle Length, Fixed Needle

701	10μL	22s	3	None	ea	80365
702	25μL	22s	3	None	ea	80465
705	50μL	22s	3	None	ea	80565
710	100μL	22s	3	None	ea	80665
725	250μL	22	3	None	ea	80765
750	500μL	22	3	None	ea	80865

*Order needles separately, see page 342.

Save Money on Model 701 with Multi-Packs

- Economical—syringes cost less in six packs
- Easy identification—six numbered dots provide quick syringe identification



4802

Hamilton® 700 Series Six-packs (2" Needle Length)

Model	Volume	Gauge	Pt. Style	Repl. Needle	Qty.	Part No.
<i>Cemented Needle Syringes (N), 2" Needle Length</i>						
701N	10μL	26s	2	None	6	80366
701N	10μL	26s	2	None	12	803662
701RN	10μL	26s	2	7758-02	6	80336

Guide

Plunger Guides reduce the expense of replacing or repairing syringes with bent plungers. They are especially useful on syringes with small diameter plungers.



4800

Chaney Adapter

Chaney Adapters ensure consistent sample delivery. You will know the sample size is right every time.



4799

Guides and Chaney Adapters

Description	Part No.
Guide for 701	14806
Guide for 702–750, 7000	14906
Chaney Adapter for 701, 75	147000
Chaney Adapter for 702–750 and 7000	14725

900 Series MICROLITER™ Syringes

- Low price with a reinforced construction



4808

Hamilton® 900 Series Syringes

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>Cemented Needle Syringes (N), 2" Needle Length</i>					
95	5μL	26s	2	None	87920
901	10μL	26s	2	None	803600
<i>Removable Needle Syringes (RN), 2" Needle Length</i>					
95	5μL	26s	2	7758-02	87925
901	10μL	26s	2	7758-02	803700

600 Series MICROLITER™ Syringes

- Suitable for Rheodyne®, Beckman®/Altex, and Valco® VISF-2



4804

Hamilton® 600 Series Syringes

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>Removable Needle Syringes (RN), 2" Needle Length</i>					
62	2.5μL	22s	3	7770-01	87942
65	5μL	22s	3	7770-01	87943

best value

Hamilton® Syringes

800 Series MICROLITER™ Syringes

- General purpose syringe
- Extended handle simplifies sampling from test tubes or long-necked flasks



4805

Hamilton® 800 Series Syringes

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>Cemented Needle Syringes (N), 2" Needle Length</i>					
85	5µL	26s	2	None	84850
801	10µL	26s	2	None	84852
802	25µL	22s	2	None	84854
805	50µL	22s	2	None	84856
810	100µL	22s	2	None	84858
<i>Removable Needle Syringes (RN), 2" Needle Length</i>					
85	5µL	26s	2	7758-02	84851
801	10µL	26s	2	7758-02	84853
802	25µL	22s	2	7758-03	84855
805	50µL	22s	2	7758-03	84857
810	100µL	22s	2	7758-03	84859
825	250µL	22s	2	7758-03	84861
<i>Removable Needle Syringes (RNW) For Waters® U6K Injection Valve, 1.97" Needle Length</i>					
801	10µL	25s	3	80426	84815
802	25µL	25s	3	80426	84816
805	50µL	25s	3	80426	84817
810	100µL	25s	3	80426	84818
825	250µL	25s	3	80726	84819

7000 Series MODIFIED MICROLITER™ Syringes

Plunger-in-Needle Design, 0.5µL to 5µL

- No dead volume
- Replaceable barrels and plunger wires
- Not recommended for viscous samples



4803

Hamilton® 7000 Series Syringes

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>Knurled Hub Syringes (KH), 2.75" Needle Length</i>					
7000.5	0.5µL	25	2	17887	86259
	0.5µL	25	3	17187	86250
7000.50C*	0.5µL	32	3	86258	86257
7001	1µL	25s	2	17886	80135
	1µL	25s	3	17188	80100
7101	1µL	22s	2	17890	86211
	1µL	22s	3	17190	86200
7002	2µL	25	2	17891	88411
	2µL	25	3	17191	88400
7102	2µL	23	2	17892	88511
	2µL	23	3	17192	88500
7105	5µL	24	2	17893	88011
	5µL	24	3	17193	88000

*Needle length = 3.94" (2cm).

Guides and Chaney Adapters

Syringe Model	Part No.
Guide Assembly for 7000 Series	14906
Chaney Adapter for 7000 Series	14725

1000 Series GASTIGHT™ Syringes

Gas and Liquid Tight, 1mL to 100mL

- PTFE-tipped plungers
- Replaceable barrels and plungers



4809

Hamilton® 1000 Series Syringes

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>Removable Needle Syringes (RN), 2" Needle Length</i>					
1001	1.0mL	22	2	7779-01	81330
1002	2.5mL	22	2	7779-01	81430
1005	5.0mL	22	2	7779-01	81530
1010	10.0mL	22	2	7779-01	81630
<i>Luer Tip Syringes (LT), 2" Needle Length</i>					
1001	1.0mL	—	—	**	81301
1002	2.5mL	—	—	**	81401
1005	5.0mL	—	—	**	81501
1010	10.0mL	—	—	**	81601
<i>Luer Tip w/Cemented Needle Syringes (LTN), 2" Needle Length</i>					
1001	1.0mL	22	2	None	81317
	1.0mL	22	5	None	81343
1002	2.5mL	22	2	None	81417
	2.5mL	22	5	None	81443
1005	5.0mL	22	2	None	81517
	5.0mL	22	5	None	81543
1010	10.0mL	22	2	None	81617
	10.0mL	22	5	None	81643
<i>PTFE Luer Lock Syringes (TLL), 2" Needle Length</i>					
1001	1.0mL	—	—	**	81320
1002	2.5mL	—	—	**	81420
1005	5.0mL	—	—	**	81520
1010	10.0mL	—	—	**	81620
1025	25.0mL	—	—	**	82520
1050	50.0mL	—	—	**	85020
1100	100.0mL	—	—	**	86020
<i>Removable Needle Syringes, 0.75" Needle Length For Valco® (VISF-1) Injection Valves — Black</i>					
1001	1mL	22	3	76515	81331
1002	2.5mL	22	3	76515	81431
1005	5mL	22	3	76515	81531
1010	10mL	22	3	76515	81631
<i>For Rheodyne®, Valco® (VISF-2), Beckman®/Altex, and SSI — Black</i>					
1001	1mL	22	3	7780-04	81365
<i>Luer Tip w/Cemented Needle Syringes (LTN), 2" Needle Length For Rheodyne®, Valco® (VISF-2), Beckman®/Altex, and Black SSI</i>					
1001	1.0mL	22	3	None	81316
1002	2.5mL	22	3	None	81416
1005	5.0mL	22	3	None	81516
1010	10.0mL	22	3	None	81616

**Order needles separately, see page 342.

Hamilton® Syringes

1700 Series GASTIGHT™ Syringes

Gas and Liquid Tight, 10µL to 500µL

- PTFE-tipped plungers
- Replaceable barrels and plungers



4780

Hamilton® 1700 Series GASTIGHT™ Syringes

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>Cemented Needle Syringes (N), 2" Needle Length</i>					
1701	10µL	26s	2	None	80000
	10µL	26s	3	None	800750
	10µL	26	3	None	800850
	10µL	26	5	None	80039
1702	25µL	22s	2	None	80200
	25µL	22s	3	None	802750
	25µL	22s	5	None	80239
	25µL	22	3	None	80285
1705	50µL	22s	2	None	80900
	50µL	22s	3	None	80975
	50µL	22s	5	None	80939
	50µL	22	3	None	80985
1710	100µL	22s	2	None	81000
	100µL	22s	3	None	81075
	100µL	22s	5	None	81039
	100µL	22	3	None	81085
1725	250µL	22s	2	None	81100
	250µL	22s	3	None	81175
	250µL	22s	5	None	81139
	250µL	22	3	None	81185
<i>Removable Needle Syringes (RN), 2" Needle Length</i>					
1701	10µL	26s	2	7758-02	800300
1702	25µL	22s	2	7758-03	80230
1705	50µL	22s	2	7758-03	80930
1710	100µL	22s	2	7758-03	81030
1725	250µL	22s	2	7779-03	81130
1750	500µL	22	2	7779-01	81230
<i>Luer Tip Syringes (LT)</i>					
1701	10µL	—	—	*	80001
1702	25µL	—	—	*	80201
1705	50µL	—	—	*	80901
1710	100µL	—	—	*	81001
1725	250µL	—	—	*	81101
1750	500µL	—	—	*	81201
<i>Luer Tip with Cemented Needle Syringes (LTN), 2" Needle Length</i>					
1750	500µL	22	2	None	81217
	500µL	22	3	None	81216
	500µL	22	5	None	81243
<i>PTFE Luer Lock Syringes (TLL) / Without Slots</i>					
1705	50µL	—	—	*	80920
1710	100µL	—	—	*	81020
1725	250µL	—	—	*	81120
1750	500µL	—	—	*	81220

*Order needles separately, see page 342.

Hamilton® 1700 Series GASTIGHT™ Syringes

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>Removable Needle Syringes</i>					
<i>For Waters® U6K Injection Valve (RNW), 1.97" Needle Length</i>					
1702	25µL	25s	3	80426	80238
1705	50µL	25s	3	80426	80938
1710	100µL	25s	3	80426	81038
1725	250µL	25s	3	80726	81138
<i>For Rheodyne®, Valco® VISF-2, Beckman®/Altex, SSI (RNR), 2" Needle Length</i>					
1701	10µL	22s	3	7770-01	80065
1702	25µL	22s	3	7770-01	80265

Hamilton® 1700 Series GASTIGHT™ Syringes (continued)

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>For Rheodyne®, Valco® VISF-2, Beckman®/Altex, SSI (RNR), 2" Needle Length (continued)</i>					
1705	50µL	22s	3	7770-01	80965
1710	100µL	22s	3	7770-01	81065
1725	250µL	22	3	7780-04	81165
1750	500µL	22	3	7780-04	81265
<i>For Valco® VISF-1 (RNCP), 0.75" Needle Length</i>					
1702	25µL	22s	3	76517	80231
1705	50µL	22s	3	76517	80931
1710	100µL	22s	3	76517	81031
1725	250µL	22s	3	76517	81131
1750	500µL	22	3	76515	81231

1800 Series GASTIGHT™ Syringes

Gas and Liquid Tight with Reinforced Plunger, 10µL to 250µL

- Similar to the 1700 Series but with a reinforced, protected plunger
- PTFE-tipped plungers
- Replaceable barrels and plungers



4781

Hamilton® 1800 Series Syringes and Accessories

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>Cemented Needle Syringes (N), 2" Needle Length</i>					
1801	10µL	26s	2	None	84875
1802	25µL	22s	2	None	84878
1805	50µL	22s	2	None	84881
1810	100µL	22s	2	None	84884
1825	250µL	22s	2	None	84887
<i>Removable Needle Syringes (RN), 2" Needle Length</i>					
1801	10µL	26s	2	7758-02	84877
1802	25µL	22s	2	7758-03	84880
1805	50µL	22s	2	7758-03	84883
1810	100µL	22s	2	7758-03	84886
1825	250µL	22s	2	7779-03	84889
<i>Removable Needle Syringes (RNW)</i>					
<i>For Waters® U6K Injection Valve, 1.97" Needle Length</i>					
1802	25µL	25s	3	80426	84980
1805	50µL	25s	3	80426	84983
1810	100µL	25s	3	80426	84986
1825	250µL	25s	3	80726	84989
<i>Hamilton Accessories</i>					
Chaney Adapter for 801-825, 1801-1825					32146

Super Gas Syringes

Gas Tight, Large Volume Syringes, 500mL to 2000mL

- Ideal for air and gas sampling
- Graduated every 20mL
- Acrylic barrels with PTFE-coated aluminum pistons



4783

Hamilton® Super Gas Syringes

Model	Volume	Part No.
<i>Syringe with PTFE Luer Lock (TLL)</i>		
S-0500	0.5 Liter	86311
S-1000	1.0 Liter	86312
S-1500	1.5 Liter	86313
S-2000	2.0 Liter	86314

Hamilton® Syringes

Autosampler Syringes

For the Agilent 7673 and 7683 Autosamplers

- Standard needle length is 1.71"

Syringes for the Agilent 7673 and 7683 Autosamplers

Model	Volume	Gauge	Pt. Style	Qty.	Part No.
<i>Cemented Needle Syringes (ASN)</i>					
75	5µL	23s	AS	ea	87987
	5µL	23s	AS	6	87990
	5µL	23s	2	ea	87991
	5µL	26s	AS	ea	87988
	5µL	26s	AS	6	87989
	5µL	26s	2	ea	87992
	5µL	23s-26s	AS	ea	87993
	5µL	23s-26s	AS	6	87994
701	10µL	23s	AS	ea	803871
	10µL	23s	AS	6	803901
	10µL	23s	2	ea	80398
	10µL	26s	AS	ea	803881
	10µL	26s	AS	6	803891
	10µL	26s	2	ea	80399
	10µL	23s-26s	AS	ea	80393
	10µL	23s-26s	AS	6	803911
<i>Removable Needle Syringes (ASRN)</i>					
75	5µL	23s	AS	ea	87957
	5µL	26s	AS	ea	87958
	5µL	23s-26s	AS	ea	87959
701	10µL	23s	AS	ea	80357
	10µL	26s	AS	ea	80358
	10µL	23s-26s	AS	ea	80359
<i>Cemented Needle GASTIGHT™ Syringes (ASN)</i>					
175	5µL	23s	AS	ea	800741
	5µL	23s	AS	6	80090
	5µL	23s-26s	AS	ea	800761
	5µL	23s-26s	AS	6	80092
	10µL	23s	AS	ea	800801
1701	10µL	23s	AS	6	80094
	10µL	23s-26s	AS	ea	800791
	10µL	23s-26s	AS	6	80096
	10µL	23s-26s	AS	6	80096
<i>Removable Needle GASTIGHT™ Syringes (ASRN)</i>					
175	5µL	23s-26s	AS	ea	80086
1701	10µL	23s	AS	ea	80087
	10µL	23s-26s	AS	ea	80089

Replacement Needles for Agilent Autosamplers

- For 5 and 10µL syringes

Agilent Autosampler Replacement Needles

Gauge	Needle Length	Pt. Style	Qty.	Part No.
23s-26s	1.71"	AS	6	7785-01
23s	1.71"	AS	6	7786-01
26s	1.71"	AS	6	7786-02

For the Waters® WISP™ Autosampler

Syringes for the Waters® WISP™ Autosampler

Model	Volume	Part No.
<i>GASTIGHT™ Syringes with PTFE-Tipped Plungers</i>		
1725 WISP™	250µL	80024

more info

See page 195 for Hamilton® TLC Syringes.

For the Agilent 7670, 7671, and 7672 Autosamplers

Syringes for Agilent 7670, 7671, 7672 Autosamplers

Model	Volume	Gauge	Pt. Style	Qty.	Part No.
<i>Cemented Needle Syringes (N), 2" Needle</i>					
701N	10µL	26s	2	ea	80300
	10µL	26s	2	6	80366
<i>Removable Needle Syringes (RN), 2" Needle</i>					
701	10µL	26s	2	ea	80338
<i>Cemented Needle with PTFE-Tipped Plungers (N), 2" Needle</i>					
1701	10µL	26s	2	ea	80000
<i>Removable Needle with PTFE-Tipped Plungers (RN), 2" Needle</i>					
1701	10µL	26s	2	ea	800110

For the PerkinElmer® Autosystem

Syringes for the PerkinElmer® Autosystem

Model	Volume	Needle o.d.	Needle Lgth.	Pt. Style	Part No.
<i>Cemented Needle Syringes (ASN/PE)</i>					
75	5µL	0.47mm	2.756"	3	880401
	5µL	0.63mm	2.756"	3	880351

SampleLock™ Syringes

- 1000 and 1700 Series syringes with twist valve



Hamilton® SampleLock™ Syringes

Model	Volume	Gauge	Pt. Style	Repl. Needle	Part No.
<i>SampleLock™ Syringes, 2" Needle Length</i>					
1705	50µL	22s	2	7779-03	80956
1710	100µL	22s	2	7779-03	81056
1725	250µL	22s	2	7779-03	81156
1750	500µL	22	2	7779-01	812560
1001	1mL	22	2	7779-01	81356
1002	2.5mL	22	2	7779-01	81456
1005	5mL	22	2	7779-01	81556
1010	10mL	22	2	7779-01	81656
1025	25mL	22	2	7779-01	863260
1050	50mL	22	2	7779-01	863360
1100	100mL	22	2	7779-01	86346

Valves and Adapters



4812



4811



4810

Valves and Adapters

Description	Qty.	Part No.
<i>Sampling Valve</i>		
Inert Gas Sampling Valve		86580
<i>Luer Adapters</i>		
Female Luer to Removable Needle Hub		35081
Male Luer to Removable Needle Hub		35080
Male Luer Lock to Removable Needle Hub		35083
<i>Septum Adapter</i>		
Septum Adapter (TLL), Includes 12 Septa	ea	313350
Replacement Septa, 7mm	12	75810

Hamilton® Needles

RN Replacement Needle Packs

- For syringes designated "RN"
- Needle length is 2"

RN Replacement Needles

Gauge	Pt. Style	Qty.	5-100µL Part No.	250µL-10mL Part No.
<i>RN Needles for 5µL — 100µL Syringes</i>				
22	2	6	7758-01	7779-01
22	3*	6	7770-02	7780-04
22	5	6	7784-06	7784-04
22s	2	6	7758-03	7779-03
22s	3*	6	7770-01	7780-03
22s	5	6	7784-05	7784-03
26	2	6	7758-04	7779-04
26	3	6	7768-02	7780-02
26	5	6	7784-08	7784-02
26s	2	6	7758-02	7779-02
26s	3	6	7768-01	7780-01
26s	5	6	7784-07	7784-01

*Compatible with Rheodyne® Valves.

Replacement Needles for HPLC Syringes

HPLC Replacement Needles

Gauge	Length	Pt. Style	For Valve	Qty.	Part No.
<i>RN Needles for 5µL — 100µL Syringes</i>					
22s	0.75"	3**	Valco®	6	7787-01
22s	2"	3*	Rheodyne®	6	7770-01
25s	1.97"	3***	Waters®	6	8647-01
<i>RN Needles for 250µL — 10mL Syringes</i>					
22	0.75"	3**	Valco®	6	7787-02
22	2"	3*	Rheodyne®	6	7780-04
22s	0.75"	3**	Valco®	3	76518
22s	2"	3*	Rheodyne®	6	7780-03
25s	1.97"	3***	Waters®	6	8648-01

CTFE Luer Hub Needles

22	2"	3*	Rheodyne®	6	90536
22s	2"	3*	Rheodyne®	6	90534

*Compatible with Rheodyne®, Beckman®/Altex, SSI, and Valco® Model VISF-2 Valves;

Compatible with Valco® Valves; *Compatible with Waters® Valves.

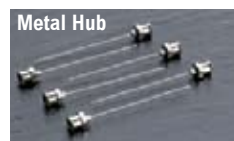
tech tip

Needle Gauge vs. o.d.-i.d.

Gauge	o.d.		i.d.	
33	0.008"	0.2032mm	0.004"	0.1016mm
32	0.009"	0.2286mm	0.004"	0.1016mm
31	0.010"	0.2540mm	0.005"	0.1270mm
30	0.012"	0.3048mm	0.006"	0.1524mm
29	0.013"	0.3302mm	0.007"	0.1778mm
28	0.014"	0.3556mm	0.005"	0.1270mm
27	0.016"	0.4064mm	0.008"	0.2032mm
26s	0.0185"	0.4699mm	0.0045"	0.1143mm
26	0.018"	0.4572mm	0.010"	0.2540mm
25	0.020"	0.5080mm	0.010"	0.2540mm
24	0.022"	0.5588mm	0.012"	0.3048mm
23	0.025"	0.6350mm	0.013"	0.3302mm
22	0.028"	0.7112mm	0.016"	0.4064mm
22s	0.028"	0.7112mm	0.006"	0.1524mm
21	0.032"	0.8128mm	0.020"	0.5080mm
20	0.035"	0.8890mm	0.023"	0.5842mm
19	0.042"	1.0668mm	0.027"	0.6858mm
18	0.049"	1.2446mm	0.033"	0.8382mm
17	0.058"	1.4732mm	0.042"	1.0668mm
16	0.065"	1.6510mm	0.047"	1.1938mm
15	0.077"	1.9558mm	0.054"	1.3716mm

Standard Luer Hub Needles

- Will fit any luer or luer lock hub
- Needle length is 2"
- All needles are 304 SS



4797



4798

Standard Luer Hub Needles

Needle			Metal Hub	Kel-F® Hub
Gauge	Pt. Style	Qty.	Part No.	Part No.
16	2	6	N-716	KF-716
16	3	6	91016	90516
16	5	6	7729-12	7746-01
17	2	6	N-717	KF-717
17	3	6	910170	90517
17	5	6	7729-11	7746-02
18	2	6	N-718	KF-718
18	3	6	910180	90535
18	5	6	7729-10	7746-03
20	2	6	N-720	KF-720
20	3	6	910200	905200
20	5	6	7729-09	7746-04
21	2	6	N-721	KF-721
21	3	6	910210	90521
21	5	6	7729-08	7746-05
22	2	6	N-722	KF-722
22	3*	6	91022	90536
22	5	6	7729-07	7746-06
22s	2	6	N-722s	KF-722s
22s	3*	6	910380	90534
22s	5	6	7729-02	7746-11
23	2	6	N-723	KF-723
23	3	6	910230	90523
23	5	6	7729-06	7746-07
24	2	6	N-724	KF-724
24	3	6	91024	90524
24	5	6	7729-05	7746-08
25	2	6	N-725	KF-725
25	3	6	910250	90525
25	5	6	7729-04	7746-09
26	2	6	N-726	KF-726
26	3	6	91026	90533
26	5	6	7729-03	7746-10
26s	2	6	N-726s	KF-726s
26s	5	6	7729-01	7746-12

*Compatible with Rheodyne® Valves.

Metal Luer Needles

- Economical



5048

Metal Luer Needles

Description	Gauge	Length	Qty.	Part No.
<i>Beveled Point</i>				
Metal Luer	18	1.5"	12	90096
Metal Luer	22	1.5"	12	90100

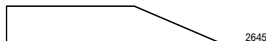
more info

For more replacement parts for Hamilton® Syringes, please visit our website.

VICI® Precision Syringes

Point Styles

Point Style 2



Gas Syringe Features					
Series	Pressure Rating	Removable Needle	Luer Needle	Valve Type	Plunger Stop
A	250psig	X		Twist-Lock	X
A-2	250psig	X	X	Push-Button	X

Series A Syringes

Gas Tight with a Twist Valve, 100µL to 10mL

- PTFE-tipped plunger and needle seal
- Twist valve stores sample in barrel



5041

Series A Syringes

Volume	Ndl. o.d.	Pt. Style	Repl. Needle	Part. No.
<i>Removable Needle Syringes, 2.25" Needle Length</i>				
100µL	0.029"	2	913050	010025
250µL	0.029"	2	913050	010031
500µL	0.029"	2	913050	010032
1mL	0.029"	2	913050	010033
2mL	0.029"	2	913050	010034
5mL	0.029"	2	913050	010035
10mL	0.029"	2	913050	010036

Series A-2 Syringes

Gas Tight with a Push Valve, 25µL to 10mL

- PTFE-tipped plunger and needle seal
- Push-button valve stores sample in barrel



5040

Series A-2 Syringes

Volume	Needle o.d.	Pt. Style	Repl. Needle	Part. No.
<i>Removable Needle Syringes, 2" Needle Length</i>				
25µL	0.028"	2	943050	050023
50µL	0.028"	2	943050	050024
100µL	0.028"	2	943050	050025
250µL	0.029"	2	943051	050031
500µL	0.029"	2	943051	050032
1mL	0.029"	2	943051	050033
2mL	0.029"	2	943051	050034
5mL	0.029"	2	943051	050035
10mL	0.029"	2	943051	050036
<i>Luer Syringes— Needle Supplied, 2" Needle Length</i>				
25µL	0.028"	2	943060	16014
50µL	0.028"	2	943060	16016
100µL	0.028"	2	943060	16018
250µL	0.028"	2	943061	16023
500µL	0.028"	2	943061	16025
1mL	0.028"	2	943061	16027
2mL	0.028"	2	943061	16029
5mL	0.028"	2	943061	16032
10mL	0.028"	2	943061	16034



VICI® Precision Replacement Parts

Replacement Plunger Tips and Needles

Replacement PTFE Plunger Tips

Description	Part No.
<i>For Series A and A-2 Syringes</i>	
100µL	16192
250µL	16194
500µL	013932
1mL	013933
2mL	013934
5mL	013935
10mL	013936

Replacement Needles 3/pk

Fit Models	Ndl. o.d.	Ndl. i.d.	Ndl. Lgth.	Pt. Style	Part. No.
<i>Removable Needles</i>					
A	0.029"	0.012"	2.25"	2	913050
	0.029"	0.012"	2.25"	3	913052
A-2	0.028"	0.005"	2"	2	943050
	0.029"	0.012"	2"	2	943051
	0.029"	0.012"	2"	3	943052
<i>Luer Needles</i>					
A-2	0.028"	0.006"	2"	2	943060
	0.028"	0.016"	2"	2	943061
	0.028"	0.016"	2"	3	943062

Mininert® Syringe Valves

- Add storage capability to standard syringes



5045

Mininert® Valves

Description	Part No.
To Fit Any Standard Luer Tip Syringes	654051

more info

For our full VICI® Precision offering, including replacement parts and other syringes not listed here, visit the product portion of our website.

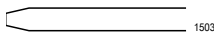
technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)
Email: contact.alltech@grace.com
Online: www.discoverysciences.com

SGE® Syringes

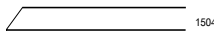
Point Styles

Point Style 1



#1 Cone Needle Tip – Designed for autosamplers. Recommended for use with pre-drilled septa.

Point Style 2



#2 20° Bevel Needle Tip – Standard general purpose needle.

Point Style 3



#3 HPLC Needle Tip – 90° square cut with chamfered and polished edges. Use with HPLC valves.

Plunger Protection Syringes

General Purpose Syringes with Reinforced Plunger, 5µL and 10µL

- Includes certificate of conformance to NIST

SGE® Plunger Protection Syringes

Volume	Gauge	Length	Pt. Style	Repl. Needle	Qty.	Part No.
<i>Fixed Needle Syringes</i>						
5µL	26	5cm	2	None	ea	85184
10µL	26	5cm	2	None	ea	85056
10µL	26	5cm	2	None	6	85190
10µL	26	5cm	2	None	10	85400
<i>Removable Needle Syringes</i>						
5µL	26	5cm	2	85272	ea	85186
10µL	26	5cm	2	85294	ea	85050
10µL	26	5cm	2	85294	6	85194

Standard Syringes

General Purpose Syringes, 5µL and 10µL

- Includes certificate of conformance to NIST

SGE® Standard Syringes

Volume	Gauge	Length	Pt. Style	Repl. Needle	Qty.	Part No.
<i>Fixed Needle Syringes for Use with Merlin Microseal®</i>						
5µL	23	4.2cm	1	None	ea	85005
10µL	23	4.2cm	1	None	ea	85003
<i>Fixed Needle Syringes</i>						
25µL	25	5cm	2	None	ea	85058
50µL	25	5cm	2	None	ea	85002
100µL	25	5cm	2	None	ea	85012
250µL	25	5cm	2	None	ea	85060
500µL	25	5cm	2	None	ea	85062
<i>Removable Needle Syringes</i>						
25µL	25	5cm	2	85274	ea	85164
50µL	25	5cm	2	85274	ea	85008
100µL	25	5cm	2	85274	ea	85006
250µL	25	5cm	2	85274	ea	85052
500µL	25	5cm	2	85274	ea	85054

more info

For our full SGE® offering, visit the product portion of our website.

SuperfleX™ Syringes

Syringes with Flexible Plungers, 5µL and 10µL

- Includes plunger protection guide



4913

SGE® SuperfleX™ Syringes

Volume	Gauge	Length	Pt. Style	Repl. Needle	Qty.	Part No.
<i>Fixed Needle Syringes</i>						
5µL	26	5cm	2	None	ea	85196
10µL	26	5cm	2	None	ea	85206
10µL	26	5cm	2	None	6	85208
10µL	26	7cm	2	None	ea	85185
<i>Removable Needle Syringes</i>						
5µL	26	5cm	2	85272	ea	85200
10µL	26	5cm	2	85294	ea	85210
10µL	26	5cm	2	85294	6	85212

NIST Syringes

NIST and NBS Traceable, 5µL to 500µL

- Includes certificate of calibration



4905

SGE® Factory Calibrated Syringes

Volume	Gauge	Length	Pt. Style	Repl. Needle	Part No.
<i>Fixed Needle Syringes with Repeating Adapter</i>					
5µL	26	5cm	2	None	85015
10µL	26	5cm	2	None	85017
25µL	22	5cm	3	None	85023
50µL	25	5cm	2	None	85025
100µL	25	5cm	2	None	85027

Guided Plunger Syringes

Extended Barrel Syringes, 5µL and 10µL

- Reinforced plunger



4901

SGE® Guided Plunger Syringes

Volume	Gauge	Length	Pt. Style	Repl. Needle	Part No.
<i>Fixed Needle Syringes</i>					
5µL	26	5cm	2	None	85022
10µL	26	5cm	2	None	85038
<i>Removable Needle Syringes</i>					
5µL	26	5cm	2	85272	85016
10µL	26	5cm	2	85294	85018
10µL	26	7cm	2	85163	85159

SGE® Syringes

Gas Tight Syringes

Gas and Liquid Tight,
10µL to 100mL

- Replaceable PTFE-tipped plunger



SGE® Gas Tight Syringes (Needles sold separately, see page 346)

Volume	Needle o.d.	Length	Pt. Style	Part No.
<i>Fixed Luer Lock</i>				
50µL	—	—	—	85357
100µL	—	—	—	85359
250µL	—	—	—	85361
500µL	—	—	—	85363
1mL	—	—	—	85080
2.5mL	—	—	—	85123
<i>Removable Luer Lock</i>				
5mL	—	—	—	85088
10mL	—	—	—	85092
25mL	—	—	—	85125
50mL	—	—	—	85096
100mL	—	—	—	85098
<i>Luer Lock with Valve</i>				
1mL	—	—	—	85127
2.5mL	—	—	—	85131
5mL	—	—	—	85133
10mL	—	—	—	85135
20mL	—	—	—	85137
50mL	—	—	—	85139
100mL	—	—	—	85143

SGE® Gas Tight Syringes, Needles included

Volume	Gauge	Length	Pt. Style	Repl. Needle	Part No.
<i>Fixed Needle</i>					
10µL	26	5cm	2	None	85064
10µL	26	7cm	2	None	85066
25µL	25	5cm	2	None	85321
50µL	25	5cm	2	None	85323
100µL	25	5cm	2	None	85325
250µL	25	5cm	2	None	85327
500µL	25	5cm	2	None	85329
<i>Removable Needle</i>					
10µL	26	5cm	2	85294	85004
25µL	25	5cm	2	85274	85331
50µL	25	5cm	2	85274	85070
100µL	25	5cm	2	85274	85072
250µL	25	5cm	2	85274	85074
500µL	25	5cm	2	85274	85076
1mL	23	5cm	2	85276	85078
2.5mL	23	5cm	2	85276	85117
5mL	23	5cm	2	85278	85086
10mL	23	5cm	2	85278	85090

Repeating Adapters

- Preset to any desired volume



SGE® Repeating Adapters

Description	Part No.
RA-6 for 0.5, 5, 10µL Syringes	85263
RA-8 for 25-500µL Syringes	85265

Autosampler Syringes



SGE® Autosampler Syringes

Volume	Gauge	Pt. Style	Repl. Needle	Qty.	Part No.
<i>for Agilent 7673 Autosamplers</i>					
<i>Fixed Needle</i>					
5µL	23	1	None	ea	85014
5µL	23	1	None	6	85140
5µL	26	1	None	ea	85136
5µL	26	1	None	6	85138
10µL	23	1	None	ea	85144
10µL	23	1	None	6	85036
10µL	26	1	None	ea	85142
10µL	26	1	None	6	85034
<i>Removable Needle</i>					
0.5µL	23	1	85292	ea	85134
0.5µL	26	1	85262	ea	85132
5µL	23	1	85298	ea	85248
5µL	26	1	85296	ea	85394
10µL	23	1	85302	ea	85148
10µL	26	1	85300	ea	85146
25µL	23	1	85040	ea	85047
50µL	23	1	85040	ea	85416
<i>for PerkinElmer® Autosystem</i>					
<i>Fixed Needle</i>					
5µL	23	1	None	ea	85069
5µL	26	1	None	ea	85067
50µL	23	1	None	ea	85419
<i>Gas Tight Fixed Needle</i>					
5µL	23	1	None	ea	85160
5µL	26	1	None	ea	85158
<i>Removable Needle</i>					
0.5µL	23	1	85308	ea	85156
0.5µL	26	1	85306	ea	85154
<i>for Shimadzu® Autosamplers</i>					
<i>Models AOC14 and 17—Removable Needle</i>					
0.5µL	26	1	85312	ea	85166
10µL	26	1	85316	ea	85172
<i>for Varian® Autosamplers</i>					
<i>Model 8000—Removable Needle</i>					
10µL	25	5	85167	ea	85176
<i>Models 8035, 8100, 8200—Removable Needle</i>					
10µL	25	5	85173	ea	85180
<i>for CTC/Fisons AS200 and AS800 Autosamplers</i>					
<i>Fixed Needle (50mm)</i>					
10µL	26	1	None	ea	85297
25µL	26	1	None	ea	85401
<i>Fixed Needle (80mm)</i>					
10µL	26	1	None	ea	85398
<i>Gas Tight Fixed Needle (50mm)</i>					
10µL	23	1	None	ea	85399
25µL	23	1	None	ea	85402

SGE® Syringes

Micro Syringes

- Plunger-in-needle, 0.5µL to 5µL
- Liquid and gas tight to 650 atmospheres*

SGE® Microvolume Syringes

Volume	Gauge	Length	Pt. Style	Repl. Needle/Plunger	Part No.
<i>Standard Barrel—8mm o.d.</i>					
0.5µL	23	7cm	1	85266	85028
0.5µL	23	7cm	2	85235	85209
0.5µL	26	7cm	1	85237	85039
1µL	23	5cm	1	85268	85000
1µL	23	7cm	1	85284	85030
1µL	23	7cm	2	85243	85211
1µL	26	7cm	1	85245	85213
5µL	23	5cm	1	85247	85215
5µL	23	7cm	1	85270	85032
5µL	23	7cm	2	85253	85217
<i>Standard Barrel with Repeating Adapter</i>					
0.5µL	23	7cm	1	85266	85219
1µL	23	5cm	1	85268	85223
1µL	23	7cm	1	85284	85225
1µL	26	7cm	1	85245	85227
5µL	23	5cm	1	85247	85229
5µL	23	7cm	1	85270	85231

*Use a repeating adapter to prevent plunger blow-out at elevated pressures.

HPLC Syringes

- Syringes and needles sold separately



SGE® HPLC Syringes

Volume	Gauge	Length	Pt. Style	Part No.
<i>Luer Lock Syringes</i>				
1mL	—	—	—	85080
2.5mL	—	—	—	85123
5mL	—	—	—	85088
10mL	—	—	—	85092
25mL	—	—	—	85125
<i>HPLC Injector Specific Luer Lock Needles (2/pk)</i>				
For Rheodyne®/Valco®	22	2"	3	85151
For Waters® U6K	24	1.97"	3	85153

On-Column Syringes

- 0.5µL to 10µL



best seller

SGE® On-Column Syringes

Volume	Needle o.d.	Length	Repl. Needle	Part No.
<i>On-Column Syringes, Fused Silica Needles</i>				
5µL	0.17mm	10cm	85365	85382
10µL	0.17mm	10cm	85367	85384
<i>For 0.53mm i.d. Capillary Column, Stainless Steel Needles</i>				
0.5µL	0.47mm	7cm	85237	85039
1µL	0.47mm	7cm	85245	85213

SGE® Accessories

Syringe Valves



Model VLL — Connect to any SGE® removable needle syringe 25µL–2.5mL. Luer lock fitting cone with Kel-F® core.

Model VLLMA — Designed specifically for the SGE® larger capacity luer lock syringes 5mL–100mL.

Model SLLV — Can be fitted to any luer lock or luer tip syringe or device.

SGE® Retro-Fit Syringe Valves, Use Luer Hub Needles

Description	Part No.
Model VLL	85043
Model VLLMA	85049
Model SVLL	85055

Replacement Needles

SGE® Replacement Needles

SGE No.	o.d.	Needle Length	Style	Qty.	Part No.
<i>For 5µL Syringes</i>					
036110	0.47mm	5cm	2	5	85272
036710	0.47mm	4.2cm	1	2	85296
036720	0.63mm	4.2cm	1	2	85298
<i>For 10µL Syringes</i>					
037011	0.63mm	5cm	1	2	85364
037110	0.47mm	5cm	2	5	85294
037715	0.47mm	4.2cm	1	2	85300
037736	0.47mm	5cm	1	2	85197
037745	0.47mm	5cm	1	2	85316
037747	0.63mm	5cm	1	2	85334
037785	0.47mm	5cm	1	2	85317
<i>For 25–500µL Syringes</i>					
038110	0.5mm	5cm	2	5	85274
038250	0.028"	2"	3	5	85332
038260	0.5mm	5cm	3	5	85338
038810	0.63mm	5cm	1	ea	85377
<i>For 1–2.5mL Syringes</i>					
039110	0.63mm	5cm	2	5	85276
<i>For 5–10mL Syringes</i>					
031516	0.63mm	5cm	2	5	85278
<i>For Luer Lock and Luer Tip Syringes</i>					
039802	0.63mm	5cm	2	5	85287
039803	0.63mm	5cm	5	2	85145
039822	1.07mm	5cm	2	5	85289
039823	1.07mm	5cm	5	2	85147
039862	1.67mm	5cm	2	5	85149
039895	0.028"	2"	3	2	85151
039897	0.5mm	5cm	3	2	85153
<i>On-Column Needles</i>					
036675	0.23mm	7.5cm	1	2	85369
036625	0.17mm	11cm	1	2	85373

Popper Glass Syringes

- All-glass plunger and barrel
- Corrosion and heat resistant
- Flat flanges prevent rolling
- Needles sold separately



5046

Interchangeable Glass Syringes

Description	Qty.	Part No.
<i>Glass Male Luer Tip</i>		
2cc Volume	ea	3663
5cc Volume	ea	3972
10cc Volume	ea	3979
20cc Volume	ea	3984
30cc Volume	ea	3989
50cc Volume	ea	3991
<i>Metal Male Luer Lock</i>		
2cc Volume	ea	3393
5cc Volume	ea	3394
10cc Volume	ea	3395
20cc Volume	ea	3396
30cc Volume	ea	3369
50cc Volume	ea	3397



5047

Serial Numbered Glass Syringes

Description	Qty.	Part No.
<i>Glass Male Luer Tip</i>		
2cc Volume	ea	4687
5cc Volume	ea	4691
10cc Volume	ea	4693
20cc Volume	ea	4697
50cc Volume	ea	4707
100cc Volume	ea	4709
<i>Metal Male Luer Lock</i>		
1cc Volume	ea	4694
2cc Volume	ea	4696
5cc Volume	ea	4706
10cc Volume	ea	4708
20cc Volume	ea	4710
50cc Volume	ea	4714



4798

more info

Use needles on page 342 with Popper Syringes.

Syringe Accessories

Redi-Cut Fine Wires

- Rust-proof stainless steel



4670

Redi-Cut Fine Wires and Handle

Description	Part No.
Redi-Cut Fine Wires, 10 each of diameters 0.003", 0.005", 0.010", 0.020"	4046
Handle	8184

Syringe Cleaning Solutions

- Syringe Kleen removes metal deposits from metal plungers
- SK-2 soaking solution for hard-to-remove silicones and organic residues



4671

Cleaning Solutions

Description	Part No.
Syringe Kleen, 8oz	2030
Syringe Kleen, 4 Bottles/pk	20304
SK-2, 8oz	2040
SK-2, 6 Bottles/pk	20406

Needle Sharpener

- Protect GC septa by sharpening needle in groove



4674

Needle Sharpener

Description	Part No.
Needle Sharpener	2033

Plastic Syringes

- Use luer hub needles—sold separately (refer to page 342)



4675

Plastic Syringes

Description	Qty.	Part No.
<i>Plastic Syringes with a Luer Tip</i>		
1mL Syringe	12	44701100
5mL Syringe	12	447012
20mL Syringe	2	447018

Vials Introduction

Your sample, the type of vial, cap and septa, the solvent used, and the type of autosampler and detector all contribute to the end quality of your analysis. Choose from our wide selection of vial options to get the right vial for your analysis.

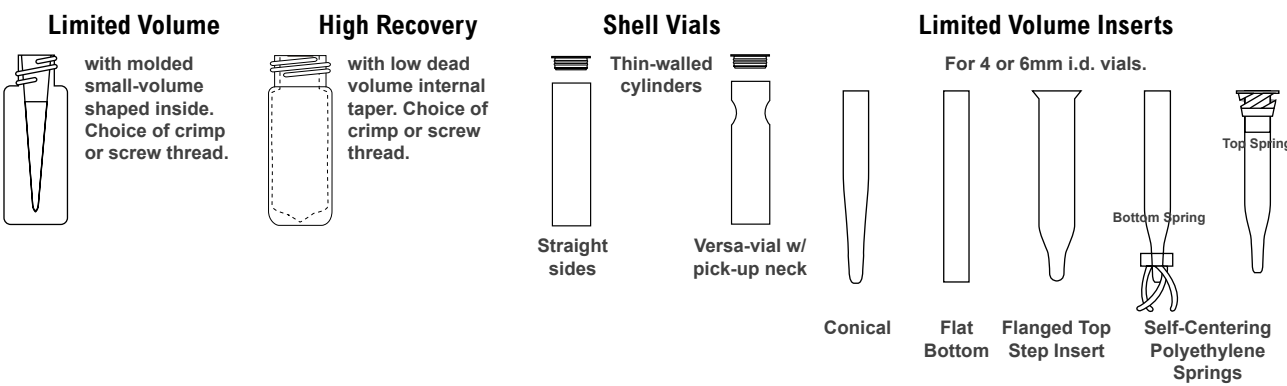
Screw Thread



Crimp Style



Additional Vial Options



Properties of Plastics						
	LDPE (Low-Density Polyethylene)	HDPE (High-Density Polyethylene)	PP (Polypropylene)	PMP(TPX) (Polymethyl-pentene)	PS (Polystyrene)	PTFE
Max. Temperature	80°C/176°F	120°C/248°F	135°C/275°F	175°C/347°F	90°C/194°F	260°C/500°F
Transparency	Translucent	Translucent	Translucent	Clear	Clear	Opaque
Sterilization Method						
Autoclaving	No	No	Yes	Yes	No	Yes
Disinfectants	Yes	Yes	Yes	Yes	No	Yes
Dry Heat	No	No	No	Yes	No	Yes
Radiation	Yes	Yes	No	No	Yes	Yes
Specific Gravity	0.92	0.95	0.90	0.83	1.05	2.14–2.24
Flexibility*	Good	Rigid	Rigid	Rigid	Rigid	Rigid

*Depends on thickness.
Chart is general guideline only. Always test your selection using your test conditions.

Borosilicate Glass Properties		
	Clear	Amber
Linear Coefficient of Expansion:	33	51
Strain Point (Max. Use Temp.):	515°C	535°C
USP Class Type:	Type 1	Type 1
Light Protection:	No	Yes

Note: Vials in this catalog are not recommended or designed for use with elevated temperatures, pressures, or vacuum reactions. This restriction includes vials that use the term "pressure" or "reaction" in the description.

Vial Volumes vs. Dimensions		
Volume	Dram	Dimensions (o.d. x Height)
2mL	0.5	12 x 32mm
4mL	1	15 x 45mm
7mL	2	17 x 60mm
15mL	4	21 x 70mm
22mL	6	23 x 85mm
40mL	10.7	29 x 81mm

Vial Introduction

Septum Materials Capability

Capability Chart	Natural (cispolyisoprene)	Butyl (isobutylene isoprene)	Silicone (polysiloxane)	PTFE (polytetra fluorocarbon)	Fluoroelastomer Polymer (fluorocarbon)
<i>Property:</i>					
Specific Gravity (g/cc)	0.93	0.9	1.1–1.6	2.14–2.24	1.4–1.95
Minimum Use Temp. °C	-51	-53	-84	-65	-53
Maximum Use Temp. °C	82	149	204	260	260
Hardness (Durometer)	30–90	40–90	30–90	50–65	65–90
Tear Resistance	Excellent	Good	Fair	—	Poor to Fair
Abrasion Resistance	Excellent	Good to Excellent	Poor	—	Good
Resealability	Good	Good	Excellent	Poor	Fair
<i>Chemical Resistance:</i>					
Oxidation	Good	Excellent	Excellent	Excellent	Excellent
Heat Aging	Good	Excellent	Excellent	Excellent	Excellent
Solvents					
Aliphatic Hydrocarbons	Poor	Poor	Fair	Excellent	Excellent
Aromatic Hydrocarbons	Poor	Poor	Poor	Excellent	Excellent
Alcohols	Good	Very Good	Excellent	Excellent	Excellent
Oil, Gasoline	Poor	Poor	Poor	Very Good	Very Good
Animal, Vegetable Oils	Poor to Good	Excellent	Excellent	Very Good	Very Good
Acids	Fair to good	Excellent	Very Good	Excellent	Good to Excellent
Alkalies	—	—	—	Excellent	Poor to Good
Permeability to Gases	Low	Very Low	High	—	Low
Water-swell Resistance	Fair	Excellent	Excellent	Excellent	Excellent

Note: 1. Chemical resistance data are general guides only. Many factors such as temperature, chemical combinations, concentration, pressure, exposure time, etc. can influence or alter the resistance characteristics of a product. Always test your selection using your test conditions. As a general rule, as temperature increases, resistance to attack decreases. 2. Combination septum (Ex. PTFE/Silicone) has the resistance of the facing material (PTFE) prior to puncture. After puncture, a small portion of the other material is exposed and its sealing and resistance characteristics must then be considered. 3. Colored closures and septa are free of heavy metals to comply with CONEG standards.

How to Measure for Vial, Cap, and Septum Selection

Bottles and caps are described with a two-part number system referred to as the Finish*. (Example: 13/425). The first number represents the neck size of the vial or cap in millimeters.

The vial is measured from the outside edge of the threads on one side to the outer edge of the threads on the opposite side (**Figure 1**). The cap is measured from one side of the inner wall to the opposite side of the inner wall (**Figure 2**).

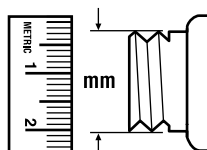


Figure 1

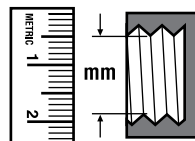


Figure 2

The second number describes the thread pattern and assures the bottle and cap will fit together (**Figure 3**).

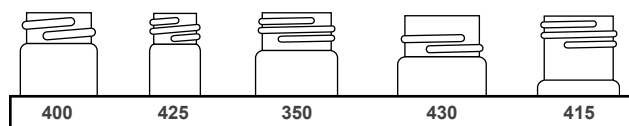


Figure 3

*Neck finish specifications of both caps and vials are controlled by the GCMi-Glass Container Manufacturers Institute.

Septum size can be determined by comparing septa or crimp seals to the measured circles (**Figure 4**).

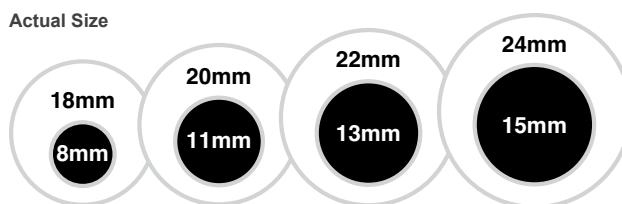


Figure 4

With combination septa (Ex: PTFE/silicone, 5/55), the numbers represent the thickness of the individual components of the septum in mils. This same septum could be described as 0.060" or 60 mil.

Durometer or hardness of septum material is referred to as "shore" and is an important consideration in working with some autosamplers (45-60 shore is the typical range for autosampler septa). Septa with slits or molded starburst patterns (**Figure 5**) allow easier needle penetration which can prevent needles bending or jamming on the autosampler arm.



Figure 5

Actual Size Drawings of Vials with Fill Volumes

12x32mm Standard Mouth Vials and Inserts

C-66002
A-95221

C-95191
A-95194

100µL
27mm
4mm
95203

100µL
30mm
5mm
98107

200µL
30mm
5mm
98028

100µL
31mm
5mm
C-95201
PP-98137

50µL
25mm
4mm
98018

100µL
30mm
5mm
C-98031
PP-98069

Abbreviation Key

A = Amber
BT = Bevel Top, Rounded or Flat Bottom
C = Clear Glass
GI/PI = Glass Insert/Plastic Outside
GI/GI = Glass Insert/Glass Outside
PE = Polyethylene
PP = Polypropylene
TPX = Polymethylpentene (PMP)

Part Numbers are indicated in Bold.
Unless otherwise indicated, vials are clear glass.

12x32mm WIDE Mouth Vials & Inserts

C-95160
A-95163

C-98030
A-98095

C-98213
A-98245

C-98133
A-98135

400µL
30mm
6mm
981391
PP-99183

250µL
29mm
6mm
C-98322
PP-98106

250µL
31mm
6mm
C-98745
PP-98729

100µL
30mm
5mm
C-98052
PP-92102

250µL
29mm
6mm
C-98049
PP-98108

50µL
25mm
6mm
98024

12x32mm Robotic Autosampler Vials

C-95386
A-95388

R.A.M.™

100µL
PP-90273

R.A.M.™

1.5mL
72013

R.A.M.™

12x32mm Conical Vials

1.1mL
74125

1.1mL
74145

1.1mL
74135

12x32mm Limited Volume Vials (One Piece, No Assembly)

100µL
C-95183

1.5mL
C-72016

100µL
PP-12960
TPX-12968

300µL
GI/GI-98086

200µL
GI/PI-98230

5mL
PP-98842
TPX-72011

750µL
PP-98050
TPX-72015

0.5mL
PP-98310

0.7mL
PP-98099

100µL
C-9480

300µL
PP-12990

300µL
C-95240
A-95268

0.5mL
PP-12964

1.5mL
C-72009

100µL
C-9482

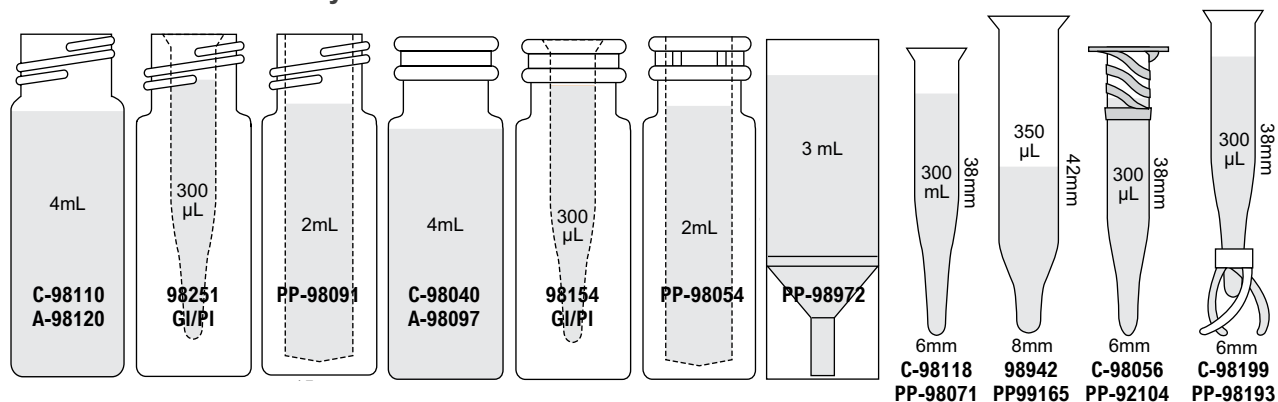
100µL
PP-12962
TPX-12970

200µL
GI/PI-98220

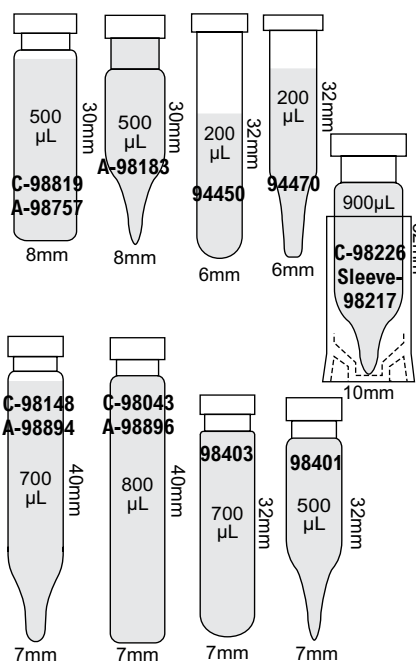
0.5mL
PP-12966

vials

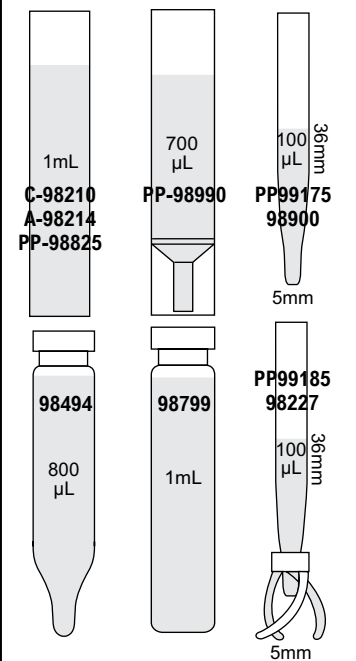
15x45mm 4mL WISP™ Style Vials and Inserts



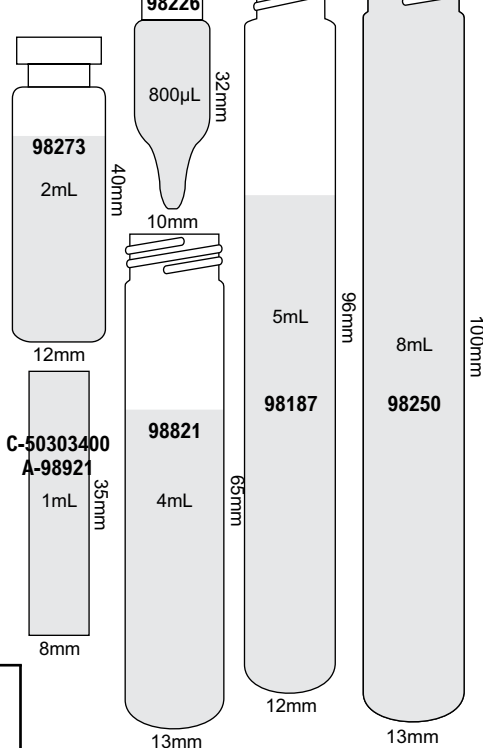
8mm Crimp Top



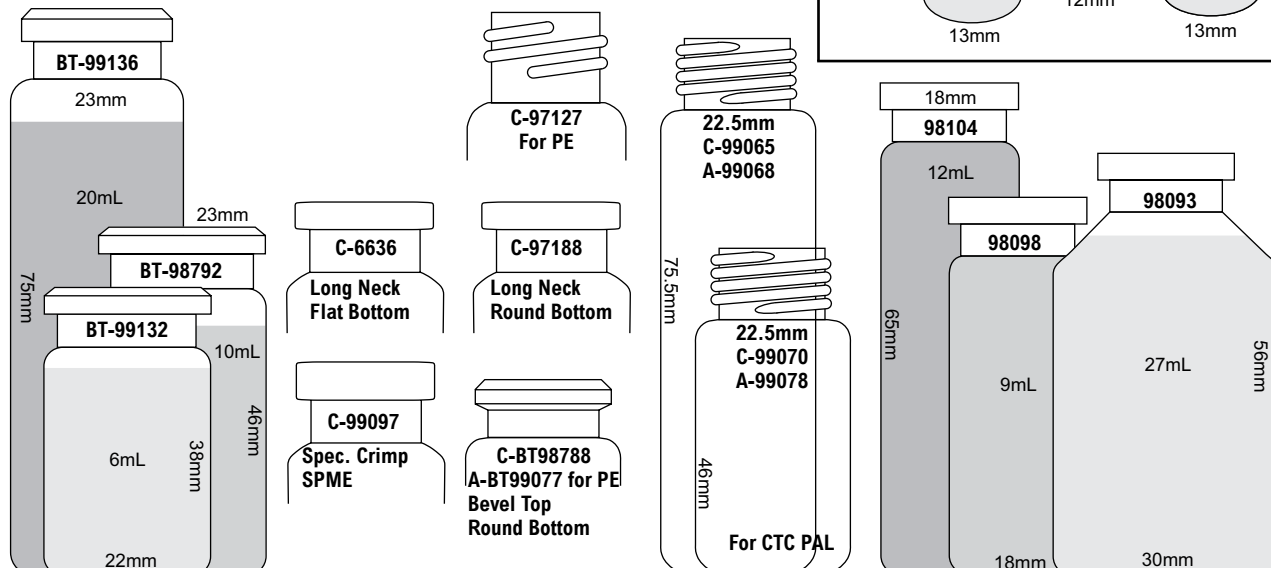
8x40mm 1mL WISP™ Style



Misc.



Headspace Vials



Vial Selection by Autosampler

		12x32 Screw Thread, 8/425,	12x32 Crimp Style	12x32 Screw Thread, 10/425	12x32 Screw Thread, Robotic	12x32 Snap Seal Wide Mouth	15x45, Screw Thread, 13/425	15x45, Crimp Style	8x40 Crimp Style	8x30 Crimp Style	7x32 Crimp Style	7x40 Crimp Style	6x32 Crimp Style	Headspace	Specialty
Autosampler Chart															
Autosampler Manufacturer	Model														
Agilent	1100, 1200 8042, 1050, 1084, 1080 7670A, 7671A, 7672, 1042 1090 (LC), 1082, 7673A/B, Headspace 7673, 7683		.	.	.										
Alcott	738 718AL, 719D	.	.	.	.	.									.
Alltech (Grace)	570, 580 (standard tray)	.	.	.	.										
Beckman	501, 502, 507 504 508	.		.	.	.						.	.		
Carlo Erba/Fisons Instruments	AS-V42, AS 105 AS-V 60 AS 800, 8000 A200S HS250		.		.				.			.		.	
Dynatech/Precision Sampling	42 Vial Tray, LC 2000 60 Vial Tray GC111, 311	.	.	.	.				.	.			.		
Finnigan	A200S		.		.							.			
Gilson	232-401, 231-401 Asted™ Aspec™	.	.		.							.	.		
Hitachi**	AS-2000, AS-6000 S6551 L-7200, 7250	.	.		.		.	.	.				.		
Jasco**	851-AS, AS-950 LC 800,900 Series AS-2055/2057/2059	.	.		.	.									
Leap Technologies	CTC A200S CTC A105S Headspace	.	.	.	.					.	.	.	.	.	
LDC	Marathon, Promis 713 Others	.	.	.					.	.			.	.	
PerkinElmer	Autosystem Integral 4000 AI-1, ISS100, ISS200 LC600 42 Tray LC600 (60), AS100 420/B, 4900 AS100B, AS300, 8300 AS2000, LC30, 2000, B2000 Headspace, HS40 Series 200	.	.		.	.			.	.			.	.	
Pharmacia LKB	2157-010 2157-020	.	.		.							.			.
Phillips/Pye UNICAM	LC-XP S4, S8, 4700LC/GC 4247, 4710	.	.		.	.						.			
Shimadzu**	AOC-8B/9, SIL-6A AOC-14/1400, AOC-17 SIL-2AS SIL-6B, -9A, -8A, -10A Headspace HSS-2B AOC-20i/20S AOC-5000 LC-10A SIL-Hta/SIL-HTc	.	.	.	.	.	.						.	.	
Spark Holland	SPH 125 Marathon Promis Triathlon, Midas	.	.		.									.	
Spectra-Physics/TSP	8875, 8880 AS100/1000;300/3000		.		.										
Varian	Prostar 400, 410, 430 8000, 9000 Series	.	.	.	.	.									
Waters	Alliance® 2690 48-Position 96-Position 717 Alliance® Acquity UPLC® Breeze™ 2710 Sample Manager	.	.	.	.	.	.	.	.				.		

**Special Cap is Required.

Vials by Autosampler Part No. Cross Reference

Autosampler Part No. Cross Reference Chart					
Agilent	PerkinElmer	Varian	Waters	Grace	Description
<i>12x32mm Standard Mouth Screw Thread Vials</i>					
5183-4428	N930-2945	392611639	—	95191	8/425 Clear Screw Thread Vial
5183-4429	—	392611640	—	95194	8/425 Amber Screw Thread Vial
—	—	—	WAT094174	98061	8/425 Black Polypropylene (PP) Open-Hole Cap with PPTFE/Silicone Septum
5183-4442	N930-3441	392611641	—	980611	8/425 Flush-Fit Black PP Open-Hole Cap with PTFE/Silicone Septum
<i>12x32mm Wide Mouth Screw Thread Vials</i>					
—	—	392611646	WAT063300	98133	10/425 Clear Screw Thread Vial
5182-3454	—	—	186000984	72009	High Recovery Vial (HRV), Wide Mouth Crimp
—	—	392611650	WAT094174	98144	10/425 Black PP Open-Hole Cap with PTFE/Silicone Septum
—	—	—	WAT058876	97013	10/425 Black PP Open-Hole Cap with PTFE/Silicone Septum with Slit
<i>12x32mm Vials for Use with Robotic Arm, Wide Mouth, Screw Thread Vials</i>					
5182-0714	—	392611653	186000273	95386	R.A.M.™ Clear Vial for Robotics
5182-0715	—	—	—	88540	R.A.M.™ Clear Vial with Marking Spot for Robotics
5182-0716	—	392611654	186000848	88542	R.A.M.™ Amber Vial with Marking Spot for Robotics
5183-2030	—	—	—	72013	High Recovery Vial (HRV) for Robotics
5182-0717	—	392611661	—	95308	9mm Blue Cap with PTFE/Butyl Septum
5182-0720	—	392611659	186000274	95360	9mm Blue Cap with PTFE/Silicone Septum
5183-2076	—	392611660	186000305	95385	9mm Blue Cap with PTFE/Silicone Septum with Slit
<i>12x32mm Standard Mouth Crimp Style Vials</i>					
—	N930-1385	392611626	—	66002	12x32mm Clear Standard Mouth Crimp Vial
—	N930-2680	392611628	—	95221	12x32mm Amber Standard Mouth Crimp Vial
5182-0544	—	—	WAT094219	98030	12x32mm Clear Snap Ring Vial
5182-0546	—	—	—	98033	12x32mm Clear Snap Ring Vial with Marking Spot
5182-0545	—	—	WAT094220	98083	12x32mm Amber Snap Ring Vial with Marking Spot
5182-0550	—	—	—	98038	11mm Snap TOP Cap with PTFE/Butyl Septum
5182-0541	—	—	186000303	98034	11mm Snap TOP Cap with PTFE/Silicone Septum
5183-4511	—	—	186000304	98168	11mm Snap TOP Cap with PTFE/Silicone Septum with Slit
—	—	392611875	—	95232	11mm Poly Crimp Seal with PTFE/Butyl Septum
—	—	392611873	—	95234	11mm Poly Crimp Seal with PTFE/Silicone Septum
—	—	392611874	—	95325	11mm Poly Crimp Seal with PTFE/Silicone Septum with Slit
<i>12x32mm Wide Mouth Crimp Style Vials</i>					
5181-3375	—	392611634	WAT094222	98213	12x32mm Clear Wide Mouth Crimp Vial
5182-0543	—	—	—	98001	12x32mm Clear Wide Mouth Crimp Vial with Marking Spot
5181-3376	—	392611635	WAT094223	98003	12x32mm Amber Wide Mouth Crimp Vial with Marking Spot
<i>11mm Aluminum Seals for 12x32mm Standard and Wide Mouth Crimp Style Vials</i>					
5181-1210	N930-6015	392611632	—	73070	11mm Aluminum Seal with PTFE/Butyl Septum
5182-0552	—	392611631	—	98740	11mm Aluminum Seal with PTFE/Silicone Septum
<i>Limited Volume Inserts for 12x32mm Autosampler Vials, i.d. as noted</i>					
5183-2089	N930-2681	392611593	—	95201	100µL LV Glass Insert for Standard Mouth Vial
5183-2088	—	392611591	—	98031	100µL LV Glass Insert with Polyethylene (PE) Bottom Spring for Std Mouth Vial
5183-2090	—	—	—	98028	250µL LV Glass Flat bottom Insert for Standard Mouth Vial
5183-2085	—	392611596	—	98322	250µL LV Glass Insert for Wide Mouth Vial
5181-1270	—	392611594	WAT094170	98049	250µL LV Glass Insert with PE Bottom Spring for Wide Mouth Vial
5181-3377	—	—	—	981391	400µL LV Glass Flat Bottom Insert for Wide Mouth Vial
5182-0549	—	—	—	98108	250µL LV PP Insert with PE Bottom Spring for Wide Mouth Vial
5183-2087	—	—	—	99183	350µL LV PP Flat Bottom Insert for Wide Mouth Vial
<i>15x45mm (4mL) Vials</i>					
5183-4448	—	—	186000840	98110	15x45mm Clear Glass Vial
5183-4450	—	—	186001135	98120	15x45mm Amber Glass Vial
5183-4464	—	—	186000841	98610	13/425 Black PP Open-Hole Cap with PTFE/Silicone Septum
—	—	—	186000842	97017	13/425 Black PP Open-Hole Cap with PTFE/Silicone Septum with Slit
—	—	—	WAT015199	98118	300µL Glass Limited Volume Insert, 6x38mm
<i>8x40mm (1mL) WISP™ Style Vials</i>					
—	—	—	WAT078515	88613	8mm PE Starburst Snap Plugs, Clear

Note: This list contains some of the more popular products used in these instruments. Every effort has been made to provide the Grace equivalent product or one most similar to the manufacturers' product description. There are many more Grace® vial, cap, liner, and kit combinations available on the individual product page listings.

related products

Accessories for your system. Grace has an assortment of Accessories Quick Reference guides available for many popular instruments.

• Waters® Alliance® System Accessories
– Request M202

• Agilent 1100 and 1200 System Accessories
– Request M203

• Waters® Acuity® System Accessories
– Request M204



8x40mm (1mL) Shell Vials

- Shell vials with thicker walls for safer sample handling
- 8x40mm vials for Waters® WISP™ 96 style autosamplers



4718

8x40 Shell Vial Kits are Ideal for Waters® or Shimadzu® Autosamplers

Convenience kits simplify ordering with one part number to remember. Kits provide both vials and caps for a perfect fit every time.



best value

6308

Limited Volume Inserts for 8x40 Shell Vials

- Select the appropriate limited volume insert for your microsampling needs
- Polyethylene springs act as shock adsorbers and help maintain proper insert alignment



4741

8x40mm Shell Vials for WISP™ 96 Style

Description	100/pk Part No.	1000/pk Part No.
<i>Shell Vials, 1mL, 8x40mm, Use 8mm Snap Plugs</i>		
Clear Shell Vial	88610	98212
Amber Shell Vial	88614	98216
Polypropylene Shell Vial	88625	98827
Silanized, Clear Shell Vial	886101	—
<i>Limited Volume Shell Vial, 8mm, Use Polyethylene Conical Snap Plugs</i>		
8x40mm Polypropylene Vial, 700µL	98990	98992

8x40mm Vial Kits

Description	100/pk Part No.	1000/pk Part No.
<i>8x40mm Shell Vial Kits for WISP™ Style Autosamplers</i>		
Clear Vials, Clear Snap Plugs with Starburst†	88617	73021
Amber Vials, Clear Snap Plugs with Starburst†	88597	73003
Polypropylene Vials, Clear Snap Plugs with Starburst†	88626	98224
Clear Silanized Vials, Clear Snap Plugs	982108	—
<i>8x40mm Shell Vial Kits for Shimadzu® Autosamplers</i>		
Clear Vials, Clear Easy Pierce Snap Plugs with Starburst†	70118	70132
Amber Vials, Clear Easy Pierce Snap Plugs with Starburst*	70134	70136

*Use to prevent bent needles.

†Thinner starburst for use with Shimadzu® autosamplers.

Limited Volume Inserts for 8x40mm Shell Vials

Description	100/pk Part No.	1000/pk Part No.
<i>Glass</i>		
150µL, 5x29mm, Requires Spring	95201	95202
150µL, with Bottom Spring, 5x29mm	73054	73074
200µL, 5x36mm	98900	98902
200µL, with Bottom Spring, 5x36mm	98227	98229
250µL, with Bottom Spring, 6x29mm	98658	98660
200µL, 5x31mm	73024	73025
Metal Springs for Inserts	73026	73027
200µL, Silanized, No Spring	989008	—
<i>Polypropylene</i>		
250µL, 6x31mm, No Spring	98106	98406
250µL, with Bottom Spring, 6x31mm	98108	98408
200µL, with Bottom Spring, 5x36mm	99185	99187

Polyethylene Snap Plugs with Starburst† 8mm

Description	100/pk Part No.	1000/pk Part No.
<i>Easy Pierce Snap Plug†</i>		
Clear Plug	70117	70129
<i>Snap Plug with Starburst*</i>		
Clear Plug	88613	98865
Red Plug	88618	98228
Blue Plug	88615	98232
Green Plug	88622	98234
Yellow Plug	88624	98879
Silicone Lined Snap Plug, Clear, Resealable	98662	98664
<i>Conical Snap Plug for Limited Volume Polyethylene Vial</i>		
Clear Plug	98994	98996
Red Plug	99003	99013
Blue Plug	99005	99015
Green Plug	99007	99017
Yellow Plug	99009	99019

*Use to prevent bent needles.

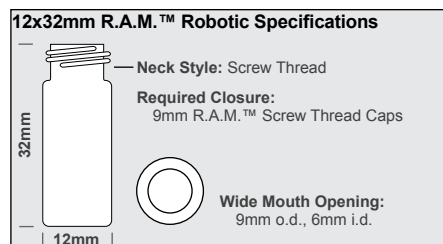
†Thinner starburst for use with Shimadzu® autosamplers.

12x32mm R.A.M.™ Robotic Screw Thread Vials

- Works on virtually every autosampler
- Use to replace crimp vials for use with robotic arms on autosamplers
- Crimp style height with screw thread configuration
- Incorporates unique StepVial design to precisely align insert and vial
- Economical kits simplify ordering
- Choose pre-slit septa for Waters® Acquity® Systems



4715



		100/pk	1000/pk	Silanized 100/pk	With White Marking Spot 100/pk	1000/pk	With White Graduated Marking Spots 100/pk	1000/pk
<i>Vials</i>								
Clear		95386	95387	953861	88540	88544	95521	95522
Amber		95388	95389	953881	88542	88546	95531	95532
<i>Limited Volume Vials</i>								
1.5mL High Recovery Vials		72013	—	—	—	—	—	—
100µL Polypropylene Vials		90273	90271	—	—	—	—	—
100µL PMP (TPX) Vials		95096	95098	—	—	—	—	—
<i>Kits: Vials</i>	<i>Open-Hole Caps</i>							
Clear Vials	9mm	89135	89136	—	89120	89126	—	—
Amber Vials	9mm	98004	98006	—	89125	89127	—	—
Clear Vials	9mm	89145	89146	953868	89100	89104	—	—
Clear Vials	9mm	89149	89139	—	89128	89129	—	—
Amber Vials	9mm	89151	89152	—	89130	89131	—	—
<i>9mm R.A.M.™ Open-Hole Caps</i>								
<i>with Septa</i>								
Blue Cap	Bonded Interseal PTFE/Silicone Septa with Slit	70416	70418	—	70416	70418	70416	70418
Blue Cap	Bonded Interseal PTFE/Silicone Septa	70415	70417	—	70415	70417	70415	70417
Black Cap	PTFE/Silicone Septa with Slit	95380	95382	—	95380	95382	95380	95382
Blue Cap	PTFE/Silicone Septa with Slit	95385	95390	—	95385	95390	95385	95390
Black Cap	PTFE/Butyl Septa	95320	95319	—	95320	95319	95320	95319
Blue Cap	PTFE/Butyl Septa	95308	95311	—	95308	95311	95308	95311
Clear Cap	PTFE/Butyl Septa	95352	95348	—	95352	95348	95352	95348
Green Cap	PTFE/Butyl Septa	95346	95344	—	95346	95344	95346	95344
Red Cap	PTFE/Butyl Septa	95356	95354	—	95356	95354	95356	95354
Yellow Cap	PTFE/Butyl Septa	95358	95357	—	95358	95357	95358	95357
Black Cap	PTFE/Silicone Septa with Slit	95324	95342	—	95324	95342	95324	95342
Blue Cap	PTFE/Silicone Septa with Slit	95360	95359	—	95360	95359	95360	95359
Clear Cap	PTFE/Silicone Septa with Slit	95365	95364	—	95365	95364	95365	95364
Green Cap	PTFE/Silicone Septa with Slit	95362	95361	—	95362	95361	95362	95361
Red Cap	PTFE/Silicone Septa with Slit	95367	95366	—	95367	95366	95367	95366
Yellow Cap	PTFE/Silicone Septa with Slit	95377	95378	—	95377	95378	95377	95378
Black Cap	PTFE/Silicone/PTFE Septa	95328	95338	—	95328	95338	95328	95338
Blue Cap	PTFE/Silicone/PTFE Septa	95379	95381	—	95379	95381	95379	95381
Clear Cap	PTFE/Silicone/PTFE Septa	95371	95370	—	95371	95370	95371	95370
Green Cap	PTFE/Silicone/PTFE Septa	95369	95368	—	95369	95368	95369	95368
Red Cap	PTFE/Silicone/PTFE Septa	95374	95372	—	95374	95372	95374	95372
Yellow Cap	PTFE/Silicone/PTFE Septa	95376	95375	—	95376	95375	95376	95375
<i>9mm Unlined, Open-Hole R.A.M.™ Caps</i>								
Black Cap		90257	90268	—	90257	90268	90257	90268
Red Cap		90259	90270	—	90259	90270	90259	90270
Blue Cap		90261	90272	—	90261	90272	90261	90272
Green Cap		90263	90274	—	90263	90274	90263	90274
Yellow Cap		90265	90276	—	90265	90276	90265	90276
Clear Cap		90267	90278	—	90267	90278	90267	90278
<i>Septa for 9mm R.A.M.™ Caps</i>								
PTFE/Red Rubber—40mil		88701	88691	—	88701	88691	88701	88691
PTFE/Silicone—40mil		88705	88695	—	88705	88695	88705	88695
PTFE/Silicone/PTFE—40mil		88710	88699	—	88710	88699	88710	88699

more info

12x32mm R.A.M.™ Vials are compatible with Waters® Alliance® and Acquity® Systems, Agilent 1100 & 1200, and Varian® 8000 & 9000. Refer to page 352 for more autosampler compatibility.



4748

related products

Do you have small samples?

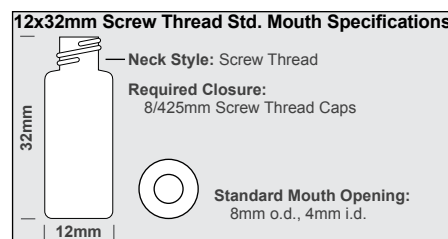
Choose limited volume vials or see our selection of limited volume inserts on page 361.

12x32 Screw Thread Standard Mouth Vials

- Work with a variety of autosamplers that require narrow neck vials
- Economical kits simplify ordering

more info

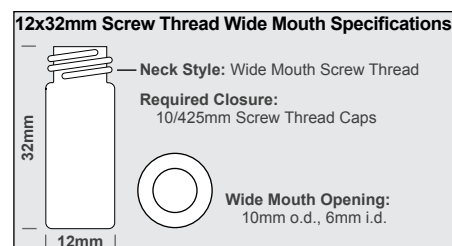
Compatible with Waters® Alliance®, Hitachi, Jasco, and Varian® autosamplers. Refer to page 352 for more autosampler compatibility.



			100/pk	1000/pk	Silanized 100/pk	With White Marking Spot 100/pk	1000/pk	With White Graduated Marking Spots 100/pk	1000/pk
Vials									
Clear			95191	95192	951911	98068	98161	95481	95482
Amber			95194	95195	951941	98078	98171	95491	95492
Limited Volume Vials									
1.1mL Glass Tapered Bottom, requires sleeve			74135	98574	—	—	—	—	—
Support Sleeve for 74135 (50/pk)			98558	—	—	—	—	—	—
100µL Heavy-Walled Glass with PTFE/Silicone-Lined Cap (12/pk, 10x12/pk)			9482	94823	—	—	—	—	—
600µL Polypropylene Vials (500/pk)			89073	—	—	—	—	—	—
100µL Polypropylene Vials			12962	12963	—	—	—	—	—
100µL PMP (TPX) Microvials			12970	12971	—	—	—	—	—
200µL Glass Insert in Clear Plastic Vial			98220	98222	—	—	—	—	—
200µL Glass Insert in Amber Plastic Vial			98225	98899	—	—	—	—	—
Preassembled Kits									
Vials	Caps	with Septa							
Clear Vials	8/425 Black	PTFE Septa—10mil	98533	98535	—	—	—	—	—
Clear Vials	8/425 Black	PTFE/Butyl Septa—40mil	98380	98382	—	—	—	—	—
Clear Vials	8/425 Black	PTFE/Silicone Septa—45mil	95175	95176	—	—	—	—	—
Clear Vials	8/425 Black	PTFE/Silicone Septa	—	—	72666	—	—	—	—
Amber Vials	8/425 Black	PTFE/Silicone Septa—45mil	95179	95181	—	—	—	—	—
Amber Vials	8/425 Black	PTFE/Silicone Septa	72670	—	—	—	—	—	—
Preassembled Kits Spectra Physics/Varian®									
Vials	Caps	with Septa							
Clear Vials	Flush-Fit 8/425 Black	PTFE/Silicone Septa	895175	895176	—	—	—	—	—
Clear Vials	Flush-Fit 8/425 Black	PTFE/Butyl Septa	898380	898382	—	—	—	—	—
Clear Vials	Flush-Fit 8/425 Black	PTFE/Silicone/PTFE Septa	898537	898539	—	—	—	—	—
Amber Vials	Flush-Fit 8/425 Black	PTFE/Butyl Septa	898385	898387	—	—	—	—	—
Preassembled 8/425 Polypropylene									
Open-Hole Caps	with Septa								
Black Cap	Bonded Interseal PTFE/Silicone Septa		70412	70414	—	70412	70414	70412	70414
Black Flush-Fit Cap	PTFE/Silicone Septa		980611	980611	—	980611	980611	980611	980611
Black Cap	PTFE/Silicone Septa with Slit		97018	97018	—	97018	97018	97018	97018
Black Cap	PTFE/Silicone Septa		98061	98061	—	98061	98061	98061	98061
Black Cap	PTFE/Silicone/PTFE Septa		98701	98701	—	98701	98701	98701	98701
Black Cap	PTFE/Silicone TOP Hat Septa		98065	98065	—	98065	98065	98065	98065
Yellow Cap	PTFE/Silicone TOP Hat Septa		98055	98055	—	98055	98055	98055	98055
Clear Cap	TOP Seal Closure, Molded Poly Septa—10mil		98060	98160	—	98060	98160	98060	98160
Solid 8/425 Top Caps									
Green Phenolic Cap	PTFE Septa		73067	98067	—	73067	98067	73067	98067
Black Polypropylene Cap	PTFE Septa		98063	98163	—	98063	98163	98063	98163
Black Polypropylene Cap	—		98105	98109	—	98105	98109	98105	98109
Open-Hole Unlined 8/425 Caps									
Black Flush-Fit Side Cap for Spectra-Physics and Varian® Autosamplers			730441	730442	—	730441	730442	730441	730442
Black Cap			73044	73059	—	73044	73059	73044	73059
Red Cap			98072	98172	—	98072	98172	98072	98172
Blue Cap			98074	98174	—	98074	98174	98074	98174
Green Cap			98076	98176	—	98076	98176	98076	98176
White Cap			98084	98184	—	98084	98184	98084	98184
White Cap for Shimadzu®, Hitachi, and Jasco Autosamplers			98087	98089	—	98087	98089	98087	98089
Yellow Cap for Shimadzu®, Hitachi, and Jasco Autosamplers			73063	73065	—	73063	73065	73063	73065
Septa for 8/425 Caps									
PTFE/Silicone with Slit—5/40mil			98088	98188	—	98088	98188	98088	98188
White PTFE—10mil			98094	98194	—	98094	98194	98094	98194
Red PTFE/White Silicone—5/55mil			73048	73060	—	73048	73060	73048	73060
Red PTFE/White Silicone—5/60mil			98096	98196	—	98096	98196	98096	98196
PTFE/Silicone—10/90mil			98499	98497	—	98499	98497	98499	98497
Blue PTFE/White Silicone—5/60mil			98747	98749	—	98747	98749	98747	98749
PTFE/Silicone/PTFE—2/36/2mil			98081	98181	—	98081	98181	98081	98181
PTFE/Butyl—5/40mil			98190	98192	—	98190	98192	98190	98192
Black Fluoroelastomer Polymer—30mil			98026	98047	—	98026	98047	98026	98047

12x32mm Screw Thread Wide Mouth Vials

- 40% larger opening aids in sample transfers
- Larger target area prevents bent needles
- StepVial design precisely aligns insert and vial
- Economical kits simplify ordering



		100/pk	1000/pk	Silanized 100/pk	With White Marking Spot 100/pk	1000/pk	With White Graduated Marking Spots 100/pk	1000/pk
<i>Vials</i>								
Clear		98133	98433	981331	98291	98295	95501	95502
Amber		98135	98435	981351	98622	98624	95511	95512
<i>Limited Volume Vials</i>								
500µL Polypropylene Vial		98310	98314	—	—	—	—	—
750µL Polypropylene Vial		98099	98211	—	—	—	—	—
<i>Preassembled Kits:</i>								
<i>Vials</i>	<i>Caps</i>	<i>with Septa</i>						
Clear Vials	Black 10/425	PTFE Septa		98891	98906	—	—	—
Clear Vials	Black 10/425	PTFE/Silicone Septa		98893	98908	981338	—	—
Clear Vials	Black 10/425	PTFE/Silicone/PTFE Septa		98895	98910	—	—	—
Clear Vials	Black 10/425	PTFE/Butyl Septa		98290	98292	—	—	—
Amber Vials	Black 10/425	PTFE Septa		98274	98277	—	—	—
Amber Vials	Black 10/425	PTFE/Silicone Septa		98281	98284	981358	—	—
Amber Vials	Black 10/425	PTFE/Butyl Septa		98294	98296	—	—	—
<i>Unassembled Kits:</i>								
<i>Vials</i>	<i>Caps</i>	<i>with Septa</i>						
Clear Vials	Black 10/425	PTFE/Silicone Septa		97239	97229	—	—	—
Amber Vials	Black 10/425	PTFE/Silicone Septa		97249	97259	—	—	—
<i>Preassembled 10/425</i>								
<i>Open-Hole Caps</i>		<i>with Septa</i>						
Black Cap		Bonded Interseal PTFE/Silicone Septa w/Slit		70422	70426	—	70422	70426
Black Cap		Bonded Interseal PTFE/Silicone Septa		70411	70413	—	70411	70413
Black Cap		PTFE/Silicone Septa with Slit		97013	97023	—	97013	97023
Black Cap		PTFE/Silicone Septa		98144	98152	—	98144	98152
Black Cap		PTFE/Silicone/PTFE Septa		98705	98707	—	98705	98707
Black Cap		PTFE/Red Rubber Septa		97274	97216	—	97274	97216
Clear Cap		TOP Seal Closure, Molded Poly Septa		98405	98407	—	98405	98407
<i>Solid Polypropylene 10/425 Top Caps with Septa</i>								
Black Cap		PTFE Septa		98124	98424	—	98124	98424
Black Cap				98162	98167	—	98162	98167
<i>Unlined 10/425 Caps</i>								
Black Cap				98143	98443	—	98143	98443
Red Cap				98136	98436	—	98136	98436
Blue Cap				98138	98438	—	98138	98438
Green Cap				98140	98440	—	98140	98440
Yellow Cap				98122	98134	—	98122	98134
White Cap				98126	98426	—	98126	98426
<i>Septa for 10/425 Caps</i>								
PTFE/Silicone with Slit—5/55mil				98021	98421	—	98021	98421
White PTFE—10mil				98023	98423	—	98023	98423
Red PTFE/White Silicone—5/55mil				98141	98441	—	98141	98441
Red PTFE/White Silicone—5/65mil				98025	98425	—	98025	98425
PTFE/Silicone/PTFE—2/36/2mil				98027	98427	—	98027	98427
PTFE/Butyl Rubber—5/40mil				98029	98429	—	98029	98429

more info

12x32 Screw Thread Wide Mouth Vials are compatible with Waters® Alliance®, Agilent 1100 & 1200, Varian® 8000 & 9000. Refer to page 352 for more autosampler compatibility.



related products

Do you have small samples?

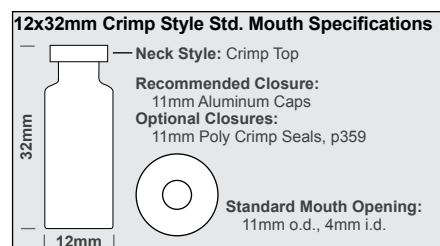
Choose limited volume vials or see our selection of limited volume inserts on page 361.

12x32mm Crimp Style Standard Mouth Vials

- Work with most autosamplers
- Economical kits simplify ordering
- For small samples use limited volume vials or inserts — see page 361 for inserts



4712



			100/pk	1000/pk	With White Marking Spot 100/pk	1000/pk	With White Graduated Marking Spots 100/pk	1000/pk
<i>Vials</i>								
Clear			66002	66003	98073	98191	95461	95462
Amber			95221	95222	98077	98197	95471	95472
<i>Limited Volume Vials</i>								
100µL Glass Heavy Walled (12/pk, 10x12/pk)			9480*	94802*	—	—	—	—
600µL Polypropylene Vial (500/pk)			—	88363*	—	—	—	—
300µL Polypropylene Microvial			12990	12991	—	—	—	—
300µL Polypropylene Microvial (12x31mm)			12982	12983	—	—	—	—
<i>Kits: Vials Seals with Septa</i>								
Clear Vials	11mm Aluminum Seals	PTFE Septa—10mil	98389	98391	—	—	—	—
Clear Vials	11mm Aluminum Seals	PTFE/Silicone Septa	98318	98329	—	—	—	—
Clear Vials	11mm Aluminum Seals	PTFE/Butyl Septa	95161	95162	—	—	—	—
Amber Vials	11mm Aluminum Seals	PTFE/Silicone Septa	98368	98371	—	—	—	—
Amber Vials	11mm Aluminum Seals	PTFE/Butyl Septa	95151	98331	—	—	—	—
<i>11mm Aluminum Caps with Septa</i>								
Silver Cap		1/8" Center Hole with PTFE/Butyl Septa—40mil	98298	98304	98298	98304	98298	98304
Silver Cap		PTFE/Butyl Septa—40mil	73070	73071	73070	73071	73070	73071
Red Cap		PTFE/Butyl Septa—40mil	98051	98151	98051	98151	98051	98151
Blue Cap		PTFE/Butyl Septa—40mil	98053	98153	98053	98153	98053	98153
Green Cap		PTFE/Butyl Septa—40mil	98057	98157	98057	98157	98057	98157
Gold Cap		PTFE/Butyl Septa—40mil	98059	98159	98059	98159	98059	98159
Silver Cap		PTFE/Silicone Septa—3/37mil	98740	94867	98470	94867	98740	94867
Silver Cap		PTFE/Silicone/PTFE Septa—2/36/2mil	94855	94865	94855	94865	94855	94865
Silver Cap		Black Fluoroelastomer Polymer Septa—40mil	94852	94862	94852	94862	94852	94862
Silver Cap		PTFE/Gray Chlorobutyl Septa—2/38mil	98742	94870	98742	94870	98742	94870
Silver Cap		Polypropylene Septa—10mil	98011	98111	98011	98111	98011	98111
Silver Cap		PTFE Septa—10mil	98013	98113	98013	98113	98013	98113
<i>Unlined 11mm Aluminum Seals</i>								
Silver Seal, Open-Hole			98746	66405	98746	66405	98746	66405
<i>Septa for 11mm Aluminum Seals</i>								
White PTFE—10mil			98007	98017	98007	98017	98007	98017
PTFE/Silicone—5/55mil			98009	98019	98009	98019	98009	98019
PTFE/Silicone/PTFE—2/36/2mil			98010	98020	98010	98020	98010	98020
PTFE/Butyl Rubber—5/40mil			98398	98400	98398	98400	98398	98400

*See correct quantity specified in description.

more info

12x32mm Crimp Style Vials (on pages 358, 359) are compatible with Agilent and Varian® autosamplers. Refer to page 352 for detailed autosampler compatibility.

technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)
Email: contact.alltech@grace.com
Online: www.discoverysciences.com

related products

Looking for a crimper or decrimper?
Refer to page 383.



4949



3309

12x32mm Crimp Style Wide Mouth Vials

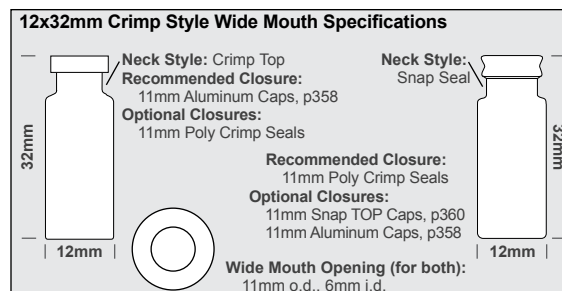
Standard Crimp Top

- 40% larger opening aids in sample transfers and prevents bent needles
- StepVial design precisely aligns insert and vial
- Economical kits simplify ordering



Snap Seal

- Unique design allows secure seal
- Economical kits simplify ordering



		100/pk	1000/pk	With White Marking Spot 100/pk	1000/pk	With White Graduated Marking Spots 100/pk	1000/pk
Snap Seal Vials							
Clear		95160	95190	95165	95155	95401	95402
Amber		95163	95153	95167	95157	95411	95412
Crimp Top Vials							
Clear		98213	98239	98001	98201	95441	95442
Amber		98245	98249	98003	98203	95451	95452
Snap Seal Limited Volume Vials							
100µL Clear Glass Micro Vial, Heavy Wall		95183	—	—	—	—	—
1.5mL Clear Glass High Recovery (HRV) Vial		72016	—	—	—	—	—
Crimp Top Limited Volume Vials							
1.5mL Glass High Recovery (HRV) Vial		72009	—	—	—	—	—
2mL Glass Round Bottom Vial		74125	98560	—	—	—	—
1.1mL Glass Tapered Bottom Vial, Requires Sleeve		74145	98562	—	—	—	—
Support Sleeve for 74145 (50/pk)		98558	—	—	—	—	—
300µL Clear Glass LVI Vial		—	—	95240	—	—	—
300µL Amber Glass LVI Vial		—	—	95268	—	—	—
Snap Seal Kits:							
Vials	Seals	with Septa					
Clear Vials	11mm Poly Crimp Seals	PTFE/Butyl Septa	88487	88491	—	—	—
Clear Vials	11mm Poly Crimp Seals	PTFE/Silicone Septa	88496	88475	—	—	—
Clear Vials	11mm Poly Crimp Seals	PTFE/Silicone/PTFE Septa	88494	88473	—	—	—
Amber Vials	11mm Poly Crimp Seals	PTFE/Butyl Septa	88493	88479	—	—	—
Amber Vials	11mm Poly Crimp Seals	PTFE/Silicone Septa	88498	88484	—	—	—
Crimp Top Kits:							
Vials	Seals	with Septa					
Clear Vials	11mm Aluminum Seals	PTFE Septa—10mil	98457	98459	—	—	—
Clear Vials	11mm Aluminum Seals	PTFE/Silicone Septa	98419	98428	—	—	—
Clear Vials	11mm Aluminum Seals	PTFE/Silicone/PTFE Septa	98447	98451	—	—	—
Clear Vials	11mm Aluminum Seals	PTFE/Butyl Septa	98397	98404	—	—	—
Amber Vials	11mm Aluminum Seals	PTFE/Silicone Septa	98434	98437	—	—	—
Amber Vials	11mm Aluminum Seals	PTFE/Butyl Septa	98413	98417	—	—	—
Clear Vials	11mm Poly Crimp Seals	PTFE/Silicone Septa	88369	88366	—	—	—
Clear Vials	11mm Poly Crimp Seals	PTFE/Butyl Septa	88368	88380	—	—	—
Amber Vials	11mm Poly Crimp Seals	PTFE/Silicone Septa	88375	88378	—	—	—
Amber Vials	11mm Poly Crimp Seals	PTFE/Butyl Septa	88374	88396	—	—	—
11mm Poly Crimp Seals							
Clear Seal	with Septa		95325	95340	95325	95340	95325
Clear Seal	PTFE/Silicone Septa with Starburst		95335	95350	95335	95350	95335
Clear Seal	PTFE Septa—10mil		95230	95330	95230	95330	95230
Red Seal	PTFE Septa—10mil		95207	95341	95207	95341	95207
Blue Seal	PTFE Septa—10mil		95215	95343	95215	95343	95215
Green Seal	PTFE Septa—10mil		95217	95345	95217	95345	95217
Yellow Seal	PTFE Septa—10mil		95219	95347	95219	95347	95219
Clear Seal	PTFE/Butyl Septa		95232	95332	95232	95332	95232
Red Seal	PTFE/Butyl Septa		95235	95349	95235	95349	95235
Blue Seal	PTFE/Butyl Septa		95237	95351	95237	95351	95237
Green Seal	PTFE/Butyl Septa		95239	95353	95239	95353	95239
Yellow Seal	PTFE/Butyl Septa		95233	95355	95233	95355	95233
Clear Seal	PTFE/Silicone Septa		95234	95334	95234	95334	95234
Red Seal	PTFE/Silicone Septa		95293	95224	95293	95224	95293
Blue Seal	PTFE/Silicone Septa		95295	95225	95295	95225	95295
Green Seal	PTFE/Silicone Septa		95297	95226	95297	95226	95297
Yellow Seal	PTFE/Silicone Septa		95285	95227	95285	95227	95285
Clear Seal	PTFE/Silicone/PTFE Septa		95236	95336	95236	95336	95236
Red Seal	PTFE/Silicone/PTFE Septa		95310	95164	95310	95164	95310
Blue Seal	PTFE/Silicone/PTFE Septa		95312	95166	95312	95166	95312
Green Seal	PTFE/Silicone/PTFE Septa		95316	95182	95316	95182	95316
Yellow Seal	PTFE/Silicone/PTFE Septa		95318	95184	95318	95184	95318

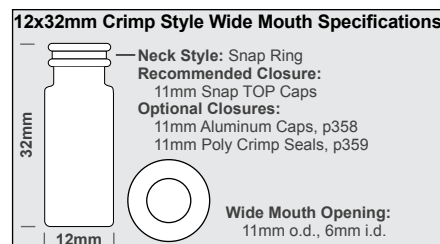
12x32mm Crimp Style Wide Mouth Vials

Snap Ring

- 40% larger opening aids in sample transfers
- StepVial design precisely aligns insert and vial
- Economical kits simplify ordering



4714



Snap Ring Vials

	100/pk	1000/pk	With White Marking Spot	With White Graduated Marking Spots
Clear	98030	98130	98033	98202
Amber	98095	98195	98083	98205

Snap Ring Limited Volume Vials

300µL Glass Insert in Clear Glass Vial	98086	98238	—	—	—	—
750µL Polypropylene Vial	98050	98215	—	—	—	—
750µL TPX (PMP) Vial	72015	72017	—	—	—	—
500µL Polypropylene Vial	98842	98844	—	—	—	—
500µL TPX (PMP) Vial	72011	72014	—	—	—	—
100µL Polypropylene Vial	12960	12961	—	—	—	—
100µL TPX (PMP) Microvial	12968	12969	—	—	—	—
200µL Glass Insert in Clear Vial	98230	98231	—	—	—	—
200µL Glass Insert in Amber Vial	98235	98236	—	—	—	—

Snap Ring Kits:

Vials	Caps	with Septa				
Clear Vials	11mm Snap TOP Caps	PTFE/Silicone Septa with Slit	98465	98467	—	—
Clear Vials	11mm Snap TOP Caps	PTFE/Silicone Septa with Starburst	98469	98471	—	—
Clear Vials	11mm Snap TOP Caps	PTFE/Butyl Septa	98473	98477	—	—
Clear Vials	11mm Snap TOP Caps	PTFE/Silicone Septa	98483	98485	—	—
Amber Vials	11mm Snap TOP Caps	PTFE/Butyl Septa	98479	98481	—	—
Amber Vials	11mm Snap TOP Caps	PTFE/Silicone Septa	98487	98489	—	—

11mm Snap TOP Caps

	with Septa					
Clear Cap	PTFE/Silicone Septa with Slit	98168	98268	98168	98268	98168
Clear Cap	PTFE/Silicone Septa with Starburst	98252	98255	98252	98255	98252
Clear Cap	PTFE/Silicone/PTFE Septa with Starburst	98257	98259	98257	98259	98257
Clear Cap	Red Fluoroelastomer Polymer Septa	98223	98243	98223	98243	98223
Clear Cap	PTFE Septa—10mil	98032	98442	98032	98442	98032
Red Cap	PTFE Septa—10mil	98332	98333	98332	98333	98332
Blue Cap	PTFE Septa—10mil	98334	98335	98334	98335	98334
Green Cap	PTFE Septa—10mil	98336	98337	98336	98337	98336
Yellow Cap	PTFE Septa—10mil	98338	98339	98338	98339	98338
Clear Cap	PTFE/Silicone Septa—10mil	98034	98444	98034	98444	98034
Red Cap	PTFE/Silicone Septa—10mil	98340	98341	98340	98341	98340
Blue Cap	PTFE/Silicone Septa—10mil	98342	98343	98342	98343	98342
Green Cap	PTFE/Silicone Septa—10mil	98344	98345	98344	98345	98344
Yellow Cap	PTFE/Silicone Septa—10mil	98346	98347	98346	98347	98346
Clear Cap	PTFE/Silicone/PTFE Septa—40mil	98036	98446	98036	98446	98036
Red Cap	PTFE/Silicone/PTFE Septa—40mil	98348	98349	98348	98349	98348
Blue Cap	PTFE/Silicone/PTFE Septa—40mil	98350	98351	98350	98351	98350
Green Cap	PTFE/Silicone/PTFE Septa—40mil	98352	98353	98352	98353	98352
Yellow Cap	PTFE/Silicone/PTFE Septa—40mil	98354	98355	98354	98355	98354
Clear Cap	PTFE/Butyl Rubber Septa—40mil	98038	98448	98038	98448	98038
Red Cap	PTFE/Butyl Rubber Septa—40mil	98356	98357	98356	98357	98356
Blue Cap	PTFE/Butyl Rubber Septa—40mil	98358	98359	98358	98359	98358
Green Cap	PTFE/Butyl Rubber Septa—40mil	98362	98363	98362	98363	98362
Yellow Cap	PTFE/Butyl Rubber Septa—40mil	98364	98365	98364	98365	98364
Clear Cap	Polyethylene Septa—10mil	98170	98270	98170	98270	98170

11mm GC Snap TOP Caps

	with Septa					
Clear Cap	PTFE/Red Butyl Septa	88351	88364	88351	88364	88351
Clear Cap	PTFE/Silicone Septa	88359	88367	88359	88367	88359
Clear Cap	PTFE/Silicone/PTFE Septa	88362	88469	88362	88469	88362

more info

GC Snap TOP Caps provide better seal for volatile samples.

related products

Looking for crimping tools?
Refer to page 383.

Limited Volume Inserts for 12x32mm Vials

- Select the appropriate limited volume insert for your microsampling needs
- Polyethylene springs act as shock adsorbers and help to maintain proper insert alignment
- Flange step inserts align precisely in StepVial design neck



4747

Vial Adapter

For Use with Waters® Alliance® Autosampler

- Reuseable adapter
- Adds versatility to use of your Waters® 717 and Alliance® autosamplers



5222

Prepare samples in one 8x30mm vial and analyze using either the Waters® WISP™ 96 or Alliance® autosampler trays.

technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)
Email: contact.alltech@grace.com
Online: www.discoverysciences.com

Limited Volume Inserts for Standard Mouth Vials (4mm i.d.)

Description	100/pk Part No.	1000/pk Part No.
<i>Glass</i>		
100µL, No Spring	95201	95202
100µL, with Polyethylene Bottom Spring	98031	98131
50µL, with Polyethylene Bottom Spring	98018	98058
50-100µL, Requires Spring	95203	95204
Metal Springs for (95203)	95205	95206
250µL, Flat Bottom	98028	98128
100µL, Silanized, No Spring Required	952018	—
<i>Polypropylene</i>		
100µL, No Spring	98137	98237
100µL, with Polyethylene Bottom Spring	98069	98169
250µL, Flat Bottom, 5x31mm	99176	99179
<i>Glass for Screw Thread 4mm i.d. Only</i>		
100µL, with Polyethylene Top Flange	98107	98117

Limited Volume Inserts for Wide Mouth Vials (6mm i.d.)

Description	100/pk Part No.	1000/pk Part No.
<i>Glass</i>		
250µL, No Spring	98322	98324
250µL, Glass Flange Step Insert	98745	98755
50µL, with Polyethylene Bottom Spring	98024	98064
100µL, with Polyethylene Top Spring	98052	98452
250µL, with Polyethylene Bottom Spring	98049	98449
400µL, Flat Bottom	981391	98439
250µL, Silanized	983228	—
250µL, Silanized with Polyethylene Bottom Spring	99060	—
<i>Polypropylene</i>		
100µL, with Polyethylene Top Spring	92102	98402
250µL, with Polyethylene Bottom Spring	98108	98408
250µL, No Spring Required	98106	98406
250µL, Polyethylene Flange Step Insert	98729	98739
350µL, Flat Bottom, 6x30mm	99183	99189

Vial Adapter for Waters® Alliance® Autosampler

Description	100/pk Part No.	1000/pk Part No.
<i>Reusable Adapter for Alliance® 12x32mm Autosampler Tray</i>		
Adapter for Use of 8x30mm Vials in a 12x32mm Tray, 24/pkg	98374*	—
<i>Kits—Vials and Caps for Use with Waters® 717 or Alliance® Autosamplers</i>		
8x30mm Shell Vials, 8mm Clear Starburst Snap Plugs	98100	98360
<i>Vials and Caps for Use with Waters® 717 or Alliance® Autosamplers</i>		
8x30mm Shell Vials, Clear Glass	97029	98037
8x30mm Polypropylene Shell Vial, 900µL	99184	99192
8x30mm Polypropylene LV Shell Vial, 500µL	99178	99182
8mm Clear Starburst Snap Plugs	88613	98865
<i>Vials and 10/425 Caps for Waters® Alliance® Autosamplers</i>		
12x32mm Clear Wide Mouth Vials	98133	98433
12x32mm Amber Wide Mouth Vials	98135	98435
Black Polypropylene Caps, PTFE/Silicone Septum, 60mil	98144	98152

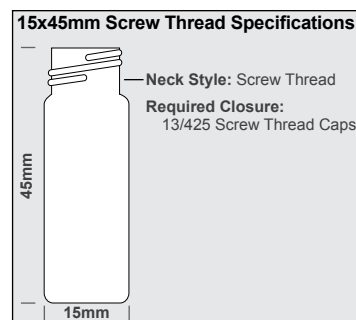
*Correct quantity specified in description.

15x45mm Screw Thread Vials

- Compatible with Waters® WISP™ 48 position, 717, Breeze™ and Shimadzu® autosamplers
- Use for waste/wash vials for other autosamplers
- 13/425 open top caps and septa
- StepVial design precisely aligns insert and vial
- Economical kits simplify ordering



4716



Vials

	100/pk	1000/pk	Silanized 100/pk	With White Marking Spot 100/pk	1000/pk	With White Graduated Marking Spots 100/pk	1000/pk
Clear	98110	98207	981101	98241	98247	97084	97088
Amber	98120	98484	981201	98261	98267	97097	97117

Limited Volume Vials

3.1mL Glass High Recovery Vial	72018	—	—	—	—	—	—
1.2mL Polypropylene Limited Volume Vial	70149	70198	—	—	—	—	—
2.5mL Polypropylene Vial	98091	98491	—	—	—	—	—
300µL Plastic Vial with Glass Insert	98251	98253	—	—	—	—	—

Preassembled Kits:

Vials	Caps	with Septa					
Clear Vials	Open-Hole Caps	PTFE Septa—10mil	98000	98002	—	—	—
Amber Vials	Open-Hole Caps	PTFE Septa—10mil	98004	98006	—	—	—
Clear Vials	Open-Hole Caps	PTFE/Silicone Septa—10/50mil	98008	98012	72676	—	—
Amber Vials	Open-Hole Caps	PTFE/Silicone Septa—10/50mil	98014	98016	72680	—	—
Clear Vials	Open-Hole Caps	PTFE/Silicone/PTFE Septa	98549	98551	—	—	—
Amber Vials	Open-Hole Caps	PTFE/Silicone/PTFE Septa	98618	98621	—	—	—
Clear Vials	Open-Hole Caps	PTFE/Butyl Septa—40mil	98623	98626	—	—	—
Amber Vials	Open-Hole Caps	PTFE/Butyl Septa—40mil	98628	98630	—	—	—
Clear Vials	Open-Hole Caps	TOP Hat Septa—65mil	98633	98632	—	—	—

Limited Volume Inserts

250µL Flange Step Glass Insert	70205	70215	—	70205	70215	70205	70215
275µL 7x44mm Polypropylene LV Insert	99165	99180	—	99165	99180	99165	99180
300µL 6x38mm Glass Insert, Requires Metal Spring	98118	98218	—	98118	98218	98118	98218
300µL 6x38mm Polypropylene Insert, Requires Metal Spring	98071	98271	—	98071	98271	98071	98271
Metal Springs for 300µL Inserts	98121	98221	—	98121	98221	98121	98221
300µL Self Centering Glass Top Spring	98056	98256	—	98056	98256	98056	98256
300µL Self Centering Polyethylene Top Spring	92104	98204	—	92104	98204	92104	98204
300µL Self Centering Glass Bottom Spring	98199	98299	—	98199	98299	98199	98299
300µL Self Centering Polyethylene Bottom Spring	98193	98293	—	98193	98293	98193	98293
300µL Silanized Glass Insert	—	—	981188	—	—	—	—
350µL Flange Step Glass Insert	98942	98944	—	98942	98944	98942	98944
500µL 8x43mm Glass Flat Bottom Insert	98581	98583	—	98581	98583	98581	98583

Preassembled 13/425

Open-Hole Caps	with Septa						
Black Cap	Bonded Interseal PTFE/Silicone Septa	70420	70424	—	70420	70424	70420
Black Cap	PTFE/Silicone Septa with Slit—60mil	97017	97027	—	97017	97027	97017
Black Cap	PTFE/Silicone Septa—65mil	98610	98612	—	98610	98612	98610
Black Cap	PTFE/Silicone/PTFE Septa	98735	98737	—	98735	98737	98735
Black Cap	PTFE/Silicone TOP Hat Septa	98075	98475	—	98075	98475	98075
Clear Cap	TOP Seal Closure with Molded Septa—10mil	98070	98480	—	98070	98480	98070

Solid 13/425 TOP Caps with Septa

Solid Green Phenolic Cap with PTFE Septa	98209	98476	—	98209	98476	98209	98476
Solid White Cap with Interseal PTFE/Silicone Bonded Septa	99031	—	—	99031	—	99031	—
Solid Black Cap with PTFE/F217 Septa	98430	98432	—	98430	98432	98430	98432
Solid Black Cap	98614	98616	—	98614	98616	98614	98616

Unlined 13/425 Caps

Black Cap	73090	73092	—	73090	73092	73090	73092
Red Cap	98454	98466	—	98454	98466	98454	98466
Blue Cap	98456	98468	—	98456	98468	98456	98468
Green Cap	98458	98470	—	98458	98470	98458	98470
Yellow Cap	98460	98472	—	98460	98472	98460	98472
White Cap	98462	98474	—	98462	98474	98462	98474

Septa for 13/425 Caps

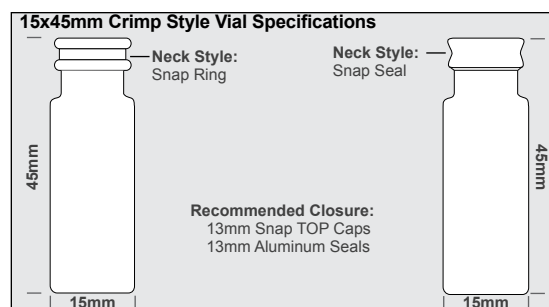
PTFE—10mil	73094	73096	—	73094	73096	73094	73096
PTFE/Silicone with Slit—5/55mil	98164	98464	—	98164	98464	98164	98464
PTFE/Butyl Rubber—5/55mil	98367	98369	—	98367	98369	98367	98369
Red PTFE/Silicone—5/55mil	98846	98848	—	98846	98848	98846	98848
PTFE/White Silicone—10/50mil	98123	98450	—	98123	98450	98123	98450
PTFE/White Silicone—10/90mil	98219	95248	—	98219	95248	98219	95248
PTFE/Silicone/PTFE—2/36/2mil	98280	98282	—	98280	98282	98280	98282
Black Fluoroelastomer Polymer—30mil	98606	98608	—	98606	98608	98606	98608

15x45mm Crimp Style Vials

- Compatible with Waters® WISP™ 48 position, 717 and Shimadzu® autosamplers
- Use for waste/wash vials for other autosamplers
- Economical kits simplify ordering



4717



Snap Seal Vials, 4mL

	100/pk	1000/pk	With White Graduated Marking Spots 100/pk	1000/pk
Clear	98040	98240	95545	95546
Amber	98097	98297	95547	95548

Snap Ring Limited Volume Vials

300µL Plastic Vial with Glass Insert	98154	98156	—	—
2.5mL Polypropylene Vial	98054	98254	—	—

Unassembled Kits:

Snap Seal Vials	Caps	with Septa		
Clear Vials	13mm Snap TOP Caps	PTFE Septa—10mil	98390	98392
Clear Vials	13mm Snap TOP Caps	PTFE/Silicone Septa	98874	98876
Amber Vials	13mm Snap TOP Caps	PTFE/Silicone Septa	98870	98872
Clear Vials	13mm Snap TOP Caps	PTFE/Butyl Septa	98636	98638
Amber Vials	13mm Snap TOP Caps	PTFE/Butyl Septa	98640	98644
Clear Vials	13mm Snap TOP Caps	PTFE/Silicone/PTFE Septa	98646	98648

Unassembled Kits:

Snap Seal Vials	Seals	with Septa		
Clear Vials	Caps	PTFE/Silicone Septa	98132	98269
Clear Vials	Caps	PTFE/Butyl Septa	98145	97266
Clear Vials	Caps	PTFE/Silicone/PTFE Septa	98147	97273

Limited Volume Inserts

250µL Flange Step Glass Insert	70205	70215	70205	70215
275µL 7x44mm Polypropylene LV Insert	99165	99180	99165	99180
300µL 6x38mm Glass Insert, Requires Metal Spring	98118	98218	98118	98218
300µL 6x38mm Polypropylene Insert, Requires Metal Spring	98071	98271	98071	98271
Metal Springs for 300µL Inserts	98121	98221	98121	98221
300µL Self Centering Glass Top Spring	98056	98256	98056	98256
300µL Self Centering Polyethylene Top Spring	92104	98204	92104	98204
300µL Self Centering Glass Bottom Spring	98199	98299	98199	98299
300µL Self Centering Polyethylene Bottom Spring	98193	98293	98193	98293
350µL Flange Step Glass Insert	98942	98944	98942	98944
500µL 8x43mm Glass Flat Bottom Insert	98581	98583	98581	98583

13mm Snap TOP Caps

	with Septa			
Clear Cap	PTFE Septa—10mil	98042	98242	98042
Clear Cap	PTFE/Silicone Septa	98044	98244	98044
Clear Cap	PTFE/Silicone/PTFE Septa	98046	98246	98046
Clear Cap	PTFE/Butyl Rubber Septa	98048	98248	98048
Clear Cap	PTFE/Silicone Septa with Starburst	98586	98588	98586
Clear Cap	PTFE/Silicone/PTFE Septa with Starburst	98593	98594	98593

13mm Aluminum Seals

	with Septa			
Silver Seal	PTFE Septa—10mil	98101	98103	98101
Silver Seal	PTFE/Silicone Septa	98283	98289	98283
Silver Seal	White PTFE/Butyl Septa	98776	98206	98776
Silver Seal	PTFE/Silicone/PTFE Septa	98596	98598	98596
Gold Seal	Pharma-Fix Septa	6687	98208	6687

13mm Aluminum Seals, Unlined

Silver Seal, Center Tear Off	98778	66410	98778	66410
Red Seal, Center Tear Off	98780	—	98780	—
Blue Seal, Center Tear Off	98783	—	98783	—
Green Seal, Center Tear Off	98785	—	98785	—
Gold Seal, Center Tear Off	98787	—	98787	—
Silver Seal, Tear-Away	98789	66416	98789	66416

13mm Septa for Aluminum Seals

White PTFE—10mil	98177	—	98177	—
PTFE/Silicone—10/50mil	98791	95253	98791	95253
PTFE/Silicone—10/90mil	98793	95254	98793	95254
PTFE/Silicone/PTFE—2/36/2mil	98180	98182	98180	98182
PTFE/Butyl Rubber—40mil	98173	98175	98173	98175

Headspace Vials

- Crimp style vials, made of borosilicate glass
- New screw thread headspace vial
- Five finish styles available
- Choose from three vial sizes, 6, 10, or 20mL

For reproducible results, it's very important that the headspace vials and caps form a tight seal. In headspace analysis, the sample is sealed into the vial and heated until the concentration in the gas phase (headspace) is in equilibrium with the concentration in the liquid phase. An aliquot from the headspace is then analyzed.



Headspace Vials

Description	100/pk Part No.	1000/pk Part No.
<i>Flat Top, Flat Bottom, Clear Glass, Long Neck</i>		
22.5x75.5mm, 20mL Vials	6636	66361
22.5x46mm, 10mL Vials	6655	66551
<i>Flat Top, Round Bottom, Clear Glass</i>		
22.5x75.5mm, 20mL Vials for CTC PAL, Long Neck	97188	97190
22.5x75.5mm, 20mL Vials, for SPME**	99097	99099
<i>Bevel Top, Flat Bottom, Clear Glass</i>		
23x75mm, 20mL Vials	99136	99138
23x46mm, 10mL Vials	98792	98794
22x38mm, 6mL Vials	99132	99134
<i>Bevel Top, Round Bottom</i>		
23x75.5mm, 20mL Vials, Clear	98788	98790
23x75.5mm, 20mL Vials, Amber	99077	99093
22.5x46mm, 10mL Vials, Clear	98938	98676
22x38.25mm, 5mL Vials, Clear	99056	99058
<i>Shimadzu® Headspace Vials</i>		
30x60mm, 27mL, Clear Vials	98093	98546
<i>Tekmar® Headspace Vials</i>		
18x50mm, 9mL, Clear Vials, 125/pk	98098*	98548
18x65mm, 12mL, Clear Vials, 125/pk	98104*	98877
23x75.5mm, 20mL, Clear Vials	95128	95137
<i>Screw Thread Headspace Vials for CTC PAL***</i>		
20mL Clear	99065	99069
20mL Amber	99068	99074
10mL Clear	99070	99072
10mL Amber	99078	99075

*Correct quantity specified in description.

**SPME vial has thicker glass top so cap with thinner septum will crimp tightly.

***New units only. Older models have weak magnets.

Shimadzu® HSS-2B



Vials for Tekmar®



Cross Reference of Headspace Vials to Autosamplers

Instrument manufacturers recommend use of various vial shapes for best results with their analytical systems so we offer all of the vial shapes available.

Headspace Vials** and Corresponding Autosamplers		
Recommended For Autosampler	Part No.	Vial Description
PerkinElmer® HS6	99056	5mL Bevel Top/Bound Bottom
Carlo Erba HS250/HS800; CTC500; Fisons HS500/HS800; Chrompack™ 9020/25	98938	10mL Bevel Top/Round Bottom
PerkinElmer® HS40/HS100/101	98788	20mL Bevel Top/Round Bottom
Tekmar® 7000 Series	95128	20mL Bevel Top/Round Bottom
CTC PAL	97188	20mL Flat Top/Round Bottom
Carlo Erba HS850; Dani HS86.50/HS39.5; Fisons HS850; Hewlett-Packard HS 7694	6655,6636	10mL, 20mL Flat Top/Flat Bottom
SPME	99097	20mL, Magnetic Cap
Shimadzu®	98093	27mL, 30x60mm
CTC PAL, Gerstel	99065/99070	Screw Thread Magnetic Cap
	99065/99070	Screw Thread Magnetic Cap

**This list is only a guide to the most popular vial and autosampler combinations. Many instruments will allow use of other combinations of flat or beveled tops with flat or rounded bottoms. If a particular type of vial is required for your instrument, the information should be provided by your autosampler or instrument manufacturer.

20mm Seals and Septa for Headspace Vials

- Increased selection of septa in aluminum, pressure release (PR), or magnetic seals
- Now available in convenience kits with headspace vials and pressure release caps

20mm Polyethylene Seal

Low cost, polyethylene seal for rinse vials or low pressure analysis. No crimping is required.



Types of Aluminum Seals



Center Hole



Pressure Release (PR)



Center Tear-Off



Tear-Away

Magnetic Caps



5mm Center Hole



8mm Center Hole

Types of Septa



Aluminum Faced/Silicone



Silicone or PTFE/Silicone



PTFE Faced/Butyl Molded Septum
(Pharma-Fix Septum)

Stoppers



20mm Seals and Septa for Headspace Vials

Description	Qty.	Part No.	Qty.	Part No.
<i>Polyethylene Seal</i>				
with PTFE/Silicone Septum—5/45mil	100	95586	1000	95576
<i>Aluminum Seals, Open Center Hole with Septa</i>				
Seal, PTFE/Butyl Rubber Septum	100	98801	500	98552
Seal, PTFE/Silicone Septum—10/50mil	100	95756	1000	95758
Seal, PTFE/Silicone Septum—125mil	100	95587	1000	95577
Seal, PTFE/Chlorobutyl Septum	100	95584	1000	95578
Seal, Aluminum/Silicone Septum	100	98687	1000	98689
Seal, Black Butyl Rubber Septum	100	98683	1000	98685
Center Tear-Off Seal, Butyl Septum	72	98841	10x72	98550
<i>Specialty Seals with Septa</i>				
Seal with Pharma-Fix Septum	100	6689	1000	98898
PR Seal, PTFE/Silicone Septum—118mil	100	95581	1000	95579
PR Seal, PTFE/Gray Butyl Septum—118mil	100	95590	1000	95580
PR Seal, Aluminum/Silicone Septum—118mil	100	98691	1000	98693
Magnetic*, 5mm Center, PTFE/Silicone Septum—118mil	100	95594	1000	95588
Magnetic*, 8mm Center, PTFE/Silicone Septum—118mil	100	95139	1000	95143
Magnetic*, 5mm Center, PTFE/Gray Butyl Septum—118mil	100	95592	1000	95582
Magnetic*, 8mm Center, PTFE/Gray Butyl Septum—118mil	100	95156	1000	95189
Magnetic Seal for SPME Vial, PTFE/Silicone Septum 1.5mm	100	99102	1000	99106
Magnetic Seal for SPME, Fluoroelastomer Polymer Septum, 1.0mm	100	99104	1000	99107
<i>Aluminum Seals without Septa</i>				
Standard Seals, 10mm Center Hole	144	66381	1000	89075
Tear-Away Seals, Silver	144	66501	10x144	98805
Silver, Center Tear-Off Seal	144	66440	10x144	98803
Red, Center Tear-Off Seal	144	66441	10x144	66418
Blue, Center Tear-Off Seal	144	66442	10x144	66419
Green, Center Tear-Off Seal	144	66443	10x144	66425
Gold, Center Tear-Off Seal	144	66444	10x144	66426
Magnetic Tinplate Seal*, 5mm Center	100	98532	1000	98534
<i>Septa for 20mm Aluminum Seals</i>				
Red Butyl Septum	100	98695	1000	98697
Red Silicone Septum	72	98536	10x72	98538
PTFE/Silicone Septum—10/90mil	72	95313	10x72	98809
PTFE/Gray Butyl Septum	72	98540	10x72	98542
Aluminum Faced/Silicone—60mil	72	98665	10x72	98667
<i>Stoppers for 20mm Crimp Top Vials</i>				
Natural Rubber Stoppers	72	95304	1000	95255
Butyl Rubber Stoppers	72	95305	1000	95256
Hycar Rubber Stoppers	72	6683	10x72	98813
<i>Magnetic Screw Thread Caps with Septa for Screw Thread Headspace Vials</i>				
White PTFE/Blue Silicone Septum, 1.3mm	100	99071	1000	99081
PTFE/ Red Butyl Septum, 1.6mm	100	99073	1000	99083
Blue PTFE/White Silicone Septum, 1.5mm	100	99076	1000	99091
Fluoroelastomer Polymer, 1.0mm	100	99079	1000	99086

*Magnetic Seals are used with CTC and Carlo Erba autosamplers.

Specialty Autosampler Vials



8x40mm



8x30mm



7x32mm



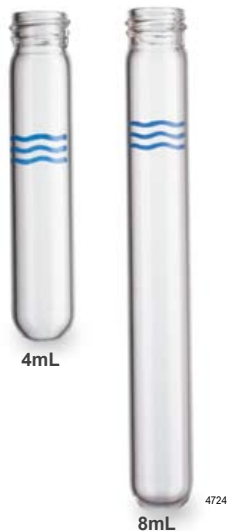
7x40mm

**Shimadzu®
ASI-5000**

**DuPont®
Vials**



5mL
Vial Tube



4mL
8mL

8mm Closures



Aluminum Seals
with Septa



Polypropylene
Snap Seal

Specialty Autosampler Vials

Description	Qty.	Part No.	Qty.	Part No.
<i>8x40mm WISP™ Crimp Style Vials (Use 8mm Closures Below)</i>				
1.0mL Clear Vial	125	98799	1000	98035
1.0mL Clear Taper Vial	500	97269	1000	98496
<i>8x30mm Crimp Top Vials (Use 8mm Closures Below)</i>				
0.5mL Clear, Flat Bottom	200	98819	1000	98823
0.5mL Amber, Tapered Bottom	—	—	500	97260
Sleeve for Tapered Vial (98183)	50	98146	—	—
<i>7x32mm Crimp Top Vials (Use 8mm Closures Below)</i>				
500µL Amber, Tapered Bottom	—	—	500	97264
700µL Amber, Round Bottom	125	98403	500	98411
Sleeve for 7x32mm Vials	40	98415	—	—
<i>7x40mm Crimp Top Vials (Use 8mm Closures Below)</i>				
700µL Clear, Tapered Bottom	125	98148	1000	98150
700µL Amber, Tapered Bottom	200	98894	1000	95171
800µL Clear, Flat Bottom	200	98043	1000	98045
800µL Amber, Flat Bottom	200	98896	1000	95170
<i>6x32mm Crimp Top Vials (not shown) (Use 8mm Closures Below)</i>				
6x32mm Tapered, 0.2mL	100	94470	1000	94472
6x32mm Round, 0.3mL	100	94450	1000	94463
Black Support Sleeve for HP1090A	20	94455	—	—
White Support Sleeve for HP1050, 7673A	20	94460	—	—
<i>Miscellaneous Vials, Clear Glass (not shown) (Use 11mm Seals)</i>				
12x40mm, Use 11mm Seal	100	98273	1000	98570
10x32, 0.9mL, Use 11mm Seal	500	98226	5x200	98572
Support Sleeve for 98226	100	98217	—	—
<i>Alcott Micromeritics Vials (not shown)</i>				
8x35mm, Clear Shell Vial with Plugs, 1mL	200	98903	1000	50303400
<i>Shimadzu® Autosampler Vials and Tubes</i>				
Vial, 12x96mm, 5mL, 10/425 Threads	100	98187	1000	98564
Tube, 12x96mm, 5mL, No Cap Required	100	98375	1000	98379
<i>DuPont® Autosampler Vials (Use 13/425 Screw Cap)</i>				
13x65mm, 4mL, 13/425 Threads	125	98821	8x125	98566
13x100mm, 8mL, 13/425 Threads	125	98250	8x125	98568

8mm Closures

Description	Qty.	Part No.	Qty.	Part No.
<i>Aluminum Seals with Septum</i>				
Silver Seal with PTFE/Butyl Rubber Septum	100	94831	1000	95172
Silver Seal with PTFE/Silicone Septum	100	94832	1000	94833
Silver Seal with PTFE/Silicone/PTFE Septum	100	94251	1000	94253
Silver Seal with Black Fluoroelastomer Polymer Septum—50mil	100	94834	1000	94835
Polypropylene Snap Seal	100	83122	1000	83130

Silanized Glassware



4711

tech tip

Use of silanized glassware can often improve the separations of polar compounds such as antibodies, amines, pesticides, phenols, and proteins. Pharmaceutical compounds in solution and metabolites are especially sensitive and often absorb to the walls of an untreated glass container destroying any quantitative value the solution might have.

Our HMDS, high temperature silanization process eliminates active sites and prevents sample loss or degradation.

more info

Convenience kits simplify ordering with one part number to remember. Kits provide both vials and caps for a perfect fit every time.



4932

Silanized Vials

Description	Qty.	Part No.
<i>12x32mm Vials</i>		
Clear, Standard Mouth, 4mm i.d., 8/425 Thread	100	951911
Amber, Standard Mouth, 4mm i.d., 8/425 Thread	100	951941
Clear, Wide Mouth, 6mm i.d., 10/425 Thread	100	981331
Amber, Wide Mouth, 6mm i.d., 10/425 Thread	100	981351
Clear, R.A.M.™ Robotic, 6mm i.d., 9mm Thread	100	953861
Amber, R.A.M.™ Robotic, 6mm i.d., 9mm Thread	100	953881
<i>8x40mm Shell Vials</i>		
Clear	100	886101
<i>15x45mm Vials</i>		
Clear, 13/425 Thread	100	981101
Amber, 13/425 Thread	100	981201

more info

See individual product pages for a complete listing of closure options.

Silanized Inserts and Specialty Vials

Description	Qty.	Part No.
<i>Limited Volume Inserts for Vials</i>		
100µL for 12x32 Standard Mouth	100	952018
250µL for 12x32 Wide Mouth	100	983228
250µL with PE Bottom Spring for Wide Mouth	100	99060
100µL for 1mL WISP™ 96 Style Vials, 8x40	100	989008
300µL for 15x45 WISP™ Style Vials	100	981188
<i>Silanized Culture Tubes</i>		
13x100mm Culture Tubes	1000	985911
10x75mm Culture Tubes	1000	985901
12x75mm Culture Tubes	1000	985871
16x100mm Culture Tubes	1000	985951
<i>Special Silanized Vials</i>		
300µL Crimp Top Microvials, 8mm Seals with PTFE/Butyl Septa	100	944508

Silanized Vial Kits

Description	Qty.	Part No.
<i>12x32mm (2mL) Silanized Screw Cap Vial kits</i>		
Clear, Standard Mouth Vials, 8/425 Caps, PTFE/Silicone Septa	100	72666
Amber, Standard Mouth Vials, 8/425 Caps, PTFE/Silicone Septa	100	72670
Clear, Wide Mouth Vials, 10/425 Caps, PTFE/Silicone Septa	100	981338
Amber, Wide Mouth Vials, 10/425 Caps, PTFE/Silicone Septa	100	981358
Clear, R.A.M.™ Robotic Vials, 9mm Caps, PTFE/Silicone Septa	100	953868
Amber, R.A.M.™ Robotic Vials, 9mm Caps, PTFE/Silicone Septa	100	895388
<i>1mL WISP™ Style 96 Silanized Vial Kit</i>		
Clear Vials with Clear Snap Plugs	100	982108
<i>15x45mm (4mL) Silanized Screw Thread Cap Vial Kits</i>		
Clear Vials, 13/425 Caps, PTFE/Silicone Septa	100	72676
Amber Vials, 13/425 Caps, PTFE/Silicone Septa	100	72680



4741

related products

Custom Silanization Service
Have we missed a vial or tube size that you need? Call to inquire about custom silanization for any vial or tube size that you need for your application, C-8500.

Screw Thread Vials and Storage Bottles

Screw Cap Vials



4745

Boston Round Screw Cap Bottles



4746

PTFE Septum Vials

- Usable to 250°C
- Ideal for alkaline reactions
- Useful for silylation, acylation, alkylation, and hydrolysis reactions
- Do not use as a pressure vessel



more info

For Screw Thread Closures see page 369.

Screw Cap Vials and Bottles for Sample Storage

Volume	Glass Color	Neck Finish	Dia x Ht (mm)	Qty.	Part No.	Qty.	Part No.
<i>Screw Cap Vials</i>							
2mL	Clear	8/425	12x32	100	95191	1000	95192
2mL	Amber	8/425	12x32	100	95194	1000	95195
2mL	Clear	10/425	12x32	100	98133	1000	98433
2mL	Amber	10/425	12x32	100	98135	1000	98435
4mL	Clear	13/425	15x45	100	98110	1000	98207
4mL	Amber	13/425	15x45	100	98120	1000	98484
8mL	Clear	15/425	17x60	144	98862*	200	988621
8mL	Amber	15/425	17x60	144	98864*	200	988641
14–16mL	Clear	18/400	21x70	144	98866*	200	988661
14–16mL	Amber	18/400	21x70	144	98186*	—	—
24mL	Clear	20/400	23x85	144	98868*	200	988681
40mL	Clear	24/400	28x95	100	98912	1000	98914

Boston Round Screw Cap Bottles

30mL–1oz	Clear	20/400	31x79	12	9529	—	—
30mL–1oz	Amber	20/400	31x79	12	9536	—	—
60mL–2oz	Clear	20/400	39x94	12	9531	—	—
60mL–2oz	Amber	20/400	39x94	12	9537	—	—
125mL–4oz	Clear	22/400	48x112	12	9523	—	—
125mL–4oz	Amber	22/400	48x112	12	9538	—	—
250mL–8oz	Clear	24/400	60x136	12	9535	—	—
250mL–8oz	Amber	24/400	60x136	12	9539	—	—
480mL–16oz	Amber	28/400	75x168	12	95391	—	—
960mL–32oz	Clear	33/400	94x206	12	95392	—	—

*Includes vials and caps with white styrene butadiene rubber septa.

Sampling Devices

Volume	Qty.	Part No.
<i>PTFE Mini-Vials (Supplied with Caps and Septa)**</i>		
5mL PFA Mini-Vials, 2.54x3.5cm	10	97050
7mL PFA Mini-Vials, 2x3.4cm	10	97070
15mL PFA Mini-Vials	10	97150
30mL PFA Mini-Vials	10	97300
23mm PTFE/Silicone Septum, Fit 5, 7mL	30	95363
31mm PTFE/Silicone Septum, Fit 15, 30mL	30	95373
24mm Mininert® Valve, Fit 5, 7mL	12	95326

**Vials are made of PTFE, a perfluoroalkoxy copolymer with properties similar to PTFE and FEP.

related products

Refer to pages 380–381 for racks and storage containers.



4951

Screw Thread Closures

Open-Hole Screw Thread Caps, Unlined



Open-Hole Screw Thread Caps, Unlined

Neck Finish	Description	Qty.	Part No.
<i>Open-Hole Screw Caps, Unlined, Polypropylene</i>			
8/425	Black Open-Hole Cap	100	73044
8/425	Black Open-Hole Cap	1000	73059
10/425	Black Open-Hole Cap	100	98143
10/425	Black Open-Hole Cap	1000	98443
13/425	Black Open-Hole Cap	100	73090
13/425	Black Open-Hole Cap	1000	73092
15/425	Black Open-Hole Cap	72	95261
18/400	Black Open-Hole Cap	72	95281
20/400	Black Open-Hole Cap	72	95301
22/400	Black Open-Hole Cap	72	95331
24/400	Black Open-Hole Cap	72	95321

Septa for Open-Hole Caps



Septa for Open—Hole Caps

Neck Finish	Description	Qty.	Part No.
<i>Septa for Open—Hole Screw Thread Caps</i>			
8/425	PTFE/Silicone Septum—5/55mil	100	73048
8/425	PTFE/Silicone Septum—5/55mil	1000	73060
8/425	PTFE/Silicone Septum—10/90mil	100	98499
8/425	PTFE/Silicone Septum—10/90mil	1000	98497
10/425	PTFE/Silicone Septum—5/55mil	100	98141
10/425	PTFE/Silicone Septum—5/55mil	1000	98441
13/425	PTFE/Silicone Septum—5/55mil	100	98846
13/425	PTFE/Silicone Septum—5/55mil	1000	98848
13/425	PTFE/Silicone Septum—10/90mil	100	98219
13/425	PTFE/Silicone Septum—10/90mil	1000	95248
15/425	PTFE/Silicone Septum—10/50mil	72	95262
15/425	PTFE/Silicone Septum—10/90mil	100	98793
18/400	PTFE/Silicone Septum—10/50mil	72	95282
18/400	PTFE/Silicone Septum—10/90mil	72	95283
20/400	PTFE/Silicone Septum—10/50mil	72	95302
20/400	PTFE/Silicone Septum—10/90mil	72	95303
22/400	PTFE/Silicone Septum—10/90mil	72	95333
24/400	PTFE/Silicone Septum—10/50mil	72	95322
24/400	PTFE/Silicone Septum—10/90mil	72	95323

Open-Hole Screw Thread Caps with Septa



Polypropylene Screw Thread Caps with Septa

Neck Finish	Description	Qty.	Part No.
<i>Open-Hole Screw Caps with PTFE/Silicone Septa—60mil</i>			
8/425	Black Cap with PTFE/Silicone Septum	100	98061
10/425	Black Cap with PTFE/Silicone Septum	100	98144
13/425	Black Cap with PTFE/Silicone Septum	100	98610
<i>Open-Hole Screw Caps with PTFE/Silicone/PTFE Septa—40mil</i>			
8/425	Black Cap with PTFE/Silicone/PTFE Septum	100	98701
10/425	Black Cap with PTFE/Silicone/PTFE Septum	100	98705
13/425	Black Cap with PTFE/Silicone/PTFE Septum	100	98735

Screw Thread Caps with Molded Septa

- One-piece “Top Seal” closure saves time
- 0.010" molded septum allows easy needle penetration
- Polypropylene construction for solvent resistance



Top Seal Closures with Septa—10mil

Neck Finish	Description	Qty.	Part No.
<i>Top Seal Closures with Molded Polypropylene Septa—10mil</i>			
8/425	Clear Cap with Polypropylene Septum	100	98060
8/425	Clear Cap with Polypropylene Septum	1000	98160
10/425	Clear Cap with Polypropylene Septum	100	98405
10/425	Clear Cap with Polypropylene Septum	1000	98407
13/425	Clear Cap with Polypropylene Septum	100	98070
13/425	Clear Cap with Polypropylene Septum	1000	98480

Solid Top Screw Caps with Septa

- Convenient for sample storage



Solid Screw Thread Caps and Septa

Neck Finish	Description	Qty.	Part No.
<i>Solid Screw Thread Caps with Interseal PTFE/Silicone Bonded Septa</i>			
13/425	White Cap with PTFE Septum	100	99031
15/425	White Cap with PTFE Septum	100	99041
18/400	White Cap with PTFE Septum	100	99050
20/400	White Cap with PTFE Septum	100	99051
22/400	White Cap with PTFE Septum	100	99052
24/400	White Cap with PTFE Septum	100	99054
<i>Phenolic Solid Screw Thread Caps with PTFE/F217* Septa</i>			
15/425	Green Cap with PTFE Septum	50	95269
18/400	Green Cap with PTFE Septum	50	95289
20/400	Green Cap with PTFE Septum	50	95309
22/400	Green Cap with PTFE Septum	50	95339
24/400	Green Cap with PTFE Septum	50	95329
28/400	Green Cap with PTFE Septum	50	95395
<i>Polypropylene Solid Screw Thread Caps with PTFE Septa</i>			
8/425	Black Cap with PTFE Septum	100	98063
8/425	Black Cap with PTFE Septum	1000	98163
10/425	Black Cap with PTFE Septum	100	98124
10/425	Black Cap with PTFE Septum	1000	98424
13/425	Black Cap with PTFE Septum	100	98430
13/425	Black Cap with PTFE Septum	1000	98432
<i>Polypropylene Solid Threaded Cap with Polyethylene-Cone Septa</i>			
13/425	Black Cap with Poly-Cone Septum	100	95247
15/425	Black Cap with Poly-Cone Septum	100	95267
18/400	Black Cap with Poly-Cone Septum	100	95287
20/400	Black Cap with Poly-Cone Septum	100	95307
22/400	Black Cap with Poly-Cone Septum	100	95337
24/400	Black Cap with Poly-Cone Septum	100	95327
28/400	Black Cap with Poly-Cone Septum	100	95393
33/400	Black Cap with Poly-Cone Septum	100	95394
<i>Polypropylene Solid Screw Thread Caps, Unlined</i>			
8/425	Black Cap	100	98105
10/425	Black Cap	100	98162
13/425	Black Cap	100	98614

*F217—Polyethylene foam material.

Crimp Top Vials and Storage Bottles

Crimp Top Containers Provide Positive Seal and Serve as Ideal Storage Vessels

- Borosilicate glass containers
- Supplied without seals



Serum bottles are made of borosilicate glass that has a higher coefficient of expansion than autosampler vials. They have less resistance to sudden temperature changes.

Crimp Top Vials and Bottles

Volume	Glass Color	Neck Finish	Dia x Ht (mm)	Qty.	Part No.	Qty.	Part No.
<i>Crimp Top Vials and Bottles</i>							
0.3mL	Clear	11mm	12x32	100	95240	1000	—
0.3mL	Amber	11mm	12x32	100	95268	1000	—
0.5mL	Clear	8mm	8x30	200	98819	1000	98823
0.8mL	Clear	8mm	7x40	200	98043	1000	98045
0.8mL	Amber	8mm	7x40	200	98896	1000	95170
1mL	Clear	8mm	8x40	125	98799	1000	98035
1.5mL	Clear	11mm	12x32	100	72009	1000	—
2mL	Clear	11mm	12x32	100	66002	1000	66003
2mL	Amber	11mm	12x32	100	95221	1000	95222
2mL	Clear	11mm	12x40	100	98273	1000	98570
4mL	Clear	13mm	15x45	100	98040	1000	98240
4mL	Amber	13mm	15x45	100	98097	1000	98297
6mL	Clear	20mm	22x38.5	100	99056	1000	99058
9mL	Clear	20mm	18x50	125	98098	1000	98548
10mL	Clear	20mm	22.5x46	100	6655	1000	66551
12mL	Clear	20mm	18x65	125	98104	1000	98877
20mL	Clear	20mm	22.5x75.5	100	6636	1000	66361
27mL	Clear	20mm	30x60	100	98093	1000	98546

Crimp Top Serum Bottles



Crimp Top Bottles and Stoppers

Volume	Glass Color	Neck Finish	Dia x Ht (mm)	Qty.	Part No.	Qty.	Part No.
<i>Crimp Top Vials and Bottles, Wheaton™ 400</i>							
2mL	Clear	13mm	15x40	288	66021	—	—
5mL	Clear	20mm	23x47	288	66041	—	—
10mL	Clear	20mm	25x54	288	66036	—	—
30mL	Clear	20mm	37x63	288	66038	—	—
50mL	Clear	20mm	43x73	288	66040	—	—
100mL	Clear	20mm	52x95	144	66042	—	—
<i>Stoppers for Serum Bottles</i>							
11mm	Natural Rubber Stoppers			100	6626	1000	66261
13mm	Natural Rubber Stoppers			72	95244	1000	95250
13mm	Butyl Rubber Stoppers			72	95245	1000	95252
20mm	Natural Rubber Stoppers			72	95304	1000	95255
20mm	Butyl Rubber Stoppers			72	95305	720	98811

Stoppers



more info

For Aluminum Seals and Septa see page 371.

more info

For more information on Crimpers and Decappers, see page 383.

Crimpers and Decappers

Volume	Description	Qty.	Part No.
<i>Adjustable Hand Crimpers for Crimp Top Vials</i>			
8mm	Hand Crimper*	ea	666008
11mm	Hand Crimper	ea	60041
13mm	Hand Crimper	ea	60043
20mm	Hand Crimper	ea	60045
<i>Hand Decappers for Crimp Top Vials</i>			
8mm	Hand Decapper	ea	98709
11mm	Hand Decapper	ea	98711
13mm	Hand Decapper	ea	98713
20mm	Hand Decapper	ea	98719
<i>Plier Decappers for Crimp Top Vials</i>			
8mm	Plier Decapper	ea	6662
11mm	Plier Decapper	ea	6660
13mm	Plier Decapper	ea	6661
20mm	Plier Decapper	ea	6663

*Not adjustable.

Aluminum Seals and Septa

Aluminum Seals with Septa

- One-piece design saves time by eliminating the process of inserting septa into the closures
- For maximum sample protection, the seal should be replaced before storing the sample
- Available in a wide assortment of colors



4754

Aluminum Seals with Septa

Description	Size	Qty.	Part No.
<i>Seal with PTFE Septum—10mil</i>			
Silver Seal	11mm	100	98013
		1000	98113
	13mm	100	98101
		1000	98103
	20mm*	100	99103
		1000	99105
<i>Seal with PTFE/Butyl Septum</i>			
Silver Seal	8mm	100	94831
		1000	95172
	11mm	100	73070
		1000	73071
	13mm	100	98776
		1000	98206
	20mm	100	98801
		500	98552
Red Seal	11mm	100	98051
Blue Seal	11mm	100	98053
Green Seal	11mm	100	98057
Gold Seal	11mm	100	98059
<i>Seal with PTFE/Silicone—10/50mil</i>			
Silver Seal	8mm	100	94832
		1000	94833
	11mm	100	98740
		1000	94867
	13mm	100	98283
		1000	98289
	20mm	100	95756
		1000	95758
<i>Seal with PTFE/Silicone/PTFE</i>			
Silver Seal	8mm	100	94251
		1000	94253
	11mm	100	94855
		1000	94865
	13mm	100	98596
		1000	98598
<i>Seal with PP Septum—10mil</i>			
Silver Seal	11mm	100	98011
<i>Seal with Pharma-Fix Septum</i>			
Silver Seal	13mm	100	6687
	20mm	100	6689
<i>Seal with Black Fluoroelastomer Polymer Septum</i>			
Silver Seal	8mm	100	94834
		1000	94835
	11mm	100	94852
		1000	94862

*Not suitable for headspace seals.

Aluminum Seals, Unlined

- Also available in a wide assortment of colors. Call for additional colors.

4999
5003

Aluminum Seals, Unlined

Maximum Size, Limited			
Description	Size	Qty.	Part No.
<i>Standard Seals</i>			
Silver—Open Center	11mm	100	98746
		1000	66405
Silver—Center Tear-Off	13mm	100	98778
		1000	66410
Silver—Center Tear-Off	20mm	144	66440
		1440	98803
<i>Tear-Away</i>			
Silver	13mm	100	98789
		1000	66416
	20mm	144	66501
		1440	98805
<i>Magnetic Tinplate</i>			
Silver	20mm	100	98532

Septa for Aluminum Seals

- Refer to the septum compatibility guide on page 349 to choose the septum best suited for your application



4756

Septa for Aluminum Seals

Description	Size	Qty.	Part No.
<i>White PTFE Septum—10mil</i>	11mm	100	98007
	13mm	100	98177
<i>PTFE/Silicone Septum—60mil</i>	11mm	100	98009
		1000	98019
	13mm	100	98791
		1000	95253
<i>PTFE/Silicone Septum—100mil</i>	13mm	100	98793
	20mm	72	95313
<i>PTFE/Silicone/PTFE Septum—40mil</i>	11mm	100	98010
		1000	98020
	13mm	100	98180
		1000	98182
<i>PTFE/Butyl Rubber Septum—40mil</i>	11mm	100	98398
		1000	98400
	13mm	100	98173
		1000	98175
<i>Red Butyl Septum</i>	20mm	100	98695
<i>Red Silicone Septum</i>	20mm	72	98536
		1000	99108
<i>PTFE/Gray Butyl Septum</i>	20mm	72	98540
<i>Aluminum/Silicone Septum—60mil</i>	20mm	72	98665

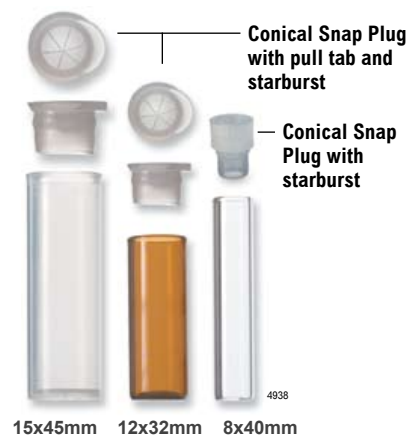
more info

For a complete listing of 20mm Aluminum Seals and Septa see page 365.

Shell Vials and Kits

Shell Vials with Polyethylene Conical Starburst[†] Snap Plug Style Closures

- Thicker glass walls for safer handling
- Special safety plug eliminates sore fingers when pressing plugs into shell vials



Limited Volume Vials



TITESEAL[®] Disposable Glass Shell Vials and Polyethylene Plug Style Closures

- Maximum temperature use of 80°C for stopper



Shell Vial Kits and Replacement Caps

Description	100/pk Part No.	1000/pk Part No.
<i>8x40mm (1mL) Kit Includes: Shell Vials, Clear Conical Snap Plugs</i>		
Clear Vials, 200/pk	88631**	98834
Amber Vials, 200/pk	88612**	98838
Polypropylene Vials, 200/pk	88626**	98224
<i>Limited Volume Shell Vials (use Conical Plugs, not supplied with vials)</i>		
700µL Polypropylene, 8x40mm	98990	98992
<i>8mm Replacement Polyethylene Conical Starburst Snap Plugs[†]</i>		
Clear Plug	98994	98996
Red Plug	99003	99013
Blue Plug	99005	99015
<i>12x32mm (2mL) Kit Includes: Shell Vials, Clear Conical Snap Plugs</i>		
Clear Vials	98840	98843
Amber Vials	98845	98847
Polypropylene Vials	98849	98851
Polypropylene Vials for Dionex	91450	91455
<i>12mm Replacement Polyethylene Conical Starburst Snap Plugs[†]</i>		
Clear Plug	98980	98989
Red Plug	99033	99053
Blue Plug	99035	99055
<i>15x45mm (4mL) Kit Includes: Shell Vials, Clear Conical Snap Plugs</i>		
Clear Vials	98853	98857
Amber Vials	98859	98863
Polypropylene Vials	98867	98869
<i>Limited Volume Shell Vials (use Conical Plugs, not supplied with vials)</i>		
15x45mm Polypropylene, 3mL	98972	98974
<i>15mm Replacement Polyethylene Conical Starburst Snap Plugs[†]</i>		
Clear Plug	98976	98978
Red Plug	99023	99043
Blue Plug	99025	99045
Green Plug	99027	99047
Yellow Plug	99029	99049
<i>Safety Plug for Inserting Plugs into Any Size Shell Vial</i>		
Multi-Plug Safety Sleeve, 5/pk	96431**	—

[†]With Starburst for easier needle penetration.
^{**}Correct quantity specified in description.

TITESEAL[®] Disposable Shell Vial Kits

Description	200/pk Part No.	1000/pk Part No.
<i>Unassembled Disposable Vial Kits</i>		
8x30mm (0.75mL), Clear Vials and Plugs	98824	73101
8x43mm (1mL), Clear Vials and Plugs	98578	73146
12x31mm (2mL), Clear Vials and Plugs	73112	98826
15x45mm (4mL), Clear Vials and Plugs	98828	73131
<i>Replacement Plugs for TITESEAL[®] Disposable Vials</i>		
Plugs for 8mm Vials, 500/pk	73108**	—
Plugs for 12mm Vials, 500/pk	73120**	—
Plugs for 15mm Vials, 500/pk	73139**	—

^{**}Correct quantity specified in description.

Polypropylene Vials for Ion Chromatography



Polypropylene vials eliminate interferences associated with glass surfaces.

tech tip

Polypropylene containers

Use of polypropylene containers is important to avoid the possibilities of interference from metallic ions that can be leached from glass containers under certain sampling conditions.

related products

Looking to further eliminate interferences in your samples for IC?

See our IC SPE devices on pages 304 and 310.

Polypropylene Vials and Caps

Description	100/pk Part No.	1000/pk Part No.
<i>12x32mm Standard Mouth Screw Thread Vials, 4mm i.d.</i>		
600µL Polypropylene Vial, 8/425 Thread, 500/pk	—	89073*
100µL Polypropylene Vial with 8/425 Thread	12962	12963
8/425 Black Cap with PTFE/Silicone Septum	98061	98066
<i>12x32mm Wide Mouth Screw Thread Vials, 6mm i.d.</i>		
Kit—Includes Polypropylene Vial (98099), Red 10/425 Cap and 10mil PTFE Septum	88538	—
750µL Polypropylene Vial with 10/425 Thread	98099	98211
500µL Polypropylene Vial with 10/425 Thread	98310	98314
10/425 Black Cap with PTFE/Butyl Septum	97274	97216
10/425 Black Cap with PTFE/Silicone Septum	98144	98152
<i>12x32mm Robotic LV Vials, 6mm i.d.</i>		
1.5mL Clear Polypropylene Vial	99098	99140
1.5mL Amber Polypropylene Vial	99109	99142
100µL Polypropylene R.A.M.™ Vial	90273	90271
9mm Blue R.A.M.™ Cap, PTFE/Silicone Septum	95360	95359
<i>12x32mm Crimp Style Vials, use 11mm Seal</i>		
750µL Polypropylene Vial	98050	98215
600µL Polypropylene Vial, 500/pk	—	88363*
500µL Polypropylene Vial	98842	98844
300µL Polypropylene Vial	12990	12991
100µL Polypropylene Vial	12960	12961
11mm Aluminum Seal with PTFE/Butyl Septum	73070	73071
11mm Aluminum Seal with PTFE/Silicone Septum	98740	94867
11mm Poly Crimp Seal with PTFE/Butyl Septum	95232	95332
11mm Poly Crimp Seal with PTFE/Silicone Septum	95234	95334
<i>8x30 and 8x40mm Shell Vials</i>		
8x30mm Shell Vial, 900µL	99184	99192
8x30mm Limited Volume Vial, 500µL	99178	99182
8x40mm Polypropylene Shell Vial, 1mL	88625	98827
8mm Polyethylene Starburst Snap Plug	88613	98865
700µL LVI Polypropylene vial	98990	98992
8mm Polyethylene Conical Plug	98994	98996
<i>15x45mm Vials</i>		
2.5mL Polypropylene Vial, 13/425 Thread	98091	98491
1.2mL Polypropylene Vial, 13/425 Thread	70149	70198
13/425 Black Cap with PTFE/Silicone Septum	98610	98612
3mL Polypropylene LVI Shell Vial	98972	98974
13mm Clear Conical Plug	98976	98978
2.5mL Crimp Style	98054	98254
13mm Snap TOP Cap, PTFE/Silicone Septum	98044	98244

*Actual quantity listed in description.

For Polypropylene Limited Volume Inserts see:

more info

For 4mm i.d. Standard Mouth Vials, see page 361.

more info

For 6mm i.d. Wide Mouth Vials, see page 361.

more info

For 8x40mm Shell Vials, see page 354.

more info

For 15x45mm Vials, see page 362.



Limited volume inserts provide greater access to small sample volumes.

Finneran Versa-Vials™

- Secure seal for sample integrity
- Vase-like neck allows pick up with autosampler's robotic arm
- Selection of closures improves sample compatibility

Easy use of pipet tips with 9.5mm i.d. opening.



6461



6461

Soft press-in plugs eliminate breakage when capping.



6460

A new generation of 12x32mm shell vials to upgrade and automate your shell vial sampling.

Versa-Vials™ and Plug Closures

Description	100/pk Part No.	1000/pk Part No.
<i>Versa-Vials™, 12x32mm, 1.8mm</i>		
Clear Glass	99063	99163
Amber Glass	99064	99164
Clear Glass with Marking Spot	99066	99166
Amber Glass with Marking Spot	99067	99167
<i>Limited Volume Inserts with Flanged Top</i>		
250µL Glass, LVI	99095	99195
250µL Polypropylene LVI	99089	99191
350µL Polypropylene Flat Bottom	99183	99189
<i>Plug Closures</i>		
PTFE/Silicone Plug with Slit*	99080	99082
PTFE/Silicone Plug	99085	99087
PTFE/Gray Chlorobutyl Plug	99090	99092
Polyethylene Plug with Conical Starburst	99094	99096

*Prevents bent needles.

Tubes and Vials for Robotics

Tubes and Vials for Robotics

Description	Qty.	Part No.	Qty.	Part No.
<i>Culture Tubes, Borosilicate Glass</i>				
10x75mm Tubes, 5mL	250	98829	1000	98590
12x75mm Tubes, 6mL	250	98585	1000	98587
13x100mm Tubes, 10mL	250	98589	1000	98591
16x100mm Tubes, 15mL	250	98593	1000	98595
20x150mm Tubes, 23mL	125	98597	500	98599
25x150mm Tubes, 60mL	125	98601	500	98603
<i>Glass Autosampler Vials, Caps Sold Separately</i>				
12x32mm Clear, Crimp Top, 11mm	100	66002	1000	66003
12x32mm Amber, Crimp Top, 11mm	100	95221	1000	95222
15x45mm Clear, 13/425 Screw Thread	100	98110	1000	98207
15x45mm Amber, 13/425 Screw Thread	100	98120	1000	98484
<i>Scintillation Vials (Supplied with White Urea Caps with Cork Foil Liners)</i>				
20mL Glass Scintillation Vials, 28x57	100	98613	500	98615
20mL Polyethylene Scintillation Vials	100	98617	500	98619



0522

more info

See also R.A.M.™ Vial page 355.

Mini-Vials, Maxi-Vials, and Accessories

Mini-Vials and Maxi-Vials

- Heavy wall, clear borosilicate glass
- Tapered cone for maximum recovery
- Mini-vial starter kit contains 2 each of the 0.3, 1.0, 3.0 and 5.0mL clear vials



Mini-Vials and Accessories

Description	Qty.	Part No.
<i>Clear Mini-Vials and Maxi-Vials (Supplied with Screw Caps)</i>		
0.1mL Mini-Vials, 13/425	12	95001
0.3mL Mini-Vials, 13/425	12	95003
1.0mL Mini-Vials, 13/425	12	95010
2.0mL Mini-Vials, 20/400	12	95020
3.0mL Mini-Vials, 20/400	12	95030
5.0mL Mini-Vials, 20/400	12	95050
10.0mL Maxi-Vials, 20/400	12	95100
<i>Mini-Vial Starter Kit</i>		
2 ea of 0.3, 1.0, 3.0 & 5.0mL Clear Vials	ea	9511
<i>Caps</i>		
13/425 Replacement Phenolic Caps	48	95090
20/400 Replacement Phenolic Caps	48	95053

Crimp Top Micro-Reaction Vials

- Reusable, crimp-top mini-vial
- Use 20mm aluminum seals
- Cone-shaped interior for sample retrieval



Crimp Top Micro-Reaction Vials

Description	Qty.	Part No.
0.3mL Vials, 20mm Septa and Seals	5	9494
1.0mL Vials, 20mm Septa and Seals	5	9495
5.0mL Vials, 20mm Septa and Seals	5	9498
20mm Standard Aluminum Seals	144	66440
20mm Tear-Away Seals	144	66501
Liners for 20mm Micro-Reaction Vials	12	9493

Microflasks

- Ideal for extraction of trihalomethanes (EPA Method 501.2)
- Use screw-caps or 20mm Mininert® valves
- Do not autoclave



Microflasks

Description	Qty.	Part No.
10mL Microflask	12	9551
25mL Microflask	12	9553
Open-Hole Screw Caps, 20/400	72	95301
PTFE/Silicone Septa for Screw Caps	72	95302
PTFE/Silicone Septa, 10/90 for Caps	72	95303

Mininert® Valves

- PTFE is only sample contact
- Replace septum without exposing sample
- Maximum pressure = 120psig
- Use 20–26 gauge needles
- Do not autoclave



Mininert® Valves and Accessories

Description	Qty.	Part No.
<i>Mininert® Valves</i>		
13mm Mininert® Valve for 13/425 Neck	ea	9544
	12	95246
15mm Mininert® Valve for 15/425 Neck	12	95266
18mm Mininert® Valve for 18/400 Neck	12	95286
20mm Mininert® Valve for 20/400 Neck	ea	9546
	12	95306
24mm Mininert® Valve for 24/400 Neck	12	95326
<i>Other Mininert® Valves</i>		
20mm Crimp Top Mininert® Valve	12	66806
Standard Taper Valve, 14/20	ea	621102
Standard Taper Valve, 19/22	ea	621103
1/4-28 Male to Mininert®	ea	631201
1/4-28 Female to Mininert®	ea	631203
1/4-28 Male to 1/4-28 Male	ea	631205
1/4-28 Female to 1/4-28 Female	ea	631206
1/8" Male NPT to Mininert®	ea	631202
1/8" Female NPT to Mininert®	ea	631204
<i>Mininert® Accessories</i>		
Mininert® Septum Inserter	ea	644850
Replacement Mininert® Septa	12	9548
	50	644350

Magnetic Stirring Bars

- PTFE-coated, octagonals with a molded pivot ring



Magnetic Stirring Bars for Vials

Description	Qty.	Part No.
Spin Vanes, for 0.3–1mL Mini-Vials	6	903061
Spin Vanes, for 2–10mL Mini-Vials	6	903063
Stirring Bars, 1.5x8mm	6	9670
Stirring Bars, 3x12.7mm	6	9672
Stirring Bars, 8x16mm	6	9674
Stirring Bars, 8x25.4mm	6	9676
Stirring Bars, 9.5x38mm	6	9678
Stirring Bars, 9.5x51mm	6	9680
PTFE Coated Stirring Retriever*, 9.5x300mm	ea	9682

*Polyethylene.

EPA Sample Containers

Variety of storage bottle sizes and styles in glass or polyethylene. Available unwashed or cleaned to meet requirements for VOA analyses



related products

Working on an EPA method? Refer to pages 232–234 for our Guide to Capillary Columns for Environmental Analysis.



EPA Sample Containers

Volume, Description, Neck Finish (Cap Size)	Dimensions Ht x Dia	Qty.	Unwashed Part No.	Washed Part No.
<i>Septa Bottles— Supplied with Open Top Poly Caps with PTFE/Silicone Septa</i>				
8oz (250mL), Amber Septa Bottle, 24/414	5-11/16" x 2-3/8"	12	89159	89158
4oz (125mL), Clear Tall Septa Jar, 48/400	4" x 1-7/8"	24	89099	89079
<i>Wide Mouth Glass Jars— Supplied with Poly Caps with PTFE Septa</i>				
4oz (125mL), Clear Tall Glass Jar, 48/400	4" x 1-7/8"	24	89198	89169
4oz (125mL), Clear Short Glass Jar, 58/400	2-1/8" x 2-3/8"	24	89309	89308
4oz (125mL), Amber Glass Jar, 38/400	3-13/16" x 2"	24	89332	89320
8oz (250mL), Clear Short Glass Jar, 70/400	3-3/8" x 2-7/8"	24	89168	89167
8oz (250mL), Amber Glass Jar, 45/400	4-3/4" x 2-1/2"	24	89359	89351
16oz (500mL), Clear Short Glass Jar, 89/400	3-3/4" x 3-1/2"	12	89356	89352
16oz (500mL), Amber Glass Jar, 53/400	5-7/8" x 3-1/8"	12	89360	89353
32oz (1.0L), Clear Tall Glass Jar, 89/400	6-1/2" x 3-5/8"	12	89367	89354
32oz (.95L), Amber Glass Jar, 53/400	6-1/2" x 3-5/8"	12	89368	89355
<i>High Density Polyethylene (HDPE) Cylinders— With Poly Caps and Polyfoam Septa</i>				
8oz (250mL), HDPE Round Cylinder, 24/410	6-1/8" x 2"	24	89372	89369
16oz (500mL), HDPE Round Cylinder, 28/410	7-3/8" x 2-1/2"	24	89373	89370
32oz (1.0L), HDPE Round Cylinder, 28/410	9-3/8" x 3"	12	89374	89371

technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)
Email: contact.alltech@grace.com
Online: www.discoverysciences.com

EPA Vials for Volatile Organic Analyses



6296

Cleaning Protocol B

1. Wash bottles, septa, and caps in laboratory grade, biodegradable, non-phosphate detergent.
2. Rinse three times with tap water.
3. Rinse three times with ASTM Type one deionized water.
4. Oven dry.
5. Assemble in organic-free environment.

tech tip

Advantages of TOP Hat Closure

- Molded TOP* Hat PTFE/Silicone septum locks into its unique cap opening
- Prevents septa falling out of caps
- Available for washed or unwashed vials in all sizes

Cross-Section Cap and Septum



TOP Hat Septum locks securely into the black cap.

125 mil Septum

*Time Oriented Products.

- Available washed* or unwashed in 20, 40, and 60mL vial sizes and in 12x32 and 15x45mm autosampler vial sizes
- Washed* EPA vials are supplied with a certificate of analysis—equivalent to I-CHEM™ Series 3
- Washed vials are recommended for the analysis of volatile organics
- All vials are borosilicate glass
- Three septum choices for maximum versatility—0.125" for EPA/VOA Samples, 0.125" TOP Hat Septum Locks Securely Into Cap, 0.06" for autosampler use (purchase separately)
- All are supplied as kits with vial and cap specified

*Washed to Protocol B specifications.

EPA/VOA Vial Kits

Description	Qty.	Unwashed Part No.	Qty.	Washed Part No.
<i>20mL Vials</i>				
Clear Vials, White Caps, PTFE/Silicone Septa	72	89515	72	89517
Amber Vials, White Caps, PTFE/Silicone Septa	72	89516	72	89518
Clear Vials, Solid White Cap, PTFE Septum	—	—	72	89325
Clear Vials, Black Caps, 0.125" TOP Hat PTFE/Silicone Septa*	72	98641	72	98643
<i>40mL Vials</i>				
Clear Vials, White Caps, PTFE/Silicone Septa	72	89525	72	89527
Amber Vials, White Caps, PTFE/Silicone Septa	72	89526	72	89528
Clear Vials, Solid White Cap PTFE Septum	—	—	72	89326
Amber Vials, Solid White Cap, PTFE Septum	—	—	72	89199
Clear Vials, Black Caps, TOP Hat PTFE/Silicone Septa*	72	98649	72	98651
<i>60mL Vials</i>				
Clear Vials, White Caps, PTFE/Silicone Septa	72	89535	72	89537
Clear Vials, Solid White Caps with PTFE Septa	—	—	24	89327
Clear Vials, Black Caps, TOP Hat PTFE/Silicone Septa*, 24/pk	24	98657	24	98659
<i>12x32mm (2mL) Vials with Cap and Septum</i>				
Clear Screw thread (8/425) Vial, Cap with PTFE/Silicone/TOP Hat Septum	100	98625	100	98627
<i>15x45mm (2mL) Vials with Cap and Septum</i>				
Clear Screw thread (13/425) Vial, Cap with PTFE/Silicone/TOP Hat Septum	100	98633	100	98635
<i>24/414 Replacement Caps with Septa for EPA Vials, Unwashed</i>				
White Caps with 0.060" PTFE/Silicone Septa	100	89519	—	—
White Caps with 0.060" PTFE/Silicone Septa	1000	89520	—	—
Black Caps, TOP Hat PTFE/Silicone Septa*	100	98085	—	—
Black Caps, TOP Hat PTFE/Silicone Septa*	1000	98079	—	—
White Cap Only	100	89226	—	—
0.125" Septum for EPA Vials	100	89277	—	—

*Patented TOP Hat Closure with 125mil septum meets EPA Requirements.

I-CHEM™ Vials

- 20, 40, and 60mL I-CHEM vials for EPA volatile organic analyses
- All vials are borosilicate glass
- Choice of closure/liner for maximum versatility—0.06 for autosampler use, 0.125 for EPA/VOA samples



4943

I-CHEM™ Sample Containers

Septa Bottles and Jars

- For analysis of volatile organics



4944

Wide Mouth Glass Jars

- For semi-volatile, PCBs/pesticide, metals, and cyanide analysis



4945

Polyethylene (HDPE) Round Cylinders

- For metals and cyanide analysis



5318

I-Chem™ EPA/VOA Vials—Series 2**

Description	Qty.	Part No.
<i>Processed* I-CHEM™ Vials, Assembled with Caps and Septa</i>		
20mL Vials, Processed		
Clear Vials, 24/414 Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	98702
Clear Vials, 24/414 Solid Caps, PTFE Septum	72	98704
40mL Vials, Processed		
Clear Vials, 24/414 Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	98706
Amber Vials, 24/414 Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	98708
Clear Vials, 24/414 Open-Hole Caps, 0.060" PTFE/Silicone Septum	72	98710
Amber Vials, 24/414 Open-Hole Caps, 0.060" PTFE/Silicone Septum	72	98712
Clear Vials, 24/414 Solid Caps, PTFE Septum	72	98714
Amber Vials, 24/414 Solid Caps, PTFE Septum	72	98716
60mL Vials, Processed		
Clear Vials, 24/414 Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	97022
Amber Vials, 24/414 Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	97024
<i>Unwashed I-CHEM™ Vials, Assembled with Caps and Septa</i>		
20mL Vials, Unwashed		
Clear Vials, Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	98682
Clear Vials, 24/414 Solid Caps, PTFE Septum	72	98684
40mL Vials, Unwashed		
Clear Vials, Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	98686
Amber Vials, Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	98688
Clear Vials, Open-Hole Caps, 0.060" PTFE/Silicone Septum	72	98690
Amber Vials, Open-Hole Caps, 0.060" PTFE/Silicone Septum	72	98692
Clear Vials, 24/414 Solid Caps, PTFE Septum	72	98694
Amber Vials, 24/414 Solid Caps, PTFE Septum	72	98696
60mL Vials, Unwashed		
Clear Vials, Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	97012
Amber Vials, Open-Hole Caps, 0.125" PTFE/Silicone Septum	72	97014

*Processed vials are recommended for use in analysis of volatile organics.

**Certificate of analysis is available by lot number. Request after purchase.

Replacement Caps and Septa for I-CHEM™ Vials

Description	Qty.	Part No.
Caps Only, 24/414, Open Top without Septum	24	92414
Septa Only, 0.125" PTFE/Silicone	24	92416

I-CHEM™ Sample Containers

Volume	Description	Neck Finish (Cap Size)	Dimensions Ht x Dia	Qty.	Part No.
<i>Septa Bottles— Supplied with Open Top Poly Caps with PTFE/Silicone Septa</i>					
8oz (250mL)	Amber Septa Bottle	24/414	5-11/16" x 2-3/8"	12	98720
4oz (125mL)	Clear Tall Septa Jar	48/400	4" x 1-7/8"	12	98722
<i>Wide Mouth Glass Jars— Supplied with Poly Caps with PTFE Septa</i>					
4oz (125mL)	Clear Tall Glass Jar	48/400	4" x 1-7/8"	12	98718
4oz (125mL)	Clear Short Glass Jar	58/400	2-1/8" x 2-3/8"	24	98732
4oz (125mL)	Amber Glass Jar	38/400	3-13/16" x 2"	12	98734
8oz (250mL)	Clear Tall Glass Jar	58/400	4-13/16" x 2-1/4"	12	98698
8oz (250mL)	Clear Short Glass Jar	70/400	3-3/8" x 2-7/8"	12	98576
8oz (250mL)	Amber Glass Jar	45/400	4-3/4" x 2-1/2"	12	98700
16oz (500mL)	Clear Short Glass Jar	89/400	3-3/4" x 3-1/2"	12	98736
16oz (500mL)	Amber Glass Jar	53/400	5-7/8" x 3-1/8"	12	98738
32oz (1.0L)	Clear Tall Glass Jar	89/400	6-1/2" x 3-5/8"	12	98399
32oz (.95L)	Amber Glass Jar	53/400	6-1/2" x 3-5/8"	12	98730
<i>High Density Polyethylene (HDPE) Cylinders—with Poly Caps and Polyfoam Septa</i>					
8oz (250mL)	HDPE Round Cylinder	24/410	6-1/8" x 2"	24	98724
16oz (500mL)	HDPE Round Cylinder	28/410	7-3/8" x 2-1/2"	24	98726
32oz (1.0L)	HDPE Round Cylinder	28/410	9-3/8" x 3"	12	98728

96-Well Products

Glass Inserts for 96-Well Plates

for Waters® Alliance® HT System* Ritter Style Plate

- Push-point tip design allows sample access to 10µL
- Snug fit allows use with shakers and vortexers
- Use molded covers or 8mm snap plugs for inserts
- Ideal solution for reactive chemistry applications



Glass inserts eliminate chemical resistance problems associated with polypropylene 96-well plates for chromatography analysis.

Components for 96-Well Ritter Style System

Description	Qty.	Part No.
<i>Borosilicate Glass Inserts for Square Well Plates</i>		
0.7mL Glass Tapered Insert	100	91501
1.0mL Glass Tapered Insert, Flat Tip	100	91508
<i>Covers for 1mL Inserts in Plate, Molded Round Well</i>		
PTFE/Blue Silicone	5	91496
<i>Convenience Kits: Plate with Inserts Inserted</i>		
Plate with 0.7mL Insert	1	91497
Plate with 1.0mL Insert	1	91505
Plate with 1mL Flat Tip Insert	1	91509

*Ritter style plate designed for use in Waters® Alliance® HT (2790/2795) system. Inserts also work in equivalent deep well 2mL plates.

96-Well µLPLATES and Inserts

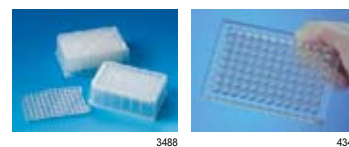
- In Polypropylene or PTFE
- Piercible non-coring covers
- Choice of shallow, medium, or deep wells
- Chimney well design prevents sample crossover

Components for µLPlate System

Description	Qty.	Part No.
<i>Microliter 96-Well Plates</i>		
Deep-Well Plates, Polypropylene		
2.0mL, Square Well, V-Bottom Plates	1	70098
Shallow and Medium-Well Plates, Polypropylene		
500µL, Medium, Round Well, Round Bottom Plates	1	70089
Shallow-Well Plates, PTFE		
450µL, Round Well, Round Bottom Plates	1	70208
<i>Borosilicate Glass Inserts for µLPLATES</i>		
<i>For Medium Well Plates*</i>		
350µL Inserts for 12x32mm Vials	100	70048
350µL Silanized Inserts for 12x32mm Vials	100	70063

*Use 350µL insert to transfer directly from 96-well plate to 12x32mm robotic autosampler vials.

96-Deep Well Microplates and Cover Mats



- Standard 8x12 format
- Borosilicate glass plates
- Polypropylene square or round wells

Microplates and Accessories

Description, Well Capacity, Well Volume	Qty.	Part No.
<i>All-Glass 96-Well, Class A Borosilicate Plates</i>		
Glass, Flat Bottom, 500µL	1	91504
<i>96-Well Square Deep Microplates and Caps</i>		
Polypropylene, Square Deep Well, 2mL	100	80910

Bio-Tech Sealing Systems

Molded Liners for Round or Square 96-Well Plates

- Superior resealability, resists coring and tearing
- Tight seal prevents cross contamination and sample evaporation
- Autoclavable and excellent chemical compatibility
- Now available in clear pre-slit design



Molded Liners for 96-Well Plates

Description	Qty.	Part No.
<i>Gray PTFE-Lined Silicone</i>		
Round well	5	91458
Square well	5	91464
<i>Clear PTFE-Lined Silicone</i>		
Round well	5	8619141
Round well, Pre-slit	5	8619145
Square well	5	8619142
Square well, Pre-slit	5	8619146

Sealing Films for Round or Square Well Plates

- Superior quality films with uniform, consistently applied adhesive
- Adheres to polypropylene, polystyrene, or polycarbonate plates
- Choices offer temperature and chemical resistance
- Fits all 96-well, 384-well, and 1536-well plates



Sealing Films for 96-Well Plates

Description	Qty.	Part No.
<i>Blue PTFE Film, Adhesive-Free Over 96-Well Area</i>		
5mil Thickness	100	91490
<i>SealPlate for ELISA, EIA, and Similar Assays</i>		
2mil Polyester Film, Non-pierce	100	91487
<i>Aluminum Foil Film for Light Sensitive Samples</i>		
Pierceable, for Robotics	100	91488

Racks and Storage Containers

Polypropylene Vial Storage Racks

- Choice of sizes to fit 8 to 28mm o.d. vials
- Autoclavable
- Stackable



Polypropylene Vial Storage Racks

Fits Vial Diameter	Holds (#Vials)	Description	Qty.	Part No.
8mm	96	185mm x 127mm x 33mm	ea	94838
8mm	96	185mm x 127mm x 33mm	5	94839
12mm	50	194mm x 100mm x 23mm	ea	94874
12mm	50	194mm x 100mm x 23mm	5	94875
15mm	48	270mm x 97mm x 30mm	ea	94877
15mm	48	270mm x 97mm x 30mm	5	94878
15mm	90	327mm x 172mm x 30mm	ea	94879
15mm	90	327mm x 172mm x 30mm	5	94880
28mm	50	325mm x 171mm x 30mm/EPA	ea	94881
28mm	50	325mm x 171mm x 30mm/EPA	5	94882

Polypropylene Rack with Handle

- Stackable—empty or full
- Autoclavable



Polypropylene with Handle

Fits Vial Diameter	Holds (#Vials)	Description	Qty.	Part No.
10–33	72	9-3/8" x 4-3/8" x 3-1/2"	ea	2035
13–16	40	10" x 4-3/8" x 3-1/2"	ea	2037
16–20	40	10" x 4-3/8" x 3-1/2"	ea	2039
21–25	40	10-5/8" x 5" x 5"	ea	2041
26–30	24	11-3/4" x 5" x 3-3/4"	ea	2043

Metal Storage Cabinet

- 9-drawer metal cabinet provides clean organized vial storage
- Dimensions: 11" H x 17" W x 11" D (28cm H x 43cm W x 28cm D)



metal storage cabinet

Description	Qty.	Part No.
9-Drawer Metal Storage Cabinet	ea	98934

Ampul-store

- Eliminates need to relabel or transfer open 2mL ampule contents
- Minimizes sample odors in the lab

To use: Break off the ampule top. Place the ampule in the Ampul-store and attach cap. Inject through the open top screw cap/stopper to remove sample.



Ampul-store

Description	Qty.	Part No.
2mL Silanized Amber Ampules	36	72690
Ampul-store for 2mL Ampules	5	98932

The Ampule Cracker

Slip the Ampule Cracker over the top at the prescored position, snap it, and discard both the ampule top and the safety collar to prevent contamination.



Ampule Cracker

Description	Qty.	Part No.
Ampule Cracker for 1–4mL Ampules	100	01111

Stretch-it—PTFE Sealing Tape

- Provides a chemically resistant cover for reactions in progress
- Eliminates deteriorated foil and paraffin film covers
- 108ft per roll



Stretch-it-PTFE Sealing Tape

Description	Qty.	Part No.
1/2" Wide	ea	3241
3/4" Wide	ea	3243
1" Wide	ea	3245
3" Wide	ea	3247
4" Wide	ea	3248
5" Wide	ea	3249

Plastic Storage Boxes

- Convenient accessible storage of small parts
- Available with 1, 9, or 18 compartments



Plastic Storage Boxes

Description	Qty.	Part No.
1 Compartment, 9" x 5" x 2"	ea	98928
9 Compartment, 8 of (1-3/8" x 1-5/8") 1 of (1-1/8" x 3-1/4")	ea	6264
18 Compartment, 12 of (2" x 2") 6 of (2" x 4-3/16")	ea	6266

Racks and Storage Containers

The Polypropylene Snap Rack™

- Stores vials and caps together
- Stackable



4955

Polypropylene Snap Rack™

Description	Qty.	Part No.
8mm Snap Rack™ Tray, Holds 96 Vials	ea	95076
12mm Snap Rack™ Tray, Holds 50 Vials	ea	95086

VialTainer Storage Box

- Clear polystyrene box
- Designed for use with autosampler vials



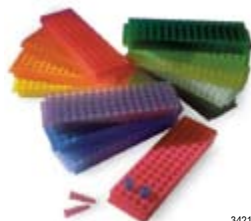
3428

VialTainer Storage Box

Fits Vial Diameter	Holds (#Vials)	Description	Qty.	Part No.
12mm	72	Small, 189x94x62mm	4	2049
15mm	40	Large, 189x94x62mm	4	2051

Freezer Racks

- Hold 80 microcentrifuge tubes
- Autoclavable
- Polypropylene racks



3421

Freezer Racks

Description	Qty.	Part No.
Racks, 1 of ea: Red, Blue, Orange, Green, Yellow	5	7363

Floating Racks

- Polyfoam racks hold multiple tube sizes
- Ideal for water baths



3413

Floating Racks

Description	Qty.	Part No.
Small, Hold 0.5 or 0.25mL Tubes	3	7320
Medium, Hold 0.5 and 1.5mL Tubes	3	7322
Large, Hold 15 and 50mL Tubes	3	7324
Assorted, 1 each of Small, Medium, and Large	3	7318

Polypropylene Gridded Boxes in Neon Colors

- Hold either 50 or 100 12x32mm vials
- Available in blue, green, orange, pink, yellow, and clear for colorful storage and identification



3697

Specifications

Raised Edges Provide Non-Slip, Stackable Storage with Writing Panel on Lid Front for i.d.

Alpha-Numeric Code on Grids for Easy Sample i.d.

Hinged Lid with Secure Snap Clasp

Rated to -90°C, Ideal for Freezer or Room Storage

Dimensions: 100 Grid—2.1" H x 6.0" W x 5.5" L
(53mm H x 152mm W x 140mm L)
50 Grid—2.1" H x 3" W x 5.5" L
(53mm H x 76mm W x 140mm L)

Neon Storage Boxes

Fits Vial Diameter	Holds (#Vials)	Description	Qty.	Part No.
<i>To Hold 100 Vials</i>				
12mm	100	Clear	5	95129
12mm	100	Blue Neon	5	95131
12mm	100	Green Neon	5	95132
12mm	100	Orange Neon	5	95133
12mm	100	Pink Neon	5	95134
12mm	100	Yellow Neon	5	95135
12mm	100	Assorted, 1 of ea/5 Colors	5	95005
<i>To Hold 50 Vials</i>				
12mm	50	Clear	5	95029
12mm	50	Blue Neon	5	95106
12mm	50	Green Neon	5	95027
12mm	50	Orange Neon	5	95028
12mm	50	Pink Neon	5	95089
12mm	50	Yellow Neon	5	95108
12mm	50	Assorted, 1 of ea/5 Colors	5	95008

Multi-Use Vial Rack System

- Increased spacing around vials for easy sample access
- PETG trays snap easily into the polypropylene frame
- Holder and trays sold separately



4954

Multi-Use Vial Rack System

Fits Vial Diameter	Holds (#Vials)	Description	Qty.	Part No.
—	—	Universal Tray Holders	5	98600
5mm	25	Insert Trays, 98x105mm	5	98671
7mm	25	Insert Trays, 98x105mm	5	98673
8mm	25	Insert Trays, 98x105mm	5	98675
12mm	25	Insert Trays, 98x105mm	5	98677
15mm	25	Insert Trays, 98x105mm	5	98679

Sampling Handling Accessories

Block Heaters

- Use to control reaction temperatures
- Use solid block as hot plate or drill to fit vials

The block heater has separate high and low thermostats and has an on-off switch and pilot light. The low setting is for ambient to 60°C, while the high setting covers the 50 to 130°C range. The heater measures 3" H x 5" W x 8" L (7.6cm H x 12.7cm W x 20.3cm L).

All of the blocks listed are 2" H x 2-15/16" W x 3-3/4" L (5.1cm H x 7.5cm W x 9.5cm L) and are interchangeable. Wells are 1.75" (44cm) deep with rounded bottoms.



4961

Block Heaters

Description	Qty.	Part No.
Temp-Block*, 110V	ea	9707
Temp-Block*, 220V	ea	97071
Heating Block, 20x13.5mm Holes	ea	9708
Heating Block, 12x17.5mm Holes	ea	9709
Heating Block, 8x20.5mm Holes	ea	9710
Heating Block, 6x25.4mm Holes	ea	9711
Heating Block, Solid	ea	9711S
Thermometer, -20 to 150°C	ea	9711T

*Order Temp-block and Heating Blocks separately.

related products

Looking for gas sampling bags and other gas sampling accessories? See pages 276–279.



6647



4664

technical assistance

Contact Tech Support: Phone: 1.800.255.8324 (North America)
Email: contact.alltech@grace.com
Online: www.discoverysciences.com

Vacuum Bottles with Septum Ports

- Prepare gaseous calibration blends
- Easy sampling with a syringe
- Measure volatiles in packaging materials
- Prepare coated packings
- Wide-mouth accessibility



4965

Vacuum Bottles with Septum Ports

Description	Qty.	Part No.
170cc, 2" Mouth, 2" Diameter, 5.5" Height	ea	8089
390cc, 2" Mouth, 2" Diameter, 6.5" Height	ea	8090
770cc, 3" Mouth, 3" Diameter, 10" Height	ea	8091
1350cc, 3" Mouth, 3" Diameter, 12" Height	ea	8092
2300cc, 3" Mouth, 3" Diameter, 9" Height	ea	8093

Replacement Parts for Vacuum Bottles

Septa, Red Silicone, 6mm o.d. x 8mm	12/pk	7000
Septa-Out (Removal Tool)	ea	6412
Replacement O-rings, 2"	ea	8087
Replacement O-rings, 3"	ea	8088

Diazomethane Generators

Diazomethane is used to methylate acidic compounds for analysis by gas chromatography. It offers the advantages of clean and quantitative reactions but it is highly toxic and explosive. Instructions for use are included with each unit.

Note: Always use appropriate safety precautions when handling and preparing diazomethane and its solutions.



4963

Diazomethane Generators

Description	Qty.	Part No.
Diazomethane Generators (Milli-Mole Size)	ea	9559
Replacement PTFE/Silicone Septa	72	95242

Crimpers and Decappers

Adjustable Hand Crimper

- Adjustable block corrects for differences in septum thicknesses

The Adjustable Crimper has an adjustable pressure block in the crimper head that allows crimping of liners with a thickness range of 0.25 to 3.0mm. The unit looks like the standard hand crimper but it is supplied with an allen wrench and special instructions for making adjustments.

Adjustable Crimper Instructions

The crimper has an adjustment feature which will allow it to be used with a variety of septa, discs, stoppers or lined caps. The user may adjust the stroke or movement for each application as needed.

Adjustment Method:

1. Hold crimper with jaws up, notice hex socket screw.
2. Insert hex wrench into screw socket.
3. For looser septa, turn screw clockwise 1/8" turn. For tighter septa, turn screw counter clockwise 1/8" turn.



Hand Crimper

- Permits minor handle pressure adjustments
- Works best for seals with 40–50mil liners



Hand Decapper

- Removes crimped seals from vials



Plier Decapper

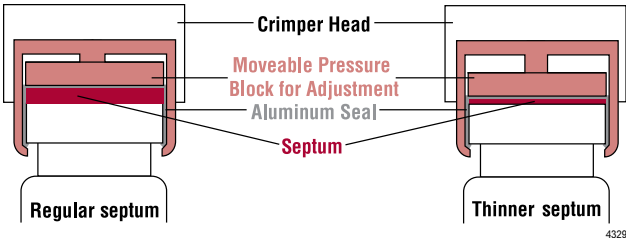
- Inexpensive tool to remove sealed caps



tech tip

What's special about the adjustable hand crimpers?

The new design has an adjustable pressure block that corrects for differences in septum thickness and provides a tighter seal. Crimping is accomplished by placing the crimper head over the aluminum seal and squeezing the handle.



Crimpers and Decappers

Volume	Description	Qty	Part No.
<i>Adjustable Hand Crimpers for Crimp Top Vials</i>			
11mm	Hand Crimper	ea	60041
13mm	Hand Crimper	ea	60043
20mm	Hand Crimper	ea	60045
<i>Hand Crimpers for Crimp Top Vials</i>			
8mm	Hand Crimper	ea	666008
11mm	Hand Crimper	ea	666011
13mm	Hand Crimper	ea	666013
20mm	Hand Crimper	ea	666020
<i>Hand Decappers for Crimp Top Vials</i>			
8mm	Hand Decapper	ea	98709
11mm	Hand Decapper	ea	98711
13mm	Hand Decapper	ea	98713
20mm	Hand Decapper	ea	98719
<i>Plier Decappers for Crimp Top Vials</i>			
8mm	Plier Decapper	ea	6662
11mm	Plier Decapper	ea	6660
13mm	Plier Decapper	ea	6661
20mm	Plier Decapper	ea	6663

Color-Coded PEEK Tubing

- Chemically inert and biocompatible
- High strength polymer replaces stainless steel
- Easy to cut with razor blade or tubing cutters

PEEK tubing is the ideal metal-free tubing. Its mechanical strength, chemical resistance, and biocompatibility make it appropriate for a wide variety of high pressure LC applications. Tubing is color-coded to indicate i.d.

PEEK Tubing Specifications	
Material:	PEEK
Maximum Temperature:	100°C
Maximum Pressure:	Varies by Size, See Price Block
Typical Use:	High-Pressure Plumbing



5535

Striped PEEK Tubing

- No dye contacts fluid path



0753A

Striped PEEK Tubing

Color	o.d.	i.d.	Maximum Pressure (psig)	Length	Striped Part No.
Red	1/16"	0.005"	7,000	10' (3.05m)	35714
				50' (15.25m)	35715
Yellow	1/16"	0.007"	7,000	10' (3.05m)	35712
				50' (15.25m)	35713
Blue	1/16"	0.010"	5,000	10' (3.05m)	35702
				50' (15.25m)	35703
Orange	1/16"	0.020"	5,000	10' (3.05m)	35708
				50' (15.25m)	35709
Green	1/16"	0.030"	4,000	10' (3.05m)	35710
				50' (15.25m)	35711
Grey	1/16"	0.040"	3,000	10' (3.05m)	35705
				50' (15.25m)	35707
Black	1/16"	0.055"	1,000	10' (3.05m)	35741
				50' (15.25m)	35742

Solid Color PEEK Tubing

- Entire tube is colored for faster identification



0753B

Solid Color PEEK Tubing

Color	o.d.	i.d.	Maximum Pressure (psig)	Length	Solid Part No.
Red	1/16"	0.005"	7,000	10' (3.05m)	35720
				50' (15.25m)	35721
Yellow	1/16"	0.007"	7,000	10' (3.05m)	35722
				50' (15.25m)	35723
Blue	1/16"	0.010"	5,000	10' (3.05m)	35728
				50' (15.25m)	35729
Orange	1/16"	0.020"	5,000	10' (3.05m)	35726
				50' (15.25m)	35727
Green	1/16"	0.030"	4,000	10' (3.05m)	35724
				50' (15.25m)	35725
Natural	0.071"	0.030"	4,000	10' (3.05m)	35776
				50' (15.25m)	35778
	1/8"	0.062"	5,000	10' (3.05m)	35716
				50' (15.25m)	35717
	1/8"	0.080"	3,000	10' (3.05m)	35718
				50' (15.25m)	35719



6673

related products

Need high-pressure polymeric fittings? See pages 112–114 for our full selection of high-pressure fittings.



5377

related products

See page 391 for the Clean-cut tubing cutter designed to make clean square cuts on PEEK tubing.

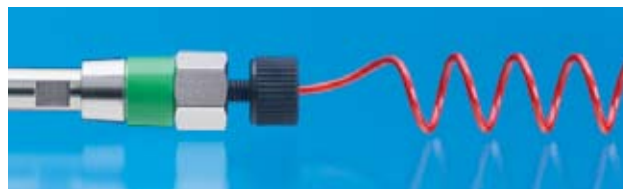
Flex-Connect™ PEEK Tubing

- Self-adjusting length
- Will not bend or kink
- PEEK construction is biocompatible and inert

Flex-Connect™ is ideal for modular LC systems, giving you the freedom to move components without breaking connections. The coiled format springs back to keep excess tubing out of your way. Each piece has 6" of straight tubing at each end and comes with two 1-piece Hex-Head Fittings. Tubing is color-coded to indicate i.d.



5527



Flex-Connect™ Tubing stretches to make connections easier.

6264

Custom Flex-Connect™ Tubing

Description	Part No.
Custom Flex-Connect™ Tubing*	C-35800

*Please specify the following when ordering: color coding (solid or striped), i.d. (0.005"–0.030"), and extended length (cm, 800cm max.).

Striped Flex-Connect™ Tubing

- No dye contacts fluid path



0753A

Striped Flex-Connect™ PEEK Tubing

Color	o.d.	i.d.	Max. Pressure (psig)	Size Range*	Striped Part No.
	1/16"	0.005"	7,000	1–5cm	35851
				2–10cm	35852
				3–15cm	35853
				5–25cm	35854
				10–50cm	35855
				15–75cm	35856
	1/16"	0.007"	7,000	1–5cm	35861
				2–10cm	35862
				3–15cm	35863
				5–25cm	35864
				10–50cm	35865
				15–75cm	35866
	1/16"	0.010"	5,000	1–5cm	35871
				2–10cm	35872
				3–15cm	35873
				5–25cm	35874
				10–50cm	35875
				15–75cm	35876
	1/16"	0.020"	4,000	1–5cm	35881
				2–10cm	35882
				3–15cm	35883
				5–25cm	35884
				10–50cm	35885
				15–75cm	35886
	1/16"	0.030"	4,000	1–5cm	35891
				2–10cm	35892
				3–15cm	35893
				5–25cm	35894
				10–50cm	35895
				15–75cm	35896

*Size range indicates where coil is completely retracted and pulled to a comfortable distance. Excludes 6" straight piece on each end.

Solid Color Flex-Connect™ Tubing

- Entire tube is colored for fast identification



0753B

Solid Color Flex-Connect™ PEEK Tubing

Color	o.d.	i.d.	Max. Pressure (psig)	Size Range*	Solid Part No.
	1/16"	0.005"	7,000	1–5cm	35801
				2–10cm	35802
				3–15cm	35803
				5–25cm	35804
				10–50cm	35805
				15–75cm	35806
	1/16"	0.007"	7,000	1–5cm	35811
				2–10cm	35812
				3–15cm	35813
				5–25cm	35814
				10–50cm	35815
				15–75cm	35816
	1/16"	0.010"	5,000	1–5cm	35821
				2–10cm	35822
				3–15cm	35823
				5–25cm	35824
				10–50cm	35825
				15–75cm	35826
	1/16"	0.020"	4,000	1–5cm	35831
				2–10cm	35832
				3–15cm	35833
				5–25cm	35834
				10–50cm	35835
				15–75cm	35836
	1/16"	0.030"	4,000	1–5cm	35841
				2–10cm	35842
				3–15cm	35843
				5–25cm	35844
				10–50cm	35845
				15–75cm	35846
	1/8"	0.062"	2,500	5–50cm	35807
				10–100cm	35808
				20–200cm	35809
				5–50cm	35827
				10–100cm	35828
				20–200cm	35829

*Size range indicates where coil is completely retracted and pulled to a comfortable distance. Excludes 6" straight piece on each end.

Stainless Steel Tubing

Hi-EFF™ Tubing

Hi-EFF™ grade stainless steel tubing is especially tempered for easy bending and is washed with acetone to remove any residual materials. Type 316 is recommended for plumbing LC systems.

Stainless Steel Tubing

This Stainless Steel Tubing is the same high quality as the Hi-EFF™ grade, but has not been washed with acetone. Type 316 is recommended for LC use.



related product
Looking for tubing cutters?
Refer to page 391.

Hi-EFF™ and Standard Stainless Steel Tubing Specifications

Material:	300 Series Stainless Steel
Maximum Temperature:	500°C
Maximum Pressure:	Varies according to i.d.
Typical Use:	High-Pressure Plumbing

Stainless Steel Tubing

		o.d.	i.d.	10ft (3m)* Part No.	25ft (7.5m)* Part No.	50ft (15m)* Coil Part No.	200ft Coil Part No.
Hi-EFF™	Type 316 Stainless Steel	1/8" (3.18mm)	0.085" (2.16mm)	5141338	5141342	30109	—
		1/4" (6.35mm)	0.210" (5.33mm)	5141337	5141343	30309	—
	Type 304 Stainless Steel	1/8" (3.18mm)	0.085" (2.16mm)	5141336	5141344	30106	—
		1/4" (6.35mm)	0.210" (5.33mm)	5141335	5141345	30306	—
Standard	Type 316 Stainless Steel	1/32" (0.79mm)	0.007" (0.18mm)	5141387	5141320	81951	—
		1/16" (1.59mm)	0.004" (0.10mm)	5141386	5141321	30212	—
			0.007" (0.18mm)	5141385	5141322	30142	—
			0.010" (0.25mm)	5141384	5141323	3005	30052
			0.020" (0.51mm)	5141383	5141324	3002	300220
			0.030" (0.76mm)	5141382	5141325	3000	300020
			0.040" (1.02mm)	5141381	5141326	3003	—
			0.050" (1.27mm)	5141380	5141327	3004	—
		1/8" (3.18mm)	0.085" (2.16mm)	5141346	5141410	3010	30108
		1/16" (4.76mm)	0.147" (3.73mm)	5141332	5141413	3020	—
	Type 304 Stainless Steel	1/4" (6.35mm)	0.210" (5.33mm)	5141333	5141412	3030	—
		1/8" (9.53mm)	0.305" (7.75mm)	5141334	5141411	3032†	—

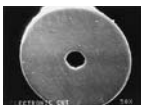
*Meters based on closest estimate; feet being exact. †40' coil.

EDM-Cut Stainless Steel Tubing

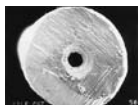
- Highly polished, burr-free ends
- Ultra-low volume connections
- Ultrasonically cleaned and passivated for maximum inertness
- Cut using an Electronic Discharge Machine (EDM)
- Color-coded caps identify internal diameter

EDM-Cut Stainless Steel Tubing Specifications

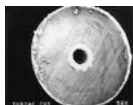
Material:	316 Grade Stainless Steel
Maximum Temperature:	500°C
Maximum Pressure:	Varies according to i.d.*
Typical Use:	High-Pressure Plumbing



EDM Cut



File Cut



Abrasive Cut

EDM-Cut Stainless Steel Tubing

Cap Color	i.d. (10/pk)	Length	Part No.
Red	0.005"	4cm	97001
		5cm	97006
		10cm	97011
		20cm	97016
		30cm	97021
Black	0.007"	5cm	97026
		10cm	97031
		20cm	97036
		30cm	97041
Blue	0.010"	5cm	97046
		10cm	97056
		20cm	97061
		30cm	97066
Green	0.020"	5cm	97076
		10cm	97081
		20cm	97086
		30cm	97091

EDM-Cut Stainless Steel Tubing Kits



6263

EDM-Cut Stainless Steel Tubing Kits

Description	Tubing i.d.	Part No.
Standard Tubing Kit—Includes 10 pieces 5cm and 10cm tubing	0.005"	97132
	0.007"	97134
	0.010"	97136
	0.020"	97138
	0.030"	97141
Deluxe Tubing Kit—10 pieces—5cm x 0.010, 10cm x 0.010, 5cm x 0.020, 10cm x 0.020	Varies	97131
5 pieces—2cm x 0.010, 2cm x 0.020		
2 pieces—5cm x 0.030, 10cm x 0.030, 20cm x 0.030		

Low-Pressure Tubing

Tefzel® Tubing

- Higher pressure rating compared to PTFE tubing



5530

Tefzel® Tubing Specifications	
Material:	Tefzel®
Maximum Temperature:	100°C
Maximum Pressure:	Varies by Size, See Price Block
Typical Use:	Low-Pressure Plumbing

Tefzel® Tubing

o.d.	i.d.	Length	psig	Part No.
1/16"	0.007"	10'	4000	35681
1/16"	0.007"	50'	4000	35682
1/16"	0.010"	10'	3600	35685
1/16"	0.010"	50'	3600	35686
1/16"	0.020"	10'	3200	35699
1/16"	0.020"	50'	3200	35672
1/16"	0.030"	10'	2500	35701
1/16"	0.030"	50'	2500	35673

PTFE Tubing

- Maximum inertness



5531

PTFE Tubing Specifications	
Material:	PTFE
Maximum Temperature:	100°C
Maximum Pressure:	Varies by Size, See Price Block
Typical Use:	Low Pressure Plumbing

PTFE Tubing

o.d.	i.d.	Length	psig	Part No.
1/16"	0.007"	10'	1600	35677
1/16"	0.007"	50'	1600	35678
1/16"	0.010"	10'	1500	20064
1/16"	0.010"	50'	1500	35669
1/16"	0.020"	10'	1200	20033
1/16"	0.020"	50'	1200	35668
1/16"	0.030"	10'	900	20031
1/16"	0.030"	50'	900	35670
1/16"	0.040"	10'	600	20106
1/16"	0.040"	50'	600	3132
1/8"	0.063"	10'	900	20063
1/8"	0.063"	50'	900	35671
1/8"	0.100"	10'	300	20096
1/8"	0.100"	50'	300	3134
0.160"	0.125"	10'	300	35667
0.160"	0.125"	50'	300	35674
1/4"	0.125"	50'	900	3136

Color-Coded PTFE Tubing

- Color-coded for easy identification of i.d.



5532

Color-Coded PTFE Tubing Specifications	
Material:	PTFE
Maximum Temperature:	100°C
Maximum Pressure:	Varies by Size, See Price Block
Typical Use:	Low-Pressure Plumbing

Color-Coded PTFE Tubing

Color	o.d.	i.d.	Length	psig	Part No.
Blue	1/16"	0.010"	10'	1500	35660
	1/16"	0.010"	50'	1500	35661
Orange	1/16"	0.020"	10'	1200	35662
	1/16"	0.020"	50'	1200	35663
Green	1/16"	0.030"	10'	900	35664
	1/16"	0.030"	50'	900	35665

Low Permeation Tubing

- Eliminates regassing without sacrificing inertness
- Flexible, convenient, and versatile
- Easy to install and use



5533

This low-pressure tubing has a double wall to prevent mobile phase regassing. The inert inner PTFE wall carries the mobile phase. The non-wetted outer wall is made from a translucent, flexible polymer with extremely low gas permeability. This low permeation tubing cuts regassing rates to negligible levels, while preserving PTFE's chemical resistance, visibility, and handling properties. Use with low permeation fittings kit.

Low Permeation Tubing Specifications	
Material:	PTFE, Proprietary Non-Wetted Outer Layer
Maximum Temperature:	100°C
Maximum Pressure:	900psig
Typical Use:	Low-Pressure Plumbing

Low Permeation Tubing

o.d.	i.d.	Length	Part No.
1/8"	1.5mm	10'	47100
1/8"	1.5mm	50'	47102

Low Permeation Fittings Kit

Description	Part No.
1/4-28 Low Permeation Fittings Kit*	47120

*Includes 10 nuts, 10 ferrules, 10 inserts.

Stainless Steel Tubing

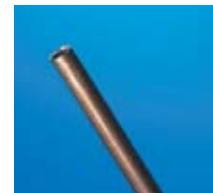
AT™ Steel—Activity Tested Steel Tubing

Delivers the Strength of Stainless Steel and the Inertness of Deactivated Fused Silica

- Flexible, and strong
- Maximum temperature limit of 340°C–350°C

A combination of chemical vapor deposition techniques and silicone chemistries transform durable stainless steel tubing into a chromatographically inert material. AT™ Steel activity tested steel tubing is suitable for sample loops, transfer lines, capillary, and packed GC columns.

AT™ Steel may be cut with standard tubing cutters or high speed wheel cutters and can be rinsed with common solvents to remove particulates and contamination that have built up during use. To ensure a truly inert pathway, use AT™ Steel treated fittings. Sold separately below.



5105

AT™ Steel Tubing

i.d.	6ft Length Part No.	25ft Length Part No.	50ft Length Part No.	100ft Length Part No.
<i>1/32" o.d. Tubing</i>				
0.021"	11085	11086	11087	11088
<i>1/16" o.d. Tubing</i>				
0.010"	11060	11061	11062	11063
0.020"	11064	11065	11066	11067
0.030"	11068	11069	11070	11071
0.040"	11072	11073	11074	—
<i>1/8" o.d. Tubing</i>				
0.085"	11076	11077	11078	—
<i>1/4" o.d. Tubing</i>				
0.210"	11092	11093	—	—

AT™ Steel Unions

Description	Part No.
1/8"–1/16" Reducing Union	11080
1/16" Union	11081
1/8" Union	11082

AT™ Steel Tees

Description	Part No.
1/16" Tee	11083
1/8" Tee	11084

Fittings are Parker-Hannifin® A-Lok® fittings with two-piece ferrules that have been chemically modified for improved inertness.

Straight Stainless Steel Tubing

- Type 304 Stainless Steel
- 6ft or 10ft lengths



5097

Straight Stainless Steel Tubing

o.d.	i.d.	Length*	Qty.	Part No.
1/8" (3.18mm)	0.085" (2.16mm)	6ft	10	30106ST
1/8" (3.18mm)	0.085" (2.16mm)	10ft	10	301010ST
1/4" (6.35mm)	0.210" (5.33mm)	6ft	10	30306ST
1/4" (6.35mm)	0.210" (5.33mm)	10ft	10	303010ST

*10ft lengths must ship via motor freight.

PTFE-Coated Stainless Steel Tubing

- Sturdy SS tube with 0.001" thick PTFE coating
- Must be preconditioned at 250°C for three hours



5103

PTFE-Coated Stainless Steel Tubing

o.d.	i.d.	Length	Part No.
1/8" (3.18mm)	0.085" (2.16mm)	per ft*	31421
1/8" (3.18mm)	0.085" (2.16mm)	50ft	3142
1/4" (6.35mm)	0.210" (5.33mm)	per ft*	31441
1/4" (6.35mm)	0.210" (5.33mm)	50ft	3144

*Minimum tubing order is 3ft.

tech tip

Choosing a tubing material for GC analysis.

A number of options are available for packed column tubing. The most inert material is glass, which should be used for active compounds. Glass-lined tubing and AT™ Steel provide the inert surface of glass combined with the mechanical strength of a metal column.

Metal tubing provides an economical and rugged column for suitable application. Passivated nickel tubing can frequently be used with active compounds such as phenols and amines. Stainless steel tubing is recommended for hydrocarbon, fixed gas, and solvent analyses where column inertness is less of a concern.

PTFE tubing is extremely inert, but due to temperature limitations and poor column efficiency, PTFE is generally only recommended for the analysis of corrosive gases which are too reactive for glass.

Glass-Lined Stainless Steel Tubing (GLT)

- Flow lines for corrosives
- GC/MS interfaces
- Capillary column connections



5101

Glass-Lined Stainless Steel Tubing

o.d.	i.d.	Length	Part No.
1/16" (1.59mm)	0.3mm	180cm	3137
1/16" (1.59mm)	0.5mm	180cm	3164
1/16" (1.59mm)	0.7mm	180cm	3139
1/8" (3.18mm)	0.75mm	180cm	3166
1/8" (3.18mm)	1.0mm	180cm	3168
1/8" (3.18mm)	1.5mm	180cm	3170
1/8" (3.18mm)	1.8mm	180cm	3141
1/4" (6.35mm)	4.0mm	180cm	3149

Metal Tubing

Aluminum Tubing

- Economical choice for GC gas lines



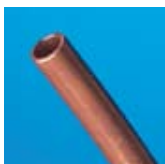
5106

Aluminum Tubing

o.d.	i.d.	Length	Part No.
1/8" (3.18mm)	0.065" (1.65mm)	50ft	3090
3/16" (4.76mm)	0.128" (3.25mm)	50ft	3100
1/4" (6.35mm)	0.190" (4.83mm)	50ft	3110
3/8" (9.53mm)	0.315" (8.00mm)	50ft	3120

Copper Tubing

- Economical choice for GC gas lines



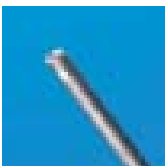
5100

Copper Tubing

o.d.	i.d.	Length	Part No.
1/8" (3.18mm)	0.065" (1.65mm)	50ft	3040
3/16" (4.76mm)	0.128" (3.25mm)	50ft	30509
1/4" (6.35mm)	0.190" (4.83mm)	50ft	30609
3/8" (9.53mm)	0.315" (8.00mm)	50ft	30709

Nickel Tubing

- Pure Nickel 200, more inert than stainless steel
- Acid washed and rinsed for additional inertness



5099

Nickel Tubing

o.d.	i.d.	Part No.
<i>50-Foot Coil</i>		
1/16" (1.59mm)	0.010" (0.25mm)	3083
1/16" (1.59mm)	0.020" (0.51mm)	3131
1/16" (1.59mm)	0.040" (1.02mm)	3085
1/8" (3.18mm)	0.083" (2.11mm)	3080
1/4" (6.35mm)	0.210" (5.33mm)	3081
<i>200-Foot Coil</i>		
1/16" (1.59mm)	0.010" (0.25mm)	30832
1/16" (1.59mm)	0.020" (0.51mm)	31312

PTFE-Lined Stainless Steel Tubing

- Ideal for use with reactive chemicals and for trace quantities of water
- Order PTFE ferrules to grip SS and PTFE portions of tubing below



5102

PTFE-Lined Stainless Steel Tubing

o.d.	i.d.	Length	Qty.	Part No.
1/8" (3.18mm)	0.070" (1.78mm)	6ft	1	3152
1/8" (3.18mm)	0.070" (1.78mm)	10ft	1	3154
1/4" (6.35mm)	0.180" (4.57mm)	6ft	1	3156

Polymeric Tubing

- Maximum Inertness



5104a

PFA (Perfluoroalkoxy) Tubing

PFA (Perfluoroalkoxy) Tubing

o.d.	i.d.	Length	Part No.
1/16" (1.59mm)	0.030" (0.76mm)	25ft	45734
1/8" (3.18mm)	0.062" (1.57mm)	25ft	45735
1/4" (6.35mm)	0.156" (3.96mm)	25ft	45736

FEP (Fluorinated Ethylene Polypropylene) Tubing

FEP (Fluorinated Ethylene Polypropylene) Tubing

o.d.	i.d.	Length	Part No.
1/16" (1.59mm)	0.030" (0.76mm)	25ft	45739
1/8" (3.18mm)	0.062" (1.57mm)	25ft	45740
1/4" (6.35mm)	0.156" (3.96mm)	25ft	45741

Polypropylene/Polyethylene Tubing

Polypropylene/polyethylene Tubing

o.d.	i.d.	Type	Length	Part No.
1/8" (3.18mm)	0.080" (2.03mm)	PP	50ft	3203
1/8" (3.18mm)	0.080" (2.03mm)	PP	100ft	3201
1/4" (6.35mm)	0.125" (3.17mm)	PE	50ft	3207
1/4" (6.35mm)	0.125" (3.17mm)	PE	100ft	3205



related products

Need fittings?

See pages 282–285 for a complete selection of GC fittings.

PEEKsil™ Tubing

- Inert fused silica bonded to PEEK
- Square cut and polished tubing ends for zero dead volume connections
- Ideal for plumbing micro, capillary and nano LC systems



SGE's PEEKsil™ tubing maintains the easy handling and convenience of PEEK tubing, but offers the tight i.d. tolerances that can only be offered with fused silica.

Each PEEKsil™ tubing end is cut to an exact 90° angle and polished smooth to ensure a true zero dead volume connection. Tubing is color-coded to identify i.d. It is the ideal choice for plumbing capillary and micro LC systems where conventional 1/16" or 1/32" fittings are used.



PEEKsil™ Tubing Specifications

Material:	Fused Silica-Lined PEEK
Maximum Temperature:	100°C
Typical Use:	Plumbing Capillary LC Systems
Maximum Pressure:	15,000psig

PEEKsil™ Tubing, 1/16 o.d.

Color	i.d. (mm)	Length			
		10cm 5/pk Part No.	15cm 5/pk Part No.	20cm 5/pk Part No.	50cm 2/pk Part No.
Orange	0.025	226	227	228	229
Natural	0.050	252	254	253	250
Black	0.075	291	292	293	294
Red	0.100	302	304	303	300
Purple	0.150	231	232	233	234
Yellow	0.175	352	354	353	350
Blue	0.200	403	406	404	401
Grey	0.300	416	417	418	419

Fused Silica Capillary Tubing

- Tight size tolerances for maximum reproducibility
- Easy to cut to desired length



High quality fused silica tubing is commonly used to plumb capillary LC systems due to the size availability and extremely tight tolerances. All tubing below has 360µm outer diameter.

Fused Silica Capillary Tubing Specifications

Material:	Polyimide-Coated Fused Silica
Maximum Temperature:	350°C
Maximum Pressure:	Limited by connection system
Typical Use:	Plumbing Capillary LC Systems

Fused Silica Capillary Tubing

i.d. (mm)	1 meter Part No.	15 meter Part No.
0.025	991100	—
0.050	602035	—
0.100	602036	—
0.180	19603	602014*
0.250	602600	602615
0.320	603600	603615
0.450	19602	—

*Length for 0.180mm is 10 meter.

Micro-Tubing

- Consistent square cut for low volume connections

Use micro-tubing for connecting fused silica capillaries to ensure proper low volume connections with your micro LC applications.



Micro Tubing

Color	Reduction	Part No.
Red	1/16" to 127µm o.d.	3109278
Yellow	1/16" to 178µm o.d.	3109280
Natural	1/16" to 229µm o.d.	3109282
Blue	1/16" to 280µm o.d.	3109283
Orange	1/16" to 330µm o.d.	3109284
Red	1/16" to 360µm o.d.	3109299
Green	1/16" to 380µm o.d.	3109285
Black	1/16" to 457µm o.d.	3109286
Natural	1/16" to 533µm o.d.	3109287

Tubing Cutters



Rotary Tubing Cutter

- Cuts 1/32" to 1/8" o.d. tubing burr-free
- Leaves tubing i.d. open
- Works with metal and glass-lined tubing



5110

Heavy-duty Tubing Cutter

- Inexpensive, well-built tool
- Cuts 1/8" to 1-1/8" o.d. tubing
- Works with metal tubing



5113

Plier-type Tubing Cutters

- Cuts 1/16" o.d. tubing
- Ideal for cutting tubing in tight places
- Cuts metal or plastic tubing



3306

Ceramic Fused Silica Cutter

- Cleanly cuts fused silica tubing
- Small enough to keep handy in your pocket
- Just score and snap



4502

Electric Tubing Cutter

- Cut 1/16", 1/8", and 1/4" o.d. tubings with internal diameters as small as 0.008"
- Requires no lubricant or cutting fluid
- Assures square and burr-free cuts



6281

Clean-cut Tubing Cutter

- Use with PTFE, Tefzel®, Polyolefin, PEEK
- Make clean, square cuts without deforming inner diameters
- Cuts 1/32" to 1/8" o.d.



5377

Plastic Tubing Cutter

- Ideal for PEEK, Tefzel®, and other plastic tubing
- Cuts any size up to 1/4" o.d.



5376

Tubing Cutters

Description	Qty.	Part No.
<i>Rotary Tubing Cutter</i>	ea	3165
Replacement Cutting Wheels	3	3167
<i>Heavy-Duty Tubing Cutter</i>	ea	13995
Replacement Cutting Wheels	3	13981
<i>Plier-Type Tubing Cutter</i>	ea	3169
<i>Ceramic Fused Silica Cutter</i>	5	3194
<i>Electric Tubing Cutter 110–120/220–240VAC, 50/60Hz</i>	ea	10-0200
<i>Replacement Parts and Accessories</i>		
Dressing Tool for 1/8" and 1/4" o.d. Tubing	ea	10-0118
Replacement Cutting Wheels	3	10-0124
Replacement Dressing Tool for 1/16" o.d. Tubing	ea	10-0116
<i>Clean-Cut™ Tubing Cutter</i>	ea	35902
Replacement Blade	ea	35903
<i>Plastic Tubing Cutter</i>	ea	3206
Replacement Blade	ea	3214

Tubing Accessories

Flex-wrap Tubing

- Holds parallel tubing or wiring together
- Ideal for gradient pumps or purging-gas lines
- Chemically inert 100% PTFE



2357

Flex-Wrap Tubing

Color	1/8"–1/2" Part No.	3/16"–1" Part No.	1/4"–2" Part No.
Blue	35913	35923	35933
Orange	35914	35924	35934
Black	35916	35926	35936
White	35917	35927	35937

Cable Turtles

- Neat, easy way to organize messy cables
- Patented "Turtle" stores and conceals excess cords



4174

Flexible rubber cup opens to let you coil extra cables, cords, tubing, or wires. Small Cable Turtle will holds up to 1 meter of standard appliance cord, and 3 meters of telephone wire. Large Cable Turtle holds up to 1 meter of thick instrument cord, 2 meters of standard appliance cord, or 6 meters of telephone wire.

Cable Turtles

Description	Qty.	Part No.
<i>Small</i>		
Red	5/pk	5274
Blue	5/pk	5276
Black	5/pk	5278
Grey	5/pk	5280
<i>Large</i>		
Red	4/pk	5282
Blue	4/pk	5284
Black	4/pk	5286
Grey	4/pk	5288

Organizers

HPLC Columns and Accessories Organizers

- Holds 10 HPLC columns
- 17 compartments
- PVC construction
- 12" H x 24" W x 6" D
(30.48cm H x 60.96cm W x 15.24cm D)



HPLC Columns Organizers

- 30 HPLC columns
- Wall-mounts with two screws
- PVC construction with acrylic doors
- 17-3/8" H x 15" W x 2-7/8" D
(44.18cm H x 38.1cm W x 7.3cm D)



Plastic Box with Removable Dividers

- 13 removable dividers
- Ideal for fittings and bore-cut tubing



Lab Organizer with Adjustable Bins

- 14 adjustable dividers, 4 shelves
- PVC construction
- 20" H x 24" W x 10.5" D
(50.8cm H x 60.9cm W x 26.7cm D)



GC Column and Accessory Organizers

- 5-Column Organizer:
13" H x 10.5" W x 14" L
(33cm H x 26.5cm W x 35.5cm L)
- 10-Column Organizer:
12.75" H x 10.5" W x 25" L
(32cm H x 26.5cm W x 63.5cm L)



Organizer Box

- 9-compartment organizer includes eight 1-3/8" x 1-5/8" (3.5cm x 4.13cm) slots and one 1-1/8" x 3-1/4" (2.8cm x 8.2cm) slot
- 18-compartment organizer includes twelve 2" x 2" (5cm x 5cm) slots and six 2" x 4-3/16" (5cm x 10.6cm) slots



Organizers	
Description	Part No.
HPLC Supplies Organizer	5238
HPLC Column Storage Unit	5240
Plastic Storage Box with Removable Dividers	803880
Lab Organizer with Adjustable Bins	5242
GC Column and Accessory Organizers	
GC Column Organizer, 5-Column	6390
GC Column Organizer, 10-Column	6392
Organizer Box	
9-Compartment Box	6264
18-Compartment Box	6266

related products
Looking for vial organizers
and storage racks?
See pages 380 and 381.



Tools

Magnifiers

- For inspecting capillary column ends



20X Magnifier

5325

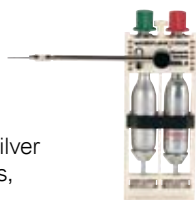


Lighted Magnifying Glass

2156

Deluxe Torch Kit

- Ideal for sealing the ends of capillary columns
- Kit contains the torch, six Micronox cylinders, three butane cylinders, six silver soldering rods, flux tube, two flame tips, one butane tip, one spark lighter, and complete instructions



5181

Capillary Tool Kit

- Kit includes diamond scribe, two open end wrenches, PTFE-coated forceps, ruler, ferrule pick, 10' high temperature string, 20X magnifier, and pipe cleaner



5179

23-Piece Tool Kit in Zippered Case

- Kit includes seven screwdrivers, adjustable wrench, two pliers, wire stripper, knife, alignment tool, stainless rule, hex key set, scissors, two flexible files, burnisher, miniature soldering iron, solder aid, coil of solder, and desoldering braid



5323

Adjustable Wrench

- Chrome-Plated



5322

Open-End Wrench

- Chrome-Plated



5321

Handy-Lok Fitting Wrench

- Ideal for connections on injection valves



5641

9-Way Wrench

- For use with gas cylinders



5178

Miniature Files, Fine Cut

- Set includes six different-shaped, 5-1/2" long files
- Made of hard chrome steel suitable for smoothing and deburring



6279

Miniature Reamers

- Set includes six different sizes: 0.028"/0.018", 0.040"/0.026", 0.048"/0.032", 0.080"/0.050", 0.085"/0.053", 0.104"/0.062"



5324

Flame Checker

- Pivoting mirror head fogs when flame is lit



5715

Tools

Description	Qty.	Part No.
Magnifier, 20X	ea	3163
Magnifier, Lighted (includes battery)	ea	3196
Deluxe Torch Kit		14606
Micronox Cylinders	6/pk	14602
Butane Cylinders	6/pk	14603
Piercing Knob, Butane	ea	14604
Piercing Knob, Micronox	ea	14605
Capillary Tool Kit	ea	16879
23-Piece Tool Kit and Case	ea	16533
Adjustable Wrench		
4" Long—1/2" Capacity	ea	16549
6" Long—3/4" Capacity	ea	3211
8" Long—7/8" Capacity	ea	16522
Open-End Wrench		
1/4" x 5/16"—Fits 1/16" Fitting Nuts	ea	1998
7/16" x 1/2"—Fits 1/8" and 3/16" Fitting Nuts	ea	1999
9/16" x 5/8"—Fits 1/4" and 3/8" Fitting Nuts	ea	2000
Handy-Lok Fitting Wrench	ea	35761
9-Way Cylinder Wrench	ea	412933
Miniature Files, Fine Cut	6/pk	7237
Miniature Reamers	6/pk	7330
Flame Checker	ea	7047